

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
AUGUST 30, 2016

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The Hydrographic Services Review Panel
met in the City Club of Cleveland, Conference
Room 200, 850 Euclid Avenue, Cleveland, Ohio, at
8:30 a.m., Bill Hanson, Chair, presiding.

MEMBERS PRESENT

BILL HANSON, HSRP Chair
JOYCE E. MILLER, HSRP Vice Chair
DR. LAWSON W. BRIGHAM
KIM HALL
EDWARD J. KELLY
CAROL LOCKHART
DR. DAVID MAUNE
CAPTAIN ANNE MCINTYRE
SCOTT R. PERKINS
EDWARD J. SAADE
SUSAN SHINGLEDECKER
GARY THOMPSON

NON-VOTING MEMBERS

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

RICH EDWING, Director, CO-OPS, NOAA

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

STAFF PRESENT

REAR ADMIRAL SHEP SMITH, HSRP Designated
Federal Official

DAVE HOLST, Chief of Staff, NOAA/NOS

MIKE ASLASKEN, NOAA/NGS

GLENN BOLEDOVICH, NOAA/NOS

CHRISTA JOHNSTON, NOAA/NOS

GARY MAGNUSON, NOAA/OCS

RACHEL MEDLEY, NOAA Customer Affairs
Branch

LYNNE MERSELDER-LEWIS, HSRP Coordinator

RUSS PROCTOR, Chief, Navigation Services
Division, NOAA/OCS

ALSO PRESENT

CAPTAIN PAUL D.J. ARNETT, Chief, Preventive
Division, 9th Coast Guard District for
the Great Lakes and Saint Lawrence
Seaway, U.S. Coast Guard

MARVOURNEEN DOLOR, PhD, St. Lawrence Seaway
Development Corporation

JOSH FELDMAN, Chief of Operations, Buffalo
District, Great Lakes and Ohio River
Division, U.S. Army Corps of Engineers

CAPTAIN GEORGE P. HAYNES, Vice President,
Lakes Pilots Association, Inc.

GLEN G. NEKVASIL, Vice President, Lake
Carriers Association

MIKE PISKUR, Program Manager, Conference of
Great Lakes and St. Lawrence Governors
and Premiers

BETTY SUTTON, Administrator, Saint Lawrence
Seaway Development Corporation, U.S.
Department of Transportation

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(8:31 a.m.)

1
2
3 CHAIR HANSON: Good morning. My name
4 is Bill Hanson. I'm a chair of the Hydrographic
5 Services Review Panel. I'm going to call this
6 meeting to order and welcome everyone to
7 Cleveland and to the Great Lakes.

8 It's been a while since we've met
9 here, but it's -- as the fourth coast of the
10 United States, it needs a lot of attention and
11 also just one of the conversations that we're
12 going to have over the next few days to talk
13 about some maritime and coastal heritage as well
14 as its future.

15 My day job, I work for Great Lakes
16 Dredge and Dock Company, a 126 year old company
17 based in Chicago, but we don't work in the Great
18 Lakes anymore because it's all small business set
19 aside because of lack of investment and lack of
20 care. And those are things we'd like to see
21 changed over the years.

22 But certainly there's a great heritage
23 as I mentioned, and Cleveland is the -- it's a
24 great place for us to be meeting. I want to
25 thank the panel members and the staff who've
26 worked very hard the last several months putting
27 together the agenda.

28 We've got a very robust program that's
29 not just to listen to presentations and
30 conversations about what's going on in the local
31 community but also engage panel members a little
32 more vigorously than we have in the past,
33 perhaps, to get some of our thoughts on paper and
34 as we seek to advise the Under Secretary.

35 A special thanks to Glen Nekvasil,
36 Vice President of the Lake Carriers Association.
37 Thanks for being there, sir, and Deborah Lee,
38 Director of NOAA's Great Lakes Environmental
39 Research Laboratory, for agreeing to serve as
40 panel moderators.

41 This is my first meeting as chair.
42 I've obviously got very big shoes to fill. Scott
43 Perkins sitting on the sideline on this one, but
44 we have Joyce Miller as Vice Chair as well and
45 thank you, Joyce, for all your hard work putting
46 this together.

47 We'll do our best to keep everything
48 on schedule, but we want to make sure people have

1 -- both the panel members and moderators and
2 audience also have an opportunity to participate
3 as appropriate.

4 So let me go ahead and begin by
5 introducing Rear Admiral Shep Smith, our new
6 Federal Designated Officer. As many of you may
7 know, Admiral Smith just a few days ago assumed
8 the position of Director of NOAA's Office of
9 Coast Survey.

10 This recent position follows a
11 remarkable number of accomplishments during his
12 23-year NOAA career, including leading advances
13 in state of the art hydrography and cartography
14 and commanding several NOAA vessels.

15 A full biography on Admiral Smith is
16 in your meeting materials. Admiral Smith, it is
17 an honor to have you with us and to be our
18 Designated Federal Officer. Please share with us
19 any opening comments you may have.

20 RADM SMITH: Thanks, Bill. I am brand
21 new. This is my second day on the job, and I've
22 not yet been -- this is also my second HSRP and I
23 sat in the back the last time, so I will ask for
24 your humoring me along and advising me on what my
25 appropriate role should be during this week.

26 I do see that HSRP is a really
27 important part of our strategic thinking process
28 though for Coast Survey and the navigation
29 services and NOAA overall.

30 What I hope for our relationship is to
31 -- is for you to ask us the questions and ask the
32 questions of us or in general that we're not
33 asking, to get us out of the ruts of thought
34 patterns and to take us up to the next level of
35 strategic thinking, the more over-the-horizon
36 stuff leaving the day-to-day bureaucratic battles
37 of working within the government more in our
38 lane.

39 So I don't -- that's all I have to
40 share for now, but welcome and, again, thank you
41 all and again thank you all to our staff and the
42 hosts who have put this all together.

43 CHAIR HANSON: Well, thank you,
44 Admiral Smith. Next we'd like to go ahead and do
45 the introductions and we'll start with the panel
46 members, but we'd also like to engage with the
47 audience as well.

48 I know we have staff and other

1 visitors and with that thought, it might be
2 helpful to know a little bit about you guys as
3 well as you know about us.

4 So if we can start with the panel to
5 my right, Joyce. We'll go around and end up with
6 Mr. Holst, and then we'll get the audience up.
7 Okay? So thank you.

8 VICE CHAIR MILLER: I'm Joyce Miller.
9 I'm a certified hydrographer. I retired last
10 year. I semi-retired last year, I guess I would
11 say, but I worked with NOAA both directly and as
12 a commercial contractor and also through
13 academia. So it's a pleasure to be here.

14 MR. ARMSTRONG: I'm Andy Armstrong.
15 I'm the NOAA Co-Director of the Joint
16 Hydrographic Center and a non-voting member of
17 the panel.

18 DR. MAYER: Larry Mayer. I am the UNH
19 Co-Director of the Joint Hydrographic Center, the
20 Director of the Center for Coastal and Ocean
21 Mapping and a non-voting member of the panel.

22 MEMBER PERKINS: Good morning. I'm
23 Scott Perkins. I'm with Surveying and Mapping.
24 I'm the Director of Federal Programs responsible
25 for our federal line of business that includes
26 land surveying, aerial imagery, remote sensing
27 and hydrographic surveying.

28 MEMBER MAUNE: My name is Dave Maune.
29 I work for Dewberry in Fairfax, Virginia. I
30 manage projects dealing with photogrammetry,
31 topographic LIDAR, bathymetric LIDAR. I've
32 written books on those subjects as well as
33 accuracy standards. By the way, books include
34 Sonar written by Guy Noll.

35 MEMBER LOCKHART: My name is Carol
36 Lockhart. I own a small business called
37 Geomatics Data Solutions, also doing survey like
38 these guys. I'm a hydrographer. My expertise is
39 in sonar and LIDAR. Thanks.

40 MEMBER THOMPSON: Good morning. My
41 name is Gary Thompson. I'm the Chief of the
42 North Carolina Geodetic Survey in the
43 Division of Emergency Management, State of North
44 Carolina.

45 MEMBER SHINGLEDECKER: I am Susan
46 Shingledecker. I'm Vice President of the BoatUS
47 Foundation. That is the non-profit arm of
48 BoatUS, the Boat Owners Association of the United

1 States and a recreational boater, grew up boating
2 on Lakes Erie and Ontario.

3 MEMBER HALL: Hi. I'm Kim Hall. I'm
4 with the Cruise Lines International Association,
5 which is the global trade association for the
6 cruise industry. And I am the Director of
7 Nautical Operations and Security there.

8 MEMBER KELLY: Good morning. I'm Ed
9 Kelly. I'm the Executive Director of the
10 Maritime Association, the Port of New York and
11 New Jersey. My expertise and background is in
12 international ship management operations and port
13 operations.

14 MEMBER MCINTYRE: Good morning, Anne
15 McIntyre. I'm a maritime pilot with the Columbia
16 River Pilots, and I'm an end user of a lot of the
17 NOAA products.

18 MEMBER BRIGHAM: Good morning. I'm
19 Lawson Brigham from the University of Alaska,
20 Fairbanks. I do climate change and arctic policy
21 work up at the university, also a retired Coast
22 Guard officer and did a lot of icebreaking out
23 here on the lakes.

24 MEMBER SAADE: I'm Ed Saade. I'm
25 President of Fugro USA, and I'm the regional
26 director for everything that we do in the
27 Americas, both North and South America. We have
28 a number of support contracts with NOAA for
29 mapping, whether its hydrographic or geospatial
30 or coastal or multiple other items.

31 MR. ASLASKEN: Good morning. I'm Mike
32 Aslasken. I'm here representing Ms. Juliana
33 Blackwell, the Director of the National Geodetic
34 Survey, also a non-voting member. She wishes her
35 well wishes to all of you here.

36 In my day job at NGS, I'm Chief of the
37 Remote Sensing Division, and of interest to the
38 panel, we provide the shoreline and nearshore
39 bathymetry, the nautical charts as well as have
40 an emergency response imaging program.

41 MR. EDWING: Good morning. I'm
42 Richard Edwing. I'm the Director of the Center
43 for Operational Oceanographic Products and
44 Services. My office acquires oceanographic
45 information along the coast, primarily physical,
46 tides and currents and turns those into products
47 and services for the mariner and other users.

48 MR. HOLST: Good morning. I'm Dave

1 Holst. I am the Chief of Staff of NOAA's
2 National Ocean Service.

3 CHAIR HANSON: All right. And if we
4 can get back to the audience. Glenn? I'm sorry.

5 MR. BOLEDOVICH: Glenn Boledovich. I
6 am not a panel member. I'm the Policy Director
7 of NOAA's National Ocean Service.

8 MR. NEKVASIL: I'm George Nevkasil
9 from Lake Carriers Association. We represent the
10 US-flag vessel operators on the Great Lakes.

11 MR. LOEPER: Good morning. I'm Tom
12 Loeper. My day job is running the publications
13 branch for NOAA, and I'm also the Great Lakes --
14 the Acting Great Lakes Navigation Manager.

15 CAPT. HAYNES: Hi. Good morning. My
16 name is George Haynes. I'm a pilot with Lakes
17 Pilots Association, based in Port Huron,
18 Michigan. Our district covers Lake Erie, Detroit
19 and Saint Clair Rivers.

20 MR. CHAPPELL: Hi. Ashley Chappell,
21 NOAA's Integrated Ocean and Coastal Mapping
22 Coordinator.

23 MR. DEBOW: Hi. Sam DeBow. I'm a
24 contractor working back at NOAA. Thank you.

25 MR. CONNER: Hi. I'm David Conner.
26 I work for National Geodetic Survey as a regional
27 geodetic advisor based here in Ohio, and I've
28 represented NGS on the Great Lakes Coordinating
29 Committee for about 20 years. So I've got a lot
30 of history here in the lakes and thank you.

31 MS. MEDLEY: Good morning. I'm Rachel
32 Medley. I'm the Chief of the Customer Affairs
33 Branch in the Office of Coast Survey at NOAA. I
34 manage all the navigation managers around the
35 country.

36 MR. WRIGHT: Good morning. I'm Darren
37 Wright. I'm the Maritime Services Program
38 Manager for CO-OPS with Rich Edwing.

39 CAPT SMITH: Hi. Good morning. I'm
40 Scott Smith. I'm the Chief of Office of
41 Navigation Systems at Coast Guard Headquarters.
42 I'm also the Designated Federal Official for our
43 Navigation Safety Advisory Committee, FACA.

44 MS. DOLOR: Good morning. I'm
45 Marvoureen Dolor. I'm a contractor working as an
46 environmental policy advisor to the Saint
47 Lawrence Seaway Development Corporation, and
48 that's the U.S. side.

1 MR. RAMOS: Morning. John Ramos. I'm
2 an industry trainee working with the Lake
3 Carriers Association. I'm just kind of absorbing
4 all the information.

5 MS. DAY: Good morning. I'm Jennifer
6 Day, and I'm also the Great Lakes Regional
7 Coordinator for NOAA from Ann Arbor.

8 MR. CHU: Morning. Philip Chu, Great
9 Lakes Environmental Research Lab. Our team
10 develop and implement the Great Lake hydrodynamic
11 forecasting system and also ecological models for
12 the Great Lakes Region.

13 MS. BRUCE: Good morning. I'm
14 Samantha Bruce with QPS. That's a software
15 company. We specialize in hydrographic data
16 acquisition and processing. Our softwares are
17 QINSy for acquisition, Qimera for processing,
18 Fledermaus for visualization and analysis and
19 Qastor for precise navigation, piloting and
20 docking.

21 MR. KRUMWIEDE: Good morning. My name
22 is Brandon Krumwiede. I work with NOAA's Office
23 for Coastal Management serving as the Remote
24 Sensing Specialist and Great Lakes Geospatial
25 Coordinator.

26 CDR MAFFIA: Good morning. Tony
27 Maffia, District 9 Waterways Management. We
28 manage the AtoN, DOMICE and cutters for the
29 district.

30 MR. THOMAS: Good morning. Lorne
31 Thomas, Chief of External Affairs, the 9th Coast
32 Guard District. One of my principal duties is
33 liaison with the many federal and state agencies
34 that are here on the Great Lakes.

35 MR. MERSEK: Good morning. My name's
36 Lee Mersek. I'm just a graduate student
37 observing the panel. Thank you.

38 MS. MERSFELDER-LEWIS: Hey. Good
39 morning. I'm Lynne Mersfelder-Lewis. I'm the
40 HSRP Program Manager. If you have questions,
41 complaints, talk to somebody else. I'm just
42 kidding.

43 MR. PROCTOR: Good morning. I'm Russ
44 Proctor. I work for Admiral Smith as his
45 Navigation Services Division Chief, and I'm also
46 the Alternate Designated Federal Officer.

47 MR. MAGNUSON: Good morning, and
48 welcome to the land of Cleve. My name is Gary

1 Magnuson, and I'm advisor to CO-OPS and Office of
2 Coast Survey. Good to see you all.

3 MS. JOHNSTON: Christa Johnston,
4 Navigation Services Policy Liaison for NOS.

5 CAPT ARNETT: I'm Paul Arnett, Chief
6 of Provision for the 9th District here on behalf
7 of Admiral Ryan, the 9th District Commander.

8 MR. FELDMAN: And I'm Josh Feldman.
9 I'm Chief of Operations for Buffalo District, the
10 Army Corps of Engineers. I'm here representing
11 the Great Lakes and Ohio River Division.

12 CHAIR HANSON: Well, thank you.
13 That's quite helpful for all of us to do those
14 introductions, so I appreciate that. At this
15 point, we actually have some HSRP business to
16 take care of.

17 We have some members who are going to
18 take the oath of office officially, and we have
19 here representing NOAA leadership and Chief of
20 Staff for NOAA Ocean Service, Dave Holst, who's
21 going to administer the oath of office for our
22 newest members, Anne McIntyre and Gary Thompson.

23 (Oath of office administered)

24 CHAIR HANSON: Well, thank you, Dave,
25 and congratulations, Anne and Gary, a lot of
26 contributions, high expectations for you guys, so
27 appreciate the work you've already put into HSRP
28 and though we've got a lot more to tap into
29 there.

30 As we've noticed with the new members
31 we brought on last time, last meeting as well as
32 this one, we think HSRP has a very broad and
33 diverse representation for the industry. And we
34 definitely look forward to the challenging and
35 vigorous debates and discussions. So thanks for
36 making the panel as diverse as it is.

37 All right. We'll go ahead and get
38 started with our agenda. Next is a presentation
39 by Captain Paul Arnett. Thank you, sir, for
40 being here, Prevention Division for the U.S.
41 Coast Guard's 9th District, which includes the
42 Great Lakes and the Saint Lawrence Seaway.

43 His duties include overseeing regional
44 Coast Guard icebreaking, aids to navigation,
45 waterways management, port security and boating
46 safety. We have Captain Arnett's biography in
47 your meeting materials again. Sir, it's great to
48 have you with us. We look forward to your

1 remarks.

2 CAPT ARNETT: Well, thank you very
3 much. Admiral, again congratulations. Welcome
4 to Cleveland. I'm glad you had the opportunity
5 to meet with Admiral Ryan yesterday. She sends
6 her regrets to the panel. We have her spread
7 very thin throughout the District, so she sent me
8 in her stead.

9 Just a broad overview of the 9th
10 District and what we do here. The 9th District
11 is responsible for all Coast Guard operational
12 activities in the Great Lakes region, the bi-
13 national area. In fact, we do a great deal of
14 collaboration with the Canadians to that end.

15 The Great Lakes, just some statistical
16 information to provide some reference,
17 approximately \$1.3 trillion in business is done
18 commercially on the waterways here.

19 To put it into context, if you were to
20 cull out the eight states and the two provinces
21 of the Great Lakes region as an economy in and of
22 itself, it would be the fourth largest in the
23 world.

24 Primary products being transported are
25 bulk products: steel, coal, grain, lime. They
26 work in a compressed season because we do get
27 ice, as Dr. Brigham certainly is well aware of.
28 That's an issue that we certainly have to contend
29 with here, and I believe it will be a topic of
30 discussion.

31 In addition, the waters of the Great
32 Lakes represent 21 percent of the world's fresh
33 water on the planet's surface. The 9th District
34 has the complete complement of eleven statutory
35 missions that the Coast Guard is obligated to
36 perform: ports and waterway safety, drug
37 interdiction, search and rescue, marine safety
38 just to name a few of them.

39 The organization at the 9th District
40 is broken down as administrative oversight to the
41 operational command centers distributed
42 throughout the region. We have -- I'm Chief of
43 Prevention. We've already gone over what those
44 topics cover.

45 We have the response side. We have
46 External Affairs, Legal, Chaplain Corps as well
47 as the logistical support staff. Those divisions
48 are External Affairs, Legal, Prevention Response

1 and Resources and Planning.

2 There are four sectors within the 9th
3 District. They're located in Buffalo, Detroit,
4 Sault Ste. Marie and in Wisconsin as Sector Lake
5 Michigan. Within those sectors there are over 75
6 command -- source site commands comprised of
7 stations and Aids to Navigation Teams.

8 There are ten cutters. All but one of
9 them are either icebreakers or have an
10 icebreaking capability. The Might Mackinaw is
11 the queen of the fleet. She is the one red hull
12 that we have here, the large buoy tending
13 icebreaker.

14 Next we have two, 225-foot
15 icebreaking-capable buoy tenders, six 140-foot
16 icebreaking tugs, two of which are outfitted with
17 barges that are capable of handling aids to
18 navigation work as well.

19 There's two air stations as well
20 within the region. Currently, they're configured
21 to operate the 65s. These are the smaller
22 Dolphin helicopters. Air Station Traverse City
23 is currently in the process of swapping those 65s
24 out for the more durable, long range 60s, which
25 are more suitable to the environment we have
26 here.

27 I left out one of our cutters. That's
28 the Buckthorn. She is not icebreaking-capable.
29 She's a very old, 100-foot blue-belt class buoy
30 tender, generally does nearshore buoy operations.

31 Moving on, the Coast Guard's an
32 extremely small service. As such, we're
33 dependent upon the assistance of other agencies
34 partnering up with NOAA, with the Army Corps,
35 federal, state, local agencies as well as our
36 Canadian counterparts.

37 In doing so, we're able to leverage
38 their assets and be more effective in performing
39 our missions. The Coast Guard and NOAA
40 Cooperative Maritime Strategies establishes three
41 strategic priorities for that joint
42 collaboration: to promote the safe, sustainable
43 environment, enhance regional collaboration and
44 foster innovation and science, technology and
45 youth education. And we're achieving all of
46 those here in the 9th.

47 It's a little difficult for the Coast
48 Guard to parse out each of the specific offices

1 within NOAA because there's such broad overlap
2 between each of them, and we look at NOAA as a
3 complete package in that collaborative effort.

4 For instance, the Scientific Support
5 Coordinators are a tremendous asset to our
6 ability to manage and respond to environmental
7 situations. Most recently, the Barge Argo, a
8 petroleum barge that went down around the 1930s
9 thought to have been in the Canadian side, during
10 some work by NOAA, and other sources, identified
11 it on the U.S. side.

12 Shortly thereafter, it began burping
13 up product and at that point it became more of an
14 issue that required immediate response, so we did
15 so.

16 Heading into the rough winter months,
17 we leaned upon NOAA to provide us with the
18 scientific background information to safely and
19 effectively do that. And we were able to offload
20 the product in time before the ice set in and the
21 weather got too nasty.

22 But the support provided by NOAA to
23 that end was absolutely essential in making sure
24 that it was done safely and effectively and
25 provided us with the support necessary.

26 Likewise, I've already mentioned how
27 rough the weather is up here. The lakes are
28 tremendous. If you've never seen them before,
29 there's nothing quite like them. They are oceans
30 unto themselves, and the weather can get to you
31 very quickly.

32 NOAA is absolutely essential in
33 providing us that information. In fact, every
34 morning, the admiral's brief starts with the NOAA
35 reports on weather, so we can attempt to
36 anticipate what kind of day we're going to have,
37 whether it's our own cutters or responding to
38 other folks that are caught up in the
39 environment.

40 Fisheries is another area that we work
41 closely with NOAA in, and sometimes there's even
42 serendipitous benefits gained from some of the
43 services NOAA provides to the Coast Guard,
44 unintended but in the end they're incredibly
45 valuable.

46 VMS is a system where a transponder is
47 put on a fishing vessel to determine whether or
48 not it's operating within a closed fishing area.

1 That same technology, however, is
2 available to the Coast Guard, and we use it to
3 determine the location of vessels that are in
4 jeopardy and to help us initiate our search and
5 rescue operations. It'll give a ping and a
6 location every half hour, hour depending upon the
7 fishery.

8 So these tools are critically
9 important to us. Even if their initial intention
10 wasn't that, we're able to take advantage of the
11 work already done by NOAA and leverage that.

12 Just looking through the recent report
13 and the number of items that are listed as being
14 up for address, and I just wanted to touch on
15 those and mention the Coast Guard's interest in
16 them and support for them.

17 MIST, the Mobile Integrated Survey
18 Team, is available for performing hydrographic
19 work here on the Great Lakes as conditions
20 warrant, and availability of that service is very
21 important.

22 Argo is an example of an occasion
23 where having that capability to be deployed to
24 the Great Lakes. I know we don't have an
25 indigenous service here. Perhaps the workload
26 doesn't warrant that, but having the viability
27 for the mobile team to deploy is very valuable.

28 Recapitalization of the fleet, well,
29 we're personally sensitive to that issue. We're
30 undergoing a complete renovation of our 140-foot
31 buoy tender fleet to make sure that they're up to
32 snuff with the latest technology and capable of
33 performing the mission that we require of them.
34 A recapitalization of NOAA's fleet to do likewise
35 is equally as important to us.

36 Charts database consolidation, being
37 able to -- the project moving forward to
38 consolidate the database for the raster charts as
39 well as the electronic charts just makes sense.
40 That way, you're going to make sure that you have
41 perfect synchronicity across the board and we're
42 not going to have any conflicts.

43 Certainly we would look forward to
44 that as well as the completion of the new surveys
45 establishing the future datum. Coast Pilot,
46 Coast Guard can't live without the Coast Pilot.

47 In its electronic form, its -- I
48 reference it on my desk. It's accessible, easy

1 to understand and the ability to link to other
2 documents is extremely valuable.

3 In some areas we do provide feedback
4 to NOAA where we feel that there's areas for
5 charts to be improved, revised. One of the
6 issues, if I can make this request, is to maybe
7 establish a turnaround time on -- or at least a
8 return receipt that the recommendations have been
9 received and that they're being considered.

10 Right now, we send them on up and it's
11 kind of hit or miss as to whether or not we get a
12 return on the recommendation as being something
13 taking for action or in error or any feedback.
14 So that would be extremely valuable to us.

15 Of course the data buoys: we service
16 those. That's an example of our collaborative
17 effort. IATONIS is a shared database and
18 ensuring that that system maintains its
19 integrity, is up and running is incredibly
20 valuable to the Coast Guard.

21 We're currently -- and Captain Smith
22 is here. We're currently in the process of
23 testing electronic aids to navigation. That's
24 another technology that, as we start to play with
25 it and experiment, we're finding greater and
26 greater value.

27 But in the same course of business,
28 we're finding some challenges. One of the
29 challenges we had -- what the electronic aids to
30 navigation does is take an AIS signal, identifies
31 the location in the waterway where a buoy should
32 be or at least currently is.

33 There's a physical aid there. Then we
34 project it on there. Then we call it a synthetic
35 aid, so you get both the physical aid as charted
36 as well as an overlay of electronic.

37 There's no aid there. It's called
38 synthetic -- I'm sorry, virtual. And in that
39 case we can use those if we've lost the buoy to
40 weather. It's sunk or been dragged away, ice
41 damage, or in an emergency situation where now we
42 have an obstruction that wasn't necessarily
43 charted.

44 But we can at least project an
45 electronic AIS representation on electronic
46 charting so that mariners know that this is a
47 hazard area. We can avoid that.

48 We're also looking at opportunities to

1 expand that into our icebreaking operation, to
2 set down bread crumbs for track lines that have
3 been cut into the ice and then project that onto
4 the charts for the shipping that's going through
5 so they can make sure that they're staying within
6 the channel that was cut by the icebreakers.

7 So it's a very interesting
8 opportunity. One of the challenges we've had
9 though is clutter. The labeling of the
10 electronic aids as displayed on the vessels on
11 the electronic charting tend to get all bunched
12 up, especially when you start compounding AIS
13 signals from other vessels, it just becomes a big
14 mess. So we need to figure out a way to more
15 concisely identify the electronic aids so that
16 they don't clutter up the screen.

17 We have worked closely with NOAA in
18 our icebreaking operations and our understanding
19 of ice on the Great Lakes. Last fall, we sent up
20 some drones, or NOAA sent drones. We were the
21 platform that provided the access, attempting to
22 see if there's a technology capable of looking
23 down at the ice, sending light through and
24 getting a determination as to its thickness, its
25 configuration and makeup.

26 Also working with satellite imagery on
27 understanding the ice as well as the University
28 of Alaska has come aboard on an initiative that
29 was begun by Admiral Ryan.

30 She wanted to figure out a predicting
31 model on ice on the Great Lakes, what are we
32 facing, something that's a forecast, maybe more
33 like a hurricane condition type of chart but
34 something that would be a good planning tool,
35 able to fairly well predict where ice is going to
36 be and what type of ice we should face during a
37 certain period of time.

38 That's gained some traction. It's
39 left the 9th District. It's now in academia and
40 on the coast as well to expand to arctic
41 research. The hope is to be able to identify the
42 conditions that would indicate a certain type of
43 ice developing and would help us plan where we're
44 going to make sure our icebreakers are, how we're
45 going to queue vessels through a particular
46 waterway, whether or not we should or just wait
47 until conditions improve rather than put vessels
48 at risk, taking them where we probably shouldn't.

1 Offshore energy, a lot of folks are
2 looking to put windmills up in the lakes. This
3 is certainly going to be an obstruction and
4 potential hazard to navigation, so we need to be
5 absolutely certain where these things are and
6 whether they're being put in the appropriate
7 place so as to ensure that marine transportation
8 isn't impacted and they're appropriately located.

9 Waterfront development, the lakes are
10 being rediscovered. People are coming to the
11 water. That means more and more people are
12 competing with the waterway, so the accuracy of
13 navigation on the waterway is an absolutely
14 essential safety feature. We need to know where
15 everyone is, and we need to know where everyone
16 else is.

17 Marine sanctuaries, the marine
18 sanctuaries is, we have one in Thunder Bay,
19 another being looked at over towards Wisconsin
20 and Lake Michigan. The lakes have claimed a
21 tremendous number of vessels, and those vessels
22 on the bottom are an archeological treasure, but
23 they're also a tremendous attraction to divers.

24 Many of them are proximate to the
25 shipping lanes. This conversion of people and
26 commercial activity is a recipe for potential
27 disaster. We need to make sure that we're not
28 having a clash of cultures coming together here.

29 There is a move to mark the vessels
30 that are on the bottom with buoys. These would
31 be seasonal buoys permanently placed, provide a
32 mooring location so that those folks that are
33 going out there doing the recreational diving
34 don't drop down their anchors or grapnels down to
35 the wrecks, ending up wrecking the wrecks and
36 defeating the whole purpose of having the
37 sanctuary itself.

38 But there's some concerns with that.
39 Given the weather conditions, buoys get away.
40 These would be private aids to navigation, not
41 aids that are managed by or tended by the Coast
42 Guard.

43 So there's a certain number of costs
44 and certain provisions that have to be in place
45 to make sure that these buoys, one, they're in a
46 safe location outside of the main shipping
47 channels and that there's sufficient monitoring
48 in place to make sure that if they do get away,

1 they're retrieved quickly so they don't pose a
2 navigation hazard in and of themselves.

3 Alien invasive species between ballast
4 water and jumping carp trying to get up the
5 Mississippi as well as what we already have is a
6 particular challenge. And on the science side,
7 we link up with NOAA as well to address those
8 issues and head on particularly the invasion of
9 the Asian carp into the lakes would be
10 devastating. Soo Locks, I will leave that Army
11 Corps.

12 Likewise, water diversion, that's a
13 particularly sensitive issue, and I could
14 certainly see NOAA's involvement there as well to
15 make sure that we had the right people at the
16 table.

17 And I will leave it at that as a broad
18 overview of the Coast Guard's interest in
19 collaborative overlap with NOAA. I thank you for
20 the opportunity. I look forward to talking to
21 you further about the future of shipping on the
22 Great Lakes. Thank you.

23 (Applause.)

24 CHAIR HANSON: Thank you, Captain
25 Arnett. I'd like to open up to panel members.
26 Are there any questions? Susan, I think the
27 thing that always -- when you start talking about
28 recreational users and commercial users is how do
29 you guys fit in, that is, how you engage with the
30 Coast Guard particularly on the Great Lakes?

31 MEMBER SHINGLEDECKER: I could
32 probably ask this question at the start of every
33 panel meeting, but I would love to hear your
34 thoughts on issues that you have with
35 recreational boaters in the region and how that -
36 - how you're working with that and working with
37 NOAA on that.

38 CAPT ARNETT: Like you said, the lakes
39 are a tremendous place. They're being
40 rediscovered as a destination. In fact, I'm
41 still sore from going kayaking out of Bramalea
42 this weekend.

43 And kayakers in particular are a
44 challenge. It doesn't take much to go to your
45 newly opened Cabela's down the road, toss a \$250
46 kayak on your boat and splash it down. No real
47 obligation to have any understanding of the
48 complexities of the waterway.

1 And the Cuyahoga is one, and the
2 shipping canals of Chicago are another, where
3 each of the cities are trying to reinvest in
4 their waterway, make it a destination, bring
5 people to the water.

6 But these waterways work for a living.
7 These ships that go through here -- if you want
8 some entertainment, take a walk down to the
9 Cuyahoga and watch a laker thread this waterway
10 up to the steel mill. It's absolutely amazing
11 how they make 90, 102 degree turns. It's
12 precision.

13 But these are huge, and they don't
14 stop on a dime, and folks are out there without
15 lights, without much knowledge of the waterway,
16 the rules of the road and they're getting
17 themselves in precarious situations. It's scary,
18 to be honest with you.

19 That said, everyone has the right and
20 should have an opportunity to enjoy the
21 waterways. The question is how do we balance
22 that. And quite frankly, it's something we're
23 struggling with.

24 We're not going to shut down commerce
25 for the benefit of recreational boaters when
26 there are other opportunities. So we're looking
27 to work through the Harbor Safety Committees,
28 through the recreational communities, the
29 marinas, and get the dialogue going.

30 First, just simply awareness that
31 these things don't have a brake pedal. They
32 don't stop, and there's other hazards that are
33 invisible hazards, suction, being just brought in
34 underneath the vessel and the constricted
35 waterways.

36 NOAA's involvement with that would be
37 to -- I don't want to box them in, but certainly
38 it's making sure that charting is good so that
39 the deep-draft vessels have good water to be in,
40 allowing shallower water for those recreational
41 boaters to escape outside of any kind of
42 hazardous reach.

43 But it is, it's a constant pressure on
44 the waterway and one that's expanding.
45 Fortunately though, once you start the dialogue,
46 people do listen and you explain the dynamics of
47 large shipping. Generally, they get it. But the
48 challenge is getting the word out.

1 CHAIR HANSON: Any other questions?

2 MEMBER PERKINS: Captain Arnett, you
3 mentioned the marine sanctuaries and the wrecks
4 and the diving sites. And if I heard you
5 correctly, the proposal -- the plan is private
6 buoys marking those sites.

7 And so my question is, why not
8 electronic aids to navigation marking those
9 sites?

10 CAPT ARNETT: These particular buoys,
11 their placement is to serve as a mooring buoy.
12 The first rationale is to keep people from
13 dropping anchors and grapnels and securing
14 themselves to the wreck themselves, furthering
15 the damage. So that wouldn't work.

16 MEMBER PERKINS: Great. Thank you.
17 That's the piece I was missing. It's the mooring
18 piece that I missed. You had another comment
19 about the Coast Guard's providing input on where
20 charts need updated on the Great Lakes.

21 And you said you need a commitment
22 from NOAA. And can you add more color to that on
23 what that commitment is that you're asking for?

24 CAPT ARNETT: Yes. I'm just simply
25 looking for a return receipt type of arrangement.
26 Whenever we identify an error or discrepancy on a
27 chart, we submit that in. And it's not
28 necessarily our discovery.

29 It could be coming from -- and more
30 often than not, it's coming from mariners. And
31 we go out and verify. But we provide the
32 information on up to NOAA.

33 We'd just like to make sure that it
34 has been received. It's been queued for
35 consideration and have some sort of tracking
36 opportunity to see where it stands in the process
37 of consideration.

38 MEMBER SHINGLEDECKER: I just want to
39 --

40 MEMBER PERKINS: Seems like a logical
41 and reasonable request.

42 MEMBER SHINGLEDECKER: Scott, I just
43 wanted to follow up on the e-Aids to Navigation
44 or virtual AtoNs. Exciting technology when it
45 comes to recreational boaters, if it's in
46 recreational locations or you're trying to
47 communicate information to recreational boaters.

48 The vast majority of them will not

1 have the technology onboard to access that
2 information, so that's just an important thing to
3 consider.

4 MEMBER PERKINS: Chairman, if I can
5 make one more comment, I just want to share with
6 you last month I did the MR340, the Kansas City
7 to St. Louis endurance paddle event. It was a
8 Coast Guard sanctioned event.

9 So I have personally encountered
10 dredges, barges and large commercial traffic from
11 the perspective of sitting in the canoe as these
12 things come upstream.

13 So I know exactly what you're talking
14 about, about the novice getting on a major
15 maritime waterway for recreation and having no
16 idea what you're about to encounter. So it is
17 indeed a problem.

18 CHAIR HANSON: And of course you had
19 your charts with you. Right? I think one of the
20 things I always think about on the Great Lakes is
21 the diversity of the environment.

22 You're talking all the way from Duluth
23 to, I mean, to Buffalo. Do you have the same
24 recreational issues throughout the lakes, or is
25 it certain -- obviously near the major city, I
26 suspect, is where the recreational issues are.

27 But taconite coming out of Minnesota
28 and all the other commerce, just curious if you
29 can comment a little bit on the diversity of the
30 environment.

31 CAPT ARNETT: Right now, it is in the
32 major population centers. It's going to be on
33 the Cuyahoga, Chicago. I haven't heard so much
34 around Toledo. Detroit has a different story.

35 There's an annual float-down there
36 that's an unsanctioned event, and if you watch
37 the news, the United States invaded Canada last
38 month with about 1500 inebriated individuals that
39 the wind blew over there and the Canadians were
40 good enough to return them.

41 So it is primarily in the major
42 population areas, and this isn't just in the
43 Great Lakes. We had similar issues in Boston and
44 other cities as well, certainly around New York.

45 The waterways are interesting. People
46 are rediscovering them. Now you don't just have
47 a bicycle. You have a kayak and then it's making
48 it accessible to folks.

1 So potentially Duluth, I don't know.
2 It's probably a short season up there. But for
3 the Great Lakes, it is our region here in
4 Cleveland and over in Chicago. But I would
5 expect it'll grow. This is a national issue, not
6 simply a Great Lakes issue.

7 DR. MAYER: Coming back to the
8 question of sanctuaries and wrecks, are there
9 survey requirements before establishing a
10 sanctuary? And if there are, have those been all
11 fulfilled?

12 CAPT ARNETT: NOAA is managing the
13 sanctuaries. They make the declaration and then
14 it goes through a process. And I would refer you
15 to their website for great detail.

16 The proposals are online, and you can
17 see where they're looking at. And they actually
18 provide a couple different alternatives to the
19 proposals as well. So that process is entirely
20 in NOAA's hands.

21 But there is an opportunity for
22 feedback, both public comment as well as
23 interagency comment. The wrecks are already
24 charted. Not all of them are eligible for the
25 buoys to be affixed to them. Some of them are
26 sitting right in the middle of a channel. That's
27 not going to work.

28 But there are clusters that are
29 outside the channel. I believe the closest to a
30 primary channel of the latest iteration is the
31 one that's up on Lake Michigan that's being
32 proposed. It's about a mile and a half from a
33 channel. But I'd have to look into the proposal
34 again.

35 So it's not every wreck in the Great
36 Lakes. You wouldn't be able to go out on the
37 Great Lakes if that were the case, but there are
38 definitely areas that are set-asides for the
39 proposed sanctuaries.

40 VICE CHAIR MILLER: In terms of the
41 sanctuary area, in Hawaii the -- a lot of the
42 wrecks, they don't want to tell the exact
43 location. Is that different in the Great Lakes?

44 CAPT ARNETT: There's probably gold on
45 those, but ours was grain that fed the fish long
46 ago. Not that I'm aware of, as far as I know all
47 the -- there's hundreds and hundreds of wrecks.
48 I think the highest concentration of wrecks

1 anywhere in our Great Lakes, and they're on
2 charts.

3 With the exception of Erie, a lot of
4 the lakes are very deep. Erie is almost like a
5 floodplain more than a lake compared to the
6 others. But the ones we know of are charted. I
7 don't know if there's anything out there that is
8 yet to be discovered.

9 MEMBER KELLY: Captain Ed Kelly here.
10 Question, you mentioned Canada. Obviously they
11 are joint waterways and there's joint
12 responsibilities. Is there anything you want to
13 bring to the attention of this panel regarding
14 navigational issues, survey issues, et cetera for
15 how you interplay with the Canadian entities?

16 CAPT ARNETT: I do understand the
17 current effort underway to -- for the new datum,
18 it's International Great Lakes Datum, and it's
19 going to be a collaborative effort between NOAA
20 and their Canadian counterparts.

21 For our part, we work very closely
22 with the Canadian Coast Guard in planning and
23 executing the icebreaking season. In fact, we
24 have an icebreaking conference coming up shortly
25 where last year we hosted it here in Cleveland.
26 This year it will be in Canada.

27 They have two icebreakers that they
28 contribute that are approximately the same size
29 as the Mackinaw. They're good size. If it
30 appears through forecasting that it's going to be
31 a particularly rough winter in terms of ice,
32 they'll also shuttle in a couple additional
33 icebreakers to support us. That's what they had
34 to do in '15 and '14.

35 So we work very closely with them. In
36 the morning we have an ice teleconference where
37 we go ahead and identify what the tactical
38 operation is going to be for that particular day.

39 And it doesn't matter if it's a
40 Canadian cutter or a U.S. cutter, we operate as
41 one fleet during the icebreaking season. It's
42 just based upon the capabilities of the
43 particular vessel and where they are and where
44 the vessels are that are in the queue to be
45 moving.

46 So it's almost as one entity when it
47 comes to working the winter ice season.
48 Throughout the regular season we support one

1 another for search and rescue operations.

2 We have primarily a helicopter fleet.
3 They have C-130 capability, so they're able to go
4 up and do reconnaissance and stay in the air for
5 a great deal of time and identify an individual.
6 And then we can go in with the helicopters or the
7 vessels and extract them.

8 We also work with each other for
9 border protection. They sent back our illegal
10 immigrants a couple weeks ago, so it's pretty
11 effective. So it is a particularly close
12 relationship here on the lakes.

13 Admiral Ryan works very closely with
14 her Canadian counterpart, Commissioner Gascon.
15 They have an outstanding relationship. For
16 example, the Blough went aground just outside of
17 Whitefish Bay.

18 The forward, let's see, port quarter
19 was in Canadian water, which was the damaged
20 portion which the Canadians noted and
21 appreciated. And the rest was in the U.S. The
22 ship was right down the middle sitting on a reef.

23 It's our ship. It went aground
24 starting in U.S. water, so we had the response,
25 but we immediately reached out to the Canadians
26 and then had them fully engaged in each and every
27 brief along the way as a unified command.

28 A few weeks later, they were able to
29 return the favor when one of their vessels went
30 aground on their side, and that was outside of
31 the Buffalo region. So we have very close
32 relationships with the Canadians and we've come
33 to depend upon them.

34 CHAIR HANSON: All right, Captain
35 Arnett, thank you very much. Thank you for
36 taking all the questions. You can probably tell
37 we can keep pummeling you with questions for a
38 while here, but thanks again for speaking to us.

39 (Off microphone comment)

40 CHAIR HANSON: It's typically the
41 other way around, but that's okay, appreciate you
42 being here. And Josh, before you get started, I
43 neglected to mention a couple housekeeping notes
44 if you'll permit me.

45 First off, restrooms are outside if
46 you guys haven't found those yet, appreciate
47 keeping the traffic to a minimum. As you can see
48 the room here and like to keep the focus on the

1 speakers and the conversation, so appreciate your
2 honoring that.

3 Cell phones silent, please. I think
4 I'm going to double check mine now even though I
5 triple checked it already, but the speakers
6 certainly do appreciate the lack of interruption.

7 And then finally from a safety
8 perspective, the exits. Obviously we came up the
9 elevators some of you. There's also a stair just
10 to the right in case the elevators are out of
11 commission and in case of emergency, let's go
12 down the steps and meet outside.

13 It is late August, early September.
14 If it was a different part of the year, we might
15 not want to spend that much time outside, but it
16 should be a nice day outside. So hopefully that
17 won't be necessary, but I did want to mention
18 that.

19 All right. Josh Feldman is here from
20 the Buffalo District, Great Lakes Division's
21 Chief of Operation. Thanks for joining us. We
22 do like to have the Corps at these meetings,
23 important partner in all these issues.

24 And last time we met in Galveston we
25 had Chris Frabotta come speak to us as well, so
26 your colleague from a different part of the
27 country. So welcome and look forward to your
28 comments, Josh. Thank you.

29 MR. FELDMAN: Thank you, Chairman. As
30 the chairman mentioned, my name is Josh Feldman.
31 I'm here representing the Great Lakes and Ohio
32 River Division.

33 My outgoing commander, Colonel Bigelow
34 and my incoming commander -- it's happening this
35 week, the change of command -- Brigadier General
36 Toy send their regrets.

37 But I'm happy to be here, and I'd like
38 to take the time allotted to me to talk a little
39 bit about what the Corps does on the lakes, how
40 they do it and why they do it. So I guess the
41 why is upfront. The economic value of the Great
42 Lakes to the region and to the nation really
43 can't be overstated.

44 The Great Lakes navigation system is
45 a little bit unique, especially compared to the
46 port navigation or the coastal navigation system
47 where all 140 of our ports, or primarily the
48 commercial ones, are heavily interdependent on

1 each other.

2 We can't focus our efforts on only
3 those high-use harbors and expect that the
4 traffic will move there. Cargo is shipped out of
5 the areas where the raw material is mined or
6 harvested, and it's pushed to the end user.

7 Oftentimes that end user is at the
8 harbor facility or at the port facility without
9 any other way to receive that material. So it
10 isn't a matter of, well, everybody has port
11 facilities or 60 of them on the Great Lakes. We
12 can push it wherever.

13 We have to maintain the system as a
14 system in order to keep it healthy. It moves 145
15 million tons a year. Twenty percent of that is
16 exported. The real bottom line here and the
17 reason why we're in business doing what we're
18 doing is that the Great Lakes navigation system
19 saves the nation \$3.6 billion each year over the
20 next least-cost mode of transportation.

21 And that has a big asterisk on it
22 because that assumes that the next least costly
23 mode of transportation is available and that it
24 has capacity. And in fact, it probably does not.

25 So this just gives you a sense. It's
26 a graphical depiction of where our U.S. harbors
27 and ports -- our federally maintained ports and
28 harbors are on the Great Lakes. The red are the
29 commercial, 60 of those, and 80 of them are
30 federally maintained in theory and authorization.

31 In practice it's a different story,
32 but 80 of them are recreational harbors. But
33 this gives you a sense of the proximity and the
34 geographic disparity of them.

35 Great Lakes navigation for us, the
36 Army Corps of Engineers, really it requires four
37 components. The bread and butter of what we do
38 is dredging. In a very related matter and a very
39 hot topic as of late is managing the material
40 that we dredge out of those channels.

41 We have the onus to maintain the
42 navigation structures, those piers, breakwaters,
43 jetties that form in a lot of cases these non-
44 natural harbors and really the lynchpin of the
45 system, the Soo Locks connecting the upper lakes
46 with the lower lakes.

47 And again, the interdependency of the
48 system requires that system approach, and

1 recently Congress has started to recognize that,
2 that although Corps of Engineers is funded and
3 appropriated and authorized on a harbor by harbor
4 by harbor basis, to do that, to isolate those
5 harbors and try and fund or try and direct
6 funding towards a specific harbor does an
7 inservice to the -- or disservice to the system
8 as a whole.

9 So dredging. Most of the dredging on
10 the Great Lakes, actually all now, is done by
11 contract, and most is done by clamshell. So you
12 see -- you can see a depiction of it there. It
13 seems to be a relatively low-tech operation, but
14 we have a handful of contractors that make it
15 their living to do this dredging and do a very
16 good job of it.

17 And this again, it's just another
18 graphical depiction. I won't go through each
19 harbor, but it just gives you a sense. The green
20 dots and triangles are those harbors that we're
21 funded at in FY '16, in fiscal year '16. And the
22 red are where we're not.

23 And those dots will move around from
24 year to year, but some of the higher use or some
25 of the more -- those harbors that require a
26 greater need or have a greater dredging need will
27 be funding year in and year on. But we do try
28 and address all the harbors that see commercial
29 traffic on the lakes.

30 The reason I put this slide -- it's a
31 list of harbors that are funded but this tells a
32 little bit of a story. I just mentioned a little
33 while ago that Congress has started to recognize
34 the Great Lakes as a system.

35 But the other thing they're starting
36 to do, and it started with the Water Resource and
37 Development Act, is they're starting to fund us
38 better. The President's budget provided the
39 funding for the harbors that are listed there in
40 black.

41 And then each year over the last
42 handful of years that Congress has set aside --
43 we call them pots of funds, additional
44 appropriations, whatever you want to call them.

45 But it gives the Corps a little bit
46 more discretionary authority to go after some
47 harbors that may not be addressed through the
48 President's budget. And those are those red

1 harbors. The pluses indicate that we just have
2 additional quantity, but we also picked up
3 harbors that weren't at all funded. And that's a
4 very, very, very positive sign.

5 So FY '17, this is our President's
6 budget. It gives you a sense of the order of
7 magnitude of funding. As I said, we're getting a
8 \$3.6 billion return on this investment, \$100
9 million investment each year. You see it's about
10 40 percent goes towards dredging.

11 We have another ten or so in dredge
12 management and six focused on the Soo and the
13 balance of that is hydrographic surveys, a lot of
14 different support activities that keep the system
15 moving.

16 Again, sensing of where those harbors
17 are, and you can see there's a lot fewer green
18 dots on this map. Again, this is just the
19 President's budget, so we expect or hope, I
20 suppose, to see additional funding when the
21 Congress signs their appropriations bill, if they
22 sign an appropriations bill.

23 In this slide I won't bore you with
24 the numbers, but it's the trend that's
25 interesting. The days of the year mark are long
26 gone, and that used to be the greatest way that
27 we could address -- the Corps could address the
28 maintenance needs at our recreational harbors is
29 that the members would go to the Hill and bring
30 home the bacon for whatever recreational harbor
31 they had in their district.

32 Once that ended in about 2010, you see
33 our funding ended. There was a little anomaly in
34 2014. There was a regional provision that was
35 given to the state of Michigan, but generally
36 speaking, it's dried up and we don't see the
37 forecast changing anytime soon.

38 So we often get calls from concerned
39 citizens, from the Coast Guard, of different
40 issues that show up in those harbors but we don't
41 have two nickels to rub together to address them.

42 Dredge material management, I'll
43 briefly touch on this. This is probably our
44 greatest challenge. Dredging is something we --
45 I said it. It's our bread and butter. We do it,
46 and I think we do it fairly well and fairly
47 economically.

48 Dredge material management's the 800

1 pound gorilla. It is something that we're having
2 a very difficult time coming up with long-term,
3 large scale sustainable ways to manage the dredge
4 material other than putting it in the open lake.

5 And I'll tell the story here quickly.
6 The short of it is prior to the Clean Water Act
7 passing in the 70s, it was -- the dredge material
8 management was placed in the open lake.

9 Then after the passage of the Clean
10 Water Act, the Corps said all right. Let's
11 figure out a way to get this legacy material out
12 now that there's regulation in place to prevent
13 the continuation of the pollution. Let's figure
14 out a way to just get it out of the system, set
15 it aside.

16 So we built confined disposal
17 facilities. A lot of them were in the water or
18 are in the water, just dike structures that we're
19 filling up and essentially creating fastland.
20 And we're at that point now where most of it is
21 fastland, that there isn't a lot of capacity
22 left.

23 So rather than return to the typical
24 solution of putting it in the open lake, although
25 we have been doing that at a vast majority of our
26 harbors, we're looking at other ideas of how do
27 we take this material, in some cases 3 million
28 yards or in some years 3 million yards in the
29 Great Lakes and find something useful to do with
30 it and sustainable.

31 There's always really good ideas for
32 10, 20, 30,000 cubic yards at some harbor, but
33 it's a matter of finding something that we can do
34 year-in and year-out on that type of volume.
35 That's been our biggest challenge.

36 Navigation structures. This is the
37 third of the four categories of work that I
38 mentioned. Of course they provide the safe and
39 predictable wave climate for commercial
40 navigation and recreational navigation.

41 A lot of times the recreational
42 kayakers and fishermen will be behind them either
43 fishing off them or enjoying the water there. It
44 also prevents shoaling within our harbor to an
45 extent.

46 And there's some additional benefits.
47 They originally authorized the navigation
48 project, but of course they -- a lot of the

1 cities, these were built 100 years ago. A lot of
2 cities have grown up behind them because of the
3 storm and wave protection that they afford.

4 They also protect some of our confined
5 disposal facilities and again, a lot of critical
6 infrastructure, municipal infrastructure.

7 This is our challenge though. Fifty
8 percent of them were -- are 100 years old. They
9 were designed for a 50-year service life. Eighty
10 percent of them have exceeded that, and we really
11 just haven't addressed the greatest needs.

12 We've done recently quite a bit of
13 work through the Sandy Supplemental as I think a
14 lot of folks in the room are aware. The Great
15 Lakes took a huge blow from Superstorm Sandy, and
16 so did our breakwaters.

17 And there was quite a bit of funding
18 set aside from the Congress to address that, and
19 we used that. So we actually have some real
20 costs, and we're talking for a lot of these it's
21 \$10,000 a foot to repair, to completely
22 rehabilitate some of these breakwaters.

23 So the funding requirements to renew
24 and recapitalize these structures that as I said
25 before, a lot of them form -- physically provide
26 the safe harbor for these ports, is very, very
27 difficult.

28 And 30 percent -- the recent low
29 water, although I guess that's kind of an old
30 thing, but they did see quite a bit of advanced
31 deterioration once those timber cribs were
32 exposed to atmosphere.

33 And this is just a graphical depiction
34 of the condition. It's a typical stoplight
35 system, red, green, amber. Well, I guess it's a
36 few colors on there, but you can kind of get a
37 sense of -- there's not a lot of green.

38 There's a few places that are.
39 There's a few places we've been able to get after
40 or been able to maintain or just have weathered
41 the storms better. But a lot are in that yellow,
42 orange and red category.

43 And you can see some of the magnitude
44 of costs along that left column to restore those
45 breakwaters and navigation structures.

46 And then the fourth area that we're
47 most concerned with and draws probably the
48 greatest attention, maybe second only to

1 dredging, from the shipping industry is Soo Lock
2 reliability.

3 There are three locks on the Great
4 Lakes. There's the Soo. There's Black Rock Lock
5 and there's the Chicago Lock. But the Soo Locks
6 are the ones that see 70 percent of the
7 commercial commodities on lakes.

8 I'm sorry. Seventy percent are
9 limited to Poe Lock. That's important because
10 there's actually two locks, of course the Soo
11 Lock, the MacArthur and the Poe. The Poe is the
12 largest, so 70 percent of the commodity
13 transitioning the Soo is limited to the Poe
14 Locks.

15 Poe Locks are aged. There's no
16 redundancy, and you can see that they have a huge
17 consequence if and when there's an outage at the
18 lock. The 30-day estimate of impact to industry
19 is about \$160 million.

20 So we're not blind to that. We've
21 done what we can within the authorization
22 appropriations that we have, so there's two
23 things that we're doing. Through our O&M
24 program, we're implementing an asset renewal
25 plan.

26 It's a very deliberate and well
27 planned approach to address the most critical
28 needs of the Soo at the Soo Locks and start to
29 recapitalize the existing lock. We were
30 authorized the construction of a redundant Poe
31 Lock at 100 percent federal expense, which is a
32 huge win.

33 Unfortunately, it just hasn't gotten
34 off top dead center, and the primary reason is --
35 well, of course it's always funding, but right
36 now we have a benefit-to-cost ratio that -- well,
37 when it was first looked at was less than one.

38 So there's been quite a bit of work to
39 relook at that because there's been quite a bit
40 of founded allegation that the benefits weren't
41 properly captured.

42 So our economists out of our Detroit
43 district have gone back and relooked at that, and
44 there's quite a bit of indication that the
45 benefit-to-cost ratio will be far more favorable.

46 And again, for us it always comes --
47 I guess everything comes down to money, but this
48 just gives a sense. And again, this is only up

1 here, not for the pure impact of the numbers but
2 the trend.

3 You can see in the late 2000s we had
4 considerable funding. We were in the green,
5 sustainable funding range. That's what we think
6 we need to maintain year-in and year-out, not to
7 lose traction or lose ground against the changing
8 condition on the lakes.

9 We had a huge drop off in 2011, 2012.
10 Our President's budget shrank. Congressional
11 adds went away, but now you're starting to see
12 that trend reverse.

13 And really the catalyst for that was
14 that Water Resources Development Act that I
15 mentioned, that renewed the focus, directed the
16 Congress to renew focus on the Great Lakes and
17 direct more of the Harbor Maintenance Trust Fund
18 to these harbor projects.

19 And you can see that. That green band
20 in '14, '15 and there is one for '16 -- it's just
21 depicted on the slide -- is those additional
22 provisions that Congress gave us.

23 So the takeaway here is for us, the
24 Great Lakes navigation system as I mentioned,
25 it's a huge asset to the region and the nation.
26 It's the cornerstone for our American steel
27 industry.

28 It provides great cost energy -- great
29 energy at a low cost. You see quite a bit of
30 construction materials go through that spur
31 construction throughout at a low cost, that spur
32 construction throughout the Great Lakes region.

33 Our grain is competitive, and of
34 course, we try to tout the environmental
35 sustainability implications for using water to
36 transport goods. So with that, questions?

37 CHAIR HANSON: Thanks, Josh. I'll
38 start off with the first question in terms of the
39 funding and the capabilities. One of the things
40 that the ARRA funding exposed throughout the
41 country was Corps' ability to execute and given
42 the money.

43 So you've got a record \$100 million,
44 \$109 million present when everybody else is going
45 down, so congratulations. The question is, we
46 talk about in terms of shovel-ready, research-
47 ready, survey-ready with this group.

48 How much money -- what's the

1 capability on an annual basis? If -- it's \$109
2 million plus what?

3 MR. FELDMAN: Much of what we do, 90
4 percent is done by contract. So really it's the
5 contractor's capability more than anything.
6 We've estimated, to give you a hard number,
7 somewhere in the 160 to \$170 million range.

8 It should be well and above anything
9 we can reasonably expect, so we think we're well
10 positioned no matter what happens, good or bad
11 that we can execute.

12 CHAIR HANSON: Okay. And as the
13 largest dredging company in the U.S., Great Lakes
14 Dredge and Dock, we'd love to come back to the
15 lakes if that funding ever gets to that level.
16 Right?

17 MR. FELDMAN: Yes, sir. I would love
18 to have you back, too. Competition's a good
19 thing.

20 VICE CHAIR MILLER: Yes. Can you kind
21 of outline briefly what the most important NOAA
22 services to you are?

23 MR. FELDMAN: I kind of glossed over
24 it. We have a pretty robust hydrographic survey
25 capability. It's really kind of an augmentation,
26 a real time picture of the charting that NOAA
27 does.

28 So of course, we -- well, what we do
29 is both out of Buffalo and our Detroit district
30 is we have, as I said, hydrographic survey
31 capability that we do survey of the federal
32 projects.

33 So we provide project condition
34 surveys that are available to the public. Now a
35 lot of those, of course, are based off NOAA
36 gauges. We use the charting as kind of an
37 underlay for our products.

38 And I know there's quite a bit of
39 linkage between those two, both the charts and
40 the project condition surveys that we provide.
41 So I mean it's invaluable, the data and resources
42 that NOAA provide that allow us to provide that
43 hydrographic survey capability.

44 MEMBER PERKINS: Mr. Feldman, are you
45 moving into remotely operated hydrographic survey
46 vessels? What new technology is Army Corps
47 embracing on the Great Lakes to bring more
48 efficiency into that hydrographic surveying cost?

1 MR. FELDMAN: No, we're not moving --
2 we have some ROV capability. We're looking at
3 unmanned aerial. We have some smaller vessels.
4 I mean when I say small I meet three, 4 feet
5 small, single beam, ROV type capabilities.

6 But where we've really made the
7 greatest advances is we are staying on top of the
8 state of the industry with our software and
9 equipment that is vessel mounted. All of our
10 crews now are multibeam survey capable.

11 We have vessel mounted LIDAR so we're
12 able to take pictures both underwater and above
13 water. We've just actually recapitalized our
14 fleet, especially in Buffalo. And we're in the
15 process of doing it in Detroit.

16 So we have a reliable fleet, one that
17 can work in more difficult conditions, weather
18 conditions and we're actually, because of all
19 these kind of changes, we've actually gone to
20 smaller crew sizes and we produce more data in a
21 given year than we ever have.

22 FEMALE PARTICIPANT: The hydrographic
23 data that you're collecting from those vessels,
24 does that get submitted to NOAA somehow for
25 charting, or are you charting that in some other
26 way or giving that to the use and the needs in
27 some other way?

28 MR. FELDMAN: We are not explicitly
29 providing to NOAA. We make it available, but to
30 answer your question, we post to our website. We
31 post it both in just a PDF format so it's usable
32 to the general public, but we also had
33 MicroStation and AutoCAD, XYZ data points that
34 can interface.

35 That's actually one of the suggestions
36 that I came here with is to have on the charts,
37 on the NOAA charts, some linkage. I don't know
38 the right mechanism for it, but to where we store
39 our data.

40 We update our data very frequently
41 just because we're doing project condition
42 surveys or just a general survey, but we're also
43 doing dredge surveys, so there's tons of data.

44 So it's almost easier to have NOAA
45 link to us than us to push to NOAA, I think,
46 unless somebody's smarter and it says that's no
47 way to go.

48 RADM SMITH: Josh, I'm very interested

1 in making that better. We have some very old
2 fashioned ways of doing that. I could go back to
3 channel tabs, which nobody loves, and some other
4 very laborious ways of doing it. But I like the
5 direction of your thinking and would like to
6 follow with you on that.

7 MR. FELDMAN: Okay. Thank you, sir.

8 MEMBER MAUNE: You mentioned vessel-
9 mounted LIDAR. I'm used to the aerial LIDAR.
10 Can you explain how you use the vessel-mounted
11 LIDAR?

12 MR. FELDMAN: It's very similar. It's
13 just that. It is mounted. We have both
14 stationary LIDAR capabilities where we take a 360
15 degree picture, but this is a relative -- well,
16 it's new to us -- a relatively new technology.

17 So it has heat, pitch and roll
18 compensating capabilities. So it just sits on
19 the back of the boat, and it'll interface. There
20 is actually some overlap if we're taking a
21 multibeam.

22 Probably the best example is a
23 breakwater. So if we're running along the
24 breakwater and taking multibeam survey you start
25 to get refraction near the surface where the
26 LIDAR can penetrate a little bit under the water,
27 and it completes the picture above water.

28 So it's actually just an integrated
29 XYZ-type survey. But the density of the data is
30 so great that you actually get really kind of a
31 topographic map, and a detailed one at that.

32 MEMBER LOCKHART: I want to clarify
33 that you're talking about in-air LIDAR, so it's
34 above the water line, not below the water line.
35 Correct?

36 MR. FELDMAN: Well, there is -- yes.
37 It is in-air.

38 MEMBER LOCKHART: Or are you using
39 both?

40 MR. FELDMAN: There is a little bit.
41 There is some overlap. I mean we're talking in
42 the first foot of so, that we kind of -- we
43 select the best data, but yes. It is in-air.
44 Yes, it's not below water.

45 MEMBER LOCKHART: Okay. Thanks.

46 MEMBER BRIGHAM: I just wondered about
47 the extension of the navigation season through
48 the ice season and the impacts on the Soo Locks

1 and how is their relationship and maintenance and
2 just whole operation.

3 I was here long ago when we actually
4 had year-round navigation throughout the whole of
5 at least the upper lakes, and it seemed like that
6 was a controller, whether the locks would be
7 operating through the winter.

8 MR. FELDMAN: Let me make sure I
9 understand. Are you asking -- let me see if I
10 can answer it this way, and you let me know if I
11 answered it for you. Yes, so our closure season
12 of course is well negotiated and well-
13 coordinated, I guess, with the Lake Carriers,
14 with the Coast Guard.

15 But of course it is primarily driven
16 by the maintenance requirements in the off
17 season. And there's -- like I said, there's a
18 lot of push to keep as much outages -- or keep
19 the outages as low as possible and cram as much
20 work in and do as much work as we can while the
21 locks are operating.

22 MEMBER BRIGHAM: Thanks.

23 MEMBER SHINGLEDECKER: You hinted at
24 water level challenges with regard to the
25 maintenance of the breakwaters. I was wondering
26 -- this could be for either of you. Certainly
27 the Great Lake water levels are very dynamic, and
28 do you have the tools that you need to predict
29 and manage to changing water levels?

30 MR. FELDMAN: I think I can answer
31 that, too, if you want.

32 CAPT ARNETT: I was going to say from
33 our point of view, we're relying upon their
34 models for sourcing that. But I think the best
35 predictor is whether or not we have ice. If we
36 have ice, the water came back last year. We have
37 a few more of that. The best way to manage the
38 ice is not have it, but there's consequences.

39 MR. FELDMAN: Yes, I echo the
40 captain's comments. Sure, we spend a lot of time
41 and actually John Allis from our Detroit district
42 who is head of our Hydraulics and Hydrology
43 Department will be here tomorrow as part of a
44 panel.

45 And he heads up that effort of
46 modeling and predicting water levels, but again,
47 for us we can only manage to what our
48 authorizations are. Now there was when we had

1 the severe low water levels, there was a push.
2 And we executed some dredging that instead of
3 just being say 27 feet below low water datum, we
4 actually were allowed to dredge 27 feet before
5 water.

6 So there was some additional dredging
7 that was allowed to be done to maintain those
8 depths. But yes, a rising tide floats all boats,
9 so the better and more water we have, the better
10 we are. And Scott mentioned, it's ice that --
11 when we see ice, we get excited.

12 CHAIR HANSON: We're going to have to
13 cut the questions off there because we could talk
14 all day. Again Josh, appreciate you being here.
15 There's so many important topics you guys are
16 involved in.

17 The dredge material management is very
18 important. You guys looked to privatization this
19 last year and had some interesting conversations
20 and interesting results.

21 You've also got involved in some state
22 engagements, state of Michigan coming up with
23 money for some of their dredging as well. And so
24 you're seeing a more systemic approach to all
25 this.

26 But both the Coast Guard and the Corps
27 are very important partners for NOAA and for this
28 effort, so we appreciate your being here.

29 MR. FELDMAN: Thank you.

30 CHAIR HANSON: Last speaker, Dave
31 Holst. You're going to speak from here, Dave, or
32 you going to --

33 MR. HOLST: I can speak from here.

34 CHAIR HANSON: As you wish. Chief of
35 Staff of NOAA's Ocean Service. We introduced him
36 before, and now without his right hand up --

37 MR. HOLST: Exactly.

38 CHAIR HANSON: -- welcome.

39 MR. HOLST: All right. Good morning,
40 and thank you to the HSRP panel for having me as
41 the NOAA representative today. I really
42 appreciate the opportunity.

43 First I want to congratulate Anne,
44 Gary and Lindsay Gee as the newest members. The
45 panel now has a full complement of members, and I
46 think there's diversity and a broad breadth of
47 expertise and experience, which is great.

48 Vice Admiral Manson Brown, the NOAA

1 Deputy, and Dr. Russell Callender, the NOS
2 Assistant Administrator, asked me to convey their
3 greetings to all of you and their regrets for not
4 being able to be here. But they did want me to
5 pass along their great appreciation for your
6 commitment and the expert advice you provide the
7 NOAA administrator.

8 NOAA leadership certainly recognizes
9 the importance of HSRP in providing innovative
10 ideas on how NOAA can improve our navigation
11 programs and products and services.

12 And your guidance also helps shape and
13 define NOAA and industry roles in a thoughtful
14 and effective manner for both independent and
15 collaborative efforts, so we certainly share your
16 commitment to the success of NOAA's hydrographic
17 services today and into the future. And you all
18 play a very important role in that.

19 So we're right down the street from
20 the Rock n' Roll Hall of Fame, and the late,
21 great David Bowie had a song called "Changes,"
22 and I think that's appropriate. There's a lot of
23 changes here and into the future.

24 We have three new panel members. We
25 have a new chair, a new vice chair. Rear Admiral
26 Smith is the new Director of Co-Survey. We had a
27 3-in-1 ceremony last week with promotion, change
28 of command and retirement.

29 And we certainly are going to miss
30 Rear Admiral Glang, but we look forward to Shep's
31 leadership in co-survey and his role as the
32 Designated Federal Official for this panel.

33 But we're also upcoming -- there's a
34 presidential election, which means we'll soon
35 have a new administration and new political
36 leadership within NOAA.

37 And for us within NOAA, that means we
38 need to develop new relationships with the new
39 political team and try to quickly educate them on
40 the Ocean Service and the value and the
41 importance of the products and services we
42 provide.

43 We're in the process of planning for
44 the transition, but it'll kick into high gear
45 right after the election when the landing team
46 from the winning party arrive at NOAA.

47 But also, there's -- many of our NOAA
48 partners are starting to plan for the next

1 administration, the transition as well. And I
2 encourage the HSRP to begin thinking about how to
3 strategically message to the next administration
4 the unique value of this panel and also the
5 importance of NOAA's hydrographic products and
6 services.

7 But with change comes opportunity as
8 well, and there's also an opportunity to really
9 advocate. And I know Dr. Callender in the past
10 has talked to the panel about advancing the
11 understanding the delivery of stakeholder needs.

12 And I know you've worked hard to
13 identify and provide recommendations on
14 technology and infrastructure through the three
15 issue papers, the NOAA Hydrographic Survey Fleet,
16 the Hampton Roads Regional Pilot Project as well
17 as the U.S. Maritime in the Arctic, Charting the
18 Arctic.

19 And these papers are really concise
20 and compelling, and you've done a really nice job
21 on these. And my understanding is there's more
22 in development, and I look forward to reading
23 those and also hearing from the panel on how best
24 to maximize the impact of these papers,
25 particularly with the upcoming transition.

26 I do want to note, I do and NOS and
27 NOAA certainly share your concerns on the
28 Hydrographic Survey Fleet. The hydrovessels are
29 some of the oldest in the NOAA fleet, and we are
30 seeing the impact of old aging vessels on
31 execution.

32 And it is a priority for NOS and for
33 NOAA to recapitalize the fleet. We're starting
34 to get Congressional support. We have got a
35 number of internal and external efforts to refine
36 the requirements as well as what the make-up of
37 the NOAA fleet should be in the future. So it is
38 a big priority for us as we move forward.

39 Let me move on to budget, which always
40 takes up a lot of our time. So the House and the
41 Senate appropriations committees have passed the
42 FY '17 NOAA funding measures. Unfortunately,
43 they're both below the President's budget for the
44 navigation, observation and positioning programs.

45 They are actually below the
46 President's budget across the board for NOS. The
47 House proposed \$11.8 million below the
48 President's budget. The Senate, 2.5. That's

1 generally how it goes. The Senate's much more
2 favorable than the House.

3 But as you imagine, \$11.8 million
4 reduction would have significant impacts across
5 the board on NOAA's hydrographic products and
6 services. It will almost certainly be on a
7 continuing resolution to start the year.

8 And so we'll be operating in FY '16
9 funds until a budget is passed. No idea when
10 that's going to be, but based on the last couple
11 presidential elections, that usually hasn't
12 happened until the springtime.

13 So we will likely be operating under
14 a CR until the spring. But we certainly are
15 going to hope for -- much closer to the Senate
16 than the House for sure.

17 So I think it's appropriate that this
18 meeting takes place in Cleveland, to highlight
19 the importance of the Great Lakes and not only
20 the environmental, economic and social importance
21 of the fourth coast.

22 And I grew up on the Great Lakes, just
23 north on Lake Michigan, just north of Chicago, so
24 the Great Lakes are near and dear to me. And
25 it's my first time in Cleveland, but I'm looking
26 forward to coming back here in late October when
27 the Cubs play the Indians in the World Series.
28 But I will not be rooting for your home team
29 here.

30 CHAIR HANSON: I think there's another
31 rock n' roll song called "Dream On."

32 MR. HOLST: So -- but I'm looking
33 forward to this week. It should be a very
34 productive meeting. We've got some really good
35 topics and speakers, which you've already heard
36 several today this morning.

37 I'm really looking forward to this
38 afternoon's panel and the regional navigation
39 issues. And NOAA is really interested in hearing
40 the panel's perspective on the issues, the
41 challenges and the opportunities here in the
42 Great Lakes.

43 And I think that's one of the real
44 benefits of having these regional meetings is
45 hearing firsthand the issues and how NOAA can
46 better provide the products and services to
47 support these issues. So I'm looking forward to
48 that.

1 But also partnerships are really the
2 key to NOS. We are a partnership-based
3 organization. We can't accomplish our mission
4 without our partners, and we see that firsthand
5 here in the Great Lakes.

6 And I'm pleased to join CO-OPS
7 director, Rich Edwing, and the Lake Carriers
8 Association in announcing a new partnership
9 between CO-OPS and the Lake Carriers Association.

10 They maintain support for sensors on
11 the Cuyahoga River for critical navigation. And
12 before Jim Weakley and the Lake Carriers
13 Association stepped forward with their support,
14 we would likely have been unable to operate these
15 sensors if there was a failure.

16 So it just -- and we're going to have
17 a little plaque ceremony when I'm done here, but
18 it just really highlights the importance of
19 partnerships and working together, particularly
20 in tough budget times but also highlights the
21 importance of maintaining and strengthening these
22 partnerships and reaching out to new partners and
23 having us better understand what the needs are
24 that we can provide, the products and services to
25 meet these.

26 So we've got a lot going on in the
27 Great Lakes in the Ocean Service and across NOAA
28 that I want to kind of briefly highlight, the
29 various activities that we have going on here in
30 the region.

31 The first thing I want to mention,
32 it's not necessarily an NOS program, but one we
33 work very closely with and are partners within
34 NOAA, the Great Lakes Environmental Research
35 Laboratory, which is conducting really innovative
36 research and products and tools for the Great
37 Lakes and coastal ecosystems.

38 And Debbie Lee, the director, is going
39 to be here. And I believe she's speaking
40 tomorrow, but we have a really good partnership
41 with GLERL. Also, we've got the NGS Geodetic
42 Advisor, Dave Conner, and Tom Loeper, the Great
43 Lakes Nav Manager, here as well.

44 And GLERL, CO-OPS and NGS provide
45 tactical expertise to the U.S. -- the
46 representatives to the coordinating committee,
47 which is a bilateral committee charged with the
48 responsibility to collect, compile and provide

1 technical advice on hydraulic vertical control
2 and water levels for the Great Lakes, so it's a
3 really good collaboration.

4 But as we briefly touched on this
5 morning, NOS, we've got a lot going on besides
6 just the navigation services. We have two
7 estuarine research reserves in the Great Lakes,
8 one in Lake Superior and one just down the road
9 in Huron on Lake Erie, Old Woman Creek Estuarine
10 Research Reserve, which I visited yesterday,
11 which is really a beautiful area.

12 But these reserves are great
13 federal/state partnerships where we conduct a lot
14 of research, monitoring and education to address
15 the key coastal issues that are facing not only
16 that area but the whole region, whether it's
17 invasive species, impacts to climate change,
18 restoration. So it's a really good partnership.

19 Also sanctuaries. We touched on
20 sanctuaries this morning. We've got Thunder Bay
21 up in Lake Huron, but also the process is
22 underway for a potential designation in Lake
23 Michigan, and the sanctuaries designation, it's a
24 public process.

25 The nomination was submitted from the
26 community to NOAA, and we've held public meetings
27 and now we're into the phase of developing draft
28 management plans and potential boundary
29 proposals.

30 And there will be another opportunity
31 throughout this process for additional public
32 input as well, but this will protect some
33 important maritime heritage assets in the Great
34 Lakes.

35 Also, the CO-OPS continues with the
36 harmful algal bloom forecasts, and the good news
37 is the forecast in Lake Erie is going to be less
38 than in year's past when we had pretty
39 significant impacts to Toledo's drinking water.

40 CO-OPS co-serving GLERL have
41 established the Great Lakes Coastal Forecasting
42 System, which developed models for predicting
43 lake circulation and other physical processes in
44 real time, nowcast and forecast mode.

45 And this is really important
46 predictions for navigation, HABs and other
47 various uses. Also, the Great Lakes Observing
48 System provides real-time and historic data on a

1 variety of issues, hydrology, biology, cultural
2 resources.

3 And GLOS also serves recreational
4 boaters through ongoing support of the Great
5 Lakes Boaters Tool and also funds and facilitates
6 buoys that helps weather forecasts. So it's
7 another really good partnership there.

8 We work closely with the Army Corps
9 USGS and the Naval Oceanographic Office on LIDAR
10 technology development to help support nearshore
11 areas on our nautical charts.

12 The NGS, and you're going to hear more
13 of this from the program updates, has completed
14 the GRAV-D collection in the Great Lakes and is
15 currently working with Canada and the
16 coordinating committee in the Great Lakes towards
17 a modern framework for both land and water
18 measurements.

19 And CO-OPS and NGS are also working to
20 update the International Great Lakes Datum, which
21 is used by the United States and Canada as a
22 reference system for water levels across the
23 Great Lakes and Saint Lawrence River.

24 And this is a critical bilateral water
25 management that supports power generation,
26 navigation safety and a variety of uses. Also,
27 there are electronic navigation charts. We're
28 making good progress.

29 By the end of next year they should be
30 completed for the Great Lakes region. And also
31 last month Co-Survey launched the final phase of
32 its Chart Tile Service, which provides users
33 faster, more frequent updates.

34 So that just gives kind of a slice of
35 the various activities going on in the Great
36 Lakes. And you're going to hear more detail as
37 the various programs give their updates. But
38 also just the importance of the Great Lakes and
39 the partnerships we have here.

40 And just in closing, I want to thank
41 the panel for your personal and for your
42 professional investment as you continue to make
43 and support NOAA's navigation-related services.

44 I look to forward to having the
45 opportunity to talk with you more and hearing
46 your strategic recommendations and views of where
47 NOAA should focus its priorities in the future.

48 And with Bill and Joyce as leading the

1 panel, combined with the new members and the
2 expertise here, I believe the panel really is an
3 opportunity to help NOAA advance our navigation
4 products and services.

5 And we've got a real opportunity with
6 the transition to the new administration to
7 really help send that message as we move forward.
8 So I will end there, and I appreciate again the
9 time for being here and opportunity to speak.

10 CHAIR HANSON: Well, thank you. Okay.
11 I think you have a presentation as well. Yes, do
12 you want to do that? I had one question if I
13 could before you started --

14 MR. HOLST: Sure.

15 CHAIR HANSON: -- because the
16 transition is something that concerns all of us,
17 not just the changes and the "ch-ch-ch-changes" -
18 -

19 MR. HOLST: Right.

20 CHAIR HANSON: -- on the committee,
21 but also the changes in the administration and
22 NOS moving and OCS moving forward. Maybe just a
23 recap for some of us. Who is appointed to the
24 position, and who is staff? Who stays?

25 MR. HOLST: Who stays and who goes?

26 CHAIR HANSON: Yes, who stays and who
27 goes?

28 MR. HOLST: "Should I Stay or Should
29 I Go?" All right. So within NOAA, the political
30 leadership, I mean they're gone with the election
31 and they --

32 MALE PARTICIPANT: Specifically, who
33 is that?

34 MR. HOLST: Specifically, yes. So
35 it's Dr. Sullivan. It's the two assistant
36 secretaries, Vice Admiral Brown. And Chris
37 Blackburn's in an acting role, Chief of Staff
38 Renee Smith, the chief scientist Rick Spinrad.

39 There's a number of also staffers as
40 well, but those are the main political
41 leadership. Also the Fisheries Service is headed
42 by a political appointee as well, Eileen Sobeck,
43 so she will be replaced as well.

44 But NOAA has actually a small number
45 of political appointees, but it's the core
46 leadership team at NOAA. And from what we've
47 heard is -- I mean you never know when they're
48 going to leave. Everyone's looking for jobs.

1 They certainly know their time is
2 coming to an end. But we've heard that Dr.
3 Sullivan and her senior political leadership team
4 are committed to staying until the end.

5 CHAIR HANSON: I know I speak for the
6 panel because I know we've got a lot of work in
7 queue we're working on, and I think we've got
8 enough to keep us busy for the next few months,
9 but we're going to be looking to make some things
10 happen as soon as we can -- the new
11 administration.

12 I know Glen's going to talk about that
13 a little bit at lunchtime as well, so appreciate
14 that.

15 (Simultaneous speaking.)

16 MR. EDWING: So it's traditional when
17 we establish a new port system that we have some
18 sort of event commemoration just noting that new
19 system's in place. It's also traditional we
20 provide a plaque to the partner, the sponsoring
21 partner to the ports.

22 And here today I'm going to present
23 this plaque to Glen Nekvasil, Vice President of
24 the Lake Carriers Association --

25 MR. NEKVASIL: Thank you very much.

26 MR. EDWING: -- for the Cuyahoga River
27 PORTS. This is a current meter. Actually, it's
28 one of three current meters established about ten
29 years ago with earmark funds, but the funds are
30 no longer there to kind of keep these operating.

31 It was a demonstration project, so
32 we've been looking for a home for these meters,
33 and I think this meter in particular is very
34 important for the Lake Carriers to be able to
35 bring ore from the Cleveland waterfront up to the
36 steel mills up river because of the currents.

37 MR. NEKVASIL: Yes, thank you very
38 much. It's a pleasure for us to co-sponsor on
39 this. As Captain Arnett said, that's a very
40 challenging river, and sometimes the current is
41 so strong in that river that we just won't try to
42 enter. So it is critical that we know the
43 current conditions in there.

44 MR. EDWING: Okay. Great.

45 MR. NEKVASIL: Thank you.

46 MR. EDWING: Did we get a picture?

47 (Simultaneous speaking.)

48 CHAIR HANSON: Lawson?

1 MEMBER BRIGHAM: Just a quick comment
2 about what Dave told us, particularly ominous
3 numbers for the stuff that we're dealing with
4 here at this panel. And it just makes clear we
5 got to redouble our efforts in all of NOAA in the
6 economic security issues related to what we do
7 and what services does for our country.

8 And let me just add a little point
9 about the arctic. I think most of us are worried
10 with the new administration and that the United
11 States is no longer chair of this Arctic Council,
12 but in fact, be less interest in arctic things,
13 particularly arctic charting and hydrography.

14 And what many of us are concerned
15 about is the individual agencies, but here
16 whatever arctic strategy is developed within the
17 new NOAA with its new administrator that there
18 wouldn't be any loss in interest in the economic
19 and national security issues related to
20 hydrography and charting in the arctic.

21 So I just throw that in as public
22 comment because I think there's great concern. I
23 serve on a couple committees, one for the Council
24 on Foreign Relations, and we're coming up with a
25 list of infrastructure.

26 And right at the top of it with some
27 pressure from me and others is the place isn't
28 charted, so we don't have a safety net. So, in
29 fact, we have a lot to do over the next century
30 or so, but maybe -- but shorter than a century.
31 So huge issue but kind of a side issue related to
32 the economic security issues and how we argue
33 those issues on the Hill.

34 CHAIR HANSON: Okay. Scott, following
35 a tradition of not being on time, taught me well.
36 But we would like to go ahead and take a short
37 break here, if we can reconvene at 10:25. I
38 would like to again thank our panelists. Thanks
39 for kicking us off with great challenge and
40 appreciate your time. Thank you.

41 (Whereupon, the above-entitled matter
42 went off the record at 10:10 a.m. and resumed at
43 10:30 a.m.)

44 CHAIR HANSON: All right. Well, the
45 canned line is, "Thanks for your punctual
46 return," or maybe we should just say, "We'll get
47 it right next time."

48 Our final speakers for this morning

1 are the directors of NOAA's navigation-related
2 service programs and the co-directors of the
3 NOAA/UNH Joint Hydrographic Center for Coastal
4 and Ocean Mapping.

5 I'll introduce each followed by their
6 presentation, but let's hold questions until
7 after the last presentation. If panel members
8 are compelled to ask questions after that, go
9 ahead, as if I can control that anyway, right?

10 So our first speaker is Mr. Rich
11 Edwing, Director of NOAA's Center for Operational
12 Oceanographic Products and Services. Rich is no
13 stranger to this panel, and he's held many
14 positions of increasing responsibility within
15 NOAA over many years.

16 As Director of CO-OPS, he oversees
17 24/7 operation, providing physical oceanographic
18 information to mariners and other users. Rich
19 also serves as an advisor to the American
20 Association of Port Authorities' Harbors and
21 Navigation Committee, where we see each other
22 quite a bit as well, and we're both missing that
23 meeting this week. So anyway, Rich, please
24 proceed.

25 MR. EDWING: Okay. So this morning
26 I'm going to just touch on some FY '16
27 accomplishments over the past year and in some
28 areas I'll talk about where we're going in '17.

29 And you've heard mentioned earlier the
30 update of the IGLD, and that's the slide I'm
31 going to lead off here with for obvious reasons
32 given the locale. This is a big deal. This is a
33 seven year effort to update this datum.

34 It's within NOAA. It's NGS and CO-OPS
35 primarily responsible for this, but we're getting
36 a lot of support from GLERL, the Great Lakes
37 Environmental Research Laboratory, in terms of
38 helping us with the education, communication and
39 outreach, helping identify stakeholders and
40 connecting with them in this effort.

41 CO-OPS is responsible for title
42 datings around the coast. NGS is for geodetic
43 datum, horizontal and vertical reference frame,
44 so I give these a little bit of a unique datum
45 that we're both responsible for. It's kind of a
46 blended datum, but both the geodetic and water
47 level datum.

48 I always -- I really like this

1 graphic. You can see it shows the upper lakes,
2 really pretty much at the same elevation but then
3 you got the large drop off in elevation there at
4 Niagara Falls down to Lake Ontario and then
5 further down to the Saint Lawrence River. Most
6 people don't realize that sort of elevation drop
7 in the lakes.

8 So why do we need to update this
9 datum? Well, it's because the Great Lakes are
10 tilting. The western end is still rebounding
11 from the glaciers retreating a millennia ago.
12 The same thing's happening in parts of Alaska.
13 The eastern end's is subsiding a bit, so it's
14 tilting, so that the datum gets out of whack.

15 So this year, and I think the Coast
16 Guard as some of you mentioned is also a
17 bilateral effort. It's just not the U.S. working
18 on this. It's Canada as well.

19 So this year our accomplishment was we
20 got our plan in place. It took a lot of work
21 between NOAA and Canada to get the plan in place,
22 who's going to do what, when.

23 Those are some research questions that
24 have to be answered, but that's going to be --
25 approve this at their fall -- the coordinating
26 committee meeting is this fall, so that's kind of
27 our accomplishment for '16.

28 So -- and then we'll actually begin
29 the update in '17, but the other thing I'm going
30 to mention is there's a large component of this
31 that relies on seasonal gauging. We can update
32 the IGLD just using the 53 NLWON stations that
33 are up in the Great Lakes.

34 And in actually 1985 when the last
35 update occurred, that's all that was used because
36 they couldn't get the funding to do seasonal
37 gauging. The seasonal gauging is short-term
38 measurements at 140 other smaller ports and
39 harbors, and that's what establishes that updated
40 datum in those areas.

41 And we tried to get funding to good
42 large effort. We were not successful. However,
43 sort of taking a different approach. We're
44 taking kind of a partnership, patchwork approach.

45 We got funded by the Coastal Storms
46 program to do some initial gauging over the last
47 year or two. I think six different locations,
48 really just to kind of knock the rust off and

1 practice some seasonal gauging for some other
2 applications. It will help this update.

3 But now that's positioned us, and
4 again this was with help from GLERL, we were
5 successful and got a little bit of funding
6 through the Great Lakes Restoration Initiative
7 for some seasonal gauging in '17.

8 And then in '18 and '19, we're going
9 to be using VDatum funds. We're going to be
10 doing our VDatum surveys to update the VDatum
11 models in the Great Lakes in '18 and '19 but also
12 do a lot of this, you know, it's killing two
13 birds with one stone.

14 And then we're talking with the Corps.
15 The Corps does some -- has some gauging funds
16 that we're trying to talk them into helping put
17 towards this problem. So I don't think we're
18 going to get to 140, but we've prioritized
19 locations. I'm hopeful we'll get to at least
20 half over this seven-year frame and get the datum
21 updated in those areas.

22 We've been continuing to work on
23 enhancing the NLWON network. It's over -- it's
24 about 210 stations. We're transitioning away
25 from the acoustic sensor, which is our primary
26 sensor, to the radar microwave water level
27 sensor.

28 There's a lot of benefits to doing
29 that. The microwave is a non-contact sensor.
30 Nothing gets in the water, so even though the
31 sensor itself is about the same cost as an
32 acoustic sensor, about \$2500, we eliminate all of
33 the components that have to go down into the
34 water with an acoustic sensor.

35 And it avoid biofouling, corrosion,
36 getting banged up by boats, so a whole host of
37 issues and avoids costly diving services to
38 maintain that. So a microwave's a more cost
39 effective sensor to operate.

40 Also, we had to change out the
41 acoustic every year because of calibration. The
42 microwave, we've really not detected any drift in
43 it. We're going to change it out about once
44 every four or five years to be conservative, but
45 it's very cost effective that way as well.

46 But we're also excited about it
47 because we're looking to dual purpose it. We're
48 pretty confident we can actually get wave

1 information out of this sensor as well in
2 environments where it's deployed in a wave
3 environment and whether that information will be
4 useful, that's a project we'll be starting to
5 work on soon.

6 But in the meantime, we started in
7 earnest to transition the network a couple of
8 years ago. Right now, we've got 38 stations
9 that have the microwave installed.

10 We actually installed that in addition
11 to the acoustic, and we operate them in parallel
12 for a year, do data comparisons. We want to make
13 sure we have no surprises when we pull that
14 acoustic out.

15 And we've got six stations at this
16 point that have completed all the data
17 comparisons, and we've either removed the
18 acoustic stuff, or we'll do it during the next
19 annual inspection.

20 Current surveys, I think in Galveston
21 I kind of showed this same slide. We were kind
22 of on the front end of these surveys. We hadn't
23 done them yet. Now we've done them.

24 Puget Sound, we're in the mid portion
25 of a three-year project, the largest probably
26 survey we've done in decades over, I think it's
27 138 total meters that will have been deployed or
28 are going to be deployed.

29 We did the middle section of the
30 survey this year. We did the southern last year,
31 and next year we'll be doing the northern
32 portion. It kind of coincides nicely with the
33 potential HSRP meeting out in Seattle I think was
34 in the next year or so.

35 So -- but much needed in that area.
36 There was a lot of places where predictions are
37 out of date or some of these were new locations
38 where predictions were identified to us by the
39 community. We have a lot of community outreach.

40 Cape Fear River. We had reports from
41 down there that predictions are out of date, so
42 we did a survey down there. I think it was 15 or
43 18 locations, something like that. And you can
44 see the locations here. That's been done.

45 So all the data from all these surveys
46 will get into the prediction tables for next
47 year, and this is just a picture from the Cape
48 Fear survey. We used a small vessel for this

1 survey, and I'm going to say this one's being
2 deployed because that bottom, that looks pretty
3 clean. They look pretty filthy when you pull
4 them up, so yes.

5 Okay. So I mentioned VDatum surveys
6 before. We've been doing surveys for a number of
7 years now, and it's to reduce the uncertainties
8 in the VDatum models that transform between
9 geodetic and title datums.

10 And this past year, we did some
11 surveys up in the Pacific Northwest. It's about
12 a total of 30 locations all together. Those have
13 been completed, and that data will now go into
14 the larger VDatum project to improve those
15 models.

16 New PORTS. We just dedicated the
17 Cuyahoga River here, but we also got a new one
18 down in Savannah, Georgia, through the Port
19 Authority there. It's an air gap sensor on a
20 bridge. This is actually up and running. They
21 just kind of asked us to hold off announcing it
22 until they could kind of play with it, use it for
23 a while, which is fine.

24 And that PORTS also incorporates the
25 NLWON station at Fort Pulaski, which is at the
26 entrance to the river that leads up to the PORTS.
27 So that's number two. And number three is off of
28 Cape Cod, Massachusetts, which is a wave buoy.

29 And this was kind of interesting
30 because there's a lot of partners involved. The
31 partner there is the Massachusetts Department of
32 Transportation. They wanted a wave buoy out
33 there.

34 I think they were concerned about some
35 of the windfields that are going in out there,
36 but interestingly enough in the legislation, the
37 state of Massachusetts says any ocean observing
38 systems that are funded by the state have to be
39 PORTS systems through the PORTS program.

40 I think that's because it was an oil
41 spill there a number of years ago and they put
42 some sort of tax on oil revenue somehow, and
43 that's kind of collecting for these sorts of
44 purposes.

45 But regardless, so we worked with
46 NERACOOS, which is the IOOS Regional Association
47 up there because they're very interested in this.
48 They're going to be kind of the operator of the

1 PORTS system. And they're hoping to grow it with
2 more centers as time goes on.

3 But then USGS, we actually were able
4 to accelerate this one for next year to this year
5 because USGS happened to have a wave buoy on the
6 shelf they'd purchased for another project, were
7 done with it.

8 They loaned it to us to put out there.
9 It's been deployed. It's operating. We're
10 disseminating data, and we'll buy another wave
11 buoy and kind of they'll get theirs back.

12 But again, we're kind of ready to
13 announce that all the communications people with
14 all the partners are working and wanting to do
15 that, but these are in and operating and putting
16 out data. So the system continues to grow.

17 So I talked about improving water
18 level technology. Well, and directly related to
19 PORTS, we're improving how we're doing current
20 sensor measurements that are add, our AtoN
21 deployments, our Aids to Navigation deployments.

22 We worked out a number of years ago,
23 about ten years ago or more, how to put current
24 meters on Coast Guard navigation buoys because
25 that puts the measurement right along the ship
26 channels right where the mariners need them.

27 But with the older technology, we had
28 the sensor out on the buoy, and the data had to
29 be slimmed in to a shore station, data
30 collection platform, which would then go up
31 through those and come back to us.

32 Now we're using the Iridium satellite.
33 We can get more data through it, uses less power,
34 so everything's out on the buoy now. And we
35 eliminated that shore station, so that's really
36 reduced the cost of these.

37 That's probably about \$50,000 worth of
38 equipment and installation costs by getting rid
39 of that shore station. And one of our biggest
40 issues with data reliability was kind of that
41 radio link between the buoy and the shore
42 station.

43 And that was eliminated, so that's
44 really going to improve the data reliability. So
45 again, we're always looking for ways to improve
46 technology or use technology to improve
47 effectiveness and reduce costs, so good success
48 story here.

1 Modeling. You heard about this a
2 little bit earlier. I think again in Galveston I
3 said we were getting ready to launch the new Lake
4 Erie model. This is a retrofitter upgrade of the
5 former model.

6 The Great Lakes was actually the first
7 locations where we launched the modeling program
8 with the five Great Lakes models, which were
9 developed by GLERL and transitioned over to NOS.

10 And now GLERL has delivered us the new
11 regime of models, with significant improvements,
12 much higher resolution. The forecasts go out now
13 120 hours into the future and other things as
14 well.

15 So again, GLERL's been a big partner
16 in this to help, and then we'll be going into the
17 other lakes after this. This was the first one
18 to be retrofitted.

19 And one of the reasons this was the
20 first one was because we needed that to help
21 drive the Harmful Algal Bloom Model. And again,
22 CO-OPS is the operational home for Harmful Algal
23 Bloom Models and NOAA, we've got -- kind of done
24 the Gulf.

25 But you've been aware of the -- you've
26 heard about the Harmful Algal Blooms up here in
27 Lake Erie and the impacts on drinking water in
28 Toledo over the last couple of years. Our sister
29 office, the National Centers for Coastal Ocean
30 Science developed a model, and they transitioned
31 it over to us this year.

32 We kind of dove it in parallel and
33 test it and try to break it. We've completed
34 that testing in '16, so we've achieved what's
35 called an initial operating capability. And then
36 next year we're going to take it the whole way to
37 full operations and go live with it.

38 And I'll mention again, GLERL's been
39 a partner in this. They do a lot of monitoring
40 that's needed for Harmful Algal Bloom models, so
41 we've worked closely with them as well.

42 Inundation Dashboard. This is another
43 big deal, another big project we've been working
44 on for a couple of years. If you're familiar
45 with our Storm QuickLook product, which is when a
46 hurricane or a big nor'easter approaches the
47 coast, it's a way of looking at all of the water
48 level stations that are being impacted and kind

1 of being able to pull them all in at once.

2 And you can look at the data on
3 different datums and there's some customizable
4 things about it. This brings it into a GIS
5 environment. It's going to do the same thing as
6 QuickLook did but with a lot more features.

7 It's also going to be able to bring in
8 data from other partner networks. It's going to
9 be able to -- it's going to use some of the
10 Weather Service to find local flooding
11 thresholds.

12 Each WFO defines kind of a minor,
13 moderate and major flooding threshold. It's
14 going to use those thresholds to help communicate
15 the flooding. You're going to be able to look at
16 historic data for some of these stations.

17 Where it's a long-term station, you'll
18 be able to go back and see what were some of the
19 older flooding elevations to help inform what's
20 going to be happening. And we're also kind of
21 tying our landmark partnership into this.

22 That's where we work with different
23 communities and we get -- where there's a tie
24 gauge and using geodetic connections we tie local
25 landmarks into the tie gauges, and then we get
26 photographs of landmarks. And we can illustrate
27 how different elevations of flooding is going to
28 impact those landmarks.

29 It gets around the -- and hopefully
30 it's going to get around the communication
31 efforts. People don't understand title datums.

32 They don't understand geodetic datums,
33 but they know what it means when the water is
34 going to get above that first step of town hall
35 or the statue of General Grant in the park or
36 whatever the local landmark may be.

37 So we did a prototype. We delivered
38 a prototype this last year for these three hours,
39 and we're going to be going final with that in
40 '17. Although it's not going to have all of the
41 features, we'll continue to add features on next
42 year.

43 Sea levels and coastal resilience.
44 One thing we did this year was we actually
45 implemented a formal assistance program. That's
46 always been kind of done ad-hoc as people have
47 looked for assistance in past years.

48 We've got an FTE dedicated to doing

1 this, and he's held several trainings already.
2 People always want to know how to put in their
3 own tie gauges to NOAA standards and how to
4 process data or do things. And so now we kind of
5 have a dedicated capability to do that.

6 And we're also continuing to enhance
7 our sea level products. We're trying to now --
8 how do people get seal level trends if they don't
9 have an NLWON station nearby or some sort of
10 long-term tie gauge nearby.

11 So our researchers have been doing
12 work on that. They developed some approaches and
13 actually Department of Defense has picked us up
14 as well to use overseas because they don't have
15 NLWON stations overseas, and they may not have
16 local, long-term tie gauges. So this methodology
17 is being applied overseas as well to help protect
18 military facilities.

19 And so my last slide is just about
20 some of the partnerships we've developed. Dave
21 mentioned how we're a partnership agency, and
22 certainly through our PORTS program and we just
23 have lots of different partnerships for different
24 applications.

25 I know Lawson's going to be happy to
26 hear we got another arctic station installed. We
27 don't have enough of them, but knocks our gaps
28 down from 21 to 20 up there. But the Weather
29 Service funded the establishment of the station
30 up in Unalakleet.

31 It's installed. It's still going
32 through quality control but should be putting out
33 -- going live here soon, so we're excited about
34 that. We've been partnering with the National
35 Park Service because they're interested in
36 establishing long-term tie stations to NOAA
37 standards in some of their national parks which
38 are being threatened by sea level rise.

39 So we're working with them, and
40 there's going to be actually another one going up
41 in Alaska, West Coast of Cook Inlet, which is not
42 in the arctic, but Alaska still needed more tie
43 gauges, does fill an NLWON gap so lots of
44 benefits there.

45 And they're going in other areas as
46 well. And again, we were just down in Texas in
47 TCOON, and I don't know. I forget how much we
48 talked about this, but they had established for

1 these new platforms, these sentinel of the coast
2 platforms, hadn't been instrumented yet.

3 But now two of these have been fully
4 instrumented, and they're about to go live. The
5 other two are in the process of being
6 instrumented and will go live soon, but after
7 Hurricanes Katrina and Rita, we got funding to
8 design a new type of tie gauge that was going to
9 provide data when it's most needed during a
10 hurricane.

11 And we put in four of those off the
12 coast of Louisiana and Mississippi. After Ike
13 and Gustav, the Corps funded the establishment of
14 two more off of Houston, Galveston and up in
15 Sabine Pass. And now they got four more along
16 the coast of southern Texas.

17 So there's ten of these total, and
18 these are funded through a federal grant to the
19 state, so I've only really directly established
20 four of them.

21 Partners have established six of them,
22 but it's a nice growing picket fence of sentinels
23 along the Gulf Coast to help provide data during
24 these extreme events, so I'm pretty excited about
25 that.

26 So I think that -- yes -- I think.
27 Are we going to hold questions for the end, Bill?
28 Okay. I'm done.

29 CHAIR HANSON: Thanks, Rich. So Cook
30 Inlet's not in the arctic, but you can see it
31 from there.

32 MR. EDWING: It's not a song, Bill.

33 CHAIR HANSON: Our next speaker is
34 Mike Aslasken, Chief of NOAA's Remote Sensing
35 Division, presenting on behalf of Ms. Juliana
36 Blackwell, Director of the National Geodetic
37 Survey.

38 As Chief of Remote Sensing, Mr.
39 Aslasken oversees field surveys, which are
40 integral to nautical charting. Mike?

41 MR. ASLASKEN: Thank you, sir. So I
42 have the great opportunity to give you all an
43 update on what we've done this year for NGS and
44 again on behalf of our director who couldn't be
45 here this week.

46 First and foremost folks, new datums
47 are coming. We've got to prepare for this. This
48 is going to be mind-shattering to some, but a

1 better thing for everybody in most cases.

2 And I wanted to point to a lot of
3 ongoing activities. Most notably is our
4 international collaboration, both with the
5 Canadians, the Mexicans and the Caribbean nations
6 as far as ensuring that we have consistency and
7 that we're all talking the same terminologies and
8 approaches.

9 We have some experimental geoids out
10 there. That's very important, especially when
11 you're looking at GPS and getting accurate
12 heights in trying to achieve the goal of getting
13 similar accurate heights from GPS directly.

14 There is a quarterly National Spatial
15 Reference System newsletter out from the NGS
16 site. The website is down here at the bottom of
17 the page. Please make that one of your quarterly
18 readings if you can. It's very important to see
19 what's going on and how we're doing.

20 In conjunction of the approach of
21 updating the datums, we have to validate that
22 approach. So a follow on to the 2014 as I look
23 to my geodetic advisor, geodetic slope validation
24 we're doing in 2017, again to look at validating
25 the approach that we're doing to make sure we're
26 doing the right things.

27 And then a highlight of the 2017
28 Geospatial Summit, which I think there's a slide
29 in her eon that. Correct. Put this on your
30 calendars. It'll be in Silver Spring at the
31 Silver Spring Summit -- Silver Spring Civic
32 Center downtown, a very nice venue, April 24th
33 through the 25th.

34 Again, we will give an update from the
35 last summit of our planned activities of the
36 update to the datums as well as we use it as an
37 opportunity to bring together our geodetic
38 advisors and interests across the nation to talk
39 geodesy and get on the same page. But please
40 highlight that in your calendars. If you can
41 attend and participate, it would be well
42 welcomed.

43 GRAV-D. So we're over halfway. Over
44 53 percent of the U.S. has been collected with
45 the airborne gravity. Again, this is critical to
46 the update of the new vertical datum. This is
47 how we are defining that.

48 It is one of the important components

1 of the gravity data we're using to get to that
2 vertical reference. Alaska, 60 percent. We have
3 also, in parallel to our operations with manned
4 aircraft, we've had a successful SBIR with
5 testing an optionally piloted unmanned aircraft.

6 If you all are familiar or want more
7 information, I can provide that, but that's been
8 an interesting test in SBIR that we got funded
9 through SBIR process. And again, we have ongoing
10 collections in Minnesota and Oregon as current
11 activities.

12 We also hosted an international
13 airborne gravity summer school, again at the
14 Silver Spring -- that's actually the facility
15 there in downtown Silver Spring that the county
16 runs that we use quite a bit.

17 We had over 60 participants from over
18 14 nations. Again, the approach and this really
19 validates not only our approach but
20 internationally the approach used in airborne
21 gravity to update your vertical datums.

22 They will be pulling together a
23 textbook for this class, and I'll be able to
24 share broadly. But again, great success, and we
25 actually had a lot of folks waiting in line to
26 get to this one.

27 Might not be in the top of a lot of
28 folks' around the table's list of training, but
29 we were very happy to see the international
30 participation and interest in this activity.

31 Our regional advisor and state advisor
32 and coordinator's activities. Again, we're well
33 on our way as you can see to achieving that
34 approach where again we have regional advisors
35 that are NOAA funded.

36 We still have a few state advisors.
37 They're highlighted there I think primarily in
38 agreeing that the state help provide funds, too,
39 and then we have our coordinators, like Mr. Gary
40 Thompson here that we work with closely.

41 But again, a very active and important
42 group not only from answering at the state level,
43 geodetic questions that they may have or
44 interests but also advocating for an enabling the
45 new datums as we go forward with that.

46 Again, a focus with the new datums on
47 increased customer engagement. Again, I kind of
48 highlighted the regional geodetic advisor program

1 in providing -- and this group specifically is
2 really responsible for over 50 percent of the
3 states receiving training within the last year.

4 We also have a very active training
5 center in Corbin, Virginia, that does not only
6 monthly online offerings but targeted offerings
7 to community interests through the webinars and
8 such as you see there.

9 And highlighting this increased video
10 library through the COMET and INCAR group. Maybe
11 during the breaks we can play some of these
12 videos.

13 We just recently -- I think it's on
14 the next slide here, developed one for collecting
15 coastal LIDAR elevation data, really putting
16 information into layman's terms that people can
17 put in their iPads or bring to those folks that
18 they can talk to and that we can't.

19 But again, from an educational
20 standpoint spans not only that LIDAR but also all
21 types of topics of geodesy. Here, this is
22 actually the video here. We won't have enough
23 time to go through it now, but hopefully we can
24 play it through the break to give you an idea.

25 But NGS has been working and we have
26 a VDatum video coming out, about two minutes,
27 enough to keep people's interest but really at a
28 low level being able to educate folks on a very
29 technical subject. I know you guys will agree
30 with that.

31 VDatum. Rich touched on some of the
32 highlights going on within CO-OPS participation.
33 Again, the program management happens within my
34 group for VDatum, but the highlights for '16
35 included the regional datum update for San
36 Francisco.

37 We developed and released a web-based
38 version of the tool. Previously, you'd have to
39 download the software on your PC and run. This
40 allows you to take a few select points, and if
41 you want to just convert them online you can do
42 that versus a lot of the applications or enablers
43 are for large data sets like LIDAR and
44 hydrography.

45 Again, along with that was a big
46 release of the software. And as I mentioned, we
47 have the COMET video in place. And just the key
48 takeaway here, this is the real key enabler to

1 these new technologies, whether airborne, space-
2 based or shipborne to really getting this data to
3 the reference that we can actually make nautical
4 charts and actually compare data over time.

5 Coastal mapping. So we delivered over
6 10,000 miles of shoreline this year, which was
7 again, helps update over 285 nautical charts. We
8 updated 37 ports with updated shoreline.

9 And then in addition, we also analyzed
10 35 ports for changes. Those changes, once they
11 were identified, are then identified to be
12 updated. You can see some of the activities of
13 the collections we've done over the years since
14 2014. But again, a lot of activity both on the
15 inventory and LIDAR activities.

16 This was a big win for us for -- well,
17 four weeks we were able to go up to Alaska. And
18 what you see there in the green we were able to
19 collect about 1600 miles of oblique imagery. To
20 your reference to oblique imagery, and that's an
21 image there that you can see.

22 But -- and we also did a collection of
23 over 19 ports. Again, the ports were identified
24 based on rotation of where they are in the
25 system, but a lot of them were special request
26 because there's a lot of activity, a lot of
27 building in the ports, especially for the cruise
28 line industry that we needed to address based on
29 requests from Office of Coast Survey.

30 This data is -- I thought I was going
31 to be able to tell you it was released today, but
32 we're having a little technical problems.
33 Hopefully this week we'll have that imagery
34 available on our viewer, again GIS-ready,
35 download, take away.

36 And this data is very -- serves a lot
37 of different purposes beyond navigation, but from
38 a coastal intelligence, coastal resiliency we've
39 addressed collecting the data of the lower 48 to
40 really use as a baseline for event planning as
41 well, whether it's El Nino hurricanes. This
42 serves as the baseline data to do comparisons if
43 we have impacts.

44 But also from a Coastal Zone
45 Management or any use, these data can be used for
46 different applications whether you're monitoring
47 use or building or CZM applications. So we're
48 very happy to get this data out there.

1 And not to leave the fourth coast
2 behind, you notice we are currently in collection
3 with the Great Lakes. We're attempting and
4 trying to collect all the U.S. shores of the
5 Great Lakes with this imagery in addition to 20
6 ports and some special request survey that we
7 have that address some of the shoaling in the
8 areas.

9 Again, once the data is collected and
10 processed, it'll be available on that same
11 website. That's the Brown's stadium for you all
12 and to your left there's the Rock n' Roll Hall of
13 Fame there. And this is the viewer for that
14 website for your reference when you take this
15 stuff home.

16 Topobathy. Collected over 700 square
17 nautical miles of topobathy and LIDAR this year.
18 That was 300 more than our metric again focusing
19 on the finishing up Puerto Rico and the outer
20 reef of the Florida Keys and the Florida Keys
21 itself.

22 That image down there in the lower
23 right is actually several vessels on top of the
24 water, and you can actually see the returns from
25 the coral underneath them. And then the upper,
26 there's the Dry Tortugas.

27 Again, not only from a navigation
28 standpoint, this is data important but also to
29 our partners within both the USGS and NOAA and
30 other interests for coral reef and coral reef
31 mapping and habitat mapping.

32 Also, in addition we're delivering
33 data or have collected data this year at the
34 support survey requirements of Buzzards Bay. The
35 red line there that you can make out is what we
36 call the NALL line, the navigation limit line.
37 That's 4 meters.

38 That line is where operations in shore
39 that are restricted are not allowed for the
40 safety of the launch, and if we can collect to
41 that with airborne assets that makes the entire
42 operation not only safer but also more efficient.

43 And as you can see from here in an
44 area that we know has questionable water clarity
45 and dark bottoms -- dark bottoms are bad for
46 LIDARs. They like white, bright sand, but we did
47 fairly well and hope to show that we can provide
48 some increased efficiency and maybe add a few sea

1 days on to the NOAA assets when they come to
2 these areas.

3 So this is a concept of operation that
4 we're working with Coast Survey on that we come
5 in, collect LIDAR and then within the next year
6 we deliver it to them where they have
7 hydrographic requirements that meet that
8 shoreline.

9 Contracted projects for LIDAR this
10 year. Again, a pretty effort there in South
11 Carolina down to Georgia, almost 613 square
12 nautical miles and then in and around Martha's
13 Vineyard, Nantucket for another 225.

14 Response efforts. So responded to
15 Joaquin. We responded to the U.S. floods of
16 January and most recently this is the efforts we
17 did in Louisiana.

18 More and more we're seeing the
19 requests, and in fact, we're mission-assigned in
20 both cases of the flooding because typically the
21 weather does not support overhead satellite
22 operations to collect data.

23 So the importance of this imagery in
24 identifying impacts is becoming more and more
25 important because the ability to fly underneath
26 the clouds and collect the data, which doesn't
27 always produce the best data, but having some
28 data is better than none when the folks are
29 trying to address impacts.

30 And especially with this event, the
31 Weather Service was very concerned because a lot
32 of their models do not take into effect the
33 backflooding as they called it that came days
34 after. So again, we're able to provide this data
35 to those folks that are impacted there.

36 In fact, contract -- Dewberry had the
37 contract. I think they threw the assessments on
38 here, and I think it was briefed. It was 60 to
39 80,000 homes that used this imagery to help
40 address.

41 Just the damage of Baton Rouge that I
42 grabbed to show you the extent of the flooding.
43 And that's it.

44 CHAIR HANSON: Thank you, Mike.
45 Admiral Smith, we've introduced you once already,
46 so I think we'll let you just get after it.

47 RADM SMITH: I'm going to do a time
48 check here. It's sort of on for 20 minutes-ish.

1 All right.

2 So I have -- I didn't follow quite the
3 assigned format for the Coast Survey Update.
4 It's sort of a mix of retrospective last year and
5 some of the things we're working on and some of
6 the ideas that we've been tossing around for the
7 direction that we're going. So bear with me as
8 we sort of move from the past to the future here
9 a little bit.

10 (Off microphone comments)

11 RADM SMITH: So I think we're at a
12 really interesting time in navigation product
13 history. We're really at sort of a cusp of a new
14 era as we modernize not only the way we collect
15 data but also the way that we turn it into
16 navigation products and get it all the way to the
17 user.

18 This is a theme that we sort of picked
19 up more broadly through NOAA through the Weather
20 Ready Nation as we're looking really at the
21 decisions that our information is supporting and
22 thinking about it all the way through to the end
23 and outside of the context of our narrow way that
24 we have traditionally done -- made products.

25 So I'm going to look at the drivers
26 shaping NOAA's navigation products and how our
27 partnerships with the commercial industry and
28 other government agencies will help get us there.
29 And I'll be trying to use some examples from the
30 Great Lakes as we go along here.

31 I'm going to skip actually to the next
32 slide on this. In the last 25 years or so, we
33 have focused almost exclusively on deep draft
34 traffic going into major ports. We called it the
35 critical area. It was our main sort of
36 performance measure. It defined 43,000 special
37 square nautical miles that we concentrated all of
38 our survey efforts on.

39 We're nearing the end of that story.
40 The remaining work within that is less compelling
41 than the first work that we did, and the work
42 that we have not done for the last 25 years
43 really have left us with a lot of our coastal
44 charts pretty badly out of date.

45 And as we heard from the Coast Guard,
46 there's been a new resurgence in small boat
47 traffic and coastal -- small commercial traffic
48 in these coastal areas that we have not been

1 keeping up with.

2 So there are over 2000 -- just one
3 little example, there are over 2000 places on our
4 charts where we have had a shoal reported. And
5 that you might think, well, how many are we going
6 to have next year? How many of these are we
7 resolving?

8 Well, we've only measured our
9 performance in square miles of critical area, not
10 in resolving shoals that are reported. And
11 that's just one example.

12 There are loads of places where fish
13 nets -- if you look at the Great Lakes charts,
14 it's all full of fish net stakes which have
15 probably been on the chart for years but shoal
16 wrecks PA, position approximate and that sort of
17 thing.

18 So all of these things add up, not
19 only to chart clutter but to mask the real
20 dangers that are out there. If only 1 percent of
21 the fish stakes are really fish stakes, then
22 people -- we're training all of our users to
23 ignore the hazards that we have on our charts.

24 This is particularly now a problem
25 with ENCs because these are charted as isolated
26 dangers. The systems are programmed to give you
27 an alarm when you approach an isolated danger,
28 particularly one without a lease depth.

29 Well, we have thousands and thousands
30 of these, and what we're hearing from all of our
31 ENC users is that there are way too many alarms.
32 Heard from a pilot, oh, I don't even know what
33 those pink things are. I just ignore them.

34 Well, they're isolated dangers, right?
35 And some of them are real. So we really -- I'm
36 really -- this is one of the things that keeps me
37 up at night is that we have an imbalance in our
38 approach to what we're surveying.

39 All right, next slide. So we've been
40 -- we don't have a big program on how to solve
41 this yet, but we've been trying to sort of work
42 with some experimental ways of trying to do this.

43 We could justify a square nautical
44 mile, a fairly extensive survey for large ships
45 with tight under keel clearances going in with
46 gajillion dollars per inch of extra draft and
47 that sort of justification.

48 We can't really justify the same level

1 of care or expense for a lot of these smaller
2 waterways and sort of less economically impactful
3 users. So I sort of say we can't solve a \$10,000
4 problem with \$1 million solution, right.

5 We have to scale the solution to the
6 problem, so we're looking at ways of using
7 partnerships, remote sensing for satellite-
8 derived bathymetry and other things to try to
9 solve these problems in a more efficient way.

10 For instance, in the Yukon River in
11 the middle slide there, this chart was last
12 updated in the late 1800s, right. So this was a
13 while ago, and we've actually been able to --
14 with Landsat imagery, we've been able to see if
15 you sort of play back the Landsat imagery in an
16 animation you can see these shoals moving around.

17 And so there's a certain sort of
18 pattern to it. And so we sort of took it to the
19 next level and said well we can't send a ship
20 there. There's not that much traffic on the
21 Yukon River.

22 We can't survey it every year. It's
23 not justifiable, but we could use the satellite-
24 derived bathymetry for instance to do an
25 approximate shoreline. So on an annual basis we
26 can update this at very low cost from cubicles in
27 Silver Spring, and it gives them a starting place
28 for the barge traffic that's heading up the river
29 each year.

30 At the same time, the charts have been
31 linked inextricably to the paper, and there's
32 only so much detail you can show on paper. So
33 until two years ago, we would not put anything on
34 the ENC that could not go on the paper because it
35 would make them out of sync with each other.

36 We got over that about two years ago
37 and allow ourselves now to put more detail in the
38 ENC and in fact have turned our production line
39 around so that we are updating the ENC first with
40 the new source data and whatever can go on the
41 raster could go on the raster. But the ENC we're
42 allowing to have more information and more
43 detail.

44 As we've started to do this, we're
45 starting to recognize just enormous demand for
46 larger scale, more detail, right. That's the way
47 the customers talk about it. We want more
48 detail. Cartographers talk about scale.

1 Customers talk about detail.

2 So just one little example on the
3 right there, the production facility off Long
4 Island, we did a small area of larger scale
5 coverage just on that production facility. And I
6 think we did not actually worry too much about
7 what was going to go on the paper chart for that
8 one.

9 So I mentioned -- well, first of all,
10 I just got to point out this picture. I did
11 mention -- so what you're seeing here is -- that
12 was off my old ship. That's a small, unmanned
13 survey vessel that sort of launched from the
14 launch.

15 So Mike mentioned how we could not get
16 into really shallow water with those 30-foot
17 launches and their millions of dollars of
18 equipment, fragile equipment, bolted on the
19 bottom.

20 And so we started using these little
21 -- they're called Z-Boats, which can get into the
22 shallow water. They're just single beam boats at
23 this point because they pick up where the
24 multibeam is no longer practicable, so there's
25 really not much point in doing multibeam in the
26 really shallow water.

27 They've also got sidescan on them, so
28 we can get in there and get those wreck PAs and
29 that sort of thing in the shallow water. It's
30 the first year we've really gone operational with
31 them, and we're really excited about the
32 prospects of it.

33 I think our colleagues at UNH will
34 probably talk about some larger versions that we
35 hope will really allow us to reduce cost and
36 extend our reach with bigger systems going
37 forward.

38 iPad timed out. So on the left there
39 is some satellite-derived bathymetry. I think we
40 may now have some LIDAR in that same area, and
41 this is off of -- between Martha's Vineyard and
42 Nantucket.

43 But if you look carefully, you can see
44 that the shoal has moved significantly with
45 respect to the chart. And so we were able to
46 estimate the depth from satellite-derived
47 bathymetry and then groundtruth it with some
48 single beam and multibeam from the ship.

1 And that allows us to sort of
2 calibrate the satellite-derived bathymetry to
3 make it more broadly applicable as well as
4 understand the sort of failure modes and
5 limitations of that approach.

6 Both -- as I mentioned, both we and
7 our contractors are using unmanned surface
8 vessels -- vehicles, increasingly getting close
9 to the margin where they make efficiency sense.

10 We've been focusing more than they can
11 do things that we can't do with manned boats. I
12 think we're starting to see the point where they
13 will start to be a real force multiplier for us
14 in some areas.

15 In particular, we're looking in Alaska
16 where we don't have to worry so much about
17 collision avoidance and traffic because it's --
18 there's fewer boats around.

19 On the right there, crowdsourced
20 bathymetry. This is another really big effort.
21 There have been a number of sort of clubs of
22 crowdsourcing from Olex and Navionics over the
23 years. Those are -- they are sort of not as
24 accessible to us as a chart provider, although we
25 do have some agreements with them.

26 Worldwide there's a big demand for
27 crowdsourced bathymetry particularly in places
28 where hydrographic services are really limited in
29 the Third World.

30 And so the IHO -- NOAA partnered with
31 the IHO to stand up a publically accessible in
32 and out crowdsourced bathymetry database for
33 trackline bathymetry. And it's hosted at NOAA at
34 NGDC -- what used to be NGDC in Boulder, and
35 we're just starting it up in the past year.

36 We've got some early adopters. This
37 is a system that doesn't necessarily require you
38 to install a particular piece of hardware on your
39 boat, a new piece of hardware because a lot of
40 chart navigation systems can already log the
41 depth data and GPS data as they go.

42 So there's no need to do something
43 new. You just need that network connection. We
44 have a great partnership with a company called
45 RosePoint out of Washington state. They dominate
46 the navigation systems on the western rivers and
47 on all tow boats.

48 This is just a little screenshot of

1 after just a few weeks of having the system stood
2 up, we already have quite a few tracklines in
3 there.

4 At this point, we've not yet assessed
5 how useful the data is that's in there, but it
6 gives us some hope that we'll be able to use it
7 at least for change detection and in some cases
8 to update the chart with approximate contours and
9 that sort of thing.

10 Here's one example. This is the -- we
11 used a multibeam system that's already installed
12 on one of the Great Lakes Environmental
13 Laboratory boats and the National Marine
14 Sanctuary to -- along with some hydrographers
15 from Coast Survey to do a little survey during
16 the summer season in Lake Huron.

17 And we expect that this is a model we
18 can continue to sort of expand on as more vessels
19 have -- I guess there may be more vessels that
20 have multibeam vessels installed on them than
21 have experts to run them.

22 And so the corps of experts that we
23 have may be able to find boats that -- to run on
24 that are already geographically dispersed. Not a
25 very great slide, but we are updating the
26 shoreline up here, too, lots of it, thousands and
27 thousands of miles.

28 So the ECDIS is just one place, right.
29 We've been talking about ECDIS for 20 years or
30 so, and it's now rolled out. It's just basically
31 about as good as we planned it to be 20 years ago
32 in my opinion, and while everything else has much
33 more nimble and short development cycles.

34 And a lot of these are American
35 companies which have some of the best navigation
36 software, mobile apps, chart plotters. Susan can
37 probably give some figures on this. The U.S.
38 really dominates the small navigation systems
39 market.

40 Some of that is because our charts are
41 free, and they're increasingly starting to take
42 advantage of not only our -- the after-market
43 charts from some of our downstream
44 redistributors, but increasingly, the charts
45 themselves directly from NOAA.

46 And the Chart Tile Service, which Dave
47 mentioned earlier is essentially a bridge -- is
48 essentially a new type of chart format that is

1 geared toward modern web services and mobile
2 devices. And even the chart plotters are all
3 using the same type of data.

4 I use this slide just to sort of --
5 again to motivate thinking about all of those
6 other users. As we go down from the tens of
7 thousands of SOLAS class ships worldwide to
8 hundreds of thousands of light commercial and
9 millions of recreational boats throughout the
10 U.S.

11 And we heard a plea from the Coast
12 Guard to get the small boats into the shallow
13 water and out of the way, and this is one of the
14 ways that we're hoping to support that.

15 We talked about the tile service.
16 It's just a graph that's starting to take off.
17 It's really just less than a year it's been out,
18 and we're seeing millions and millions of hits
19 and an exponential growth curve on it.

20 So the ENC's. So ENC's were built from
21 the paper, right. They were digitized faithfully
22 one-by-one from the paper and were originally
23 thought of as standalone, individual chart
24 products, sort of like the paper.

25 And they all look great if you look at
26 them by themselves, but nobody looks at them by
27 themselves because they're meant to be seamless.
28 They're meant to be used as one. I don't even
29 like to talk about ENC's as a -- in the plural.
30 There's really one with different scales and
31 should be seamless.

32 Well, if you -- this is one example
33 nearby here, but it doesn't take long to find
34 examples of massive discontinuities in the ENC
35 suite. And so we're hearing about too many
36 alarms, insufficient attribution, all these
37 isolated hazards, inconsistent depth areas, which
38 gives you the blockiness in the color shading.

39 If you look across Lake Erie, which I
40 was just looking at a minute ago, these
41 recommended routes will like come and go as you
42 go along the lake at different scales. So we
43 recognize this, and as we have now shifted our
44 emphasis really toward the ENC's, we are -- we
45 haven't quite named it, but the internal working
46 name is sort of an ENC 2.0, which is designed
47 from scratch to be used as an ENC and not just a
48 faithful copying of the paper.

1 That's a pretty big effort because it
2 means going back to source for a lot of these
3 different -- to reattribute depth areas and to
4 make these things consistent, but we're -- it's a
5 crucial part of our long-term planning, medium-
6 term planning I should say, for how to improve
7 our chart products for the next generation.

8 We're making progress on Great Lakes
9 ENC's now. I just undermined myself on this, but
10 this is again the faithful digitization of the
11 paper charts, which is necessary for all the rest
12 of it. But I recognize it's also insufficient.

13 The recommended courses that go across
14 the Great Lakes have been on there forever.
15 They're not official IMO approved anything, but
16 they are -- they do form an important base of
17 understanding of how the traffic flows on the
18 lakes.

19 And we don't have any intention of
20 changing them or taking them off, but we do need
21 to straighten them out because they don't line up
22 and they're discontinuous and that sort of thing.
23 So we're working with the Coast Guard and the
24 Lake Carriers Association to sort of turn them
25 into a consistent set.

26 Tom Loeper is our part-time nav
27 manager here in the Great Lakes. We have not had
28 a full-time nav manager since Brian Link retired
29 about four years ago, and it's on our list of
30 things that we would like to do.

31 But we -- again, you've heard about
32 some budget uncertainty. That's the sort of
33 thing that costs money, and we can't -- at this
34 point we can't commit to things, that or many
35 other things that we would like to do with the
36 budget uncertainty that we have going forward.

37 But we -- this -- our navigation
38 manager group, which Rachel Medley leads --
39 Rachel is here -- is a really strong part of our
40 customer outreach program. We hear a whole lot
41 from being on the ground with our nav managers.

42 Mr. Chairman, I think I've overstayed
43 my time, but all right.

44 CHAIR HANSON: Thank you very much,
45 Admiral Smith, and I'm sure we're all developing
46 a long list of questions. So Dr. Mayer and Mr.
47 Armstrong.

48 Our last speakers of the morning are

1 Dr. Larry Mayer and Andy Armstrong, co-directors
2 of the Joint Hydrographic Center located on the
3 beautiful campus of the University of New
4 Hampshire. Those extensive bios are available,
5 so please review them.

6 DR. MAYER: Forty pages.

7 CHAIR HANSON: Gentlemen, please
8 proceed.

9 MR. ARMSTRONG: Thanks, Mr. Chairman.
10 Larry's going to give the bulk of the
11 presentation, but I just want to thank you and
12 Admiral Smith for getting us on the program here.

13 And our intention today is to give you
14 an overview of the center and then in future
15 meetings, we'll try to present maybe in more
16 detail some of the individual topics that we're
17 engaged in. So Larry's going to take over from
18 here and give you our presentation.

19 DR. MAYER: Yes, thank you. And
20 again, I join Andy in thanking you all for this
21 opportunity. I guess Andy and I have been around
22 at these meetings for some time, but I guess
23 somebody said maybe we should talk about where
24 we're from and what we do.

25 And so I'm going to talk about two
26 entities, the Center for Coastal and Ocean
27 Mapping and the Joint Hydrographic Center.
28 They're actually the same set of people for the
29 most part, and hopefully by the end of this
30 you'll have some idea of what those differences
31 are.

32 We began in 2000 about. Andy was
33 actually there a little earlier than that, but we
34 began, and I'll have to say this publicly, as an
35 earmark from Senator Gregg at the time. But I
36 think we looked at this as an opportunity.

37 I always said the attitude is to take
38 the pork and try to make it into prosciutto, and
39 if it indeed works, then something good happens
40 and you can maintain. And if not, it should be
41 thrown out.

42 And I think in our case things did
43 work out. Within a few years, we became a line
44 item in the President's budget. We started with
45 a building that was built special for us about
46 8,000 square feet, that little white addition
47 there you can see, to an existing ocean
48 engineering facility.

1 By October 2008, we had grown to the
2 point that we actually needed to add another
3 10,000 square foot addition, and as I'll mention
4 in a minute, we're growing again and building yet
5 another addition.

6 In 2009, we became about as far away
7 as you can from an earmark with the authorization
8 of a joint hydrographic center, not our Joint
9 Hydrographic Center, but the authorization of the
10 existence of a joint hydrographic center.

11 And with that, there was competition
12 for the center as there should be, and in 2010,
13 we competed for -- to become the home of the
14 Joint Hydrographic Center and we won that award
15 and were granted a five-year -- five years of
16 funding.

17 In 2013, there was a small
18 reorganization of things at the university. A
19 School of Marine Science and Ocean Engineering
20 was formed, and our entity became part of that.

21 And in May 2015, there was a second
22 call for five-year competition. A federal
23 funding opportunity came out for a joint
24 hydrographic center from 2016 to 2020. We
25 competed for that and were awarded that in
26 November. And so we're just starting that second
27 iteration of these competitive grant processes.

28 And as I mentioned, we're building a
29 new addition. It's kind of what you see the cars
30 down there and the green grass. That'll add
31 about nine new offices to -- for us. It'll add a
32 lot of space for a new program, an undergraduate
33 program in ocean engineering, a bachelor's in
34 ocean engineering, which we're thrilled about.

35 But probably most importantly to you
36 folks if you do come and meet with us, it'll add
37 a large, 85-seat amphitheater type seminar room
38 that we can fit you all very nicely.

39 And as our colleagues from OCS know,
40 sometimes it gets a little crowded when the big
41 crowds come. Since day one we've had several
42 specific goals in terms of mission. Obviously,
43 the statement, we want to be a world leader in
44 the development.

45 You'll see just a little bit of
46 schizophrenia at the time, and I think this is
47 departed in hydrographic and ocean mapping
48 technologies. And that's always been our idea

1 that the work we do in support of safe navigation
2 has many, many other applications.

3 And we've always been a big proponent
4 of that, and I think we've seen a broad
5 acceptance of that. And I think the Integrated
6 Ocean and Coastal Mapping initiative is one
7 example of that.

8 The second one, again, to expand the
9 scope of ocean mapping clients and constituencies
10 due to the development of innovative applications
11 and collaborative work with the private sector
12 and government labs.

13 And that, in part, will explain the
14 two hats that we wear. With respect to the
15 interaction with the private sector, something we
16 believe in very strongly, we have a number of
17 industrial partners.

18 I count 46. They get fewer each year
19 because if you see the long list of Teledyne
20 there, these were all individual partners and now
21 they're all being incorporated under one hat. So
22 we keep listing them as individual, but soon
23 it'll just say Teledyne there, but hopefully the
24 others will maintain and continue.

25 And these are companies that we don't
26 ask for a cash contribution but basically some
27 sort of contribution in kind, and in return for
28 that, they get access to the products, the tools
29 we develop, which are typically software
30 products, sometimes hardware, but for the most
31 part software products.

32 And they get that for no cost
33 basically except a small licensing fee they have
34 to pay, but no royalties. And it's on a non-
35 exclusive basis, and that's worked out very, very
36 nicely over the years.

37 We've seen a number of the tools we've
38 developed now become commercial products through
39 a number of our partners. We also have an
40 educational goal. I think it was Nancy Foster
41 who said at the time, make baby hydrographers,
42 when the center was created. And so we've tried
43 to do that very hard, working at it.

44 We have both an M.Sc. and a Ph.D.
45 program in a number of tracks, bringing students
46 in, our engineering students, who were earth
47 science students, computer science students, and
48 we even have some of our first biological or

1 zoological -- zoology majors who come in and get
2 a specialization then in ocean mapping.

3 We also have a graduate certificate
4 program that was started in response to Nippon
5 Foundation GEBCO program that I'll talk about in
6 a minute. And we offer some non-degree programs,
7 short courses and seminars, and we've had real
8 fun hosting summer research fellows who are
9 typically rising juniors and seniors at the
10 undergraduate level and a few Hollings Scholars.
11 And that's worked out very, very nicely.

12 Just to give you an idea of the number
13 of graduates we've had, 138. And look at number
14 one. You see number one? And I mentioned this
15 at the change of command ceremony that there's
16 nothing that makes you feel older than having one
17 of your students become an admiral, actually
18 except having one of your students who became an
19 admiral retire.

20 And both of those happened to me last
21 week, so I felt very, very good. But I think
22 Rachel, you're on there too somewhere, and I
23 don't know if you can see the color coding, but
24 the color coding -- you can't make out the
25 difference between the blue and white.

26 There are 15 of these students who
27 came from NOAA. The ones we're even more proud
28 of are the green ones who are students who were
29 not from NOAA but after graduating have started
30 to work for NOAA.

31 And I think if we track the rest of
32 them, they're scattered amongst the industry. I
33 don't think we've had a student who really has
34 come out without being quickly scuffed up by
35 somebody or another, so we're very proud of that,
36 too.

37 We are a CAT A certified program, an
38 IHO Category A certified program. That's thanks
39 to lots of hard work on Andy's part when we first
40 got there and then our renewal again ten years
41 later and that we're up for renewal again next
42 year.

43 So the effort starts again. It's
44 very, very comprehensive process to get that
45 certification. And as I mentioned, there is a
46 new Bachelor's of Ocean Engineering program at
47 the university which will become a greater feeder
48 for us and for all of us. And I think we're very

1 excited about that and supporting that very, very
2 strongly.

3 I mentioned this certificate program
4 that was started in response to again a
5 competition put out by GEBCO, the people who make
6 the deep bathymetric maps, the general
7 bathymetric charts of the ocean, to train
8 bathymetrists as opposed to hydrographers. And
9 we won that competition about -- well, 12 years
10 ago.

11 And since that time, the Nippon
12 Foundation has funded six students from somewhere
13 around the world to come to UNH. You can see the
14 coverage in terms of countries where they've come
15 from, all those orange places.

16 And it adds a wonderful dynamic and
17 builds beautiful networks of hydrographers and
18 ocean mappers around the world for us and our
19 students and our NOAA partners.

20 Just to highlight an event this year
21 that the Nippon Foundation sponsored in Monaco,
22 it was a reunion of I think 47 of our alumni came
23 back to a program that was called a Forum on the
24 Future of Ocean Mapping.

25 It was a very exciting program.
26 Admiral Smith was there, and it really outlined a
27 hope to see the deep ocean completely mapped by
28 2030. The Prince of Monaco, he's supportive of
29 that. But probably more importantly, the
30 director of the Nippon Foundation, Mr. Sasakawa,
31 who can see there who could actually afford to
32 pay for this if he wanted to. This is the
33 richest foundation in the world.

34 Okay, but leading to these two
35 complementary centers we have the Joint
36 Hydrographic Center, which is really the result
37 of the MOU between NOAA and the university.

38 And this is where the official
39 interaction between NOAA and the university takes
40 place, with our primary sponsor within that being
41 the Office of Coast Survey, our primary customer
42 I like to say.

43 But we also have support from OAR,
44 another line in NOAA, particularly through their
45 Ocean Exploration Program. We continue to work
46 with NGS, all the NOAA labs, NCEI, IOOS, CO-OPS
47 and so on, but we try to serve all of NOAA but
48 with the recognition that it really is OCS that's

1 our primary customer.

2 The other name that you keep hearing
3 referred to, the Center for Coastal and Ocean
4 Mapping, is that body that is independent of NOAA
5 in the sense that this is strictly a university
6 entity.

7 And being at arm's length from NOAA
8 there, we're free to then enter into contracts
9 and grants with many, many organizations as many
10 standard academic groups are.

11 And so you can see over the years a
12 list of other people who have funded the
13 organization and this year. To give you an idea,
14 we have about \$3.6 million of funding from non-
15 NOAA sources.

16 So we try to maintain that balance
17 between NOAA and non-NOAA sources, but hopefully
18 always leveraging what we do from the non-NOAA
19 sources for NOAA applications.

20 In terms of who we are, we have a
21 large -- I'm not going to go through all the
22 people, teaching and research faculty. Again the
23 color coding, I'm not sure you can see the
24 differences, but the ones in blue were NOAA
25 people seconded there.

26 The light -- some of the light ones
27 are basically adjunct folks, and if we look at a
28 group of NOAA people that are seconded there,
29 they really come from the IOCM office, OER and
30 folks that have been picked up for the Superstorm
31 Sandy Project.

32 We had a separate, two-year grant with
33 respect to Superstorm Sandy, and the ones in
34 italics -- at least you can see that -- are NOAA
35 folks who are also in Ph.D. programs and one in
36 an M.S. program so they can take advantage of
37 their time there to also increase their education
38 -- and CO-OPS, yes.

39 We also have a visiting scholar
40 program. This is open to government employees,
41 too, if you want where people come for between
42 three months and a year and just spend time with
43 us. And we pump them for all we can in terms of
44 stuff that we need to know and hopefully we pass
45 on a little stuff to them, too.

46 Just again, to give you the idea of
47 numbers, we have about 22, 23 students at this
48 time. And again, the ones that are lightly

1 colored here are NOAA students and our GEBCO
2 scholars.

3 You can get an idea of the countries.
4 This actually all changed last week as the new
5 set of GEBCO students came in, but I don't have
6 their names yet until we get back.

7 We have a range of wonderful
8 facilities, as Bill mentioned. It is a pretty
9 place, but we also have lovely facilities,
10 particularly a lot of effort on visualization and
11 in this case, telepresence, something we strongly
12 believe in and a way to operate cruises remotely.

13 And hopefully at lunchtime -- so we'll
14 actually, if Lindsay calls in who's on the ship
15 that these guys are looking at now, the Nautilus.
16 She's out there now with telepresence capability.
17 We can show you what that looks like.

18 And again, focus a lot on
19 visualization, advanced visualization techniques.
20 We have a visualization lab looking at many, many
21 aspects of it in terms of the kind of things that
22 Admiral Smith was talking about but what that
23 might look like in four or five years down the
24 line and the tools we might be taking a look at.

25 And just as importantly, a series of
26 really wonderful tank facilities that let us
27 really get to the guts of what's going on with
28 many of the sonar systems and LIDAR systems.

29 We've been doing a lot of LIDAR
30 simulator work and trying to understand really
31 what the limits and the constraints of these
32 systems are with a series of very deep tanks,
33 mostly for the acoustic testing and wave tanks
34 that we can create different sea surface
35 conditions and look at the behavior of LIDAR
36 throughout those types of things.

37 We have a couple of vessels or have
38 had a couple of vessels. We still do have a
39 couple of vessels. The original one, again, a
40 donation by one of our industrial partners.

41 That hull though was 50 years old.
42 You see this wonderful boom on the front for
43 mounting any kind of sonar, and that we have just
44 decommissioned this year. It was really coming
45 to the end of its life.

46 We have a vessel that is on loan from
47 NOAA. This original vessel had no fantail and no
48 ability to tow vehicles or tow anything or take

1 cores, no A-frame. So we had a second vessel on
2 loan from NOAA that we were able to put an A-
3 frame on so we can do those kinds of operations.

4 But we just this year, actually just
5 a month or two ago, took the liberty of a brand
6 new build vessel, a 48-foot vessel that
7 eventually can take all of those tasks over in
8 terms of both the coring and towing operations.

9 And it has, you can see towards the
10 aft of the house there, a very, very large boom
11 also that can retract, and again, the platform
12 for mounting almost any kind of sonar we want.
13 So we're very, very pleased with that and very
14 appreciative of the funding that allowed us to do
15 that.

16 We've also, in collaboration with
17 Higgs Hydrographic, another one of our industrial
18 sponsors, had been looking at approaches. We
19 started off for many years with a jet ski and now
20 a multibeam on a very, very small platform, a
21 very maneuverable platform. We'll be looking at
22 that.

23 So as Andy said, I just wanted to give
24 you an overview of the structure and kind of who
25 we were. We're not going to go into much detail
26 about the actual research efforts, and hopefully
27 we'll have lots of fun over the next sets of
28 meetings. We'll dive into -- we'll kind of poll
29 people and see what you want to hear about.

30 What's guided our research themes for
31 the last ten years has been these seven themes,
32 one focusing on sensors, sonar systems, LIDAR
33 systems, data processing which has really always
34 been a strong area of interest for us, sea floor
35 habitat characterization and of late, water
36 column mapping, always a visualization theme that
37 runs through everything we do.

38 An effort that has been going on for
39 ten years and I alluded to in terms of what the
40 chart of the future might look like, we've had
41 since 2002, I guess, strong effort in terms of
42 actually collecting data in support of U.S.
43 potential submission under the Law of the Sea
44 Treaty and then finally IOCM efforts.

45 So these have been the themes. They
46 are outlined in the federal funding opportunities
47 for the earlier proposals. As we've evolved now
48 into the latest proposal, there are a different

1 set of guidelines or programmatic priorities that
2 were called for in the FFO for the new grant.

3 They're under four categories,
4 innovate hydrography. And for those of you who
5 follow the NOAA mission and the OCS mission,
6 you'll see there's a linkage there. Transform
7 charting and change navigation, explore and map
8 the continental shelf. That's the ECS
9 activities. Develop and advance hydrographic and
10 nautical charting expertise.

11 Under each of those four programmatic
12 priorities, three or four -- you can see four,
13 three, three, four or a total of 14 research
14 requirements were prescribed in the Federal
15 Funding Opportunity.

16 We then responded with a proposal, and
17 we actually took a little different approach than
18 in the past. In the past, our sponsors have been
19 broader and vaguer, but this time you're not
20 going to be able to read this next slide.

21 But to give you an idea of what we did
22 is actually from the programmatic priorities, you
23 see the four of those on the left side, the 16 or
24 14 research requirements in the next column.

25 From those, we broke them down into
26 themes, subthemes and finally to individual -- 60
27 individual projects, which each have an internal
28 PI. And this is going to, I think, help us much
29 better assure that we're on track.

30 And as we interact with sponsors and
31 our customer, get much, much better feedback as
32 we go along and just to pick one of them here.
33 And I can hardly even read this from here, but if
34 we look at the data processing one, we'll see
35 that we have a subset of that, that is about
36 algorithms and processing, something we've been
37 doing for a long time, and a project that is
38 specifically on data quality and survey
39 validation tools, the next generation of tools to
40 give us real time feedback for data quality and
41 so on.

42 And so I just wanted to take the last
43 couple of minutes and touch on a couple of things
44 that we are doing under this new grant now, and
45 again, we'll be able to go into much more detail.

46 And this is something that Admiral
47 Smith mentioned. We have in the data collection
48 on the innovate hydrography a data collection

1 theme, innovative platforms.

2 We have maintained for many years a
3 look at autonomous underwater vehicles, and I
4 think we concluded long ago that from a shallow
5 water hydrographic perspective these may not be
6 the most efficient way to help our mission.

7 But we are very excited about the
8 possibility of autonomous surface vessels, and so
9 we've been looking at this in a number of
10 different ways, both from a theoretical
11 perspective, building control software and things
12 like that, feedback mechanisms.

13 But we've also, through our industrial
14 partners, through some part of Teledyne, have the
15 Z-Boat that Admiral Smith mentioned from NOAA
16 from some early work they did.

17 These are just very small little
18 platforms to what they call the Emily Boats, but
19 the big effort we've focused on is something
20 that's a quite a big larger. That vessel you see
21 there is 4 meters in length, so it's a small,
22 launch size vessel, totally autonomous.

23 And we're taking delivery of this on
24 Thursday. It's coming over from the U.K. on
25 Thursday, and I think we'll be looking at just
26 how far we can push this in terms of hydrographic
27 and other applications, too, and hopefully
28 coordinate this with the efforts of NOAA and be
29 able -- once we get it to a point we think things
30 are ready actually try to get it on an
31 operational platform and see how things go.

32 So that's just one example. Another
33 example under the transform charting and
34 navigation, the chart adequacy and computer-
35 assisted cartography theme, we are looking at
36 issues of resurvey priorities.

37 We're combining theoretical models
38 using AIS information, best guess of about the
39 stability of the sea floor, putting that all into
40 a model and basically looking at real time and
41 predictive decision aids for surveys and how it
42 can be applied to resurvey priorities.

43 I should say within the cartography
44 aspect, I always take advantage of any large
45 group. It's an area that we've recognized from a
46 real cartography, traditional cartography
47 perspective, that we do not have the expertise in
48 the lab.

1 And so part of the process for this
2 new effort is an advertisement for a new faculty
3 position, which is out now on the streets. It
4 has a closing date of tomorrow, but we'll keep it
5 open as long as necessary to try to bring in
6 somebody with really digital cartographic
7 experience that can coordinate with our
8 visualization people and our computer people. So
9 if anybody knows anybody like that, please let us
10 know.

11 And finally, the last topic I want to
12 touch on, which is something that is of grave
13 concern to us and something that the FFO asked us
14 to look into, both for us and for NOAA.

15 And this is the growing concern over
16 the potential impact of sonar systems in general,
17 but particularly the multibeam sonar systems that
18 we use on marine mammals.

19 And we are very, very concerned that
20 much of what we're being told in terms of
21 regulation is based on anecdotes or lack of
22 science. And so what we're trying to do here is
23 to actually try to put the science behind it in
24 terms of both a very sophisticated modeling
25 effort to really understand what the radiation
26 patterns of the multibeam sonars are and their
27 source levels are in the water column.

28 But at the same time, a new hire,
29 again under the new grant, a woman, Jennifer
30 Miksis-Olds from Penn State who's a really top
31 notch marine mammal bioacoustician.

32 And so she has both the acoustics
33 background and the marine mammal background, and
34 so we're going beyond just the modeling of the
35 radiation patterns but looking at what the impact
36 of that might be on a range of marine mammal
37 species. And so that's part of this ongoing new
38 effort.

39 And finally, last slide I think, I
40 want to point that we do maintain a large
41 outreach effort. This is part of it. I'm doing
42 my outreach now, but we have a number of programs
43 that bring schoolchildren in.

44 I think last year we had 900
45 schoolchildren through the course of the year
46 from local schools. We have Ocean Discovery Day.
47 It's a weekend where we get actually several
48 thousand people in through the lab and hopefully

1 2018 -- is that the time -- you'll all be able to
2 join us there and see what we're doing.

3 So I thank you. I think that's it.
4 And I do have -- if there's -- it could just play
5 silently in the background while questions are
6 being asked, a short little video of a survey of
7 the Cuyahoga River done by a local New Hampshire
8 industrial partner, so just let that play. It
9 might interesting for you to see.

10 CHAIR HANSON: Thank you, Dr. Mayer.
11 While we're watching that, we'll go ahead and
12 have a few questions. We're going to get short
13 on time here, but we had some great discussions.
14 And I'd like to see if we have some questions for
15 the panel.

16 MEMBER SAADE: I have a couple.

17 CHAIR HANSON: I thought you might.
18 Go ahead, Ed.

19 MEMBER SAADE: I'll be quick. Rich,
20 on that Inundation Dashboard, is that active
21 already? Is that functioning?

22 MR. EDWING: As a prototype yes, on
23 the website.

24 (Off microphone comments)

25 MEMBER SAADE: But anybody can go in
26 and kind of give it a test drive?

27 MR. EDWING: So it's active. We have
28 it up on an internal website. I can see if I can
29 get that URL for you if you want to go in and
30 play around with it. Yes.

31 MEMBER SAADE: Okay. Then Mike, on
32 that geodesy summer school, Everything You Wanted
33 to Know about Airborne Gravimetry, is that
34 textbook-ready? Is that accessible?

35 MR. ASLASKEN: No. It was such a
36 success afterwards I think people really realized
37 they needed to document that, so I think there's
38 been assignments made.

39 And I don't know the date of delivery,
40 but I can provide that to you. But yes, so
41 they're going to put something together. I just
42 don't know what the timeframe is right now.

43 MEMBER SAADE: Okay. And then Larry,
44 on the mammals, so how soon can we access
45 information and findings and use it in our
46 defense?

47 DR. MAYER: That's a good question.
48 We're actually going through our own NEPA process

1 right now. And so we have gone through this
2 first iteration in support of the NEPA process.

3 We've turned this over to NOAA at this
4 point. And NOAA then carries on the process.
5 But I would assume that once that process is
6 finished, we would certainly be happy to make at
7 least what we found public. Certainly everything
8 we do we try to make public as quick as possible.

9 MR. ARMSTRONG: That's right. So
10 there's two pieces going on. One is the -- we're
11 working through the regulatory process so that
12 the researchers at the center can proceed with
13 echosounding in the course of their research.

14 After we get through that, then we're
15 going to be spending a little more time on the
16 research goal, which is the more generalized
17 modeling and understanding. And so in the
18 regulatory process, we're in that process and not
19 really able to share outside of the government
20 deliberative process, but as soon as we get
21 through that, I think we'll be, as with all our
22 work, we'll be able to and want to share what
23 we've got with the whole community.

24 So I guess it's probably six months to
25 a year before we're able to start getting outside
26 of sort of our internal regulatory issues.

27 MEMBER SAADE: Okay. Well, then from
28 the industrial partner point of view I would just
29 state that if you need to have access to vessels
30 in different parts of the world, in different
31 locations that may be a platform for you to do
32 some testing on, I think you should talk to some
33 of your industrial partners and ask if you can
34 ride along.

35 DR. MAYER: That's a great offer and
36 one we'll probably take you up on --

37 MEMBER SAADE: Okay.

38 DR. MAYER: -- because certainly that
39 will ultimately be the final test. We're
40 producing a lot of models, what we think the
41 radiation patterns look like, but we need to
42 actually then sit in an area on a vessel and make
43 a measurement to see if we're close.

44 MEMBER SAADE: Thanks.

45 CHAIR HANSON: Lawson?

46 MEMBER BRIGHAM: Lawson Brigham. It's
47 just to make maybe in our letter that we note the
48 role of public/private partnerships and

1 federal/state partnerships and even interagency
2 cooperation and all of what you said.

3 They were good examples. And
4 particularly what Rich and Mike were saying, so I
5 think it might be a topic to speak to and to note
6 progress and to push forward.

7 CHAIR HANSON: Agree and also
8 challenge maybe interacademic as well, other
9 academic -- who else is doing what you're doing,
10 and how can we leverage that for more attention.

11 I'm going to have to unfortunately cut
12 it off. Fortunately, all five of these guys are
13 going to be around for a couple days, so we still
14 got them. And so we can catch up with you with
15 the long list of questions I know we have.

16 Lunch, we're going to break for lunch.
17 HSRP and NOS staff have a working lunch. For
18 everyone else, it's on your own. We're going to
19 reconvene at 1:00 p.m. promptly.

20 And we're going to hear from our
21 navigation stakeholders, and I think that'll be a
22 very interesting panel. I encourage everyone to
23 be back here by 1:00.

24 Lynne, I think she might have gotten
25 a little advertising out of this, but Heinen's
26 Supermarket on the corner has gourmet sandwiches,
27 9th and Euclid, so just down the corner here. So
28 we'll go ahead and adjourn and see you at 1
29 o'clock.

30 (Whereupon, the above-entitled matter
31 went off the record at 11:51 a.m. and resumed at
32 1:01 p.m.)

33 CHAIR HANSON: All right. Thank you.
34 We have one navigation stakeholders panel this
35 afternoon, and I can see some very esteemed
36 colleagues so appreciate you all being here and
37 sharing your thoughts on what's going on in the
38 lakes.

39 Moderating the panel is a guy we've
40 met a couple times already, Glen Nekvasil, Vice
41 President of Lake Carriers Association, a
42 membership trade association representing U.S.
43 flag vessel operators on the Great Lakes.

44 Mr. Nekvasil also has served -- also
45 serves as secretary of the Great Lakes Maritime
46 Task Force, a labor management coalition to
47 promote Great Lakes shipping. Sir, I'll turn the
48 floor over to you and let you introduce your

1 panelists.

2 MR. NEKVASIL: Thank you very much.
3 Okay. I have a few slides here before I
4 introduce my panelists. The reason why we talk
5 about navigation challenges on the Great Lakes is
6 because there's a lot of navigation.

7 We move a lot of cargo here on the
8 Great Lakes, and I'd just like to take a couple
9 of minutes to talk about those cargos and the
10 importance of those cargos.

11 Actually though, one thing, I do want
12 to apologize for my attire today, but I was told
13 this was business casual. And frankly, after 40
14 years of white shirts and pinstripe suits, when
15 somebody tells me I can skip it, I skip it, all
16 right. Okay. I was not being disrespectful
17 today, ladies and gentlemen.

18 But again, Great Lakes, there is an
19 awful lot of cargo moving here on the Great
20 Lakes. If you take a look at the last couple
21 years, it's been between 135 million and 142
22 million tons of dry bulk cargos.

23 And on top of that total I should add
24 the Seaway in addition to the grain that's in
25 this table. They move five, 6 million tons of
26 general cargo a year. And when the economy is
27 really hitting on all cylinders, those totals
28 will be much higher.

29 But just to take a look at the major
30 trades here, the iron ore trade in recent years
31 has been about 59 million tons. And there's
32 really only one thing you can do with iron ore,
33 and that's make steel.

34 There's only one other little
35 application. They use some of the taconite dust
36 basically, and they mix it in with cement as a
37 strengthener.

38 The next big cargo on the lakes is
39 coal. It's been about 25 million tons here in
40 recent years. It wasn't all that long ago that
41 the coal trade was about 35 million tons, but
42 Ontario has phased out the use of coal for power
43 generation.

44 That knocked seven, 8 million tons of
45 coal off the lakes. And also, too, with the
46 cheap price of natural gas and some of the new
47 regulations coming in, we're seeing some of the
48 older coal-fired power plants being retired. So

1 that has had a major impact.

2 So frankly, the coal trade is in a
3 period of reinventing itself. It's not going to
4 go away. We're always going to move coal on the
5 lakes, but again, the numbers have been somewhat
6 reduced here.

7 Limestone rounds out what we call the
8 big three cargos, and about 65 percent of the
9 limestone that moves on the lakes is aggregate
10 for the construction industry, the base for
11 highways and all the various building projects.

12 And we also move what's called flux
13 stone, and that's a type of limestone that's used
14 as a purifying agent in the steel mills. They
15 charge it into the blast furnace, or in some
16 instances, we haul the limestone up north.

17 Then they rail it up to the iron ore
18 mines, and they mix it in while they're making
19 the pellets. And then we get to bring it back
20 down. That's actually getting to carry the same
21 cargo twice, which is something ship guys like
22 very much.

23 And then the other dry bulk cargo here
24 on the lake is grain. It's one of the big ones.
25 It's 10 to 12 million tons a year, at least
26 recently. But George was telling me that this
27 has been a very, very good year for grain, and
28 they're expecting a big harvest in the fall. So
29 that total should be higher, I think.

30 Another major cargo is salt. It will
31 be about 10 million tons. It's -- basically,
32 it's determined by the severity of the preceding
33 winter. But again, if Mother Nature is tough on
34 us, it'll be ten, 11 million tons.

35 We move about 5 million tons of
36 cement, and then there's some other cargos, such
37 as gypsum and pot ash. There are some liquid
38 products, and we move some sand. Now, my members
39 and the US-flag vessels -- and these are the Lake
40 Carriers Association folks, we will move about 90
41 million tons a year in this market.

42 And if things got revved up again,
43 that would go over 100 million tons. And again,
44 as you can see, iron ore is our number one cargo.
45 Limestone has now taken over from coal, and it's
46 about 23 million tons.

47 That number -- the construction market
48 in the Great Lakes Basin has never really shaken

1 off the recession yet. So if we ever get
2 rebuilding all these bridges and highways and
3 stuff, that limestone total will go up
4 significantly.

5 I mean we have limestone here on the
6 Great Lakes, The quarry at Rogers City is
7 reportedly the largest in the world, and I'm told
8 they have reserves to go for about another 400
9 years. So we're going to be moving limestone on
10 the Great Lakes as long as the United States is
11 an industrial power.

12 So again, that's the kind of cargo
13 volumes that we have here on the lakes, and
14 that's why NOAA is charged with providing so many
15 of these services and why those services are so
16 important.

17 So that's going to be it from me for
18 now. I'd like to move on to the panelists. You
19 all have biographies of the panelists in your
20 packet, so I'm not going to add too much to that.

21 But our first speaker, Betty Sutton,
22 who is administrator of the Saint Lawrence Seaway
23 -- I do want to add one thing, is in my bio there
24 you saw that I am secretary of the Great Lakes
25 Maritime Task Force. In 2010, we presented her
26 an award as Great Lakes Legislator of the Year,
27 and it was our pleasure. So Betty?

28 MS. SUTTON: Thank you, and I was very
29 honored to receive that award. Thank you very
30 much, Glen, and thank you all for inviting me to
31 join you here today.

32 So this is a little bit of a different
33 presentation than the ones that I'm used to, so
34 you'll have to be kind and gentle with me as I go
35 through some of the more technical aspects and
36 some of the innovation that we're doing on the
37 Seaway.

38 I also have with me Marvourneen Dolor,
39 who works with us. And should you have any
40 questions at the end that she might be able to
41 address, she's a little bit more of a technical
42 expert than I.

43 With that said, though, I can tell you
44 all about the Saint Lawrence Seaway. Over 2300
45 miles, as you can see, if you go down the system.
46 You cross the international border 27 times,
47 which makes it an imperative that we work closely
48 with our Canadian counterparts because certainly

1 if people are going through the system, they
2 don't want to feel like they're crossing the
3 border 27 times.

4 So we work very carefully to make sure
5 that we share not only operations with the
6 Canadian Management Corporation. They are a
7 little bit different than us. On the Canadian
8 side, the Transport Canada has a contract with
9 the Saint Lawrence Seaway Management Corporation,
10 who manages their 13 locks on the system.

11 As for the U.S. side, of course the
12 Saint Lawrence Seaway Development Corporation is
13 a government-owned corporation that is housed
14 within USDOT. We are a little bit different than
15 most of the operating modes in USDOT.

16 We not only operate a transportation
17 system, the locks, and maintain the
18 infrastructure in the Seaway, but we also have a
19 trade development mission and an economic
20 activity mission.

21 The point of the Seaway in many ways,
22 from where we sit, is economic activity in the
23 Great Lakes Region, and as you can see, we are
24 definitely in the thick of it on the economic
25 impact side of things. Next slide will show us
26 that.

27 We are an environmentally sensitive
28 transportation route. I don't need to tell all
29 of you in this room. You know that. Home to the
30 world's largest source of freshwater, one-fifth
31 of the world's freshwater.

32 Home to almost a quarter of the
33 continent's population. Home to one-half of the
34 Fortune 500 industrial companies. It's an
35 amazing market in which we find ourselves.

36 If we were an economy as a region with
37 the eight Great Lake states and the two Canadian
38 provinces, we would represent the third largest
39 economy in the world behind only the U.S. and
40 China.

41 Now I like to say that when I started
42 this job we were the fourth largest economy in
43 the world, and now we're third. But I think it's
44 just a coincidence, or maybe we're adding it up
45 differently. But at any rate, we're the third
46 largest economy in the world.

47 An economic impact study that was done
48 not too long ago documented that the benefits of

1 the maritime activity in the Great Lakes Seaway
2 System annually sustains 227,000 jobs, \$33.6
3 billion in business revenue, \$14.1 billion in
4 wages and \$4.6 billion in taxes. So it is a big
5 deal.

6 We also see ourselves as an
7 environmental gatekeeper, certainly on the
8 Atlantic side. When the Seaway was built, it was
9 a technological marvel of its day. In fact, in
10 the year 2000, the American Public Works
11 Association dedicated it as one of the top ten
12 public works projects for the 20th century.

13 It does consist of the 15 locks, 13
14 Canadian locks, two U.S. locks. They are 57
15 years old. We are going through a major
16 recapitalization on both sides of the border and
17 all of the locks at this time.

18 Close to a billion dollars for both
19 the U.S. and Canada is being spent on this major,
20 not only rehabilitation, but modernization of the
21 system, and I can talk a little bit more about
22 that.

23 It was modeled on the Panama Canal.
24 It's clearly nothing fancy, but it is extremely
25 reliable, which is part of our mission to provide
26 a safe, efficient, reliable waterway. And
27 reliable it is, available 99.7 percent of the
28 time.

29 At the Seaway, we have a tradition of
30 innovation, and part of that is due to the
31 necessity of things with the environment in which
32 we work, certainly that fragile environmental
33 component of our work along with some of the
34 other challenges we face with weather and things
35 like that.

36 Working with basic infrastructure, we
37 have that strong culture of innovation. The
38 future in our minds lies less in what we are
39 going to build that is different in the Seaway
40 than in making the most of the infrastructure
41 that we have.

42 With the single lock system connecting
43 the lakes to the Atlantic, safety of navigation
44 and a state of good repair is of critical
45 importance to us.

46 Since 1998, we've seen a series of
47 investments bi-nationally, as I mentioned, and
48 we're continuously working on R&D. Seaway users

1 were among the first to adopt the new
2 technologies in vessel traffic management.

3 The Seaway Corporations, both on the
4 U.S. and the Canadian side, supported the testing
5 and the use of technology in the Seaway. The
6 Canadian laker fleet actually led the development
7 and the implementation of the Electronic Chart
8 Display and Information System in the early
9 1990s.

10 The ECDIS depicts vital information,
11 as you all know, for mariners within the display
12 links to traffic management system, resources,
13 provide information, such as wind data, wind
14 levels and vessel order of turn for a given lock.

15 The automated -- Automatic
16 Identification System, or AIS, was also developed
17 in the 1990s. It was adopted in 2002 and
18 implemented in 2003. AIS is a shipboard
19 broadcasting transponder system operating in the
20 VHF maritime band.

21 I know you all know this, so forgive
22 me, that sends vital information such as ship
23 identification, position, speed, heading from
24 ship to shore, shore to shore and ship to ship.

25 We are committed to ongoing technology
26 innovation. DIS, as I said, implemented in 2012
27 vessel spotting. Vessel self-spotting has
28 already been implemented by the Canadian Seaway
29 in 2013. And we are all in the process of
30 implementing something called Hands-Free Mooring.

31 SLSMC is scheduled to have it
32 completed on the Canadian side in 2017. We are
33 scheduled to have that completed on the U.S. side
34 in 2018. As you can see, as things have
35 progressed from old to new, we literally had
36 little pieces of cardboard that we moved.

37 And now we have moved a little bit
38 further into the present, and this is our vessel
39 traffic control center in Massena, New York.
40 That is where our operations center is.

41 We started to explore the use of
42 technology as a means to safely prevent or delay
43 draft reductions and when possible to make better
44 use of the available water column.

45 In doing so, we entered into
46 agreements with other agencies to share water-
47 level data on a real-time basis to provide mutual
48 redundancy. We modified the AIS messages to

1 transmit and flag estimated water level readings.

2 In the Montreal-Lake Ontario section,
3 we use water level gauges owned and operated by
4 one of the two Seaway Corporations or several
5 other organizations, Hydro-Quebec, Ontario Power
6 Generation, New York Power Authority.

7 There is one NOAA gauge at the Port of
8 Ogdensburg in New York. These additional gauges,
9 though, in the waterway, provide redundancy.
10 They're important to us, but not necessarily what
11 we're relying on as primary information systems.

12 The system automatically detects when
13 a gauge is not transmitting and transfers to a
14 redundant gauge or calculates an estimated value.
15 We transmit the minimum reading of the last hour
16 via AIS.

17 There's a similar network -- DIS
18 network for the Welland Canal, and it's critical
19 that we know the water elevation but also that --
20 where the bottom of the channel is. We have a
21 well-established sounding program that's
22 developed over the last 50-plus years.

23 Soundings are conducted on a regular
24 basis, especially in areas susceptible to
25 silting. And in early 2000, the Transportation
26 Development Center, in partnership with the
27 Seaway entities and industry, we conducted a
28 study to determine vessel squat using DGPS data
29 collection with vessels underway.

30 So what are the benefits of this draft
31 information system? We certainly have increased
32 safety. The use of algorithm allows the masters
33 to see up to ten miles ahead, offering time for
34 the course change, a required reaction in
35 transit, so while it's actually happening.

36 Increased efficiency, use of the
37 technology allows vessels to utilize deeper
38 drafts of up to 3 inches, meaning up to an
39 additional 360 metric tons of cargo per voyage.

40 We have improved traffic and fleet
41 management through this use. Climate change
42 mitigation is impacted due to greater
43 fluctuations in water levels. This tool allows
44 more flexibility with less water, adjusts to
45 variable water levels.

46 We have increased productivity and
47 competitiveness for the Seaway, which is really a
48 critical thing, given our constraints, our

1 natural constraints. We take pride in being
2 ahead of the curve.

3 As such, the Seaway was one of the
4 first inland waterways to deploy DIS technology,
5 and we -- our -- the development of DIS has
6 become a basis for developing an international
7 standard for DIS technology.

8 So the little old Saint Lawrence
9 Seaway has become a leader in this world. Draft
10 information system -- oh, I think I might have
11 missed a slide there. Sorry about that, guys.

12 Draft information system overview. So
13 what exactly is it? It relies on real time
14 water-level gauge networks along the vessel's
15 route, which is communicated by the AIS network,
16 it interpolates water levels between two points,
17 displays the vessel's position and speed in real
18 time and it provides a look-ahead future, minimum
19 distance that it would take a vessel to come to a
20 full stop.

21 It utilizes high-resolution
22 bathymetric data, S-57 format, overlaid on an
23 electronic navigation chart. It uses a set of
24 squat equations developed to approximate the
25 squat of a given ship type in the given
26 navigation environment, whether it's a confined
27 channel or a channel within the lake.

28 Now these screens that you're going to
29 see on the next two slides are screenshots from
30 the two different system developers of DIS
31 technology. In both cases, the red indicates
32 that if the vessel continues at its current speed
33 and passes any of the red spots, it will have
34 less than one foot of under-keel clearance, as is
35 required in the Seaway.

36 The other items listed on these slides
37 provide information about the transit status,
38 like the time, the date, the heading position as
39 well as information used to compute the vessel's
40 under-keel clearance, which of course again is
41 speed over ground, speed through water, depth
42 with respect to the chart data, draft, squat,
43 ship type, area type, et cetera.

44 Each developer chose to display items
45 differently in different screens, but they both
46 conform to the implementation specification.
47 This is the other example.

48 There were no international standards

1 for this technology available at the time when it
2 was developed. The two Seaway Corporations, in
3 partnership with the shipping industry, worked
4 with a third party to develop specs for use of
5 the technology in the Seaway System.

6 We determined that the implementation
7 of the draft information system needed to go
8 through the rulemaking process, so we did put it
9 through that process. The final rule became
10 effective in July of 2012.

11 Some of the key dates and usage for
12 the DIS. On May 8, 2012, the first shipping
13 company was given provisional approval. On May
14 14th, the first vessel transited with a load of
15 iron ore bound for Toledo at a draft of 26 feet,
16 9 inches, which was 3 inches above the published
17 maximum permissible draft.

18 There were 17 transits in that first
19 2012 period, in that season. During this year's
20 shipping season, through the end of June, there
21 were already 74 DIS transits. So it's picking
22 up.

23 At the beginning of the 2016
24 navigation system, there were 43 vessels equipped
25 with DIS using it in the Seaway. So now that
26 you've heard about this technology and the
27 benefits that we have been able to gain from this
28 cutting-edge system available in our waterway,
29 I'm curious to hear from you, at the proper time,
30 of other ways that maybe the Saint Lawrence
31 Seaway Development Corporation and NOAA can work
32 together to develop technologies that might be
33 beneficial certainly for navigation through this
34 very delicate part of our world. All right.
35 Thank you.

36 MEMBER KELLY: Ed Kelly. This system
37 that gives the squat and either gives a go, no go
38 type of a decision for a ship to transit, is
39 there any sovereign immunity involved with this
40 because of the development with the Seaway and
41 the governmental agency, or are ship owners just
42 using this as information?

43 As an example, if something looked
44 green on DIS, but he grounded, the lawyers want
45 to know who pays.

46 MS. SUTTON: Well, I don't know the
47 answer to that question, but it's a very, very
48 good question. And certainly, I don't know if,

1 Marvourneen, you have that information.

2 MEMBER KELLY: Okay, because some of
3 the high-end value of PORTS and some of the
4 products that NOAA does deliver is that it is a
5 government with a QA/QC that we have basically
6 almost a sovereign immunity.

7 We can rely on that data and do so
8 without legal consequence. So that's why the
9 PORTS data is so valuable as opposed to things
10 that might be out there from universities or this
11 or that without any definite legal protection to
12 it. So I would just be curious. What
13 protections are available to use the DIS system?

14 MS. SUTTON: We will, even in real
15 time, try to get you the answer to that question
16 before the day is up. I feel that obviously it's
17 a question right on the money, pretty significant
18 to know. So --

19 MEMBER KELLY: Because I'm impressed
20 with one foot anyway, even in Port of New York
21 where we're two under and two above. So if you
22 can get away with one foot, God bless you.

23 MS. SUTTON: Thank you. We do.

24 CHAIR HANSON: Go ahead, Ed.

25 MEMBER SAADE: I just had a quick
26 question. Did you reference how often you update
27 it? Is it multibeam that's done daily, or how do
28 you know that it's changing within a three-inch
29 window?

30 MS. SUTTON: It is done in real time.
31 It is updated constantly. Marvourneen, is that
32 correct?

33 DR. DOLOR: I'm not sure I understand
34 the question. You're asking if your vessel is
35 going out through a multi-beam --

36 MEMBER SAADE: Correct.

37 MS. SUTTON: Oh, okay.

38 DR. DOLOR: We can follow up with you.

39 MEMBER SAADE: So how do you know if
40 it's right?

41 DR. DOLOR: We'll follow up with you
42 with -- that's a --

43 MS. SUTTON: It is determined in real
44 time while you're operating, so I don't know the
45 technical nature of how that works, but obviously
46 you need to know that it's right. We haven't
47 seen any negative implications from the use of
48 this information, so it is working, this

1 technology.

2 VICE CHAIR MILLER: Joyce Miller. One
3 question I have, and this is as much to NOAA as
4 to you. We've visited LA-Long Beach where they
5 have something called a Precision Navigation
6 System, and these are models of ship movement
7 associated with that. Has there been any
8 crosslinks between NOAA and this DIS system?

9 MR. MAGNUSON: I'd be glad to answer
10 that.

11 VICE CHAIR MILLER: Okay.

12 MR. MAGNUSON: When Dave MacFarland
13 was Director of Office of Coast Survey, a few of
14 us I'd say, Darren, about eight of us went over
15 to Saint Lawrence Seaway offices. Craig arranged
16 for that, Betty.

17 And we had an interplay between their
18 staff and the Draft Information System. That's
19 when we first learned about it. Perhaps it's
20 time to revisit that.

21 RADM SMITH: Yes, quite more recently
22 we'd spent a lot of time with Louis Maltais, CHS,
23 on the hydrographic survey side, often at the
24 same conferences and that sort of thing. And so
25 the Precision Navigation project that we did in
26 LA-Long Beach was in fact inspired by this.

27 There were pieces of it that for the
28 very reasons that Ed Kelly brought up, we decided
29 not to have the system -- the integration of all
30 the information be a government project, that we
31 would limit, the government involvement to
32 providing the bathymetry, the water level modes,
33 the wave models, but integrating how those
34 interact with a vessel and the settlement and
35 squat that has to do with the vessel's operation
36 not to do with the government.

37 And so perhaps -- that was sort of how
38 we drew the line. I will also say, however,
39 comma, we're still waiting for a really good
40 system integrator to come along to help take that
41 over the line, and so we do need to be -- maybe
42 QPS is still in the room, I'm hoping their ears
43 will perk up here because we are looking for a
44 good system integrator.

45 MS. SUTTON: And I would say this is
46 an example of someplace where the Seaway
47 Corporations can innovate and move ahead
48 sometimes in a way forward laying that groundwork

1 and others can't, just because of our size and
2 sort of the way that we're structured.

3 MR. EDWING: Thank you. So I've been
4 aware of the system for quite a while. I've been
5 very impressed with it. Have you ever done an
6 economic benefits study in terms of how much gets
7 invested each year and what the benefits are that
8 you get back?

9 MS. SUTTON: I don't believe that we
10 actually have a study. We have anecdotal kinds
11 of information you can hear from those who have
12 utilized the system to their advantage, but I
13 would be wrong to quote that.

14 MR. EDWING: Okay. All right. Thank
15 you.

16 MR. NEKVASIL: All right. If there
17 are no more questions, we'll move on. Our next
18 speaker is Captain George Haynes, the Vice
19 President of the Lakes Pilot Association, and
20 he's going to talk about Great Lakes Weather and
21 Commercial Navigation; A Pilots' Perspective.

22 CAPT HAYNES: There we go. Thank you,
23 and thank you to the review panel for getting --
24 allowing the pilots to speak to you, and thank
25 you to Lynne for coordinating it all, and thanks
26 for saying we're esteemed. I appreciate that.
27 I'll let my wife know that.

28 So I want to just make a distinguished
29 -- excuse me. I pilot -- my group, we pilot the
30 foreign ships that come onto the Great Lakes off
31 the Ocean, and that's pretty much true anywhere
32 in the United States with pilots, but I just want
33 to make the distinguishment that we're -- they've
34 got the lake freighters or lakers, the domestic
35 fleets that Glen's organization represents.

36 There are two different kinds. The
37 lake freighters have captains and officers that
38 are already licensed pilots on their ships. They
39 never really leave the lake, so they know these
40 waters really well. Foreign freighters come to
41 the Great Lakes. They may never have been here
42 before, so they have to hire registered pilots,
43 which is what my group does.

44 So I want to talk about a couple
45 things. I had a couple weeks to put this
46 together and research, and I'm a little new at
47 this presentation, too. But I went out and asked
48 as many people as I could, pilots, and I have a

1 lot of friends who work on the lakers as well,
2 what are you using?

3 My presentation is going to be more
4 weather-based. I'm going to talk about PORTS,
5 too, not charts. So I asked, what are guys using
6 out there. And what's your favorite stuff? Do
7 you use anything?

8 And so, I came up with this list, and
9 it's not necessarily in order of importance or
10 most used. What I did find was, and it's
11 probably surprising, that older, more experienced
12 navigators who have been around a lot longer tend
13 to use text-based products because that's what
14 they've always used and they've gotten it through
15 VHF. They're not so much prone to pulling up
16 their phones and looking at the websites. So the
17 text-based services are still very important
18 here.

19 And of course the younger pilots,
20 which I like to include myself in that category
21 although I'm probably getting borderline now, but
22 tend to use the web, visual, interactive-type
23 sites.

24 And really, it's a matter of personal
25 preference. There's no -- everybody's got their
26 favorite. I got a bunch of emails here what
27 people described. Everybody's got their favorite
28 stuff and how they like to see the world when it
29 comes to making decisions whether to go in and
30 out of a port, whether to proceed or not.

31 So one thing I would like to
32 compliment on is the Operational Forecast
33 Systems. I work on Lake Erie, so that's what I
34 know the best. That is an excellent tool, to be
35 able to go in hour increments into the future to
36 see exactly what the lake is going to be doing
37 and the winds and velocities, the currents and
38 water levels.

39 So I just used it last week intensely.
40 I was on a tug and barge off of Buffalo, and we
41 knew we were going to be arriving in Buffalo at
42 0300. And the afternoon before we were able to
43 look at the OFS for Lake Erie and see that we had
44 a window to get into Buffalo.

45 Now if we had just listened to the
46 marine forecast, it's more general. We really
47 don't know where the winds are going to shift and
48 what the lake is going to do, but looking at that

1 OFS, we went for it and turned out it was pretty
2 accurate. It was just the wind shifted a little
3 too early, and we lost a whole day. So we never
4 got in, but the thing is we had a chance and it
5 was because of that OFS. We probably wouldn't
6 even had tried had we not had that information.

7 So the challenge for pilots other than
8 a lot of things going on this year, using the
9 Internet-based products. On the Great Lakes we
10 pilot the ship for its entire Great Lakes
11 transit, whereas on the coasts you have pilots
12 get aboard at a harbor entrance or a sea buoy,
13 then take it through a river or into the harbor.

14 We get onboard, and there's always a
15 pilot on these vessels going across all the lakes
16 right down the middle of each lake or wherever
17 they're going.

18 So talking to my laker friends, they
19 have Internet -- satellite-based Internet
20 service. When they're in the middle of Lake
21 Superior, Lake Michigan or Erie -- excuse me --
22 they can pull up all the great services that you
23 provide -- NOAA provides on the Internet.

24 Pilots, we're different. We're on
25 different ships every day. A lot of these
26 foreign ships don't have sophisticated equipment.
27 They have the basics. We're pretty limited, so
28 we're highly reliant on our smartphones to get
29 the websites and the real-time point reports.

30 And the problem is if we go down the
31 middle of a lake, we're maybe 20, 30 miles
32 offshore, and there is no cell phone service. And
33 we're not going to run the shoreline close just
34 to get cell phone service. We might do that for
35 television, but we won't do it for cell phone
36 service.

37 So anyways, our problem is we're kind
38 of blind when we're out in the middle of the
39 lake. We have no way of really getting all these
40 great products.

41 The only thing we can get is VHF
42 reports, and that would be Canadian Marine
43 Forecasts and the National Weather Service
44 forecasts, which are primarily land-based. I
45 know there's a lot of marine information,
46 forecasts and so on.

47 So when I -- let's say I leave the
48 Welland Canal and I'm going to Cleveland or

1 Toledo, and I give an ETA to an agent who's
2 handling the needs of the vessel at that port.
3 And they have to line longshoremen, line
4 handlers, tug boats, customs and everything.

5 And so I give him a good ETA, and then
6 we got out in the middle of the lake and I have
7 no updates. I mean I can look at the forecast
8 and have a good idea, but I might be 12 to 14
9 hours out in the lake kind of blind from Internet
10 service, and a lot can happen with changing
11 weather in 12 to 14 hours.

12 So I might get to Cleveland and all of
13 a sudden there's this big weather system that's
14 preventing me from coming in, or the front
15 finally came through or it came too early, and
16 then I'm caught off guard, and then all those
17 services that he lined up had to be cancelled,
18 which is expensive to the shipping companies.

19 Or I get there, and maybe I said I'm
20 going to -- let's wait four hours, and I'll give
21 you a later ETA. And maybe I could have gone in,
22 so having that real-time information is really
23 helpful to reduce costs for the industry users.

24 So what I was going to ask as a
25 recommendation is -- I know we can't -- you
26 cannot put all this information on VHF, but you
27 do have -- the National Weather Service
28 broadcasts are already in place.

29 What would be great for us would be to
30 put the water levels at the different stations.
31 There's one of your OFS things, and if you look
32 at the black places, Fermi Power Plant, Toledo,
33 Marblehead, so on, those are where the water
34 gauges are, and there's also -- most of them have
35 wind speeds and directions.

36 If those point real-time information
37 could be broadcast, doesn't have to be overly
38 continuous, but every once in a while if those
39 could be broadcast over the National Weather
40 Service radio, then out in the middle of the lake
41 I have -- I can kind of see what the lake is
42 doing.

43 I know with water levels. I know the
44 winds, so that I can find -- if I'm over in
45 Buffalo, I know Toledo might have just had a wind
46 shift, and I can follow that hour by hour when
47 I'm out in the lake to know what's going on.

48 And then I can maybe somehow have the

1 ship let the agent know that hey, we're not going
2 to make it because when we get there, that's
3 weather is going to be bad. So it would be
4 really helpful. We're kind of blind.

5 Now the Canadian Weather Service used
6 to have a thing called -- I think it was called
7 LAWEB. I don't know what it stood for, but they
8 reported all their lighthouses and wind and speed
9 and velocities on the lakes, and then they
10 discontinued it, and we've been kind of lost ever
11 since.

12 So that's one of my recommendations,
13 and you can see Lake Erie. I mean look at the --
14 in the Buffalo there's less than 5 knots out of
15 the east and over in Toledo they got up to 25, 30
16 knots out of the south. So Lake Erie, you can
17 have a lot of different patterns on one lake, and
18 that was in August just a couple weeks ago.

19 And my other thing is I would like to
20 showcase one port in particular. I'm in and out
21 of there all the time, and it's on Lake Erie.
22 And Lake Erie, I think, is probably the most
23 affected by winds, gales because a lot of you
24 know this already, but the seiche effect.

25 The predominant winds coming through
26 this area are southwest and especially when the
27 wind's really going to blow. It's southwest or
28 west, and Lake Erie is so shallow it's like a
29 baking pan. This is how it was described to me.
30 You put water in a baking tray and you move it a
31 little bit, and all the water goes rushing to one
32 side and spills over. Well, that's what Lake
33 Erie does.

34 And so commonly, Buffalo gets piled
35 high with extra water and Toledo gets drained
36 right out, and so I want to showcase Toledo as a
37 place where we really could use the PORTS system.

38 And I know Cleveland's got that system
39 in place, and I was coming here to ask NOAA to
40 fund that, all four, so now I know the answer --
41 when I saw Glenn get his plaque.

42 So anyways, I won't ask for the
43 funding, but we would like the system, and so
44 Toledo at the very western end of Lake Erie, when
45 the wind blows all that water out of the west end
46 of Lake Erie, Toledo can drop 4 to 5 feet in a
47 matter of hours. And of course Buffalo gets it
48 all on the other side in a matter of hours.

1 Toledo really isn't a harbor. It's
2 more of a 6 mile long -- as far as navigational
3 purposes go, it's a 6 mile long section of the
4 Maumee River. And I like to say that Toledo has
5 it all, and I'm not in the tourist business to
6 promote it, but it has all the challenges of
7 navigation.

8 Lots of bridges. The ship is limited
9 on all sides: above, below and on both sides when
10 we go through the bridges. And so it also has --
11 some of these bridges where you wonder what were
12 they thinking? They're at angles. They're
13 narrow, and of course bridges always tend to
14 break down or they want to run their trains
15 before we -- they want to open up for us.

16 Anyways, Toledo has all the natural
17 challenges, I think. It's a flat land area.
18 It's not mountainous. So when the winds are
19 blowing, you're susceptible to crosswinds or from
20 whatever direction, extreme water levels like I
21 just explained, can drop very quickly. And then
22 when the water levels drop, of course, the
23 currents pick up out of the Maumee River and the
24 currents can also be severe, and they also can be
25 caused by rainfall.

26 If you've got heavy rains for a couple
27 days, that current in the Maumee River is really
28 ripping through there. Plus, you got a lot of
29 mud, and you got seasonal shoaling. They dredge
30 it all the time and keep it pretty cleaned up,
31 but still -- fortunately, it's mud in there and
32 not rock.

33 Just to show you how severe the water
34 levels can drop, that's Toledo in 2003. It
35 happened to be a big blow that came through
36 really fast, and it just -- it dropped everything
37 4 or 5 feet. I'm not sure what it was. It was
38 at least 5 feet.

39 So this is around the docks. A couple
40 of those tug boats are aground. That ship, I was
41 told is aground. And you can get the picture.
42 So this is a slide from just this month, two
43 weeks ago, showing the water level change.

44 Now this isn't the stormy time of
45 year. This is just -- this is summer. It's
46 supposed to be pretty calm, but even so, with the
47 25 knot wind that day the water level dropped 20
48 inches. You can see that on the far right side

1 of the slide, 20 inches in probably about six
2 hours.

3 And we're running over the ground
4 couple feet. Toledo's got another really cool
5 bridge. It's an overhead bridge called the
6 Anthony Wayne Bridge, and it's clearance over low
7 water datum is 10 feet less than what the Welland
8 Canal and the Saint Lawrence Seaway is. Again,
9 what were they thinking? Probably it was so old
10 they weren't thinking about it.

11 But the ships we bring in there and we
12 go up all the way to the head of navigation, and
13 we have to go under this bridge. And we have to
14 have the ship captains do everything they can to
15 get these ships ballasted down so that we can get
16 under that bridge.

17 And a lot of times they have to put
18 water in the cargo hold. They have to do
19 whatever they have to do, and we try to shoot for
20 101 feet for the air draft of the ship. And
21 lately we've had about 3 or 4 feet of water above
22 datum.

23 I don't expect you to understand all
24 these calculations right away, but the gist of it
25 is, when we go under that bridge we have about 2
26 feet, maybe 3 feet of clearance. And so we are
27 constantly checking these websites.

28 And I took a trainee with me the other
29 day coming out of Toledo, and to help me out I
30 said keep checking the water level and keep
31 checking the currents and everything. And so his
32 thumb was really moving the whole time because we
33 had wind, and the water levels and the current
34 were changing quickly. So anyways, I kept him
35 busy.

36 I put the head of navigation in
37 Toledo. It's about 6 miles in. There's three
38 grain elevators, and we bring a lot of the ocean
39 ships up there to load grain. And a lot of the
40 Canadian lakers go up there to load grain. The
41 American ships really don't do that anymore.

42 So anyways, that's a turning basin,
43 and this is -- when we leave a dock up there,
44 we're starting from a stationary position. The
45 tugs pull us out to the middle. We got to hit
46 the pedal to the metal and go through this
47 Norfolk Southern Bridge, which is a very, very
48 narrow bridge. Again, what were they thinking?

1 A hundred and fifteen feet wide in the
2 one side of the span, and our beams on the ships
3 are 78, so that leaves about 35, 37 feet. And I
4 think it's a lot of less. But anyways, if we
5 have a heavy current up there, we really can't
6 leave.

7 And your current meter is right up
8 there off of the -- it's called the ADM Elevator
9 Current Meter, and we are referring to that all
10 the time. That is very, very important.

11 And the red arrows, they show the
12 direction of the actual current usually. When
13 it's flowing northward or up, that's outbound.
14 So we leave the docks. We got a current setting
15 us toward the east bank. And then as we get
16 going, the current bounces off the east bank and
17 sucks us towards the west when we get into the
18 bridge.

19 So -- and if it's really running, we
20 can get in bad shape or it can really cause
21 problems. So that current meter is invaluable.
22 It used to be, before the current meters, we'd
23 get on the ship. We'd look over the side and go,
24 wow, those weeds are really going by fast. And
25 boy that log is really cruising by. Maybe we
26 shouldn't go.

27 And that's how scientific we were.
28 Now with the current meter, the tug boats won't
29 take us if it's above 0.8 knots. And so now we
30 use the current meter to make or break the
31 decision to leave or not. And the pilots, we're
32 fine with that. We don't want to get in trouble
33 either.

34 And the current meter also shows the
35 direction. We can have an inbound current. When
36 the water levels are increasing, we can have an
37 inbound current when outbound, it's a -- when the
38 water levels are decreasing. Anyways, you know.

39 So this what the current can do in the
40 space of 24 hours. The inbound and the outbound
41 current change seven times. Granted, it's not
42 that much. It was only half a knot, but when
43 it's -- when the water levels are changing, we
44 have to know that to decide whether to leave or
45 not.

46 There's a visual of that bridge,
47 Norfolk Southern Bridge, two tug boats going
48 through it. We go through the span on the left,

1 and those tug boats are 20 feet wide, so that
2 kind of gives you some perspective.

3 Leaving the dock, we start from a
4 stationary position, put the pedal to the metal
5 to get some control, and away we go. We come
6 really close to it. You can see that it's 115
7 feet wide. I don't think it is. I think it's a
8 lot less, and we're 78 feet wide. So there's not
9 a lot of room.

10 I was talking to my colleague when I
11 was taking these pictures after he cleared the
12 bridge. He was telling me how he went through
13 one time, and the bridge tender who's standing in
14 the little gray shack said hey, you're too close
15 to my bridge.

16 And I said, well, what did you say to
17 him. He goes, I didn't say anything. I just
18 slapped him. So all jokes aside, this is pretty
19 serious, and in 2001, one of the Canadian lakers
20 left the dock and the currents were from low
21 water levels in Lake Erie and heavy rainfall days
22 before. And he got out of the control. The
23 Coast couldn't save him, and he went sideways
24 against the bridge.

25 And that's a picture. You can see the
26 water flowing around his stern. He became a big
27 dam in the river, and it took seven tugs two days
28 later and lightering the ship to get that vessel
29 removed. And he's lucky he didn't hit the bridge
30 or take out one of the spans. So that's the good
31 thing.

32 So anyways, that's -- two things I
33 really wanted to say was we could use some real
34 time water level and wind spin direction on the
35 VHF channel. And that would be great. I know
36 some of it is already transmitted, but it's
37 sparse and it isn't always consistent. So I'm
38 not sure why.

39 And we also really need that current
40 meter, and we could stand to have more port
41 system. And I think South Chicago, the Calumet
42 River, Milwaukee and Duluth could benefit from
43 PORTS as well. So thank you.

44 MR. NEKVASIL: Any questions for
45 George?

46 MR. EDWING: Thank you, George. Rich
47 Edwing here. So I do have a question for you.
48 As an alternate to the Weather Service VHF, and

1 we will talk to them and see if that's an option.

2 I think we can work with them on that.
3 But how about getting you that data, the PORTS
4 data, the water level data and maybe even the
5 modeling data over AIS? Do you get AIS out there
6 in the lake?

7 CAPT HAYNES: We do, but that's kind
8 of the VHF basis.

9 MR. NEKVASIL: Yes.

10 FEMALE PARTICIPANT: Could you speak
11 into the mic?

12 CAPT HAYNES: We do get AIS, and
13 sometimes it works really great. I can see ships
14 that are 120 miles away on a temperature
15 inversion, or I might really have a hard time.

16 And then remember, we're on different
17 kinds of ships all the time and not all their
18 equipment is always working well. We see some
19 work better than others. But it's an option.
20 We're all for it if there's a better way to get
21 that real time information.

22 MR. EDWING: Right.

23 CAPT HAYNES: We'd love it.

24 MR. EDWING: Okay, because we are
25 working with the Coast Guard to make that happen.
26 We're still a little ways off.

27 CAPT HAYNES: Okay.

28 MR. EDWING: I think that's coming, so
29 that's maybe one solution. But it sounds like
30 you need several solutions, so we'll certainly
31 explore with the Weather Service.

32 CAPT HAYNES: That would be great.

33 MR. EDWING: That way we can get more
34 information out over that way as well, and we're
35 certainly aware of your interest of the current
36 meter on the Maumee River. Again, that was one
37 of three current meters we established over ten
38 years ago.

39 It was part of a demonstration project
40 with the Corps and demonstrated we could operate
41 current meters year round. They designed some
42 really nice sight shields for those, and it's
43 really long past proving that concept.

44 We've kept them going, so we know
45 people have been using them, but as Glen can
46 attest, I've been up here for a number of years
47 kind of forecasting the day when we're not going
48 to be able to keep them going and we've been able

1 to move one over into the PORTS system, so we'd
2 love to welcome you into the PORTS system with
3 that meter. But it does take some funding. The
4 good news is it's already in. It's the real
5 deal.

6 CAPT HAYNES: Yes, I know.

7 MR. EDWING: It's already in. We're
8 just looking for that O&M money to keep it going.

9 CAPT HAYNES: I did -- was talking to
10 Darren over the winter. We explored that, and
11 the people we would be partners with as pilots
12 would be a lot of the Canadian ship owners.

13 And I did talk to a couple of the
14 Canadian ship owners representatives over the
15 winter and tried to communicate with them, and I
16 never really heard anything back. So I'm not
17 sure if they're interested in that.

18 So maybe there could be some guidance
19 on who do we bring into this partnership because
20 American lakers don't really go up there. I do
21 have to say though, everybody uses it even if you
22 don't go all the way up there to the elevators.

23 The navigators use it for the mouth of
24 the lake as well. It's good information. It's
25 lets you know which direction the current's going
26 in.

27 MR. EDWING: All right. So we'll
28 continue talking with you. Our partners are as
29 diverse as they come across all the different
30 PORTS systems, so we had of maybe examples, some
31 other approaches that may help work for you as
32 well.

33 CAPT HAYNES: That would be great.

34 MR. EDWING: Okay. All right. Thank
35 you.

36 CAPT HAYNES: Thank you.

37 MR. NEKVASIL: Any other questions?
38 Okay. I would like to add just one thing to
39 George's presentation. He was talking about the
40 mud in Toledo. There's another name for it.
41 It's called Indiana. I am told that most of what
42 they dredge out of the Maumee River is Indiana
43 farmland. Oh, I'm sorry.

44 MR. WRIGHT: One source that you might
45 use for finding funding is where you're taking
46 your vessels to. If you impress on them that
47 they could be saving money by using a system like
48 this and reduce delays and making sure the

1 vessels get there safely, that might be an
2 avenue. And of course we can discuss that
3 offline.

4 CAPT HAYNES: Okay. All right. Thank
5 you.

6 CAPT HAYNES: All right. If there are
7 no more questions, then our final panelist is Mr.
8 Mike Piskur who is the Program Manager for the
9 Conference of Great Lakes and Saint Lawrence
10 Governors and Premiers, and he is going to review
11 their recently released regional strategy for the
12 Great Lakes, Saint Lawrence Maritime System.

13 MR. PISKUR: All right. Thanks Glen,
14 and thank you for the invitation to speak today.
15 As he mentioned, I'll be talking about the first
16 strategy for the Great Lakes, Saint Lawrence
17 Maritime Transportation System, which was just
18 released in June of this year. And I'll be
19 talking quickly about our organization, the
20 process we went through the develop the strategy
21 and then what's in the strategy itself.

22 So our organization is a partnership
23 of the governors of eight Great Lakes states as
24 well as the premiers of Ontario and Quebec, so
25 our organization existed as the Council of Great
26 Lakes Governors since the early 1980s and worked
27 on a lot of the pressing environmental and
28 economic issues of the time, when the group was
29 formed.

30 The conference is essentially a
31 rebranding recognizing the full partnership of
32 the two Canadian premiers who -- their
33 involvement kind of ramped up over time, and this
34 is sort of formalizing that relationship.

35 Maritime is a new, a relatively new
36 field of interest for us. Our maritime
37 initiative was launched in 2013, and
38 traditionally our work was centered on water
39 management, on aquatic invasive species, on Great
40 Lakes restoration and protection on the
41 environmental side and then regional economic
42 development and trade promotion.

43 So maritime kind of nicely bridges the
44 gap between the environmental and the economic
45 side. Governor Snyder of Michigan is our current
46 chairman and has been for several years and has
47 been instrumental in our launching of our
48 maritime initiative.

1 And as you our mission, growing the
2 region's five now almost \$6 trillion economy and
3 protecting the world's largest system of surface
4 fresh water, about 20 percent of the world's
5 fresh water.

6 So we heard from, I believe it was the
7 Army Corps this morning about the idea of the
8 Great Lakes, Saint Lawrence System as a system.
9 And that's really what informed the thinking
10 behind the strategy we put together.

11 As you see on this map here, it's not
12 just a patchwork of independent ports and
13 different actors doing their thing, but it's a
14 whole region. It's the eight states. It's two
15 provinces. It's the Seaway, and it's really all
16 of these things working in concern. And we look
17 at maritime as the backbone of that regional
18 economy.

19 So -- and a lot of the things we put
20 into the strategy eventually or that made it into
21 the strategy really is around that thinking.
22 What are some of the critical components? Where
23 are the investments that can be made that have
24 the highest return on investment, the biggest
25 bang for the buck, that really would benefit the
26 entire region?

27 So as I mentioned, the maritime
28 initiative was launched in 2013. Governor Snyder
29 convened a meeting of the governors and premiers
30 on Mackinac Island, and they signed a resolution.

31 And one of the first items included in
32 that was the creation of a maritime task force.
33 And this was the first time that all the states
34 and provinces working together had participated
35 in such a group.

36 So for some of the states, maritime
37 was an afterthought if it was thought about at
38 all. For some of the others it was a bigger
39 deal, of course, depending on the flow of
40 commerce and that sort of thing.

41 So that group was convened and was
42 tasked with developing some recommendations to go
43 about improving the efficiency and
44 competitiveness of the system. So two years
45 later, June of 2015, we had another such meeting
46 in Quebec City.

47 There you see Governor Snyder with the
48 premiers of Ontario and Quebec, and this was

1 where the work of that task force first started
2 to come to completion.

3 So there were three main items that
4 came out of that. The first was a maritime asset
5 system inventory. And like I said, for some of -
6 - particularly for some of the states, this is
7 the first time that really anyone from state
8 government was sitting down and looking at -- if
9 we're going to manage this system as a system,
10 what are the components of that system.

11 So this was looking at what are the
12 ports. What are the terminals? What cargo flows
13 are moving through? What are the connections to
14 other modes, to road and rail and sort of the --
15 again that critical infrastructure so that we can
16 begin to think more strategically about them.

17 Regional priorities. These were ten
18 overarching principles that guided the
19 development of the strategy, and these were
20 things like talking about the benefit of maritime
21 as an environmentally efficient mode of moving
22 cargo, talking about the ability to use maritime
23 to alleviate service congestion and a lot of
24 other things like that.

25 And then finally was the creation of
26 a regional maritime entity. Basically as of June
27 of 2015, that task force became this group, and
28 this will be the body moving forward that
29 coordinates regional maritime governance on
30 behalf of the states and provinces.

31 And the first order of business for
32 that maritime entity was to develop a regional
33 strategy built around those priorities. So the
34 process here, it was basically a year.

35 We started in June 2015 and finished
36 in June of 2016, and -- well it was led by the
37 state and provincial representatives. There was
38 close coordination with an advisory committee,
39 and this was a group of about two dozen or so
40 different agencies and organizations.

41 So Bill Hanson participated in that
42 group. Betty Sutton was on that panel, the Lake
43 Carriers, Admiral Ryan from the Coast Guard, the
44 Army Corps, other private sector groups,
45 environmental NGOs, really trying to get to the
46 idea of having a regional consensus.

47 The ideas coming out of the strategy
48 isn't just what the governors and premiers think

1 but what the region thinks is important. And
2 that's something we've been proud of as the
3 process that we took to get here.

4 So I'll talk a little bit more about
5 that. So in the strategy we came up with, the
6 main goal is to double maritime trade, to shrink
7 the environmental impact of transportation
8 regionally and in terms of moving freight and to
9 support the region's industrial corps.

10 As Glen mentioned and was mentioned
11 earlier, maritime is vitally important to the
12 flow of materials, into steel production and
13 automobiles and any number of other things.

14 Again, this is a really collaborative
15 process. Over the course of that year, we had
16 several meetings and any number of phone calls
17 and other things with all these groups.

18 We did have a public comment period in
19 January of this year, and we heard from I think
20 about 20 different groups. Overwhelmingly
21 supportive of the ideas and the strategy as well
22 as including some ideas and comments that we
23 integrated to the best of our ability.

24 So the strategy itself is a blend of
25 policies, programs and projects to grow the
26 regional maritime system and the regional
27 economy.

28 So getting into these here, we grouped
29 these. There's about 40 recommendations included
30 in the strategy, and they're grouped into these
31 four main categories that you see here.

32 Some of them aren't necessarily
33 relevant for this group. Some are a little more
34 so, so I'll focus on the ones that might be of
35 particular interest.

36 So around increasing efficiency and
37 reducing costs, locks for instance. We heard
38 from the Army Corps about the importance of the
39 Soo Lock. We do support the construction of a
40 new Soo Lock to reduce the risk of any sort of
41 failure there.

42 Channels and harbors, this is really
43 harbor dredging, and I wasn't aware I guess of --
44 I think there was some allusion this morning to
45 some of NOAA's capabilities and how that can
46 inform some of the dredging decisions that the
47 Army Corps makes.

48 I know that there's something like a

1 \$200 million backlog of dredging needs in the
2 Great Lakes that has existed for some time. So
3 perhaps some of the data tools that NOAA has to
4 bear can help make those decisions a little more
5 strategic to better understand some of the
6 current conditions.

7 Perhaps fluctuating water levels
8 affect some of the depths and the different
9 channels and harbors. I think I want to make
10 sure to also mention one of the items, again
11 getting to the theme of thinking about the system
12 as a system.

13 We heard from particularly a lot of
14 the industry side, that the Saint Mary's River
15 was really kind of the key artery, and if that is
16 not maintained to its authorized depth, then that
17 sort of has ripple effects throughout the rest of
18 the system, authorized up to between 27 feet for
19 the most part.

20 So ensuring that is, in fact,
21 maintained to its authorized depth as well as
22 looking at the potential for adding additional
23 depth there, 2 feet of additional depth, so that
24 would be -- and that's obviously more of a longer
25 term project requiring a lot of analysis, both on
26 the cost benefits and the environmental impact
27 but something we've encouraged in the strategy,
28 and as well as an analysis of system bottlenecks
29 of looking at where are some of the pinch points
30 through the system, which if opened up, can
31 really benefit the entire -- the ports and other
32 parts of the entire system.

33 So that's something that I think the
34 U.S. federal government is uniquely situated to
35 be able to do -- I don't know if NOAA is
36 necessarily the appropriate agency for them,
37 maybe USDOT or somebody else, but seeing that
38 sort of system wide analysis would be very
39 important to future decision making.

40 Icebreaking. We heard a bit about
41 that already and certainly would encourage
42 anything NOAA can do to better understand current
43 ice coverage situations across the lakes.

44 And efficiency and environmental
45 performance. This is -- one of the
46 recommendations included in there was for the
47 U.S. and Canadian federal governments to have
48 just better monitoring and understanding really

1 of the environmental performance of the fleets,
2 of the ports, just to get a better track.

3 I know the Lake Carriers and the
4 Seaway have a nice graphic showing the numbers,
5 but one laker equals something like 3000 railcars
6 or --

7 MALE PARTICIPANT: It's 1000 footer is
8 700 railcars or 2800 trucks.

9 MR. PISKUR: Okay. There you go. So
10 that's a great number, and being able to continue
11 to make that case and better understand and
12 advocate for the inherent efficiency of moving
13 cargo by ship.

14 Season optimization is one. Of course
15 ice is a reality in the Great Lakes. And as we
16 understand that the Soo Lock and the Seaway locks
17 require closure for maintenance at least some of
18 the year, but are there things we can do to get
19 incremental improvement of expanding the shipping
20 season, whether it's coordinating the opening and
21 closing of the different locks.

22 Again, if this is something where
23 perhaps some of NOAA's tools can help to better
24 inform the current conditions, recognizing that
25 there are important environmental considerations
26 to ice coverage as well as certainly the economic
27 benefits of it.

28 And containers, I don't really have
29 anything to say here for this group necessarily.
30 But while I'm in Cleveland I have to plug the
31 Port of Cleveland's efforts on container
32 shipping.

33 They're the only container shipping on
34 the Great Lakes currently. It's done a really
35 good job taking that from being a monthly service
36 to I believe a weekly service now, from Cleveland
37 to Antwerp.

38 And I believe there's now a piggyback
39 service to India. So that's grown nicely, and
40 it's something we would like to see hopefully
41 some of the other ports on the Great Lakes be
42 able to duplicate.

43 On passenger travel and cruising, I
44 know a couple of the members of this panel come
45 from that industry. This is something, in
46 particular, some of the governors and premiers
47 were very interested in being able to cultivate
48 on the lakes.

1 And there's sort of a small industry
2 now. There are some obstacles to them growing
3 their business, whether it's some of the customs
4 regulations, some of the costs of doing business
5 on the lake, so these are things we're trying to
6 think about, how to encourage that.

7 The Great Lakes Cruising Coalition is
8 part of our advisory committee as well, and they
9 had sent out an email recently. I don't remember
10 the group, but some international cruise tourism
11 body, apparently the Great Lakes region is one of
12 the finalists for recognizing it is the premier
13 cruising destination in the world.

14 So obviously that's great, just to
15 have that, especially if the award goes to the
16 Great Lakes for raising the profile. So again,
17 anything we can do to promote that would be
18 great.

19 And domestic/international marketing.
20 This is continuing to build on a lot of the good
21 work that the freeway has done through their
22 Highway H2O initiative and really just raising --
23 again raising the profile of the Great Lakes.

24 My boss who has traveled to Europe
25 recently to understand how they do things in
26 turns of maritime on the Baltic Sea was talking
27 to them, showing them the map of the system and
28 the 20 percent of the surface fresh water.

29 And some of these folks in Europe were
30 absolutely astounded to hear. They didn't really
31 think about geographically that there's this
32 connection from the Atlantic Ocean into the
33 essentially middle of the North American
34 continent. So there's a lot we can do to
35 continue to grow the profile.

36 This section, not a lot necessarily.
37 It's pretty new for this group. This is
38 basically looking at some of the building upstate
39 and provincial capacity, looking at ports as not
40 just a place where ships come and drop off and
41 pick stuff up but having the state and provincial
42 governments think about them as really economic
43 drivers and not just something that the -- first
44 of all, it would be great to have the Departments
45 of Transportation thinking about it.

46 And we've got that underway, but
47 really having different agencies, economic
48 development and others, thinking about how they

1 can better leverage their ports.

2 And finally a couple things here.
3 Talent and workforce development, we hear from a
4 lot of the system users that it's an aging
5 industry, that there is a growing need for
6 skilled labor.

7 So looking for ways, whether it's some
8 of the marine -- excuse me, military to marine
9 sort of transition for Coast Guard and other
10 veterans, whether it's things like maritime
11 academies, which there's in Toledo and I believe
12 here in Cleveland as well and encouraging those
13 things more system wide and encouraging people to
14 seek a career in maritime.

15 And around governance, this is one
16 where in addition to, again, building the state
17 and provincial capacity to deal with maritime,
18 it's also the idea of developing -- one thing our
19 regional maritime entity will be working on is
20 developing recommendations for a treaty between
21 the two federal governments to really manage the
22 way that they cooperatively -- I should say how
23 they cooperatively manage the bi-national system
24 going forward. So that's something we will be
25 working on over the next year or so.

26 And then finally metrics. This is
27 just better data, better understanding how the
28 system works, some of the things I mentioned
29 earlier, just the efficiencies of the system, how
30 the Great Lakes System is sort of situated not
31 just in comparison to other modes of transit but
32 even to other regions of the country, just to get
33 a better handle of I guess how we're doing -- how
34 well we're doing the things that we do.

35 So -- and there will be -- there's a
36 data working group, upstate and provincial
37 people, that are being convened basically right
38 now. And we're going to be working on some of
39 the portions of that.

40 But that's certainly something that
41 federal partners, NOAA and others, can certainly
42 participate in, in the future. So with that, our
43 web address is there at the bottom.

44 The regional strategy is available
45 there. It's a 35 or 40 page document, so please
46 check that out. Like I said, that was released
47 in June. And with that, I will take any
48 questions or comments.

1 CHAIR HANSON: I'll go ahead and
2 start, Mike. First off, just a comment because
3 the whole structure that we went through, the
4 whole conversation was really quite interesting
5 about how to develop collaboration and coalition
6 thinking, if you will, throughout the Great
7 Lakes.

8 Some of the first meetings we had with
9 a state level DOT director showing up and had no
10 clue that they even had shoreline or ports within
11 their states.

12 MR. PISKUR: Right.

13 CHAIR HANSON: And that's one of the
14 reasons you had to go to the asset list was you
15 had to go back home and start asking around to
16 see just exactly what it is that they have in
17 their state that they should be advocating for
18 and paying attention to. So they've come a long
19 way from that.

20 MR. PISKUR: Indeed.

21 CHAIR HANSON: I think one of the
22 takeaways I had from all of our meetings was the
23 optimization of the seasons and perhaps climate
24 change, whatever you want to call it. It changed
25 the way you think about the lakes and the Seaway.

26 And I'm looking at it talking to
27 Joyce. I don't think we have much conversation
28 about ice, and given the fact in the course of
29 the next couple days -- and given the fact that
30 you're shut down for several months a year, would
31 it be appropriate to give you guys -- have a
32 comment, each of you, on the impact of the
33 seasonality on your businesses.

34 How often do you shut down, and what
35 gets you back in line? And are you thinking
36 about anything changing in the future?

37 (Off microphone comments.)

38 MS. SUTTON: So the Seaway is usually
39 open from mid to late March through the end of
40 the year. We do our winter work, our maintenance
41 work, during that shut down time.

42 I think that the question -- obviously
43 there are concerns that we -- there's a whole
44 system, a whole list of things we consider when
45 we're determining what to do. Certainly the
46 weather is the biggest among them.

47 The forecast, where the assets will be
48 in terms of icebreaking assets, also what the

1 demand is. So there's -- and it's bi-national,
2 so it's done obviously in conjunction with our
3 Canadian counterparts. And safety is of utmost
4 important.

5 With that said, I think there have
6 been studies in the past. With the Seaway System
7 being mostly the bread and butter has been bulk,
8 as you've heard here today. But there is some
9 diversification going on now.

10 Those containers coming into the lakes
11 really does represent a breakthrough in Great
12 Lakes Seaway shipping. So the question with bulk
13 was always, would it really -- what did it really
14 translate into.

15 Did it translate into more voyages but
16 not necessarily more volume? And I think that
17 there was a good argument that really it didn't
18 translate into a lot of extra movement of cargo,
19 just maybe more ships passing.

20 So I think there's a question right
21 now about looking at what it would actually mean
22 if the season could be extended safely. There's
23 testing going on, on navigation aids.

24 There are advancements that could be
25 made perhaps there, but we're always going to
26 have to be concerned with safety, environmental
27 integrity and also, of course, having to get the
28 work done that we do.

29 The one thing that we tried, even as
30 we look at this and evaluate whether there's any
31 way for the season to be extended, and it has
32 been lengthened a bit over time is we don't -- as
33 a transportation route, it's important that we
34 don't focus solely on what we can't do so much
35 that we forget about what we can do.

36 So that's one of the things that we
37 preach, but thank you for letting us have a
38 chance to speak to that.

39 MR. NEKVASIL: For the lakers, our
40 season already is longer. We basically have an
41 11 month season for the domestic lakers. We'll
42 start moving cement and iron ore in early
43 February, and then when the Soo Locks open up on
44 March -- I'm sorry. We would start moving in
45 early March.

46 And things really get going when the
47 Soo Locks open on March 25. Then the Soo Locks
48 close on January 15, but we will continue to move

1 iron ore out of Escanaba until the end of
2 January.

3 And the cement trade will go until the
4 end of January, and if you're having a mild
5 season, they will actually continue into
6 February. And actually a few years ago, we had a
7 horrible winter but because the steel mills were
8 so desperate for iron ore, we tried to move some
9 iron ore there in February.

10 One ship loaded iron ore in Escanaba,
11 Michigan for the steel mill here in Cleveland.
12 Under normal circumstances, that trip would have
13 been 50 hours, but it ended up taking ten days.

14 And that winter, the ice was so bad
15 that winter, we did more than \$6 million worth of
16 damage to our vessels. So as I said, we I think,
17 have largely optimized our season right now.

18 If we were to continue to try to say
19 oh even longer, we would definitely need more
20 Coast Guard icebreaking resources. One of our
21 primary goals is getting the U.S. government to
22 build another heavy icebreaker here.

23 We have one, the Mackinaw, but we need
24 at least two. And the Canadian government, they
25 used to have seven icebreakers here on the Great
26 Lakes. They now have two that are permanently
27 stationed here. And both of them are coming to
28 the end of their useful lives.

29 Canada will bring in other assets from
30 the East Coast, but you have to remember, once
31 the Seaway is closed they can't. That option is
32 out. So -- and of course there's environmental
33 conditions that have to be -- environmental
34 considerations.

35 And two, we need some time during the
36 year to work on our boats. In a typical winter,
37 we will spend fifty to \$60 million just doing
38 routine maintenance and modernization.

39 And then this past winter, two of our
40 members collectively spent about \$50 million
41 repowering a couple boats. So there's a lot of
42 things that would need to come into place if we
43 were going to lengthen the season any.

44 MR. PISKUR: I would just add to that.
45 Our strategy does include a call for a second or
46 an additional Great Lakes class icebreaking
47 vessel. I know during the process of developing
48 the strategy, we had heard that was it 2014 was a

1 particularly harsh winter, had ice coverage.

2 There's a study that showed on the
3 U.S. side \$350 million of lost business related
4 to that halting of shipping whereas the cost of a
5 new icebreaker I believe is \$250 million.

6 So one season's loss of business more
7 than pays for a new ship. Obviously that's not
8 the only consideration. It's a lot of money no
9 matter how you cut it, but definitely something
10 to think about.

11 And then just I mentioned containers
12 before. Really the closure of the system for the
13 winter is probably the single biggest barrier
14 because anyone who wants to be able to move their
15 goods by container really needs to have that year
16 round reliability.

17 If they have to find another option
18 for three months of the year, they're going to
19 find another option for the whole year. So
20 that's it.

21 CAPT HAYNES: On the foreign freighter
22 side of the international freight side of things,
23 we can move the ships through the ice. We can do
24 that. We can go up and down the rivers. It
25 takes more time.

26 You got icebreakers. Sometimes you
27 don't need icebreakers, but we can do that. The
28 problem for the international ships is the locks,
29 getting into the Great Lakes. Like most of them
30 now have 76 to 78 foot beams, and the locks are
31 80 feet wide.

32 Once you have ice in the canals and
33 the rivers start making ice, you can't get that
34 ice out of the locks easily. They do things to
35 flush them out, run some -- open up the valves,
36 run water through to flush out any ice, so then
37 the ship can get in. But it's a lengthy process.

38 And sometimes the ships go in with ice
39 stuck between the side of the ship and the lock
40 wall, and with the pressures and everything, it
41 actually almost turns into like glue. And the
42 ship can't even get out of the lock. That's
43 happened before.

44 The other problem for the
45 international trade is they have to book their
46 cargos in advance. They have pretty good ahead
47 time where it takes two weeks to cross the
48 Atlantic.

1 They line these cargos up probably two
2 months ahead of time or a month and a half ahead
3 of time, so if you have a particularly cold
4 December and the ice starts making really fast
5 unexpectedly, a lot of cargo could be left on the
6 dock that was supposed to go by ship.

7 So unfortunately, we don't have a
8 crystal ball. The laker companies are more
9 nimble. They can book cargos in a few days'
10 notice because they're right here on the lakes
11 and they can throw in an extra iron ore load or
12 load of stone somewhere. If the locks -- if it's
13 still warm and there's not too much ice.

14 The ocean freighters have a problem.
15 We have lots of horsepower on the ocean
16 freighters. We have no problem getting through
17 ice, but it's just the locks.

18 VICE CHAIR MILLER: To what extent are
19 the lakers versus the foreign vessels ice-
20 strengthened. What type of vessels are on them -
21 - on the lakes?

22 MR. NEKVASIL: A number of our vessels
23 have ice-strengthened bows, but we still need
24 commercial icebreakers because especially the
25 newer vessels, they have been designed to
26 maximize their carrying capacity.

27 So their bows are kind of -- well,
28 let's put it this way. The old boats, they rode
29 up on the ice and broke it down. These boats
30 have a rounded bow. It maximizes the carrying
31 capacity, but it's not too good for pushing
32 through ice.

33 So that's why we have to have the U.S.
34 Coast Guard icebreakers leading the way for us.
35 We've got the hull strength, but we still need
36 somebody to break the ice for us.

37 MEMBER PERKINS: Just a curiosity
38 question on the economics. So you're able to
39 levy enough fees for the tonnage going through
40 all 13 of those locks that cover your full
41 operational and maintenance budget, and it's
42 sustainable?

43 MS. SUTTON: That's a great question.
44 Again, going back to the way the Seaway is
45 governed. As a bi-national system, the Canadian
46 Management Corporation operates on tolls.

47 And it has a number of years back. It
48 used to be identical to the Saint Lawrence Seaway

1 Development Corporation, supported by the federal
2 government of Canada.

3 Now it has privatized the management
4 so to speak of their locks. So they have 13
5 locks. They charge tolls. The Seaway on the
6 U.S. side does not charge tolls. We are an
7 appropriated agency.

8 So we operate under an annual
9 appropriation through the federal government like
10 any other operating mode or agency of the U.S.
11 So we're not mirror images. It's fascinating.

12 Although, I will tell you users of
13 course don't distinguish, and they often think
14 that they're paying Seaway tolls and they think
15 they're paying Seaway tolls to the U.S. So I'm
16 always struck by having to clarify that because
17 of course I think the U.S. Seaway is a complete
18 value add, the best deal going.

19 If I could just provide the responses
20 to the questions that were raised earlier, I'd
21 like to do yours first I think because it makes -
22 - the order makes the most sense.

23 The two DIS models in use in the
24 Seaway were verified against criteria at the
25 implementation -- in the implementation specs
26 before. Obviously they were allowed to be used
27 in the Seaway.

28 The new hydrographic survey data is
29 input when it becomes available. As it becomes
30 available and the other information, such as the
31 speed, the location, water levels, they are all
32 provided in real time via AIS.

33 So that's how that all works together,
34 which again leads us to a very important question
35 that you asked. There is no sovereign immunity.

36 This isn't really going to surprise I
37 think anybody there but -- because we don't
38 operate the technology. We allow for its use.
39 We don't mandate its use. To use it, they're
40 expected to use it within the required technical
41 specifications.

42 And so they are responsible for
43 ensuring that it's used properly. If a ship were
44 to run aground, then there would be an
45 investigation like there is an investigation for
46 any grounding. Hopefully that clarifies those
47 two questions.

48 MEMBER KELLY: And my question

1 revolved around the integrity of your data. If
2 we found that your data that they relied on to
3 use was incorrect, so you're just, like a lot of
4 the other people say, if you use this data you
5 will die, your children will die. Don't use this
6 data for navigational purposes. It's a
7 disclaimer. And if a pilot does rely on that,
8 they're going to say well, why did you do that.

9 CAPT HAYNES: We're in trouble anyway.

10 MEMBER KELLY: You're in trouble
11 anyway.

12 MS. SUTTON: Okay. So here's the
13 thing. I don't know that it's ever been tested.
14 I have not heard of the case, but you would have
15 to make your case. And the pilot would have to
16 make their case.

17 And whoever -- for responsibility
18 because it's possible that you could be using DIS
19 and a pilot could make an error. But I'm not
20 saying that would ever necessarily happen. But -
21 - so I think that the point is obviously there's
22 not protection going in.

23 And I would be interested, since you
24 raised the question, in knowing more about
25 whether there are real life examples because I am
26 not aware of problems with DIS having been raised
27 to call this issue to question. That's got to
28 say something.

29 MR. ARMSTRONG: Can I ask you a follow
30 up question? So you mentioned the hydrographic
31 surveys. And I'm just wondering who is it that
32 does those. Do you have a Seaway hydrographic
33 survey agency or the Corps of Engineers or NOAA
34 or all of the above?

35 MS. SUTTON: Well, most of our
36 information comes from the Canadian Hydrographic
37 Survey because of where the data is that we're
38 utilizing and just the partnership that we have
39 with the Canadian survey. It's a very good
40 question. Doesn't mean we couldn't use
41 information from NOAA.

42 MS. MERSFELDER-LEWIS: I have comments
43 from people online who wrote in. And someone
44 said, the last man speaking reflects our view.
45 All fine and good to talk about lengthening the
46 system, but as he said, we have maintenance to do
47 off season.

48 And with this last winter, we ran the

1 ferries all winter, very expensive to run all
2 season and hard to do all maintenance, painting
3 required. And running all season does not mean
4 clear routes.

5 We ran lots of times in ice, which
6 causes damage to hulls and problems with shifting
7 ice fields. And the bow might be strengthened
8 but can do damage to the rudder. Our ice ferries
9 have a V hull and run up on the ice to break it.

10 Not easy, but other seasoned boats are
11 not built that way. And like the man speaking
12 now, it is difficult to predict the weather. And
13 that was from Robin Russell who's with the -- who
14 owns a ferry and also is very active with the
15 Passenger Vessel Association. You guys might
16 know her.

17 And she had another comment, which
18 was, she said it was a very interesting
19 discussion regarding the currents in the Maumee
20 River. Are they predictable? These are
21 questions to you, George, sorry.

22 Are they predictable? Is it due to
23 the weather systems? Is it due to low and high
24 pressure? Do they change directions that many
25 times in a day? Very dangerous operating
26 conditions, Robin.

27 CAPT HAYNES: Yes. They are somewhat
28 predictable because you got a big low pressure
29 heading north of the Great Lakes, and it sweeps
30 through and creates a gale on Lake Erie.

31 What you know, we know that those
32 water levels are going to drop, and the currents
33 are going to pick up. If you got a couple of
34 days of heavy rainfall in Indiana or the Maumee
35 River watershed, then yes, it's going to pick up.

36 But we get surprised a lot. We get
37 surprised a lot. You can't always figure it out,
38 and Lake Erie also once the water blows all the
39 way to one end, it has to come back eventually.
40 And it's like a big lump that goes over the
41 middle of the lake.

42 And it'll slosh around back and forth
43 for two days after a severe storm. And one of
44 the great things about our water level gauges is
45 I can call up Great Lakes online or look online
46 and see where the lump is.

47 I've anchored off of Toledo for two
48 days before waiting for the water to come back

1 in, the winds to die down, and I watched the lump
2 or the wave come back from Buffalo. I was able
3 to time my arrival when I got enough water.

4 So that's what your products and these
5 gauges and the current meters do, but a lot of it
6 -- some of it's predictable but some of it isn't.
7 It still changes like the wind.

8 MR. NEKVASIL: Well, if there are no
9 more questions I would just like to make one
10 final comment here. Mike talked about the lakes
11 being a system, and earlier this morning the
12 Corps of Engineers talked about this being a
13 system.

14 I'd like to give you an example. Back
15 in late 2012, early 2013, the water levels on the
16 lakes were in a free fall. As a matter of fact,
17 Lake Michigan, Huron actually set a new low.

18 And I took the CBS Evening News on one
19 of our ships that had laid up in Milwaukee, and
20 on her last trip of the season she had come in 3
21 feet short on draft.

22 She had left about 11,000 tons of iron
23 ore back in Minnesota, but it wasn't her
24 receiving port, Gary, Indiana. It wasn't her
25 loading port. The reason why that boat lost
26 11,000 tons of cargo was there was this stretch
27 in the St. Mary's River, and that's what set the
28 draft.

29 And today, we could dredge Cleveland
30 to 50 feet, but it wouldn't make any difference
31 because there's a spot in the St. Mary's River
32 that decides how much that boat can carry to
33 Cleveland. So you have to look at this as a
34 system.

35 MEMBER BRIGHAM: Back in historical
36 record, back in the late 70s when there was
37 extended navigation almost through the year -- in
38 fact I think one year it was just shy of three
39 weeks. I think one of the unintended
40 consequences was, in fact, damage on the coastal
41 areas.

42 And so I think if we try to do this in
43 the 21st century there would be a big more
44 pressure on one of the unintended consequences of
45 ice flow and damage and coastal erosion, et
46 cetera with the new heightened interest in the
47 Great Lakes.

48 CHAIR HANSON: Anybody else? All

1 right. We'll conclude the panel, and really
2 appreciate you all that was on it. I knew you'd
3 come through for you me.

4 Sometimes a good panel actually leaves
5 as many questions unanswered as they do answered,
6 right? There's a lot going on right now. So
7 this is a public meeting, and this is an
8 opportunity for the public to speak.

9 So if we have anybody in the audience
10 who would like to address the panel or has some
11 questions, now would be a time to do so. Either
12 raise your hand or step to the mic or forever
13 hold your peace. I think we'll have another
14 opportunity tomorrow.

15 (Off microphone comments.)

16 CHAIR HANSON: All right. So the
17 meeting with adjourn for the day. We will
18 reconvene tomorrow morning at 0800, same room.
19 Thank you very much.

20 (Whereupon, the above-entitled matter
21 went off the record at 2:40 p.m.)
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This is to certify that the foregoing transcript

In the matter of: Hydrographic Services Review Panel

Before: NOAA

Date: 08-30-16

Place: Cleveland, OH

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Court Reporter

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