

U.S. DEPARTMENT OF COMMERCE

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NATIONAL OCEANIC AND ATMOSPHERIC  
ADMINISTRATION (NOAA)

HYDROGRAPHIC SERVICES REVIEW PANEL

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PUBLIC MEETING

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TUESDAY  
APRIL 18, 2017

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The Hydrographic Services Review  
Panel met in the Kimpton Hotel Monaco, Paris  
Ballroom, 1101 4th Avenue, Seattle, Washington,  
at 8:30 a.m., William Hanson, Chair, presiding.

MEMBERS PRESENT

WILLIAM HANSON, HSRP Chair  
JOYCE E. MILLER, HSRP Vice Chair  
DR. LAWSON W. BRIGHAM  
LINDSAY GEE  
KIM HALL  
EDWARD J. KELLY  
CAROL LOCKHART  
DR. DAVID MAUNE  
SCOTT R. PERKINS  
CAPTAIN SALVATORE RASSELLO  
  
EDWARD J. SAADE  
  
SUSAN SHINGLEDECKER  
  
GARY THOMPSON

## NON-VOTING MEMBERS

ANDY ARMSTRONG, Co-Director, NOAA/University  
of New Hampshire Joint Hydrographic  
Center

JULIANA BLACKWELL, Director, National  
Geodetic Survey, NOS

RICH EDWING, Director, Center for  
Operational Oceanographic Products and  
Services, NOS

DR. LARRY MAYER, Co-Director,  
NOAA/University of New Hampshire Joint  
Hydrographic Center

## STAFF PRESENT

REAR ADMIRAL SHEP SMITH, HSRP Designated  
Federal Official; Director, Office of  
Coast Survey

RUSSELL CALLENDER, Assistant Administrator,  
NOS

MIKE ASLAKSEN, Chief, Remote Sensing  
Division, NGS

MARK ARMSTRONG, Geodetic Regional Advisor,  
NOAA/NGS

GLENN BOLEDOVICH, Policy Director, NOS  
CAPTAIN RICK BRENNAN, Chief, Hydrographic  
Surveys Division

JIM CROCKER, Chief, Navigation Services  
Division

BEN EVANS, Chief, Coast Survey Pacific  
Hydrographic Branch

RACHEL MEDLEY, Acting Deputy Hydrographer  
LYNNE MERSFELDER-LEWIS, HSRP Coordinator  
ROLIN MEYER, Branch Chief, Field Operations  
Division, CO-OPS

TRAVIS NEWMAN, Marine Chart Division  
AMANDA PHELPS, Budget and Program Analyst,  
OCS

JIM RICE, NOAA/NOS

E.J. VAN DEN AMEELE, Chief, Coast Survey  
Development Laboratory

**SPEAKERS**

**JOSHUA BERGER, Governor's Maritime Sector**

**Lead, Washington State Department of  
Commerce**

**CAPTAIN JASON R. HAMILTON, Commanding**

**Officer, USCG Cutter Healy, U.S. Coast  
Guard**

**JEFF HUMMEL, Director, Sales and Marketing,**

**Rose Point Navigation Systems**

**TRAVIS NEWMAN, Marine Chart Division, Office**

**of Coast Survey, NOS**

**JAN A. NEWTON, NANOOS Executive Director;**

**Principal Oceanographer, Applied**

**Physics Lab, University of Washington**

**LIEUTENANT COLONEL ANDREW L. OLSON, Deputy**

**Commander, Seattle District, U.S. Army**

**Corps of Engineers**

**JEFF SIEGEL, President, ActiveCaptain**

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## P-R-O-C-E-E-D-I-N-G-S

8:30 a.m.

CHAIR HANSON: Good morning. Can we all take our seats and we'll get started, almost on time. Too many excuses later on during the day.

Good morning, everyone. My name is Bill Hanson. I'm Chair of the Hydrographic Services Review Panel. I both call to order and welcome all to the Panel's Spring meeting.

It's great to be in the Pacific Northwest and the great City of Seattle. We can tell by the attendance here that it's been a while since we've been here and it's probably something we need to pay a lot more attention to.

My thanks to Panel members and staff for putting together a robust program. Our program also includes presentations by our Federal partners and NOAA leadership, who are well-represented, and as is the custom and our usual practice, we have presentations from spokespersons representing prominent, local and

1 regional organizations.

2 We'll do our best to stay on schedule,  
3 but we also recognize we're here for a reason,  
4 and we all want to contribute and we may have  
5 questions to ask. But we look forward, as you  
6 do, to making the most of our time here, as we  
7 have much to discuss and do over the next three  
8 days. So, let's go ahead and get started.

9 Let me begin by introducing Rear  
10 Admiral Shep Smith, our Federal Designated  
11 Officer and Director of NOAA's Office of Coast  
12 Survey.

13 During his 23 year NOAA career, he has  
14 advanced -- advances in start-of-the-art  
15 hydrography and cartography in commanding several  
16 NOAA vessels. A full biography on Admiral Smith  
17 is in your meeting materials.

18 Admiral Smith, it's an honor to have  
19 you with us as our Federal Designated Officer.  
20 Please share with us your opening remarks.

21 RADM SMITH: Thank you, Bill. Just a  
22 few housekeeping things first.

1           Emergency exits are in the corners of  
2 the room, and then you go upstairs. The  
3 bathrooms are back there.

4           So, we're honored to have such a  
5 robust group of experts here, but I did want to  
6 acknowledge the representatives of our elected  
7 officials in the room.

8           Up in the front we have Josh Berger  
9 from the Governor of Washington. I think Beth  
10 Osborne is here from Senator Murray's office, and  
11 is Anne Johnson from the State of Alaska here?  
12 Great. Well, thank you all for coming. It's a  
13 real honor.

14           I also wanted to acknowledge that  
15 there are a lot of technical experts here that we  
16 brought from the NOAA staff, that are -- that are  
17 here to answer questions, and I hope can be  
18 involved in the conversation over the course of  
19 the week, and we shouldn't hesitate to -- to  
20 reach back to them to -- for a little bit of  
21 context, when we get into some of the issues.

22           So, but first, let me introduce.



1 There's regional staff. Rolin Meyer from the --  
2 is the Chief of Pacific Operations for CO-OPS.  
3 Mark Armstrong is the National Geodetic Survey  
4 regional point of contact from Oregon, and  
5 Crescent Moegling is the Navigation Services  
6 Managers and she's en route.

7 Mike Aslaksen is -- Mike is here from  
8 the Remote Sensing Division of NGS. This is -- a  
9 bridge program really, between NGS and Coast  
10 Survey. They do a lot of shoreline mapping  
11 that's critical to our charting.

12 New to his role is Captain E.J. Van  
13 Den Ameele from the Coast Survey Development Lab.  
14 E.J. has a long career as a NOAA hydrographer in  
15 marine operations. Happy to -- happy to have him  
16 join.

17 Jim Crocker at the Navigation Services  
18 Division is just two weeks into his current  
19 assignment. He's part of the group that oversees  
20 the NRTs and the navigation managers and the sort  
21 of public face of Coast Survey.

22 Travis Newman, who I don't think many

1 of you have met, is one of the Branch Chiefs in  
2 the Marine Chart Division and will be briefing on  
3 national charting plan.

4 Rachel Medley is here. She's a -- the  
5 Acting Deputy Hydrographer on my staff.

6 You probably all know Lynn Mersfelder-  
7 Lewis and may have met Amanda Phelps, who put a  
8 lot of this together.

9 We've got Sam Debow is here, also from  
10 Coast Survey staff, and many others.

11 So, those were the -- oh, I skipped  
12 over Rick. Captain Rick Brenna, Hydro Surveys  
13 Division.

14 Glenn Boledovich, who I think most of  
15 you know and Jim Rice.

16 So, I could keep introducing, but  
17 those are the folks that I really wanted to call  
18 out as being a resource for all of us to  
19 participate in.

20 CHAIR HANSON: Thank you, Admiral  
21 Smith, and appreciate you bringing folks here,  
22 because it certainly helps us with the

1 discussion, helps us reach conclusions, rather  
2 than just putting issues off for the next phone  
3 call, the next webinar. So, appreciate the  
4 participation.

5 Just for our Panel members and other  
6 speakers just to let you know how ground breaking  
7 and clairvoyant this group can be.

8 At our August meeting, August and  
9 September meeting last year in Cleveland, this  
10 group actually predicted the Cubs-Indians World  
11 Series, and also the Cubs win. Now, as a White  
12 Sox fan, that wasn't necessarily my choice. But  
13 that's the way things go. It's baseball.

14 So, lot of expertise around the table,  
15 and so, we appreciate the participation. I'm  
16 going to let the Panel members introduce  
17 themselves now, and I'll start off with Joyce.

18 VICE CHAIR MILLER: Hi, I'm Joyce  
19 Miller. I'm co-chair -- or I'm vice-chair of the  
20 HSRP and -- co-chair, but whatever, and I'm a  
21 semi-retired hydrographer. Spent almost my  
22 entire career in multi-beam mapping, and my last

1 -- I was last with University of Hawaii, and  
2 Dave.

3 MEMBER MAUNE: I'm Dave Maune from  
4 Dewberry. I'm a specialist with LIDAR SR  
5 photogrammetry and a little bit of sonar.

6 MR. EDWING: Morning. I'm Richard  
7 Edwing. I'm the director of the Center for  
8 Operational Oceanographic Products and Services.

9 MEMBER HALL: Good morning. I am Kim  
10 Hall. I am with the Brizo Maritime Consulting,  
11 which is my own independent maritime security  
12 non-cooperation consultancy.

13 MEMBER KELLY: Good morning. Ed  
14 Kelly. I'm the executive director of the  
15 Maritime Association in the Port of New York and  
16 New Jersey. We represent the interests of the  
17 commercial maritime industry in that area.

18 MEMBER SHINGLEDECKER: I'm Susan  
19 Shingledecker. I am vice president of Boat US  
20 Foundation. Boat US is the boat owner's  
21 association of the United States and our  
22 foundation educates boaters to be safe and to

1 take care of their waterways.

2 MEMBER THOMPSON: Good morning. I'm  
3 Gary Thompson. I'm the chief of the North  
4 Carolina Geodetic Survey.

5 MEMBER PERKINS: Good morning. Scott  
6 Perkins. Director of Federal Programs for the  
7 surveying and mapping. Consider myself a map-  
8 maker, as well. I like how you describe that,  
9 Dave. We measure the world from many  
10 perspectives. We measure success from yours.

11 MEMBER RASSELLO: My name is Sal  
12 Rassello. I am a cruise ship captain. I'm the  
13 end user of the NOAA products, and I cover the  
14 position of Nautical Director of Carnival Cruise  
15 Line in Miami.

16 MEMBER LOCKHART: Good morning. I'm  
17 Carol Lockhart. I'm the owner of a woman-owned  
18 small business, Hydrographic Surveys and  
19 Geomatics Data Solutions and my expertise is in  
20 LIDAR and multi-beam.

21 MEMBER BRIGHAM: Good morning. I'm  
22 Lawson Brigham. Professor at University of

1 Alaska Fairbanks. I chair a small working group  
2 here on the Arctic within the HSRP.

3 MS. BLACKWELL: Juliana Blackwell.  
4 The director of NOAA's national geodetic survey.

5 MEMBER SAADE: I'm Ed Saade. I'm the  
6 president of Fugro USA and the regional director  
7 for the Americas for Fugro. Fugro is the largest  
8 surveying American company -- marine survey and  
9 mapping company in the world, and we're one of  
10 the NOAA survey backlog contractors.

11 MEMBER GEE: Good morning. I'm  
12 Lindsay Gee. I'm a consultant from Portsmouth,  
13 New Hampshire, and we've had -- we're co-chairs  
14 of the technology working group.

15 MR. ARMSTRONG: I'm Andy Armstrong.  
16 I'm the NOAA co-director of the NOAA University  
17 of New Hampshire Joint Hydrographic Center.

18 DR. MAYER: And I'm Larry Mayer of the  
19 UNH, co-director of the joint hydrographic center  
20 and director for the Center for Coastal and Ocean  
21 Mapping at the University of New Hampshire.

22 CHAIR HANSON: If we can also have the

1 audience also introduce yourselves. We'll go  
2 around the room. The point of all of this is  
3 just so we can kind of know who is in the room  
4 and get a sense of the expertise and the breadth  
5 of knowledge and opportunity we have.

6 So, let's see, where do we want to  
7 start? Rachel, just because you're there.

8 MS. MEDLEY: Okay, Rachel Medley,  
9 acting deputy hydrographer. Thank you.

10 MR. BOLEDOVICH: Good morning. I'm  
11 Glen Boledovich. I'm the policy director of  
12 NOAA's national ocean service.

13 MR. RICE: Jim Rice. I work in NOS  
14 policy.

15 MS. PHELPS: Amanda Phelps. OCS  
16 budget and program analyst.

17 MS. MERSFELDER-LEWIS: Lynn  
18 Mersfelder-Lewis. I'm the purchase RP program  
19 coordinator.

20 CAPT. BRENNAN: Rick Brennan. Chief  
21 of the Hydrographic Surveys Division.

22 MR. CROCKER: Jim Crocker. Chief of

1 the Navigation Services Division.

2 MR. VAN DEN AMEELE: E.J. Van Den  
3 Ameele. Chief of the Coast Survey Development  
4 Laboratory.

5 MR. NEWMAN: Travis Newman. Marine  
6 Division. I'm Branch Chief for the area of west  
7 coast. We do all the nautical charting products  
8 for the west coast.

9 MR. ARMSTRONG: I'm Mark Armstrong.  
10 NGS Geodetic Region advisor.

11 MR. EVANS: Ben Evans. I'm the chief  
12 of the coast survey Pacific hydrographic branch.  
13 We do the quality control and preliminary  
14 compilation for the west coast surveys.

15 MR. MEYER: Rolin Meyer. Branch chief  
16 for field operations division under CO-OPS, the  
17 Seattle Pacific operations branch.

18 MR. ASLAKSEN: Mike Aslaksen. Chief  
19 Remote Sensing Division. National geodetic  
20 survey.

21 RADM SMITH: Mike, I've got a question  
22 for you. How many HSRPs have you been to?



1 MR. ASLAKSEN: A lot. Negative. Sam,  
2 where is Sam at? Sam, would know. Sam's the  
3 legacy here.

4 MS. ANDERSON: I'm Kym Anderson. I'm  
5 chief of navigation for Seattle District Corp of  
6 Engineers.

7 MR. DICKSON: Dorrel Dickson.  
8 Geospatial survey analyst for the Tulalip Tribes.

9 MR. HANSON: Eric Hanson with  
10 Portsmouth, Seattle and Tacoma.

11 MR. DASLER: Jon Dasler. Director of  
12 marine services at Dave Evans and Associates.

13 MR. BORBASH: Good morning. Matt  
14 Borbash. I'm the deputy assistant chief of staff  
15 for operations Naval Meteorology and Oceanography  
16 Command.

17 MS. JOHNSON: Anne Johnson. State of  
18 Alaska Geospatial Council.

19 MR. STEENSTRUP: Per Steenstrup.  
20 Hydrographer at eTrac, Inc.

21 MR. BERRY: Aaron Berry. Project  
22 manager for Kongsberg Underwater Technology.

1 MR. SIEGEL: Jeff Siegel. I'm the  
2 founder of Active Captain. I'll be speaking  
3 about crowd-sourcing later this afternoon.

4 MS. OSBORNE: Beth Osborne. Deputy  
5 state director for Senator Murray and director of  
6 our state outreach program.

7 MS. SCHALLIP: Michele Schallip. I'm  
8 chief of waterways management for the Coast Guard  
9 Pacific Northwest District.

10 MR. DEBOW: Sam Debow. I'm a  
11 contractor on OCS staff.

12 MS. NEWTON: Jan Newton. I'm an  
13 oceanographer at the University of Washington and  
14 director of NANOOS, which is part of the U.S.  
15 IOOS, and I'll be speaking about that this  
16 afternoon.

17 MR. JORDAN: Dan Jordan. President of  
18 the Columbia River Bar Pilots.

19 MS. DECKER: Lauren Decker.  
20 Oceanographer with RPS Evans Hamilton.

21 MS. HOWELL: Good morning. I'm Ruth  
22 Howell. I'm acting NOAA West regional

1 coordinator out of Portland, Oregon.

2 MR. GARTHWAITE: Martin Garthwaite.  
3 Fishboat.net. Developed a data acquisition  
4 device that swims like a fish, can go extremely  
5 deep and is very quiet.

6 MR. SCHROCK: Gavin Schrock.  
7 Administrator Washington State Reference Network.  
8 It's the statewide GNSS infrastructure network.

9 MR. BRIDGEMAN: Todd Bridgeman.  
10 Director of marine operations for NOAA.

11 MR. VEENTJER: John Veentjer.  
12 Executive director of the Marine Exchange Puget  
13 Sound.

14 MS. PELISH: Kathy Pelish. Co-founder  
15 of Salish Sea Trading Co-Op. We were pure shared  
16 effort at moving local goods by using wind and  
17 tides. It's on hold now, but we did not sail  
18 without checking the NOAA forecast. So, thank  
19 you, NOAA.

20 CHAIR HANSON: Well, thank you,  
21 everyone for introducing yourselves. That's  
22 helpful. We also expect to have two Panel

1 members join us via phone, Larry Atkinson and  
2 Anne McIntyre.

3 So, typically, we have very good  
4 participation by our Panel members. Obviously,  
5 coming from -- this is more for your benefit,  
6 Panel members, is that coming from all over the  
7 country, all the very diverse backgrounds. But  
8 coming to talk about these charting issues that  
9 are so critical, not only to our respective  
10 businesses, but also to the maritime -- marine  
11 environment. So.

12 It's now my pleasure to introduce  
13 NOAA's leadership representative, Dr. Russell  
14 Callender, to administer the oath of office for  
15 the HSRP's newest member, Lindsay Gee.

16 Dr. Callender currently serves as the  
17 Ocean Service's Assistant Administrator, with a  
18 1,700 person ocean coastal agency.

19 Dr. Callender's and all the speaker's  
20 biographies are included in your meeting  
21 materials, on the web, for those on the webinar.  
22

1                   Dr. Callender, thank you for being  
2 with us. We're looking forward to hearing more  
3 from you after the swearing in.

4                   DR. CALLENDER: Thanks, Bill.  
5 Lindsay, can you join us up front? We'll do this  
6 by the flags.

7                   So, I, Lindsay Gee, do solemnly affirm  
8 that I will support and defend the Constitution  
9 of the United States, against all enemies,  
10 foreign and domestic, that I will bear true faith  
11 and allegiance to the same, that I take this  
12 obligation freely, without any mental reservation  
13 or purpose of evasion, and that I will well and  
14 faithfully discharge the duties, of the office  
15 under which I'm about to enter. I solemnly  
16 affirm.

17                   CHAIR HANSON: Thank you, Dr.  
18 Callender, and congratulations, Lindsay. Yes,  
19 so, it's been a bit of a trail for you, right?  
20 We'll be expecting the book of how it came to be,  
21 but thanks, again.

22                   We appreciate your willingness to

1 serve on and contribute to the Hydrographic  
2 Services Review Panel. We know you've already  
3 offered quite a bit and expect quite a bit more  
4 in the future.

5 Dr. Callender, you're going to provide  
6 us now with an overview of current NOAA and NOS  
7 issues. Thank you, sir.

8 DR. CALLENDER: Thanks, Bill.  
9 Actually, what I'm going to do is first of all,  
10 welcome everyone from my perspective as the head  
11 of NOAA's Ocean Service, and then talk a little  
12 bit about some of the dynamics in D.C. that are  
13 relevant, I think to this board, and give folks a  
14 sense of some of the activities that I've been  
15 doing in terms of outreach to the broader  
16 community.

17 So, I want to thank the HSRP for the  
18 opportunity to join you here this morning. As  
19 you know, hopefully you know, I share your  
20 commitment to the success of NOAA's hydrographic  
21 services today and into the future.

22 Lindsay, I want to congratulate you on

1 finally getting sworn in. So, we're able to pull  
2 it off. So, thank you, as the newest member of  
3 the HSRP.

4 My boss and Acting NOAA Administrator  
5 Ben Friedman was invited and was unable to join  
6 us. He expresses his regrets. I will say that  
7 in the conversations I've had with Ben to date,  
8 he is absolutely and positively a fan of the  
9 hydrographic services that we do, what NGS does,  
10 what CO-OPS does, as well.

11 So, we've got a friend in the Acting  
12 NOAA Administrator. He just wasn't able to come  
13 because literally, he's holding down the fort and  
14 there's not a lot of other folks holding down the  
15 fort right now, which I'll talk about in a  
16 moment.

17 NOAA leadership will continue to look  
18 to the HSRP for your influential ideas, your  
19 cutting-edge thinking and innovations that will  
20 help us improve and advance our navigational  
21 related programs and services.

22 Your thoughtful guidance and

1 recommendations will continue to aid us in  
2 delivering essential federal products and  
3 services now, and into the future.

4 I'm sorry I couldn't join you in the  
5 Cleveland meeting. I was on an self-imposed  
6 travel moratorium. I had some family issues that  
7 required that I stay at home. I understand it was  
8 a very successful meeting and I'm really looking  
9 forward to the dialogue today and through this  
10 part of the week that I can join you for.

11 I see that you have time on your  
12 agenda to hear from the directors of the Coast  
13 Survey, the National Geodetic Survey and the  
14 Center for Operational Oceanographic Products and  
15 Services. What I'd like to do is offer a teaser  
16 and sort of a heads-up in terms of what their  
17 remarks are going to cover.

18 Admiral Smith, director of the Office  
19 of Coast Survey, will talk about some of the  
20 changes to the way that charting is accomplished.  
21 He'll talk about the status of the national  
22 charting plan, including an update on the



1 constituent and public comments.

2           The focus on customer engagement will  
3 also be well illustrated by the public-facing  
4 story map for the fiscal year 2017 hydrographic  
5 survey plan. Once the field work begins, the  
6 public will be able to see the most recent  
7 acquisitions every week.

8           Office of Coast Survey is also  
9 emphasizing outreach and integrated --  
10 integration in the use of un-manned systems for  
11 hydrographic surveys, by encouraging contractors  
12 to incorporate innovative technologies into their  
13 survey plans, and hopefully this kind of push and  
14 this emphasis can help to stimulate the entire  
15 industry.

16           Rich Edwing, Director of the Center  
17 for Operational Oceanographic Products and  
18 Services or CO-OPS is going to talk to you about  
19 the co-op strategic plan, their progress towards  
20 fulfilling it and the plans for the future.

21           I was really excited to see that this  
22 plan focuses on developing a more integrated

1 product suite that are really meant to be more  
2 responsive to customer needs.

3           Juliana Blackwell, Director of the  
4 National Geodetic Survey will update you on  
5 progress on the immensely important Gravity for  
6 the Re-Definition of the American Vertical Datum  
7 GRAV-D.

8           If you don't know, hopefully you'll be  
9 able to join NGS next week. They're doing a  
10 National Geospatial Summit in the D.C. area, to  
11 prepare the community for the changeover in 2022  
12 to the new datums.

13           You'll hear more about the latest  
14 developments on the National Spatial Reference  
15 System modernization and coastal mapping  
16 activities during Juliana's NGS update.

17           So, let me talk a little bit about the  
18 budget situation and what's going on in  
19 Washington, D.C.

20           Can't help but notice that there's  
21 been a lot of changes since we last met. My  
22 staff have told me that there's been a national

1 election. Kidding.

2 So, we've had a lot going on and  
3 clearly with the transition, there's a lot going  
4 on in the news, as well.

5 What I will say, with any change in  
6 administration, there is typically uncertainty  
7 and some degree of fluidity about funding,  
8 funding priorities, policy priorities and this is  
9 -- this is nothing new. Part of it is just kind  
10 of working through that fluidity and the policy  
11 changes that are happening right now.

12 Currently, for this year's fiscal  
13 budget, fiscal year 2017, we're about six months  
14 in, and we don't have a final budget. We will  
15 remain in what's called a continuing resolution  
16 or CR, until the end of the month.

17 Basically, a continuing resolution is  
18 a Congressional stop-gap funding that funds the  
19 government to the previous fiscal year, so 2016  
20 levels, until Congress can finalize their  
21 appropriations.

22 Congress is scheduled to come up with

1 the final appropriations by the 28th of this  
2 month. There is some discussion and back and  
3 forth on whether they'll actually meet that  
4 commitment or not. So, there is various  
5 scenarios that may happen with '17. But I am  
6 confident, we will get some type of appropriation  
7 fairly soon.

8 So, the next fiscal year 2018, that  
9 begins on October 1st, the White House has  
10 released a budget outline or so-called skinny  
11 budget. This proposal came out in March.

12 The preliminary budget proposal  
13 focuses on and emphasizes national defense,  
14 border security and immigration.

15 With those priorities as the backdrop,  
16 one of the challenges is, how do you fund that,  
17 and the intent laid out in this so-called skinny  
18 budget is to help cover those priorities from the  
19 discretionary budgets of the agencies.

20 NOAA's budget is completely part of  
21 that discretionary budget. That means to be able  
22 to fund the priorities that the President wants

1 to lay out there, some of the NOAA budgets,  
2 pieces of those NOAA budgets will decline.

3 I can't really talk about the details  
4 of what that looks like until the President  
5 releases those details, because essentially, this  
6 information is embargoed.

7 My understanding is that we will see  
8 the details of that budget in mid to late May.  
9 That date has slipped a little bit. It was  
10 originally mid May. Now, it's late May. It  
11 might go into June. We'll see when it comes out.

12 One thing that I do want to mention  
13 and point out to the HSRP members is, some of the  
14 language that was in this skinny budget actually  
15 points to the value of the surveys and mapping  
16 work that we do.

17 There is some language that talks  
18 about zeroing out about \$250 million in a variety  
19 of NOAA grant programs that are mentioned kind of  
20 in general terms, but then it says, and I'm going  
21 to read this language.

22 It says, "These programs are lower

1 priority than the core functions maintained in  
2 the budget, such as surveys, charting," and  
3 there's a couple other things that they  
4 mentioned.

5 I see this as a great acknowledgment  
6 and a good window, in terms of what the President  
7 is thinking and where those priorities are vis-a-  
8 vis the mapping and charting of maritime commerce  
9 support.

10 So, let me move onto transition a  
11 little bit more.

12 NOAA sits in the Department of  
13 Commerce. You may have heard that in late  
14 February, Wilbur Ross was confirmed as the  
15 Secretary. There is -- he has not had a lot of  
16 meetings with NOAA representatives to date. He's  
17 really only had one meeting with the acting head  
18 of NOAA Ben Friedman, at this point.

19 Right now, he's focused like a laser  
20 beam on trade-related issues. He is looking for  
21 some quick wins, however, and I've heard that he  
22 has expressed an interest in aquaculture and

1 looking to kind of streamline offshore  
2 aquaculture in particular.

3 If you aren't aware, it's pretty  
4 interesting to note that the Secretary does have  
5 some business interests in shipping, including  
6 some interests in Suezmax tankers and so,  
7 clearly, he has an understanding of the value and  
8 the services of the work that NOAA provides and  
9 that many of you in the industry will resonate  
10 with, as well.

11 So, in terms of political appointees,  
12 there is not a lot at this point coming in.  
13 There has been -- I would call it a slow trickle,  
14 coming into the Department of Commerce. There is  
15 only two political appointees that have come into  
16 NOAA, at this point.

17 These two individuals, I met with last  
18 Thursday, had about a two hour briefing with  
19 them. They are a gentleman by the name of George  
20 Kelly. He's the son of a Congressman,  
21 Congressman George Joseph Kelly of Pennsylvania.  
22

1           George is going to be the NOAA Deputy  
2 Chief of Staff. He's got experience in finance,  
3 real estate and public/private partnerships.

4           The other political appointee that we  
5 have in NOAA right now is a gentleman by the name  
6 of Eric Noble. He's going to serve as a senior  
7 advisor to the Under Secretary. He has a degree  
8 in meteorology from Penn State and a PhD in  
9 environmental studies from the University of  
10 Colorado.

11           From this background, you can see that  
12 neither of those individuals have really  
13 background in our issues. However, in the two  
14 hour conversation I did have with them, they did  
15 absolutely see the value of the mapping charting  
16 mission writ large.

17           We talked about the value of the -- of  
18 what NGS provides, National Geodetic Survey  
19 provides and the importance to infrastructure  
20 investments, particularly along the coast.

21           They understood the value of what CO-  
22 OPS brings, in terms of the water level



1 measurements that we do and those connections  
2 with industries, such as the re-insurance  
3 industry and the impacts of tidal flooding.

4 So, at this point, I will view them  
5 kind of as sponges to be able to learn what we  
6 do. I would see that -- say that the  
7 conversation was very positive, but we're going  
8 to have a long ways to go to really get them up  
9 to speed on our issues.

10 Other changes in NOAA in my realm.  
11 I'm probably more excited than anybody because  
12 now I finally have a Deputy Assistant  
13 Administrator. So, I'm going to be able to focus  
14 on one job instead of a job and a half or two.

15 A woman by name of Nicole Laboeuf, who  
16 has come over from NOAA Fisheries in January is  
17 going to be the Deputy Assistant Administrator.

18 I want to thank HSRP writ large and  
19 Bill and the team, for your work and your  
20 leadership on the issue papers. These papers  
21 have been extremely valuable for us in the  
22 transition. I think they're extremely well done.

1 The section talking about the actions for federal  
2 leadership or NOAA leadership, I think are right  
3 on and it's going to, I think serve us really  
4 well, to continue to use these resources and the  
5 valuable thinking that you put together. So,  
6 thank you very much for that.

7 I think your counsel and  
8 recommendations have really helped set the stage  
9 in the ocean service for a couple, fairly large  
10 things.

11 One is pointing out the far-reaching  
12 value and economic benefits of our work from the  
13 local to the national levels and secondly, made  
14 it abundantly clear that how individuals,  
15 businesses and communities rely on NOS data,  
16 tools and services to make decisions every day.

17 Because of that focus, because of  
18 where I think we are positioned with the new  
19 administration right now, I'm pretty confident  
20 that we are going to do well when the budget  
21 comes out in FY18. Well may be relative, doing  
22 well in FY18 budget might be flat, but I think we

1 will always have opportunities and I think we'll  
2 have opportunities with the Congress as well,  
3 that I'll talk about in a moment.

4 I want to briefly mention that as part  
5 of the transition, we took a look at the top-line  
6 priorities for the National Ocean Service.

7 If you recall in the past we've talked  
8 about coastal intelligence, coastal resilience  
9 and place-based conservation. What we wanted to  
10 do was to really take a look at those top-line,  
11 top-level priorities, to see if we could better  
12 communicate the value of what we do and really  
13 focus in more plain language terms on our top-  
14 level priorities, and these priorities are safe  
15 and efficient transportation and commerce,  
16 preparedness and risk reduction, stewardship,  
17 recreation and tourism.

18 So, there is a packet or a little  
19 folder in your packet. There's some outside that  
20 lay out these priorities. I urge you to take a  
21 look at that.

22 I will mention that we're not changing

1 what we do. I basically am trying to change the  
2 top-line messages. So, with the new team, with  
3 the majority in Congress, we can have an elevator  
4 conversation, describe very quickly what we do,  
5 in plain language, in economic-related terms, and  
6 that when the elevator door opens and they're  
7 ready to get off, they're going to invite us to  
8 continue the dialogue versus having the door shut  
9 behind us.

10 So, please take a look at that. I  
11 think I've been using these priorities in a lot  
12 of conversations on the Hill and they have played  
13 fairly well.

14 So, I've been spending a lot of time,  
15 now that I only have one job, focusing on  
16 engagement up and out. I've been spending a lot  
17 of time communicating our priorities and the  
18 value of what we do to constituents, partners,  
19 and stakeholders, including Congress.

20 Glenn Boledovich's policy team in the  
21 ocean service provided some amazing leadership  
22 and prepared an engagement strategy last

1 November, and I've been basically putting all of  
2 my efforts into trying to execute that engagement  
3 strategy.

4 So far this calendar year, I've had 21  
5 meetings with members of Congress or their staff.  
6 I've made between nine and ten, I lost count,  
7 presentations to external trade and professional  
8 associations about what we do.

9 When I was up here in -- in the  
10 Seattle area in January, I met with staff from  
11 Senators Murray and Cantwell and Representative  
12 Rick Larsen staff. I've also focused on spending  
13 a lot of outreach to members whose districts have  
14 major ports in their states.

15 I've talked to staff from Lindsey  
16 Graham and Representative Clyburn about the  
17 support we provided in the Port of Charleston.  
18 I've met with Representative Buddy Carter's staff  
19 about the Savannah and Brunswick ports.

20 I spent a lot of time in the Florida  
21 delegation. I spent some time with Senator Rubio  
22 and Nelson's staff focusing on our work around

1 sea level rise, recurrent tidal flooding,  
2 flooding projections. They had a strong interest  
3 in the PORTS project and in the navigation  
4 portfolio writ large.

5 I talked about the importance of home-  
6 porting the navigation response teams, near  
7 Jacksonville to Representative Rutherford's  
8 staff, and talked to Representative Ros-Lehtinen  
9 from Miami, about bringing Miami into the PORTS  
10 constellation.

11 Had an opportunity to talk with  
12 Charlie Crist about how the PORTS program started  
13 in Tampa and the vital role that the PORTS plays  
14 into the Bay are economy.

15 Finally, I met with staff from  
16 Representative Diaz-Balart and Representative  
17 Rooney's office and talked about the coast survey  
18 plans for the approaches to Naples.

19 What I've tried to do is focus on not  
20 just connecting with the staff and members that  
21 we historically have had relationships with. I  
22 spent a lot of time and effort focusing on the

1 majority. Kind of one of my goals is to make new  
2 friends, and what I've found is that particularly  
3 talking about the maritime commerce portfolio, if  
4 you will, that that has resonated extremely well  
5 with every one of those members and every one of  
6 their staff.

7           Actually for the -- one of the first  
8 time ever, I'd have to pick on Juliana here, I  
9 got a request for a dedicated NGS brief. So, I  
10 must have to been able to explain it where they  
11 understood it, and wanted to get a follow up  
12 dedicated brief on NGS. So, I saw that as a  
13 success.

14           Another part of the strategy is really  
15 to connect with state and local stakeholders, as  
16 well as other coastal partners and  
17 representatives from industry and academia.

18           So, I've met with some of the  
19 Congressional relations folk from University of  
20 Washington, from Woods Hole, from Scripps,  
21 putting the messages out about our new top-line  
22 priorities and what we do.

1           I was down in the Gulf of Mexico at  
2           the State of the Gulf Summit, met with the Gulf  
3           of Mexico Alliance. I joined them for an  
4           industry breakfast and this industry included a  
5           lot of oil industry executives.

6           We're doing some things in the ocean  
7           service around National Marine Sanctuaries that  
8           makes some of the oil industry executives a  
9           little unhappy, and so, when I got up to speak, I  
10          was told, "You're really brave coming here,  
11          Russell," and again, I just reiterated that my  
12          goal is to make new friends, and so, it was a  
13          very positive conversation that broke the ice,  
14          and we were able to talk really about some of the  
15          -- the major gaps we have, in terms of coastal  
16          observations and the gaps that we have in the  
17          coast survey plan, as well.

18          When I was in the State of Texas, I  
19          followed up on something that I learned at the  
20          HSRP down in Galveston. I met with  
21          Texas Land Commissioner, George P. Bush. He's  
22          the Commissioner of the Texas General Land



1 Office.

2 At the HSRP down in Galveston, I first  
3 learned about this very ambitious plan to  
4 essentially protect the entire Texas coast with a  
5 series of sea walls, flood gates, a series of  
6 work to restore some of the Intercoastal  
7 Waterway, some of the tidal marshes in the State  
8 of Texas, and I wanted to have that conversation,  
9 really to talk about the value of the products  
10 and the services that we provide, the  
11 foundational information through NGS, through CO-  
12 OPS that are going to aid in that effort.

13 I also took the opportunity to talk  
14 about all the work we do in the Port of Houston  
15 and Galveston, even though that's not part of his  
16 port -- his purview, but he simply got the value  
17 to the economy of Texas.

18 So, one final series of thoughts.  
19 Everywhere I've gone, there has been an interest  
20 in infrastructure and investments in  
21 infrastructure.

22 In the outreach that I've done, I talk

1 about the value of our navigation and positioning  
2 programs, as we modernize infrastructure.

3 If you think about infrastructure and  
4 how we pay for that, there's a variety of  
5 possibilities to pay for that, which may include  
6 things like tax breaks, user fees or some other  
7 ways of re-prioritizing what we do.

8 I would suggest that if we're looking  
9 at modernizing infrastructure in this country,  
10 you need to go to where the people are and where  
11 the money is.

12 Roughly 40 percent of the U.S.  
13 population is coastal shoreline counties. A large  
14 percentage of the GDP, gross domestic product of  
15 this country is also in coastal shoreline  
16 counties, and I would submit that an  
17 infrastructure investment along the coast for  
18 bridges, for roads, for port infrastructure, I  
19 think is ripe and I think what we do in this room  
20 from the NOAA side and the private industry side,  
21 the federal side, kind of writ large, is going to  
22 incredibly valuable as we look at infrastructure

1 in this country.

2 So, a couple quick points and I'll  
3 wrap up. Bill is giving me this look like,  
4 "Okay, Russell, you're done."

5 I would say that you know, our  
6 mandates that we have are unchanged, but I think  
7 the way that we need to do business must continue  
8 to evolve. I think involving the HSRP and your  
9 advice, your wise counsel to us is going to help  
10 us evolve.

11 We've very proud of the partnerships  
12 with the private sector and it's really -- and  
13 we're interested in strengthening that  
14 relationship.

15 So, the whole idea of the  
16 public/private partnerships kind of writ large is  
17 going to be an area of growth I think for us.

18 NOAA continues to provide the  
19 foundational data and validated data streams that  
20 the country needs to navigate safely and  
21 efficiently. But we're looking for new  
22 opportunities where all partners can play to

1 their strengths.

2 So, with that, I appreciate the  
3 opportunity to sort of kick this off from the  
4 NOAA perspective. I know this meeting is going to  
5 be productive and I know like always, I am going  
6 to learn a lot, which I think will help me to be  
7 able to carry the message of what we do to  
8 Congress, to our constituents and stakeholders.  
9 So, thank you.

10 CHAIR HANSON: Thank you, Dr.  
11 Callender. I don't think that was really the look  
12 I was giving you, but thank you anyway.

13 Sir, are you going to be able to stick  
14 with us for a day or so?

15 DR. CALLENDER: So, I'll be here  
16 through tomorrow morning. There is this little  
17 issue of picking the next Two-Star in NOAA, that  
18 I need to be in on that conversation in person,  
19 which is on Thursday. So.

20 CHAIR HANSON: Okay, thank you, and  
21 we'll take advantage of the time we have with  
22 you, and thank you for highlighting some of the

1 things that you've taken away from our meetings  
2 as we go around the country.

3 Certainly, the regional discussions  
4 allow us to realize this is a very large country  
5 with a lot of diverse interests and as you try to  
6 wrap your arms around that and sell the NOS  
7 mission in Washington, you've got to wrap your  
8 arms first around where the work is really done,  
9 and so, appreciate the discussion.

10 DR. CALLENDER: Yes, absolutely, and  
11 I'm really kind of disappointed because I mean,  
12 for me, the conversation, the presentations are  
13 fabulous, but being able to go out and visit  
14 those folks on the ground that are doing the work  
15 and seeing the partnerships is really where I  
16 learn a lot, and I think it's incredibly  
17 valuable.

18 So, what we can maybe do is think  
19 about as we get some of our political appointees  
20 onboard is getting them out into some of those  
21 conversations as well. I think it will open their  
22 eyes.

1                   CHAIR HANSON: Great, appreciate that,  
2 and thank you for also looking at administration  
3 changes and opportunity, because certainly the  
4 message is very clear and we offer quite a bit to  
5 the nation, as an agency. So, appreciate your  
6 work there.

7                   That ties in now, as I wanted to  
8 introduce our next speaker, Joshua Berger,  
9 because we have talked a lot about things at the  
10 state level.

11                   Dr. Callender mentioned his travels  
12 around the country. He also mentioned the Texas  
13 GLO, which is only recently realized that -- as a  
14 native Texas I can say this, has only realized  
15 that Texas has a coast and there's a lot of  
16 issues there that need to be dealt with, and  
17 they're taking it on.

18                   So, it's an impact we can't have, and  
19 Joshua comes to us from -- I want to read his  
20 title, because I think it tells us a lot about  
21 the Governor's, Governor Inslee's commitment to  
22 the maritime industry, and it's the Governor's

1 Maritime Industry Sector Lead Office of Economic  
2 Development and Competitiveness, and that's under  
3 Department of Commerce.

4 So, that says a lot about what the  
5 Governor thinks about the maritime industry. You  
6 come to us, even though your bio is in the  
7 package, I will mention that as I learned, you're  
8 a licensed mariner and you come from the maritime  
9 industry, so, you bring up a very different  
10 perspective to government that I'm sure he  
11 appreciates, as well. So, thanks for coming  
12 today, Joshua.

13 MR. BERGER: Yes, thank you. Yes, the  
14 -- coming from industry is a lot. I am learning  
15 about state government, as well.

16 Good morning. Thank you, Chair  
17 Hanson, Admiral Shepard, the advisory panel and  
18 staff for the opportunity to open your meeting  
19 and welcome you to Seattle, Washington. Honored  
20 to have you here, and on behalf of Governor Jay  
21 Inslee, welcome you to the great State of  
22 Washington.

1           He often likes to say how our maritime  
2 industry plays a central role to Washington's  
3 diverse, strong economy, and that our working  
4 water fronts are sources not only of great jobs,  
5 a critical industry, but of technological  
6 innovation and resilience.

7           So, clearly a common theme and mission  
8 of NOAA's Hydrographic Ocean Services and the  
9 important function of your review panel.

10           I'll give you just a little bit of  
11 background and introduction, and thank Chair  
12 Hanson. You know, I do come from industry, worked  
13 as a licensed mariner in the tug and two  
14 industry, as well as the maritime workforce  
15 training and sail training industry, as well.

16           I've had the pleasure of sailing a  
17 number of traditional tall ships here nationally,  
18 and around the globe as well, and have been a  
19 long time user of your products and quick  
20 anecdote.

21           My youngest brother is about eight  
22 years younger than I am. He's going for a low-



1 level master's license and a six-pack license, so  
2 he can run some small boats round the Willamette  
3 River and dreams of charter captain in the  
4 Caribbean. Is studying for his master's license.  
5 He was up just this last weekend, and you know,  
6 he looked at -- we were looking at the chart of  
7 our home waters of Western Long Island Sound,  
8 where we grew up and he said, "God, it's so  
9 beautiful and logical. Really makes a lot of  
10 sense."

11 I was -- so, wanted to make sure to  
12 bring that forward, and I think he's absolutely  
13 right.

14 It's -- so, as a matter of  
15 introduction for, you know, my role and industry  
16 here in Washington State, it is a bit of a unique  
17 role, and it gives me the opportunity to talk  
18 about resilience, relevance and innovation in our  
19 industry, and what role that plays in our state's  
20 economy, and growing and improving jobs and  
21 prosperous communities, and certainly, your work  
22 and your products and what you bring forward and

1 how critical that is for us.

2 So, I am part of what's called the  
3 industry sector lead program. I am one of seven  
4 of us representing the -- and a -- the top seven  
5 economic sectors across the state of Washington,  
6 and it's interesting program.

7 We each come primarily from industry,  
8 and we work as really the liaisons from our  
9 industry, to the Governor's office, our State  
10 Legislature, other state agencies, as well as our  
11 federal partners, all with this mission of  
12 growing and strengthening communities and  
13 creating jobs with this mission around  
14 sustainability and resilience.

15 So, across our key sectors, and lots  
16 of places where we do a lot of cross-sector work  
17 too, some of which I'm learning more and more is  
18 relevant to your work, and we'll talk a bit  
19 about.

20 You know, just real briefly, we play  
21 in kind of these three realms. Our charter is  
22 really to help coordinate our respective

1 industries. As you can imagine and I'm sure know  
2 in the maritime industry, it's incredibly  
3 diverse, and we'll talk a bit about that.

4 So, coordination is a key function, as  
5 well as supporting and developing public/private  
6 partnerships, both on policy issues, as well as  
7 economic development opportunities.

8 We also work to do what we can to grow  
9 and support the business climate for our  
10 respective industries. Takes the shape of  
11 regulatory reform, tax incentives, you know,  
12 across the board, as well as developing a 21st  
13 century workforce, as we look especially at  
14 shifts in the maritime industry, how critical  
15 that is, especially critical that our industry is  
16 part of the conversation as our education and  
17 training workforce is continuing to develop.

18 So, you can imagine the various  
19 partners we're constantly juggling around this  
20 swirling sphere.

21 I think it's one of the more  
22 interesting jobs in state government.

1 Absolutely. So much so that there are a number  
2 of our colleagues in the state legislature that  
3 are vying for open positions. It's an interesting  
4 role.

5 So, what is the maritime sector? You  
6 know, we define the maritime industry here in the  
7 state and everything from paddle boards to  
8 container ships and everything in between,  
9 including commercial fishing and seafood,  
10 shipyards, all the support services that go along  
11 with that. As you know, many of those support  
12 services are dedicated. Consider a lot of the  
13 folks here in the room in the work that you do as  
14 part of that, and somewhere in between kind of  
15 military and government, and the support services  
16 around the mapping and work that gets done.

17 Here in Washington State we're pretty  
18 unique, in that it is incredibly diverse and  
19 continuing to grow and very supportive of our  
20 state's economy.

21 It's also incredibly complex and  
22 segmented, and so, working across those silos and

1 finding unified voice for the industry and where  
2 there is kind of this  
3 sub-sector crossover in many areas is a key  
4 function of what we're doing across the state.

5 Just a quick highlight of the impact.  
6 So, the maritime industry is really third largest  
7 economic driver across the state. It's over a  
8 \$37 billion economic impact.

9 About 70,000 direct jobs, impacting  
10 almost 190,000 jobs across the State of  
11 Washington, and as the most trade-dependent state  
12 in the country, our port infrastructure complex  
13 is incredibly important.

14 One in four jobs in the state are tied  
15 to -- tied to trade with the combined Ports of  
16 Seattle and Tacoma now co-manages the Northwest  
17 Seaport Alliance, makes us somewhere in the realm  
18 of about fourth largest container in logistics  
19 terminal in the country.

20 So, critical part of who we are and  
21 how we define ourselves. As you can imagine  
22 though in a large state like this, there is no

1 Boeing like there is for the aerospace industry.  
2 There is no Amazon or Microsoft, like there is  
3 for the IT industry.

4 So, that work of coordinating across  
5 the industry and everything, from folks that are  
6 working on refrigerator down in Ballard, to  
7 mapping to folks that are supporting and engaging  
8 with our federal partners, there is an incredible  
9 amount of coordination that happens -- needs to  
10 happen across this diverse and quite inter-  
11 dependent industry.

12 As I said, there is kind of these  
13 three realms. This coordination, public/private  
14 partnerships is a key function of what -- of work  
15 that we do. We choose kind of our respective  
16 statewide trade associations, and kind of  
17 embedded in those here in the State of  
18 Washington, the Washington Maritime Federation  
19 was formed about the same time that the Sector  
20 Lead Program was stood up. This, giving the  
21 opportunity for coordination and connection  
22 across the breadth of the industry.

1           Lots of arenas which the maritime  
2 federation plays, so, you know, stand is -- and  
3 all transparency was the first director of the  
4 organization getting it stood up and then moved  
5 over into this role, but continue to play, each  
6 of the sector leads play a role in the advisory  
7 board or board of directors of our trade  
8 associations.

9           So, the maritime federation,  
10 especially for the folks here locally, as well as  
11 working federal, is a place of first contact into  
12 the breadth of the industry. You would often  
13 find, well, we need industry, stakeholder input  
14 to an issue and they'll go to somebody they know  
15 in the shellfish industry and say, "Well, we have  
16 input for the maritime industry."

17           Not necessarily out of, you know, any  
18 ill-will or miss, but not necessarily knowing  
19 where to coordinate, and the maritime federation  
20 plays a large role of that, as well as finding  
21 the key top priorities, whether they're policy  
22 priorities, funding priorities that go forward

1 that can communicate in one single voice, and I  
2 say when you have a shipyard that's fishing in  
3 seafood and support services and ports all  
4 walking in the room together, it's send a really  
5 strong message and the level of advocacy that the  
6 organization does.

7 Some of the examples of these kind of  
8 public/private partnerships and coordination  
9 that's relevant to a lot of the work that you do  
10 certainly, is our working connection with the  
11 University of Washington, in connecting with the  
12 both College of Environment, marine affairs and  
13 across the board is really key and important with  
14 our federal partners, as well, Army Corps, Coast  
15 Guard, a number of places, all playing a role in  
16 the priorities going forward.

17 We are in the process of a marine  
18 spatial planning for the coast of Washington  
19 State, looking towards the future of any  
20 potential renewable energy or ocean energy  
21 projects that could come to the shores of  
22 Washington State. We do feel that that is likely



1 way off in the future, but trying to get a jump  
2 on that in our Washington Marine Coastal Advisory  
3 Committee and I play a role in that, again,  
4 bringing a voice of the breadth of the industry  
5 across the state to that Governor's Council, and  
6 we utilize a lot of your services and a lot of  
7 that marine spatial planning that's taking place  
8 to help kind of shape what our policy priorities  
9 are going to be moving forward.

10 Another area and I know it's going to  
11 -- is on the agenda today is the relationship to  
12 the changing Arctic, and a lot of the work that  
13 you're doing in putting forward your priorities  
14 and thoughts, as we look towards, you know,  
15 mapping and charting that area.

16 Washington State plays an important  
17 role in the changing Arctic, in infrastructure  
18 development and in passage and supporting  
19 terminal, you know, certainly so just for  
20 perspective, about 95 percent of everything that  
21 makes its way on a shelf in the State of Alaska  
22 comes through the Ports of Seattle and Tacoma,

1 let alone we start talking about infrastructure  
2 development, parts, pieces.

3 I personally towed pieces up to Coast  
4 Guard station up in Kodiak based out of here and  
5 Seattle and Tacoma.

6 So, we play a vital role in that  
7 intersection and that pathway up to the Arctic.  
8 We also have a lot to offer as both in terms of  
9 technology innovation, infrastructure  
10 development. There is a lot of expertise in this  
11 area that we offer into what's going to be  
12 changing up there, is changing and so, it's a  
13 number of folks in the room had attended the  
14 Arctic Encounter Symposium that was here in  
15 Seattle just last week.

16 So, the role that my office plays in  
17 conjunction with the maritime federation plays in  
18 those -- that coordination and public/private  
19 partnerships is infinitely critical.

20 In terms of supporting economic  
21 development and the business climate for the  
22 maritime industry, there is a number of key

1 priorities that we're working on.

2 Protecting industrial land use is  
3 certainly important. Again, as we're the most  
4 trade-dependent state in the country and that --  
5 this is important, not only for those here. If  
6 you know the -- you know a bit about Washington  
7 State, we have this kind of divider between east  
8 and west, the Cascade Mountains. There is  
9 sometimes a political divide, sometimes a  
10 cultural divide, but not so much in commerce, you  
11 know how critical it is our for cherries and  
12 apples and potatoes and all the agriculture, as  
13 well as even some of our small boat builders that  
14 happen over on the east side of the mountains,  
15 how critical the access to the ports are for  
16 those communities, as well.

17 So, this industrial land use and port  
18 competitiveness is a key issue statewide that  
19 we're having lots of conversations about.

20 Regulatory reform and infrastructure  
21 development. A lot of that goes hand-in-hand as  
22 well, as we look at aging infrastructure across

1 the industry and in our ports, a critical role it  
2 is that we remain competitive. Our key  
3 competition here is actually up in British  
4 Columbia, where a discretionary port, 70 percent  
5 of all that comes into the Port of Seattle and  
6 Tacoma is headed elsewhere. A lot different than  
7 LA/Long Beach where 70 percent stays right there  
8 to feed, clothe and house that population.

9 So, it's just as easy for someone, you  
10 know, CMA CGM to head up to Prince Rupert, as it  
11 is down to Tacoma, sort of critical role it is  
12 that we have, you know, clear pathways.

13 So, you know, when we're looking at  
14 larger ships that are coming, and the needs that  
15 are -- that the needs that are around all of  
16 that, it's critical that we have the partners,  
17 certainly with the work that you all do, to make  
18 that viable as the shipping industry has been  
19 changing so dramatically in the last couple of  
20 years.

21 Modernization of vessels, as well, and  
22 here in the slide it talks about the

1 modernization of our fishing fleet and certainly  
2 our fish -- the fishing fleet, specifically the  
3 North Pacific fishing fleet, you know, large part  
4 of the North Pacific fishing fleet up in the Gulf  
5 of Alaska and the Bering Sea is housed here in  
6 Seattle in Washington State, and it's about a  
7 \$9.5 billion industry just to Washington State's  
8 economy, and the amount of jobs that that  
9 creates, and I think it's 40 percent of all the  
10 seafood on US tables comes from the North Pacific  
11 fishery, and how critical that is. We're fishing  
12 the most sustainable fishing ground in the world,  
13 with 40 to 70 year old vessels.

14 But not just the fishing fleet. We're  
15 looking at our Arctic or polar icebreaker  
16 vessels. We look at new vessels for NOAA, and I  
17 see that's a key priority for you as well, and  
18 re-capitalization of NOAA's fleet as well as the  
19 universities.

20 We're building new vessels up at  
21 Dakota Creek and Anacortes. We are -- we've got  
22 the Thompson in dry dock right now in Seattle,

1 certainly the Healy, Star and others are all  
2 based, you know, out of here in Seattle and our  
3 vast network of the maritime industry from our  
4 large shipyards to our electricians to the  
5 electronic service providers are all part of what  
6 we see as modernizing in the industry. So, all  
7 we do to support that is key focus.

8 And supporting the 21st century  
9 workforce, very key as we look forward to  
10 expanding and growing industry, as well as our  
11 own needs here in Washington State, in supporting  
12 diverse and economic equality.

13 So, you know, Seattle has the most  
14 cranes as any other city in the United States. I  
15 think we're up to 60-something. Chicago is next  
16 with 20-something. Economic, you know, boom here  
17 as well as, you know, housing prices, that goes  
18 along with that. We're also seeing continued  
19 income inequality, particularly with our rural  
20 communities.

21 Maritime industry offers as one as  
22 many, an important access to living wage jobs and

1 trade jobs that are critical, that are  
2 technologically advanced and are looking into the  
3 future, and so, all we do to connect that, to  
4 make sure the curriculum supports that is  
5 critically important.

6 A quick story about the port of port  
7 or Port Townsend. Small community up on the  
8 Olympic Peninsula. It's a Victorian seaport.  
9 It's you know, got a strong tourist economy. It  
10 also has a very strong maritime industry and  
11 marine trades.

12 The school district in Port Townsend  
13 sees the connection to the maritime industry so  
14 much so that it is looking at right now, moving  
15 all of its curriculum so that it's called the  
16 Discovery Maritime School System, so that each  
17 part from kindergarten on through high school has  
18 a tie into the maritime industry, whether it's  
19 arts, law, trades, operations across the board,  
20 there's a tie into what's happening in their  
21 community every day.

22 I was up there talking to the entire

1 junior and senior class about a month ago, about  
2 opportunities in the maritime industry, and I  
3 showed a video of a hydrographic survey ship and  
4 a young woman who had been working for NOAA for a  
5 number of years, and the amount of conversations  
6 that came back to me from these juniors and  
7 seniors in high school, and the opportunity was  
8 remarkable.

9 Young men and women that see this both  
10 in combining their passion for the environment,  
11 for technology and being out at sea, what a great  
12 place for that to happen.

13 I will say also on the workforce side  
14 is that we're working very closely with US  
15 Department of Labor and others, on this Military-  
16 to-Mariner transition.

17 So, as we have folks transitioning out  
18 of the military, there has actually been a great  
19 connection with NOAA specifically and the Army as  
20 well, in connecting these dots and doing what the  
21 crossover is and coming out of the military and  
22 into civilian work both, you know, whether it's



1 MSE ships or NOAA, across the board. We're doing  
2 a lot of work to make sure that connection and  
3 transition is seamless.

4 The other thing I just wanted to put  
5 out is about the focus on technology innovation  
6 here in Washington State.

7 We do see ourselves as global leaders  
8 in maritime technology innovation and best  
9 management practices. We're developing  
10 partnerships across University of Washington,  
11 Applied Physics Lab, our national laboratories,  
12 PNNL and everything from electrification of  
13 vessels to ballast water treatment systems,  
14 underwater and unmanned systems. So much  
15 innovation is happening here in these  
16 partnerships. We see ourselves as leaders and  
17 we're developing a long term strategy for what  
18 technology and innovation and how we continue our  
19 role in leadership there and I see that going  
20 hand-in-hand again, with a number of your  
21 priorities, so much so that I'm working cross-  
22 sectorly with our information technology sector

1 lead, as well as our aerospace sector lead, in  
2 supporting an  
3 Unmanned Systems Advisor Council to the Governor  
4 and to industry, as we're trying to push forward,  
5 our support and work in unmanned systems from  
6 space to the bottom of the ocean.

7           You know, all in all, just kind of a  
8 brief overview of what we have to offer here in  
9 Washington State, the importance of our maritime  
10 industry, the importance that the Governor has  
11 called out in our maritime industry, and that  
12 will continue to support, you know, the important  
13 necessary work of NOAA's hydrographic function,  
14 and while reading over, you know, most of these  
15 recent issue papers, it reiterated to me exactly  
16 how much of the fate and growth of our industry  
17 here in Washington and across our nation's  
18 waterways and waterfronts is so highly dependent  
19 on NOAA's National Ocean Services, and so, highly  
20 dependent on the role that the panel plays to  
21 communicate that value and certainly set  
22 priorities and seek implementation.

1           So, again, please consider the State  
2 of Washington and our local industry partners in  
3 this process, and wish you great rest of your  
4 meeting. Productive. Thank you.

5           CHAIR HANSON: Thank you, Josh, well  
6 that hit all the high points, and I know there's  
7 a lot of meat there. We could probably ask  
8 questions for a couple hours here. But I  
9 understand you're going to be able to stick  
10 around this morning.

11          MR. BERGER: Yeah.

12          CHAIR HANSON: Okay, great.

13          MR. BERGER: Thank you.

14          CHAIR HANSON: We'll see if we have  
15 time for questions at the end. We're pretty sure  
16 you'll be around during the break, and I'd like  
17 to catch you there and talk a bit more.

18          MR. BERGER: Yeah, great.

19          CHAIR HANSON: State's role in  
20 maritime cannot be over-estimated certainly when  
21 dollars are tight, coming back from Washington,  
22 Governor's role in this and this whole discussion

1 is extremely important. So, congratulations on  
2 your role there.

3 MR. BERGER: Yeah, thank you.

4 CHAIR HANSON: Next on the agenda, we  
5 have a presentation by Captain Jason Hamilton.  
6 Commanding Officer of the US Coast Guard  
7 Icebreaker, US Healy. It's home-ported right  
8 here in Seattle.

9 Captain Hamilton is an Icebreaker  
10 sailor who has completed multiple Arctic,  
11 Antarctic, and Great Lakes ice-breaking missions.  
12 He's also a judge advocate who has served with  
13 distinction in various legal officer positions.

14 In the interest of time, of course we  
15 have the bio in the package again. Captain  
16 Hamilton, thank you for your service and I  
17 suspect along some way, we will get some Lawson  
18 Brigham stories.

19 CAPT. HAMILTON: Well, Lawson will  
20 probably provide those at the breaks, but maybe I  
21 can interject a couple as we go along. I don't  
22 know.

1                   Chair Hanson, Admiral, doctors,  
2                   captains, colleagues, thank you for allowing me  
3                   to come down here to meet with you today and to  
4                   talk a little bit about the Arctic.

5                   Again, seeing shipmates that I've  
6                   sailed with and captains that have been mentors,  
7                   it's really an honor to be here with this group,  
8                   and particularly, doing it here in Seattle,  
9                   Washington, the gateway to the Arctic is, as Josh  
10                  already alluded to, how important Seattle is and  
11                  to getting to the Arctic and what happens there.

12                  The Coast Guard Cutter Healy, it's  
13                  been an honor to be the captain now for almost  
14                  two years, and a ship that's named after a  
15                  revenue cutter captain who, quite frankly, was  
16                  operating in the Arctic and off Alaska, basically  
17                  as soon as the United States acquired it.

18                  So, it's -- again, it's a privilege to  
19                  be here with you today and I'm going to talk a  
20                  little bit about a user's perspective, some of  
21                  the products I get both from NOAA and our other  
22                  interagency partners and how that helps become a

1 force multiplier for us while we're up in the  
2 Arctic.

3 Because again, if you look at the  
4 Arctic strategy and where the United States fits  
5 within the Arctic, it really is about broadening  
6 partnerships, working together, whether it be our  
7 interagency groups, whether it be with the state  
8 or the local bureau, or whether it be with our  
9 international partners.

10 So, with that, we'll see if I can get  
11 this to operate. User error. There we go. I  
12 might have to point. We'll see. I'm going now.

13 All right. So, this is a slide that  
14 has a picture of Healy and some of our  
15 capabilities.

16 So, when we talk about icebreakers and  
17 the polar ice-breaking fleet, and when I say  
18 fleet, that's kind of a stretch, but there are  
19 two of us.

20 There is the Polar Star, which is the  
21 heavy icebreaker, which just got back from  
22 McMurdo, and her mission is basically to go down

1 and break in the McMurdo science station, and she  
2 has been doing that annually. She's approaching  
3 -- she's right at 40 years of age now, toward the  
4 end of her service life. In fact, 10 years  
5 beyond what service life was written as, but  
6 that's how we operate, both in NOAA and the Coast  
7 Guard.

8 But the Polar Star is the heavy  
9 icebreaker. She can break up to six feet of ice  
10 at three knots, and she can back and ram into and  
11 break up to 20 feet of ice. It's really an  
12 amazing technological break-through back in the  
13 70s.

14 Now, they basically cover down the  
15 Antarctic. We cover down the Arctic. So, when  
16 we talk about in the high latitudes, what vessels  
17 does the United States have operating up there,  
18 the Navy does not play in that space at all, at  
19 least on the surface.

20 So, when we talk about in the Arctic  
21 itself and when you get up into the ice, it is,  
22 it's Coast Guard Cutter Healy and while this

1 talks about our primary mission focus, which is  
2 supporting National Science Foundation  
3 objectives, at all times, the Coast Guard is  
4 military, as well as interagency.

5 So, when we're up there, we're  
6 conducting all of the Coast Guard's 11 mission  
7 sets, and our capabilities that we can break up  
8 to 4.5 feet of ice at three knots and while we're  
9 rated to break up to eight feet of ice, I can  
10 tell you that I've seen us break well over 10,  
11 and that was certainly necessary as we got  
12 ourselves all the way up to the North Pole, not  
13 to -- not in the distant past.

14 So, when we talk about our navigation  
15 system, we have an electronic chart display and  
16 we've got DGPS. We've got three systems, one for  
17 navigation and then we've got the POS MV and the  
18 Seapath, which are GPS systems for our  
19 bathymetric survey systems.

20 We have large format printers onboard  
21 that we can utilize to expand on the products  
22 that we receive, so we can get them both



1 electronically and then print them out.

2           It's a -- you know, the charts we  
3 receive are critical to what we do up there and  
4 we're much appreciated for those

5           This is a -- the picture that you see  
6 in here is the Healy Seamount, which was  
7 discovered using our multi-beam back in 2003 and  
8 Larry, were you onboard for that?

9           Okay, so, again, we've got people who  
10 have been on Healy a lot longer than I have in  
11 the room, which is why it's -- it's -- you know,  
12 I can leverage Larry if necessary, as we go  
13 forward here.

14           But again, when we talk about  
15 movements forward, our multi-beam echo-sounder,  
16 when operational, and operating correctly, really  
17 does an exceptional job at providing these 3D  
18 maps for us and again, 288 simultaneous beams it  
19 puts out there. Constantly running and  
20 collecting data.

21           So, again, what we're doing these 11  
22 mission sets throughout the Arctic, we've got all

1 sorts of equipment onboard that are collecting  
2 different types of data for the science  
3 community, and this goes into a repository and  
4 can be requested at any time, and when we look at  
5 the -- you know, the charts and where we're at,  
6 at the moment, and again, you have chronological  
7 data, very substantially in your latest  
8 periodicals, but again, it looks like only about  
9 three percent of the Arctic marine corridors are  
10 surveyed to modern standards.

11 So, at least having this multi-beam  
12 echo-sounder gives us some background and  
13 information up there.

14 This is a picture of us, as well as  
15 with the PARS study, which I'll hit on a little  
16 bit more in the next slide.

17 But it's basically, we're looking to  
18 create a corridor up there for deepwater traffic  
19 that it's clear what at least what the hazards  
20 are underneath the vessel, and we've done  
21 multiple bathymetric surveys of this Bering  
22 Transit Corridor using our multi-beam and in 2014

1 and 2015, we had eight different sonar transits,  
2 each time we go north, we offset it about 1,000  
3 yards, so that we could cover as much area as  
4 possible, while headed up to our missions, and  
5 over 5,000 miles of data has been collected at  
6 this point.

7 So, the PARS route survey. This is a  
8 picture of it. Essentially, you're getting  
9 yourself from Unimak up off the Seward Peninsula  
10 and then all the way up through the Bering end of  
11 the Arctic, and it's been a great interagency  
12 effort between the NOAA and the Coast Guard, and  
13 again, the intent is to try and deal with those  
14 hazards, to minimize the risk to the mariner in  
15 this seaway, because the traffic is increasing  
16 and as we go further north, as the ice recedes,  
17 we're just going to see more and more of that.

18 In fact last summer, when I was moored  
19 up in Seward, we had the Crystal Serenity  
20 directly next to us, and most people in this room  
21 are aware of that ship and the number of people  
22 it had, and it went up and over and through the

1 Northwest Passage. So, something that the entire  
2 interagency was -- was looking at closely,  
3 planning for and just like we are with the --  
4 with the smaller pleasure crafts that are going  
5 up there.

6 I can tell you last summer, I saw 17  
7 -- I had 17 different interactions with vessels  
8 that quite frankly, that's almost like reinforced  
9 sailing vessels. I mean, these are small craft,  
10 really not ice-capable up there operating.

11 So, the more we can do to chart up  
12 there and to have products that they can use to  
13 avoid the hazards, the better it's going to be.

14 Another -- when we talk about the  
15 PARS, one of the things I also wanted to  
16 highlight is as you work something like this,  
17 it's not just the operational side and putting  
18 the charts together, but the diplomacy and the  
19 legal end that's been going into this.

20 It's been a well-over 10 year effort.  
21 In fact, it was a handshake back in 2007, between  
22 the then PAC Area Commander

1 Vice Admiral Worcester and his Lieutenant General  
2 courter-part over in the Russian Border Guard.

3 So, back in 2007, they said, "Hey,  
4 let's look at surveying this."

5 Well, as governments do, about three  
6 years later, the Russians are like, "Well, why  
7 are you surveying us? We don't want you to do  
8 this. We don't want to be a part of this. This  
9 is going to put us in a place that we don't want.  
10 We want complete autonomy."

11 So, we, as a government, continued  
12 forward with this and now, we're at a point where  
13 we've put it out for notice and comment, and for  
14 three months, and then we're hoping to go to the  
15 International Maritime Organization by 2018 to  
16 propose it there, and we've given ourselves some  
17 diplomatic wiggle room with it, by having that  
18 corridor over by Russia, that we could  
19 essentially choose to negotiate with Russians or  
20 not.

21 So, again, when we talk about the  
22 diplomatic side, that's as critical as the

1 operational piece, and when I look at the people  
2 in this room, I thank you for continuing those  
3 efforts on our behalf as mariners.

4 One other area that we are interacting  
5 with the Canadians on right now, in a similar  
6 fashion is the North Slope PARS, which is in its  
7 infancy right now. But when you talk about  
8 diplomatic and legal issues, when we talk about  
9 the Northwest Passage and trying to get agreement  
10 with one of our closest partners, you know, we're  
11 never going to I think, settle the international  
12 vice inland issue through the Northwest Passage,  
13 but we have such good relations with the  
14 Canadians that I think we'll figure out a way to  
15 survey up there and come up with a good route  
16 that we can work for the mariners and the  
17 operators, which is what I see as critical as a  
18 ship captain and a person that would have to  
19 respond to some of these events.

20 Other interagency efforts. We have a  
21 working group at headquarters, that's been  
22 working on ocean and coastal mapping, helping

1 fulfill the ocean and coastal geospatial data  
2 demands.

3 In these pictures, you see the Spar,  
4 which Commander Schallip back there, had  
5 commanded at one point, as well as a wave glider  
6 and some of the displays there.

7 But again, the intent there is to  
8 maximize the minimum, because again, there just  
9 aren't that many vessels up there operating. So,  
10 the more we can use equipment, even on Coast  
11 Guard vessels, to provide input, we're trying to  
12 do that.

13 Back to the Arctic strategy and  
14 interagency and cooperation and looking at states  
15 and locals, as well as industry.

16 This is a picture of a Search and  
17 Rescue Exercise we conducted back in 2015. So,  
18 not last summer, but the summer before and in  
19 that, we launched an unmanned aerial vehicle from  
20 Dead Horse and then transferred control of that  
21 from the shore side to the ship, used it to the  
22 find the person in the water, in this case it was

1 a dummy, Oscar, and then vectored in the  
2 ConocoPhillips helicopter, working with the North  
3 Slope of Alaska, as well as the Coast Guard 60.

4 So, what I'm trying to show there is  
5 again, the interagency cooperation that is  
6 necessary up in the Arctic, for multiple  
7 different reasons.

8 When we talk about support that we  
9 receive, you know, many are well aware of the  
10 charting side, but as an ice operator, one of the  
11 things that I have found particularly critical is  
12 satellite and satellite imageries, and the  
13 National Ice Center, which is an interagency-run  
14 center that's in Silver Spring, co-located with  
15 NOAA, you've got NOAA, the Coast Guard and the  
16 Navy, that operate this National Ice Center, and  
17 the products that they give us are absolutely  
18 critical, because when you look at ice-breaking  
19 the number one rule is if you can avoid it, do  
20 so.

21 The number two is if you aren't going  
22 to avoid it, find the path of least resistance,



1 which means find the area where the ice has  
2 receded the most. Find the first year ice. Find  
3 that path of least resistance, and these products  
4 really do it.

5 If you can see that, this is -- this  
6 picture it's color-filled, but you can see the  
7 open water and you can see how the ice gets to  
8 the multi-year level in different locations, and  
9 quite frankly, when I'm with Larry or the other  
10 senior scientists, this is really part of our  
11 planning process that we do each evening, because  
12 we need to maximize our time on scene to complete  
13 whatever the research projects are that we're  
14 doing.

15 Here is another product and with this,  
16 you can see that it's -- again, you can see where  
17 the open water is. There is ice analysis that's  
18 put into this, to show you where the different  
19 types of tents, again, whether it's first year  
20 ice, whether it's multi-year ice, because if you  
21 don't get that product and you're left to  
22 yourself and your visual devices, I have this up

1 for a reason, because last year in our first  
2 mission, we didn't get satellite imagery for the  
3 first five days, and during that time, we had  
4 what you always had in the Arctic, which is low  
5 to no visibility.

6 So, we're heading up and we found  
7 probably the biggest pack of multi-year ice you  
8 could find, and we then spent four days backing  
9 and ramming at significant -- significant wear  
10 and tear on the vessel, significant wear and tear  
11 on the captain, as he's interacting with the  
12 scientists as to why aren't we where we're  
13 supposed to be yet, and in -- quite frankly, it  
14 came down to not having the imagery when I needed  
15 it to make those operational calls.

16 So, Larry will probably recognize this  
17 slide, because it's when we were headed up to our  
18 dredge, and again, the satellite imagery helped  
19 us get all the way up to 82 North, quite frankly  
20 expeditiously and without this, it wouldn't have  
21 been expeditious and it allowed us to, in a --  
22 quite frankly, less than a three week period, get

1 all the way up there, complete a dredging  
2 mission, as well as all of the mapping that we  
3 were scheduled to do, and the year prior to that,  
4 what this satellite imagery did, along with the  
5 historical data, was allow us as a ship to find  
6 the path of least resistance up to the North  
7 Pole, and as a country, surface vessels, Healy  
8 has been there and one of the Polars has been  
9 there.

10 In fact, talk about Captain Brigham's  
11 stories, he was the first. So, we'll give him  
12 that, at least on the US side, when he was on  
13 Captain of the Polar Sea, but we were the first  
14 unaccompanied last summer, and that was -- or two  
15 summers ago, and again, the products and imagery  
16 and everything else that was presented to us is,  
17 quite frankly, the -- what enabled us to do it,  
18 and again, being here with NOAA, it's always good  
19 to highlight the science piece of what we're  
20 doing, and this is a -- these are pictures from  
21 our mission last summer, the first mission was  
22 Chukchi Borderlands.

1                   Dr. Russ Hopcroft was the principal  
2                   investigator and the pictures on the bottom left  
3                   is basically what we'll call a pock mark area.  
4                   As the climate is changing up there, we have  
5                   areas with methane gas, which have created new  
6                   areas that we're not certain exactly what's going  
7                   on and/or what type of life is there, and we had  
8                   a remote operated vehicle that we were able to  
9                   take down to the sea floor, and we were able to  
10                  discover two new forms of jelly-fish and a  
11                  benthic ctenophore.

12                  So, really quite frankly, exciting  
13                  times on the ship and it's always great to work  
14                  with our interagency partners too, to go to the  
15                  end of the globe and make these new discoveries.

16                  Again, back while we're up there, not  
17                  only are we sampling, doing all of the different  
18                  data sets that we can on the ship, leveraging it  
19                  as best as possible, we're also giving our input  
20                  to the Ocean Prediction Center and I've got our  
21                  box up there because again, we're usually the  
22                  only ones operating up there, that are reporting.

1           So, it really helps the models, and we  
2 certainly appreciate the models and look to have  
3 the interchange and exchange back and forth to  
4 try and get it right.

5           So, our future efforts, what we're  
6 looking at doing is as best as we can, to try and  
7 incorporate all these things into one display  
8 because as an operator right now, you're looking  
9 at multiple things, whether it's your ice radar,  
10 whether it's the satellite images, whether it's  
11 the ECDIS itself.

12           So, ideally, if we could get data  
13 fusion where we have as much as possible with the  
14 weather, the ice, the data from the coast pilot  
15 in one place, and working with the National Ice  
16 Center and our research and development center,  
17 to try and bring that along.

18           Now, I'm really walking into shoal  
19 water with Dr. Larry Mayer in the room, but I'm  
20 sure everyone here is familiar with the ECS and  
21 the project and how it's been going on for the  
22 last decade.

1           But it -- I would be remiss if, in  
2 talking about icebreakers and the value we bring,  
3 if I didn't talk about the fact that again, with  
4 that -- with our multi-beam, we're able to  
5 collect that the data that's necessary to put  
6 this plan together.

7           This picture, you'll see, has the pink  
8 areas are where we're expecting that we'll be  
9 able to show the Extended Continental Shelf, and  
10 the Extended Continental Shelf is basically where  
11 we're demonstrating that our continental shelf  
12 goes beyond 200 nautical miles. I think of it as  
13 basically, a modern day Louisiana Purchase  
14 without the purchase. It's us demonstrating that  
15 through this bathymetric and seismic data.

16           This was our third mission. Again, it  
17 was with Dr. Mayer. The pictures on the bottom  
18 are the Alpha Ridge where we went up and we did a  
19 couple of dredging operations and back to --  
20 again, the Arctic strategy and the cooperation,  
21 not just inter-governmental, but with our other  
22 partners, in this case it was with Canada, and

1 Canada does quite a bit of work for us in the  
2 Eastern Arctic and in this case, there was an  
3 agreement at the Arctic Ministerial that we would  
4 conduct a couple of dredges for them up at 82  
5 North and we successfully were able to grab a few  
6 rocks off the bottom for them, for their ECS  
7 submission.

8 Why I talk about that is, when you  
9 look at the Arctic Nations, and you think about  
10 the United Nations convention on the law of the  
11 sea, the Arctic really is a place where we work -  
12 - quite frankly, we have a legal framework.  
13 We've worked generally, fairly well together.

14 There are areas where we rub, but we  
15 -- we work cooperatively up there, and this was a  
16 case of us doing that with the Canadians.

17 These were the legs that we ran for  
18 the bathymetric mapping last summer, and if you  
19 look at it holistically, and this doesn't include  
20 the data from last summer, but over the course of  
21 the program, we have data for an area larger than  
22 the size of Texas, and we have seismic data from

1 LA to New York over three times.

2 So, again, all this information now is  
3 being collated at a NOAA facility in Colorado  
4 with the Department of State team to get our  
5 submission ready, so that we can demonstrate what  
6 we have up there.

7 So, with all of that as some  
8 background and the Coast Guard, where we're at  
9 with icebreakers, we talked about only two of  
10 them at the moment.

11 So, organizationally and budget-wise,  
12 in the -- the current fiscal year budget, we're  
13 looking at \$150 million if it gets adopted and  
14 that's through the Department of Defense.

15 What we've done with the icebreaker  
16 money this time is like Healy's acquisition.  
17 We've now moved it from a DHS acquisition over to  
18 DoD, which seems to be at the moment, a pot  
19 that's more reliable.

20 So, we're hoping that the -- that it  
21 stays at the \$150 million, which is the great  
22 start, and what I can tell you, we've already



1 awarded five contracts to those five shipyards.

2 So, there is activity and there is  
3 industry involvement now. It's -- it -- it's  
4 getting really good forward momentum, and in  
5 fact, I've had members of those shipyards  
6 onboard, and this afternoon, I'll be going to see  
7 another Congressional delegation to talk about  
8 this.

9 But bottom line is, we'll looking at  
10 having the studies completed from one of these  
11 ships -- from all of these shipyards within the  
12 next year, and hoping to have the contract  
13 awarded by 2019, and the first icebreaker  
14 delivered in 2023.

15 So, again, it's been great to be here  
16 with you this morning and to talk a little bit  
17 about ice-breaking, and I want to thank you for  
18 the interagency cooperations and partnerships  
19 that we've had over the years, and as a Coastie,  
20 it's a great privilege to work with you.

21 CHAIR HANSON: Thank you, Captain  
22 Hamilton, and of course, again, more -- a lot of

1 meat there to be sure to have about two hours'  
2 worth of questions, but we have to move on for  
3 right now. Will you be able to stick around with  
4 us a little bit this morning?

5 CAPT. HAMILTON: I can stick a little  
6 this morning.

7 CHAIR HANSON: Okay, thank you very  
8 much. They'll be a line up to talk to you. So,  
9 thank you again, and thank you also for  
10 mentioning the interagency cooperation.

11 Certainly, just a few months ago  
12 Admiral Shep was at a hearing alongside the Coast  
13 Guard and Corp of Engineers talking about the  
14 various surveying and charting missions, and as  
15 Congress looks to explore the under-gap that  
16 Admiral Smith has coined and hopefully, you  
17 copyrighted that phrase, but it's all important  
18 discussion to have, to see how we can be more  
19 efficient with the dollars we get.

20 So I'll introduce Lieutenant Colonel  
21 Andrew Olson from Seattle District. He's  
22 actually seven months onboard with the Corp side

1 of the Army. As you give your presentation, sir,  
2 I just want to thank you for your service and I  
3 notice Kosovo, Afghanistan, Kuwait and I'm sure  
4 there are many other missions and thank you for  
5 your service. Thank you.

6 LT. COL. OLSON: Thank you, Bill.  
7 Good morning. It is great to be here with you  
8 and it's a pleasure to be included in the group  
9 here.

10 My friends call me Andy. So, we've  
11 introduced ourselves. So, I'm Andy, all right.

12 So, I'm the Deputy District Commander  
13 for the Seattle District here. Colonel Buck is  
14 elsewhere today and sent me to represent him.

15 I'm here today with my chief of  
16 navigation, Kym Anderson, and we both want to  
17 just thank you for inviting us, and for the  
18 opportunity to participate and really, for the  
19 continuing collaboration that we all experience  
20 with NOAA and others.

21 So, while the Corp of Engineers is a  
22 globally recognized leader in civil engineering

1 and sciences and other things, today we'll  
2 obviously just focus on that navigation mission  
3 that we have, and particularly, that's where we  
4 have a lot of inter-dependence with NOAA.

5 So, here is the mission. Safe,  
6 reliable, efficient, effective and  
7 environmentally sustainable waterborne  
8 transportation systems for the movement of  
9 commerce, for national security needs and for  
10 recreation.

11 What in the world does the Army have  
12 to do with this, when you read this mission  
13 statement, right? I've asked myself that. I  
14 presume some of you have.

15 I just think back to Lewis and Clark,  
16 right, they were basically Army engineer  
17 officers, navigating, mapping and from there, we  
18 had West Point, the first engineering school in  
19 the nation, and things just progressed from  
20 there, right? So.

21 Anyway, going back to 1824, that's  
22 when the first laws first authorized --

1 authorizations from Congress came, funding the  
2 Corp of Engineers to improve safety on the Ohio  
3 and Mississippi Rivers, and several ports.

4 So, navigation was really the first  
5 civil works mission that the Army Corp of  
6 Engineers ever had.

7 Locally, our navigation mission  
8 stretches throughout the Puget Sound, up around  
9 the Peninsula and down the coast of Washington.

10 We maintain our own survey based our  
11 of Hoquiam and you know, they perform routine  
12 surveys and particularly provide support to our  
13 own dredging operations.

14 In The Puget Sound, we operate the  
15 Puget, and you can see the picture at the bottom  
16 of the slide. The Puget tools around the Sound  
17 and the harbors and picks up the snags and the  
18 hazards that are sometimes floating out there,  
19 keeping things safe for everybody.

20 It also serves as a backup skimmer for  
21 the Coast Guard and participates in routine  
22 drills for that, and the next one is actually

1 scheduled for June 6th.

2 Our Dredged Material Management Office  
3 works in concert with the EPA and with the  
4 Washington Department of Natural Resources and  
5 Ecology as the multi-agency dredged material  
6 management program, assessing dredged material's  
7 suitability for in-water placement.

8 We maintain federal navigation  
9 channels with high and moderate use channels  
10 dredged on a more regular basis. There are other  
11 channels that are low use, that don't get --  
12 don't get so much attention.

13 Our program today includes 23 active  
14 channels and that supports several ports. The  
15 amount of work we executed in fiscal year '16 was  
16 uniquely large, but that was due in large part to  
17 end-of-year funding and particularly to repair  
18 some storm damage of revetments.

19 This fiscal year, and Dr. Callender  
20 mentioned, we're still under that continuing  
21 resolution authority, which kind of limits the  
22 work that we can do to just kind of regular

1 routine type of dredging.

2 I guess a summary here with this slide  
3 would be that, you know, dredging has just become  
4 more difficult as time has gone on. The costs  
5 have gone up and the funding has not, and in  
6 addition to the costs, there's several  
7 constraints.

8 You look at constraints on the  
9 beneficial reuse, constraints on where that  
10 dredged material can go, and then we have  
11 protected species that sometimes limit the time  
12 that we can operate, time and places.

13 So, when you put all that together,  
14 it's just a little bit more difficult, and when  
15 you get all these factors it's really kind of  
16 imperative, it becomes obvious that we have to  
17 figure out a cost effective way to do things as  
18 much as possible.

19 One point on that is, you see the  
20 bottom of the slide, eHydro is something I want  
21 to introduce to you today. It's a good news  
22 story. It's a recent -- just came online this

1 past year in 2016.

2 It's a cost effective way for federal  
3 agencies to share survey data with each other,  
4 but also with the public.

5 This slide shows a detailed flow  
6 chart, kind of explaining how that whole thing --  
7 how eHydro works.

8 So, you're taking the framework for  
9 the channels that we have, the actual survey  
10 data, putting it together and you've got a lot of  
11 outputs, and a lot of different customers that  
12 use the different types.

13 So, obviously we like -- we're very  
14 concerned and interested in the condition plots  
15 that go along with different projects, and then  
16 we have NOAA reports and the channel indices.

17 So, this information is then available  
18 on the internet. You can pull it down in these  
19 different formats, and like I said, for the  
20 public, as well as for the agencies, and it comes  
21 in -- you know, some of it is PDFs, documents  
22 that you can easily print.



1           So, if you were to see -- let me get  
2           to the next slide here.

3           If you were to see a boat out there  
4           taking a survey, you could realistically expect  
5           to see those -- to see that data available to  
6           you, as a member of the public, about six or  
7           seven days later. That's how fast it's  
8           happening.

9           So, I'll say that the data generated  
10          by USACE is limited to what is collected in  
11          support of a federal channel, but the data is  
12          also incorporated by NOAA in the chart  
13          development.

14          Current status of implementation for  
15          these surveys and this data is that the large to  
16          moderate ports have been posted from the last  
17          five years, and we're currently working on the  
18          smaller ports and the due date or the expected  
19          date is about 2018. This will be more of a  
20          complete collection.

21          There's a website here for you. I also  
22          found it myself, just tooling around on our

1 public website. You can click, you know,  
2 'navigation' and it's an obvious button in there.  
3 So.

4 So, it's been mentioned, but this --  
5 this CMA, CGM, Ben Franklin, right, which visits  
6 Seattle last year. It's 18,000 20-foot  
7 equivalent unit ship, 52-foot draft, and  
8 highlights the fact that vessels are getting  
9 bigger, and as that happens, this navigation  
10 mission becomes more and more critical,  
11 increasing the clearances and increasing our  
12 understanding of the bottom, to ensure safe  
13 navigation. I'm skipping a little bit.

14 So, I guess I'd want to shout-out to  
15 NOAA for the various products that contribute to  
16 our mission with the navigable waterways of the  
17 U.S. All these products here you see, I just  
18 want to highlight the fact that, you know, we're  
19 also a user. We provide and we use, and we  
20 support each other in that. So, thank you.

21 Some of you are probably familiar and  
22 have heard about a study going on with the

1 Seattle Harbor. I just wanted to throw that out  
2 there as a tidbit, if some of you are interested.

3 Basically, we're looking to see if the  
4 authorized depth can increase down to 57 feet.

5 So, it's looking at alternatives for navigation  
6 improvements to both the east and the west  
7 waterways, that you can see there on the left and  
8 right.

9 The authorized depth of the Federal  
10 Navigation Channel in the west waterway is 34  
11 feet, and existing depths range from 50 to 60  
12 feet, so that would be a big improvement there in  
13 the depth.

14 In the east waterway, it's authorized  
15 at 51 feet on the north end, and the south end is  
16 authorized at 34 feet, currently, and both the  
17 widths of those waterways is 500 feet in both  
18 cases.

19 So, where we're at with that as a far  
20 as a time line goes. You see the Draft  
21 Feasibility Report coming out last summer, and  
22 looking to finalize that here in the coming year,

1 and hopefully, we'll get authorization and  
2 appropriation to go ahead and design and  
3 construct in about 2019. Of course, that's  
4 subject to Congress, right? So, don't hold your  
5 breath, but we'll hope.

6 All right, I just want to highlight to  
7 another case of great collaboration that -- the  
8 Hylebos Waterway down by Tacoma.

9 So, maybe you're familiar with the  
10 story. A rock barge, barge carrying rip-rap, big  
11 rocks sunk in this waterway and posed kind of an  
12 obstacle.

13 With the sunk there, it changed  
14 things. People had to offload a lot and could  
15 not -- could not draft as deep and were limited  
16 to high tides and so, there's a financial  
17 interest there, in getting that cleared out.

18 But in this case, you know, the Corp  
19 of Engineers, the Coast Guard, NOAA worked  
20 closely together. We established a  
21 Virtual Aids to Navigation, that was near  
22 instantaneous, where you know, through the GPS

1 and things, you get the alerts and notice, notice  
2 of the hazard, and then in the meantime, we're  
3 able to work -- work the issue of getting the  
4 stuff actually removed, and you can see the time  
5 line of how it worked out.

6 So, a success story, and it's a  
7 pleasure to work with the Coast Guard and with  
8 NOAA, and it's been highlighted in multiple cases  
9 now, but just wanted to share that with you.

10 It's also a good example of the  
11 benefit of electronic management of the  
12 navigation charting information.

13 So, Bill, I know you're going to ask  
14 me. I'm going to be around for a couple hours.  
15 But Kym Anderson will be here all day, and she's  
16 -- her information is here, and that's why her  
17 information is there, because you'll get farther  
18 talking to her, than you will to me.

19 But I'm -- I appreciate this --  
20 appreciate the chance to be here. Thank you for  
21 allowing me to participate.

22 CHAIR HANSON: Thank you, sir, and

1 actually we do know Kym and we know where to find  
2 her, so thank you for that, as well.

3 Thank you for the presentation. In  
4 terms of the deepening project, it's an  
5 interesting project, but with the Congressional  
6 representation that Washington enjoys,  
7 particularly Beth and Senator Murray's group, I  
8 think the odds are pretty good that you'll see  
9 some support for that. So, good luck with that  
10 project.

11 I think I'm going to pull Chairman  
12 prerogative here and extend us for a few more  
13 minutes because this is -- one of our premier  
14 panels and we want to take some time to take  
15 advantage of them if we can.

16 Go ahead and open it up to the Panel  
17 for a few questions.

18 MEMBER PERKINS: Scott Perkins.  
19 Captain Hamilton, I'm curious, you mentioned, you  
20 know, the dilemma of not having the -- you know,  
21 the remote-sensing data that you needed, you  
22 know, to navigate the ice in a timely fashion.

1           Do you see onboard, unmanned aerial  
2           vehicles as your self-sufficient solution for  
3           that going forward, or do you think the  
4           dependency upon satellite, you know, remote  
5           sensing is, you know, with the launch of all the  
6           small sats, which solution is going to be more  
7           cost effective for the Coast Guard and give you  
8           what you need when you're at the helm of that  
9           vessel?

10           CAPT. HAMILTON: Both. So, there is  
11           the strategic.

12           So, ice-breaking is strategic and  
13           tactical. Strategically, you're trying to look  
14           out 10, 20, 200, 300 nautical miles ahead, and  
15           your satellite is going to give you, you know,  
16           gives you that data and information that is  
17           helpful there.

18           But we used to carry helicopters and  
19           we had a polar operation division. So, when I  
20           was the operations officer on Polar Star, that  
21           helicopter, and quite frankly, the German  
22           icebreakers, all the icebreakers that are up in

1 the -- in the Arctic -- well, I shouldn't say  
2 all. Many carry helicopters and they give you  
3 that tactical kind of closer in view up over the  
4 ice.

5 We don't have those at the moment.  
6 So, I think the UAS is going to be the solution  
7 for that tactical close in range and that's  
8 something over the last two summers, you know,  
9 you saw the SAR-X where I said we had the Scan  
10 Eagle.

11 We'd also worked with NOAA with the  
12 PUMA. We're figuring out what that UAS is going  
13 to look like for the internal, but I don't think  
14 shutting down the satellites is an option, and I  
15 personally think that's something that's got to  
16 stay there, and I think it's a both, not an  
17 either/or.

18 MEMBER PERKINS: Thank you.

19 CAPT. HAMILTON: Thank you, sir.

20 MEMBER BRIGHAM: I've got a question  
21 for Andy. The release of the eHydro data is not  
22 just a table of numbers, correct?



1 LT. COL. OLSON: Right.

2 MEMBER BRIGHAM: And so, when I see,  
3 and I've looked at it, what I would consider a  
4 chart, I wonder that we now have two kind of  
5 charting agencies of the United States, and how  
6 the release of that data and how it correlates  
7 with NOS.

8 I'm just interested in the process of  
9 how, because I would say for Boulder, that what I  
10 would take down in that picture is kind of my  
11 chart.

12 So, I think there are -- I mean, it's  
13 not necessarily for you to answer this directly,  
14 but to me, it's a new challenge.

15 LT. COL. OLSON: I don't know, Kym, do  
16 you want to just go ahead and --

17 MS. ANDERSON: That nexus of multiple  
18 data sources is something that we've been working  
19 on with NOAA.

20 Sorry, I thought I was talking loud  
21 enough.

22 So, that nexus of multiple data

1 sources is something that we've been working on  
2 with NOAA and with pilots for a while now.

3 I think where we're at right now is,  
4 you have to look at the date of the information,  
5 and it really does depend on the user.

6 So, from the Corps' perspective, we  
7 have the responsibility of providing that  
8 information for the navigation channel, and  
9 that's why it's our intent to post that as near  
10 real-time as possible.

11 So, a pilot or a boater can pull down  
12 both the PDFs like we talked about, as well as  
13 the xyz data.

14 At the same time now, we have NOAA  
15 being able to pull down, I'm not sure how  
16 frequent, and they use the same information to  
17 then update their charts.

18 So, sometimes you would actually see  
19 something on our website before it had gotten  
20 onto the NOAA charts.

21 Then you also have the ports  
22 themselves, if you're a pilot, for example, I

1 don't know, Columbia River pilot. The ports will  
2 have their burden areas mapped separately and  
3 that won't be on there.

4 So, it's knowing all the different  
5 data sources and how to plan your trip.

6 MEMBER BRIGHAM: It's really a  
7 coordination between the two agencies and it's  
8 the timing of the release of these products.

9 MS. ANDERSON: Yes, and I don't know  
10 Chris, if you can say how often you guys pull  
11 from it to -- I think it's like, we get the call  
12 at least once a year, if not twice a year.

13 MR. NEWMAN: Various districts do  
14 different things, that's another problem within  
15 the Corps, is some districts send us their data.  
16 They push it to us. Some districts tell us to  
17 pull their data off the website at certain  
18 intervals.

19 So, I can't really answer what is done  
20 in the Washington District, but we do -- we do  
21 pull it off and apply it.

22 I'm going to touch on this -- some of

1 this. This is good discussion on the national  
2 charting plant, also.

3 MEMBER SAADE: This is Ed Saade. Is  
4 there any method to include industry or the  
5 public in being able to upload the data, or is  
6 this software available? Is it public domain  
7 software for others to get involved?

8 MS. ANDERSON: Not to download. You  
9 can pull stuff off, but you can't put stuff on.

10 MEMBER SAADE: Is there any reason not  
11 to start to think about including others besides  
12 federal agencies?

13 MEMBER PERKINS: Ed, may I -- may I  
14 add onto that?

15 I went and visited the Portland  
16 District three years ago, after we got introduced  
17 to eHydro at an HSRP meeting. So, I went there  
18 and I met with the programmers, Mike Boulin,  
19 specifically, inside the Portland District.

20 It's a very complicated, you know, GIS  
21 toolset that they've developed to aggregate the  
22 data and automate the chart production process,

1 so they can get that near real-time data back  
2 out, publicly facing in those printable PDFs.

3 You're asking, I think, a very  
4 important strategic question, that I think  
5 remains unanswered or unclear, on can that eHydro  
6 toolset, and the intellectual property that's  
7 been developed by Army Corps, specifically  
8 Portland District, is that to a state and a point  
9 to where it can be rolled out and be -- have  
10 further beneficial use, by both the public, the  
11 private sector and other agencies.

12 Mr. Olson, in your comments, you  
13 mentioned the use of eHydro by other agencies,  
14 and so, it would be -- as a follow up, I don't  
15 expect you to pull it, you know, out of the thin  
16 air this morning, but it would be interesting to  
17 find out.

18 I know there is a community of  
19 practice established for eHydro within Army Corps  
20 of Engineers. They have a monthly user's  
21 meeting.

22 But has that group, in the last four

1 years, since I looked at it closely, has that  
2 expanded and are other agencies, you know, using  
3 it and is that eHydro toolset something that can  
4 be expanded for the inland navigation system, you  
5 know, beyond just ports and harbors?

6           You know, there's been a -- there's  
7 been a good investment, right? Army Corp has  
8 done really good work making that product fit the  
9 need for that specific application, you know, but  
10 can it -- can it be taken farther, you know, and  
11 more beneficial use from that investment?

12           LT. COL. OLSON: Great question.  
13 Great point. I don't know. I'm going to ask Kym  
14 again. Do you have any thoughts on that one?

15           MS. ANDERSON: Yes, so, I know they did  
16 just have an eHydro conference last week, where  
17 they -- and that was part of the discussion.

18           I know the focus has been on getting  
19 all of the information that we collect on the  
20 system first.

21           So, again, it's in infancy, you saw  
22 the deadline, by 2018. I think once we reach that

1 milestone, then we can start having those  
2 conversations, both about if other parties want  
3 to use it, as well as other mechanisms that could  
4 be developed to advance the usefulness of it.

5 CHAIR HANSON: Newest member, Lindsay  
6 Gee.

7 MEMBER GEE: Yes, Lindsay Gee. I've  
8 got a question for Mr. Berger.

9 You mentioned in your -- I think it  
10 was just near the end of that, you mentioned  
11 about autonomous system, and it was -- I think  
12 you said from the air to the sea bottom.

13 But I wondered whether that included  
14 actually, autonomous vessels operating in the  
15 states waters, and not maybe for research and  
16 observation, but actually just operating vessels  
17 autonomously.

18 MR. BERGER: Yes, I think rather than  
19 saying the sky is the limit, the ocean depths are  
20 the limit for that.

21 There is a core group of folks who are  
22 -- and I'll speak particularly on kind of the

1 maritime and marine technology side that are  
2 collaborating quite closely, both in directly to  
3 the marine technology and the marine science  
4 base, but also on the commercialization on a lot  
5 of that technology.

6 We have companies that are spinning  
7 out of the University of Washington's applied  
8 physics lab. We have the development of a  
9 statewide strategy around technology, as well as  
10 the -- looking at the development of a  
11 commercialization test center, an innovation  
12 center, and incubator for that.

13 So, you know, the work that's  
14 happening around autonomous vehicles is extensive  
15 and I think at this point, it's kind of gathering  
16 what we know, gathering kind of the IT side of  
17 that, gathering kind of the manufacturing side of  
18 that.

19 There is great support and interest.  
20 Some of that is moving -- some of that is moving  
21 forward on particular products, and some of that  
22 is pretty nascent, as well.



1                   CHAIR HANSON: All right, at the risk  
2 of having a very short tenure as Chairman, I  
3 think I need to say thank you to our panelists.  
4 Thanks for getting us off to a great start. It's  
5 a star-studded group here and a lot of things to  
6 think about over the next three days, and you've  
7 really kicked us off well, so thanks again.

8                   I think I'll try to get us back in  
9 here at 10:30, if we can just take a 10-minute  
10 break please. Thank you.

11                   (Whereupon, the above-entitled matter  
12 went off the record at 10:21 a.m. and resumed at  
13 10:35 a.m.)

14                   CHAIR HANSON: It's just like when you  
15 throw a party, everybody congregates in the  
16 kitchen. So, everybody is back at the coffee  
17 pot.

18                   So, thanks for this morning. Our  
19 final speakers for this morning are the directors  
20 of NOAA's navigation-related services programs,  
21 Center for Operational Oceanographic Products and  
22 Services, otherwise known as CO-OPS, National

1 Geodetic Survey NGS and the Office of Coast  
2 Survey OCS.

3 Complete biographies are included in  
4 your meeting packages. This morning, I'll be  
5 introducing each, then they'll present, and then  
6 we'll invite questions at the end of the last  
7 presentation.

8 If you want to ask a question sooner  
9 than that, write it down. But we'd still like  
10 you to ask it later. So, thank you.

11 First speaker, Mr. Rich Edwing, a  
12 man about town in Washington, D.C., because I  
13 know I see him everywhere.

14 Director of NOAA Center for  
15 Operational Oceanographic Products and Services.  
16 Rich has held many positions of increasing  
17 responsibility within NOAA, and as director of  
18 CO-OPS, he oversees the 24/7 operation of  
19 providing physical oceanographic information to  
20 mariners and other users.

21 Rich also serves as an advisor to the  
22 American Association of Port Authorities, Harbors

1 and Nav Committee. Rich, thanks for being with  
2 us.

3 MR. EDWING: Thank you, Bill. So,  
4 while we're waiting for the slides to come up,  
5 good morning everyone, and there they are.

6 So, this morning I think kind of the  
7 common theme between the three directors that  
8 we'll be talking are strategic priorities. I  
9 think Juliana and I are kind of talking about our  
10 strategic plans and the progress we've made, and  
11 where we're going. Think Shep is talking about  
12 maybe some new strategic priorities he's putting  
13 in place as the new, you know, director of coast  
14 survey.

15 So, this is actually a good time for  
16 me to talk about our strategic plan, because  
17 we're really kind of halfway through executing  
18 it, and actually, we developed this a little  
19 early and put it in place maybe in FY14. So,  
20 I'll be talking about, you know, that time frame,  
21 really FY14 until now.

22 Our four main goals are -- the first

1 one is customer service. It's really about, you  
2 know, making sure we provide great customer  
3 service to our existing suite of users. You  
4 know, identifying new users out there, and  
5 monitoring and measuring how we're doing with  
6 that.

7 Our Integrated Observing System goal  
8 is really about integrating the observing system  
9 that I manage, or my program manages, our NWLON,  
10 our Currents Program and our PORTS program.

11 But also, integrating with external  
12 partners, whether they're other federal agencies  
13 or local partners.

14 Advanced products and services is just  
15 continuing to evolve our -- our suite of products  
16 and services to meet emerging needs, but also to  
17 again, as I think as Russell mentioned, to  
18 integrate those, again, not just internally  
19 within CO-OPS, but also with outside third party  
20 applications like ECDIS and AIS and those sorts  
21 of things.

22 Then finally, our human capital

1 infrastructure title we try to build the best  
2 workforce in the nation, as a lofty goal, and  
3 this also focuses on our IT infrastructure.

4 So, I'm going to move through this.  
5 Again, it's by the goals and roughly by the  
6 objectives we have in the plan. I'm not holding  
7 strictly to that, to try to tell a little bit of  
8 a story.

9 On this slide, I'm not going to list  
10 all the customers, you know, our traditional  
11 customers, you guys are all pretty much familiar  
12 with those.

13 But some of the new ones we've  
14 identified over the last few years is the  
15 Reinsurance Association of America and some water  
16 quality boards. These are organizations we  
17 didn't really know used our information or how  
18 they used the information, and they didn't really  
19 know who we were. So, building those  
20 relationships are important to both sides.

21 In terms of direct customer  
22 engagement, a few years ago, really in parallel

1 with the LA Long Beach project, the offices put  
2 together, or actually contracted for an  
3 engagement strategy document, kind of a user's  
4 manual for us to use, which now is guiding our  
5 future efforts, and the LA Long Beach project, I  
6 think you're well aware of. You know, we talked  
7 about this at past meetings. We're pretty much,  
8 I'll say done with that one, we still are doing  
9 some things there, but it's really up to the Port  
10 of LA now, to kind of get the under-keel  
11 clearance forecast model into place with the data  
12 that's been provided.

13 But since then, we've now taken the  
14 lessons learned from that, we've gone down to the  
15 Gulf of Mexico in the last year, year and a half,  
16 we've been doing an intensive and extensive  
17 outreach to all the different users down there,  
18 to figure out what requirements they have, what  
19 unmet needs.

20 Is there a very specific issue, like  
21 the Port of LA Long Beach had, or is it a lot of  
22 smaller things?

1           We've kind of completed that effort  
2           and are now, you know, we put those requirements  
3           together and are seeing what we can do with that,  
4           and really complementary to that, but somewhat  
5           separate, coast survey and CO-OPS, with the help  
6           of the GCOOS, which is the IOOS RA down there,  
7           held a modeling meeting, where we brought  
8           together both coastal modelers and the response  
9           community.

10           You know, the response community had  
11           the requirements. The modelers were developing  
12           models for whatever reasons, but brought  
13           everybody together to see how we can call work  
14           together and how we might be able to leverage  
15           what's going on down there with the modeling  
16           community for our operational forecast systems.

17           So, where we're going next is again,  
18           well, like I said, well, what's our next steps  
19           for the Gulf of Mexico?

20           One of the major needs down there was  
21           -- there's a gap between our models and the Corps  
22           river models. We need to kind of close that gap.

1 That's just one example.

2 Our modeling meeting down in the Gulf  
3 was very well-claimed and successful, so we're  
4 going to be doing more of those. We're in the  
5 Delaware Bay area next, and of course, we're  
6 always looking to identify new user groups out  
7 there.

8 One thing we've done in the last few  
9 years is, we've established a dedicated and  
10 technical assistance capability. Before it was  
11 just, you know, trying to use bits and pieces of  
12 different people's time to help folks throughout  
13 the organization. But we have an employee who is  
14 dedicated to doing nothing but going out and  
15 training folks, developing all the materials,  
16 which you know, range from workshops to  
17 PowerPoints to videos, and of course, this is  
18 more on the gauging and the observing system  
19 side.

20 But the whole idea is if we can, you  
21 know, train people to do this work, more is going  
22 to get done then if we try to, you know, actually



1 do it with ourselves.

2 On the product side, of course, we  
3 also have to help people understand how to best  
4 use our products. So, and we do this through a  
5 variety of ways.

6 Work through the IOOS RA's, you know,  
7 they have a lot of expertise and they can be a  
8 great extension of, you know, what we're trying  
9 to do, with helping people to understand how to  
10 use our products and services.

11 We're engaged with the Corps of  
12 Engineers in their natural and nature-based  
13 engineering, helping bringing the geospatial  
14 foundation that we provide, along with NGS  
15 inclusive to that effort.

16 The South Florida Compact, which is an  
17 organization of Southeast Florida, you know,  
18 counties and local governments, trying to deal  
19 with the sea level rise. We've worked with them  
20 a lot, to help them understand how to use our  
21 products and services for that purpose.

22 Just this last January, we released a

1 new report which is using  
2 satellite altimetry to come up with regional  
3 estimates of sea level rise.

4 Up until now, you've had to have an  
5 end-launch station in the vicinity to be able to  
6 come up with a good sea level estimate. This  
7 reports lay out all the technical background of  
8 how it got there, but we can now come up with  
9 these regional estimates. Folks who don't have  
10 an end-launch station nearby can come up with  
11 information that they need for planning, but they  
12 need to know how to use that information. So,  
13 we've been doing a lot of outreach on that.

14 Of course, the nuisance flooding,  
15 there's been a whole series of reports on that,  
16 and this has gotten a lot of media attention, but  
17 again, we're there to help people -- how do they  
18 apply that information to their planning efforts?

19 So, in terms of measuring how we're  
20 doing, I think like NGS, I'm not sure if coast  
21 survey uses this, but ForeSee is a company and  
22 they put the surveys up on your site and they

1 collect -- they ask the questions and collect all  
2 the information and kind of come back to you and  
3 advise on what needs improving. So, we've been  
4 using them for a number of years.

5 They also report back to us, something  
6 called a customer satisfaction index, that top  
7 green line are our scores over the past few  
8 years. That middle line is the average score of  
9 all the federal agencies that use ForeSee to  
10 collect information in the websites, and that  
11 lower line is the private sector. All the  
12 private sector companies that use ForeSee.

13 So, you know, so far, we've been  
14 doing, I guess better than the average, but of  
15 course, we always want to improve that.

16 Some of the other website improvements  
17 we've been doing are the confused GIS  
18 capabilities, their websites and products, and  
19 just last week, we rolled out a new homepage,  
20 which was in direct response to some of the  
21 recommendations that ForeSee made to us.

22 People were having a little trouble

1 navigating and finding stuff. So, hopefully,  
2 this new homepage will help improve that. But  
3 we're going to have to continue to monitor that  
4 and see.

5 So, in the future, we're going to  
6 continue. Now, our next step, really the  
7 homepage is really just step one. Now, we have  
8 to start, you know, going down into all the other  
9 parts of our website, which is our window to  
10 serving up data to everybody, to make changes  
11 there, do some of the product integration that  
12 Russell mentioned, as well, improving  
13 functionality and taking all that input and  
14 making it a reality.

15 So, moving into the observing systems,  
16 and again, we're looking at kind of what can we  
17 do with the -- you know, the observing systems  
18 under my program's direct control, as well as  
19 partnering with other people.

20 Certainly, from an NWLON we're really  
21 looking to enhance and expand. So, we're doing a  
22 lot of partnerships with people to fill gaps in

1 the NWLON. There is a list of folks there in  
2 that first bullet. This first graph is not very  
3 good, but the little pin up in the upper left  
4 there, that's Turkey Point. That's a Natural  
5 Estuarine Research Reserve off the Hudson River,  
6 got a lot of gauges down there in New York  
7 Harbor, but nothing up the river, and there's a  
8 gap there for us.

9 We're working with the research  
10 reserve to get a gauge in there to our standards,  
11 and we've worked with a number of other research  
12 reserves. What we're trying to do is work with  
13 them now, collectively as a system, and not as  
14 one-offs, because we can't really afford to do  
15 that.

16 This is Unalakleet, a gauge that the  
17 weather service funded up in the -- up in the  
18 Arctic, to fill one of the many gaps there. I  
19 think I spoke about that at a meeting or two ago,  
20 so I won't say much more.

21 I've also spoken about our efforts  
22 with USGS. I think this is probably our most

1 promising effort because that's another federal  
2 agency that's along the whole coast, where we're  
3 working -- making progress on our project on the  
4 Northeast Coast, to integrate stations there.

5 Now, in terms of enhancement, and it's  
6 probably a little hard to see here, but in 2005  
7 and 2006, Katrina and Rita really wiped out  
8 almost all of the stations, the tide stations in  
9 the Gulf. As we rebuilt, we have just not put  
10 them back in. But we've hardened them. So, next  
11 time around, we're going to do better.

12 They're not really marked here, but  
13 there's now 10 Sentinels of the Coast in the Gulf  
14 of Mexico. There's some others of our stations  
15 that are on these kind of elevated piles, as  
16 well, and where we have stations that are inland  
17 or up a river or somewhat of a protected  
18 location, we've also hardened them by elevating  
19 them up on steel frames or doing other things.

20 So, this is the Gulf, where we've also  
21 made a lot of progress, as well on the east  
22 coast, and these are probably the two most

1 vulnerable areas of the network.

2 Other things we're doing in working in  
3 conjunction with NGS, we're co-locating CORS at  
4 some of the stations, to help tease out the land  
5 motion for sea level rise information, and we've  
6 also completed a low cost gauge study, where what  
7 I asked my engineers to do is, I said come up  
8 with the most simplest, cheapest tide gauge you  
9 can do, to our -- that still gives us data to our  
10 standards, which really is a sensor and a data  
11 logger, right, and then just start adding things  
12 on to mitigate risks, and one thing might be,  
13 well, if you want that -- actually, you don't  
14 want to have to go there and get the data. You  
15 might want to add a communication system.

16 If you want to avoid data gaps, you  
17 might want to add a backup sensor. If you want  
18 to avoid this risk or that risk, you might want  
19 to add -- and if you mitigate all these risks,  
20 you really almost have built yourself an NWLON  
21 station, which meets my requirements.

22 But other people don't have all the

1 same requirements I have. So, this gives them  
2 all the options and lays out the philosophy we  
3 have and how we operate an NWLON station.

4 So, in terms of moving forward, we're  
5 really trying to work more now in this local-to-  
6 national integration of networks, both at NWLON  
7 levels and other levels. We put out a tiered  
8 data policy, which defines three kind of main  
9 tiers of data accuracies and collection rates for  
10 meeting different kinds of applications.

11 One thing I'm going to try to do with  
12 this gauge study is go out to industry and say  
13 can you build a product line that kind of allows  
14 people to add all these modules, and maybe you  
15 can even put in some of my software which has it  
16 to my formats.

17 If they see value in that, that's  
18 great. It's going to make it easier for me to  
19 work with folks and then kind of help build this  
20 local-to-national integration.

21 The PORTS system. We're up to 28  
22 PORTS. We've got kind of five more in progress.



1 I'll say we've put a pause on the system right  
2 now because it's been too successful a program.  
3 We're kind of over-scribed, we're at a capacity  
4 to take on more. I'll talk a little bit more  
5 about that in a minute.

6 But we're still able to make some  
7 improvements, you know, and I've got -- that's  
8 just an air gap sensor. But we can still bring  
9 in data and new products from other systems, like  
10 the IOOS High Frequency Radar Systems. This is  
11 in San Francisco Bay, but we've done this in New  
12 York, New Jersey, Chesapeake Bay and I think  
13 we're going to Delaware Bay next to do that  
14 enhancement.

15 But the future priorities for this  
16 system is one thing I've been trying to do for a  
17 lot time is to get the PORTS data out and  
18 integrated into AIS. It's really on the Coast  
19 Guard side of the fence right now to get done.  
20 They're like this close to getting it done, but  
21 they've got some IT security issues they're  
22 trying to work their way through, but I'm

1 hopeful, I've said this before, I'm hopeful it's  
2 going to be soon.

3 Then we're working on what's the new  
4 business model for the PORTS system? As I said,  
5 we're kind of at a capacity, under the existing  
6 model. So, we're looking at different  
7 alternatives of how we can maybe get that back on  
8 a sustainable path.

9 Current surveys. You've seen these  
10 before. So, just in the last few years, we done  
11 a couple of small surveys, Casco Bay, which is in  
12 Maine, Cape Fear in North Carolina, and this year  
13 we're doing the last year of our Puget Sound  
14 survey, 138 deployments overall, and finishing  
15 that up.

16 I'll say this five year plan is where  
17 we're going next, but as we speak, this is being  
18 revised because the budget is really not going to  
19 be able to support this plan right here. So, now  
20 we're going to have to kind of move some of this  
21 stuff to the right.

22 Of course, it's always important to be

1 continually identifying and fusing new technology  
2 into observing systems. You know, I've spoken  
3 about our transition of the microwave water level  
4 sensor into our network. We're making great  
5 progress on that. We're doing about 10 stations  
6 a year and starting to see some of the benefits  
7 of that.

8 Now, we've got about 40 or 50 other  
9 stations converted. This iridium aids the  
10 navigation current meter system. This is where  
11 we put the current meters out on the Coast Guard  
12 buoys. By going through iridium satellite, we're  
13 able to eliminate the shore based station because  
14 we're using line of sight radio before, and that  
15 really reduces the cost of that system  
16 dramatically. It also increases the reliability,  
17 because we were having problems with the line of  
18 sight, and you can also put these buoys further  
19 offshore now, because you don't have to worry  
20 about the line of sight, and the Port of Miami,  
21 we have the -- the new Miami port system is  
22 taking advantage of this.

1           Hermit is just the name. It's not an  
2 acronym. I'm not sure why I got the name, but  
3 that's our underwater system that we developed  
4 for up in the Arctic, to try and get long term  
5 measurements up there. We've been successful in  
6 doing that, in terms of getting at least 18  
7 months of data under the ice, which is great for  
8 predictions and datums. But that's the extent of  
9 it. I'm sorry, I've been -- I should be  
10 scrolling through.

11           So, that's the iATON. That's Hermit,  
12 at least that's the little buoy that's above with  
13 the sled with the pressure sensors is on the  
14 bottom, and then another tri-office project was  
15 the GPS buoy where -- and this has gone into  
16 operations and we can deploy these. Right now,  
17 they're being deployed mainly to support hydro  
18 surveys, mainly up in Alaska, where it can be  
19 very challenging to get tide gauges established  
20 on rocky low shores, and this is much easier,  
21 much more cost effective, but could be used other  
22 locations as well, and probably for our VA

1 project.

2 So, other things we're working on for  
3 the future is we're adding that real-time  
4 capability to Hermit, because that's what people  
5 really want is that real-time capability. That's  
6 why there was that little buoy in that previous  
7 picture.

8 We're looking at how can we leverage  
9 GPS, to really kind of modernize what we do in  
10 the Water Level Observation Network, and NGS has  
11 provided great support. I really appreciate what  
12 Juliana and her folks have done with this,  
13 although we're really just starting the effort,  
14 but one thing is integrating a GPS sensor with a  
15 water level sensor. So, it's self-monitoring its  
16 stability and maybe we can eventually sunset our  
17 benchmark network in that area.

18 Also, we're getting the land motion  
19 out of that as well. So, there's a lot of  
20 things, I think a lot of efficiencies we can  
21 achieve with that. So, we're looking at that,  
22 and again, I've talked about, we're pretty

1 confident we can get wave information out of the  
2 microwave water level, and we know we can get the  
3 current meters, as well.

4 So, it's dual-purposing sensors that  
5 are already out there, and getting more  
6 information out of them.

7 So, moving into the advanced products  
8 and services.

9 Under the coastal preparedness area,  
10 we've been putting out a lot of reports with what  
11 I talked about earlier. We've developed this  
12 Coastal Inundation Dashboard, which I believe  
13 I've briefed the Panel on. That's still a work  
14 in progress, although it's gone operational in a  
15 couple places.

16 The Storm Quick-Look product is kind  
17 of encompassed in that. But will eventually be  
18 totally integrated into that. But the dashboard  
19 really brings together historic data. It brings  
20 together the real-time data and it brings  
21 together the forecast data and it can also bring  
22 in, in the future we're hoping to bring in

1 partner data, to really provide a comprehensive  
2 overview of what's going on when the storm is  
3 approaching the coast.

4 We've put out a new High Tide Bulletin  
5 product last year because when king tides,  
6 perigean tides, were, you know, occurring along  
7 the coast, people were getting concerned, you  
8 know, seeing minor flooding, what's going on?

9 So, we start putting out advanced  
10 information. This is coming. Don't be worried  
11 about it.

12 So, again, future priorities. Again,  
13 it's really continuing to educate and work with  
14 people on sea level rise, how to prepare for  
15 that. Particularly, this new regional sea level  
16 capability that we come out with, and it's  
17 continuing that dashboard expansion and  
18 enhancement. It's operational in three areas  
19 right now. We want to continue expanding that to  
20 other areas and adding the additional features  
21 on.

22 We've got the IGLD update coming. We

1 talked about this at the Cleveland meeting we  
2 just had. We've got the bilateral plan completed  
3 between Canada and the US. We've got a small  
4 amount of funding to do some seasonal gauging and  
5 we've actually started a data collection effort.  
6 It's a seven year effort, and this year was the  
7 first year.

8 So, as that moves along, in the future  
9 we need to, you know, start to educate people and  
10 communicate out what this is going to mean to  
11 people. But we also have a tidal epoch update  
12 coming.

13 Every 25 years, we'll look to see what  
14 kind of changes there's been in the sea level,  
15 and do we need to make adjustments to our tidal  
16 datum, so that they're still relevant, and I'm  
17 going to -- I'm going to guess pretty confidently  
18 here that we're going to have to do that.

19 Vdatum, our main role is to do the  
20 tide gauging surveys to reduce the uncertainty in  
21 the models. We've done a couple of multi-year  
22 projects in the New England Northeast and the



1 Pacific Northwest the few last years. A couple  
2 new models have been rolled out in the areas  
3 there on the slide.

4 Kind of again, reducing that  
5 uncertainty. I think it also expanded their  
6 geographic coverage, as well, and that's what  
7 we'll continue doing, going into the future, more  
8 surveys, but also we're going to dual-purpose  
9 some of those up in the Great Lakes, to also meet  
10 IGLD requirements, as well.

11 So, we've invested a lot in recent  
12 years, in kind of modernizing and taking some of  
13 our water level -- actually all of our normal  
14 water level processing algorithms and tools, and  
15 getting them up onto a website, so that  
16 partially, it's because allows our folks to  
17 telework and kind of access these tools remotely,  
18 but it's also, we can allow other people to come  
19 in and use these tools to process water level and  
20 come up with some other products.

21 For people who don't have data to our  
22 standards, we've put out a stand alone

1 datums calculator, so they can put their data  
2 into that and come up with a tidal datum. That  
3 was -- it's been an often requested tool that  
4 we've delivered.

5           Then another tool that's been  
6 delivered is a MAPTITE product, and again, this  
7 was a great collaboration with NGS, as well as  
8 our Office of NCCOS, within NOS, the Centers for  
9 Coastal Ocean Science, and this is a tool that  
10 brings in land elevations, tidal datums,  
11 frequency innovation, different plant types and  
12 allows you to design your own restoration  
13 project, because different plants like different  
14 elevations to survive at.

15           So, really one of our next big steps,  
16 and again, this is all again, goes back to the  
17 local-to-national integration of networks for  
18 water level. So, I need to enhance my system to  
19 be able to take in data to other standards. Tier  
20 B and Tier 8 -- Tier C standards to be able to  
21 process those, as well. Right now I can't do  
22 that.

1 Forecast models. This is our -- this  
2 is the old paradigm of forecast models which was  
3 mainly building smaller, estuary-specific  
4 models. There was about 13 of them, but we  
5 realized that was not a very good paradigm, so we  
6 came up with a new paradigm, which were these  
7 larger, offshore models. We built those first  
8 because they provide the boundary conditions and  
9 then they also include the models that nest up  
10 into the estuaries, much more cost effective to  
11 maintain and it will actually allow us to get to  
12 full CONUS coverage in five years.

13 All these models are operated over the  
14 high performance computers at the  
15 National Centers for Environmental Prediction  
16 with the weather service.

17 So, in the future we've got -- there's  
18 a few of them that still need to be upgraded to  
19 the newest model engines. So, we've got to do  
20 that. There's other NWS enhancements that we're  
21 bringing in like down in Tampa Bay. They've  
22 developed the capability to forecast fog, which I

1 hear about all the time when I talk to ports and  
2 harbors. So, get that done down there and maybe  
3 try to start replicating that in other areas.

4 On the west coast we got a big -- the  
5 west coast model is also experimenting with  
6 simulating real-time data. All different kinds  
7 of data, bringing that in. First of all, just  
8 seeing if we can do it, and second of all, seeing  
9 if it actually improves the forecast at all, and  
10 depending on how that turns out, maybe starting  
11 to replicate that enhancement to other places,  
12 and you heard last, at the last meeting up in  
13 Cleveland, GLERL is developing an ice model,  
14 module -- ice forecasting capability for the  
15 Great Lakes. So, we'll add that in.

16 Ecological forecasting. The Gulf of  
17 Mexico forecasts have been around for 10 years or  
18 more, but we've made a lot of improvements to  
19 them and they're much more efficient to produce  
20 now, which allows us to take on bulletins in  
21 other areas, and so, we're working with NCCOS who  
22 has been developing the Lake Erie one. We did an

1 initial operating capability last year and in a  
2 month or two, we're going to move over to the  
3 full operations with that, and then we'll start  
4 working on Gulf of Maine next.

5 So, human capital and infrastructure,  
6 and in '14 and '16, we did some very extensive  
7 internal org -- you know, health surveys, just  
8 asking employees a lot of the questions on what  
9 could be improved, you know, looking for ideas.

10 Actually, that was -- those next three  
11 bullets should have been indented a little bit.  
12 Those are kind of three main areas that came out  
13 of the first one. But for both of these, we put  
14 together action plans and we're working on those,  
15 and really our next step is going to be to go  
16 back this next time around, and monitor. Now  
17 let's measure how well we've done on that, how we  
18 actually answered the mail.

19 I've got diversity inclusion down  
20 there. There's been a major effort in NOAA, I'd  
21 say over the last couple of years to really pay  
22 more attention to this. There's been a new NOAA

1 strategic plan put out. Russell has been a huge  
2 driver I think behind that, as well as within  
3 NOS, he has kind of launched several diversity  
4 inclusion initiatives within NOS.

5 So, again, you know, we need to  
6 measure the effectiveness of what we've done  
7 internally to CO-OPS, and also make sure we're  
8 fully behind Russell and the rest of NOAA in  
9 supporting those plans.

10 We've completed our Reliable Operating  
11 System which is really our project management  
12 system, but it's got thousands of standard  
13 operating procedures documented behind there for  
14 everything from putting a tide gauge in to  
15 processing data to do other things.

16 We have our KEEP training program.  
17 That's a knowledge, enhancement expertise  
18 program. That's kind of in-house university,  
19 which kind of has a level one, level two, level  
20 three, if it's for new people coming in and how  
21 can they progress up from an entry level person  
22 to kind of a master expert in the areas, we teach

1       them all the stuff that those, what they learned  
2       in college. But that's specific to CO-OPS.

3               Environmental compliance. We've all  
4       made a lot of progress and put good environmental  
5       compliance programs into place the last couple  
6       years, with a little encouragement from Russell.

7               The last thing is sustainability road  
8       map. That's where engineering divisions, we're  
9       really going back and revisiting all of our  
10      observing system protocols, procedures,  
11      everything we can do to try to find efficiencies  
12      and maybe better ways to do things.

13              On the IT side, we've rebuilt our  
14      database system and it had been a collection of  
15      all these legacy systems, multiple, many  
16      databases, down to two now and it makes  
17      programming much easier.

18              We've built an R&D sandbox capability.  
19      People can go in and you know, kind of test and  
20      play around with new products and things, without  
21      you know, threatening to crash something on our  
22      production servers. We do still have some legacy

1 Fortran code and things that need to be upgraded.  
2 So, we're working that, and cyber security is  
3 just an ongoing, you know, priority for the --  
4 for everybody, really.

5 So, we're going to conclude with the  
6 grand challenges slide, and again, this goes back  
7 to what you've seen. But we've just like PORTS,  
8 we've got, you know, we've and an exponential  
9 increase really in demands for water level  
10 information, and in some cases, they're asking  
11 for that water level information and gaps I have  
12 in my inlet system, and that kind of allows me to  
13 work with them at one level and maybe, you know,  
14 contribute something. In other cases, they're  
15 just trying to solve a local sea level or storm  
16 surge or habitat restoration or issue.

17 We can still provide some maybe help  
18 and expertise and that's mainly what our  
19 technical program is for. But at some point, we  
20 want to try to get these all kind of working from  
21 top to bottom, so that as a storm approaches, we  
22 can reach down and grab the lower level data and



1 put it together for some specialized products.

2 I'd like to -- the partnership  
3 challenges. It takes a lot of time and effort to  
4 work with folks, because there's lots of  
5 different kinds of hardware out there, software  
6 formats, all sorts of things, levels of  
7 understanding. It just takes a lot of time and I  
8 got 180 people in my organization and we got a  
9 nation to serve, so just, you can kind of do the  
10 math here. So, it's a big challenge.

11 Then this sustainable business model  
12 for ports. It's an over-subscribed program at  
13 this point, and we've got a new administration  
14 and they've got some ideas about how to approach  
15 things in terms of who does what, monetization is  
16 a big term with the new administration. So,  
17 we're looking at that.

18 So, we're putting together some  
19 alternatives that we need to, you know, consider  
20 and then pick one to try to keep this program on  
21 a sustainable course.

22 So, that's really the end of my

1 strategic plan, sort of briefing. I just have  
2 two slides here at the end, and we all have  
3 something similar in our presentations.

4 So, just kind of this just tries to  
5 illustrate how we partner in terms of managing  
6 our programs, both in terms of just, where does  
7 the money go, in terms of contracts and things,  
8 or who are we working with?

9 This doesn't really show you who we're  
10 working with, but it shows you where we're  
11 working with other entities to get stuff done.

12 So, just very quickly, that bottom  
13 one, the data collection, I got my three  
14 observing networks. You know, two of them are  
15 base funded and we do a lot of that really with  
16 in-house assets. But also, a lot of that goes  
17 out the door in contracts. That's that little  
18 yellow shading, and or also partner with people  
19 to get those things done, which is the red.

20 The PORTS is you know, primarily a  
21 partnership program, and that provides all the  
22 data, right, and then comes up. So, we're buying

1 a lot of equipment from the ocean technology  
2 vendors down there.

3 Then you move up into the product  
4 development, you know, we bring all the data in,  
5 we quality control, we process it and then we  
6 start putting it out as kind of products, and I  
7 tend to bin those into three main areas.

8 There's our historic data, those long  
9 data records, you know, predictions, data,  
10 sealable trends, there's that box on the left,  
11 real-time data in the middle, forecast data, the  
12 models on the right, and we put all that  
13 information out there to be used. You know, in a  
14 lot of cases, it's just used directly by folks.

15 But the third tier is how do we  
16 distribute that? Well, for tide tables some of  
17 the -- and the predictions, those are the -- the  
18 tables are published by the private sector. We  
19 don't publish anything hard copy anymore.

20 But really, the rest of it goes out  
21 over our website to a variety of ways, but that's  
22 what enables all sorts of third party

1 applications, research models, reports, the whole  
2 spectrum of things, and of course, the major  
3 societal benefits at the top and the traditional  
4 safe and efficient marine transportation and then  
5 coastal preparedness.

6 This just shows kind of in terms of  
7 dollars going out the door. On the left there is  
8 appropriated dollars. You can see 30 percent of  
9 the appropriated dollars goes out through  
10 contracts, different kinds of contracts. Five  
11 percent is used to buy equipment and the rest  
12 goes to, you know, FTE salaries, rents,  
13 telecommunications, those kinds of things.

14 Then the right-hand side is all the  
15 reimbursable dollars. We get primarily through  
16 the PORTS, our PORTS partners, but other  
17 partners, as well, and you could see pretty much  
18 all of that goes out the door either in terms of  
19 contracts or buying equipment. So, I guess we're  
20 holding questions for the end.

21 CHAIR HANSON: Yes, sir. Thank you,  
22 and actually, we need to take a two minute break,

1 I understand for a reboot of the system. So, the  
2 conversation was here, so stand by.

3 (Whereupon, the above-entitled matter  
4 went off the record at 11:08 a.m. and resumed at  
5 11:13 a.m.)

6 CHAIR HANSON: All right. I want to  
7 get us back on track here.

8 Now, Rich, you have to do yours over,  
9 right, during lunch? Roll the tape.

10 I'm going to do a brief intro here.  
11 Juliana Blackwell is director of the National  
12 Geodetic Survey. As such, she is responsible for  
13 the financial, administrative and programmatic  
14 performance of NGS, the lead federal agency for  
15 positioning activities -- positioning activities  
16 in the nation.

17 Ms. Blackwell serves as Chair of the  
18 Federal Geodetic Control Subcommittee, of the  
19 Federal Geographic Data Committee, exercising  
20 government-wide leadership in the development and  
21 improvement at geodetic surveying specifications,  
22 methods, instrumentation and data transfers.

1 Thank you, Juliana.

2 MS. BLACKWELL: Thank you, Bill.

3 Okay, so, similar what Rich did, I'm going to  
4 walk through some of the strategic goals that we  
5 have at NGS. I've briefed on these before to the  
6 Panel.

7 So, some of the information for the  
8 public is not going to be as apparent, because  
9 you don't have the background on it, but a lot of  
10 this information is available on our website.

11 But for the purposes of updating the  
12 Panel members on some of the recent activities,  
13 I'm going to go through these slides rather  
14 quickly, and also point out some areas where we  
15 have partnerships and how we're collaborating  
16 with other sectors to get the work done.

17 So, if you will just bear with me,  
18 we'll see if we can get this to work. There we  
19 go. Here we go.

20 So, NGS has a 10 year strategic plan.  
21 We last updated this in 201, we're about midway  
22 through this. We have a long going effort to

1 modernize and improve the NGRS the National  
2 Spatial Reference System, and that's -- it was  
3 one of the reasons why we did this out for 10  
4 years, because we knew that the plans that we had  
5 were going to take a while and we wanted to get  
6 everything written down in one place, but we also  
7 realized that with the ten year plan, you've got  
8 to kind of check in at midpoint, at least and do  
9 some course correction.

10 So, what I'm going to do is step  
11 through the main three objectives that we have,  
12 our support, the users of the NSRS, modernize and  
13 improve the NSRS and expand our stakeholder base,  
14 and I'm not going to spend too much time talking  
15 about the development of the workforce and the  
16 organizational components of it, which I have  
17 mentioned on other occasions, but for the due to  
18 the time limitations, I'm just going to stick to  
19 the first three objectives.

20 Just to refresh everybody's memory on  
21 what, you know, we do here at NGS, providing the  
22 spatial reference system is what provides the

1 coordinates, the heights, the gravity, the  
2 deflection of the vertical, all the components of  
3 positioning for mapping and charting purposes,  
4 for the nation and our territories.

5 So, anything having to do with taking  
6 information from GPS, GNSS systems, knowing where  
7 you are in reference to other things, it all,  
8 although it might get your data from GPS, it's  
9 all relevant to where you are on land, and NGS  
10 provides that frame work, that underpinning of  
11 positions for all surveying and mapping and  
12 geospatial needs.

13 So, this is important again, for  
14 things like transportation systems, intermodal,  
15 not just maritime. We do a lot of work in the  
16 FAA, airport survey data, again with navigation  
17 and certainly coast to coast with our land  
18 surveying community and GIS users, and anybody  
19 that's doing any sort of construction and update  
20 on infrastructure, as well as monitoring changes  
21 that happen over time, because as we all see,  
22 things are dynamic and in some cases, more



1 dynamic than others.

2 But things change and we need to make  
3 sure that we have accurate information for  
4 positioning purposes, no matter where you are,  
5 and that's the basis of what we do at NGS, is  
6 provide that framework for the nation.

7 So, I'm going to give a few little  
8 samples of some of the data and information that  
9 we serve out and what we've accomplished thus far  
10 this year, to support the users of the National  
11 Spatial Reference System.

12 So, just the six month point here,  
13 some products that we've delivered so far and the  
14 magnitude or the volume of products that we've  
15 delivered, over 1.6 million survey mark data  
16 sheets have been distributed through our website.

17 We track these things on a monthly  
18 basis. Some of those are just through downloads.  
19 Some of those are whole areas of information that  
20 are downloaded. Some states download the data on  
21 a regular basis, so that they can update their  
22 databases.

1                   We also have over 19 million CORS  
2 datasets that have been downloaded, and the CORS,  
3 in case you're not familiar with it, these are  
4 the continuously tracking stations that serve as  
5 the most accurate survey points for the NSRS.  
6 These are stations that Rich talked about having  
7 some of those co-located with our NOAA tide  
8 gauges, NWLON stations, so that we can track  
9 what's happening through GPS, as well as  
10 monitoring what's happening on the water.

11                   But from the geodetic standpoint,  
12 we're interested in having those core stations,  
13 so that we can find the stable points and provide  
14 starting points for surveyors.

15                   The 19 million again, is people  
16 download that information. They use those data  
17 sets to post-process a lot of their survey work  
18 or to do research, so that they can monitor and  
19 see what's changing over time, and a whole bunch  
20 of other research opportunities that folks have  
21 come up with.

22                   The last one here is 1.4 million

1 online geoid computations. So, we provide models  
2 for people to translate the data that they get  
3 out of their GPS equipment into something that is  
4 more relevant, as far as heights go, and a lot of  
5 folks are using that through our geoid  
6 computation models.

7 The image that you see here is just  
8 another example of some of the -- it's a service  
9 that we provide, as well as products, and this is  
10 a map showing a local survey that was completed  
11 recently, from the airport up through Seattle,  
12 from King County airport through downtown to the  
13 Portage Bay area of Lake Union.

14 It's basically a leveling project that  
15 provided the new second order first-class  
16 leveling on like 19 different bench marks.

17 This project was not performed by NGS,  
18 although NGS serves as technical advisors on a  
19 lot of these types of surveys, but the data is  
20 sent to NGS. We quality review it and then we can  
21 load that into our database and have that  
22 information available for others to use if

1 they're doing work in that local area.

2           So, this is just one example of the  
3 types of projects that we get in. QA and then  
4 make available, make the final information  
5 available to others for their purposes.

6           Next one I'm just going to highlight  
7 some of the results of the FY16 work that was  
8 completed. This is mainly looking at the coastal  
9 mapping side of NGS, because not only is the NSRS  
10 about latitude and longitude and position, it  
11 also includes providing the national shoreline  
12 for the nation and in particular, for application  
13 to NOAA's nautical charts.

14           There is certainly a lot more  
15 information that's derived from the imagery and  
16 the LIDAR data that's collected, compiled and  
17 disseminated, but for the primary purposes of  
18 updating the shoreline, we've produced over 9,000  
19 miles of compiled shoreline in 2016, representing  
20 5.5 percent of the US, and over 285 nautical  
21 charts received, updated shoreline with 37 ports  
22 updated and other ports, 35 other ports analyzed

1 for change.

2 Also in, you know, continuing to grow  
3 in the bathymetric topobathy LIDAR work that we  
4 do, as well as just the airborne LIDAR and so,  
5 400 square nautical miles of airborne LIDAR  
6 bathymetry data we've delivered, over 700 square  
7 nautical miles that were collected. So, it takes  
8 a little bit of time to collect things and get  
9 things processed and disseminated.

10 So, not sure you're going to see this  
11 very clearly, but I just wanted to highlight one  
12 of the areas that we completed in 2016. This is  
13 just a little image of work that was done in the  
14 southern part of Florida on the west coast side,  
15 just showing the work that's done, as far as  
16 updating information that goes on the nautical  
17 chart.

18 There is green and light blue lines  
19 that will show what is mapped, as far as the  
20 shoreline goes. Some of it being natural, some of  
21 it being manmade bulkheads.

22 If we zoom in a little bit more, maybe

1 you see some of the additional detail, and it's  
2 going to be hard for you probably from where  
3 you're sitting to see this, but the take-away is,  
4 is that as you go through and reference what we  
5 know now, from what we had before, there  
6 definitely is many changes that are seen now with  
7 the new data that's been collected, and this is  
8 what gets applied to the nautical chart for those  
9 updates.

10 Another example of some of the work  
11 that's being done with the topobathy LIDAR, this  
12 is a couple of insets with information that was  
13 collected down in Southern Florida, that's pulled  
14 out in one of the inset boxes, as well as in  
15 Puerto Rico.

16 But let me start with the background  
17 image here. The data that you see, there's  
18 starting at the top, there's the east coast, you  
19 see the blue, Martha's Vineyard collection, and  
20 the green shoreline, and then some yellow,  
21 different project areas, the green being the  
22 Sandy work that was collected.

1           Some of the other areas, partly  
2 collected by NOAA, others were contracted out,  
3 and then some of the work that's been done as far  
4 as either planned, acquired or completed in the  
5 different areas in Southern Florida, and again,  
6 in Puerto Rico.

7           So, there is a mix of contract work.  
8 Some of it again, is collected by contractors  
9 other -- and compiled. Others is just compiled  
10 by contracts. So, this is an example of a mix of  
11 that information. It's not really colored that  
12 way, but we do have that information available.

13           The second strategic goal that we have  
14 is to modernize and improve the NSRS, and this is  
15 where we get into updating the current datums  
16 that we have, NAD83 and NAVD88, and all the  
17 things that go with the -- the update of that --  
18 the datums for positioning, including how do you  
19 improve the data submission process? How do you  
20 provide the tools that are necessary for people  
21 to convert their data back and forth from the old  
22 to the new, and then what does it mean to

1 surveyors? How can they do their surveying more  
2 efficiently and that's updating survey  
3 methodologies.

4 So, one thing that Russell had  
5 mentioned about GRAV-D. This is our airborne  
6 gravity collection that -- that is about 59.6  
7 percent complete for the US.

8 This is the data set that's going to  
9 be the foundation for the updated geopotential or  
10 vertical datum for the US. This is going to be  
11 where you're going to see the most change when we  
12 publish the new datums in 2022.

13 The basic starting point for heights  
14 that are relative to measurements on land are  
15 going to change anywhere from, you know,  
16 approximately no change in the Southern Florida  
17 area, to an estimated 1.5 to two-meter change up  
18 in Alaska.

19 So, we know this is just because of  
20 the way that the datums were -- the technologies  
21 that we had to do the datums back in the 1980s,  
22 before we had GPS available. We know that that



1 is in need of updating, and that's why we have  
2 this massive ten year plan underway.

3 We still have several more years of  
4 collection for GRAV-D. We're currently  
5 collecting data in Alaska, trying to get as much  
6 of that state complete in the next couple of  
7 years as possible. We're  
8 leaving the Aleutians for the last because that's  
9 a big challenge, but we're -- we're definitely on  
10 target for getting the work done as planned in  
11 support of the 2022 roll out of the new datums.

12 One of the other things that goes  
13 along with this new methodology for new data sets  
14 for our vertical datum is validating the data  
15 that we are getting out of the airborne gravity  
16 collection.

17 The Geoid Slope Validation Survey will  
18 be the -- that we perform this year, will be the  
19 third of three that we have scheduled. This will  
20 be in a more mountainous area in the southern  
21 part of Colorado, and it will really test the  
22 processes we're using for the airborne gravity

1 data against other geodetic surveying  
2 methodologies, to ensure that what we're getting  
3 out of the airborne data and the way that we're  
4 processing it and utilizing it meets the goals  
5 that we have of one to two centimeters for most  
6 parts of the United States as far as accuracy  
7 goes.

8 We know in the mountainous areas, it's  
9 going to be a little bit more challenging. We're  
10 going to see what we get out of this survey  
11 that's going to be complete this summer, see how  
12 we do in higher elevations with the airborne  
13 gravity data.

14 So, I'm not going to go into this too  
15 much detail because you all will glaze over and  
16 fall asleep, but I want you to know that datums  
17 are complicated. We know that they're  
18 complicated and what we're doing is trying to  
19 make them easier for folks in the future, to  
20 utilize their GPS information and try to serve  
21 both worlds, as far as the scientific community  
22 and the surveying community and making it as easy

1 as possible to get the data in the right datum,  
2 in the right format that's necessary, which  
3 involves one, defining new datums. What -- what  
4 that means to people, where they will fall under  
5 which tectonic plates, and then building the  
6 right tool kit, so people can move from the old  
7 to the new, when the new datums are available, or  
8 reference frames are available, and part of that  
9 is naming them and defining them and that's what  
10 we've been doing over the past few months.

11 We're going to roll that out here at  
12 our Geospatial Summit that's coming up next week,  
13 but there are many, many different datums and  
14 different ways of measuring things from, you  
15 know,  
16 International Great Lakes Datums to geoid models,  
17 etcetera, and what we want to be able to do is  
18 take those, make it simpler and provide folks the  
19 tools to make that information transferable.

20 So, one of the things that we have on  
21 our modernization effort is providing an improved  
22 geodetic tool kit that would be a web service,

1 that would provide coordinate conversions between  
2 latitude and longitude, no matter what type of  
3 datums, federal datums, national datums that are  
4 available and give you the information in  
5 whatever format that you're interested in.

6           So, this is -- it's on our beta site.  
7 If you're interested in datums, I'd invite you to  
8 take a look at this, test it out and provide us  
9 feedback, because this is the basis of what we're  
10 going to be doing and in -- and updating all of  
11 our other datum transformation tools into  
12 something of this format.

13           So, we want to get it right, and we  
14 want our stakeholders to provide us feedback on  
15 this, and for those of you who are into the GIS  
16 etcetera, this is going to be an important tool  
17 for getting apples to apples and oranges to  
18 oranges, when you start moving your data around.

19           Some of the other beta mapping  
20 applications that we're coming up with to improve  
21 the way we display information are our CORS map.  
22 We've got three beta sites that I'm going flash

1 up here quickly.

2 One is to load information about our  
3 CORS network, have a display in ways that are  
4 meaningful to people. We've got a new beta CORS  
5 map available. We also have an OPUS share map  
6 that's got a new look and feel to it, and we  
7 invite feedback from you all on that.

8 OPUS is what people -- it's an  
9 Online Positioning User Service. People collect  
10 data. They process it in reference to one of our  
11 CORS, our multiple CORS sites and they get back a  
12 latitude and longitude elevation and a lot of  
13 meta data about the site that they collected.

14 We also have more on the historic  
15 geodetic control diagrams. We have a new webpage  
16 that's available that shows a lot of information  
17 from the past, and so, that's now readily  
18 available.

19 Once we receive the feedback from  
20 folks and think about it, how we have to change  
21 these websites, we'll get those more into an  
22 operational phase if it looks like that's the

1 direction people are responding.

2 We also have another datum  
3 transmission tool which you all heard about,  
4 Vdatum, and I think at some point, we want all of  
5 our transformation tools to converge into one  
6 delivery system, but we're not quite there yet.

7 But we have made strides in getting  
8 the Vdatum tool to an online web service version  
9 for folks to be able to use, and that's what the  
10 images here are on the left, and then just sort  
11 of another perspective of how that data will get  
12 entered, and then the image in the middle is just  
13 showing where some of the -- where the station --  
14 the gauging installations were, in order to  
15 support the information for the modeling that  
16 goes into the Vdatum product.

17 The third objective or goal that I  
18 want to talk about is expanding our stakeholder  
19 base, and some of the efforts that we have  
20 underway or have recently completed regarding  
21 outreach and education, university engagement and  
22 some of our IOCM work.

1 I mentioned, we have a geospatial  
2 summit. We have had a number of these in the  
3 past, but as we continue to move forward on our  
4 progress with updating the geometric and  
5 geopotential datums and rolling this out, we're  
6 inviting folks to come and hear more details  
7 about our plans and what that means to them, and  
8 to hear from some of our federal stakeholder and  
9 others, about how they are preparing for the  
10 datums and questions that they have about the  
11 work that we're doing.

12 The geospatial summit is going to be  
13 in Silver Spring, Maryland. It's also going to  
14 be available via webinar. So, if you're  
15 interested in that, there's still time to sign up  
16 for that, even if you just listen in remotely to  
17 bits and pieces of that. So, that's available on  
18 our website, if you're interested.

19 We also completed a lot of our  
20 regional advisor program last year. We  
21 transferred from a state-base, although it wasn't  
22 100 percent state-base, to a regional approach,

1 and completed that, so that we have every state  
2 represented by a geodetic advisor at this point.

3 We have Mark Armstrong, who was  
4 introduced earlier, who is here in the Northwest.  
5 He's done a great job of connecting NGS to  
6 stakeholders in the Northwest and talking about  
7 our products and services and hearing you know,  
8 what the special, you know, special circumstances  
9 are in different regions, depending on what's  
10 happening in dynamics and just helping people  
11 build their knowledge base of what our products  
12 and services are.

13 We've also been doing a lot of  
14 collaborative work with Oregon State University.  
15 They're helping us right now in looking at  
16 updating some of our plans for surveying  
17 methodologies, doing some assessments for us and  
18 been partnering with them as a cooperative  
19 institute for a while now, and I think there is  
20 certainly opportunities with Oregon State and  
21 other universities, to continue to work on  
22 research projects and help us in our



1 modernization effort.

2           You all have heard about the  
3 Coastal Mapping Program. This is just a --  
4 again, an overview slide of that, but in the  
5 interest of time, I'm just going to hopefully get  
6 to the next one.

7           Point out that this information of the  
8 shoreline that NGS collects and that OCS utilizes  
9 for the charts is publicly available on this  
10 website. It's there for you to look at and  
11 download and utilize, and that's just a map  
12 representing that.

13           Also, I've mentioned before, the  
14 efforts to collect oblique imagery, different way  
15 of looking at infrastructures and natural  
16 features, so that you can more easily identify  
17 what it is that you're photographing, and this is  
18 just a sample of Seattle oblique imagery that was  
19 collected recently.

20           I'm going to talk a little bit about  
21 stakeholder growth, primarily in the products  
22 from the coastal mapping side of things and the

1 data that's available through NOAA's digital  
2 coast, which is where the image -- we have our  
3 topobathy and our imagery that's available, as  
4 well.

5 This is -- I know you can't see this  
6 image, but I want to show you over a ten period  
7 of time, what -- how things have evolved and the  
8 information that's available and how people are  
9 using it.

10 So, for the past ten years, we've got  
11 counsel on this. We've got over 11,000 data sets  
12 that have been downloaded through the Digital  
13 Coast and again, this is information that's part  
14 of the Integrated Ocean and Coastal Mapping  
15 effort, and if you look at it and slice it and  
16 dice it this way, whether it's DEMs, imagery,  
17 LIDAR work or just overall total, which is the  
18 purple line that you see, you can see how things  
19 are continuing to grow, as far as useful -- the -  
20 - how people are downloading this and the number  
21 of folks that are downloading it.

22 The spike that you see is Sandy.

1 That's where there was a huge increase in the  
2 number of data sets that were downloaded, and if  
3 you look at it a little bit different way, you'll  
4 see the blue, which is almost half the circle  
5 here. This .com is folks who are in the .com  
6 industries using our data, and then the red is  
7 .edu. So, educational institutes is about 23  
8 percent there.

9 The last two slides I have just  
10 highlighting again, some of the areas in  
11 partnerships that NGS has and the areas of  
12 research, data collection, product development  
13 and distribution.

14 So, as far as research goes, things  
15 that we do in NGS involving modeling, development  
16 of survey methodologies, development of sensors,  
17 and in cloud processing and new ways of  
18 manipulating data with different types of IT  
19 resources.

20 We utilize a number of partnerships  
21 through contracting, through cooperative  
22 institutes, through grantees, as well as visiting

1 scientists who come to NGS and help us with these  
2 efforts.

3           Likewise, with the data collection  
4 effort, whether it's data collection of  
5 shoreline, topobathy, LIDAR, CORS data, GRAV-D  
6 data or just geodetic control projects that come  
7 in, a lot of those are done by our contractors,  
8 our partners and our CORS network. We have over  
9 200 organizations that own and maintain CORS  
10 stations.

11           Certainly, academia, surveyors,  
12 federal and state agencies and private citizens,  
13 and then for product development in the areas of  
14 like data processing, compilation of our data and  
15 just management of our data, a lot of the work is  
16 done through contracting and third party vendors.

17           Then product distribution, again, the  
18 data that we provide is ingested by a number of  
19 federal, state and local agencies,  
20 GIS community, universities and other vendors, to  
21 take our information that's publicly available  
22 and have that be included into products and

1 services that are done by a myriad of other  
2 entities.

3 Then the last slide is just generally  
4 similar to what Rich showed. Out of the  
5 resources the NGS has available, this is a  
6 snapshot for this year.

7 Thirty-seven percent is going out to  
8 contracted services. About 63 percent is that  
9 "all other" category of labor, rents and just  
10 other costs associated with running the  
11 organization, and if you look at the 37 percent  
12 that's contracted services and break it down a  
13 little bit more, 72 percent goes out on  
14 contracts, 21 percent of that goes out as a grant  
15 and then seven percent is basically contracted  
16 out through -- for travel support, again, going  
17 back out to industry and tourism organizations,  
18 etcetera, and paying for part of what we're doing  
19 here today.

20 So, that's just kind of a snapshot of  
21 our current resources, and that's it. Thank you.

22

1                   CHAIR HANSON: Thank you, Juliana, and  
2 you notice when you made your comment about  
3 putting people to sleep with the datum, you  
4 forget your crowd here, because about half the  
5 people in the table here were eagerly waiting to  
6 hear that discussion.

7                   So, maybe after hours. But thanks  
8 again.

9                   Admiral Smith, we've already  
10 introduced you a couple times. So, I think we'll  
11 just let you go right into your presentation.

12                  RADM SMITH: I'll jump right in, in  
13 the interest of time.

14                  When I last presented to you, last  
15 August, I had been on the job for four days. In  
16 fact, I think I wore this uniform first at an  
17 HSRP meeting.

18                  I've been in my position for about  
19 eight months -- for about eight months now, and  
20 within those eight months, we've been working  
21 with the coast survey leadership to really hammer  
22 out four major areas that we'll be focusing on in

1 the coming years.

2           The National Charting Plan, our  
3 external source data policy, the hydrographic  
4 survey priorities and Autonomous Systems Roadmap,  
5 and all of these, I'll be covering today.

6           So, I really am going to have to  
7 dispense with everything else that's going on, in  
8 order to be able to focus on these four areas.

9           We distributed documents for three out  
10 of four of those, well in advance, and one, last  
11 night and this morning. But they -- they're here  
12 to sort of support the presentation.

13           My final remarks will be about what we  
14 -- the final slide, I'll come back to a similar  
15 slide about the public/private partnership and  
16 how really how we do business.

17           So, the National Charting Plan.  
18 Travis is going to be speaking on some of this,  
19 this afternoon. But what -- I want to just sort  
20 of frame it out a little bit.

21           So, interestingly at dinner last  
22 night, there was some confusion about this, and I

1 want to make some sort of by distinction, talk  
2 about what it is that I'm talking about here.

3 So, when we say charting, we really  
4 mean the charts. We don't mean any of the  
5 activity having to do with surveys or datums or  
6 aircraft or ingest of data. We really mean, you  
7 know, assembling and publishing and distributing  
8 the charts themselves.

9 So, in that narrower definition of  
10 what we mean by charting, the charting plan is  
11 about what the form and distribution mechanisms  
12 and role of those charts in the maritime industry  
13 and how they're used for safe navigation.

14 So, we recognize that we must have --  
15 we must have adequate data to support the charts,  
16 but the focus on where the data comes from is  
17 contained in the other -- in external source data  
18 policy and also our unified hydrographic surveys  
19 priorities plans.

20 So, in general, we've been hearing for  
21 years that our charts lack detail, and people  
22 say, "I want more detail. I want to be able to



1 zoom in. I want to be able to see more."

2 In fact, the slide that Juliana showed  
3 was a really good example of that, where we have  
4 much better detail. The Army Corps surveys show  
5 much better detail in the channels. The  
6 limitation wasn't really about the paper chart.  
7 That was how we made charts for many years, and  
8 in really it was only about a year ago that we  
9 really allowed the ENCs to diverge significantly  
10 from the limitations of scale of the paper chart.

11 So, we're now at a pivot point where  
12 we can think about how the charts ought to be,  
13 instead of how they are limited by being in their  
14 - by the limitations of paper and print  
15 distribution, the print distribution system.

16 It's an exciting pivot point. So, the  
17 ENCs were really introduced about 30 years ago,  
18 but really have been a side product for quite  
19 some time. They really are the heart of what we  
20 do now, and the paper products are a branch of  
21 that production line, and it's really changed  
22 everything in ways that we're still becoming

1 aware of now.

2 I think there is a little piece of  
3 vision here, and that is that the way that most  
4 people under 30 experience maps is on their  
5 device. If they want to bring up a map, turn it  
6 on essentially, and it covers all space and all  
7 scales, and they don't know where the edges are.  
8 They don't know what the chart number is. They  
9 don't know what edition it is. They never have  
10 to correct it, for goodness sake, and so, if you  
11 want the chart, you turn on the chart.

12 The infrastructure we need to support  
13 that way of doing things is much more like other  
14 types of modern mapping and database driven,  
15 consistency of scales, consistency of  
16 attribution, you know,  
17 seamlessness of features, and everything that  
18 goes with it.

19 So, we're envisioning, you know,  
20 that's where we need to go. Our data holdings  
21 are still essentially the paper chart, and so,  
22 we're -- you know, it's going to take an

1 evolutionary process to get from the data  
2 holdings we have, 133 different scales for 1,000  
3 charts, to what we think is the right number at  
4 about eight different scales, and this is a  
5 generational level project, really, probably,  
6 because we need to collect new data in some cases  
7 too.

8           But we're leaning bravely forward here  
9 to put out there what we think the end state is  
10 going to look like, and start talking about that  
11 end state, without a whole lot of regard to how  
12 hard it's going to be or how expensive it's going  
13 to be to get from -- to get to that place.

14           Then we'll figure out really where --  
15 really, really what -- how we can most  
16 efficiently get there and where we do it first to  
17 get the most bang for the buck.

18           So, Travis will be briefing on this  
19 more in detail this afternoon, so I'm not going  
20 to take all of his great slides or anything, but  
21 I did want to show just one little example, which  
22 I think is different than the examples we usually

1 use for charting because it's not a big ship,  
2 it's not a big ship story.

3 In the 1970's, this is the Merrimack  
4 River in Massachusetts. In the 1970s, there was  
5 little to no recreational boating on the  
6 Merrimack River because it was an industrial  
7 dumping ground of an industrial part of the  
8 country. Clean Water Act had just been passed.

9 So, in the same year that the Clean  
10 Water Act got passed, we decided that one day  
11 80,000 scale, which is on the right there, that  
12 amount of detail is -- would be sufficient for,  
13 you know, an industrial pond, and you know, since  
14 then, fortunately it's gotten all cleaned up.  
15 All those towns have now turned their face toward  
16 that river and are trying to make economic use of  
17 it. Huge amount of boats at Newberry port. They  
18 won't come up the river, it turns out, because  
19 there was no chart, and the people on the river  
20 figured this out, and put together a coalition to  
21 pay for some surveying, to better -- to take care  
22 of some data gaps, and then put a letter writing

1 campaign together.

2           So, sort of out of the blue on my  
3 first week on the job, we got 80 letters from the  
4 Congresswoman Niki Tsongas, all the way down to  
5 the guy that runs the pizza store, asking for an  
6 -- larger scale chart. So, this just doesn't  
7 happen, and it was really a really well  
8 integrated story.

9           So, I want to pass that on and because  
10 it, and so, we -- we are -- turns out we had all  
11 the data nearly, and have now put together a  
12 larger scale chart and it's out in time for the  
13 recreation season this year. So, that's kind of  
14 a fun, good, new story.

15           But it just happened that those people  
16 got their act together and wrote to us and made  
17 it easy. There are probably hundreds of other  
18 coastal areas that could be -- that could also  
19 benefit from -- from better charting.

20           So, I added a couple slides form the  
21 -- these are mostly for reference afterwards, but  
22 Lynne has encouraged me to be very clear about

1 what it is that I'm hoping that the HSRP will do.

2 So, I sort of wrote down in advance.

3 So, we appreciate already what you've done in  
4 reviewing the plan to date, from some great  
5 detailed chart geek type comments from Captain  
6 Sal, to some -- to some great editorial and  
7 strategic comments from the rest of you.

8 However, since you are the HSRP, we  
9 can't take those comments individually. We have  
10 to have the recommendation from the HSRP. So,  
11 I'd ask for a consolidated set of comments, so  
12 that we can treat that as -- as input from the  
13 HSRP rather than from individual experts. That  
14 would be more powerful for us.

15 Probably that doesn't all need to go  
16 to the letter to the Administrator. Maybe a few  
17 high level comments about how the -- about the  
18 plan and where it's going and what you think  
19 needs to be tweaked on it and then detailed  
20 comments direct to us.

21 I did want to point out that the  
22 existing, it's a bit of a skeleton still. It's

1 going to be followed up by you know, a detailed  
2 chart scheme for how we think the charts ought to  
3 be laid out, with specific scales in specific  
4 areas and Travis will cover that more. But we  
5 don't, in fact, have that layout now. We'll be  
6 doing that over the course of this year.

7 External source data. So, it is --  
8 it's our policy to use the best available up to  
9 update the nautical charts. We've not always  
10 been very clear about that and we've made a big  
11 effort in the last six months to really dig into  
12 it and be really clear and simple, but that is  
13 the single, simple policy statement, that we use  
14 the best available data to update the nautical  
15 charts.

16 If you think about the converse, that  
17 means that we are -- we're public -- we publish  
18 charts on Thursday. We are knowingly publishing  
19 charts this week that we know are wrong. So,  
20 that's not a good alternative either.

21 Do we wish all the data were perfect?  
22 You know, and designed specifically for charting,

1 with all of the attributes necessary and all of  
2 the detail necessary and the right places, fully  
3 documented. Sure, but we're not going to get it.

4 We need to -- this needs to be a  
5 coalition of incorporating data from many  
6 sources, and our, really our gold plated data  
7 that we and NGS collect specifically for  
8 charting, we will do it specifically in the areas  
9 that that's justified. But we need to be aware  
10 of and welcoming of all of the -- of all data  
11 from different sorts, you know, from different  
12 sources.

13 Part of that is we need to -- the way  
14 we're thinking about this is that we're not going  
15 to sit and wait for people to send us data,  
16 because that has something to do with them. It  
17 doesn't have to do with us or our customers'  
18 needs.

19 We start with where we have a problem,  
20 where we have -- where we have evidence that the  
21 chart is inadequate somehow and seek out data to  
22 solve those problems.



1                   There was a great example down in  
2 Galveston, I think, that somebody was just  
3 telling me about, that that it wasn't Galveston.  
4 Rachel is shaking her head. It was Mississippi?  
5 Yes, nodding her head of some -- of some -- you  
6 know just some -- long standing discrepancy on  
7 the chart that everybody been bothering everybody  
8 for years. Nobody said anything. We were able to  
9 get it fixed in two weeks with some Army Corps  
10 data that we were -- that we sought out to  
11 address that issue.

12                   So, it's a -- doesn't always mean that  
13 we have to go out. Problems don't always mean we  
14 have to go out to collect new data.

15                   But we do. We will catalogue and  
16 evaluate all data that is offered to us, but the  
17 real effort is to get all of the data that is  
18 collected into archive, discoverable and  
19 accessible and even, there's some good big chunks  
20 of NOAA that are not very good about getting  
21 their data out of the shoeboxes and into the  
22 archives, as required by various rules, and we're

1 working with all of them, to make that available,  
2 and then from there, it's easy for us to seek it  
3 out and get it on the chart in a time and a  
4 manner that it's important for us and our  
5 customers.

6 We will -- we do need to honor the use  
7 constraints or conditions that are associated  
8 with the candidate data set. Many academic  
9 environments have sort of a little bit of a  
10 proprietary, semi-proprietary feel to the data  
11 for some period for time before, so to allow the  
12 principal investigator the first rights of  
13 publishing and we can honor those, but we don't  
14 want that to go into the shoebox forever, and --  
15 and -- and so, we're aware of those constraints  
16 and we need to be respectful of it, and we'll  
17 prioritize the incorporation of data sets that  
18 makes the most difference to the accuracy of the  
19 chart or rebuild, you know, building new charts,  
20 in this case.

21 So, that's it. That's -- it's -- it's  
22 -- I don't think it's -- it's real rocket

1 science. That's the high level policy. There's  
2 a whole lot of -- of detail that has -- that we  
3 have to put in place, to sort of get that to be  
4 not only built into our systems and procedures,  
5 but into our culture because there's some pieces,  
6 there's some parts of our culture that are not --  
7 that are not as accepting of that elasticness of  
8 the quality of data. But although, I was really  
9 encouraged to hear both Rich and Juliana also  
10 talk about it -- you know, different -- you know,  
11 partnerships with other data sources, to use them  
12 in an appropriate way of acknowledging what they  
13 are and help to make them better. So, I think  
14 that's a theme that's really across NOAA.

15 Here's one little example. Some of  
16 you may have been tracking this. This was a  
17 Quintillion. This was a pipeline company, went  
18 up and over Alaska, a little core, and you know,  
19 in the grand scheme of things, it was a narrow  
20 little corridor. But we were able to bring it  
21 in. It's available and -- and -- and you know,  
22 compare it to the chart, if there were things

1 that were -- that were made clear by this narrow  
2 corridor, that we -- that were inaccurate on the  
3 chart, we're able to do that.

4 So, that was a success, it's also a  
5 really good example of the type of commercially,  
6 collected data that we'd like to make much better  
7 use of. Fugro has been leaning forward a lot on  
8 this, you know, on figuring out how to share  
9 proprietary data for public use, for public for  
10 use for science more broadly, and I think there's  
11 a lot of really, really good opportunities there,  
12 and appreciate certainly, Fugro's, leadership,  
13 but I think we're going to see a lot more of this  
14 in the coming years.

15 So, the third -- the third main focus,  
16 I wanted to talk about today -- one more slide  
17 here.

18 So, external source data policy, we're  
19 probably not going to release it as a formal  
20 Federal Register notice in that it -- we're  
21 probably just going to tell everyone that's  
22 interested, that that's where it is and make it -

1 - make it so internally.

2           There is not very much bandwidth in  
3 the government right now for reviewing this type  
4 of thing. So, if we don't need to do a formal  
5 public release, we probably will not.

6           So, any comments that you have would  
7 be helpful, and again, in -- in the -- you know,  
8 general comments to the letter, specific comments  
9 to us maybe.

10           But I did want to just call out, you  
11 know, I think CO-OPS had Class A, B and C type  
12 data, that sort of thing. We struggled for  
13 years, mightily to try to class this wide  
14 spectrum of external source data into buckets,  
15 and struggled more with the bucket definitions,  
16 than we did you know, trying actually making  
17 progress, getting it in-house.

18           So, we're -- we've sort of eased off  
19 of the bucket definitions. I think there is still  
20 some useful things we'll do internally. But  
21 there is no fixed standard, best available data,  
22 and I also wanted to just call out our -- our

1 reliance on NCEI for as the holding pen, which is  
2 real, which is their role, in fact.

3 So, hydrographic survey priorities.

4 Back when I first started, the QE2, I guess it  
5 had either just happened or was just happening, I  
6 can't remember and we got really focused on large  
7 ships under-keel clearance and getting full  
8 bottom coverage for areas where large ships were  
9 -- were navigating close to the bottom.

10 We had performance measures against  
11 it. We bought technology with what shallow water  
12 multi-beams and digital side scans, talked about  
13 this critical area, even got into sort of reduce  
14 survey backlog language and the appropriations  
15 bills. It was all about that definition of large  
16 -- large ships transiting what, you know, in  
17 shallowish water.

18 I don't want to say that problem is  
19 totally solved, but it's not. We're in a  
20 different place than we were 25 years ago, on  
21 that. We're sliding more into a maintenance mode  
22 on that. We've surveyed most of the areas where

1 big ships transit near the bottom, and the -- and  
2 so, all the performance measures and language and  
3 technology and procedures that we built around  
4 that one focus are not flexible enough to allow  
5 us to do -- to justify other types of work, or to  
6 -- or to -- or to sort of broaden our focus into  
7 some other areas.

8 So, we've -- we're working on that,  
9 but I'll ask for your help in sort of helping to  
10 frame this better. So, the -- so, focus area one  
11 is -- is again, it's critical under-keel  
12 clearance areas, ports, approaches, corridors and  
13 passes.

14 So, this is maintenance of that high  
15 resolution, surveys to maximize the efficiency  
16 and safety and large ship traffic in the vicinity  
17 of ports and passages.

18 If you look at the whole country, the  
19 percentage of area is -- is -- is relatively  
20 small, where truly it is under-keel clearance  
21 challenge.

22 But we may also have and we'll talk

1 about this some more this afternoon, an  
2 opportunity to have different products in those  
3 areas, to go with different styles of surveys.

4 So, focus area two, these are just two  
5 examples, are what we're calling discrepancies.

6 So, there are -- it -- I -- we  
7 estimate and we really don't have a way to come  
8 up with a number on this, because we just  
9 recently had a real functioning data base, but it  
10 -- the -- probably around 500 to 1,000 reports  
11 every year from the public, or other agencies,  
12 for -- of -- of discrepancies on the charts.

13 So, this might be a new wreck or I hit  
14 a piling, you know, I was about there, or those  
15 types of things.

16 So, we you know, you'll see, if you  
17 look at the charts, and this is a Galveston Bay,  
18 this example on the left, I think is a really  
19 good example, where the challenge is not about  
20 the depth of the water.

21 If you look at that chart, it's all  
22 sevens and eights and nines, and it doesn't



1 matter to any user, whether it's seven, eight or  
2 nine. What matters is all of those other things  
3 that are on there, and I'll give a shout out to  
4 Jeff Siegel, if he's here.

5           There's a little teardrop looking  
6 things on there are Active Captain hazard  
7 markers. If you click on any of those, there's a  
8 sob story about somebody ruining their boat on  
9 each one of those things.

10           So, in this one little tiny place, we  
11 have documented -- documented, but not sort of  
12 government reported examples of major damage to -  
13 - to personal property, and you know, hazard to  
14 life from all of these little features.

15           But how many square miles of critical  
16 area is associated with that? None. That in the  
17 current way that we count hydrographic  
18 accomplishment, those things don't count for  
19 anything.

20           So, we need to change the rules, so  
21 that we can start to put value on these -- on  
22 these real hazards, and so, this is again, a

1 pretty extreme example, but -- but the -- you  
2 know, there's other styles. Joyce will probably  
3 know exactly where this right hand screen, and  
4 she's probably already collected the data to fix  
5 the chart there. We just don't have it on there  
6 yet.

7 This is somewhere off the Northwest  
8 Hawaiian Islands. But if you take a look at  
9 basically, every depth that's not one of the  
10 general background depths, they're all reported.  
11 Some of them quite anciently. I don't -- you --  
12 19 -- yeah, all of them, 27, 50, so, somebody  
13 reported it, thinking that maybe the government  
14 was going to come along and solve this problem  
15 some time. So, 90 years later, we haven't yet.

16 But -- but maybe, you know, maybe we  
17 should. This is a great opportunity for  
18 outside source data because -- because a lot of  
19 these places are of interest to science, as well  
20 as interest to navigation, and we probably could  
21 solve half of these with existing data sources  
22 that if it's not at NCEI already, it's sitting in

1 some shoebox someplace, if we could just find it.

2 Third focus area is the everything  
3 else. We've talked a lot about how ocean mapping  
4 is an interdisciplinary and cross program type of  
5 an effort. It's not just about charts. It's  
6 about, you know, fisheries requirements under  
7 Magnuson-Stevens. It's about ocean exploration.  
8 It's about minerals exploration. It's about  
9 extended continental shelf. It's about knowing  
10 what -- knowing something about the country that  
11 we -- that we -- what we own and control, and you  
12 know, so coast survey has a piece of that.

13 The biggest of that, that we have  
14 really is our expertise. We have the biggest  
15 pot, pool of experts, you know, with our  
16 relationships at UNH and our really rigorous way  
17 of tracking meta data and data stewardship. We  
18 may be slow, but you can always find our surveys.  
19 You know, 50 year later.

20 Those types of things, you know,  
21 really those -- they can be the core for a  
22 nationwide or a NOAA wide perhaps, a nationwide

1 ocean mapping effort, to compliment the  
2 international effort that's known as Seabed 2030.

3 So, I don't have time to get into all  
4 of that right now. But there's a big effort  
5 really starting worldwide to stop complaining  
6 about the fact that we know more about the  
7 surface of Mars than we know about the bottom of  
8 the ocean, and do something about it.

9 So, the first question is how much of  
10 the ocean do we have mapped? Turns out that  
11 that's actually a pretty hard question, not just  
12 because of the shoebox problem, but because there  
13 have been so many different definitions of mapped  
14 over the years, that -- that we -- you can't  
15 answer the same -- you can't answer that question  
16 the same way two times in a row, five years  
17 apart.

18 We're trying to come up with sort of  
19 a common definition that will be used from the  
20 international to the national, and to have a  
21 common sense of this, which is basically just  
22 hundred meter resolution. You have a unique

1 measurement in a 100 meter bin. If that's the  
2 case, we'll call it map for the purposes of that  
3 one question, and then we can -- and then we can  
4 build out a program.

5 So, we've got some ongoing work, both  
6 with NCEI and UNH, to better answer that question  
7 and lay the ground work for a larger campaign to  
8 map our coasts.

9 Okay, so, so, the document that we  
10 distributed yesterday is probably a little less  
11 mature than the others that we documented -- that  
12 we sent out, and I apologize that we sent them  
13 out so late.

14 But the main point is that we'd invite  
15 you to join this conversation with us, fairly  
16 early on here, about whether you know, these are  
17 -- this is the right framing, these three  
18 buckets, these three focus areas, and -- and --  
19 and any suggestions that you can help us with for  
20 how to think about what the scope of the problem  
21 is or how to -- how to put a value on -- on the -  
22 - on route -- on resolving those issues.

1           So, under-keel clearance, resolution  
2 of charted discrepancies and  
3 broad interdisciplinary mapping.

4           We've started already internally to --  
5 to change the focus and change the way we're  
6 thinking about and -- and talking about our  
7 surveys and planning them, but it's going to take  
8 us a few years for our long range projects to  
9 sort of come into focus in this way, and so, it's  
10 -- so, you probably won't see it. This isn't  
11 something we can turn overnight. But you will  
12 start to see us talking about it in a different  
13 way.

14           So, please, any comments on the  
15 general approach and I'm sure we'd love to talk  
16 about it some more in September.

17           The last thing I wanted to talk about  
18 was unmanned systems for -- specifically for  
19 hydrography.

20           We've -- I could run through a bunch  
21 of different things. I think it was mentioned  
22 earlier already. These are all pictures of

1 unmanned systems, operations that were done in  
2 the context of our programs somehow.

3 The lower left is on the NOAA Ship  
4 Thomas Jefferson. The upper right was year one  
5 of some TerraSond work that was done in Alaska  
6 with sort of a duck and duckling arrangement, a  
7 little boat running next to the big boat,  
8 collecting another line of data.

9 One of those two is UNH's boat, and  
10 I've forgotten which one is which. No? Neither  
11 one? Okay.

12 Well, UNH -- UNH purchased an ASV. I  
13 think the low right is the TerraSond take two and  
14 the upper left is the Nancy Foster charter, and  
15 then I guess I don't have UNH's boat on there.  
16 Nope? Got one? All right.

17 Well, I'll update my slide. But the  
18 idea is that, you know, we think there is real  
19 potential in the long run for unmanned surface  
20 vessels in particular, to really help to be a  
21 force multiplier and allow us to get places that  
22 we can't get now more safely, for the coastal

1 hydrographic program.

2           So, you know, UNH is working on -- on  
3 some of the really difficult issues of control  
4 and optimization. Through our contracts, we've  
5 got a number of different sort of operational use  
6 case scenarios that are getting tested out, and  
7 we've got some of our own people working with  
8 them, both through a time charter arrangement  
9 that we had last Fall, and on the Thomas  
10 Jefferson, where we've got some very small boats  
11 for inshore work.

12           We do -- so, there is an autonomous  
13 road map, and this is -- it's -- I think the main  
14 -- I'll let you read it, but I think the main  
15 point is that it's actually hard to take a yellow  
16 thing like this and take it off a ship and get it  
17 into the water and back again without breaking  
18 it, but -- but that's actually relatively easy,  
19 and having it drive around and follow an auto  
20 pilot, that's actually pretty easy too.

21           The hard part is having it collect the  
22 data and monitor that, but even more so, you



1 know, if that things come back after driving back  
2 and forth after that, you know, in that area in  
3 Galveston with all those pilings, and it comes  
4 back and it comes back with digital side scan and  
5 multi-beam pinging at 50 hertz in eight feet of  
6 water, and a laser scanner that's been running  
7 continuously for 12 hours, it's going to have a  
8 trillion points in a big point cloud.

9 Well, thanks. You know, that's  
10 actually not very helpful. What we need to do --  
11 what we need to know is that needs to be really -  
12 - you know, we need to have a level of processing  
13 involved in that and analysis and machine  
14 learning, that we'll know, that will come back  
15 and say, "Yeah, boss, there's 14 pilings out  
16 here."

17 Not a trillion points in the point  
18 cloud, and that's where -- you know, that's where  
19 a lot of the investment needs to be, is in that  
20 automated processing and you know, and analysis,  
21 because collecting the data is not really the  
22 hardest part.

1           So, request to you all is we invite  
2           your general thoughts on the direction that we're  
3           going with the unmanned systems road map. We are  
4           focusing on surface vessels for coastal  
5           hydrography. Underwater is not much of an  
6           advantage in very shallow water, and we're  
7           optimistic, but we're sober about the -- the  
8           prospects and the challenges of where we can get  
9           to in the next few years, and we need to invest  
10          in parallel and in process -- processing  
11          automation.

12           Okay, the last slide is -- is really  
13          -- we put this together because we've got a lot  
14          of new bosses in Washington, and they're --  
15          interestingly, the questions are less what do you  
16          do and is it important, than how are you doing  
17          it?

18           Surely, you're stuck in the old ways  
19          and this is all feds and you're -- and you're --  
20          your business model needs to be improved and we  
21          got a business guy right here to help you do it,  
22          and I actually wanted to sort of share where we

1 are, because I'm actually pretty proud of the  
2 balance that we have and -- in the hydrographic  
3 program overall, for what we do ourselves and  
4 what we contract out.

5 So, sort of starting from the bottom  
6 and going up a little bit of a value chain.

7 We've got some R&D that we do  
8 ourselves in our own little lab there that E.J.  
9 runs and the -- and quite a bit of work down at  
10 UNH and a few other places.

11 When I start -- I -- one of my first  
12 jobs was the programmer. I worked for Andy and I  
13 was a programmer, writing acquisition and  
14 processing software for hydrography.

15 Well, we don't do that anymore.  
16 Right, we buy stuff that does that, and so, that  
17 -- so, that next -- that survey system vendors,  
18 that's a completely contract operation.

19 Again, in the mid 90s, several of you  
20 in the room were involved in this on both sides  
21 of being the contractor and the -- on the  
22 government side. We started contracting for

1 hydro surveys and so, that's been a really  
2 successful program. Wouldn't trade it, and in  
3 fact, if we have growth, that's where it needs to  
4 be -- for growing all of those -- all of those  
5 requirements, and we're, you know, externally  
6 source data.

7 So, you could read on up there, you  
8 know, the various -- the various buckets about  
9 what we do, what we do in-house and what we  
10 contract out.

11 What I did want to call attention to  
12 is we -- that last piece, where the rubber hits  
13 the road is all through partnerships.

14 So, when we start -- when -- you know,  
15 back when we made paper charts, we sold paper  
16 charts. People would go into the store and  
17 they'd roll them up under their arm and they'd  
18 walk out, and we had that kind of a relationship  
19 with the customer.

20 We don't -- you know, we privatized  
21 the printing in distribution. It's mostly  
22 through navigation systems and value added

1 resellers of various sorts.

2 So, our relationship directly on a  
3 one-to-one with the customer is mediated through  
4 those -- through all of those companies, which is  
5 great. I don't resent it at all, but it -- but  
6 the way that we then interact, it means that we  
7 need to be interacting with our customers through  
8 those -- through the lens of those systems, and  
9 so, is that my -- are you gonging me, Lynne?

10 MS. MERSFELDER-LEWIS: Totally  
11 inadvertently.

12 RADM SMITH: It happens that I am  
13 done. So.

14 CHAIR HANSON: All right. Well, I  
15 guess it's no longer morning. So, we will have  
16 to cut off questions at this point.

17 But I do note that all three of you  
18 will be here this afternoon, and so, we can track  
19 you down and for those listening on the webinar,  
20 if you have specific questions for any of our  
21 three panelists right now, I guarantee you, we  
22 can track them down and make sure they provide an

1 answer to you.

2 So, with that, I think we need to  
3 adjourn for lunch. We will re-adjourn at 1:45,  
4 and we have the working lunch with HSRP member  
5 and NOAA HSRP staff, and for everybody else, we  
6 will see you here at 1:45.

7 (Whereupon, the above-entitled matter  
8 went off the record at 12:16 p.m. and resumed at  
9 1:47 p.m.)

10 CHAIR HANSON: All right. We're ready  
11 to get going here. This is the afternoon  
12 session. Just a couple housekeeping notes.

13 First of all, we know we've had some  
14 people join us this afternoon. Make sure that  
15 you sign in. The sign-in desk, and if you'd like  
16 at this point, we can have you identify yourself,  
17 as we did this morning. Anybody new this  
18 afternoon?

19 All right, one of the things we have  
20 to be reminded of occasionally is that we are a  
21 federal advisory committee, which means that  
22 according to the rules, this is a public meeting,

1 and we're looking to engage the public as well.

2 So, at this point, based on -- we'd  
3 like to go ahead and since we didn't get to do  
4 that after the session this morning, we thought  
5 we might take a minute or two to see if there are  
6 any public comments, either from the audience  
7 here in the room or online.

8 MS. MERSFELDER-LEWIS: If there are  
9 folks who are interested, just come on up and  
10 we'll hand you a microphone, especially for the  
11 previous panel who didn't get any questions. If  
12 you want to ask a question from this morning,  
13 feel free.

14 So, there is a question from Rod Evans  
15 that says, "Can we see the autonomous road map  
16 that Rear Admiral Smith talked about? Thanks,"  
17 and the answer is that it's on the -- our public  
18 website for this meeting, and I will send that to  
19 you, Rod, and for anyone else that wants it,  
20 we'll put it up on the slide at the next break.

21 CHAIR HANSON: Admiral Smith, I  
22 believe this afternoon is all yours.

1           RADM SMITH: It says light -- there we  
2 go. So, I'm not going to take very much time for  
3 this to introduce, but sort of keying off the  
4 last slide of my presentation, a lot of what -- a  
5 lot of what we're going to be hearing about from  
6 this panel is what happens -- how the value is  
7 delivered from the services that we generate  
8 across -- you know, both at Coast Survey, CO-OPS  
9 and IOOS and NGS.

10           So, this is -- this is about the value  
11 delivery, and we've got some fabulous, fabulous  
12 partners who have their -- have their own take on  
13 things.

14           But we're going to start with Travis  
15 to really pick up where I left off on the  
16 national charting plan.

17           So, Travis and I both started with  
18 NOAA 23 years ago, within a few months of each  
19 other, and Travis has been involved in ENC's from  
20 -- through many of the different iterations that  
21 we've had over the years, and was -- and was the  
22 leader really, of MCD's effort to get all of our



1 -- all of our ENC's loaded into a database and  
2 made available to have this sort of resilient  
3 system that we are about to enjoy. So, we're  
4 really close to that. So, Travis, please go  
5 ahead.

6 MR. NEWMAN: Thank you. All right,  
7 the national charting plan. Hopefully, everybody  
8 has had a chance to view it and read it.

9 It's a strategy to improve NOAA chart  
10 coverage on our products and distribution. It  
11 describes actions that will provide the customer  
12 a more up to date useful product, which will be  
13 more safer for navigation.

14 Some of these activities include  
15 reducing unwarranted alarms and clutter in the  
16 ECDIS system, converting depths and contours to  
17 meters. Providing timelier data to the mariner.

18 Improving RNC chart coverage, RNC and  
19 paper chart coverage, while also rescheming our  
20 current ENC suite to a more orderly layout.

21 Reduce uncertainties by systematic  
22 reviewing those features that are labeled on the

1 chart, position approximate, existence doubtful  
2 or reported.

3 Improving chart update information,  
4 which is the next slide, and then also increasing  
5 efficiency by strengthening partnerships with  
6 some of our data providers.

7 Okay, this is a screen capture of one  
8 our new features on our website. It provides a  
9 mariner -- they can type in their chart number  
10 and it tells all of the critical and non-critical  
11 changes that were made to that product for that  
12 week.

13 This allows a mariner to help decide  
14 whether he wants to buy a new print-on-demand  
15 chart or not. So, it's really a nice feature.  
16 It's new.

17 One thing we have recently done under  
18 Admiral Smith, when he was the -- when he was  
19 Captain Smith in the marine chart division, we  
20 started putting out non-critical information  
21 weekly, along with our critical information  
22 updates.

1           So, before, we would wait until a new  
2 edition of a paper chart, to release any non-  
3 critical information that was built up over that  
4 year or two years or whenever the last new  
5 edition was -- was printed.

6           So, now, the mariner is getting more  
7 up to date information quickly, and as it -- as  
8 it comes in and out.

9           All right, converting soundings and  
10 depth curves to meters. This is a popular one.

11           The U.S. is, you know, one of the few  
12 countries that has -- that uses imperial units of  
13 measurement on the charts. Most other countries  
14 use meters.

15           Our hydrographic surveys are collected  
16 in meters. We are -- we then apply those surveys  
17 to our chart production database in meters, and  
18 then when we want to update the raster or the  
19 paper charts, we convert those meters to either  
20 feet or fathoms and then we have to round them to  
21 a whole feet or whole fathom, or fathoms and  
22 feet, so forth.

1           So, that causes a loss in precision in  
2           that -- in that depth. So, there is -- you know,  
3           it's -- there's a lot of issues with that, going  
4           in between products, ENC's and rasters.

5           Our first step though is if -- you  
6           could see on the -- on the slide there that the  
7           contours on all of our ENC's were collected right  
8           off the raster chart. That's how we built all  
9           the ENC's. We just digitized all the raster  
10          charts.

11          So, the 1.8 meter curve is the six  
12          foot curve and then the -- what is that, the 12  
13          and the 18 is shown there.

14          So, there are decimal meter curves --  
15          values, and that -- there's a lot of -- you know,  
16          so the first step we want to do is to convert  
17          those to whole meters, and just on the -- just on  
18          the ENC. That's the first step.

19          We're now investigating the  
20          feasibility of converting all of our products to  
21          meters, including raster and paper. We feel that  
22          having all of our chart formats use the same

1 units of measurement would be more efficient for  
2 us to update all the -- all of our charting  
3 products.

4 The use of the -- of our NOAA charts  
5 would be less confusing those mariners transiting  
6 in and out of U.S. waters, and for those who  
7 still want to see English units, you can still,  
8 you know, view ENCs in your ECDIS or ECS based  
9 on, you know, the software you're using, you can  
10 view those, whatever unit you want.

11 So, the second one there is to reduce  
12 unwarranted alarms and danger symbology. Again,  
13 you know, we collected a lot of this information  
14 off the rasters. There's a lot of wrecks out  
15 there that don't have any depth information on  
16 them. They came through in the local notice to  
17 mariners.

18 So, what the ECDIS does is it displays  
19 those wrecks and puts an isolated danger symbol  
20 when there isn't a depth -- minimum depth encoded  
21 in them.

22 So, you know, we're committed to

1 improving our data and coding practices to reduce  
2 these types of unwarranted alarms and clutter,  
3 and so, one thing we're working on now is, we're  
4 taking -- doing an effort to estimate and  
5 populate these safe clearance depth values for  
6 all wrecks that are deeper than 66 feet, which we  
7 view 66 feet as non-dangerous.

8 All right, channels. We did talk a  
9 lot, or not a lot, but a little bit about  
10 channels and the Corps of Engineers data.

11 We get a lot of Corp of Engineers data  
12 in our -- in that -- that comes into marine chart  
13 division, and we receive it in various formats  
14 and then there's a big push for eHydro, for all  
15 the districts to standardize their delivery.

16 But, you know, regardless of how it's  
17 delivered, there's still -- there's still the  
18 problem of their data on their website might be  
19 more -- it's probably more up to date than what  
20 we have on our chart.

21 It takes us a while to get the data  
22 in, get it on the chart. We -- whether it's a

1 tabulation or not.

2 So, the chart can be out of sync with  
3 the data on their website, and it can cause  
4 issues such as harbor pilot access of data.  
5 Prior to its application to the chart it can  
6 cause disagreements with -- you know, between a  
7 pilot and a vessel's captain.

8 So, we're looking at ways to  
9 standardize our -- our Corps of Engineers data of  
10 how we portray the data.

11 One idea is to replace our channel  
12 tabulations on the raster, which is what --  
13 what's on the slide there, on the left, to just  
14 showing project dimensions.

15 We would have a -- a note that points  
16 them to the Corps of Engineers website for the  
17 channel controlling depths, but we would also  
18 still populate our ENC data to show the minimum -  
19 - the controlling depths.

20 We also -- this is another way we show  
21 some Corps of Engineer -- we show Corps of  
22 Engineer data is we populate the hydro inside the

1 channel.

2           So, we could remove that and show that  
3 -- the channel quartering or minimum depth, or  
4 you know, in some areas, based on local wants and  
5 needs, they like to see full hydro developed  
6 inside the channel.

7           Okay, and this here -- this shows how  
8 we had this channel quartered, and the turning  
9 basin here is a little -- there was a legend, but  
10 the cartographer decided that since they didn't  
11 want to shoal up that whole entire basin for a  
12 few shoal soundings in the corner there, they --  
13 we requested the full survey from the Corps and  
14 then put the shoaling in there and then added a  
15 legend that gave them a little more water.

16           Another, you know, ideas to distribute  
17 NOAA and Corps data simultaneously, it would  
18 require some work on both parties, but that's  
19 another idea that's -- that's in the nautical  
20 charting plan, or national charting plan.

21           This is the last -- this is most of  
22 our channel -- our big channels are shown like



1 this with a -- just the four quarters and the  
2 minimum controlling depth on each quarter.

3 Data consistency. We realize that we  
4 have a lot of inconsistencies in the data out  
5 there because -- just because they were collected  
6 off the raster. This shows two ENC's adjacent to  
7 each other. One has a -- there's a gap there,  
8 it's hard to see. But there's a gap in the hydro  
9 because that's where the bar scale was, I  
10 believe.

11 So, lot of times, there's a note for  
12 a bar scale or something on the raster that we  
13 would have to -- you know, go in and pull the  
14 original hydro survey and populate some soundings  
15 in that area to make it -- to make it whole.

16 But you know, we realize there's  
17 issues like that out there that -- that I'm sure  
18 if you're -- if you used our ENC's or looked at  
19 them on ENC online, you can see -- see those  
20 issues.

21 This here is New York. This is our  
22 ENC scheme. You can see it's based -- it's kind

1 of a weird irregular shaped area, based on the  
2 collection of all the charts in that area at  
3 various scales, and what we'd like to do is  
4 create a gridded layout and also reduce -- reduce  
5 the number of scales on our products from --  
6 right now, there's 131 to about 20 or so, and  
7 also adopt the IHO standard scales for ENC.

8 We also use ENC only when appropriate  
9 now, when we're creating new products. I think  
10 the Merrimack one you showed is an ENC only. I  
11 don't think we created paper for that one, and  
12 that's what New York is supposed to look like, or  
13 going to go to.

14 Here is another issue like  
15 standardizing scales, but it's also a data issue.  
16 There is two charts there in the Gulf. One is  
17 one to 250,000. One is 350,000 scale, and you  
18 can see where one of the charts is not showing  
19 any pipelines, while the other one does and I  
20 don't think they all just stop there.

21 So, you know, over the years, there's  
22 been various products and when you create a

1 chart, there's a chart spec and for one -- one  
2 reason, that one said we're not going to show any  
3 pipelines on it. Maybe it was too cluttered or  
4 something. We want to show one without  
5 pipelines, and you also see that with depth  
6 contours, where one depth contour, even on the  
7 same scale charts adjacent to each other, one, we  
8 might have a 30 foot contour on an ENC that's  
9 coming across, and then it stops at the  
10 boundaries, and that's just because it was never  
11 on the raster.

12 So, those kind of issues, we need to  
13 go in and clean up too, you know?

14 This is a small craft chart in Puget  
15 Sound. It's no longer -- we canceled it  
16 actually. But for 60 years, small craft charts  
17 had been around, but you know, NOAA feels that  
18 there are easier, safer ways to get rec-boaters  
19 to use charts in the ECS.

20 So, some of these charts have over two  
21 dozen panels and various skewed projections. The  
22 red arrow -- arrows there indicate the North-up.

1 So, when you load those -- load the BSB and ECS,  
2 a lot of the labels are kind of sideways or  
3 upside down and they're hard to read.

4 So, now, we're migrating all of these  
5 panels onto either, you know, same scale  
6 conventional charts or larger scale charts. This  
7 one would -- there was only two panels out of all  
8 those panels that did not already -- that was not  
9 already covered by conventional scale --  
10 conventional charts in the area.

11 If you look at Puget Sound, the raster  
12 catalogue, there's a lot of scale that's covered  
13 very well for most areas, and so, we only had to  
14 move two panels onto existing conventional  
15 charts, what we call conventional.

16 So, that gives us a consistent North-  
17 up product with no loss of coverage, and a bonus  
18 is, there's the reduction of duplicate same scale  
19 products. So, it's less maintenance for our  
20 cartographers in the shop.

21 Recently, the U.S. Coast Guard and  
22 Coast Survey have started to develop a process

1 for extracting all the Aids to Navigation changes  
2 from the Coast Guard database, which then could  
3 be applied to our production database, and  
4 weekly, and that would refresh all the positions  
5 and any characteristic changes.

6 So, that's being worked on now. That  
7 would save us a lot of time. Right now, we have  
8 cartographers who get the local notice to  
9 mariners from each district and they input the  
10 changes by hand, into a -- into our critical  
11 correction database, and then from there, all the  
12 changes are made to all the products by hand.

13 Coast Survey will continue to practice  
14 an open data policy, which includes free data  
15 offered in useable formats, consistent with  
16 international standards, consistent with all  
17 federal policies. Bottom line is we want our  
18 data to be used for purposes other than  
19 navigation.

20 So, there you can see we have -- we  
21 offer channel framework or channels, maritime  
22 limits, boundaries, shipping lanes, regulations.

1           Okay, and some of those -- some of  
2           these changes have already begun, like the --  
3           like the unwarranted alarms, populating wrecks.  
4           Others are being evaluated, such as converting  
5           all products to meters. That's one we've -- I've  
6           seen some few feedback on.

7           But the feedback is going to help us  
8           refine these initiatives and you know, hopefully  
9           maybe identify new ones, which we aren't -- that  
10          aren't on our radar.

11          So, how to provide feedback, it's  
12          right there. It's in your -- it's in all your  
13          packets. That's about it. Thank you.

14          RADM SMITH: Thanks, Travis. I think  
15          we'll -- in the interest of time, I think we'll  
16          hold questions for the end.

17          So, with that, I'll introduce Jane  
18          Newtown, who is the director -- I didn't hear  
19          your bio, director of NANOOS, which is the  
20          Regional Association associated with the IOOS  
21          network across the U.S., and she's been doing  
22          some fabulous stuff with delivering -- delivering

1 NOAA and other data out to the public in a  
2 variety of ways. So, please, Jan.

3 DR. NEWTON: Thank you. There we go.

4 Well, thank you so much, and I really  
5 want to thank the organizers for inviting me to  
6 come and speak to you about IOOS and NANOOS, and  
7 specifically, as the Admiral said, linking that  
8 with stakeholders in the Pacific Northwest.

9 Okay, let's see if I can make it work.  
10 There we go.

11 All right, so, first of all, just to  
12 make sure we're all on the same page, what is  
13 IOOS? The Integrated Ocean Observing System. I  
14 was glad to see -- I was speaking in the  
15 integrating NOAA's navigation service data panel  
16 because integrated is our first name with IOOS,  
17 and so, these are bullets from the IOOS website  
18 about what IOOS is and it very much is national  
19 regional partnership, so, federal/non-federal  
20 partnership, integrating ocean information from a  
21 variety of sources, providing easier and better  
22 access that allows stakeholders, the public,

1 different decision makers to do the things that  
2 they want to do, widely used and needed, and of  
3 course, including maritime operations.

4 So, where is IOOS? It is a federal  
5 interagency, but it is housed at NOAA within NOS.  
6 We're one of Russell's children, so to speak.

7 So, there you can see the layout, if  
8 you can see it. Carl Gouldman is the new  
9 director taking over from Zdenka Willis. So,  
10 we're in the navigation, observations and  
11 positioning part of NOS.

12 All right. So, as I mentioned, it's  
13 a Federal interagency. So, these are the 17  
14 federal agencies that are part of the U.S. IOOS  
15 operation, and what the -- the people who  
16 constructed IOOS from the get-go, back in the  
17 late 90s had the wisdom to do is to have both the  
18 Federal and then a regional component to this.

19 So, you see 11 regional associations  
20 around the nation. NANOOS there in the Pacific  
21 Northwest, but covering all of the Pacific,  
22 Alaska, the Caribbean, the Great Lakes, as well



1 as the Continental U.S. coasts.

2 All right. So, these regional  
3 associations, or RA as we call them provide end  
4 to end observations, so, in-water observations,  
5 infrastructure, forecast and modeling, data  
6 management, user products and then the outreach  
7 and education to get them in the hands of users.  
8 But we start at the bottom and make sure that  
9 we're making observing systems that will fill  
10 stakeholder needs.

11 There's a lot of leveraging and a lot  
12 of linking, and there, you see the regional  
13 associations. What we do by our mandate is to  
14 engage with diverse local stakeholders.

15 So, I engage with stakeholders from  
16 Washington and Oregon. My colleagues in SECOORA  
17 engage with stakeholders in Florida.

18 So, it's distributed that way, but  
19 because we are a system, we can assure consistent  
20 national capability. All of the regional  
21 associations are undergoing certification by  
22 NOAA.

1           So, we've all ascribed to the same  
2 standards, inter-operable data and all sorts of  
3 acronyms when you get into the data management,  
4 SOS and all of the stuff that is beyond me.

5           All right. So, you are in NANOOS  
6 land, and there is our logo. So, NANOOS stands  
7 for the Northwest Association of Network Ocean  
8 Observing Systems. There's our website and as I  
9 mentioned, we serve Washington and Oregon, but we  
10 do have good collaborations with Canada, through  
11 their ONC and other -- Environment Canada, other  
12 Canadian entities there, and then all of the  
13 regional associations kind of overlap and  
14 interact together. So, certainly with California  
15 to our south.

16           So, each of the RA's started be  
17 defining their region, their users and the needs,  
18 and so, I'm not going to go through this, but  
19 there you see the natural habitats within the  
20 Pacific Northwest, as well as the regional user  
21 groups, and you can see maritime. I did not  
22 doctor this slide. It was actually written that

1 way a long time ago. Fisheries, etcetera,  
2 etcetera, and you see that there's a diversity  
3 there.

4 So, maritime, fisheries, environmental  
5 management, shoreline, hazards, educators, marine  
6 recreation. So, it's the full gamut, and very  
7 much encompassing of NOS's objectives.

8 All right. So, we heard loud and  
9 clear from the beginning, about the needs of the  
10 maritime community in the Northwest. Here is a  
11 quote from Captain Dan Jordan from the Columbia  
12 River Bar Pilots, who is in our audience today,  
13 talking about the Columbia River Bar as one of  
14 the most dangerous harbor entrances in the world,  
15 and a recognition of NANOOS's efforts.

16 Another quote by Oregon State agency  
17 called DOGAMI. For some reason they make their  
18 acronym that way, but anyways, talking about the  
19 utility of NANOOS to the coastal community  
20 stakeholders.

21 So, we knew that this was important  
22 and set about how can we be useful?

1 All right. So, one of the things we  
2 do, aside from funding some of the observations  
3 and modeling and outreach is to create this data  
4 portal that allows people to access data. We  
5 call it the NANOOS Visualization System or NVS,  
6 and you can see there is all of these little  
7 buttons you can push on.

8 So, the one first up at the top data  
9 explore has basically all of NANOOS' assets and  
10 data inventory that you can access from that. We  
11 tend to call that the kitchen sink because, for  
12 obvious reasons.

13 But then all of these ones are  
14 specialized, different user groups.

15 So, we have maritime operations. We  
16 also have one that's more designed for  
17 recreational boaters, and then one for tuna  
18 fishers, as well as shellfish growers and people  
19 worried about tsunamis, etcetera, and I'm just  
20 going to go through the ones that are outlined  
21 there, to give you a sense for how we are serving  
22 needs of these three different user groups and of

1 course, there is overlap, but we try to optimize  
2 it.

3 So, first, here is a view of the  
4 kitchen sink. It's on your basic Google Map, and  
5 each one of those little icons is a different  
6 asset. Along the side, you see there's models  
7 and remote sensing and mobile platforms,  
8 etcetera, and it can be actually, quite  
9 overwhelming for people.

10 So, what we've done, so now, up at the  
11 top we're going to look at maritime operations.  
12 So, instead of saying data explore, it's going to  
13 say maritime operations at the top.

14 So, one of the first things we done is  
15 make available, the NOS charts as NVS overlays.  
16 So, users can click on whatever chart they would  
17 like to see, but you also still see the icons  
18 there, and we'll get to that just in a moment.

19 All right. So, here is -- if a user  
20 wants to select current conditions instead of  
21 querying one icon at a time, they can ask, show  
22 me all of the winds.

1           So, there you see color-coded and with  
2           the little tail, the speed and direction of the  
3           wind at the current time.

4           But we can also see that against the  
5           backdrop of the NOS charts, and then we can also  
6           see that same thing on the backdrop of Wave Watch  
7           III forecast, and on the Wave Watch III, you see  
8           both the vector and the color.

9           If you turn off the color, you can see  
10          the chart behind it. So, this has wide  
11          flexibility, in terms of how a user wants to  
12          interact with it.

13          Another thing you can do is then query  
14          an individual buoy, and so, here is a CDIP buoy  
15          from Grays Harbor and pulling up the wave height,  
16          and so, you can interact with that time bar down  
17          at the bottom. There's also the little white  
18          pop-up thing that gives you the wave height and  
19          you can actually download the data. You can  
20          interact with the data. You can print a plot of  
21          it, that sort of thing.

22          All the while, where the -- the wind

1 conditions, the current conditions are still  
2 staying there, as well as the chart, or whatever  
3 overlay you want to use. It's very flexible that  
4 way.

5 So, other features are shown here.  
6 I'm going to show you two of them. The little  
7 yellow dots down the coast, you can disregard for  
8 a moment, but let's focus on the blue things.

9 So, that is now surface currents,  
10 another NOS product and you notice we're scaled  
11 out here quite large, and I zoom in, those little  
12 blue things and the blue arrows multiply. So, it  
13 scales with whatever you're -- the view that  
14 you're looking at, so people can go in or out.

15 Then again, at the same time, while  
16 you're looking at the currents, maybe you want to  
17 know if the wind is in the opposite direction or  
18 if it's strong. So, you can query the winds, as  
19 well as that.

20 All right. Maritime operations. I've  
21 been showing you so far, just the observations in  
22 the forecast. But one of the features I love

1 really a lot is this little tab called the  
2 Comparator, where you see the forecast and the  
3 observation at the same time.

4           So, the red is the forecast. The blue  
5 is the reality, the observation from a NDCB buoy,  
6 and I used this all the time, before I take  
7 students out on research vessels, and whoever was  
8 looking at this would have been well-advised to  
9 not believe the forecast, and that way we can let  
10 mariners see things in a real-time.

11           So, I want to thank both John  
12 Veentjer, Captain John Veentjer and Captain Dan  
13 Jordan, as well as Coast Guard member whose name  
14 escapes me at the moment, for being our inner --  
15 our first focus group to talk about what are some  
16 of the features that maritime operators would  
17 want to see, and then our developers have gone  
18 off and made this and we're just about to re-  
19 engage with user groups, to try to understand  
20 better, the needs, are we on target.

21           Okay, what about those little yellow  
22 circles? Well, those are wave forecasts with yet



1 another model, and so, there you see the wave --  
2 significant wave height forecast along the coast.

3 We have also the ability to plot the  
4 HF radar currents. I didn't make a slide of  
5 that, but we are investing in X-band radar at  
6 different ports. This one is off of Yaquina Bay,  
7 and you see the conditions there at the bar.

8 All right. So, another -- so, that's  
9 great, very sophisticated for maritime operators.  
10 Recreational boaters, again, that might be a  
11 little overwhelming. A lot of things that maybe  
12 aren't needed as much for the kinds of navigation  
13 that a recreational boater might want to do.

14 So, we made an app for boaters, which  
15 has an abbreviated list and more common terms,  
16 and all of these, you can either have metric or  
17 you can have English, whatever it's called, non-  
18 metric, feet, and so, here is a simplified  
19 showing the Xtide predictions there, and again,  
20 these -- the scale, if you click on one of the  
21 tide stations, you can see the tide things going  
22 out into the future, and we think this is really

1 helpful for boaters because a lot of them are  
2 planning like crabbing or fishing, which really  
3 relies on tidal conditions.

4 But then let's say I want to take a  
5 boat from Oak Harbor on Whidbey Island to  
6 Victoria, Vancouver Island, and I want to do this  
7 in a way that I'm going to hit, you know, the  
8 tides on a certain -- in a certain way.

9 So, we have the ability to figure out  
10 a route, and so, that's that little squiggly  
11 thing, and then in that green box are all the lat  
12 longs for the wave points, and then you can  
13 download those. But you can do that, you know,  
14 several months out, planning your trip against  
15 the tides.

16 Then when a boater is out there, let's  
17 see how the forecast and the current conditions  
18 compare. So, this is just that same capability  
19 you saw before, and here we're comparing winds  
20 and winds. So, current conditions, as well as  
21 forecast, and you can see the overlays and the  
22 vectors, and again, you can pull up the chart.

1 You can see that up at the top. You can put that  
2 chart overlay.

3 So, the last use case scenario is tuna  
4 fishers, and this one came to us a bit  
5 serendipitously, but it turns out that what does  
6 a tuna fisher want to do?

7 Well, they want to find tuna and they  
8 want to be safe, and so, it turns out that you  
9 find tuna in warmer waters rather than colder  
10 waters, and it turns out that you find more tuna  
11 in 60 degree waters.

12 So, what we did is color-code our  
13 sea surface temperature horizons on a Fahrenheit  
14 and Celsius color bar, where red is basically 60  
15 and above Fahrenheit, and blue is not.

16 Now, I made this slide just a little  
17 bit ago and guess what? It's not a good time to  
18 be tuna fishing.

19 But here is a screen capture from  
20 August of 2014, and so, you can see the places  
21 where you can get to red water soonest and then  
22 it also has the surface currents.

1           Also, on this page, the tuna fisher  
2 page, not only are the forecasts, but also the  
3 current conditions from sea surface temperature  
4 and HF radar, as well as chlorophyll-a from the  
5 satellite.

6           So, last slide here we've got  
7 animations from NOAA Wave Watch III, which is a  
8 very popular item with our users, and you can see  
9 that they can make it specific to where they're  
10 at.

11           But I want to note at the bottom is --  
12 one of the things that I didn't show, but want to  
13 emphasize is the attribution is really important,  
14 and so, you see here forecast fields provided  
15 courtesy of NCEP  
16 National Centers for Environmental Prediction,  
17 and in all of our cases, people can see where the  
18 data are coming from. They might be federal.  
19 They might be academic. They might be private.  
20 They might be a shellfish grower, whatever.

21           So, in any case, I would like to say  
22 thank you for listening to what NANOOS is doing,

1 and we would love -- we value your feedback.  
2 We're not doing anything with  
3 bathymetry, so I was very interested in the  
4 eHydro, but I think there is a lot of opportunity  
5 for growing this system.

6 Visit us. Anything that I showed you  
7 is available online, and there is my email, and  
8 thank you so much.

9 RADM SMITH: Our next panelist is Jeff  
10 Hummel from Rose Point. Rose Point is -- has  
11 grown, since I've known them, 15 or more years  
12 ago, NOAA ships were some of the early -- early  
13 adopters and has grown into really, the leading  
14 PC-based navigation systems company, certainly in  
15 North America, and are -- are really ubiquitous  
16 throughout the tow boat industry, small fishing  
17 industry and the research community, basically  
18 everyone that's not required to have an active,  
19 chooses instead to have a system like this.

20 What I'm really excited about is the  
21 relationship that Rose Point has had with NOAA  
22 and others, to really, you know, lean forward to

1 make navigation systems as sort of powerful as  
2 they can be, outside of the sort of regulated  
3 environment.

4 But they've also been really big  
5 leaders in -- with the Coast Guard in defining  
6 the usage standards for ECS. So, take it away,  
7 Jeff.

8 MR. HUMMEL: Thank you, Shep. Can I  
9 get the remote? Where should I be pointing the  
10 remote? Okay, good.

11 All right. So, you might notice that  
12 my first slide doesn't really have a NOAA chart  
13 on it. It has maybe an idea of what a NOAA chart  
14 could be in the future, and what I'm going to  
15 talk about today is kind of the future, and not  
16 just the future of you know, next year or five  
17 years out, but really talk about the future 20 to  
18 25 years out, and that might seem impossible, but  
19 I really think it is possible to figure out the  
20 direction that NOAA should go in for the next 20  
21 to 25 years.

22 So, little bit of background. I mean,

1 most people probably don't realize there were  
2 electronic charting systems back in 1987. Does  
3 anyone remember Windows 3.2?

4 I worked with a company locally called  
5 Oceantech which was one of the first companies to  
6 do anything in the PC navigation market.

7 From '95 to 2001, I was with Nobeltec,  
8 which was the leading supplier, and still is the  
9 leading supplier, eventually purchased by  
10 Jefferson Boeing, followed by some ex-Microsoft  
11 developers up here.

12 In '96, I did a presentation for NOAA  
13 at the IMO and during the process of getting  
14 raster charts approved for navigation in the  
15 international market, there were many people who  
16 just thought that raster charts were evil, and we  
17 were able to convince them that raster charts  
18 were a valid stepping stone to getting towards  
19 the ENC's, and it really sped up the process for  
20 the U.S. to have official charts available for  
21 customers worldwide.

22 Last few years I've been with Rose

1 Point. Our company is focused on inland towing,  
2 coastal market, offshore oil and gas. We have  
3 the largest installed base of commercial users in  
4 the U.S. As we're sitting here today, there's  
5 probably 4,000 to 5,000 vessels operating, with  
6 someone staring at one of the screens right at  
7 this moment.

8 Rose Point chairs the SC109 committee,  
9 which is the committee at the RTCM, which has  
10 been tasked with creating the standards for ECS  
11 systems in the United States.

12 I'm happy to say that just last week,  
13 the SC109 standard was approved and now, for the  
14 first time we have a standard for ECS systems in  
15 the U.S., and it's been a long, long, long  
16 journey to get here.

17 So, what I'm going to talk about today  
18 is basically, I really want to look at the past,  
19 like, okay, well, how did -- when did the process  
20 of getting where we are today starts, and the  
21 thing that's remarkable about it is that it  
22 really started a really long time ago, even



1 before I was in the industry.

2 Kind of where do we go from here, you  
3 know, as a national direction, and then I want to  
4 just show just one little piece of technology  
5 that we've been working with NOAA to develop,  
6 which is one idea of where we could go in the  
7 future, in terms of improving electronic charting  
8 in the U.S.

9 So, I think that again, the way to  
10 make progress is to really look at where we --  
11 where we started, and one of the things that I  
12 learned in this process of doing this  
13 presentation was that there were some big changes  
14 in the late 80s and early 90s, and I don't know  
15 if any of our members are with Contract with  
16 America, you know, the Newt Gingrich era, or you  
17 know, the same ideas actually carried onto the  
18 next administration, with the reinventing  
19 Government with Al Gore, and of course, he  
20 invented the internet with that.

21 So, anyway, there was -- there were  
22 these plans, basically existing back in the late

1 80s, early 90s, and everyone knew that the United  
2 States was going to have to shift paper charts to  
3 electronic charts, and there's a big question  
4 like how you should do that.

5 So, in 1994, the National Research  
6 Council was commissioned by NOAA to do a report  
7 on what the future should look like and how they  
8 should get there, and it's called Charting a  
9 Course into the Digital Era. It was issued in  
10 1994, and looking back at it from the perspective  
11 from 2017 it was an extremely effective approach  
12 to governance and deciding priorities within  
13 NOAA.

14 It's remarkable how accurate that  
15 report was. Now, maybe it's a one off. Maybe it  
16 can't be duplicated. But I think that it can and  
17 I think that this type of approach really needs  
18 to be taken, to look at where NOAA should be in  
19 20 to 25 years. I mean, it seems like a long  
20 time. A lot of us won't be in the industry in 20  
21 to 25 years.

22 But we need to chart a direction now,

1 so that we can get to this better place in the  
2 future.

3 So, they made recommendations on some  
4 very specific topics. They talked about what  
5 sort of survey activities NOAA should be involved  
6 with and creating a database, which of course  
7 exists today, how the charts should be produced  
8 and changes like this, and it sounds like this is  
9 some gigantic document but it's only about 30  
10 pages long, but it was very specific in the  
11 recommendations.

12 How many people are actually aware of  
13 this document and its existence? So, there's a  
14 few people in the room that are aware of it, and  
15 that's great.

16 So, the 1994 report said that NOAA  
17 should establish a process aimed at minimizing  
18 the time between the acquisition of new data and  
19 publication of those data for public use, and the  
20 time period, I was told by someone at NOAA, that  
21 on average, it took about 50 weeks from some  
22 piece of information being learned by somebody

1 that something should be changed, to the time  
2 period that it actually showed up on a new paper  
3 printed chart, and you know, there was a limit on  
4 how much capacity they could actually output at  
5 the time period, based on paper charts.

6 If you look at this today, you know,  
7 it's changed completely. The notice to mariners  
8 come out, you know, very often, I'm going to talk  
9 about that a little bit later in my talk.

10 Another idea that came up and I was  
11 involved in this a little bit when I was at  
12 Nobeltec, was the privatization of collecting  
13 data.

14 So, in this report they came up with  
15 this idea that some of the activities should be  
16 privatized, and I think on this particular  
17 suggestion, it might not have been the right  
18 idea, but it was certainly well implemented by  
19 NOAA.

20 NOAA gave every attempt, you know, to  
21 make this work. There was a little bit of, I  
22 should say resistance from a number of companies

1 in the industry, but I think they gave it a  
2 worthy, you know, try and you know, at the time  
3 period, they were looking a shrinking revenue.  
4 You know, that doesn't sound like a strange thing  
5 to say today. I mean, it looks like NOAA has  
6 always had a shrinking revenue, as far as I can  
7 tell. So, or at least the outlook that there was  
8 going to be a shrinking revenue.

9 So, one of the things that came out of  
10 this was a Cooperative Research and Development  
11 Agreement with a company called BSB. We all have  
12 heard of the BSB format, but no one actually  
13 really knows what it means.

14 BSB comes from Blue Marble Geographic,  
15 Seoul and the Better Boating Association, who  
16 knew that?

17 But anyway, that's the format that  
18 every raster chart is issued in the United State,  
19 and it's just this strange, weird, you know,  
20 conglomeration of three private companies that  
21 end up being the BSB format, and but the original  
22 data or the original technology for that format

1 was actually developed by NOAA, a small group of  
2 people inside NOAA, and then they licensed in  
3 this CRADA, and the purpose of the CRADA wasn't  
4 that there was really cooperative research and  
5 development going on. It was basically a  
6 mechanism for NOAA to get their revenue to flow  
7 back into NOAA to fund some of the chart  
8 production.

9           Again, this recommendation for  
10 privatization and having that revenue flow back  
11 into NOAA was, something was directly in the NRC  
12 report.

13           So, again, I don't think it was the  
14 best idea, but they did a very diligent job of  
15 trying to make it work.

16           The BSB format, you know, was licensed  
17 to a number of companies worldwide, and this is  
18 kind of where the whole thing fell apart with the  
19 BSB format.

20           I was sitting at a hydrographic  
21 conference in Monaco with a meeting with our NOAA  
22 representative and the head of the

1 Argentine hydrographic office, and he looked at  
2 the NOAA representative and he said, "You make  
3 the world, and I live in it," and what he meant  
4 by that was that the United States creates these  
5 standards and then the rest of the world looks at  
6 us to you know, for leadership of what? Oh,  
7 well, you're doing this? Well, you guys have  
8 thought about this a lot. You must be doing the  
9 right thing.

10 So, the challenge with it, the BSB  
11 format was -- it was privately owned, and so,  
12 then you had a private U.S. company licensing the  
13 format to various hydrographic offices around the  
14 world, and it really probably should not have  
15 been done that way.

16 I think NOAA should have, you know,  
17 perhaps done it a different way, but they owned  
18 that format, and I think that one of the  
19 important roles of NOAA is to create standards.  
20 I think that is a job, as the Government, we can  
21 set the standards, this is the way we're going to  
22 do things. This is the way we expect the data.

1           I mean, it can come from industry  
2 feedback, but it's really an important part of,  
3 you know, governance and leadership around the  
4 world, is the ability to create standards and  
5 then work with other people to foster those  
6 standards.

7           Unfortunately, we've really lost that  
8 role in the U.S. The IHO, you know, has a lot  
9 more influence on what happens with the new  
10 standards than the U.S. We're not in the  
11 leadership role, and there's a big question  
12 today.

13           If you ask people who owns the BSB  
14 standard, no one really knows. I have private  
15 companies telling me like, "We still own it."  
16 I've had people in the government say, "Oh, no,  
17 the government owns it."

18           So, I have -- I don't -- honestly, I  
19 don't even know, I don't know if anyone knows who  
20 owns the BSB format today.

21           So, let's see. In 1995, NOAA began  
22 producing raster charts based on paper charts and



1 I think that you know, the approach that they  
2 took was great.

3 I mean, basically, they said we're  
4 going to make raster charts first. But before we  
5 make those charts, we're going to look at the  
6 world based on GPS. Most of the charts at that  
7 point, GPS wasn't involved in the creation of the  
8 charts. I mean, there are surveys going back to  
9 the 1800s or the 1700s or whatever, the 1940, on  
10 the next slide, I think that one of my next  
11 slides, it says that in 1993, most of the data  
12 was collected, I think before 1940 for the  
13 charts, or something like that. We'll see on the  
14 next slide.

15 Anyway, what NOAA did is they  
16 basically said, okay, these charts aren't as  
17 accurate as we have instruments today to record  
18 the differences, so we're going to basically the  
19 chart on a rubber sheet electronically, and move  
20 things around based on where we know they really  
21 are, and that worked really well, and then from  
22 there, they actually made the vector charts.

1           So, first they corrected the raster  
2 charts and they went to creating the vector  
3 charts, and so, they basically shifted  
4 everything, you know, with satellite imagery,  
5 aerial imagery, or GPS and they were able to make  
6 big corrections of the charts to make them more  
7 accurate, at a very -- without doing any  
8 surveying or very little surveying.

9           So, again, this I think was a great  
10 success. I think NOAA got charts out there in a  
11 raster format. They got them approved  
12 internationally and it was a great thing.

13           The charts eventually, initially  
14 started off at about \$250 per region, and then  
15 through process of some feedback from industry,  
16 eventually NOAA released the charts for free, and  
17 that's where we are today.

18           It took consternation worldwide and I  
19 mean, I remember talking to people at the time  
20 and everyone at IHO meeting, everyone would be  
21 against it, what are you guys doing? We have  
22 this great cartel and we get paid a lot of money

1 for these charts.

2 The British Crown for example, makes  
3 \$50 million a year selling their charts through  
4 their distribution. U.S. offers for free and  
5 more and more countries are looking at us to  
6 distribute their charts for free, based on NOAA's  
7 leadership in that area.

8 Unfortunately, the plan did create a  
9 bit of a cartel. I think NOAA was duped a little  
10 bit by the technology that these guys allegedly  
11 brought to the table, and I think that the  
12 ownership of the standards should have been  
13 either non-profit or NOAA should have maintained  
14 ownership of that standard.

15 But again, overall, successful. Let's  
16 see here. Yes, again, I think if you looked at  
17 this report, and my suggestion at the very end of  
18 my talk is that what we should do right now is,  
19 we should be planning a new NRC study and put  
20 together a group of 50 people or so, and plan out  
21 what direction NOAA should take over the next 20  
22 to 25 years, and I think based on the track

1 record of the NRC report from 1993, you can show  
2 demonstratively that it's an effective technique  
3 and will lead to the United States being in the  
4 right place in 20 to 25 years.

5           Unfortunately, the NRC report missed  
6 the biggest issue of the whole thing. It's the  
7 elephant in the room, and that is the exact  
8 method that electronic navigation would become  
9 legal in the United States.

10           The NRC report was focused NOAA's role  
11 in getting to an electronic world, where we could  
12 legally navigate using these new charts, but no  
13 one ever sat down and thought, well, how is the  
14 rest of the process going to work, and  
15 unfortunately, it didn't work very well and I  
16 think that NOAA should have a leadership role in  
17 the decisions that are made on how electronic  
18 charts are supposed to be used in the United  
19 States.

20           That role right now is designated to  
21 the Coast Guard. The Coast Guard, in the last  
22 two to three years, has done a very good job, but

1 in the last 15 to 20 years, have not done a very  
2 good job in getting this process moved forward.

3 There's a variety different reasons  
4 that that has happened. But the net result is,  
5 the United States is a long ways behind the rest  
6 of the world. You know, and I think that NOAA  
7 has the expertise to take on this role, and I'm  
8 not -- it's actually not clear to me, what  
9 changes would have to be made from a legislative  
10 standpoint, to put NOAA into this role, but I  
11 think it is the legitimate role of NOAA, and this  
12 was a mistake in the original vision of how  
13 electronic charting should be done in the United  
14 States.

15 Personally, I think it's a national  
16 embarrassment and no one really talks about it  
17 very much. It's like there are countries, you  
18 know, I call them like third-world countries,  
19 that can legally navigate on electronic charts,  
20 but in the United States, it only became legal  
21 last week. So, literally last week.

22 So, I mean, what if Malta had made it

1 to the moon before us, because that's where they  
2 are now. They're ahead of us in this process,  
3 and it's ridiculous.

4 I mean, we claim to be the leaders of  
5 the free world. Let's do it. Let's lead the free  
6 world. Let's chart a plan for the next 20 to 25  
7 years and do it right, and do it effectively.

8 So, I'll get off my soap box now, and  
9 just talk about one example of things that we  
10 could lead on, and this is some data. It doesn't  
11 show up very well on this slide. I think in just  
12 a second we're going to switch over to my  
13 computer. It seems to have turned itself off  
14 now. Hold on.

15 But anyway this is some data that Rose  
16 Point has been working with NOAA on. They've  
17 created some prototype data sets and we've just  
18 been collaborating.

19 So, we are the mechanism for NOAA to  
20 display this concept, and this is real-time and  
21 predicted high resolution current data for  
22 estuaries and coastal areas and the purpose of

1 this data is that you could literally save -- I  
2 think -- here, I think this it right here. Hold  
3 on. Pardon me. Hold on just a second. My  
4 computer went to sleep.

5 So, you know, I don't think the  
6 current administration cares too much about CO2  
7 emissions, but they do care about saving money  
8 and this system will do both.

9 The experience that we've had with our  
10 customers is that the vessel going from one  
11 location to another, hauling some cargo tends to  
12 race to that location, get there early, tie up,  
13 wait and then eight hours later or ten hours  
14 later, a day later, load the cargo, unload the  
15 cargo they're supposed to do.

16 The challenge with that is, most of  
17 these vessels are displacement vessels and if you  
18 slow down the speed of that vessel just a little  
19 bit, you end up saving a lot of fuel, and some of  
20 our customers have paid for our software and the  
21 entire installation on the first voyage that  
22 they've used our software on, because what they

1 do now is, they know much more accurately, when  
2 they're going to arrive someplace, they slow the  
3 boat down, and the fuel savings for that again,  
4 can just be massive.

5 I'll go to my next slide. Nothing is  
6 working. Usually I am him.

7 So, using this information operators  
8 can very easily calculate exactly when they're  
9 going to arrive somewhere, and it's based on  
10 computational fluid dynamic model based on the  
11 title constituents, and then it also takes input  
12 from real-time sensors, and then re-casts the  
13 model every certain amount of time.

14 Now, we were looking at now, how high  
15 a resolution does it need to be, how often do the  
16 forecast need to be, but again, this system,  
17 which is essentially based on information that  
18 NOAA already has, what we need is the mechanism  
19 for delivering it and how it's going to be  
20 delivered, you know, to the vessels in real-time.

21 It's not up there. There it goes.  
22 Okay, anyway, you can see it's incredibly high



1 resolution and you know, some analysis needs to  
2 be done on how accurate it is, but now, a vessel  
3 could plan on being somewhere an hour before they  
4 need to be there, or a half hour before they need  
5 to be there, rather than, you know, days or you  
6 know, half day or something, and it would be very  
7 easy to crunch some numbers and figure out how  
8 much money this will save industry. It will be in  
9 the billions.

10 Just using some of the stuff that Rose  
11 Point has created, we have a customer who took a  
12 vessel from the Gulf of Mexico to Chicago, and  
13 using our software, they were able to save two  
14 days off of their travel time, with a particular  
15 feature that we have. This year, we'll have the  
16 same sort of impact to industry.

17 I think now it flipped back to the  
18 presentation.

19 So, moving forward on this one, I  
20 think NOAA should come up with a clever name for  
21 the concept and -- there we go. How? In order  
22 for it to be successful in North America, it

1 would have to also include Canada. Canada is  
2 moving down the path of going to S-100 formatted  
3 data for this, and we've had to figure out how  
4 that meshes with that international standard.  
5 But again, I think it's a very valuable thing for  
6 the Government to do.

7           The like the loss of the El Faro, you  
8 know, with software with these sort of  
9 capabilities in it would have prevented something  
10 like that because they could very clearly see in  
11 their navigation software, the kind of conditions  
12 that they would have in the future.

13           So, these are my specific  
14 recommendations. NOAA should focus on open  
15 standards that don't create non-competitive  
16 exclusive relationships. I think the U.S. Coast  
17 Guard should be relieved in part of the role in  
18 implementing ECS standards within the United  
19 States, and I think NOAA should requisition the  
20 new NRC report, looking at the next 20 to 25  
21 years of where we should be at that time period.

22           That's all I have. Thank you.

1       RADM SMITH: Thank you, Jeff, that was great.  
2       Lots of -- lots of exciting stuff. Really happy  
3       to see that demo coming along. That's awesome.  
4       Next we have Jeff Siegel from active -- founder,  
5       president and everything for ActiveCaptain. For  
6       those of you who don't know what ActiveCaptain  
7       is, Jeff I'm sure will describe it to some  
8       extent.

9                 But I'm going to -- I'll fluff it up  
10       a little bit because he has -- he's really  
11       revolutionized the way people share information  
12       about -- within the sort of particular  
13       recreational cruising market, share information  
14       about hazards, about marinas, about even where  
15       they are. And he's done it in a way that is sort  
16       of, in a sense non-proprietary. That is, he  
17       partners with everyone, including us.

18                 And I met Jeff at a -- I don't think  
19       I met you. I think I heard about you and called  
20       you -- cold-called you a few years ago and I --  
21       and he was sitting on a gold mine of hazard  
22       information about where there were dangers on the

1 -- you know, dangers in the coastal areas. And I  
2 said, we're on the same side here. We're trying  
3 to -- we're trying to help people be safe.

4 Can we have access to your hazard  
5 database in order to help us plan and focus our  
6 hydrographic surveys? And as another source of  
7 information? And without blinking an eye he said  
8 absolutely. And we had an agreement in place  
9 just a few months of lawyers later to -- to share  
10 it. And it's been really revolutionary to the  
11 way that -- the way that we think about the  
12 charts and about -- and about our customer's  
13 interactions with them.

14 So Jeff promises this will be as  
15 thought-provoking and revolutionary today as has  
16 been the rest of his work. So, Jeff Siegel.

17 MR. SIEGEL: Thank you. First, I  
18 can't sit here. I live on a boat. I cannot sit  
19 here and give a talk. I need to walk around and  
20 so forgive me. I have no slides, so I'm it.  
21 You're going to have to listen -- kind of what --  
22 verbally what I have to say about some

1 interesting things about crowd sourcing.

2 I'd like to start by -- May 25, 1961  
3 was a really famous speech by John F. Kennedy  
4 when he said -- and everyone knows this speech --  
5 how we're going to send a man to the moon and  
6 bring him back safely. And that was a  
7 fascinating time and you know, back at NASA they  
8 had their own little conflict because on one hand  
9 they knew their budget was going to go through  
10 the roof. But on the other hand, they didn't  
11 know how to get the man to the moon and back  
12 again.

13 And even worse than that, they knew  
14 that they couldn't do it. But what happened over  
15 the next couple of years is something uniquely  
16 human. What happened is innovation and  
17 creativity. Because the mind set was how are we  
18 going to shoot a rocket from Cape Canaveral to  
19 the moon and have enough fuel to have it come  
20 back? The technology didn't allow us to propel  
21 that much fuel up to the moon to have any fuel to  
22 come back.

1                   It's sort of like shot putting, you  
2 know, a tennis ball. Think about how -- how  
3 poorly you could throw it in this room. And then  
4 someone realized well, you know, if I wound up  
5 and I -- just a quarter of a throw, I could -- I  
6 could hit the end of this room right here. And  
7 then the next step of that is well, let's do a --  
8 like a sling, like David and Goliath, and fling  
9 it once around. Imagine how far you could hit  
10 that tennis ball.

11                   And you know, a bunch of calculations  
12 happened and that was called the slingshot  
13 effect. And if you went into Google and you said  
14 today Apollo trajectory, what you'll see is that  
15 it shoots up from Cape Canaveral, goes around the  
16 earth once and goes to the moon. And that's how  
17 it was done. It had a lot to do with thinking  
18 outside the box. And it had a lot to do with  
19 this slingshot effect.

20                   And so my entire life has been  
21 defining what I call slingshots. And we'll come  
22 back to slingshots because they have an important

1 characteristic in crowdsourcing -- crowdsourcing  
2 data. And most of you probably have some  
3 familiarity with it because you live more in the  
4 crowdsourcing world than you realize. You know,  
5 today -- crowdsourcing is about getting a  
6 community of like-minded people together to  
7 collect data from them, somehow process it in one  
8 way or another, and then feed it back to them.

9 It's an interesting element of  
10 statistics and mathematics that isn't very well  
11 defined but it heavily roots in statistics. The  
12 terms didn't even exist until 2005 and really  
13 didn't start to come into play around 2006 or  
14 2007. I'll give you some more history of that.  
15 But there -- there's some fascinating things that  
16 most people don't realize about crowdsourcing. And  
17 there's been a lot of study. There's been a lot  
18 of scientific study into it.

19 I'll give you one example. The BBC  
20 who didn't believe any of these studies about  
21 crowdsourcing wanted to do a documentary on  
22 crowdsourcing -- crowdsourcing data. So what they

1 did was they had one scientist. He took a big  
2 glass jar and he filled it with jelly beans. And  
3 as he was filling it, he counted the number of  
4 jelly beans he put into this big glass jar. And  
5 what -- and this is all -- there's a documentary  
6 on this. If you go to YouTube and search BBC  
7 crowdsourcing there's a seven minute kind of  
8 summary all about this experiment that they did.

9           And so he put in 4,510 jelly beans  
10 into this big jar. And he was the only one that  
11 knew how many jelly beans were in the jar.

12 Closed up the jar and then walked around BBC  
13 office and just asked everyone in the office how  
14 many jelly beans are in the jar? And he wrote  
15 down every response. And the video is really  
16 great because, you know, the -- when they show a  
17 person guessing 400 jelly beans -- I mean,  
18 imagine this huge thing and someone guesses 400.

19           And then they showed another person  
20 guessing 50,000 jelly beans. And you know, this  
21 is one of the characteristics that crowdsourcing  
22 has to people that aren't involved in it where



1 you -- you take those outlying data pieces, like  
2 400 and 50,000 and you think this can never work.  
3 Of course it's wrong. It will never work.

4 All right, but what he did -- and  
5 again, on the video, showing live exactly what  
6 happened -- he wrote down every one of the 160  
7 data samples that he got. And then he did that -  
8 - the obvious thing. He added them up, divided  
9 them by 160 to get an average. The average  
10 number in that -- of all the data collected was  
11 4,515 -- off by five jelly beans. That's an  
12 incredible finding.

13 Now, and he did -- he walked into this  
14 whole experiment -- because that experiment had  
15 been done many times before -- not believing that  
16 it would work and the documentary became really  
17 incredible because it blew him away. There's  
18 been a later meta-analysis -- a meta-study -- of  
19 all of the different crowdsourcing things because  
20 jelly beans and golf balls and peanuts and a  
21 thing -- there have been so many studies like  
22 this. And so they went and collected up as many

1 as they could find just to find what's the  
2 average amount of inaccuracy.

3 And it turns out that in that study  
4 when you have 100 or more participants -- and  
5 that's not many. Just 100 people. There have  
6 been studies that they -- that they grab 20,000  
7 and you actually don't get any more -- you don't  
8 get better data than about 100. The average  
9 error is 3 percent in that kind of study. It's  
10 an incredible thing.

11 So, the -- what detractors of  
12 crowdsourcing do is they concentrate on that 400  
13 or the 50,000. We get it all the time. You  
14 know, we collect up crowdsource and we have 1.5  
15 million users today. There's 280,000 that are  
16 fairly active that, you know, contribute data.  
17 Some contribute an unbelievable amount of --  
18 there's a very interesting curve of that. And  
19 detractors of ours, basically the companies who  
20 we've competed with who didn't like what we were  
21 doing, they would come back and say oh, you know,  
22 look at this anchorage. Look what someone says.

1 They say, they just have all that information  
2 wrong.

3 And yes, they -- you know, that one  
4 comment review about that one anchorage, maybe it  
5 is wrong. But the 14 others are dead-on  
6 accurate. So as a -- as a person using this  
7 data, you can't look at any one piece of data,  
8 any one comment, and say that's the whole thing.  
9 You've got to -- you've got to bring it together  
10 in your own mind a little bit. It's the same  
11 thing with -- with TripAdvisor if you're looking  
12 for restaurants. You know, you can't look at  
13 just one of those reviews and decide that's the  
14 restaurant I want to go. You need to read a body  
15 of them a little bit and get an impression. And  
16 what walks away from that is incredible --  
17 incredible information.

18 All right, so now I want to -- I want  
19 to pull together the crowdsourcing idea with the  
20 slingshot idea because that's where the real  
21 magic happens. That's where changes happen that  
22 are completely unusual. How many of you have

1 ever used an app called Waze, W-A-Z-E? And I  
2 mean use it, that means you've been on -- you've  
3 been on the road for more than a couple of hours,  
4 especially interstate highways. So maybe 10  
5 percent have done it? Okay.

6 It's an incredible app. It was  
7 started in 2006, the same year I started  
8 ActiveCaptain. It was an Israeli company headed  
9 by Uri Levine. He -- he got a couple people  
10 together and what he wanted to do was solve the  
11 traffic problem. To get information about  
12 traffic on the roads.

13 And his -- his idea was two things.  
14 First, he would have no street maps. He didn't  
15 use any of the existing street map data at all.  
16 He started with a blank screen. And what he did  
17 was he would capture the GPS time and date and --  
18 you know, and speed of where you were in your car  
19 if you ran this free app. And it was free.

20 I was a very early Wazer. In 2006 I  
21 used the first version of it. And -- and I drove  
22 -- I lived in Maine at the time in the summers

1 and I drove around because as an early Wazer you  
2 got to pave roads, which is a weird thing, but it  
3 spoke to me and I paved a bunch of roads in  
4 Maine.

5 (Laughter.)

6 MR. SIEGEL: And what you had to do  
7 is, if you drove a road more than 10 miles an  
8 hour three times, the road became part of the  
9 database. But it did more than that behind the  
10 scenes that even an early Wazer didn't know. He  
11 also kept every intersection when you turned --  
12 or if he realized there was an intersection --  
13 and I say he, it's not he. It's the database.  
14 The database also kept track of what direction  
15 you turned.

16 So what was coming was this very  
17 unusual database of not only what roads are  
18 actually used, but at every road, what's the  
19 distribution of turn -- including going straight?  
20 Okay, then to collect real-time data about  
21 traffic, he also knew just from looking at the  
22 speed of data that your -- that your car was

1 moving, he knew the speed limit of every road  
2 that you were on.

3           So if he knew a road was 65 miles an  
4 hour and he all the sudden got four data hits of  
5 20 miles an hour, he knew there was traffic  
6 there. And in going back from that, you know,  
7 the feeder roads coming on that he would also get  
8 information on, he would know the distribution of  
9 how they would turn. All right, the result of  
10 all of this is the -- the quality of the data and  
11 the instantaneousness of the data became so good  
12 that today there are no, you know, helicopters  
13 that go up in every TV station and report on  
14 traffic because that's an instantaneous one-shot  
15 at what the traffic is. He could -- Waze not  
16 only gave you a continuous, every day of the --  
17 of the -- every minute of the day, every place on  
18 earth, what the traffic was, but he could also  
19 predict the traffic. That became the really  
20 valuable thing.

21           And it was using -- it was using speed  
22 and collecting the speed up in a way that was

1 very revolutionary. And no one even thought of  
2 it. That -- that was his slingshot. By  
3 collecting speed, he could detect traffic. He  
4 didn't have to have anyone saying that there's an  
5 accident. He could just know.

6 And Waze was purchased just a couple  
7 years ago by Google for \$1.1 billion, with a B,  
8 dollars. My wife and I look at each other and  
9 say why did we do recreational boating? You  
10 know, we could have done traffic. So --

11 (Laughter.)

12 MR. SIEGEL: We have more fun. So you  
13 know, it's really important lessons out of that.  
14 And you don't have to go too far to think that  
15 collecting speed and collecting depth -- we can  
16 put together charts and we can put together  
17 hydrography pretty well. Now, in the whole  
18 subject area of crowdsourcing there is a conflict  
19 between what I'll call the experts and the crowd.  
20 It always happens. It doesn't matter whether  
21 it's TripAdvisor and, you know, collecting up  
22 restaurant reviews and the restaurant critic in

1 the newspaper who, notice, doesn't exist anymore.  
2 There is no -- there is no restaurant -- no  
3 reviews in newspapers.

4 Or same thing with -- with theater.  
5 You know, no -- no Siskel and Ebert any more. You  
6 know, there is now websites that give you reviews  
7 on movies. And on and on. Every -- every time,  
8 you know, that we -- we had -- we had the  
9 guidebooks -- the recreational boating guidebooks  
10 who did not like at all what we were doing. And  
11 you know, they were the experts on where to go in  
12 the Caribbean. But it turns out that we were the  
13 ones collecting where people actually were going  
14 and, in their own voice, what many people were  
15 saying.

16 So, okay -- looking at crowdsourcing  
17 of depth, which is obviously what I'm talking  
18 about -- the experts in this are the  
19 hydrographers, and I recognize very clearly that  
20 I am in the belly of the beast of the hydrography  
21 expertise right now. Which is one -- another  
22 reason why I'm standing and I'm near an exit.



1 (Laughter.)

2 MR. SIEGEL: But it doesn't have to be  
3 a conflict. We need your help. And -- and  
4 there's a lot, you know, that -- that can and --  
5 and should be done. Let's look a little bit  
6 about what has been done in crowdsourcing because  
7 -- for depth data today. Because there's --  
8 there's efforts right now. There's Service  
9 Engineering, which is an Argus project. I'm sure  
10 many of you have come in contact with that in  
11 some -- one way or another. And a very similar  
12 project in the UK called from Team to Surv. Have  
13 -- have most of you heard of that? Familiar with  
14 it? No?

15 RADM SMITH: We provided the seed  
16 money for it, in fact.

17 MR. SIEGEL: The -- you provided the  
18 seed money?

19 RADM SMITH: Yes.

20 MR. SIEGEL: Good, okay. Both  
21 companies have asked us to get involved with it.  
22 Both -- and I turned down both companies because

1 their business model was just -- it will never  
2 work. It just can't work. Their business model  
3 was about -- and I don't mean to bash them at  
4 all. I mean to get the project done. And we --  
5 and it's not something that we're doing at all.  
6 We're -- they wanted us involved because we had  
7 so many users.

8 What they wanted to do was collect the  
9 data from the crowd, process it, and then sell it  
10 back to the crowd. That is a terrible business  
11 model. I mean, that just doesn't work on the  
12 internet in anywhere. It -- and it's never going  
13 to work with that too. I mean, this is the one  
14 thing where open source, where open collection,  
15 where open databases is so required.

16 There are some other commercial  
17 entities. Navionics, you've probably all seen  
18 sonar charts. They're a very, very common thing.  
19 A weird thing -- they don't -- they don't provide  
20 the information about what they do to the data.  
21 And I've done enormous personal, you know, in our  
22 boat, going on anchorages, looking at the NOAA

1 chart, looking at the sonar charts, and the data  
2 looks really neat. I mean, they're -- they have  
3 precision without accuracy. They have  
4 unbelievable contours. Just none of them are  
5 right.

6 And, you know, there's a place -- and  
7 I can give a lot of specifics. You know, just  
8 north of Addison Bridge, you know, near  
9 Titusville, Florida, we anchored there just a  
10 couple weeks ago. And if you looked on the NOAA  
11 chart, it would be a very obvious -- you get off  
12 the IC-W, you could go in the -- around by the  
13 bridge and it's a beautiful place to anchor. And  
14 in fact we did.

15 If you looked on the Navionics sonar  
16 charts, it would scare you to death. You would  
17 never even think about venturing back there  
18 because the contours showed you that there was  
19 two feet. Well, there wasn't two feet anywhere  
20 there. It was 11 feet everywhere. So I don't --  
21 they don't present where they're getting the data  
22 from and it's a big issue because there are some

1 challenges, you know, collecting -- crowdsource.

2           Garmin is doing very similar thing,  
3 you know, with their Quickdraw, if you've seen  
4 that. And that's kind of neat that as you're  
5 collecting the data they're drawing the contours  
6 ahead of you. That's a -- that's a wild user  
7 interface. And it's really interesting. And --  
8 and that does work in that, you know, the data is  
9 live to your own boat and you see where the  
10 data's coming from. It -- it solves that  
11 problem.

12           The real problem that they don't --  
13 that they don't address is tide. You know, they  
14 just ignore tide. They just figure, well, you  
15 know it means you can't share the data at all.  
16 You know, because if you're in Maine and you have  
17 12-foot tides, what does it matter what the --  
18 what the depth I got was? You know, they -- zero  
19 correction.

20           Okay, and the other side, Navico, has  
21 a thing called Inside Genesis which you may have  
22 seen. It's a wonderful product. They're

1 actually doing everything right. They are --  
2 their business model is interesting for it --  
3 they haven't really tied it into their -- to  
4 their commercial -- their normal chart plotter  
5 products. It's now really sold as a -- you know,  
6 if you want to -- if you want to survey a lake  
7 and -- for your community and figure out all the  
8 hydrography for it, it's a really inexpensive way  
9 to do that.

10           You go on a jet ski, you know, zip  
11 around a little bit and then out comes this  
12 really nice chart that is actually pretty  
13 accurate. And they take care of -- they take  
14 care of tide and current and -- so no one is  
15 doing it right yet. Now there is that IHO that -  
16 - that I've been -- I had talked to Admiral Smith  
17 about. I'm involved a little bit with it. I use  
18 -- I use Jeff's -- Jeff's a partner and a friend  
19 of mine. I use Coastal Explorer in our own boat  
20 and they have an ability to contribute to that  
21 database. There's really nice things about that.

22           But there are some challenges.

1 There's real challenges in putting this all  
2 together. You know, there is the -- the -- the  
3 tide issue, and tide is critically important. You  
4 know, in many places like Maine -- like here, you  
5 know, in the Pacific Northwest, you have enormous  
6 tides. And it really does matter. You know,  
7 people -- in our hazards today, when we try to  
8 train them -- but you know, we try to keep their  
9 comments in their own voice and we won't edit  
10 them.

11 So they'll say things like, you know,  
12 the Little Mud River is -- is -- this is me  
13 saying it, the Little Mud River the worst place  
14 on Intracoastal Waterway, you know, on the East  
15 Coast. It -- where the ICW should have about 12  
16 feet of depth, the Little Mud River -- parts of  
17 it have about 3.5 feet. So 3.5 feet on the  
18 typical cruising boat, which is around 4 feet to  
19 6 feet, means that every day of the week people  
20 are grounding there. And some are destroying  
21 their boat. Some are getting towed off. Some are  
22 just uncomfortable for a few hours. But it is a

1 very, very annoying thing.

2           So people will write comments -- we  
3 have -- we have -- if you are in ActiveCaptain,  
4 you are going to see an array of golds, which is  
5 our sign for a hazard. But people will say, so  
6 no problem at Mud River. Had at least, you know,  
7 10 feet. Saw at least 10 feet. Don't even  
8 understand what the problem is about.

9           Well, yes, that part in Georgia has  
10 eight feet of tide. So sure they saw 10 feet.  
11 They just didn't -- there's a class of boaters  
12 who doesn't really understand. They just don't -  
13 - they -- they just don't get it. They don't  
14 know that -- amazingly, they don't know that  
15 Georgia has eight feet of tide.

16           SO there is that -- but that is that  
17 guy that guessed 400 jelly beans. You know, and  
18 you've got to remember that. Because that --  
19 that -- if you look at the rest of the 80  
20 comments about that area, what you're going to  
21 find is 79 comments saying, oh my god, at mean  
22 low water, this is the depth. You know, make

1 sure you read that.

2 So again, you know, the detractors of  
3 it are going to point to that guy that said it  
4 was 10 feet here, what am I even worried about?  
5 So you know, just an important point. Tide is  
6 critically important.

7 There is a transducer issue where  
8 again, a lot of boaters don't realize that, you  
9 know, the transducer is only giving the depth at  
10 -- where the transducer is, and a lot of people  
11 put offsets into their transducer because they  
12 either want depth below the keel or they want  
13 surface level. You know, and people do it  
14 different way. So the -- if you're -- if you're  
15 just collecting the data and reporting it to a  
16 service, you have to normalize that in some way.  
17 That's actually really easy. There's a couple  
18 slingshots to make that trivial to do. But it is  
19 an issue.

20 The other issue is a spatial issue.  
21 You know, when you collect the GPS position and  
22 you collect the transducer, generally your GPS is



1 not directly over the transducer. So you're GPS  
2 may be back a little ways and your transducer may  
3 be more forward in the -- in the boat. So there  
4 could be a 15 to 50 foot difference that needs  
5 correcting.

6 There's also a privacy issue. In  
7 order -- in order to do crowdsourcing right, I  
8 believe you need to track the data to a boat.  
9 And that creates a privacy issue where some  
10 people will want to hide their identity for good  
11 reasons. And it's not because they want to trash  
12 the data. It's because, you know, I don't want  
13 someone seeing that, you know, maybe I have a  
14 house in Boston and here I am in Key West. And  
15 so I don't want someone in, you know, Boston  
16 being able to see, oh, Jeff's on his boat and  
17 he's 1500 miles away and I can -- I have all the  
18 time in the world to get into his house.

19 So -- so there is a privacy issue and  
20 it can't be overlooked. At the same time, you  
21 know, collecting the identity data is wonderfully  
22 valuable. It would allow me to say, okay, you

1 know, I don't really care about all the data  
2 going through the Little Mud River. I really  
3 want to know, you know, 50-foot and over  
4 trawlers. Because I can pretty much guarantee  
5 that those guys are going to know what they're  
6 doing. What did they find?

7           You know, or 50-foot or over  
8 sailboats. Or -- or my friends. You know, we  
9 have a -- a website that we -- we -- it's sort of  
10 very Facebook. You know, what friends you have  
11 on your boat. You know, getting all the Facebook  
12 stuff out, just friends. So I know, you know --  
13 people that I -- that I share friendships with, I  
14 kind of know those people. So show me the depth  
15 that they had through the Little Mud River --  
16 just my friends, you know, coagulate it all  
17 together.

18           All right, so what do -- what should  
19 NOAA do? You know, the data is being collected  
20 now. I would very much like to see -- one other  
21 piece. It feeds into this really importantly. I  
22 believe that paper charts had their end really

1 with the -- with the practicality of GPS. The  
2 day -- and it was around 1993 -- and this is all  
3 Jeff Siegel, it -- there's no proof in this or  
4 anything. But I believe that that was the start  
5 of the end of the paper chart.

6 And that's what -- that's what really  
7 created the ENC. Okay. There's no reason to  
8 believe we're done. There's no reason to believe  
9 there's not a next generation. And the enabling  
10 technology as bigger than GPS in 1993 is  
11 something that has affected every one of our  
12 lives today in everything that we do. From  
13 communications to information exchange to  
14 information retrieval to the way we entertain  
15 ourselves -- every single element. The way we  
16 buy things -- it's all been changed by the  
17 internet, every single one.

18 Yet, where is the internet -- where is  
19 the internet in this chart plant that -- that is  
20 in that? It's not even -- it's never even  
21 mentioned once in that chart plan. There is one  
22 time where a server is mentioned. But why won't

1 the internet affect what the ENC chart is today?  
2 And my contention is that -- that we are further  
3 than 1993 today. That really there's -- there's  
4 what I call TNT. You know, there's ENC and  
5 there's TNT. And TNT, I like the imagery of that  
6 because of the explosiveness of it. But it just  
7 -- for me it means the next thing.

8 And what ENCs are going to, I believe,  
9 change is in the process and in the -- in the --  
10 in the touching of the internet they're going to  
11 change in a big way. And the crowd data is going  
12 to be a huge piece of that. So what I'd like  
13 NOAA to do is -- this is going to sound really  
14 strange but I would like NOAA to telegraph to the  
15 recreational boating community that we are going  
16 to get out of ENCs, electronic charts, for  
17 recreational boating. I think that will do an  
18 enormously great thing.

19 It will spark developers to start  
20 figuring out how to get to this next generation.  
21 The reality is that a lot of the electronic  
22 charts are okay, that we're using today in the

1 United States. They're not great. There's too  
2 many times in the last week that, in my pilot  
3 house, I was driving on land. You know, those  
4 things need to be corrected. They have to be  
5 corrected. And there's a lot of that.

6 I think we -- that's the kind of thing  
7 crowdsourcing would fix in one week. And with --  
8 with almost -- with no effort by -- by NOAA. So  
9 I'd like to see that telegraphing. I'd like to  
10 see -- I'm not saying to end nautical charts for  
11 recreational boating because it's going to be  
12 needed for another couple of years. But  
13 telegraph to every software developer out there -  
14 - we work with 65 companies today of developers.  
15 Like Rose Point is an example.

16 We also work with guys who are writing  
17 iOS, you know, iPhone apps in their basement  
18 after work at night that are looking for, gosh,  
19 what can I do next? Well, telegraph to them that  
20 there is this big opportunity to take crowd data  
21 and make the next generation of recreational  
22 charts. And that has to come from NOAA to say we

1 -- we're thinking about getting out of this.

2 I think that a lot of what Jeff was  
3 talking about, and a lot of the other tide data  
4 that I heard today is really exciting because I  
5 don't see that. As a recreational boater I only  
6 see the -- kind of the ex-tide stations which are  
7 not good enough. We need a lot more tide  
8 information to do crowdsourcing of data properly.  
9 We need -- and it's not actually prediction.  
10 Prediction is wonderful. I'd love to see the  
11 prediction because I'd like to know -- I'd like  
12 to get -- I'd like to slow my boat down too and  
13 get there the same time.

14 But -- but just the historical data.  
15 Because the historical data of tide against the  
16 GPS and depth data collected will allow me to  
17 correct for tide. Or any -- you know, the  
18 database to correct for tide so that we can get a  
19 normalized tide value. I'd like to see that in a  
20 big way. And I understand there's some of this  
21 data, because, you know, Jeff is showing how  
22 they're using it. God, get that out to us. We

1 need that. We need that in a big way.

2           And I'd like to see some more adoption  
3 of some of the -- the crowd data. The IHO effort  
4 looks -- looks really great. And I'd like to see  
5 you know, more -- more of that happening. That's  
6 really all I have to talk about. I wanted to  
7 actually end really early too so I -- you know,  
8 answer questions and -- I know that the whole  
9 panel will answer questions, but I think there's  
10 a really fascinating element in the crowd. If  
11 you went up to ActiveCaptain and looked around at  
12 the data, you'd see there's a tremendous amount  
13 of information there and it changes the life of  
14 everyone that uses it. You know, we have -- the  
15 last point. The -- one thing that -- we have a  
16 newsletter that goes out to 280,000 boaters every  
17 week. And a month and a half ago -- I write the  
18 newsletter and I basically said I'm coming here  
19 to this meeting. And so I'd like to crowdsource  
20 what you'd like me to tell NOAA. You -- you feed  
21 back to me.

22           And -- now to be fair, there's

1 probably -- it goes out to 280,000. About  
2 230,000 actually receive it, you know for one  
3 reason or another. And these are our core users.  
4 You know, these are our most fervent users that  
5 read it. And we got back 500 responses, which is  
6 pretty good you know for -- it was within three  
7 days. And we categorized every single response  
8 that came in.

9           And interestingly they came in --  
10 there were only two categories of responses.  
11 Fifty people responded back with very specific  
12 kinds of things like you're not -- tell them  
13 they're not doing Barnegat Bay, you know --  
14 they're not doing a good enough job with the  
15 charts in Barnegat Bay. And -- and there were  
16 more New Jersey than anything else. And I don't  
17 know what that means. Maybe it's left over from  
18 Sandy, or maybe it's just people from New Jersey.  
19 I don't -- I don't know.

20           (Laughter.)

21           MR. SIEGEL: But it was that kind of  
22 thing. It was the Wilmington River -- the



1       Wilmington -- oh, sorry if you're from New  
2       Jersey. I don't mean anything. I -- I was born  
3       in Brooklyn, New York. The Wilmington River was  
4       another one. You know, the bends in the  
5       Wilmington River are just way off. You guys are  
6       not doing a good enough job.

7                 So, that wasn't even what I wanted to  
8       talk about at all. Or, it wasn't even, you know,  
9       what -- what -- that was a very personal thing.  
10      Those were people basically saying me, me, me.  
11      Fix my problem. Okay, 450 people said the same  
12      thing. They said we want to collect depth data,  
13      have NOAA put it together and feed it back to us.  
14      Four hundred and fifty people said that  
15      consistently -- every single one. They said it  
16      in a couple different ways, but they all said  
17      please tell them that.

18                So you have a recreational boating  
19      community who is really dying for that  
20      information because it will actually allow them  
21      to have more confidence in where they are going.  
22      So, thank you.

1 (Applause.)

2 RADM SMITH: Thank you, Jeff, that was  
3 awesome. And thank you to the whole panel.  
4 Let's have another round of applause for the  
5 whole panel.

6 (Applause.)

7 RADM SMITH: And Mr. Chairman, do we  
8 -- how much time do we have?

9 CHAIR HANSON: A long time, 45  
10 minutes.

11 RADM SMITH: For questions, great.

12 CHAIR HANSON: Yes, sir.

13 RADM SMITH: Fabulous, all right. Who  
14 wants to lead off? I will. Oh, I got one for --  
15 I got one for Travis. So Travis if -- if -- yes,  
16 it's a set-up question. So if you chart all the  
17 dangers right away and you automate the update of  
18 nav aids and you get rid of channel tabs, what do  
19 we need local notice to mariners for?

20 MR. NEWMAN: Good question. So if --  
21 if -- if we get rid of channel tabs, we update  
22 the dangers right away -- well, it's really for -

1 - to still support that mariner out there who is  
2 hand correcting his paper chart, if there's  
3 anybody out there still doing that. I -- you  
4 know. But that's why we write notice to  
5 mariners. And we spend a lot of time writing  
6 notice to mariners. That's a big part of our --  
7 our job and -- and it's a resource drain to  
8 identify notice to mariners and write them. But  
9 if we didn't -- you know, if we didn't have to  
10 write them, we would be able to spend a lot more  
11 time doing other -- other things like applying  
12 shoreline and hydrography and -- and so forth.

13 But it's really just to, you know,  
14 support that mariner that still has his paper  
15 chart and he looks at the local notices to  
16 mariners, or he goes on our website and looks at  
17 the chart updates and he actually hand corrects  
18 his chart.

19 MR. SIEGEL: I don't know if you meant  
20 just NOAA's notice to mariners, but you know,  
21 notice to mariners tells me when a bridge isn't  
22 opening. And so you know, Main Street Bridge in

1 Jacksonville that I just went through went from  
2 on-demand to opening every four hours. Trust me  
3 when I tell you, that makes a big difference.  
4 And we're one of the few people -- we read all 17  
5 districts every week and we -- we say we put the  
6 notice in notice to mariners. Because what we do  
7 is we go through the notice to mariners and find  
8 the places that are new that we don't have in our  
9 database already, and we put a hazard marker. Or  
10 we update the bridge that says when -- what the  
11 changes are.

12 We do that every single week and it is  
13 a huge job. I -- and by the way, every single  
14 district uses a different format. You know, I've  
15 begged the Coast Guard, give me --

16 RADM SMITH: You noticed that too,  
17 huh?

18 (Laughter.)

19 MR. SIEGEL: I begged them, give me one  
20 database so that we don't have to read -- most of  
21 them are in PDF format. They -- we can't even  
22 get the digital format to search on things. So I

1 think notice to mariners is going to be around  
2 for a long time.

3 RADM SMITH: Joyce?

4 VICE CHAIR MILLER: Yes, Jeff, you --  
5 an example of what I was going to ask you just  
6 talked about is, you know, that knowing what the  
7 sources are. You know, is it Army Corps, or is  
8 it NOAA? You know, how -- we were in -- we were  
9 in along the Intracoastal Waterway several years  
10 ago and there was -- there was incomplete  
11 understanding of who was responsible for what.  
12 How -- how many of your boaters do you think are  
13 really aware of, you know, the sources of data  
14 and -- and -- you know, the various Army Corps  
15 districts versus oh, the Coast Guard's  
16 responsible for this versus oh, NOAA makes those  
17 charts?

18 MR. SIEGEL: I'd say that the -- the  
19 vast majority have no idea. I mean, the vast  
20 majority, they're looking at a screen. I mean,  
21 this is -- we're not in -- we're not in the more  
22 responsible boater of the 1970s and 80s and 90s.

1 We're in the guy who -- and not to disparage  
2 anyone, but is in a -- a 40-foot Sea Ray that  
3 bought the boat last week and is looking at a  
4 screen and the screen is telling him where to go.  
5 And he thinks that that information is coming  
6 from God, you know, and he's going to follow it.

7           And it's -- it's what -- or, you know,  
8 just up until two seasons ago for five years the  
9 Intracoastal Waterway went across an island in --  
10 in -- in Georgia called Cumberland Dividings and  
11 -- and sadly on the sides of that in that area it  
12 -- there were temporary buoys. Which was -- if  
13 they were -- if they were fixed buoys it probably  
14 would have made a -- or, fixed marks it probably  
15 would have made a difference.

16           But they were temporary so -- so  
17 boaters would come across that and they'd see on  
18 their chart plotter that -- that the -- the buoys  
19 are taking me across this island on the chart  
20 because that's what the -- the NOAA chart had an  
21 island there. And it's the marshes of Georgia,  
22 if you see a figure, okay, I -- it looks like

1 water, but it's just underground. And I would  
2 say there were 100 boats a week that would say,  
3 the buoys must have been blown away. I'm going  
4 to go on the other side of the buoy where there's  
5 water. And they'd immediately go aground because  
6 you actually had to go over the island because  
7 that's where the deeper water is.

8 So they have no way of really  
9 understanding. And a lot of the navigation  
10 products have taken that ability to click on  
11 something and say where did that data even come  
12 from? They've taken that away from us, so we  
13 don't know.

14 You know, we try to get -- as much of  
15 that data as we can -- we use the -- we use the  
16 Army Corps of Engineers' soundings. We look at  
17 them. You know, the Wilmington District -- I'll  
18 tell you right now they -- the Wilmington North  
19 Carolina District is the best Army Corps of  
20 Engineers. They actually do almost every inlet  
21 every few months. And we get the PDFs and we  
22 translate that into stay to the green side here.

1                   And even for that, boaters have no  
2                   idea where it comes from. They -- they don't  
3                   even know what Army Corps of Engineers is. It  
4                   wouldn't even make sense to them that the Army is  
5                   involved in boating. So --

6                   MEMBER SHINGLEDECKER: Yes, Joyce, I  
7                   would echo that. It's something that I've said  
8                   for a number of meetings that, you know, asking a  
9                   boater to go to various Army Corps districts to  
10                  get the latest data and soundings for that area  
11                  is never going to happen. They -- you know, and  
12                  -- so the progress that I think we've seen in the  
13                  communications and the coordination with the  
14                  Corps over the last probably three years I think,  
15                  in terms of using eHydro it -- it has to happen  
16                  because otherwise the recreational boater is  
17                  never going to see that Army Corps data.

18                  Jeff, while I have the microphone,  
19                  question -- curious for you what your average age  
20                  of your active users are.

21                  MR. SIEGEL: That's a great question.  
22                  Well I'll tell you -- there's -- there's two



1 things. I want to -- I'll answer your question,  
2 but then I'll answer the question that I really  
3 want to answer.

4 (Laughter.)

5 MR. SIEGEL: Because there's some  
6 amazing data out of it. The -- the average age  
7 is retired. You know, without any question.  
8 That said, you know -- you know, we're in our  
9 tenth year. The -- the 65-year-old today is much  
10 different than the 65-year-old was when we  
11 started, you know, in 2007 when the first data  
12 went public.

13 You know the -- because they were 55  
14 back then and they couldn't get out of the  
15 computer era then. And so, you know, we -- we've  
16 seen our -- our user base grow incredibly.  
17 Here's the question I really want to say because  
18 it's -- it's a fascinating thing. We actually  
19 talked about it at dinner last night.

20 But, you know, one thing that we  
21 noticed too, in the recreational boating world,  
22 if you go to boating forums and even boating

1 groups on Facebook, it is a dominated male thing.  
2 There is 98 percent male contribution to  
3 CruisersForum.com, Sailnet.com, TrawlerForum.com.  
4 Ninety-eight percent male activity. We noticed  
5 in year one that more than 50 percent of our  
6 users are women. That's an incredible,  
7 interesting thing that I -- we're not 100 percent  
8 -- we think we know why, we're not 100 percent  
9 sure why. And we don't know what to do with  
10 that.

11 But there's a fascinating element to  
12 that that -- that I think could be used in a lot  
13 of ways. And I think that there's probably a --  
14 a female side to navigation that isn't being  
15 addressed by the typical navigation systems that  
16 boaters use.

17 MEMBER SHINGLEDECKER: Yes, I would  
18 say that I -- I was wondering if you would skew  
19 younger. But yes, the average age of the  
20 recreational boater in the U.S. is 55. And we've  
21 gotten ten years older in the last I think ten  
22 years. So --

1 (Laughter.)

2 MEMBER SHINGLEDECKER: No, no, sorry.  
3 That's not right. We've gotten -- we're aging  
4 six months every year. And so the -- the average  
5 age -- boaters are getting older, and as we look  
6 at the new generation that could come into  
7 boating, the amount of student debt is really  
8 holding them back from buying boats.

9 Where I tied it in -- and you warned  
10 me you'd be provocative in the -- in the  
11 presentation. I would say I'm not quite ready  
12 for NOAA to get out of recreational charting just  
13 yet. But it was interesting. The National  
14 Marine Manufacturers Association just released  
15 some first-time boat buying statistics and  
16 studies that they did. And they kind of broke  
17 boat buyers into different categories of people.

18 And one of those groups is kind of a  
19 -- something about technology and techies and  
20 guys that want the latest and greatest equipment.  
21 Usually very specific -- fishing or wakeboarding  
22 or -- and I would imagine very, very internet

1 savvy, app savvy with the latest gear. There is  
2 just as much another segment of boating that is a  
3 -- I go on my boat to escape nature and to unplug  
4 and to not be in front of my phone because that's  
5 where I am all the time.

6 So there -- it's a really diverse  
7 group of people. It is predominantly white male.  
8 Absolutely, right? But I think there's still a  
9 need for the products to be delivered in a  
10 variety of ways. That said, the ActiveCaptain is  
11 a fantastic product and it's really fun to see  
12 how we can work to incorporate that data more.

13 MR. HUMMEL: I'd like to make a  
14 comment just real quick about the -- the  
15 demographics of various users and, you know,  
16 NOAA falls under the Department of Commerce and  
17 in the United States 98 percent of international  
18 trade happens by sea. And the focus for NOAA and  
19 your mandate is to create charts for commercial  
20 users. None of the commercial users use the ICW,  
21 even though that's what it was sort of created  
22 for. It's used a little bit in the Gulf.

1           And so it's -- to me it's no surprise  
2           that there are inaccuracies. And it's because  
3           NOAA has been appropriately using your resources  
4           to address your mandate, which is commercial  
5           users. Our users, commercial users, find the  
6           charts to be very accurate, very up-to-date.  
7           Never really hear any complaints about the  
8           charts. But again, that's because you focused  
9           your energy on that particular user group and I  
10          think you've been very successful at addressing  
11          their needs.

12                 Now maybe NOAA needs to say, well the  
13          recreational boating market is worth x-dollars,  
14          and we should assign some number of resources.  
15          But I mean generally, I think it's just been  
16          ignored. But you know, I think the focus has  
17          been in the right area. Sorry Jeff.

18                 MR. SIEGEL: I agree with you.  
19          Although, you know, I -- I pass too many barges  
20          on the ICW to say that there's no commercial  
21          traffic. But yes, I -- I agree that, you know,  
22          the -- NOAA -- I'd hope that NOAA's spending more

1 time on Charleston Harbor than the Waccamaw  
2 River. You know, I mean that -- they -- the  
3 resources should be that. My whole point is that  
4 -- that the recreational boaters can take care of  
5 the Waccamaw River really, really well.

6 I mean there's 14,000 boaters that go  
7 from the New England, Chesapeake Bay down to the  
8 Florida Keys and back. You know, 28,000 passes a  
9 year. That's an enormous amount of data. Even  
10 if only 5 percent of them will collect the data,  
11 think of the surveying that will be done. You  
12 know, the -- the -- you know, think of that  
13 averaging again of what happens with crowdsourced  
14 information.

15 VICE CHAIR MILLER: A follow-up to  
16 that, though. I mean, most of the ICW -- I've  
17 sailed it, and most of the ICW is actually not  
18 NOAA data, it's Army Corps data. You know,  
19 there's -- there's very little that I'm aware of  
20 that NOAA has any responsibility for.

21 But I wanted to follow up on the woman  
22 -- what percentage of your users are -- are long-

1 term cruisers?

2 MR. SIEGEL: That's hard to get data  
3 on because a lot of people -- our primary user is  
4 someone who gets in their boat and goes to a  
5 place that they have never been before or are not  
6 used to going or is more than, you know, a couple  
7 days away from home. Those are the times you  
8 need -- if you're going -- if you're on the  
9 Chesapeake Bay and you're going from, you know,  
10 Annapolis to Rock Hall and it's something you've  
11 done 50 times, you -- certainly you don't need  
12 us.

13 So you know, it's really hard to know  
14 how many people are using it in that way. You  
15 know, because they -- people will go -- they'll  
16 charter a boat and they'll use it for two weeks.  
17 And so we can't really get really good  
18 information about that. Charters actually give -  
19 - they contribute a lot of information in the  
20 Caribbean especially.

21 You know, we get a lot -- we're also  
22 worldwide. That's another thing that you know

1       isn't -- these things are eking out. You know,  
2       we have users in Tasmania, which is kind of a  
3       cool thing, charting the hazards just like we do  
4       here. So it's easy to get geography. I can't --  
5       I can't really get -- I can't assume time and the  
6       time domain of when they're actually on their  
7       boat.

8                   VICE CHAIR MILLER: I was thinking  
9       that, you know, it -- having cruised for four  
10      years myself, it -- a lot of times you know  
11      internet things -- it -- I was thinking about  
12      your dichotomy of how many women. Is a lot of  
13      times the women were the ones on the weather  
14      reports or -- or, you know, that they keep the  
15      scheds and it may be that that's part of your  
16      demographic issue is that --

17                   MR. SIEGEL: Yes, I think -- you know,  
18      so many times we -- we pull into a marina and,  
19      you know, I say -- I tell my wife, there's four  
20      dock hands. Can you believe that? And we pull  
21      in, there's one dock hand. There's three women  
22      with their iPads having questions about



1 ActiveCaptain. And -- and what happens -- you  
2 know, so we get a chance to talk to a lot of  
3 people on how they're using it.

4 I think it -- I think that -- the --  
5 first the iPad has taken over in terms of the co-  
6 pilot chart plotter. That's without any  
7 question. And I think that the guys are still  
8 there driving the boat and -- and this is not  
9 meant to be sexist. This is going to come out a  
10 little bit sexist.

11 They're driving the boat and they're  
12 worried, you know, they're -- they're going to  
13 get to the right navigation. But the women  
14 finally have a tool that can say well, what is  
15 there to do once we get there? And that's what  
16 we do. And where do people think about going to  
17 that anchorage? And are there bugs in May?  
18 Because I just don't want any more bugs. You  
19 know?

20 And that -- that's -- those are the  
21 things that we do. You know? What chart says  
22 that there's bugs in, you know -- you know, off

1 Belle Haven, North Carolina in May? And yet,  
2 that's where they are. You know, and -- so you  
3 don't go there in May. And so I -- so -- it's  
4 more become that the women have more decided  
5 here's where we're going. And now it's the guys  
6 are just getting there. And I think it empowers  
7 them. And that's what I think they like about  
8 it.

9 RADM SMITH: Lindsay's been trying to  
10 get in here.

11 MEMBER GEE: Yes, I just -- we got to  
12 talk about this a bit on Thursday with the  
13 technology working group, but that's really for -  
14 - well, actually for all of the panel a couple of  
15 comments and questions. I think the standards  
16 are one thing, and you have to have them because  
17 you encourage navigation and all that. But it  
18 has held back then I think what we're seeing is  
19 the other -- the other group of users. And  
20 Travis kind of set up here because you are going  
21 -- you just want to talk about a charting plan  
22 and there's kind of survey, there's charting.

1           But in between that is -- as you're  
2           talking about with the internet, there's got to  
3           be this database of -- and multiple databases as  
4           information. So we see in the nanos all of the -  
5           - the various things that are integrated with  
6           that. But with those databases I wonder whether  
7           the future is, as Jeff's saying, with -- also  
8           regard that, I think if you take that kind of  
9           business approach when you do your business model  
10          and say, well, you know, what's my proposition?  
11          You've got your proposition, and who are my  
12          customers?

13                 But one of the other things is how do  
14                 you deliver to your customers? And I think what  
15                 Jeff is saying a little bit is that well, the  
16                 channel might be from the database to the --  
17                 through a third party, and there is no  
18                 recreational product. So I wouldn't say that  
19                 NOAA gets particularly out of -- my comment,  
20                 where I wouldn't see them getting out totally of  
21                 the -- the recreational boating, but you don't  
22                 deliver a product to recreational boaters.

1           I think that maybe is a way that --  
2           and because the standards and things with ECDIS  
3           if you like, it was the EC that was the important  
4           part of the electronic chart, but the display and  
5           the information side of it, I think is being kind  
6           of sadly neglected and held back. The kind of  
7           really move forward. So what -- one question  
8           with -- for Jeff, we talked about well if we --  
9           we're going on different sides of a channel and  
10          we see that all the time. Well what's to stop  
11          the iPad and handheld phone app, not for depth,  
12          but just for where boats go? Like a Waze of the  
13          -- of the -- sort of ICW, and that sort of thing?

14                 MR. SIEGEL: That's exactly what we do  
15                 today.

16                 MEMBER GEE: Right.

17                 MR. SIEGEL: We have about 900 hazards  
18                 on just the Intracoastal Waterway. And the  
19                 hazards are specific points that one or more  
20                 people have identified. And you click on that  
21                 and, you know, even though it says there's nine  
22                 feet there, so many times it says there's not

1 nine feet here. The shoal has come in from the  
2 west, you know, stay to the red side. Stay to  
3 the green side. And -- or -- and there will be  
4 specific things. People will give  
5 latitude/longitudes for where to go through a  
6 specific area.

7 And it's really funny -- what  
8 incredible happened just a couple of years ago to  
9 me, I was coming down North Carolina and I'm --  
10 in the ActiveCaptain world, I take care of every  
11 single hazard. And you know, it's -- it's --  
12 there's only two of us in the whole company.  
13 Which is another amazing thing. Resources are --  
14 are used really well in crowdsourcing. And  
15 there's two people in our company.

16 So I knew that dredging had happened  
17 and there was a hazard that said, you know, stay  
18 to the red side. And you know, we're going down  
19 in a -- we're going north in the -- in the spring  
20 and so you're naturally on the green side. And  
21 I'm watching two boats ahead of me. And the  
22 hazard had been removed because it had been

1 dredged. But you know, people don't necessarily  
2 update their ActiveCaptain data every day. And  
3 it was about a month old that -- this data.

4 And so I'm sitting there and I'm on  
5 the natural green side assuming that you -- the  
6 hazard said stay to the red. And I'm watching  
7 the two boats ahead of me all move over to the  
8 red side. Which is really funny, the hazard is  
9 gone. So you know, the -- I -- there's nothing  
10 that stops us from doing that. We're doing it  
11 today.

12 What's really needed is sort of a  
13 backdrop to make a standard for really  
14 disseminating it. I mean, we're going to always  
15 be the qualitative side of that and that's our  
16 business model. What -- what I think is needed  
17 is a quantitative side of that. And I think that  
18 that's about depth. And I think NOAA is -- NOAA  
19 through the IHO is the perfect place to have that  
20 done.

21 MEMBER GEE: Right. So -- so  
22 ActiveCaptain, but it's a -- it's an input you

1 take. You're not just tracking people as they go  
2 and just use -- like you said with Waze, that was  
3 based on speed and turns. You don't actively --  
4 you don't have a database of that. It's a --  
5 people enter hazards, and if they see an buoy out  
6 and -- is it that way? Or -- or both?

7 MR. SIEGEL: Well, we do -- we do  
8 track where people are too if they let us.

9 MEMBER GEE: Right.

10 MR. SIEGEL: If they say it's okay.

11 MEMBER GEE: Yes.

12 MR. SIEGEL: Because there again is  
13 the privacy issue. And then we have an app that  
14 you can see where all your friends are and where  
15 they're moving and you can message them and --  
16 so, I mean, there's that social element that --  
17 that's in our wheelhouse too. But we are -- we  
18 are tracking them. And we could easily feed back  
19 the depth data as well. You know, given a network  
20 where we're collecting depth, we could feed it  
21 back too.

22 I'd like to see -- I'd like to see a

1 lot of thought go into that database. I'll bet  
2 that there's not a privacy issue thought about in  
3 the database. I'd like to see things like, like  
4 course over ground and speed over ground and  
5 heading, if that's available to put in the  
6 database too. Because that will solve some of  
7 the other problems.

8 Much as Uri Levine saw, you know,  
9 collect at every intersection the direction that  
10 people turn. You know, you never know where that  
11 stuff is going to be used in the future. It is  
12 so easy to collect it today. Let's collect --  
13 let's make sure we are collecting all of the  
14 right data. And no one is better positioned in  
15 the United States to do that than NOAA.

16 MEMBER GEE: Right.

17 MR. SIEGEL: So I'd like to see them  
18 do it.

19 MEMBER GEE: Just one final comment,  
20 sorry. Shep, just regarding the -- I think this  
21 is regarding a particular user segment, which is  
22 the recreational boating. But it may be



1 something that's also applicable to other  
2 segments like the precise navigation. Maybe that  
3 is something that potentially is another type of  
4 product, and it is not just trying to adapt  
5 something that is already there. It becomes a  
6 separate product again that could be done by  
7 others if -- if it was --

8 MR. HUMMEL: I -- I'd like to --

9 MEMBER GEE: A framework to do that.

10 So --

11 MR. HUMMEL: I'd like to address that  
12 on how our commercial users handle this problem.  
13 About half of our customers are on the inland  
14 rivers. And the larger companies that we work  
15 with, for example American Commercial Lines, ACL,  
16 they actually have one person who manages all of  
17 their data. And when we originally started, they  
18 were one of our launch customers, we came up with  
19 a standard way of identifying a track file using  
20 a certain nomenclature.

21 It would say like you know, the  
22 segment of the river, line miles, what river

1 gauge was at what height, and that would just go  
2 into the file name for each file collected from  
3 each vessel. And so what they do is, as they're  
4 headed up the river, they want to use the  
5 straightest line through the river that they can  
6 at their depth. So maybe they are -- they are --  
7 the maximum depth that they have on their towboat  
8 is -- and tow, is 12 feet.

9           And so they'll call into the office  
10 and there is a guy there that all he does is  
11 handle these files -- ingoing and outgoing files.  
12 And they say give me all the files at Memphis at  
13 42 feet for river mile, you know, Upper  
14 Mississippi blah, blah, blah through blah, blah,  
15 blah. And then that -- that guy will just send  
16 out those track lines to the vessel. And the guy  
17 will sit there in the vessel and he'll look and  
18 see where every vessel with the same, you know,  
19 depth that he had traversed that area.

20           And so I mean the river is obviously  
21 -- it's changing all the time and depths is going  
22 up and down with the -- based on the flood state

1 and all that sort of stuff. And I mean our  
2 commercial users, you know, do that. But they've  
3 all implemented their own sort of way of doing  
4 that. And it's, you know, it's kind of a big --  
5 it is a big job. But it saves them so much money  
6 it's worth them having somebody in the office  
7 that just handles that one issue.

8           Similar situation with ICW. ICW is  
9 changing all the time. So there are commercial  
10 customers who are addressing that issue. But  
11 with regards to the internet connection, our  
12 software is set up for periodic internet access.  
13 So we -- we know that the vessels do not always  
14 have internet access. But more and more, every  
15 year they get more and more access. Most  
16 commercial vessels in the U.S. have internet  
17 access all the time and it's for two reasons.

18           One is they can't hire any crew  
19 members unless they have internet access. No 20-  
20 year-old wants to go work on a towboat and not be  
21 able to FaceTime his girlfriend or whatever. I  
22 mean, it's just the reality of today. All these

1 companies have, you know, high bandwidth  
2 connections. And so we've designed our software,  
3 though, for the spectrum of periodic access to  
4 access all the time. And chart updates and all  
5 that sort of stuff, there's one button that you  
6 push. It synchronizes everything. Notice to  
7 mariners, light list, you know all those -- all  
8 those things.

9 We have a new product we just rolled  
10 out which gives the corporate view -- a view of  
11 their entire fleet and they can look and see what  
12 every vessel -- the status of that vessel in  
13 terms of are those charts up-to-date on that  
14 vessel? Because the guys in the office, they're  
15 always wondering like, well did that vessel  
16 update their charts? Are they operating on the  
17 latest charts? Because if they run into  
18 something, that's going to be the first question  
19 someone asks. Did you have up-to-date charts?

20 So and I think the future is that all  
21 vessels will be connected to the internet all the  
22 time. There's a local company here -- or, SpaceX

1 is developing a new network of satellites that  
2 will allow -- you know, inexpensive internet  
3 worldwide. And when things like that, you know,  
4 exist -- I mean, I think the chart of the future  
5 has to anticipate the fact that everyone will 99  
6 percent of the time be connected.

7 CHAIR HANSON: Can we go ahead and  
8 take some questions from the audience? Sorry --

9 (Simultaneous speaking.)

10 MS. MERSFELDER-LEWIS: I have to ask  
11 Jeff if you could repeat your -- you explained  
12 about the two categories and the content of the  
13 500 comments you got back. The audio went out  
14 and so people on the webinar did not hear it. So  
15 if you could speak a little bit more closely into  
16 your mic.

17 MR. SIEGEL: Sure. Okay, the two  
18 categories were a small group of 50 people asked  
19 for specific charts to be fixed generally where  
20 they lived. And it was more -- it was kind of  
21 me, me, me. And then 450 people basically said  
22 we want to collect up depth data and be able to

1 see where the person in front of me or -- a lot  
2 of people said that. They want to be able to  
3 see, you know, who just went through that cut?  
4 You know, let me see their data. Or collect it  
5 up and let me put it all together and give me a -  
6 - give me a chart based on what the real data is  
7 over the last week or month or -- you know, how  
8 it's changing. Those -- and four -- that was a -  
9 - the bulk, 450 people asked that.

10 RADM SMITH: Actually we -- I'm sorry,  
11 Jan's been trying to get in for a few minutes  
12 here.

13 DR. NEWTON: Oh, no I just wanted to  
14 respond to the gentleman who just left the room's  
15 question. So -- so --

16 Laughter.)

17 DR. NEWTON: So maybe I will wait till  
18 he comes back.

19 RADM SMITH: You want to -- you want to  
20 wait till he comes back?

21 DR. NEWTON: Yes, sure. Go ahead,  
22 sir.

1                   CAPT. BRENNAN: I'll -- this is Rick  
2 Brennan. I'll have one for Jan. I'm curious if  
3 you could talk about how -- how the information  
4 that you're gathering from your stakeholders, do  
5 you have a method for paying that -- or getting  
6 that back to the -- all the various data creators  
7 that -- for which you get -- get the -- you know,  
8 that you're assimilating that data and how you  
9 feed that back to them. Because you're -- you're  
10 the -- you're on the front lines of actually  
11 touching the users with that. And just curious  
12 how that information gets fed back to the  
13 creators or the gatherers of data.

14                   DR. NEWTON: Yes, well that's --  
15 that's an interesting question. I think the main  
16 thing is that what we focus on is looking at  
17 available data sets that are sustained. And --  
18 and so some of these, as I mentioned, are  
19 federal. Some of the -- so, I showed you the  
20 NANOOS Portal. We use IOOS dollars to support  
21 maybe 19 of the observing data streams, but we  
22 serve over 190. So there's an order of magnitude

1 difference there.

2           And so who are the data providers? As  
3 I said, you know, NOAA, we have USGS stream  
4 gauges, we have a lot of different providers.  
5 And so what we really trying to focus on is that  
6 integration, and then also on making products  
7 that -- that would be useful. So we talk about  
8 users, well what we want to do is be useful. And  
9 so I think one of the things that -- that we  
10 heard from -- we hear from our users a lot is  
11 like, okay, well so if I want to know buoy  
12 conditions, I go to NDBC. If I want to know  
13 forecasts I go here. If I want to know this I go  
14 there.

15           And -- and so what we've really  
16 focused on is trying to integrate those data  
17 streams into something that will be useful. And  
18 so your question is are we then taking that back  
19 to the -- to the actual data providers?  
20 Certainly, if it's a forecast model and people  
21 are saying like, oh, the granularity isn't --  
22 isn't small enough or -- or whatever. We would -



1 - we would send that back. But because we are  
2 part of -- of NOAA through that US IOOS Office,  
3 we can get feedback.

4 We interact a lot with Rich and his  
5 group, with Andy BC Group and that sort of thing.  
6 We just had a -- a large effort to define what  
7 coastal moorings -- a national strategy for  
8 coastal moorings. And you know, the NDBC buoys  
9 have surface met and temperature, but there's no  
10 salinity. We could add salinity, and that could  
11 go a long way for circulation model optimization.

12 And so -- so yes, I -- there is that  
13 -- that two-way sort of street, and I don't think  
14 there's anything terribly formal, but it is very  
15 much a two-way street. And so now that -- the  
16 gentleman --

17 RADM SMITH: Yes, Lindsay's back.

18 DR. NEWTON: Yes, Lindsay, I wanted to  
19 just reply to your question. And two things that  
20 I want to emphasize to this group and it was sort  
21 of led in by your question is I think that we  
22 shouldn't underestimate the power of public-

1 private partnerships. Because I think what we  
2 really want, is we want things that will be  
3 consistent, that aren't going to go away. But we  
4 also want innovation.

5           And that's what excited me so much  
6 when the founding people for IOOS came up with  
7 this idea to have these -- these partnerships.  
8 And so I think integrating the best of both of  
9 those systems is -- is really a powerful way to  
10 go. And that's what I think we try to do through  
11 the IOOS system is be that integrator so that we  
12 can take advantage of innovation, whether it's  
13 the people behind the electrons you saw up there  
14 in those NANOOS portal screenshots or -- or new  
15 things.

16           And we link to a lot of information.  
17 So for instance, we could link to ActiveCaptain  
18 from our website so we have like, resources where  
19 people can go to that. And so that brings me to  
20 the second point which is it's all about  
21 discovery. Right? So IOOS doesn't -- or, NANOOS  
22 doesn't want to be the only place where people

1 can find, you know these -- these sorts of  
2 resources.

3 It's great to see all the different  
4 offices having those websites, having different  
5 apps, having the innovation. And all of that I  
6 think is what we really need to do is maximize  
7 discovery. So I think that's -- that's another  
8 part of what we're -- we're trying to do is to  
9 better illuminate these -- these data sets, and  
10 we want to do that in the way that's most useful  
11 to the -- to the citizenry. Thank you.

12 CHAIR HANSON: Since we've been  
13 talking about the cloud all afternoon, should we  
14 see if we have any questions from the cloud?

15 MS. MERSFELDER-LEWIS: We have no  
16 questions.

17 CHAIR HANSON: Oh, we do have one  
18 question. Okay. From a nearby cloud, I guess.

19 MR. DEBOW: Yes, this is for Jeff  
20 Siegel. You've read the National Charting Plan  
21 and on page 27 it says the reduction or  
22 elimination of all Raster Chart coverage seems

1 very likely as the use of the ENC's and ECS's  
2 increase. I'd like to know your comment on that.

3 MR. SIEGEL: Yes, RNC's are basically  
4 just paper charts for the most part. So, you  
5 know, they don't allow the overlay of data. You  
6 know, what I'm seeing for -- I don't mind seeing  
7 RNC's go away. So that -- that just seems  
8 natural. What I'd like to see is ENC's that have  
9 sort of more data layers to them than I think  
10 that is being planned. It would be fine to me if  
11 there -- if you could turn off the -- the  
12 contours and turn on a crowd layer for instance.  
13 And I don't see a facility for doing something  
14 like that.

15 But RNC's, I actually like them in my  
16 own pilot house. But for a -- a data model  
17 moving forward they are -- they're paper charts  
18 and I think they are too static.

19 MR. DEBOW: Okay, thank you. And Jeff  
20 Hummel, from Rose Point, I'd like you to put in a  
21 plug for yourself on what you've done to work  
22 with us on collecting crowdsource data.

1                   MR. HUMMEL: I'm sorry, on collecting  
2                   outsource data?

3                   MR. DEBOW: Crowdsorce.

4                   (Pause.)

5                   (Simultaneous speaking.)

6                   MR. DEBOW: -- figure out a way to do  
7                   that.

8                   MR. HUMMEL: Yes. No, okay. So I'm  
9                   just drawing a blank on that. So the thing --  
10                  that's funny about that project because one of  
11                  our developers did that and really no one in the  
12                  office knew it was going on.

13                  (Laughter.)

14                  MR. HUMMEL: And I think I -- I think  
15                  the first time I heard about it was like in a  
16                  press release. And I'm like -- I had to go into  
17                  an office and say are we really doing this? And  
18                  he's like, yes. So --

19                  So the thing is that -- the one thing  
20                  about that project is that the end-user  
21                  perception of the project is different from what  
22                  it actually is. The idea is that NOAA is

1 collecting data on -- excuse me. Our customers  
2 are sending in input and the customers think that  
3 input is going to directly change the chart. But  
4 in reality what's happening is NOAA is using that  
5 information to say well, this area is under-  
6 surveyed.

7 And so, you know, our users would love  
8 to participate in more things where they can  
9 contribute, you know, data to the charts. And I  
10 think that, you know, in the future -- you know,  
11 essentially it's free information coming in. And  
12 if -- you know, what Jeff is saying is true, you  
13 get a hundred users saying something, you know,  
14 you're going to be very, very accurate. You're  
15 going to have a three-percent, you know, margin  
16 of error.

17 So I don't know that there's been that  
18 much input provided to you guys through our --  
19 our system. Yes.

20 MR. DEBOW: Like 50.

21 MR. HUMMEL: Yes, that's not too  
22 surprising to me. But I think that --

1                   RADM SMITH: Can I -- can I comment?

2                   MR. HUMMEL: Yes.

3                   RADM SMITH: Because like I think this  
4 is a great thing. I'm conscious of the break  
5 here coming up. But basically IHO put this  
6 database together with NOAA sort -- you know,  
7 NOAA funding and -- and sort of put it out there.  
8 Rose Point, as usual, bit early and provided  
9 this, you know, interface.

10                   People like Jeff and a few other  
11 people found it in the deep, you know, beta  
12 section and turned it on. And that's been all  
13 the out -- that's been all the outreach we've  
14 done because we just wanted to see whether it  
15 would work.

16                   MR. HUMMEL: Right.

17                   RADM SMITH: So for now we're doing  
18 nothing with it. You gave us too much credit.  
19 And because -- because it is really just, you  
20 know, bringing it in, figuring out what the  
21 issues are, getting the -- getting the databasing  
22 right, getting the metadata right before we -- we

1 don't want to announce it and go -- go big with  
2 it until it works. So we're really at that -- at  
3 that early stage. So --

4 MR. HUMMEL: I think -- in order for  
5 that successful it needs to address, you know,  
6 general chart plotters, iPad applications. I  
7 mean the -- you know, we make PC-based software  
8 for recreational users and commercial users. And  
9 our recreational users tend to be the very  
10 serious boaters. The -- you know, the 100,000  
11 people or so that are doing real navigation. But  
12 the -- the real crowds are using an iPad or an  
13 iPhone or a whatever.

14 And I think once that spreads to that  
15 bigger base of users -- and just like in some  
16 cities you can hit 511 on your phone or whatever  
17 and report a pothole or whatever. I mean, it's  
18 got to be that easy where they know, it's like  
19 hey if I report something, this -- you know, and  
20 I've got five different ways of doing it. I  
21 think once that becomes more convenient, I think  
22 that you will see a lot more people contributing



1 to it.

2 RADM SMITH: We haven't heard from  
3 Carol yet. Oh, I'm sorry --

4 MEMBER LOCKHART: Did Rick want to  
5 continue the conversation before I butt in?  
6 Because I'm going to ask about something  
7 different so -- okay. I guess I have a couple of  
8 just more fundamental questions since you guys  
9 are all talking about charting specifically. I  
10 think what's interesting to me is that we're  
11 still talking about contours and soundings even  
12 with electronics charts. And I find that  
13 fascinating because obviously in a lot of places  
14 now we have a lot more information than just  
15 contours and soundings. And I understand that --  
16 that in an ENC obviously you can develop those on  
17 the fly if you have the underlying data.

18 But I'm kind of curious why -- as we  
19 look at the chart of the future, why we're not  
20 talking about maybe displaying more than just  
21 contour and sounding because you get a lot of  
22 information from that full information grid or

1 dem or -- or whatever it may be. It's a lot more  
2 obvious where rocky areas are, for example. It  
3 may be a lot more obvious.

4 And it's a lot more intuitive for  
5 people and recreational boaters to look at that  
6 than look at necessarily a contour or a sounding.  
7 And the other question -- so I guess, one  
8 question is, is anybody looking at that? I  
9 realize there's probably drawbacks to it because  
10 of data size and things like that. But I'm  
11 curious just to know if anybody's looking at  
12 that.

13 And then the other thing I'm curious  
14 to know if anybody's thinking about -- or even if  
15 it's something that people consider useful, is we  
16 are still talking about 2D, albeit with a time  
17 component. Is anybody looking at the chart of  
18 the future being in -- in 3D and is that even a  
19 useful thing?

20 MR. HUMMEL: I'd love to comment about  
21 3D. So when I worked at Nobeltec one of the  
22 owners of the company, the person that lived next

1 to him worked for Intel. And he worked in the  
2 gaming division of Intel. And he had come up  
3 with this incredible 3D engine. And because they  
4 were neighbors, they would talk. And that's how  
5 Nobeltec ended up with a 3D product -- because of  
6 this strange connection. It wasn't because of  
7 user input said hey, we want 3D.

8           So I was completely against adding 3D.  
9 I mean, my hobby is hunting for shipwrecks. I'm  
10 interested in the bottom. But we've done some  
11 studies on the data to see how accurate it  
12 actually was, and it wasn't accurate enough to --  
13 to properly depict the bottom. So I go to boat  
14 shows now and I mock all of the people who have  
15 3D because it's ridiculous. It's not accurate  
16 enough. It's not useful. As a mariner you can't  
17 do anything with it.

18           You know, a chart -- electronic chart  
19 is a tool for navigating. And it has very  
20 specific language that it speaks to a mariner and  
21 3D is not their language. Even the commercial  
22 fisherman, when I talk to them, some of the data

1 might be useful to that limited set of people,  
2 but again what I find is generally the data is  
3 not precise enough.

4 Now, multibeam, if you could have  
5 multibeam for everywhere, that might appeal to a  
6 certain number of people. But I personally think  
7 that 3D has no place in navigation. And I base  
8 that on, you know, being a navigator myself. But  
9 also just looking at shows and seeing how it's  
10 portrayed to end users and all this sort of  
11 thing. And I just -- it has nothing to do with  
12 navigation.

13 Now it may be useful for a chart --  
14 for a pretty picture to look at. What I tell  
15 people is 3D navigation is for showing your  
16 friends who don't boat what you do when you're  
17 boating. And you have a cocktail and you say oh,  
18 this is what we use. But in reality, you never  
19 use it. So, I don't know. Diane?

20 (Laughter.)

21 PARTICIPANT: This corner has really  
22 unloaded on that question.

1 (Laughter.)

2 MEMBER GEE: I think sometimes when  
3 people talk about using 3D for navigation I think  
4 it's talking too generally about how you might  
5 use that. If we take the specific example for  
6 fisherman, I find that hard to believe. We were  
7 involved -- Larry was involved and I'm the side  
8 of it -- I was involved with a company in -- up  
9 in Canada that was Clearwater Fisheries who  
10 actually bought a multibeam and mapped the whole  
11 area up in that. And basically use it now to  
12 kind of farm the -- the area in scallops. So  
13 that's a specific use of that.

14 MR. HUMMEL: I agree on that one.

15 MEMBER GEE: And I -- but I think it's  
16 unless you -- until that -- the skipper and the  
17 lead in that project saw the multibeam data it  
18 wasn't a pretty picture to him. That was the  
19 seabed to him. He was not interested in  
20 navigation at that stage. He was interested in  
21 dragging his rakes around the -- the thing.

22 And again I think well, the other

1 thing is we think of it just -- just for  
2 navigation. But part of navigation is if  
3 anybody's ever been in a bridge simulator, it's  
4 kind of that as the beginning of part of  
5 navigation. You're training people to navigate  
6 and it's a virtual reality.

7 And I think there's a number of areas  
8 here of what we've been talking about is -- is  
9 not taking on the technology that's -- that is  
10 available. And I think it's partly standards,  
11 partly conservative attitudes to -- to that by  
12 always hiding behind the -- this is for, you  
13 know, safety of navigation and those sort of  
14 things. So I think there's a -- a whole range of  
15 -- of steps forward that we don't make because  
16 we're kind of scared to or we're not willing to -  
17 - to take them. But I'll leave -- I think Larry  
18 may have a comment as well. So --

19 (Laughter.)

20 DR. MAYER: Actually, I'd like to just  
21 save my comments -- save my comments till  
22 Thursday when I'll make a presentation that will

1 -- will discuss exactly this issue. Is there a  
2 place for 3D or not? And I -- I tend to agree  
3 with Lindsay that I think we've grown accustomed to  
4 the constraints we've had and built a mindset  
5 that says this is the best we can do. And I  
6 think we just haven't been open -- open-minded  
7 enough.

8           You know, if God wanted us to see in  
9 2D, we'd have one eye. I mean, we've evolved to  
10 experience the world in 3 dimensions. And I  
11 think the more intuitive we can make a chart for  
12 particular purposes -- again, it's got to be for  
13 the purpose -- the safer things will be. But we  
14 -- we can talk about that on Thursday. And I --

15           PARTICIPANT: I'd like to address that  
16 too.

17           MEMBER SAADE: I'd just like to add  
18 that if your statement was true, then Google maps  
19 without imagery would be a lot more powerful tool  
20 than Google maps with the imagery. And that's  
21 not the case.

22           MR. HUMMEL: The thing is that as it

1 relates to navigation, 3D is a complete  
2 distraction. And again this is based on me  
3 watching people use -- recreational boaters using  
4 3D. I think the commercial fisherman and -- and  
5 there's certain applications -- if the data is  
6 accurate for knowing, you know, if your vessel is  
7 going to be able to fit in some channel or  
8 something like that. But then you're really  
9 relying on the accuracy of that data.

10 But for the -- for the general  
11 recreational boater, 3D has no role. If they're  
12 fishing, different story. But in terms of  
13 navigation -- now, if you decide that the -- the  
14 chart of the future is going to be a data set for  
15 all different types of users, environmentalists,  
16 people who are interested in pollution, or just  
17 whatever and they really want to know what the  
18 bottom looks like then yes, that chart should  
19 include that. But as a presentation to an end  
20 user telling them they're supposed to navigate on  
21 3D it -- it just doesn't work. So --

22 MEMBER GEE: I think -- that's the



1 problem, I think we're talking about the chart of  
2 the future because I don't think we're talking  
3 about a chart -- one chart. We're talking about  
4 a database that can deliver a variety of  
5 products. And if we look at the -- what was the  
6 governor's representative this morning, I think  
7 this list he had of the sectors was really a  
8 great list to say well, all of these people  
9 really need something different in each of those  
10 sectors, but what we end up, I think, talking  
11 about is kind of like the chart plan and  
12 navigation on a chart. Whereas, I think part of  
13 the future is the database and how you deliver  
14 new products.

15 DR. MAYER: And if I could add to  
16 that, you know, I think Lindsay is exactly right  
17 that what we envision as the chart of the future  
18 is something that you create on demand for your  
19 need. So should you -- should you feel more  
20 comfortable looking at it in 2D, it's a 2D  
21 display. But for those applications and -- and  
22 for those who feel more comfortable interacting

1 in 3D, it's a 3D display. That -- you know, that  
2 -- and again I'll talk about this on Thursday a  
3 little.

4 DR. NEWTON: I'll just add one thing  
5 really quickly. Not for our intention for  
6 navigation, but our intention to show the world  
7 the coastal ocean, we do have many sub-surface  
8 observations -- including the sea gliders that  
9 somebody was showing earlier this morning -- as  
10 well as -- I know that Parker MacCready will be  
11 here talking to you this morning, so his  
12 hydrographic model has depth.

13 And so you have the chance on NVS to  
14 query what depth level you want to be looking at.  
15 If you want to look 20 meters under the surface,  
16 you can do that -- 100 meters, whatever. And so  
17 there is that ability to see depth. But that is  
18 different than 3D per se.

19 DR. MAYER: 3D is passe, we're looking  
20 to 4D.

21 DR. NEWTON: Right, 4D is where you  
22 need it.

1                   RADM SMITH: I think we're running  
2 close on time here, but is there anyone online  
3 that hasn't -- that's been trying to get through?  
4 Lynne? Nobody online? Rick? Captain Brennan?

5                   CAPT. BRENNAN: So first I think there  
6 may be -- you may be arguing from the same side.  
7 If I understand what Jeff is talking about in  
8 having looked at some of the 3D displays, I don't  
9 think we're -- I mean, if I know Larry in this  
10 group over here, I think they're -- you know, I  
11 think they are thinking probably much more in 3D  
12 data and the -- the value that the 3D data brings  
13 to the table.

14                   And certainly knowing where Jeff is  
15 coming from, seeing some of the 3D displays of  
16 how they've been implemented to the mariner, you  
17 know, and as a mariner I would agree that they  
18 are -- they are not optimal for making tactical  
19 and strategic decisions from a navigational  
20 standpoint. They are -- they are interesting  
21 from a gaming perspective, but they are not --  
22 they are really not designed to give you course

1 following or, you know, or making maneuvering  
2 decisions very well. And so I think they are --  
3 they've got a lot of gee whiz value, but they are  
4 not answering a navigational question for you.

5 But that -- that said, one question I  
6 have, particularly for Jeff, is right now the S-  
7 100 standards are -- have not solidified yet.  
8 The IHO S-100 standards have not solidified. We  
9 had a S-102 which is a gridded bathymetry  
10 standard that went out. It got out to the  
11 industry and industry flatly refused it, said  
12 it's not -- it's not a viable format right now.

13 So my question for you is, for us as  
14 the hydrographic office, how do we better engage  
15 with -- with the vendors? Because we -- you  
16 know, we can come up with standards all day long  
17 and then they get to you, the software vendors,  
18 and they are -- they are un-executable, you know,  
19 for a number of reasons. And so, you know, we  
20 used to have control over the display and the  
21 content and everything when it was a paper chart,  
22 right?

1           Now, how we disseminate the data, the  
2 size of the file that we disseminate, what's in  
3 it, the meta data, the content, the form and  
4 shape of it, how it gets displayed -- I think now  
5 we're seeing, particularly with S-100, there are  
6 elements in there that can help us better control  
7 the display of it so it doesn't look like the  
8 nasty old S-52 display, you know, that we see in  
9 ECDIS's today. So I think that there is a real  
10 ripe opportunity for us, the US Hydrographic  
11 Office, to push technology forward in the IHO,  
12 but we really need to do it hand-in-hand with  
13 vendors like yourself. So how do we do that  
14 better?

15           MR. HUMMEL: I think the best way to  
16 do it is through commissioning of an NRC, you  
17 know, committee to study it and have people  
18 involved from the primary -- you know, larger  
19 manufacturers from Garmin to whoever, to people  
20 from -- you know, from various parts of NOAA and  
21 basically all come together and basically look at  
22 a roadmap. Now, I don't know if that roadmap is

1 for 10 years or how many ever years. And sort  
2 through those details in something that comes to  
3 a conclusion, which is a report.

4 Like I said, if you go back and look  
5 at that 1994 NRC report, it is absolutely  
6 remarkable how correct it actually was. And I  
7 think that that process should be followed again,  
8 and it needs to involve, you know, different  
9 people from different constituencies. Of the  
10 people in the original NRC report, Henry Marx  
11 from Landfall Navigation -- which is somebody  
12 that I know, you know that sort of expert in  
13 navigation -- and there were a couple other  
14 people in there that, you know, I have met over  
15 the years who are continue to stay -- Stan Honey  
16 is another example.

17 So, you know, bringing again people  
18 like that -- again to look at the future. I  
19 think that is the way to do it. And then come to  
20 a very concise report. It's only like 30 pages.  
21 And I think that is the process that should be  
22 followed.

1                   RADM SMITH: Mr. Chairman?

2                   CHAIR HANSON: All right. Well, first  
3 off I want to say thank you to the panel. That's  
4 exactly the type of discussion we've been looking  
5 for. You guys make a chart presentation, tell us  
6 what's on your mind, challenge us a little -- a  
7 lot -- and then listen to the guys and gals talk.  
8 And so you've gotten most of the panel to engage  
9 and I think you for that. So again, let's give  
10 the panel a round of applause.

11                   (Applause.)

12                   CHAIR HANSON: And I think we're going  
13 to take a break. If we can do it in ten minutes  
14 it would be great.

15                   (Whereupon, the above-entitled matter  
16 went off the record at 4:09 p.m. and resumed at  
17 4:22 p.m.)

18                   CHAIR HANSON: All right. No need to  
19 introduce the admiral forever known as Admiral  
20 Underlap.

21                   (Laughter.)

22                   RADM SMITH: So the -- sorry? Pull it

1 closer or Lynne will get yelled at on the -- so  
2 this was an issue that I think we -- we first  
3 raised in these terms at the last meeting. And I  
4 will -- I will do a quick update about what the -  
5 - what the problem is and then just a little bit  
6 of a state of play. But the reason I didn't jump  
7 in this morning with the Army Corps story was  
8 because we were going to be talking about it this  
9 afternoon.

10 So the problem as -- as we -- as we  
11 phrased it last meeting was that many areas with  
12 critical under keel clearance for large ships are  
13 not being surveyed to object detection standards  
14 regularly. There have been a few high-profile  
15 accidents such as the Athos oil spill for -- does  
16 everyone know what the Athos was? It was a while  
17 ago now, but it was a major oil spill. It was  
18 the second-largest oil spill ever before Exxon-  
19 Valdez. And -- I mean before the Deepwater  
20 Horizon.

21 And -- and you know, oiled a huge  
22 section of Delaware Bay. It was caused by a -- a



1        tanker hitting an uncharted derelict anchor that  
2        was -- that was in an area with very little  
3        clearance underneath the tanker. It was on their  
4        way to the berth. Nothing unusual about their  
5        passage, they just hit this -- they hit a couple  
6        things. But -- but the anchor was the thing that  
7        holed the -- that holed the ship.

8                    And so this really -- the -- the court  
9        ruling came out about it last summer. And part  
10       of the ruling did acknowledge that the Federal  
11       Government did have a responsibility for -- for  
12       surveying safe passage in federal -- federal  
13       waterways and designated anchorages and other  
14       coastal areas. And so the -- the liability on  
15       the -- on the shipping company that had chartered  
16       the vessel was cut in half as a result.

17                    So in the end this ended up costing  
18       the Federal Government -- it's under appeal, but  
19       it cost the government -- Federal Government \$80  
20       million. So that is -- that is a -- you know,  
21       that's a -- we can do a lot of surveys for \$80  
22       million. And the -- the amount of environmental

1 damage and economic disruption from that incident  
2 can't be -- can't be put back.

3 But I -- you know, since then I've  
4 been talking about this a lot in a lot of  
5 different parts of the country and almost  
6 everywhere we go, somebody says oh, yes, you  
7 know, this just -- you know, a few weeks ago this  
8 -- blah, blah, blah -- we hit this -- you know,  
9 so -- it's come -- it's been very clear to me  
10 that there are -- this is not actually a very  
11 unusual circumstance and that -- and that  
12 elisions, that is the -- a ship hitting something  
13 that's stationary, bottom touches and other near  
14 misses are actually pretty common and are really  
15 very under-reported. Many of the -- many of the  
16 parties involved do not have an interest in -- in  
17 talking about it, right?

18 The port doesn't want to make the port  
19 look like it's unsafe. The Army Corps doesn't  
20 want to admit something was in the channel. The  
21 pilot doesn't want to admit that -- that they hit  
22 something, because that could endanger their

1 license. You know, nobody really wants to talk  
2 about it. And so somebody scurries out there and  
3 pulls the thing out of the water and -- and --  
4 and then everything carries on.

5 But really, every obstruction in one  
6 of these areas where it's an under keel clearance  
7 area is a major near miss that we should be --  
8 that we should be very concerned about even if  
9 nothing hit it. And -- and -- and the fact that  
10 we hit them periodically and don't hole the ship  
11 is just luck. So, you know, when we dig into  
12 this a little bit further, the -- you know, the  
13 types of surveys that -- that NOAA does typically  
14 with digital sidescan or really high resolution  
15 multibeam processed very carefully to avoid  
16 deleting any small things off the sea floor --  
17 you know, we typically do not survey in the  
18 channels because that is sort of Army Corps  
19 territory, right?

20 They survey much more frequently than  
21 we could ever do. They are very attuned to the  
22 dredging cycles. And -- and -- and they are --

1 and they are typically right there. But the Army  
2 Corps's typical, you know, survey -- they just  
3 say that it's varied variables. Anyone from the  
4 Army Corps here? I'm happy for the Army Corps to  
5 be -- is -- she left? Bummer.

6 So I'd be happy to have my -- I think  
7 my characterizations are fair, but I'd be happy  
8 to have them corrected. It varies a lot from --  
9 from -- you know, high resolution, multibeam  
10 surveys processed in a variety of ways to, you  
11 know, pretty core single-beam surveys also  
12 processed in a variety of ways. And those -- any  
13 of the hydrographers in the room will appreciate  
14 the fact that just because you ensonify the sea  
15 floor with a multibeam doesn't necessarily mean  
16 that you have processed it in such a way that  
17 would preserve the knowledge of a -- of a small  
18 feature such as an anchor on the sea floor. It's  
19 very easy to edit those out or to choose a  
20 sounding set in a way that doesn't honor those --  
21 those features.

22 And so, you know, I've talked a lot to

1 the Army Corps about this at the -- at the very  
2 high levels and, you know, they've been pretty  
3 clear that their survey program is to support  
4 dredging and the maintenance of the channel, it's  
5 not for object detection and it's not -- not even  
6 necessarily to support navigation. Although it  
7 is very clear that that is the standard practice  
8 in the U.S. for the Army Corps surveys to be  
9 used, you know, directly for navigation by large  
10 ships entering ports.

11 And -- and so that's sort of where we  
12 are. And, you know, the -- the basic upshot is  
13 we're not doing anything differently today than -  
14 - than on the day of the Athos grounding or  
15 elision incident. Little bit more -- so -- so  
16 since then we have been working on -- we have  
17 been working to sort of get the word out and to  
18 work on trying to fill this underlap. This is in  
19 the last six months or so.

20 So we have been engaged with, you know  
21 -- through various conferences and meetings with  
22 ports, pilots, shipping concerns and -- in both

1 private and in public venues. And so we have  
2 been trying to at least be open and truthful with  
3 the public about the way this -- about the state  
4 of this -- of the situation. And we have changed  
5 our charting practice. For the real charting  
6 geeks in the room, there is a -- there is this  
7 attribute of an area on an ENC and in chart  
8 source diagrams which categorizes sort of what  
9 kind of a survey was done. Was it an -- was it  
10 an object detection survey or -- or an -- simply  
11 an accurate bathymetry survey?

12           And that distinction goes all the way  
13 back to various IHO standards that are -- that  
14 are designed specifically for finding small  
15 features. At the same time I have been having --  
16 on various levels we have been having ongoing  
17 discussions with the Army Corps at the sort of  
18 flag level plus a few levels down where they are  
19 more engaged in these things. And we are -- you  
20 know, I think they have -- you know, through -- I  
21 think it -- it takes a little while because it  
22 sounds on the surface when we talk about quality

1 of surveys and how these aren't up to standard,  
2 it sounds like we think that they are doing a bad  
3 job.

4 And in fact, that is not the case at  
5 all. It is just that they are doing a different  
6 job. And to sort of, you know, that fine  
7 distinction is sometimes lost. But I think we  
8 have -- you know, we are having the conversation  
9 in a way that is not offensive to the Army Corps.  
10 But we do need to, you know, keep being clear  
11 about this.

12 And we have -- as you noticed when we  
13 talked about the requirements for surveying going  
14 forward, we did talk about, you know, managing  
15 under keel clearance. You know, continuing to  
16 survey for under keel clearance areas, and that  
17 includes channels and anchorages as well as some  
18 approaches.

19 This is a growing concern in the  
20 maritime industry about this. You know, I would  
21 -- a few years ago if I had said CATZOC there  
22 would not have been anyone outside of the really,

1 really dorky cartographers that would even know  
2 what I was talking about. But it's -- that's not  
3 necessarily the case anymore. The Army Corps got  
4 sent a -- it got a letter from Intertanko that we  
5 were copied on that -- requesting clarification  
6 about what is the -- what is the CATZOC of Army  
7 Corps surveys?

8           For many years, basically since the  
9 beginning of ENCs, we had characterized them as  
10 unassessed, which is what we did for our own  
11 surveys for many years too until we got the  
12 ability to get them assessed. And then out of  
13 sort of professional courtesy, and because the  
14 Army Corps wasn't categorizing things in the same  
15 way, we just left them unassessed. So, you know,  
16 in this -- in this example here which I think is  
17 Tacoma, you can see there is a fairly recent NOAA  
18 survey there with a ridiculous portrayal of the  
19 stars and the triangle thing is a -- is a quality  
20 indicator portrayal which is terrible which is  
21 why everybody turns it off.

22           But, you know, then you can see just



1 inside the channel it's been unassessed because  
2 the source of that was that it was an Army Corps  
3 survey. So there is a number of -- the public --  
4 Larry's squinting his eyes, so do you -- everyone  
5 see what I'm talking about here?

6 So what does that mean? So, if we go  
7 to the actual official description of what a --  
8 what is zone of confidence defined as? So the  
9 ZOC A, A-1 and A-2 have the same description. It  
10 says full area search undertaken, significant sea  
11 floor features detected and depths measured. And  
12 then in -- in the CATZOC B it says full sea floor  
13 coverage not achieved, uncharted features  
14 hazardous to navigation are not expected by may  
15 exist.

16 And so for a typical, reasonably well  
17 executed single-beam survey, or a sloppily  
18 executed multibeam survey, that's more or less a  
19 reasonable description of what -- of the object  
20 detection expectations of that survey. However,  
21 if you are a tanker those words are not very  
22 confidence inspiring. You know, particularly in

1 an area where there might be debris in the -- in  
2 the -- debris in the waterway.

3 Here is an example -- this is slightly  
4 different example and John Dasler gave me this --  
5 gave me this excellent little -- little picture  
6 here. So the -- so this is multibeam -- I'll  
7 call it a NOAA survey. It was done for us by  
8 Dasler and his team. The black soundings are  
9 from an Army Corps survey as provided to NOAA for  
10 charting that was done after the multibeam  
11 survey. So the normal practice is, in a dynamic  
12 area, if you think the sea floor is changed you -  
13 - we update the chart based on the more recent  
14 survey. We are not going to keep a multibeam  
15 survey forever if the world has changed. Just  
16 because it was a really good description of the  
17 world 20 years ago doesn't mean we need -- that  
18 that's the appropriate thing to keep charting.

19 And so this is our -- it's our -- it  
20 is our normal practice, and so we superseded the  
21 multibeam survey with this single-beam survey and  
22 removed that 12-foot sounding which had been --

1 which was charted as a normal sounding, not as an  
2 obstruction or anything. And sometime later a  
3 large tugboat, maybe John has the details of the  
4 incident, it was a large tugboat -- came through  
5 and did some major damage to their propulsion  
6 system. And you know, by hitting the 12 which  
7 had not changed at all.

8           So this is a -- you know, this is real  
9 world example with, you know, real consequences.  
10 And you know, I think there is a -- there is  
11 another example also in the Columbia River of --  
12 of sand waves where the sand waves had been  
13 beautifully captured. Huge sand waves captured  
14 in the -- in the multibeam survey. A single-beam  
15 survey came back through, happened to be in the  
16 troughs of the sand waves and -- and the chart  
17 was superseded again and -- and a ship went  
18 aground on the sand waves.

19           So sand wave fields are awkward  
20 because they do move around. But -- but  
21 generally kind of the tops of the sand waves at  
22 first approximation kind of stay about the same,

1 even if the exact location of them moves. So  
2 there is also a limitation with our current  
3 charting practice. So this is a -- most NOAA  
4 charts as Travis showed earlier show the -- show  
5 depth -- channel depth information in a channel  
6 tabulation. This was a really clever way to do  
7 it on a piece of paper. Because you could then  
8 cut a -- you could then print out a little piece  
9 and cut it out. Right? It comes in the local  
10 notice and you cut it out and you paste it over  
11 the old channel tab on there and you've updated  
12 your chart.

13 Well, you know, in the transition to  
14 ENCs we basically kept the same information and  
15 encoded it in -- now called dredged areas using  
16 the same quartering system. And so while we  
17 don't -- no longer have those old limitations we  
18 have sort of -- the cartographic practice has  
19 perpetuated through that transition and is in  
20 some ways is -- is being held back by the fact  
21 that we still do have concurrent products of  
22 paper and raster. And part of the reason that we

1 are -- that I am so hot to get rid of channel  
2 tabs is it will allow us to move on. And we can  
3 -- and allow us to make the ENC's that much  
4 better.

5 But this is a -- I don't know whether  
6 anybody's been looking at this chart while I've  
7 been talking to see what the trick is here. But  
8 if you were to come into that channel, you've got  
9 to leave the buoys on one side, you leave the  
10 other buoys on the other side, you stay in the  
11 white part, right? Well, take a close look at  
12 it. That's a red mark on the green side. So the  
13 actual passage through there is like that.

14 What you are seeing is what was  
15 available -- is what is available. So I don't  
16 think that is very clear.

17 DR. MAYER: It would be perfectly  
18 clear in 3D.

19 RADM SMITH: It would be -- it would  
20 be clearer in 3D.

21 (Laughter.)

22 RADM SMITH: But it was not an unknown

1 situation. In fact, it was charted properly  
2 considering the way the chart was designed at the  
3 time. And this is -- this is the shoal that --  
4 that -- that was -- this is slightly out of time  
5 sequence now with the chart that I just showed  
6 you. But -- but the shoal extended across --  
7 don't have enough money, harbor maintenance trust  
8 fund has been all locked up, so we haven't been  
9 able to dredge properly. And so essentially the  
10 shoal has gone all the way across the channel  
11 leaving, happily, some good water outside of the  
12 charted channel.

13           And so it was well known, you know,  
14 what the situation was. But -- and I didn't have  
15 chance to actually get a picture of the ship that  
16 was aground here, but that red tinted area is the  
17 location of the -- of a big bulker that went  
18 aground on that shoal. And I -- they didn't --  
19 they didn't point the finger at us for bad  
20 charting but when -- as soon as I saw that I was  
21 like, I have to think that we could do better  
22 somehow in -- in making it clear where the --

1 where the good water is here.

2           So it's a -- you know, I think it is  
3 an example of a -- of the sort of challenge or  
4 our -- and limitations of our current charting  
5 practices. So we have a flag-level discussion  
6 with the Major General Ed Jackson and the people  
7 that his presence can attract. And me and the  
8 people that my presence can attract in May and  
9 they are coming to us to sort of talk through  
10 what -- how we should do this.

11           Clarify standards, roles and  
12 responsibilities between the two agencies. You  
13 know, improve the discoverability, you know,  
14 despite the fact that Seattle is fabulous, you  
15 know, many Army Corps districts are -- it is very  
16 inconsistent with, you know, what is -- what is  
17 accessible. And there is a lot of Army Corps  
18 surveys that are done for, you know, monitoring  
19 shoal migration outside of a federal channel for  
20 instance that would be very valuable to us that  
21 we usually don't know about because they don't  
22 send them to us through the eHydro system unless

1 they are a part of a -- associated with a federal  
2 channel.

3 And so just like every other  
4 organization, and NOAA is no better than others  
5 on this, there are shoe boxes full of bathy data  
6 all over the Army Corps that -- that are  
7 potentially valuable for charting. So I don't  
8 want to point fingers excessively at them because  
9 there are just as many shoe boxes around NOAA.

10 But we also really are working --  
11 working to develop public input for the next  
12 generation of methods to chart the channels. And  
13 we are going to -- we are going to leverage the  
14 national charting plan framework for that,  
15 although we haven't made very much noise under  
16 that -- under that umbrella yet. Travis did a  
17 great job of sort of putting some ideas out  
18 there.

19 In my mind I don't know what the right  
20 answer is, and there may not be a single right  
21 answer for the best way to chart channels. It  
22 may depend on the sort of depth of the channel



1 and the size of the ships that are using it, and  
2 the under keel clearance, the scale of the chart,  
3 how fast it changes and, you know, sort of how  
4 tight the tolerances are.

5 So we really need to kick off and I --  
6 you know, I think in the next six months or so we  
7 really need to kick off a different way of  
8 thinking about how to -- how we chart channels so  
9 that we can -- so that we can build a really good  
10 automated system to do that -- do that  
11 automatically, smoothly, maybe it's not even the  
12 most elegant thing that a hand cartographer could  
13 do, but if it happens automatically on a weekly  
14 basis with no latency, that would be -- that  
15 would be really, really valuable.

16 So that's it. I promised an update on  
17 it. I wanted to be sure that you all didn't  
18 think that we -- that I had raised this big  
19 concern six months ago and then forgotten about  
20 it. Because it is one of the things I'm really  
21 worried about.

22 VICE CHAIR MILLER: Yes, a question.

1 In the National Charting Plan, and -- and it was  
2 referred to Travis, I think it's unclear whether  
3 you want to continue using -- if there are  
4 soundings in a channel, whether you will plot  
5 them there. And I was a bit surprised by that.  
6 Why would you not plot -- plot soundings in a  
7 channel?

8           RADM SMITH: Well, there are soundings  
9 in every channel, right? We have access to  
10 soundings in every channel. It's a question of,  
11 you know, again giving ourselves credit for being  
12 two years, or one year out of the paper era, you  
13 know, you cannot fit the soundings in there on a  
14 -- you know, when the channel is this wide on  
15 paper. Right? So that -- so it -- you know, we  
16 -- we plotted soundings in channels where it was  
17 relatively stable and where at the scale of the  
18 chart there was enough room to show them. And so  
19 that was the -- the historic practice. So  
20 there's -- there is not one way that we have  
21 charted channels, right? There is a little  
22 legend thing, there is a channel tab, we put the

1 hydro in there sometimes with the contours,  
2 sometimes without. Sometimes we put the project  
3 depth in with exception.

4 We -- there's already a lot of  
5 different ways that we do it. And we basically  
6 follow our own practice for updating that channel  
7 whenever -- whenever we would update it. Does  
8 that answer your question?

9 VICE CHAIR MILLER: Yes, and I have a  
10 -- a second question. Let's say six months down  
11 the road after you've had these meetings that  
12 Army Corps decides to stick with its current  
13 practice. Let's put it that way. What then? I  
14 mean, Jeff here made a suggestion of you know,  
15 reviewing the national charting plan and -- and  
16 we have talked about in a draft document the  
17 possibility of a -- a -- an independent review  
18 panel to try to help review some of these issues.  
19 And I was very interested in Jeff Hummel's  
20 suggestion.

21 RADM SMITH: Sure.

22 VICE CHAIR MILLER: So what -- what do

1 you think -- I mean let's just -- you know, let's  
2 say hypothetically Army Corps says no, we're not  
3 going to -- you know, we are not going to do  
4 object detection.

5 RADM SMITH: I think it is very likely  
6 that they will say that at the corporate level.  
7 Now Seattle, Philadelphia, Wilmington -- there  
8 may be a handful of -- of Army Corps districts  
9 that are saying come on, headquarters, just get  
10 off our backs. We know how to do this. We are  
11 going to do it right. You know, give us a common  
12 standard with NOAA that we can jointly respect  
13 and no problem, we will do it. We've got the  
14 resources. We -- we recognize the value. We  
15 want it to be a competitive advantage for our  
16 port.

17 But I don't think that the Army Corps  
18 at the headquarters level is going to mandate  
19 that. It -- in a lot of ways it is a -- it is  
20 because there's 23 -- Travis, help me out. How  
21 many coastal districts?

22 MS. MEDLEY: Twenty-two.

1                   RADM SMITH: Twenty-two coastal  
2                   districts. So it is really 22 different  
3                   organizations that we are working with. And, you  
4                   know, certainly at the survey level -- at the  
5                   survey system's level it is probably more like 22  
6                   different organizations. So I -- I think it is  
7                   very likely that they will say at the corporate  
8                   level we are not going to commit to doing object  
9                   detection surveys systematically all the time for  
10                  -- you know, specifically for this.

11                  So I think there's -- and maybe that  
12                  would be overkill anyway if all you are doing is  
13                  just seeing whether the shoals are moving around.  
14                  That -- that boat for example I saw, that didn't  
15                  need object detection. That just needed faster  
16                  information provided and gotten to the point of a  
17                  decision better. And so I -- I think it would  
18                  overkill to sort of force a multibeam all the  
19                  time everywhere to this really high standard.  
20                  That -- that's probably not necessary either.

21                  So I think there's probably a  
22                  compromise out there where we could say that the

1 -- a channel maintained its sort of object  
2 detection standard qualification, if it was a  
3 survey done every two or three years, say, that  
4 would -- that would check to see whether there  
5 was no -- no more major debris in that waterway  
6 and you could then update the bathy. Maybe we  
7 would do it as an overlay.

8           So I -- I mean, there's a lot of  
9 different ways that we could go about it. And it  
10 may be that NOAA ends up doing, you know, some  
11 surveys in channels -- anchorages I think we  
12 already own and frankly are deficient in not  
13 keeping up with. That Athos incident was not in  
14 a channel, it wasn't an anchorage. And that's  
15 not -- that's not necessarily any more Army  
16 Corps' problem than ours. And so I think we  
17 already have that as a requirement.

18           Square nautical miles or critical area  
19 didn't give us any brownie points for -- for --  
20 for surveying anchorages, right? We need to be  
21 thinking about this risk management in a  
22 different way. And that's a -- I think that's a

1 -- I think there's -- there's still probably room  
2 for a joint -- a sort of joint approach to this  
3 that -- where the districts that have the -- have  
4 the capacity and the equipment and the expertise  
5 and the desire to do it, that we would recognize  
6 that as having been done. It's not -- doesn't  
7 have to do with Army Corps, it has to do with the  
8 survey.

9           And the -- and you know in other areas  
10 we might -- we might need to supplement or want  
11 to supplement with -- with our own -- with our  
12 own surveying.

13           CHAIR HANSON: Other questions? I  
14 noticed -- one of the things you closed with was  
15 the -- just the fact you had followed up and we  
16 do appreciate your -- appreciate your attention  
17 to all this. We've talked about it several times  
18 so, appreciate you engaging on this. It is an  
19 issue for the Corps and -- and as you found, with  
20 Congress as well. So.

21           MEMBER SAADE: Can we ask questions  
22 from this morning?

1 CHAIR HANSON: Absolutely, sure.

2 MEMBER SAADE: I'm going to take you  
3 back to this morning.

4 RADM SMITH: You've got me in the hot  
5 seat all by myself.

6 MEMBER SAADE: No, this one's easy.  
7 You talked about 500 to 1,000 known  
8 inconsistencies on the charts.

9 RADM SMITH: Yes, actually I -- I knew  
10 -- I meant to clarify because I -- both EJ and  
11 Rick helped me to understand that I missed the  
12 overall picture there. And the -- if you query  
13 our charts today using a -- an attribute  
14 combination for things that we would consider a  
15 discrepancy, you get about 10,000.

16 MEMBER SAADE: Okay, that's even more  
17 interesting.

18 (Laughter.)

19 RADM SMITH: So it's more like 500 or  
20 1,000 new ones a year.

21 MEMBER SAADE: Okay, so you were  
22 talking about finding ways to clarify these. And



1 for companies like ours, we have no idea where  
2 these discrepancies are. If there was a way --  
3 if you would consider for NOAA to put out a list  
4 of the discrepancies to allow those of us that  
5 are testing equipment --

6 RADM SMITH: They're already on the  
7 chart.

8 MEMBER SAADE: Okay.

9 RADM SMITH: These are just things  
10 that are already on the chart. That doesn't even  
11 include the -- the awesome database that Jeff  
12 Siegel has.

13 MEMBER SAADE: Well it would be easier  
14 -- if rather than us going and combing through  
15 all of your 1,000 charts or thereabouts, if there  
16 was a -- a list of geographic location --

17 RADM SMITH: Yes, we -- we have a --  
18 (Simultaneous speaking.)

19 RADM SMITH: We have a quiet little  
20 web -- we've been trying to figure out how to  
21 frame this, right? So we don't really want to  
22 talk about how terrible our charts are until we

1 have a plan on how to -- on how to make them  
2 better, right? So it's all about the framing.

3 So we do have a web service that will  
4 -- that, you know, highlights all of these. And  
5 part of our solution, just to keep talking here,  
6 is you know the Power Squadron -- we had a guy  
7 from the Power Squadron here earlier. He's still  
8 here. You know, the -- we have a over 50-year  
9 long relationship with the Power Squadron  
10 cooperative charting program. So this is groups  
11 of local, mostly recreational boaters all over  
12 the country who are interested in helping us keep  
13 our charts up to date and would be very  
14 interested in helping to resolve some of these  
15 same issues.

16 We need to be a little bit careful to  
17 -- not to direct either you when you're not under  
18 contract or the power squadron to do something  
19 specifically for liability reasons and  
20 environmental compliance reasons. But -- but  
21 that said, you know, these are the 10,000 things  
22 we wish we knew more about, can anyone help us?

1 Is a -- is a -- you know, I think is a reasonable  
2 way to -- you know, one of many things that will  
3 help us get them resolved.

4 MEMBER SAADE: And I was definitely  
5 thinking of completely voluntary and testing the  
6 equipment, things like that. Maybe you could do  
7 it at least through your list of contractors.

8 RADM SMITH: Sure.

9 MEMBER SAADE: Thanks.

10 VICE CHAIR MILLER: One thing on that  
11 topic. Ben Evans is back there. He and I in  
12 2002 did the -- one of the very first surveys up  
13 in the northwestern Hawaiian islands. And we  
14 called it the donut survey because we were  
15 mapping boundaries. So 25 fathoms, 50 fathoms  
16 and 100. But a lot. And it was something that I  
17 would have never been thinking about or aware of.

18 But what we did was we disproved a lot  
19 of those bad soundings that had been on the  
20 charts for years and years and years. But I  
21 don't think it is something that maybe the survey  
22 community is very aware of. You know that if --

1 if there is something -- and especially if you've  
2 got side-looking capability or something -- you  
3 know, to go up there and run a little multibeam  
4 survey over -- and just a line and say oh,  
5 nothing there. Might be worth some outreach is  
6 what I -- I was thinking.

7 RADM SMITH: Yes, and -- you know, of  
8 course that's a -- that's a useful piece of  
9 information, to run the line over it and say it's  
10 not there. However if you look back -- why did  
11 somebody think it was six fathoms deep? They  
12 probably weren't totally crazy, right? And so  
13 they probably just didn't know where they were.

14 And so there probably is a six-fathom  
15 somewhere. Probably somewhere along that  
16 latitude line and -- and, you know, it will turn  
17 up sooner or later. And so a little bit more of  
18 a coordinated campaign to -- yes.

19 MEMBER GEE: Yes, just a quick -- you  
20 mentioned about the different places and with the  
21 precise navigation and those things and then kind  
22 of doesn't fit the CATZOC B and the price of

1 navigation, obviously. And I just -- is that --  
2 I think you mentioned that, is there a plan to  
3 kind of prioritize where you thought it was  
4 important to be kind of doing this first with the  
5 Corps? Like the areas that were targeted so they  
6 really need the precise navigation. And how  
7 would you -- like, what's the federal requirement  
8 for that as well? You know --

9           RADM SMITH: I don't think that's --  
10 I don't think that's defined. What we have been  
11 talking about internally is defining any port  
12 with a draft -- with a dredged channel of 30 --  
13 30 or 35 feet or deeper would be a -- sort of a  
14 candidate for looking at this first. And paying  
15 attention to it first. And, you know, there may  
16 be other places by exception.

17           But that really we are talking about  
18 large-ship critical under keel clearance. And  
19 you know, it's not that we don't care about the  
20 smaller traffic. It's that, you know, in the  
21 grand risk management, we take care of the big  
22 guys and then when we know about problems, like

1 these 10,000 deficiencies -- many of which have a  
2 sorry story behind them -- you know, then we deal  
3 with those once we know there's a problem. We  
4 prevent their -- we get ahead of the problem when  
5 the risk is too large.

6 MEMBER PERKINS: Follow-up question  
7 this morning that -- for Juliana or maybe Mr.  
8 Aslaksen. It was reported that 700 nautical  
9 miles of bathy LIDAR data were collected last --  
10 last season or this FY. And I believe 400 of  
11 them have been processed and with a backlog of  
12 300 square nautical miles. So just wondering  
13 what -- what's the limiting factor on addressing  
14 that backlog? Is it -- is it -- you know, is it  
15 human collateral?

16 Is it processing collateral? Is it --  
17 do you -- you know, do you need more investment  
18 in the processing technology? Just trying to get  
19 a feel for -- is 400 nautical miles a year  
20 maximum capacity you know for -- for the  
21 organization? Put a little more color to that if  
22 you would, please.

1 MS. BLACKWELL: Sure, I'll start and  
2 then I'll ask Mike to correct me when I -- when I  
3 misspeak. But that's not the capacity. That's  
4 just what was collected last year. And I -- you  
5 know, there's a delay. So depending on when it  
6 was collected -- and again, those were just FY-16  
7 end-of-the-year totals. So out of that 700, you  
8 know, it's more than likely that we've got more  
9 than the 400 square nautical miles -- processing  
10 compiled at this point.

11 But we're also continuing to collect.  
12 So there's a delay in getting it in and getting  
13 it processed and compiled. And I would say it's  
14 just -- you know -- human resources. You know,  
15 part of it is just the timing, the workflow, and  
16 part of it is having people that can address  
17 these things faster. But people are stretched to  
18 their limits of trying to get all the coastal  
19 mapping work done.

20 So that. I'll ask Mike if he's got  
21 additional details to add.

22 MR. ASLAKSEN: No, ma'am.

1 CHAIR HANSON: And we need it open up  
2 to the public for comments, questions?

3 MR. DASLER: I'll comment. Is this  
4 on? Okay. I -- John Dasler, contractor with  
5 NOAA and Corps of Engineers. So we see both  
6 sides of the story. And I think Admiral Smith  
7 really touched on that. But I think often what  
8 people overlook, especially as you look at eHydro  
9 is the mission for the Corps of Engineers is to  
10 monitor dredging and when they have to dredge.  
11 So on the Columbia, for example, they have to  
12 monitor 100 miles of the river.

13 So running single-beam surveys, if  
14 their surveys are more than a couple weeks old  
15 they consider that old data. So that information  
16 is critical to know where they have to dredge and  
17 where shoaling is, but it's a generalization of  
18 the sea floor. And there's been several  
19 incidents where those surveys have missed  
20 obstructions, or in that particular case it was a  
21 charted obstruction in a federal channel, so you  
22 can't really -- I mean, there wasn't a way to put



1 an obstruction -- I'm not sure how you did that  
2 now on that chart.

3 But the tabular data showed that  
4 sounding, but as soon as a new Corps survey was  
5 done, the tabular data was replaced and so that  
6 critical sounding was displaced by the single-  
7 beam data. And in the -- within the Portland  
8 Harbor, when we did the charting for NOAA, there  
9 were so many obstructions they couldn't plot them  
10 all as obstructions, so many of them ended up as  
11 soundings which got displaced with Corps single-  
12 beam surveys that missed the obstructions.

13 So and I -- and I think the same is  
14 true with crowdsourcing, you're talking about  
15 generalizations of the sea floor, right? As  
16 opposed to anomaly detection in charting surveys.  
17 And so I think that's the real critical thing to  
18 address. I think 3-dimensional data really  
19 helps. The Columbia River pilots like to see not  
20 just a sounding but a 3D representations of what  
21 those obstructions are, and many get removed  
22 during the course of -- after the spring

1 freshets.

2 I think just keeping that in mind as  
3 that play is coming out. I -- I don't think on  
4 the Columbia they'll -- they'll switch to  
5 multibeam any time soon just because of the --  
6 the shoaling and what they have to do. I mean,  
7 it's a different mission, right? Their mission  
8 is not object detection. Thank you.

9 CHAIR HANSON: Anybody online, Lynne?

10 MS. MERSFELDER-LEWIS: No.

11 CHAIR HANSON: Okay. Thank you  
12 Admiral Smith, again. We'll go ahead and wrap up  
13 for the evening here. Kind of want to do real  
14 quick recap as we've come to do in meetings past  
15 where we kind of -- if anybody wants to offer  
16 some thoughts on the day and some of the meetings  
17 -- some highlights of the discussions, and I'm  
18 prone to volunteer others if I don't hear from  
19 you. So --

20 DR. MAYER: I'll just make a comment  
21 that I thought they were really, really good  
22 panels. I mean, I thought they really addressed

1 critical issues and all presented really well.  
2 So it was actually quite exciting.

3 CHAIR HANSON: Great. Ed, what do you  
4 think?

5 MEMBER KELLY: I would agree. I think  
6 we had a really good, broad discussion. I'm  
7 looking forward to tomorrow for a more local  
8 discussion.

9 CHAIR HANSON: All right, thank you.

10 MEMBER HALL: I think the one thing I  
11 would like to actually mention is, Admiral, I  
12 really, really appreciate you outlining what you  
13 wanted from HSRP. That's very helpful to kind of  
14 say hey, what can we do for you? And I would  
15 suggest -- I think today was great, but I think  
16 that that's helpful for everybody. Putting it in  
17 the context of what we do as HSRP and asking us -  
18 - not telling us what to do, not directing us,  
19 but it's really nice to kind of have some  
20 direction so we can focus on certain things. So  
21 thank you for that.

22 RADM SMITH: That was Lynne.

1 (Laughter.)

2 MEMBER HALL: It might be because I  
3 talked to Lynne, too.

4 (Laughter.)

5 VICE CHAIR MILLER: One -- one follow-  
6 up on that, particularly since the Admiral is not  
7 going to be here tomorrow is I think it's also  
8 helpful -- and this to also Juliana and -- and  
9 Rick -- if there are things that we touch on and  
10 you think that there might be a potential -- you  
11 know -- direct us to areas that we might want to  
12 say, write another one-pager on or something.  
13 That -- I find that helpful too. If -- you know,  
14 what would be useful?

15 And it -- generally the areas mesh  
16 quite well with what we here. But just -- we're  
17 kind of -- for next time -- we are going to  
18 discuss the papers tomorrow and we are kind of  
19 not quite sure what comes next I would say with  
20 Dave. So if there are ideas, you know, let us  
21 know.

22 CHAIR HANSON: Juliana?

1 MS. BLACKWELL: I guess maybe one thing  
2 I'd like to see if other people want to weigh in  
3 on now or discussion for later this week is the  
4 recommendation for an NRC study and whether or  
5 not that's something that could survey as  
6 considered or if the panel thinks -- would be a  
7 good idea to recommend to NOAA to do. I know  
8 that we've -- we NGS have been involved in some  
9 in the past and -- and looked at them.

10 And I'm not saying that they're --  
11 that they're easy or -- or cheap or fast to get  
12 done, but the weight of the studies and what they  
13 can provide as far as looking into the future of  
14 what -- what the organization should do, and  
15 perhaps touching on other -- other aspects of --  
16 of charting is -- is something I think we should  
17 think about and if anybody else has any thoughts.  
18 Or, Admiral if you -- if you want to comment on  
19 that because you won't be here at all tomorrow.  
20 Is that correct?

21 RADM SMITH: I'll be here -- I'll be  
22 here in the morning.

1 MS. BLACKWELL: In the morning, yes.

2 RADM SMITH: If we have a chance to  
3 think about it then, we could. I -- so I guess  
4 I'm -- I'm open to the idea. Sometimes you --  
5 careful what you ask for. But -- but I'm open to  
6 the idea and I think we could probably figure out  
7 how to pay for it if that's the -- if that's the  
8 thing.

9 But I think most importantly, I have  
10 no idea what you would do to actually do that.  
11 But the man who does is right here. Who -- and -  
12 - and I don't necessarily want to prolong the day  
13 here. But invite Larry to either now or later --  
14 to describe what it would take to do one of  
15 those.

16 DR. MAYER: Now or later, Chair?  
17 Later. Okay.

18 VICE CHAIR MILLER: We do have one  
19 suggestion similar to that in two of papers about  
20 an independent panel.

21 CHAIR HANSON: Dr. Brigham?

22 MEMBER BRIGHAM: It's nice to see this

1 evolving dialogue between the Corps and the --  
2 and you, Admiral Smith. I think during the 5 or  
3 6 years we've been on we've seen this kind of  
4 roll along slowly. I didn't say today when we  
5 were -- when I was asking Andy, lt. colonel  
6 there, that I wonder whether providing these  
7 products is under the legal authority of the  
8 Corps.

9           And because that -- the customers that  
10 -- the users are using them for navigation. And  
11 so I would say that the legal beagles of the  
12 Corps should look at eNav and -- I mean, it's all  
13 great stuff. But what is their legal authority  
14 to provide that in -- that it's used as  
15 navigation? I mean, I don't know. I'm not a  
16 lawyer. But if I was lawyer in the Corps, I  
17 might ask a friend of mine to look at that. Just  
18 -- we want to sort this out. And the  
19 relationship between the two organizations.

20           I mean, a lot of progress been made.  
21 Just an administrative thing, maybe I know -- I  
22 think NOAA sends out letters of thanks. We

1 should send a letter of thanks to the governor or  
2 the commissioner of commerce in Washington State  
3 for the presentation that Joshua. It was a good  
4 presentation. Quite enlightening. Thank you.

5 CHAIR HANSON: All right. Lynne, what  
6 you got? Do we have instructions for tonight and  
7 tomorrow?

8 MS. MERSFELDER-LEWIS: So for those  
9 interested in an informal recap, we'll be in the  
10 lobby from about now till 6:00. And then for  
11 those who are joining us for dinner, we'll be  
12 walking to the restaurant. If it's pouring rain,  
13 we can get taxis. Or if it's too -- too much for  
14 somebody because of medical stuff, you could take  
15 a cab or something like that. Okay.

16 And then tomorrow we have the same set  
17 up as we did this morning. Breakfast is at 7:30  
18 in the -- the restaurant. So please come join us  
19 there. And then the regular meetings starts at  
20 8:30 here. And we have an excellent panel. You  
21 should not miss it.

22 CHAIR HANSON: Thanks, Lynne. Hey and



1 -- and before I do that. We ought to give Lynne  
2 a round of applause. Putting these things  
3 together is no fun and we're not very easy to get  
4 along with, so --

5 (Applause.)

6 CHAIR HANSON: And we'll see you all  
7 tomorrow at 8:30. We're adjourned.

8 (Whereupon, the above-entitled matter  
9 went off the record at 5:06 p.m.)

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## A

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This is to certify that the foregoing transcript

In the matter of: Hydrographic Services Review Panel

Before: US DOC/NOAA

Date: 04-18-17

Place: Seattle, WA

was duly recorded and accurately transcribed under my direction; further, that said transcript is a true and accurate record of the proceedings.



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Court Reporter

**NEAL R. GROSS**

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