

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,
SEPTEMBER 12, 2017

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The Hydrographic Services Review Panel met in the Prescott Ballroom, Sheraton Portsmouth Hotel, 250 Market Street, Portsmouth, New Hampshire, at 9:00 a.m., William Hanson, Chair, presiding.

MEMBERS PRESENT:

WILLIAM HANSON, HSRP Chair
JOYCE E. MILLER, HSRP Vice Chair
DR. LARRY ATKINSON
DR. LAWSON W. BRIGHAM
LINDSAY GEE*
KIM HALL
EDWARD J. KELLY
CAROL LOCKHART
DR. DAVID MAUNE
ANNE MCINTYRE
EDWARD J. SAADE
SUSAN SHINGLEDECKER
GARY THOMPSON*

NON-VOTING MEMBERS:

**ANDY ARMSTRONG, Co-Director, NOAA/University of
New Hampshire Joint Hydrographic Center
JULIANA BLACKWELL, Director, National Geodetic
Survey, NOS
RICH EDWING, Director, Center for Operational
Oceanographic Products and Services, NOS**

STAFF PRESENT:

**REAR ADMIRAL SHEP SMITH, HSRP Designated Federal
Official; Director, Office of Coast Survey
DR. PAUL DOREMUS, Acting Assistant Secretary for
Conservation and Management
GLENN BOLEDOVICH, Policy Director, NOS PCAD
CAPTAIN RICK BRENNAN, Chief, Hydrographic Surveys
Division
ASHLEY CHAPPELL, IWG-OCM
DR. GREG DUSEK, CO-OPS
CARL KAMMERER, NOS OCS
LYNNE MERSFELDER-LEWIS, HSRP Coordinator
JIM RICE, NOS PCAD
ERICA TOWLE, NOS OCS
E.J. VAN DEN AMEELE, Chief, Coast Survey
Development Laboratory
LT DAVID VEJAR, NOS OCS**

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

2 9:04 a.m.

3 CHAIR HANSON: Welcome to the second
4 day of the 2017 HSRP Fall meeting in Portsmouth,
5 New Hampshire. As Admiral Smith gets prepped
6 here, we want to let the panel members know that
7 I'm going to be calling on you for some thoughts
8 on yesterday's discussions.

9 And we'll also ask the audience for
10 your introductions as well. We all introduced
11 ourselves yesterday. In fact, let me go ahead
12 and do that real quick, sir, if that's --- or you
13 want to go ahead and say something?

14 RDML SMITH: Yes. Good morning.
15 Thank you all for being here bright and early.
16 Could anyone --- we did a round of introductions
17 yesterday, so I think we don't need to repeat
18 that all around. But could any who has joined us
19 since yesterday please introduce themselves? I
20 see Jeff back there.

21 MR. LILLYCROP: Jeff Lillycrop from
22 the Corps of Engineers.

1 RDML SMITH: I think everyone else
2 has --- thank you, Jeff, and welcome.

3 MS. MERSFELDER-LEWIS: Okay, this is
4 for the record so, sorry about that.

5 MR. LILLYCROP: Good morning, Jeff
6 Lillycrop from the Army Corps of Engineers.

7 RDML SMITH: Thank you, Jeff, and
8 welcome. We'll be having some --- Jeff will be
9 speaking later this morning or later today.

10 I did want to just reflect on
11 yesterday. After the public meeting yesterday,
12 we toured the facilities at the University of New
13 Hampshire, very impressive operation. And it's a
14 real crown jewel, not only for New Hampshire but
15 for the Hydrographic community in the US and the
16 world, so really world class research and
17 development going on there with just a fabulous
18 spirit and esprit decor. So thank you, Mr.
19 Chair.

20 CHAIR HANSON: So, yesterday we had
21 our normal introductions in the morning. We also
22 were joined by Dr. Paul Doremus from NOAA.

1 And we didn't get to ask questions so
2 we thought this morning, given all that we talked
3 about with the introductions, we had the USV
4 panel which, I think, is going to be around for a
5 while, we keep talking about innovations and new
6 technologies, and then the visit to UNH. And
7 again, thanks to Andy for putting that together.

8 So we wanted to have the panel have a
9 chance to talk. Are we ready to go with this,
10 Rich?

11 So one of the things we've talked
12 about over the last several years is trying to
13 help understand and promote the good services
14 that NOS/OCS provides to the nation and, in this
15 case, actually to the world.

16 Rich, you want to tell us about what
17 you've got here?

18 MR. EDWING: Sure. So about five
19 years ago we received a grant from the State
20 Department to establish a hardened tide gauge in
21 Barbuda. It was being designed to withstand both
22 storm surge and tsunami.

1 And the purpose was to provide a gauge
2 that the Caribbean nations could use as kind of a
3 kernel for their network down there for training
4 and so forth. So let's roll the video. So this
5 is in Barbuda. This is a video one of my guys
6 found on YouTube that is going to pan around, it
7 can actually roll, there we go. All right, stop
8 it right there.

9 So there's the station. It operated
10 successfully throughout the storm, provided data.
11 We actually turned the station over to the local
12 authorities in 2015, and they've been maintaining
13 it.

14 But this morning we were talking about
15 the value of hardened tide stations and
16 particularly when it comes to these type of
17 events. And this was, I thought, a great
18 illustration. We'll talk a little bit more about
19 this later this morning during my updates.

20 CHAIR HANSON: Great, thank you.
21 Thanks, Rich. Okay, panel members, some
22 thoughts, and recommendations, discussion from

1 yesterday's meetings, tour. And as usual, if I
2 don't see volunteers, we will volunteer you. Ed?

3 MEMBER SAADE: Thanks, Bill. A couple
4 of things, well, mainly I really wanted to
5 compliment both the folks that organized the tour
6 and the panel yesterday. I thought it was a
7 great day for technology. I'm a bit of a
8 technology geek, so the whole day was really
9 educational, informative, thought provoking.

10 And I just want to emphasize, from the
11 industry side, all that that we through yesterday
12 is just another example of technology transfer.
13 Because for me personally, to take all that in
14 and then go share it with the company is a really
15 big deal. And there's a lot of things on there
16 that immediately lead to a benefit for what we
17 do. So I thought the day was a big success.

18 CHAIR HANSON: Thank you. Go ahead,
19 Kim.

20 MEMBER HALL: Sorry, just on a lighter
21 note, I missed my calling. There is specifically
22 a bubble physicist at UNH. And if I could be a

1 bubble scientist, I really want to go back in
2 life and do that.

3 CHAIR HANSON: I think there's always
4 room at UNH isn't there, Andy?

5 (Laughter)

6 CHAIR HANSON: Sure, Joyce?

7 VICE CHAIR MILLER: The thing that
8 struck me was from the Teledyne, the Valley of
9 Death from research to commercial I thought was a
10 really, really interesting comment, you know, how
11 you take something that's been developed at a
12 research facility and successfully transfer it to
13 industry.

14 It would be interesting to know, from
15 a UNH perspective, what percentage you think of
16 what's developed there really goes to industry
17 successfully.

18 CAPT ARMSTRONG: Well, I think I'd use
19 a baseball analogy about batting averages. So
20 somebody, you know, batting 300 is a pretty good
21 hitter. And I suspect that, in over a time
22 period that's sort of succinctly observable,

1 we're probably batting 300.

2 I think if you expanded that time
3 period out to 10, or 12, or 14 years, you'd see
4 that many of the things that don't appear to
5 immediately get adopted and taken in begin to
6 seep in and ultimately get adopted. So I think
7 over that longer period it's hard to put a number
8 on it. But I'd say we're up closer to batting
9 500 in that regard.

10 CHAIR HANSON: That sounds like Hall
11 of Fame. Ann, you and I had a conversation
12 yesterday. Oh, Kim's still going.

13 MEMBER HALL: Still going. Now on a
14 more serious note, it just came to me. I think
15 one of the really cool things yesterday to see,
16 which we've heard about in the past, so I know at
17 the last meeting Larry Mayer gave us presentation
18 on visualization, and we all went, "No." Or some
19 of us were, like, that doesn't work.

20 To actually see it up close and
21 personal, so for instance the three
22 visualizations for the currents, being kind of

1 the outsider non-hydrographer, non-surveyor, I
2 saw so many applications for that search and
3 rescue. You know what happens when somebody
4 falls overboard. The currents are doing this.
5 What a cool planning, you know, to add to the
6 planning process.

7 So I think to actually have seen it up
8 close and personal, I have a much bigger
9 appreciation for what it could do to transform
10 navigation and other aspects of maritime
11 operations.

12 CHAIR HANSON: Absolutely. And thanks
13 for that. Because that kind of was leading into
14 what Ann and I were talking about yesterday on
15 the trolley. It's the opportunity just for more
16 data and, as a pilot bringing ships in, just how
17 important that is.

18 MEMBER MCINTYRE: Yes, absolutely, the
19 opportunity for more data and the integration of
20 data, again, from other agencies and from private
21 resources as well, I was very impressed with the
22 autonomous presentation.

1 Just in looking at it, I see lots of
2 applications for us in an inland, you know,
3 situation where you don't have the launch and
4 recovery type of situations. Where it really got
5 me thinking is to -- you know, we're limited by
6 resources, you know, particularly financial
7 resources. And we need frequent surveys. And I
8 see something like that, you know, just one of
9 those little things, being able to buzz around
10 the river and really give us a lot of good
11 information.

12 I also was impressed with the virtual
13 reality goggles that we got to look at, just in
14 terms of how augmented reality will probably be a
15 part of jobs, you know, pilot's jobs in the
16 future, and probably not too long ahead.

17 And just looking out on it, I could
18 see that there's a lot of valuable information.
19 I can also see that there's a lot of clutter in
20 it. And then I see the need to really get ---
21 again, we were talking about end users ---
22 getting the end users in there saying what would

1 be valuable from this technology and what
2 wouldn't be valuable from this technology.

3 CHAIR HANSON: Thanks. And then
4 Susan, from the recreational boater's
5 perspective, I know the automated or the unmanned
6 stuff is kind of interesting for the boating
7 community.

8 MEMBER SHINGLEDECKER: It is. I think
9 the first knee jerk reaction from the
10 recreational community is, "Oh, more stuff we're
11 going to run into." But, you know, listening to
12 the presentation, and the investment that goes
13 into these pieces of equipment, you know, nobody
14 wants to have their baby get run over.

15 It was interesting looking at the
16 programming that goes into how do you make these
17 autonomous vessels comply with COLREGS. And as
18 one of the panelists pointed out, how do they
19 adjust for non-compliant vessels they may
20 encounter? And we recreational boaters may be a
21 few of those non-compliant vessels.

22 But I thought that was --- I would

1 love to see how the technology could go down the
2 road to help recreational boaters actually be
3 more compliant. I mean, the cars you buy today
4 have blind spot monitoring. You know, is there
5 something on a recreational vessel that could
6 help you know whether you are the stand-on vessel
7 or the give-way vessel? Because that doesn't
8 always come naturally to a novice boater, so lots
9 of applications.

10 For me yesterday, we ended up having
11 dinner with one of the UNH grad students who --
12 I'm trying to help her a bit with her thesis.

13 And it just really struck to me --
14 I've had interactions with students from high
15 school, middle school, on up lately, and how the
16 middle schoolers today are using the very high
17 tech equipment I thought I was using in graduate
18 school, and so how the technology has gone down
19 in age in what people are exposed to.

20 But yet, in my work with graduate students
21 where that gap seems to be, they have a ton of
22 experience, and a ton of insight, but kind of

1 that meshing it with the real world, and the
2 realities of working in government, and the
3 realities of policy, and politics, and how that
4 plays in.

5 And so I kept thinking how we as a
6 panel, when we go places, can interact with
7 students to help them understand some of the real
8 world, how that complicates the theoretical.
9 That had me going for a while last night.

10 CHAIR HANSON: Thanks. Any other
11 comments from the panel? Ed?

12 MEMBER KELLY: Yes, also being a non-
13 tech person, I was very impressed with how the
14 technology has advanced, especially with the
15 visualization where now common people in the
16 business are able to visualize that, and look at
17 this stuff, and say, "Aha, I got it."

18 It's not just a bunch of geeks with
19 meters, and keeping some kind of records on
20 charts I couldn't understand. Now I can look at
21 it and see what it is. And that lets me start
22 thinking for practical applications to industry.

1 So I think, you know, the technology
2 has really taken that leap where it's gone from
3 an inside technical capacity to a usable tool.
4 And I was very impressed with that.

5 And the un-manned just goes without
6 saying, we're on the brink of going un-manned in
7 so many systems, including large ocean going
8 vessels. There's already research and test
9 trials being done with that. So I think to see
10 us, you know, UNH on the cutting edge of some of
11 that technology was really very impressive.

12 CHAIR HANSON: Thanks, Ed. The other
13 Ed?

14 MEMBER SAADE: So along those lines,
15 Andy, does the University have a whole series of
16 YouTube videos that demonstrate those type of
17 things? Or could the University make a whole
18 series of --- there were so many nice things that
19 we saw that, as Ed says, are real practical for
20 anybody to look at and benefit from it. Is that
21 happening?

22 CAPT ARMSTRONG: So our center does

1 have -- and like Larry, I'm talking about
2 something I'm completely baffled by, but there is
3 a Vimeo site. We do have Vimeo account where
4 there's a number of videos from our research
5 projects that are up and available.

6 So I expect they're on YouTube as well. But
7 I don't know whether we have a dedicated
8 collection. So I can find out. Maybe Will, Will
9 is probably the person to answer that question.

10 MEMBER SAADE: Yes. Could we get a
11 demo tomorrow maybe? I don't know, two minutes,
12 five minutes.

13 MR. FESSENDEN: Hi, guys, Will
14 Fessenden, and I'm the technical coordinator for
15 our weekly seminar series at UNH, and also I'm
16 one of the sys admins for CCOM. And we,
17 throughout the spring and fall semester, have a
18 weekly seminar series where we often will record
19 it and post it to the Vimeo account that Andy
20 mentioned.

21 And I can link that in the GoToMeeting
22 that we're running. And I can also send a link

1 to any of you guys if you need it. But you can
2 also just go to our website, ccom.unh.edu. And
3 if you click on, gosh, on --- you know what, I'll
4 just send that link around. I can't remember off
5 the top of my head.

6 And as far as the YouTube presence is
7 concerned, I know that our outreach team is
8 planning on having those same videos available
9 through YouTube. Obviously, YouTube's a lot more
10 prolific in their web presence and a little bit
11 easier for some folks to get at.

12 But, yes, there are topics for both
13 our folks doing their research and, of course, we
14 invite folks from all over the country and all
15 over the world to come and speak on topics in
16 marine science specific to hydrography and
17 acoustics. Yes?

18 MEMBER KELLY: Are any of them
19 actually geared toward, like, common users? Or
20 are these mostly technical, academic
21 presentations? Are there any "gee whiz, wow,
22 that's cool" kind of thing? Because that's going

1 to attract attention and get the general
2 stakeholders more involved.

3 MR. FESSENDEN: So the short answer is
4 yes, there are some cool, wow, common folk talks.
5 Although a lot of them are geared more towards
6 the science and towards other academics. It
7 really depends.

8 I mean, we'll do everything from
9 thesis defense in that format to folks coming in
10 just to talk about emerging technologies. So
11 it's really hit or miss as far as the focus is
12 concerned. But it's always just sort of focused
13 on sort of the specialties of the center.

14 MEMBER KELLY: Yes. I think we were
15 kind of driving towards should you look at
16 creating, for public common usage, a couple of
17 YouTube type videos that would just put the
18 message out there to the general public and not
19 just to the scientific community.

20 MR. FESSENDEN: I think that that is
21 a wonderful idea. And I will leave it to Captain
22 Armstrong and the team to decide how best we

1 should do that.

2 (Laughter)

3 CAPT ARMSTRONG: That's a great point,
4 Ed. And I think that can benefit us.
5 There are probably some that are already there.
6 But we'll try to make a positive effort to do
7 that.

8 MEMBER MAUNE: I have an offer for
9 you. I am right now editing a book on digital
10 elevation models that has a section on 3D
11 visualization. And we have an eBook version of
12 this thing in which you can click on things and,
13 for example, every reference, you don't have to
14 enter the URL. You just click on it and up pops
15 the reference.

16 Is it possible to have -- up pop a 3D
17 visualization where things are moving, where the
18 students can see how some of the things work that
19 you do? I don't know if that's possible or not.
20 But if it's something we can click on, it might
21 help students.

22 That book has sections on sonar, for

1 example. And it's an offer for you if you think
2 you can do something with it. But I'd need it
3 within the next 30 days. I'm talking just a few
4 second things, 30 seconds would be fine.

5 CAPT ARMSTRONG: Thanks. I'll get
6 with you, Dr. Maune, separately and see if we can
7 find something.

8 CHAIR HANSON: Sure, go ahead, Joyce.

9 VICE CHAIR MILLER: I just wanted to
10 say how impressive everything at UNH is. And I
11 think the panel got a really good appreciation of
12 the value to the community that UNH provides. I
13 think we were partially aware of it, but great
14 job. And tell Larry.

15 CHAIR HANSON: All right. And also for Jeff
16 Lillycrop's benefit, we did get a great chance to
17 visit with Diane Foster yesterday afternoon and
18 visit her new facilities and the new ocean
19 engineering program. So take note of that one.

20 So I think we probably need to get
21 going here on our next topic which is getting
22 into our working groups. Again, thanks to the

1 panel for all the comments this morning.

2 HSRP currently has three working
3 committees, Technology, Planning and Engagement,
4 and Emerging Arctic Priorities. We'll hear from
5 the first two committees this morning and from
6 the Arctic Committee tomorrow afternoon.

7 Ed Saade is co-chair of the Technology
8 Working Group with Lindsay Gee who could not be
9 here but maybe. He said he might be able to join
10 in this morning for a little bit. He's listening
11 in, okay. Well, safe travels, Lindsay.

12 Ed, you want to --- we'll go ahead and
13 turn it over to you and to the Technology Working
14 Group please.

15 MEMBER SAADE: Thanks, Bill. So
16 basically, and since we met last time, the most
17 significant thing that the Technology Working
18 Group's generated was the position paper that
19 we're going to discuss later on regarding the
20 official position on transfer technology between
21 NOAA, the UNH, the other labs like the UNH, and
22 over to industry and advocating that this is a

1 really good thing.

2 We have to tune it up a little bit.
3 But that's the basic theme. We have some
4 examples in that, as the panel has seen and read,
5 to demonstrate the real value, return on
6 investment, good use of taxpayer money, however
7 you want to reference that, those kind of the
8 running themes behind just the technology itself.

9 The meeting yesterday with the panel
10 on AUVs and, well, particularly on ASVs, but
11 autonomous systems in particular, that is
12 directly organized, particularly by Lindsay and
13 Carol. So again, I thought that was a real good
14 success yesterday.

15 We have some ideas for where to go
16 next. I think that would be a good discussion
17 for the panel. We've done specific technology
18 presentations on the hydrographic lidar now and
19 on autonomous surface vehicles. I think there's
20 a lot of benefit there. And it's nice to see
21 that it's really appreciated by the panel and the
22 audience.

1 I'd like to advocate that we continue
2 along those lines. But I definitely think it's
3 an open discussion on what we want to do next and
4 where we should go.

5 So we've slowed down. As everyone
6 knows, we've slowed down the monthly
7 presentations to be bi-monthly. Since we last
8 met, that only allowed us to have two meetings by
9 conference call. And one of those was really
10 geared towards preparing everybody for what we
11 were going to talk about on the autonomous
12 vehicles.

13 But that seemed to really work well in
14 terms of laying the groundwork for a little bit
15 of background for everyone on what the themes are
16 and help focus us. So I think we'll try and do
17 that in the future as well.

18 So, I mean, do we want to get into the
19 specific paper? Go ahead.

20 MEMBER HALL: No. So I think we
21 wanted to get into the comments back about the
22 strategy. Because I think that's one of our due-

1 outs. That's why it was talked about yesterday
2 morning, that this is one of the things we want
3 to make sure we complete, unlike our accidental
4 not finishing up the Charting Plan comments at
5 the previous meeting.

6 So I know that I was kind of -- the
7 way you were volunteered to be the vice-chair, I
8 was volunteered to take over this with Lindsay
9 not being able to be here. But I do understand
10 from an email exchange with Lindsay, and I hope
11 he's laughing now. But I think he's taking
12 notes. So I'll leave that to him.

13 And actually, no, I'm very thankful
14 that Erica has offered to take notes. But I
15 wanted to go through this. I don't know if Ed
16 was prepared for me to do that.

17 MEMBER SAADE: No, go ahead.

18 MEMBER HALL: Okay, sorry. So we had
19 some conversations. A few of us were part of the
20 Tech Working Group meeting where we got the
21 strategy overview, similar to what we got
22 yesterday. So thanks to E.J. for spending a lot

1 of time with our panel to talk through it.

2 And based on that, the comments were
3 provided here. Some of it's based on, hey, we
4 heard you say this. We didn't see it in the
5 strategy. And I think you've seen them. So I
6 wanted to walk through these kind of quickly.

7 I understand that a couple of folks
8 might have some additional comments that they
9 want to provide. If so, I invite you to say them
10 and then write them down and send them to me in
11 bullet point form. That would be very helpful.

12 But I kind of wanted to go through --
13 Lindsay did a very good job of taking our
14 comments and trying to put them into kind of
15 general bins and cover it as much as he could.
16 So I really appreciate the legwork that Lindsay
17 did on this.

18 So overall, again, we reviewed the
19 executive summary, the roadmap, the one-pager,
20 and then the presentation that we received from
21 E.J. We kind of looked at them as a whole.
22 Hopefully, that was what you wanted us to do.

1 I'm not going to go through all the
2 document proofreading, editing. I am sure that
3 your editor is going to catch that, or I hope so.
4 But you'll see there's a few things in here, you
5 know, some consistency in acronyms and that kind
6 of stuff, which makes a difference.

7 But one of the key overarching
8 comments that we received, and the way I
9 described it was this doesn't appear to be kind
10 of crawl-walk-run strategy. Does it need to be?
11 Or it's more of a kind of a statement of where
12 we're at versus a strategy of how do we get to
13 where we want to go.

14 So that's kind of a big comment from
15 the panel. And I'll let anybody correct me if
16 they thought it was, and we missed that point.
17 So I'm not exactly sure how we want to talk about
18 this. Do we want to do it in each bin? Do you
19 want me to run through it? So we'll do each bin.

20 So I just want to see if there's any
21 other comments related to this being a strategy
22 versus a plan, the comments that are in here,

1 again, from that idea of what kind of strategy
2 really is this? Is there more that could be put
3 in to make it more understandable as a strategy?
4 How is NOAA going to get from here to there?

5 VICE CHAIR MILLER: Kim?

6 MEMBER HALL: Yes?

7 VICE CHAIR MILLER: For the panel
8 members, this is in back of Section 3 in your
9 book. It's the last part of Section 3. Do we
10 want to put either the OCS plan or our comments
11 up on the screen? They're working on it, okay.

12 Okay. The comments for the audience
13 are comments on the paper, on the OCS Automation
14 and Autonomous System Strategy. Copies are on
15 the front desk.

16 MEMBER HALL: Okay. Any comments
17 related to the recommendation that it be turned
18 more into what we usually see as a strategy and
19 how they might do that?

20 I think we've done a pretty good job
21 already of kind of giving them some next steps.
22 Okay, moving on.

1 That was one thing that was really
2 striking, so the cost benefits. You know, and
3 E.J. gave the presentation and explained that it
4 was, you know, a full crew complement just to run
5 the autonomous vehicle. And I think there was a
6 huge assumption, and we've heard it by and by,
7 that it will save money.

8 So I think, when we look at this, that
9 shouldn't be the only kind of cost benefit that's
10 viewed here. And that might not actually be the
11 case, depending on how endless they're completely
12 autonomous when we get there, but looking at what
13 Doug very kindly walked us through, a little bit
14 more of the levels of autonomy.

15 I really liked the car, or the boat,
16 and the serpents. That works for me, so yes, the
17 complements on the gap, and the Valley of Death,
18 and the small boat being a serpent.

19 So I just wanted to see there if we
20 captured everything. I'm not sure we did, in the
21 comments that were there related to this
22 particular topic area.

1 VICE CHAIR MILLER: Kim, or -- go
2 ahead, no, go ahead.

3 MEMBER MCINTYRE: The one thing that
4 we talked about informally earlier was risk. And
5 I'm not quite sure if we're seeing risk reflected
6 as far as a cost benefit where I --- just from a
7 safety standpoint, we were talking about
8 launching the, you know, the crew, or launching
9 the boats and crews being exposed to various
10 things that, from a safety standpoint perhaps,
11 maybe something like that should be mentioned.

12 MEMBER LOCKHART: Actually, my comment
13 was exactly the same thing. It's not
14 specifically a cost, but it's a huge benefit.
15 And removing people from those vessels reduces
16 risk, especially in the locations those vessels
17 could be working in shallow waters.

18 And I think that's an important, maybe,
19 selling point for this strategy. But I think it
20 needs to be mentioned somewhere. And I didn't
21 see it mentioned anywhere in either the one-pager
22 or in the strategy itself.

1 VICE CHAIR MILLER: Actually, perhaps
2 E.J. should come up and join us, since he's the
3 author of this document.

4 (Off-microphone comment)

5 VICE CHAIR MILLER: Well, why don't
6 you come join us.

7 MEMBER HALL: And just to be clear,
8 we're not looking for him to defend himself on
9 this one. We're just going through and walking
10 through. So I just wanted to make sure that
11 everyone --- this is not an attack on E.J.

12 CAPT VAN DEN AMEELE: Yes. No, I
13 certainly appreciate the comment about safety and
14 risk. And I did make a note of that during the
15 panel yesterday as well that, you know, I sort of
16 recognize that that wasn't fully addressed in any
17 of the documents, both the longer, you know,
18 strategy as well as the one-pager.

19 So, yes, a good observation from
20 yesterday's discussion as well. I appreciate it
21 from Doug's presentation. And I think that's
22 something we absolutely need to incorporate into

1 the strategy.

2 I just wanted to go back a section
3 too. I apologize, I was looking for a
4 microphone. But just on the strategy versus plan
5 comment, we kind of threw around a lot of terms.
6 I don't know if this is a strategy, or a roadmap,
7 or is it a plan? Or Lindsay suggested maybe it's
8 a strategic plan.

9 But, you know, semantics aside, I
10 think getting to the intent of it was to
11 recognize that, you know, we have places we want
12 to go with autonomous and unmanned systems but
13 recognizing that we, at least within NOAA or
14 Coast Survey, don't necessarily have all the
15 answers.

16 So it was, you know, we wanted to make
17 sure that wasn't a set of concrete things that we
18 were going to do but a place we wanted to be
19 where we invited industry and our academic
20 partners to help us get there.

21 Which is why, whatever the term may
22 be, that was sort of the intent of the document,

1 was to realize that here's where we want to go,
2 but we need everybody to sort of, you know, the
3 collaboration and the help from everybody in
4 order to get there, not that we were just going
5 to do it ourselves.

6 MEMBER HALL: Thank you for that. And
7 I think that gets to a later section here, if
8 you've seen our comments about industry
9 collaboration. So I won't skip ahead.

10 So note that benefit that we talked
11 about. And thank you, E.J., for your comments.
12 Anything else regarding costs or benefits?

13 (No response)

14 MEMBER HALL: Seeing none, I will move
15 on to the OCS focus area. I can't remember.
16 Joyce, are these your comments? I'm not trying
17 to give credit, I just want to make sure.

18 VICE CHAIR MILLER: No, I think these
19 were general comments.

20 MEMBER HALL: Okay. So again, I think
21 this comes from where in the presentation we
22 heard a lot about some focus areas. But maybe

1 that's E.J. Maybe this OCS focus area, I think -
2 --

3 CAPT VAN DEN AMEELE: Hi, sorry to
4 interject. Lindsay Gee, out on the web, had a
5 comment. I'm going to try to put him through.
6 Lindsay, if you're ready, just a moment.
7 Lindsay, I've unmuted you. Can you hear us?

8 MR. GEE: Yes, I can. Can you hear me
9 okay?

10 CAPT VAN DEN AMEELE: Yes, we can hear
11 you.

12 MR. GEE: Hey, Kim, Hi. Lindsay Gee
13 calling in from Portland. I'm sorry that I'm
14 missing the meeting there, and I hope everybody's
15 enjoying Portsmouth.

16 And I heard some of, I think about ten
17 minutes of Doug Lockhart's presentation yesterday
18 from 36,000 feet. But it was really bad, not
19 because of Doug but because of the reception
20 onboard. So I'd really like to hear that later
21 on.

22 I just want to general comment, I

1 think if --- and I know you've had discussions
2 and all that work yesterday, but I think when I
3 took these comments, it was trying not to tell
4 E.J. And I really appreciate the openness and
5 discussions I had with E.J. about autonomous
6 strategy. I was just trying to provide, I think
7 as a panel, a level of guidance, that it wasn't
8 telling him how to write it. And the details
9 within it was just some areas where we thought it
10 needed some beefing.

11 And as Kim has already discussed, you
12 know, the strategy was applying it. And some of
13 that relates to the focus areas you just got to.

14 And I think that was one of the key
15 differences in the presentation that I have seen
16 from E.J. during the Tech Working Group, versus
17 the plan itself, was that he raised the focus
18 areas and how that was, you know, part of -- the
19 technology was hopefully going to address those,
20 and then the autonomy levels that he discussed
21 and, again, that it wasn't in the plan, and it
22 was kind of the why.

1 And we know it's not, you know, cost
2 effective now. And I know it is in the future,
3 but how do we address that and how do we get
4 there? But it seemed like it needed to address
5 some of the why behind that, in particular that
6 was the discussion regarding the focus areas.

7 I mean, they have been identified by,
8 you know, a kind of survey now. And I think it's
9 important that may be kind of called out related
10 to the, you know, autonomous strategy about areas
11 that may be better addressed, all those target
12 areas when you're sort of developing the
13 strategy.

14 So that was just a general comment and
15 one specifically about the focus area. I'm not
16 sure I'm going to be able to comment later. So I
17 think the remainder of really trying to just ---
18 my thoughts of grouping, hopefully, that are
19 sensible for the discussion. Thanks.

20 CAPT VAN DEN AMEELE: Yes. No, that's
21 good, that's good observation, Lindsay. And I
22 appreciate that. We'll certainly look to

1 incorporate that.

2 MEMBER HALL: Well, I think one thing,
3 maybe based on what you just said when we were
4 talking about the strategy and plan, or versus
5 the plan, that it was kind of a larger concept,
6 not just you guys. It's kind of the broader.

7 So I think there's a fight between
8 those two things, or kind of because it's that
9 you try to encapsulate everything. Maybe you
10 talk about industry collaboration, that's kind of
11 the purpose of this. We have an idea.

12 And there's an addendum that says,
13 specifically for OCS, this is what it would solve
14 for us or, you know, the appendix on the back.
15 So that if you really do want it to be this
16 larger roadmap for everybody to kind of adopt,
17 chew on, give their input to, that you've started
18 something bigger than just NOAA, I think that's
19 great. I mean, you put the NOAA's interests, or
20 at least OCS's interests, on the back. That
21 might be an option?

22 CAPT VAN DEN AMEELE: Yes.

1 Absolutely, that's good feedback, thank you.

2 MEMBER HALL: Speaking of that, the going
3 through each thing doesn't seem to be quite what
4 I thought it was going to be. So I'd like to
5 just offer, as you look at this from the
6 panelists' perspective, if there was something
7 that caught your eye, rather than waste our time
8 with me saying let's move on, if you could just
9 let us know as we're sitting here talking, and
10 then E.J. But I'm happy for people to jump
11 around at this point and provide their comments.

12 VICE CHAIR MILLER: I think addressing
13 the --- your presentation at the webinar, you
14 know, you talked a bit about the large unmanned
15 vehicles, getting it back onboard, and so forth.

16 And I think that's a --- having driven
17 a small boat up to the side of the ship and being
18 bashed around, it's difficult. And I can see
19 that great progress has been made. But it's
20 certainly with submersibles and so forth.

21 Almost always they put a manned boat
22 in the water to get the unmanned vehicle back.

1 And so our comment is there, that you might want
2 to address that a bit more in the document.

3 CAPT VAN DEN AMEELE: Right. Sure, I
4 agree, absolutely. That is one of the larger
5 challenges and one of those enabling technologies
6 that we had talked about. It's not just the
7 autonomy but the logistics of it all.

8 MEMBER SAADE: This is Ed. I was
9 going to just mention that, just from experience,
10 it's proper that we emphasize the LRS. But we're
11 going to get there. And a lot of it has to do
12 with this technology's changing all the time. So
13 if we focus a particular LRS on the systems that
14 we're using right now, it's probably not the
15 systems we're going to be using in two to three
16 years.

17 And it's constantly an improvement.
18 It'll get there, as I said. But it is going to
19 be a changing challenge all the time. So
20 listening is right, but keeping an open mind is
21 going to be important.

22 And then on the next section about the

1 industry and other collaboration, I think
2 yesterday's panel is a really good example of
3 kickstarting that. Because there was a whole ---
4 we had everybody represented yesterday between
5 industry, and yourself, and all the different
6 ideas that go into this.

7 I think everybody's edits on this are
8 going to be greatly enhanced just because we had
9 the panel yesterday. It's a little bit cart
10 before the horse, but it's okay. Because it's on
11 everybody's mind.

12 VICE CHAIR MILLER: In reference to
13 that, I had added the last comment in that
14 section, not only industry but Naval
15 Oceanographic Office has a lot of experience with
16 that. And I know you guys are establishing a
17 remote -- or a facility down there. But looking
18 to their experience in already running partially-
19 manned vehicles, I think, would be valuable.

20 CAPT VAN DEN AMEELE: Sure. And that
21 was an absolutely great comment. And even based
22 on the feedback from the Tech Working Group, we

1 acted on that right away and already had a visit
2 to NAVO to reconnect or, you know, re-establish
3 that collaboration between us and, you know, not
4 only the Naval Oceanographic Office but others
5 who are involved as well. Thank you.

6 CAPT ARMSTRONG: So I guess I would --
7 - one thing I noticed in the comments was, in the
8 last section, in terms of the comments, was a
9 disagreement with NOAA about the clear cut
10 mission for UAVs.

11 And so I, rather than inserting myself
12 in that, I just raise it as an issue that maybe I
13 invite the panel to address or E.J. to address as
14 to whether we need to clarify that or ---

15 VICE CHAIR MILLER: Well, it was my
16 comment.

17 RDML SMITH: We've got a lot of
18 acronyms, and everybody uses different acronyms
19 for these things. Just for the clarity of the
20 room, would you mind being more clear with what
21 UAVs means in this context?

22 CAPT ARMSTRONG: Yes. So the ---

1 MEMBER HALL: He's saying --

2 CAPT ARMSTRONG: Unmanned ---

3 MEMBER HALL: -- of the aerial
4 vehicles ---

5 CAPT ARMSTRONG: Unmanned aerial
6 vehicle is the issue in question. Thank you,
7 Admiral.

8 MR. GEE: Can I comment again, please,
9 Lindsay Gee?

10 MEMBER HALL: Go for it, Lindsay.

11 MR. GEE: Yes, I think this was --- I
12 forget who put the comment in, but I also agree.
13 I think it was something --- my view was -- my
14 understanding is that most of the airborne sort
15 of photogrammetry oblique imagery is done by the
16 NGS Remote Sensing Division.

17 But I think this was more just saying,
18 look, it's not you should pursue this, it's
19 something that is there a way to use autonomous
20 technology to, again, improve safety and response
21 and, again, looking at the focus areas.

22 And this was related to more the type

1 of aerial vehicle you could launch from a ship
2 that could be used like an eye in the sky versus,
3 you know, regular mapping. So this could be
4 there's a disaster, you need to go in quick to
5 look at something. You go into a reef area, you
6 have an aerial vehicle at the right, you know,
7 angle to view something. Chart discrepancies,
8 you're going past, you can quickly go and have a
9 look with it.

10 So that was my idea. It was just ---
11 and again, this is not trying to tell Coast
12 Survey how to do business but saying, oh, just
13 consider this. And, you know, if you consider it
14 and rule it out, that's fine. Or you say
15 consider it, that's being done by the Remote
16 Sensing Division. That was my thoughts behind
17 the --- when I grouped that into the comments.
18 Thanks.

19 MEMBER HALL: I think one of the
20 things I would do to change this is an editorial
21 thing, is put it into a positive, that HSRP
22 believes that NOAA has a great mission.

1 Is that kind of what you're getting
2 at, Andy, versus the don't? And just leave that
3 there for NOAA to ask us either more questions or
4 for them to pursue on their own. Does that make
5 sense, to make it a little bit clearer here?

6 CAPT ARMSTRONG: I like that
7 suggestion. I just wanted to highlight the fact
8 that we didn't just pass over something like that
9 that was sort of a fundamental and remarks that
10 we clarified it for E.J. and the panel.

11 RDML SMITH: Can I comment? I think
12 it's worth noting that this document that you
13 reviewed is very Coast Survey-central. That is
14 mostly about the missions as we have them
15 currently divided up within NOAA.

16 And as such, we did not get into the aerial.
17 But I do know that Mike Aslasken, were he here,
18 would be commenting that they are doing unmanned
19 aerial vehicles for quick shoreline jobs. They
20 have, it's called an EV that they're using for
21 similar applications that you're suggesting.

22 So I guess one thought could be that

1 maybe we need to make the scope of this document
2 broader to include unmanned systems for
3 navigation services more broadly. And I see
4 Juliana perhaps commenting.

5 MS. BLACKWELL: So, yes, we do have
6 some work being done with the EVs. And it's
7 really very small areas that we're using these
8 systems to map.

9 I think leaving it open for future
10 opportunities is probably more where we're going.
11 Because I'm not sure that what we have right now
12 is something that's going to be efficient for the
13 types of data collections that we currently are
14 doing for the NGS mission.

15 But I think a lot of the research
16 that's being done with these smaller units in
17 estuarine areas and things like that is something
18 that can be beneficial to other communities. But
19 if you want to broaden it, we certainly can go
20 back and have Mike and his team of experts look
21 at this and help maybe massage some of the
22 aspects of it for the aerial collections, if

1 that's what you'd like.

2 MEMBER HALL: I think going back to
3 what Lindsay was saying is we're just giving you
4 an idea where we think it can go. So I --- go
5 ahead.

6 MEMBER LOCKHART: I kind of want to
7 further this a little bit and point out, I mean,
8 there are, you know, every survey company out
9 there has an aerial drone. It's actually a great
10 idea. I think this should be spun into a
11 positive that absolutely could be used, certainly
12 not for the larger area mapping.

13 And that's one of the things I wanted
14 to point out. There are actually a lot more
15 regulations on aerial vehicles right now than
16 there are on autonomous surface vehicles. That's
17 far more advanced.

18 And one of those restrictions is that
19 you can't do larger areas, because there is a
20 restriction on line of sight operations. Having
21 said that, if you're on a boat and you just want
22 to go out and do some quick shoreline

1 verification off some smaller sheet that you're
2 surveying, yes, it's a good application.

3 But you need a pilot's license, you
4 need all these things to be able to do that. So
5 there's a whole skill set that has to come along
6 with that aerial vehicle as well.

7 MEMBER SAADE: I'd just like to add
8 that, you know, autonomous is autonomous. I
9 think the UAVs, the airborne vehicles should be
10 included in this whole discussion, however we can
11 deploy them. But now that it's been raised and
12 discussed, I think it's an oversight not to have
13 it in there.

14 MEMBER LOCKHART: We did discuss
15 actually having that as part of the panel too.
16 And I think we decided there was just so much to
17 talk about in that panel that we left it out on
18 purpose. It wasn't that we ignored it, we
19 actually did that on purpose. But I agree,
20 absolutely, when we're talking about autonomous,
21 it's another tool in the toolbox, for sure.

22 MEMBER HALL: And I think that E.J.

1 might go back to the scope of the --- and your
2 vision for the strategy plan, strategic
3 priorities, whatever. And so as you guys said
4 that, you can either make it something that's a
5 little bit thinner, and specific to OCS, and kind
6 of leave that out, and then maybe a bigger plan
7 for what we do with autonomy.

8 And they have --- the MGS has their
9 own for the plan. So I think we just want to
10 leave it to NOAA. We just want to let you know
11 that that's something we saw that was missing or
12 something that could be addressed in another
13 venue.

14 VICE CHAIR MILLER: Kim, in that
15 section, other than AUVs, or UAVs, too many
16 acronyms, that section, and the personnel in
17 training issues, particularly with a large AUV,
18 my experience is the set of people that you need
19 to send out with a large AUV is not a
20 hydrographic surveyor and a boat driver. It's an
21 electronics engineer, a network communication
22 expert, on and on.

1 And I think, well, I guess when you
2 send out a Teledyne engineer or, you know, an
3 engineer from a company that knows the vehicles,
4 but as I said yesterday, talking about personnel
5 requirements without looking at the requirements
6 to maintain, and operate, and fix it when it
7 breaks is, to me, a bit glossing over your
8 personnel requirements.

9 You know, talking about personnel
10 requirements only in terms of somebody to drive
11 the thing and somebody to do the survey, the
12 person who --- one of those people has to know
13 how to fix it when it comes back onboard.

14 And so I think there needs to be perhaps a
15 broader discussion of real personnel
16 requirements. And that was one reason that I
17 questioned NOAA keeping the REMUS-600, is because
18 that's an incredible, I mean, I've been out with
19 AUVs with six people, minimum, and that meant
20 that AUV was in the water for eight hours. And
21 those six people spent the next 16 hours getting
22 it ready to go the next time.

1 And so I would ask you, you know, why
2 does NOAA, why should Coast Survey keep the big
3 guy that doesn't really meet your needs? And I
4 would recommend that you more broadly discuss the
5 personnel issues in the document.

6 CAPT VAN DEN AMEELE: Sure. No, thank
7 you, Joyce, for that feedback. That was
8 something that we, you know, at least tried to
9 touch on was the -- when we said unmanned systems
10 required different skill sets. Those are the
11 types of things that we were talking about was,
12 you're right, it's not a coxswain and a sonar
13 operator, necessarily, per se. It's somebody who
14 knows how to, you know, really get into the guts
15 of the system.

16 And if you're talking a surface
17 vehicle, then you need a diesel boat mechanic
18 who's going to be able to maintain it and all
19 those different types of skill sets.

20 So we certainly appreciate that. So
21 certainly we want to flesh it out a little bit
22 more. And just another comment, what you were

1 saying, that was something that we, you know, a
2 slogan we adopted from the Navy, I guess. They
3 say when it comes to unmanned systems, two is one
4 and one is none, meaning there's always going to
5 be one that's not in the water that's going to be
6 the next one you're sending out because of all
7 the things you just mentioned which is, you know,
8 recharging the batteries, and downloading the
9 data, and all those sorts of things that you also
10 need to do which requires those types of skill
11 sets.

12 So your comments are very much
13 appreciated. And it sounds like maybe we need to
14 go into a little bit further detailed discussion
15 on that in the paper.

16 MR. GEE: So Lindsay Gee, just to ---

17 MEMBER HALL: Go for it, Lindsay.

18 MR. GEE: Yes. No, just regarding the
19 personnel, again, trying to keep it at a top
20 level again, I think -- and E.J. almost responded
21 there, I think -- there are many issues. And I
22 think we now --- and it is a transition of

1 technology.

2 And being one of those old guys, I
3 didn't quite come from sextants, but I did come
4 from terrestrial-based navigation and with lots
5 of seamanship and, you know, tide gauges, and all
6 that sort of stuff.

7 But we had people almost in a boat
8 every day to where we are today where we don't
9 really need to go ashore sometimes. And I think
10 we sadly, well, certainly in my experience when I
11 was in Australia, I think we didn't plan ahead
12 for the transition with some of those people that
13 were great seamen into no jobs eventually.

14 And I think, just at a very top level,
15 you've acknowledged it, E.J. And I think it
16 needs to be a key part of your planning going
17 forward, to keep looking as you move forward, you
18 know, what sort of people are we going to need?
19 How are we going to train them? How are we going
20 to recruit them, and what effect does it have on
21 our overall manning? Because this goes beyond
22 just the autonomous strategy. I think it goes

1 back to your whole personnel issue, that it's
2 going to impact that.

3 And I think just acknowledging that,
4 the very top level in this document saying,
5 "Please, worry about this, because it's
6 important." And it's going to affect you, you
7 know, OCS generally, personnel in the future. I
8 think that's the level of comment I was trying to
9 put through on that.

10 MEMBER SAADE: So let me just
11 emphasize. I think, building on what Lindsay
12 just said, I think this is really important that
13 we're talking about the future. We're not
14 talking about the right now.

15 The XPRIZE is going on right now. And
16 the whole purpose of the XPRIZE is to actually
17 have an AUV that launches from shore, goes out,
18 and does all this mapping, and comes back
19 completely on its own, right. So all your
20 technical capabilities are sitting onshore.

21 And your comment about AUVs are going
22 in water for eight hours, we have AUVs that go in

1 the water for 48 hours, and 68 hours. So there's
2 a lot of technology that's changing constantly.
3 So it's really important for us to talk about
4 where do we really want to go with this stuff,
5 including the manning.

6 Because what's the point of doing it if
7 we're not trying to get to someplace that's
8 significantly better than where we are now.
9 Let's not focus on the problems that we're having
10 now. Let's focus on where we want to push this
11 stuff.

12 MR. GEE: It goes down to that as
13 well. And maybe this is the segue into the
14 industry comments and discussion. I think that,
15 having worked in a national organization, I think
16 it's sort of, you know, it's very similar to NAVO
17 and NOAA.

18 It's different to a survey company and
19 the experience of the operations from, you know,
20 the survey companies is kind of, I think, with
21 the move of technology, it becomes more important
22 for NOAA Coast Survey.

1 And the other aspects of that are --
2 I did catch it out of Doug's, you talked about
3 the Valley of Death --- for the product. And in
4 product, from my background, the product
5 development, we used to call it crossing the
6 chasm to go from the early adopters into the ---
7 you want to get to those pragmatic users who are
8 writing the purchase orders. You know, it's
9 never easy.

10 But I think that's important to
11 include and be part of kind of an industry
12 consortium here. Because there isn't the
13 momentum, and there isn't the pool of people to
14 be able to do this individually.

15 So I think that's really key to
16 embrace that. And I think one of the things that
17 we suggest that came from this team, and I agree
18 totally, is there's a real place for NOAA in this
19 to lead the, I think, coordinate that as a, you
20 know, industry partnership with government and
21 academic institutions to look at, you know, the
22 COLREGS, just at a broad level.

1 I think that's a role that I would
2 certainly support that really wasn't addressed.
3 But it then helps to push forward the overall
4 agenda of, you know, the more people using the
5 autonomous system, if they're cost effective, if
6 they lower risk, and all of those sort of things,
7 benefits everyone. And that obviously has a
8 benefit to Coast Survey if there's others using
9 that as well.

10 And I think that was one of the
11 general thrusts that you don't --- you had a
12 comment about being the leader, the nation's
13 leader or something. I think you can do that by
14 coordinating, you know, a consortium and doing
15 those things that industry can't do.

16 I mean, there was a comment in there
17 about Fugro's working because internationally
18 they work on different committees about the
19 regulations of using these and how they get
20 established. But they're kind of pushing from
21 the bottom up.

22 And I think, in the US, you have an

1 opportunity to, you know, form a really good
2 partnership across industry operators,
3 manufacturers, and academic research to
4 coordinate the activities or autonomy on the
5 water moving forward. Thanks.

6 MEMBER BRIGHAM: Yes, just what I
7 mentioned is that it's clear that, in all of this
8 development, that the IMO is going to be the
9 central organization. I think the International
10 Maritime Organization's going to develop rules
11 and regulations that are about standards, but
12 both for -- certainly for surface vessels.
13 Underwater vessels, I don't know.

14 But I guess there will be some
15 security issues too. But IMO, and NOAA, and the
16 Coast Guard have all been in IMO committees,
17 safety committees, whatever, and probably have a
18 place in all of this.

19 So I don't think they'll be regional.
20 I mean, it's a, you know, an International
21 Maritime global enterprise, so it will need
22 international rules and regulations that cover

1 the entire planet rather than just a region.

2 CAPT VAN DEN AMEELE: No, I certainly agree.
3 And I did make a note here that I don't think our
4 documents really address the regulatory or policy
5 side of this at all. And that's something I
6 think we need to mention, at least, that we need
7 to engage to make sure that it protects our
8 interests and our ability to do our missions with
9 these systems.

10 I will mention that NOAA, the agency
11 overall does have an Unmanned Systems Working
12 Group. And one of their functions or roles is to
13 advise the US Coast Guard, you know, as they look
14 to set policy for both underwater and surface
15 vehicles, you know, as to what our needs and
16 interests are to make sure that those are
17 considered. And, you know, I would say it's
18 probably a good idea to wrap that somehow into
19 this as well.

20 MEMBER HALL: E.J., in thinking about
21 that, and kind of going between the what autonomy
22 is going to be, and what it is currently, so

1 going to Joyce's issue for personnel issues,
2 maybe there's a section here for those kind of
3 hurdles and challenges that have to be overcome
4 to get there, right.

5 So that's going to be regulatory
6 policy. That's going to be technology, that's
7 going to be personnel. And maybe you split it
8 out that way and just say, hey look, this is our
9 vision to get there. But here are the hurdles
10 we're going to have to get over in general --

11 CAPT VAN DEN AMEELE: Sure. Yes,
12 absolutely.

13 MEMBER LOCKHART: So I have a comment
14 that's kind of --- I don't know that it really
15 belongs in your strategy or not, I guess. But
16 Shep, and Doug, and I were talking about this a
17 little bit yesterday.

18 You know, we talked about the
19 bandwidth yesterday of trying to get all this
20 information off of these vehicles. Because you
21 don't want it sitting out there for five days.

22 But, you know, we tend to right now,

1 this is very acquisition focused, and data
2 collection focused. And we're not really talking
3 about what we're going to do with all this data.
4 We talked about it being a force multiplier. And
5 we know there's a backlog just pushing data
6 through and getting to a product.

7 But I think there needs to be a
8 discussion within this, but maybe not necessarily
9 in this paper. And it could be something that we
10 want to hear more about later as a panel, about
11 how we're going to deal with this data.

12 Can the data be processed onboard the
13 vehicle so we actually get a product or an answer
14 back rather than just terabytes on a point cloud.
15 And I think -- I'm just thinking about that as
16 Ed talks about where want to be rather than where
17 we are now.

18 Obviously, we have to babystep it
19 right now. The answer is getting the collection
20 method down first. But I think that's a
21 necessary part of the process is, okay, we've got
22 all this stuff. What are we going to do with it?

1 MEMBER SHINGLEDECKER: Yes, I would
2 just echo that. And I think Ed brought it up
3 earlier. I think that that is an excellent topic
4 that we should be looking at as far as how is
5 data being managed, and processed.

6 And, you know, the collection is
7 fantastic, but if the product doesn't come out in
8 the end, you know, in finding that balance, and
9 the challenges, and bringing in experts that can
10 really advise on big data.

11 VICE CHAIR MILLER: I found in the
12 past that a lot of people who are involved in
13 systems see the system as being the product, not
14 the data. And if, you know, even if you've got a
15 system, if it produces bad data, then your
16 product isn't good. And so I think Carol and
17 Susan's comments are very valid.

18 MEMBER MCINTYRE: I speak from a
19 position of total ignorance on all this. But
20 when I look at this now, to me, it looks like
21 it's very relevant and near to being very helpful
22 to a waterway like mine, like an inshore

1 waterway.

2 And so I wonder, when you look at it
3 strategically, I see a lot more barriers to
4 overcome in an offshore application. But if you
5 look at it mission based, where it's like --- I
6 think there's a lot of things that can be used
7 inshore, near shore with much less of a barrier
8 to overcome. And it might be good to look at it.
9 I mean, when I see this, I see it as being super
10 helpful to us in a very near term way.

11 MEMBER SAADE: So I'm going to ---

12 MR. GEE: Can I just make one more
13 comment ---

14 MEMBER SAADE: Wait a minute. Wait a
15 minute, Lindsay.

16 (Simultaneous speaking)

17 MR. GEE: Go ahead.

18 MEMBER SAADE: Just a second, Lindsay.
19 Sorry, I just want to say real quickly on the
20 back of what you both said. It ties into the
21 comment I made this morning about big data.

22 We had a panel yesterday. And if you

1 look at everybody on the panel, including Carol,
2 we're all big time data collectors. We've been
3 to sea a lot. And we're really focus on data
4 collection, data collection. A lot of technology
5 stuff's been focused on data collection. And it
6 leads into your comment. We've got to start to
7 focus on this big data issue.

8 And not only that, as Ed pointed out,
9 it's not just the big data issue, it's the whole
10 visualization of the big data issue that gets
11 everybody's juices flowing. So it's all tied
12 together in being able to really get out there
13 and get folks involved that are not necessarily
14 technical, and they're not necessarily directly
15 working with NOAA. All right, Lindsay, your
16 turn.

17 MR. GEE: Yes. I totally agree. And
18 I think we're all really interested in the data.
19 And that's the type of people we are. But I
20 think it's folks like Susan, and Ed, and others,
21 and Sal, that should be saying here, hey, I want
22 to get products to navigate my boats or ships on.

1 I'm not really --- it's really cool
2 what I saw, but how's that helping me update the
3 products that I use and the future products that
4 are going to be available? So I think that is a
5 key aspect, in that how does that relate to
6 autonomous systems and doing that autonomously to
7 support, you know, the current systems as well.

8 Because I think we made a comment in
9 this, in our comments that one of the benefits
10 that we see from the autonomous systems is it
11 feeds back onto the current ones on the ships and
12 launches.

13 So, yes, I think it's really important
14 to not lose track and get buried in the really
15 cool technology. That overall the folks that use
16 the data, or use the information in the current
17 chart product, you know, what are we going to
18 have in the future, and how is this going to help
19 me, is kind of something we should not lose sight
20 of.

21 MEMBER BRIGHAM: Just a comment back
22 to semantics, you know, that strategy plan ---

1 strategy in plan means it's more definitive to
2 me. But this new term of ours roadmap, to me, is
3 flexible and more open.

4 And this whole thing is evolving. And maybe
5 the roadmap --- you know, the Navy has a roadmap
6 for the Arctic. And they call it a roadmap and
7 not a strategy for some very good reasons. And
8 they don't know where it's all going.

9 And so I just throw out that I think
10 that the roadmap says it's kind of what this is
11 about and not definitive, we're going to do this,
12 this, and this. It's all evolved. But it is
13 somewhat semantic. And you all and NOAA may need
14 to use the word strategy for specific budget
15 reasons. But I think the roadmap has some
16 agility.

17 MEMBER HALL: I just want to go
18 through right now, because I know we need to
19 reach consensus on this and make sure that we're
20 pretty happy. I have some changes to make.
21 Luckily I had Erica as aid notetakers while I'm
22 taking some notes.

1 So I just wanted to walk through, and
2 let you know what I heard, and what I think were
3 the things that we wanted to add a little bit
4 more to this within the next day, and make sure
5 you all agree with me. And then we can finalize
6 this on the last day, Wednesday. Is there time
7 for that, Joyce?

8 VICE CHAIR MILLER: Yes. We also need
9 to take a look at the issue paper and pad the
10 issue paper. So that's what I was going to say.

11 MEMBER HALL: I'm just going to walk
12 really quickly. I've got a couple of things.
13 So, I mean, one thing we've all talked about is
14 kind of clarify that intent and scope, whether
15 you call it a strategy, a roadmap, a plan, but
16 just clarify the intent here. It kind of, with
17 the recognition that this is an ever-evolving
18 kind of concept as technology gets better, the
19 roadmap will change slightly, right.

20 The other, going into the cost
21 benefit, obviously we know we recommend about the
22 benefit of removing people from the vessels.

1 Ultimately, when you take people out
2 of harm's way, how to incorporate kind of the OCS
3 focus area, that goes, again, back to your intent
4 and scope. Is this just an OCS thing, or is this
5 something that's for NOAA, is this general?

6 And I'll skip forward to then, if that
7 is the case, if it is NOAA-general, we say we
8 recommend looking at the UAV aspect of this as
9 well. If not, we still believe that UAV should
10 be addressed in some other form or fashion.
11 Because it is obviously also a force multiplier
12 in some ways but has its own challenges.

13 Then we have, like, going back to the
14 challenges, the support and logistics issues.
15 And that was kind of my quick talk to E.J. was,
16 hey, maybe we put this, maybe a caveat that would
17 secure the challenges. It's regulatory, it's
18 technical, it's policy, it's a port logistic hub,
19 maybe that DOTmLPPF, DOD way of looking at things,
20 what could fall underneath those?

21 And then, sorry, I'm going back and
22 forth. And finally, where there might be just a

1 consideration for big data, and it might not be
2 here as Carol was saying, but we'll put that into
3 our recommendation.

4 That doesn't necessarily mean that it
5 gets included it in the strategy, but I'll have a
6 note there just, hey, by the way, don't forget
7 all the data that you're collecting there and
8 users for this. What does this actually give
9 them?

10 And that might be able to help you
11 justify that you're doing this. Hey, this is
12 what it'll give folks like Captain McIntyre.

13 So I think that's everything. Did I
14 miss anything that we had talked about, in
15 general? And I will work with Erica's notes and
16 my notes to update this. But I just want to make
17 sure we're generally happy with a couple of
18 additions. Oh, and I'm going to make the UAV
19 comment a positive versus --

20 MEMBER KELLY: Kim, I'd just like to
21 stress what you mentioned. But I just want to
22 make it that there should be a synergistic

1 development with end users and data
2 collectors/producers so that they do keep track
3 and that it can be done in a synergistic fashion
4 so that, you know -- and I think that'll make a
5 faster track toward usable products.

6 MEMBER HALL: Well, with that, I will
7 leave it to the issue paper and possibly we'll
8 have some time for that.

9 VICE CHAIR MILLER: Ed, do you want to
10 lead the discussion on the issue paper?

11 MEMBER SAADE: Sure. We were just
12 discussing if we were going to do this now or
13 later. If we want to do it now, that's fine.

14 VICE CHAIR MILLER: We have 18 minutes. Can
15 we get that up on the screen please?

16 MEMBER SAADE: So I think the last
17 version of this, or the version that we're going
18 to take a look at, from my point of view, it
19 really captured the essence of what we were
20 trying to say in a way that was encompassing all
21 the different aspects of the contributor ability.

22 It's not just singularly focused on

1 one aspect of what NOAA does, or one aspect of
2 what the research institutions do. It's a little
3 bit more generalized capturing of the fact that
4 all of these aspects of what is going on is
5 really useful, and important, and to get the word
6 out on that.

7 So with that said, I think all of you
8 know my position on it. It's very mature and
9 ready to go. But we need to get everybody's
10 input on this to make sure that there's other
11 aspects of it, or we get everybody's opinion on
12 it. So I'm just going to open it up to whoever
13 wants to make a comment.

14 (No response)

15 MEMBER SAADE: And with that, I guess
16 we can say that it's all done.

17 (Laughter)

18 MEMBER SHINGLEDECKER: I have one
19 quick comment. As I read through it, and I think
20 about the three offices, I would maybe just ask
21 Juliana if you think that the recommendations
22 encompass the R&D in your areas as well as it

1 covers some of the other areas.

2 I'm looking specifically at the
3 recommendation, the third bullet. Let me make
4 sure I've got the right bullet, sorry. "Increase
5 R&D funding with the specific goal of improving
6 the safe and efficient pursuit of hydrographic
7 and charting tasks and with the parallel R&D
8 goals of general ocean mapping technologies."

9 I'm wondering do we need to broaden
10 those recommendations a little bit to make sure
11 we're encompassing all of the R&D elements?

12 MS. BLACKWELL: I think if we could
13 expand a little bit and include something related
14 to coastal mapping shoreline. You know, in my
15 presentation later today, I'm going to touch on
16 some of the unmanned or the one unmanned system
17 you're using for airborne gravity.

18 So there are things that it all fits
19 together. I know you don't want to make it too
20 long, too broad, to cover everything, but I think
21 there could be a few key words that would help
22 perhaps just make sure that we were included and

1 not go into too much technical detail.

2 I don't know exactly what those are
3 right now, but I would say, you know, reading it
4 again, and looking at maybe the shoreline or ---
5 I don't know what the other word would be to
6 cover the gravity.

7 MEMBER SHINGLEDECKER: So the short
8 answer is yes, there is maybe a couple words we
9 could find that'll ---

10 MEMBER SAADE: I don't disagree. I
11 think trying to get us involved in there, I just,
12 my only hang-up on it is benefits for NOAA and US
13 industry, so the shoreline part of it back to the
14 technology transfer to US industry.

15 And I know there are some gravity
16 things that are moving back and forth between
17 industry and what your group does. So that, if
18 we tweak it a little bit, let's do that. But
19 let's try and find an example that does point to
20 industry usage, if we can do that. I don't know
21 what comes off the top of your head.

22 MS. BLACKWELL: I guess I'm not quite

1 sure. I mean, most of what we're doing for
2 research is something that we would want to have
3 utilized by industry or have industry create so
4 that we could utilize it for our mission
5 requirements. I'm not quite sure I understand
6 where the disconnect is with what you're saying.

7 MR. GEE: Can I comment there please,
8 Lindsay Gee.

9 MEMBER SAADE: Go ahead, Lindsay.

10 MR. GEE: Yes, I think, just following
11 on from those comments, and Juliana
12 specifically, I think that's what we're saying,
13 is that we want anything that's researched is
14 being done, as Ed said, when it's of a great
15 benefit, and it can transfer, we want that
16 highlighted.

17 The other way is that any research
18 should have a focus in ensuring that there's a
19 structure in place to transfer that to industry.
20 And as Juliana said, she wants some of the
21 research to go to industry.

22 Well, we're kind of saying we agree,

1 and there needs to be a structure that ensures
2 that it's done, and it's optimized, and can be
3 done quickly and, you know, and that you sort of
4 started that, some of the TRLs and all that stuff
5 that gets done at CCOM.

6 And we're not trying to highlight
7 that, we're just saying, hey, here's a success,
8 and it seems to work. And it has a lot of
9 benefits to industry. Can that be applied
10 elsewhere?

11 So I would agree. That paragraph is
12 --- that can be just, I think, the two sub-
13 bullets are what we're mainly about. But the
14 words of, you know, that can be improved to say
15 sufficient pursuit of hydrographic, you know,
16 generally, if it can be inclusive of NGS and CO-
17 OPS as well, which I kind of think it does,
18 because they support those activities.

19 But it's mainly about making sure
20 that, you know, the research that gets funded
21 doesn't just get used by NOAA. That's a benefit,
22 but it needs to be used by industry for the

1 purpose of the research.

2 But what happens and the momentum that
3 builds with the associated lab at CCOM is it's
4 had much, much broader benefit that wasn't the
5 intention of the initial research.

6 And so that structure that's there allowed it to
7 do that. So it's a jewel.

8 You have to be successful for NOAA
9 with money that, R&D money, that gets spent. But
10 then you also want to have a structure in place
11 that allows you to leverage that research for
12 other use in industry. Thanks.

13 MS. BLACKWELL: So we're specifically
14 looking at JHC and CCOM and the bullets under
15 that. I'm going to take back what I said about
16 trying to make it include other things related to
17 NGS. Because I did not appreciate the fact that
18 we were speaking to those bullets under that
19 section.

20 And currently, while there's stuff
21 that's going on that may, in some way, be
22 associated with the things that we're doing in

1 the Remote Sensing Group, I think that's probably
2 already covered under the language that's in
3 there now.

4 MR. GEE: I would say that we're just
5 trying to, you know, we're just trying to use
6 CCOM as an example of a successful transfer of
7 technology, not saying this is the only model.
8 We're just saying that it was a success because
9 they had -- the way they did it and the
10 partnership with CCOM and JHC.

11 And so the recommendations are really
12 saying, okay, here was an example. And we'd like
13 to see research funding, make sure that you have
14 an industry's, you know, intent in place, and a
15 structure that allows it to be done rapidly.

16 That's more the sort of segue from,
17 okay, here was a success, and here's how it ---
18 can we go on and do that in other places, more
19 generally, to support NOAA.

20 CHAIR HANSON: Ed, just I'd suggested
21 a comment in writing here, emailed a few weeks
22 ago. But one of the thoughts when it comes to

1 advocating for R&D is the alphabet soup of
2 agencies that are involved in different parts of
3 R&D. And since we've mentioned OMB in Congress
4 and the tax there, I think we need to mention and
5 emphasize collaboration with other agencies.

6 The reason for that is because, when
7 you go to OMB or Congress, you start talking
8 about hydrographic surveys, they start thinking
9 immediately about the Corps, they start thinking
10 about USGS, and not just NOAA.

11 And so if you're advocating for a big pull,
12 you have to be sure and talk in bigger terms that
13 they understand. Yes, you're talking about NOAA
14 right now, because we're a FACA, but the success
15 we've had in other coastal issues, in terms of
16 advocacy for R&D, have come with the
17 collaborative efforts, being able to say that the
18 hydrographic, and in this case it would be a
19 hydrographic community, is interested in this
20 result.

21 We've had issues, collaborations with dune
22 research, with near shore processes, getting the

1 Corps, NOAA, USGS, and some of the other groups
2 together to look for efficiencies in the way they
3 do their R&D.

4 And by highlighting the efficiencies,
5 it's a lot easier to go advocate, to OMB
6 particularly. That's the first question they ask.
7 Are you doing that? And isn't there already
8 enough money?

9 And so the first question becomes the
10 efficiencies. And if you're not collaborating
11 with other like-minded agencies, then that
12 becomes kind of a --- puts you in a defensive
13 mode really quick.

14 So whether or not you include it or
15 not, just be aware of that as the group moves
16 forward, that collaborations with other agencies
17 are really going to be the key long term for R&D
18 investment.

19 MEMBER SAADE: Okay. I get it. And
20 I think it's a really good point. But I would
21 just go back to the roots of all this, that it
22 was, from my perspective, it was to try to

1 demonstrate that people's tax dollars go to
2 something that actually comes back to benefit
3 industry. That was the original intent for me
4 personally to advocate for this.

5 Now, obviously it's morphed into some other
6 things, and that's fine. But that was the
7 message that I was trying to drive across, and
8 that all the different parts of NOAA that we
9 represent need to get out there and brag more
10 about the fact that those tax dollars are really
11 doing something good for industry.

12 CHAIR HANSON: Amen. And sometimes
13 that's done in better context as a community as
14 opposed to an agency.

15 MR. EDWING: So I guess I just wanted
16 to remind the panel. And I'd sent around the
17 invitation for this a number of months ago, but
18 this past month NOAA held its second Emerging
19 Technologies Workshop.

20 And, you know, the first time we had
21 it, two years ago, it was just really -- mainly
22 we just invited internal folks. It was a huge

1 success. The second time around, we expanded it
2 to the private sector and invited academia, and
3 other government agencies. The panel was folks
4 from across other government agencies.

5 But, you know, this is looking at all
6 different technologies for all of NOAA's
7 observing systems. So this is kind of the other
8 end of the spectrum, but I would just encourage
9 the panel to kind of, you know, tie some of these
10 sorts of efforts into that.

11 Because one of the purposes of that is to
12 bring technologies before NOAA that we can look
13 to infuse in the next three to five years.
14 Presenting at the workshop is no guarantee of
15 funding, but we are -- that is one of the --
16 we're inviting presentations, we are looking for
17 those technologies that we think we might be
18 interested in infusing in the next three to five
19 years.

20 Now, EPA was there. He presented on
21 the ASV strategy. Saildrone was there from the
22 private sector about, you know, the gliders that

1 they have, and we had great participation. And
2 we're going to be doing this again. I'm not sure
3 it's going to be every year or every other year,
4 but just to get it on your awareness. Thank you.

5 MR. GEE: Lindsay Gee again. And I
6 think that's an area --- it's great. And I'd
7 seen that, Richard. I was interested to see it,
8 and it was kind of --- I wasn't sure whether it
9 was --- I think, yes, I think I saw it when it
10 was just internal. I didn't realize you'd opened
11 it up.

12 But again, I think that's what we're
13 saying in those last recommendations generally,
14 is that industry must be involved in those sort
15 of things. And there must be a way for that
16 structure to be in place to transfer technology
17 from industry.

18 Because that's, you know, two
19 industries saw it, because then allows industry
20 to obviously -- and it comes back to the same
21 thing where we're saying about ASV, you know.

22 The oceans are a small place in the

1 world, part of the world for research technology.
2 And all of us that try to make money on that
3 business and to gain the momentum into that, it's
4 kind of the broader use of technology.

5 And I think the partnerships between
6 industry, academia, and government are essential.
7 And what Ed is saying, I agree. He had original
8 intent with this in that there was great benefit
9 that came out separately. But it came out
10 because of the structure.

11 And that's the way, I think, you know,
12 we got turned around from the original paper,
13 because it was saying it was too CCOM oriented.
14 But this is trying to say, okay, yes, there was
15 lots of things I did right. And there was, you
16 know, collaboration through the industry
17 partnerships.

18 And certainly, Andy can comment, you
19 know, with CCOM/JNC. And there has been very
20 much interagency. There has been a sort of forum
21 for interagency development and research with
22 some of the things that have come out of the

1 labs.

2 So I'm not sure how that would --- I'm
3 sure we can fit a place in there for that, Bill,
4 about the interagency. But again, my view is
5 that, you know, how do we get things out quicker?
6 Because when it gets out quicker, it then becomes
7 a benefit, not only for industry and the economy
8 generally, but it also benefits the agency. You
9 should get use of that industry technology in a
10 usable, non-research form. Thanks.

11 VICE CHAIR MILLER: I would say, with
12 almost every paper we've done, we've had trouble
13 putting in everything that everybody wanted. And
14 everybody has their, you know, we try to, when we
15 can we try to put in the word Arctic. And that
16 makes Lawson very happy.

17 So I guess I propose --- I would
18 advise people who are working on future papers or
19 future products that the HSRP, you know,
20 produces, that I think Bill's point is a very
21 excellent one. And we should focus on the
22 interagency collaboration as possible.

1 But in the interest of getting this
2 paper finalized, I guess maybe does anybody think
3 it's not ready?

4 CAPT ARMSTRONG: I think, as a suggestion,
5 I think the panel and the Admiral then may have a
6 comment on it.

7 I think that the panel would be within
8 its structure to suggest that the --- approve the
9 paper to go forward with some final editing just
10 for clarification rather than change of content.
11 It might clarify the JHC/CCOM as an example of
12 the concept as opposed to the subject of the
13 paper itself.

14 My sense is that's what you're saying, that
15 this is an example of the process that worked as
16 opposed to saying that, you know, go fund JHC.
17 That's a great idea, but ---

18 VICE CHAIR MILLER: Well, indeed, we
19 tried to do that in the last recommendation.
20 They had had JHC in there. And Lindsay reworked
21 it to basically say it's the structure that is
22 working and, you know, it's an example.

1 I don't know. If you have
2 suggestions, you know, we can incorporate a few.
3 You know, we can incorporate some changes in it.

4 CAPT ARMSTRONG: So, I guess, my
5 suggestion would be somewhere in Paragraph 1 or
6 2, or at the end of that, is maybe a little
7 clearer statement that here's an example of what
8 we mean. I think that's there but maybe just
9 highlighting that a bit. I don't think that would
10 --- maybe I'm missing the boat here, but I don't
11 think that would change the content.

12 I think we probably can't go off and
13 change the content and come back and sign it
14 because of the character of the deliberations.

15 MR. GEE: I think, Andy, can I just
16 comment then? But, yes, you're right. That was
17 the way I --- hopefully, I was hoping that read
18 like that. Because from the industry benefits,
19 we'd kind of provided it more as a general
20 benefit and then sort of said that, you know, one
21 specific example of that application that may be
22 there.

1 Yes, the intent, I think, was not to
2 --- the intent wasn't not to fund JHC. It was to
3 say that the structure had worked, and it was an
4 example. And that was how I reworked the
5 challenges then and the recommendations.

6 So I kind of agree with you. And
7 hopefully, the panel agrees with the intent, and
8 there's just minor editing that would be okay.

9 MS. BLACKWELL: This is Juliana
10 Blackwell. So looking at a little of the
11 comments that have been provided, and the last
12 statement about using JCH/CCOM as an example, the
13 majority of the language is about the center.

14 So it's more than just, I think, an
15 example. It's the only example, and it's the
16 majority of the paper. And I'm not -- it's not a
17 criticism, I'm just saying it's really full of
18 CCOM/JHC and not other things.

19 So maybe by changing the recommendations to
20 be broader, it confuses the issue. It's confused
21 me now that we've talked about in more detail
22 with the group. So I'd just leave that as my

1 comment on the issue paper. Thank you.

2 MEMBER HALL: Just really quickly, I
3 know that we had some internal discussions about
4 this, especially Lindsay and I, about is it a
5 sales pitch or JHC? We don't want to do that,
6 obviously.

7 And I was trying to generalize it as
8 much as possible. But without using the example
9 of JHC, it is hard to point to generalities of
10 what's good out there. There's an example out
11 there.

12 So if we still need to do some work,
13 kind of where we can generalize, we should. But
14 I think that's why there's that disconnect
15 perhaps, Juliana. I was concerned that it was a
16 sales pitch and gave money just to JHC,
17 understanding that the other centers that are
18 supposed to be out there are not doing the same
19 things, have not gotten the same funding yet.

20 And we don't want to ignore them, but
21 we also don't --- we want to show that really
22 it's CCOM/JHC that's been what we want, or is

1 what we want to replicate, what we believe should
2 be replicated. So I ---

3 MR. GEE: Yes, and I think --

4 (Simultaneous speaking)

5 MEMBER HALL: Go ahead, sorry,
6 Lindsay.

7 MR. GEE: Sorry. And I think that's
8 where the separation of --- this wasn't just
9 funding JHC. And, you know, okay, they have been
10 successful in the research.

11 What we're trying to highlight was
12 there was a way with CCOM that was a part in the
13 independent organization, sister organization, at
14 UNH.

15 And the structure of that and the way
16 that developed got other funding and then managed
17 to have a mechanism that could spin technology
18 out to industry, had a momentum, could get other
19 funding and do things that were beyond, actually,
20 the research specifically for NOAA.

21 And maybe we weren't clear enough
22 about that. But that was Ed's intent. It's like

1 this really had little to do --- it was generated
2 by the organization that was there, some of the
3 original server, you know, the research was from
4 the JHC funding, but then much of it came from
5 the CCOM research which was separate.

6 And it actually leveraged this whole
7 other industry in oil and gas that has had a
8 great benefit that, you know, opened up a new
9 method of exploration that, you know, came out of
10 having a center and a structure like that.

11 And people asked us to look where ---
12 well, other examples were there, so we could
13 highlight in this issue paper and honestly
14 couldn't say anything. So that was how it ended
15 like this.

16 And I'll be just --- it'd be kind of
17 --- and again, I think an issue paper of
18 highlighting a place I don't think is a bad thing
19 for the HSRP. It's like why can't we highlight
20 success and say you need to convert this success
21 into a broader benefit. Because it's a success,
22 because it's a broader benefit for the economy

1 and other things.

2 Okay, sorry, I've got to go. So good
3 luck with the rest of the meeting. And enjoy
4 Portsmouth, my home town. Thank you.

5 MEMBER HALL: Thanks, Lindsay.

6 VICE CHAIR MILLER: I think I'd like
7 to talk to Kim and Ed at the break. And I've got
8 --- I've been sitting, talking to Andy. I've got
9 maybe a few changes that might, you know, that
10 might help with this problem. And then we can
11 discuss it briefly right after the break. Do you
12 want to --- Bill, do you want to break for 10 or
13 15?

14 CHAIR HANSON: Well, it's 10:45. To
15 get back on schedule, so I ---

16 MEMBER MAUNE: I was thinking I might
17 want to talk to Julianne too about some of the
18 things that the Remote Sensing people are doing,
19 which is really research and development, in my
20 opinion, on developing the best procedures for
21 doing different things.

22 One of the projects I know they're

1 working on is the use of differential
2 interferometric synthetic aperture radar for
3 mapping subsidence rates at the centimeter level.
4 To me, that is an R&D effort that's separate from
5 what you guys do. But it's certainly, in my
6 mind, it's an R&D project that will benefit the
7 nation as a whole.

8 MS. BLACKWELL: This is Juliana. So
9 I think there's a whole other opportunity to
10 highlight things like that. In trying to rework
11 this issue paper now, to include all those
12 things, would be detrimental to probably my
13 health in suggesting that.

14 (Laughter)

15 MS. BLACKWELL: But taking that, and
16 some of the interagency R&D that's going on that
17 JALBTCX, the Joint Airborne Bathymetric lidar
18 Technical Center of Expertise, JALBTCX -- I have
19 to think about that one -- and highlighting those
20 types of things, and maybe some of the other
21 remote sensing things, maybe that's something
22 else that we can look at as a separate paper.

1 CHAIR HANSON: Yes. I think there are
2 several more layers of this that'll add on and be
3 very beneficial. But it's kind of the point of
4 conversation. I start it off and run with it.

5 We do need to take a break at this
6 point. But just to mention to Joyce, we'll give
7 you guys until the noon break to come up with
8 something to see if we can finalize this. If
9 not, we're here for another day. So there's
10 still an opportunity to discuss. So let's make
11 sure you get it right, and then we'll go from
12 there.

13 We'll go ahead and break for now, nine
14 minutes, 10:45 if our next panelist, Jeff, and
15 Captain Brennan, you guys are our next panelists.
16 Come on up, and we'll get you set up.

17 (Whereupon, the above-entitled matter
18 went off the record at 10:37 a.m. and resumed at
19 10:49 a.m.)

20 CHAIR HANSON: All right, Dave Maune
21 and Joyce Miller are co-chairs of the HSRP
22 Planning and Engagement Group. This committee

1 has spearheaded HSRP's efforts to produce a
2 series of one page issue papers with
3 recommendations to NOAA leadership. I'll leave
4 it to you.

5 MEMBER MAUNE: We've been discussing
6 the issue paper on precision navigation for
7 almost two years now probably. And then Kim
8 stepped in and said that she would try to pull
9 all the thoughts together, and I think she's done
10 a very good job on that, so I want to turn this
11 over to Kim to take it forward.

12 MEMBER HALL: I do want to note we did
13 get a paper out because we did the ports paper
14 which was the original precision navigation. So
15 it hasn't been two years of this particular one.

16 And I do want to let you know, I know
17 you guys have heard a lot from me today from this
18 morning to this morning to now. But I wanted to
19 show my commitment to HSRP that today is the day
20 that we're actually closing on our new house and
21 I am not there.

22 So my husband will be signing in

1 Virginia. There is a sentence that says
2 something like my lovely wife has made me sign
3 for her. And then he signs for me there, and
4 then he signs his name.

5 So if we could all just have a moment
6 of silence he's going to have later, I would
7 appreciate that.

8 So I think we're pretty much at the
9 conclusion of this paper. And I know I've heard
10 from Lawson before, I've heard from Anne, I've
11 heard some others. There are a couple little
12 edits here and there from, I don't know just the
13 setting and I've got those covered.

14 You know, things like the decimeter
15 didn't make sense to focus because that's a weird
16 thing to think about, so we decided, I just did
17 the math and I didn't realize it's 3.9 inches or
18 thereabouts.

19 So within a few inches of the sea bed.
20 That makes a lot more sense to those of us who
21 think in, not in metric. I know, I know. But I
22 think for the audience, and that was a good piece

1 of feedback that we got from Glen actually of
2 kind of let's make this a little bit more
3 accessible.

4 And there's one place where I did not
5 italicize precision navigation, so that has been
6 fixed. So I prefer not to go through and do the
7 little editorial changes because we will have the
8 benefit of NOAA's eyes on that a little bit
9 later.

10 So I wanted to open it up to the
11 group. We've belabored it may be quite a bit in
12 our working group talks. I know that I offered
13 to rewrite it. I will say in rewriting it I did
14 my best to take what was already there.

15 So this is not a complete rewrite. I
16 begged, borrowed, and stole from previous papers.
17 So I appreciate and want to thank everybody who
18 had contributed to it. It truly has been a group
19 project when it comes to HSRP projects.

20 So with that I'm just going to open it
21 up, get a couple of comments, and hopefully we
22 can all agree that this is ready for the editor

1 and ready to be put out.

2 MEMBER KELLY: Yes Kim, I would say I
3 think it's where it needs to be at this point.
4 So as far as I'm concerned, other than that minor
5 insignificant typo type tweaking, it's ready to
6 go in my opinion.

7 And many thanks for helping us to get
8 there. It's been two years of continued
9 progress, Dave. So I mean, we've finally reached
10 the pinnacle of precision navigation papers.

11 MEMBER MCINTYRE: I would agree with
12 Ed. And I think that Kim has done a great job in
13 stepping up to the plate on this one. I regret
14 that I wasn't more available towards the end of
15 it. And I think it's ready to go. And thanks a
16 lot to Kim.

17 MEMBER HALL: Go ahead.

18 MEMBER BRIGHAM: The genesis of this
19 was the picture of this ship coming in. And I
20 communicated, and I think it was December of
21 2014, maybe Admiral Gland will remember, to our
22 Chair and Co-Chair, and I think Captain Rassello.

1 And I said, you know, reading in the
2 paper about the largest ship ever to come to
3 America, and I'm on this panel. And I said you
4 know, we really should comment about, you know,
5 size and precision navigation issues.

6 And then I learned that the ship
7 cleared the Golden Gate Bridge by less than two
8 feet. And I'm thinking of Rich, you know, and
9 the precision of the thing. So I think it had a
10 long history, and I think we're there. I think
11 this captures a very technical subject.

12 But the whole idea was, the genesis
13 was, you know, an issue that I was reading in the
14 paper that I think HSRP had some influence over
15 and at least have a topic to discuss. So I'm
16 pretty happy with the paper and I think it
17 captures the issue very well.

18 CHAIR HANSON: Great. And given the
19 fact that almost every East Coast port on a
20 weekly basis now is bragging about who's got the
21 biggest ship coming in, right?

22 MEMBER HALL: Well, I think with that

1 we put a little, we're done. So I appreciate
2 again everybody's help, and I will make sure that
3 this gets to Lynne and the editors, and that we
4 get it out. So do we need to do any kind of
5 motions or --

6 (Simultaneous speaking)

7 VICE CHAIR MILLER: Dave pointed out
8 that we're scheduled to vote on both these papers
9 tomorrow. So we'll tweak the --

10 MEMBER HALL: They can go ahead and do
11 that now.

12 VICE CHAIR MILLER: Okay. Shall we
13 vote on the paper? All in favor of --

14 MEMBER MAUNE: If it's okay, we can.
15 All in favor?

16 (Chorus of ayes)

17 MEMBER MAUNE: Any opposed?

18 (No response)

19 MEMBER MAUNE: None? Accepted. Thank
20 you, Kim. And everybody that contributed to it.

21 MEMBER HALL: And just so you all
22 know, since I'm taking over as the planning

1 engagement co-chair with my lovely colleague,
2 Dave, I'm not going to be rewriting papers quite
3 as often.

4 And I think this is what Joyce was
5 able to kind of try to expend a little bit as she
6 became the vice chair. So we are definitely
7 looking for more people to help as we do that.

8 And I know that there's been some
9 great volunteers out there. So you can hear less
10 of me at the future meetings, please feel free to
11 volunteer. Thanks.

12 MEMBER MAUNE: Is now the time to talk
13 about future issue papers?

14 CHAIR HANSON: Works for me.

15 MEMBER MAUNE: Okay. I had one
16 recommendation from Gary Thompson concerning the
17 need for an issue paper on licensure or
18 certification of hydrographic surveyors. I've
19 talked to a number of different people here about
20 it. We think it is important to address the
21 training and licensure issue.

22 One of the things that I got from the

1 people I talked to is that we are not in favor of
2 state licensure, but a nationwide licensure of
3 hydrographic surveyors.

4 Now how we go about doing that, I
5 really don't know. But perhaps this is a subject
6 of an issue paper to address that topic. And I'm
7 interested in feedback from others on that. Is
8 that a worthy topic for an issue paper in the
9 future?

10 VICE CHAIR MILLER: I'm wondering if
11 we should first have, perhaps at the next meeting
12 potentially in Miami, a panel on it because, you
13 know, there's a lot of questions.

14 I mean, perhaps people on the panel do
15 have the expertise. But there's a lot of issues
16 there and it might be useful to schedule a panel.
17 Carol, you have a comment?

18 MEMBER MAUNE: Carol?

19 MEMBER LOCKHART: I agree, sort of.
20 I think we're not quite at the point where we
21 need an issue paper on this. I think as a panel
22 we need to discuss it. I don't know if it needs

1 to be a full hour and a half panel or anything.

2 But I think we do have to discuss it
3 more, learn more about the bill, and then provide
4 comments. But I'm not sure that we're at the
5 stage where it's an issue paper.

6 VICE CHAIR MILLER: And it's possible
7 that Glenn Boledovich is going to discuss that in
8 his remarks to the panel.

9 MEMBER MAUNE: Go ahead, Kim.

10 MEMBER HALL: I just wanted to see
11 kind of, I know this wasn't on the public
12 meeting. But this morning during our breakfast,
13 our working breakfast we started talking about a
14 progress, just for the benefit of the crowd, for
15 prioritizing subjects that we attack.

16 And it would seem to me that how we
17 prioritize as subjects also gives us an
18 indication of where we need the most current
19 issue papers. So perhaps the cart before the
20 horse right now until we kind of figure that out.

21 I know there's some things that are in
22 the works like infrastructure, and I don't want

1 to stop people who want to be writing papers.
2 But I think before we decide what the next panels
3 are going to be and all that, we need to do that
4 process of racking and stacking. And I think
5 issue papers help us, that will help prioritize
6 our issue papers as well, such that
7 recommendation.

8 MEMBER KELLY: I would second that.
9 From what I heard this morning, I think it's an
10 issue we should approach. But I don't have any
11 real background or interest or, I mean, the devil
12 is always in the details on these things.

13 What are the pros and cons. And I
14 think before the pane could endorse a paper, we
15 need to get a lot more information on this. I
16 think perhaps a panel or some further discussion
17 in the interim would be the best way to inform
18 the panel as to what the actual issues are, thus
19 leading toward the issue paper where we could
20 make a declaratory position.

21 But right now, I don't know anywhere
22 near enough about it that I would feel confident

1 in, you know, supporting a paper right now.

2 MEMBER HALL: Maybe it's a column I
3 add to that spreadsheet that we've got where we
4 think it is, where we need more information,
5 we've got enough information, we think there's an
6 issue paper as we do the racking and stacking.

7 So I will think through that
8 spreadsheet to provide a little bit more
9 information on where we think things stand. But
10 yes.

11 MEMBER MAUNE: And while Jeff
12 Lillycrop is here this week, maybe I can use the
13 opportunity to get his opinion on that topic when
14 we're talking offline at some point, Jeff.

15 Okay, how would you proceed with the
16 prioritization? Would you like to explain that
17 for the general purpose meeting on what you had
18 in mind?

19 MEMBER HALL: I mean, I think I just
20 did. I mean, it's a spreadsheet where we have
21 topics that we've all talked about and kind of
22 see what sticks. And I will get that out to our

1 group internally to do kind of their individual
2 prioritization.

3 And then we'll do some math on the
4 back end and show people what the results look
5 like, and then figure out how we want to move
6 forward because I think specifically we know that
7 things that we actually get tasked by NOAA to do
8 need to kind of take some precedence, especially
9 if there's any time crunch on getting that to
10 them, whether it's a response to a strategy or
11 something like that.

12 And we also want to take into account
13 whatever local place we're going to and think
14 through that. But I think right now we don't
15 have the exact way that a spreadsheet is going to
16 be looking at. It's a new concept that we just
17 came up with this morning.

18 But the group agreed that we need to
19 kind of do the prioritization of the topics.

20 MEMBER MAUNE: Okay. So future issue
21 papers would flow out of this process?

22 MEMBER HALL: That's my

1 recommendation. If folks agree or disagree with
2 me, I'm happy to go either way. But I think that
3 helps us figure that out and time management.

4 VICE CHAIR MILLER: We had a previous
5 discussion, or we had a discussion in the
6 administrative session this morning. Kim, maybe
7 you could just kind of give us an overview of
8 some of the ideas that came out this morning.

9 MEMBER HALL: Sure. I've got to find
10 the right notebook.

11 CHAIR HANSON: Just before you do
12 that, Kim, Lawson had a thought.

13 MEMBER BRIGHAM: No, I was just going
14 to -- we should be transparent. And so whatever
15 issues we discussed, that we bring it out in the
16 public meeting either today or tomorrow.

17 MEMBER HALL: We didn't go into a lot,
18 we go into some detail which wasn't my intent
19 this morning on some of the subjects. But really
20 it was just throwing some ideas out there so that
21 everybody had some representation on the things
22 that were of interest to them and were of concern

1 to them and give a little bit of an insight to
2 fellow panelists on what those issues were,
3 including the licensure of hydrographic
4 surveyors.

5 So that was one. Another one is
6 infrastructure in terms of information
7 infrastructure to support those kind of physical
8 infrastructure given the current administration's
9 focus on the term infrastructure. We want to
10 make sure we've got a handle on that and some
11 good recommendations for NOAA moving forward.

12 We also had education. So it was
13 great to see yesterday the JHU and CCOM, how
14 education is advancing because right now the
15 throughput through universities for these jobs
16 will not meet the requirement for jobs on the
17 other end.

18 So there's going to be a huge demand
19 for people to process this kind of information,
20 as we talk about big data earlier this morning.
21 So looking at education, looking at, as Ed Kelly
22 put it, enhanced navigational assistance, so to

1 continue to look at ports and precision
2 navigation.

3 Crowdsourcing, so incorporating non-
4 authoritative data sets into the products that we
5 have currently, kind of a forced multiplier.
6 Autonomous vehicles, that's a continuing area of
7 interest as we look further into that strategy
8 that E.J.'s working on and other advances in
9 technology.

10 Managing data, let's see, I don't want
11 to forget anybody, offshore leases. So looking
12 more about what does that look like for charting
13 and the frontier. Disaster response, there's a
14 gap between when the funding happens and when the
15 actual, you know, incident happened.

16 So we laughed this morning, maybe not
17 laughed, to our dismay realized that hurricane
18 season is at the end of the fiscal year. How do
19 you plan to keep money around just in case
20 there's a hurricane. That becomes problematic in
21 the planning process.

22 So really it's kind of a thematic

1 areas. It could either be by topic or by office.
2 We're still kind of getting our hands around it,
3 but wanted to just kind of throw ideas out there
4 and now rack and stack to what do we want to hear
5 next, what do we want to see next at the
6 committees, what do we want to work on next.

7 So that's, does that work for you,
8 Joyce?

9 VICE CHAIR MILLER: Yes. I think that
10 covers most everything that we -- oh, a
11 communication strategy we were also talking
12 about.

13 MEMBER HALL: Right. And I think
14 that's a little bit separate. I think that's
15 more kind of an internal administrative thing. I
16 don't know if that needs to happen in the public
17 domain.

18 And I'm not trying to be non-
19 transparent, but that's kind of how we
20 communicate these issues that we have concerns
21 about to internal NOAA because it is not our job
22 to go external as the HSRP, but as individuals we

1 can.

2 So there was a request that we look at
3 how we do messaging and communication and
4 advocacy within NOAA to help kind of advance
5 these issue papers. So the issue papers aren't
6 just sitting out there, we're also following up
7 with the administrator.

8 But again, I think that's a little bit
9 of a different dog, and not the cats that we have
10 over here that we're trying to herd. But
11 definitely have note of that as something for the
12 planning and engagement working group to work on.

13 VICE CHAIR MILLER: I think that
14 pretty much summarizes it. And I think Kim's
15 idea of hopefully we will get that pretty soon
16 because issue papers will need to be drafted in
17 the not distant future, if that's the way we're
18 going to go with it.

19 CHAIR HANSON: Lawson?

20 MEMBER BRIGHAM: Yes, just a thought
21 about hearing about education throughout my
22 tenure on here. It seems like education and

1 licensure issues could be a pretty robust working
2 group and just bring in a group of people.

3 You might have a panel first, but it
4 does lead to kind of a theme for a working group.

5 CHAIR HANSON: Agreed.

6 MEMBER MAUNE: We're finished. I
7 think you can move on to the next topic.

8 CHAIR HANSON: Great, with Rick
9 Brennan. Esteemed panelists, did you guys have,
10 it's a PowerPoint this morning, right? Okay.
11 We've got bios in the package.

12 Glad to see you guys on the same panel
13 together. And you could sit a little closer. So
14 Captain Brennan, do you mind if we let the guest
15 go first? Go ahead, Jeff. Welcome and thanks
16 for coming.

17 MR. LILLYCROP: Great. On behalf of
18 General Jackson who could not make the meeting
19 today, thanks for the invitation and I look
20 forward to talking to you about a couple of
21 items. That's the slides? Okay.

22 I'm from the Corps of Engineers from

1 our Engineer Research and Development Center, and
2 my role at ERDC is the Technical Director for
3 Civil Works R&D. So all of the R&D that we do
4 within civil works falls under me.

5 And within that, it's divided into
6 navigation, flood risk management, and
7 environmental. And I'm also the lead for the
8 navigation research which is the largest part of
9 our civil works R&D budget.

10 So I have a long term connection with
11 the hydrographic services review panel. I think
12 the last time I was here was 2015, and it's a day
13 that I will never ever forget. But I can't tell
14 you on the record, so ask me at break. There's a
15 little teaser.

16 I would like to echo Bill's comments
17 about collaborative research. We've got an
18 initiative that was started in February 2009 I
19 think, or excuse me, February two years ago, 18
20 months ago that I think is transforming the way
21 the Corps and many other federal agencies and the
22 near shore processes, costal research community

1 is really approaching research.

2 We've got a very collaborative effort
3 within the federal sector, but also with NGO's
4 academia and industry. And we saw it as a way of
5 really pulling the community together to be more
6 focused, to be more inter connected so that we
7 had a louder voice, and we believe that it is
8 transforming the research that's going on in that
9 area. And I'm very proud of that effort, and
10 have been involved in it.

11 Today I'm going to cover two topics,
12 our eHydro initiative and utility crossings.
13 These are two topics that were discussed when
14 Admiral Smith and General Jackson got together
15 the first week of May, and give an update on
16 where we are with those.

17 Of course, our responsibility is civil
18 engineering where the nation's civil engineers.
19 We've got eight different civil works missions
20 ranging from flood control to water management,
21 emergency response, and others.

22 And of course navigation, and

1 navigation is our largest business line in the
2 civil works portfolio. Within navigation we have
3 locks and dams, and costal dredging. Those are
4 primarily the two big areas.

5 We have over 190 locks on the inland
6 waterways, and even including some coastal
7 waterways. And coastal ports, we've got 1,000
8 that are authorized and about 13,000 miles of
9 navigation channels. And our responsibility is
10 to keep those costal channels at authorized
11 depths.

12 We dredge about 250 million cubic
13 yards of material a year, and that covers 150 to
14 200 projects. And about 59, 60 projects cover
15 about 90 percent of the cargo that's moved
16 through the US.

17 The other nine percent is covered by
18 those top couple of hundred, and the rest, that
19 one percent is spread across many of the other
20 that make up the 1,000. But the bottom line is
21 that we're resource constrained. We can't dredge
22 everything that we want to dredge, we can't

1 maintain everything to the dimensions that are
2 authorized.

3 And that has an impact on cargo
4 movement. It disrupts cargo when ships have to
5 light-load because of channels that need
6 dredging.

7 One other thing that's kind of unique
8 in the Corps is that we're project funded. So
9 each of these projects were individually approved
10 by Congress. And so the budget goes to them.

11 We don't have a centralized dredging
12 budget. We don't have a centralized survey
13 budget. We don't have a centralized lock and
14 damn budget. Each project is a, sometimes a
15 castle unto themselves.

16 And so when we try to do something
17 from an enterprise perspective, it's a major
18 culture change, and you'll see that as we move
19 through my presentation.

20 I'll introduce eHydro as a good news
21 story because I really believe that it is. Two
22 to three years ago, and for the previous couple

1 of hundred years, we were providing NOAA
2 condition surveys of our projects from our 22
3 different coastal districts in at least 22
4 different formats and forms, paper, digital,
5 smoke signals at times. Just a whole range of
6 data.

7 And Chris Lebow was a master at
8 getting it all into chart production. But it's
9 become more and more of a challenge. And so a
10 few years ago my good friend Dave MacFarland and
11 said hey, can you help us.

12 And so the eHydro application was
13 born. And that application is to do four things,
14 three of which were previously done, and one of
15 which really needed to be done. And that is to
16 provide channel reports to NOAA, calculate
17 parameters, metrics that we use to report to
18 Congress the condition of our navigation
19 channels. And the third was to plot the data.

20 And those were all being done, and
21 they were being done different ways at each
22 project and by each district. And so we

1 developed an application that created a standard
2 tool that allowed us to do it with a couple of
3 data sets and the push of a button.

4 And then it also created the meta
5 data, or the majority of the meta data that was
6 really needed to help track these as enterprise
7 assets.

8 So the eHydro application really
9 combined three separate workflows into one. It
10 made it much simpler, it made it standard across
11 the organization, and it has been very successful
12 in many ways in doing that.

13 We have over 24,000 surveys that are
14 currently in our database. And that's been
15 collected over the last few years which is
16 phenomenal.

17 We've got every single district is
18 using it. Some of them have used it once, some
19 of them have used it over 5,000 times. So what
20 we're focused on right now is getting more
21 consistent application of the tool, making sure
22 that the data that they collect gets moved into

1 it, and then gets the last step is appending it
2 to make it accessible to NOAA.

3 And that's one thing that we've had a
4 little bit of difficulty in, but we're working on
5 that. I think the application again, if you look
6 at our culture, is really moving forward at
7 lightning speed given our culture. But we have a
8 ways to go and we are actively working on that.

9 We've got right now some efforts to
10 move it to the cloud to make it easier and
11 faster. One thing about our Corps of Engineers
12 internet system, it was really designed to move
13 email around, not large data files.

14 And so moving it to the cloud we see
15 as a way of significantly improving the
16 performance for the users on the inside of our
17 firewall. And that should improve the use of the
18 tool within the Corps, and that will help provide
19 the data to NOAA more rapidly.

20 But we have policy in place that says
21 everybody is supposed to use it, and we are
22 doubling down thanks to the meeting with Admiral

1 Smith and General Jackson on reinforcing that
2 policy and making sure that it's being used.

3 And my understanding is one of our
4 power users has been Galveston District. And
5 with all the recovery work that's going on,
6 they've been using eHydro to make sure that the
7 data is getting posted quickly.

8 The other application that we are
9 working on, another enterprise application that
10 has great value I think to NOAA is PLOVER. It is
11 an application to manage our pipeline and utility
12 crossings data.

13 Up until now, it really has been every
14 project maintains what they know. And about
15 utility crossings and where this comes in for us
16 is in our dredging.

17 We provide the dredging industry
18 information on what we know is crossing our
19 channels, but it's their responsibility to
20 actually go out and validate so that they don't
21 hit something.

22 A few years ago there was a pipeline

1 that was hit, a gas pipeline and it exploded. No
2 one was hurt, but it could have been otherwise.

3 And so the Dredging Contractors of
4 America have asked the Corps to help with
5 identifying where the utility crossings are. And
6 those are things that NOAA puts on their charts.

7 And so what we've done is taken an
8 application that was actually being used, been
9 developed in New Orleans and was being used. It
10 was a good marriage of our permitting process,
11 regulatory, and connecting with our operations
12 folks so that there was a pathway to make sure
13 that everything that was being permitted was
14 being reported to our ops folks.

15 And so we've taken this application
16 that had been used for several years, and we've
17 turned it into an enterprise application. We've
18 moved it up to our central processing center so
19 that the databases can be larger. The speed
20 should be faster. And eventually we'll move it
21 to the cloud so that it has even better
22 performance.

1 The intent is to have it deployed
2 fully in the Corps in fiscal year '18. Right now
3 it's being tested by Galveston District and
4 Mobile District. And between those three
5 districts including New Orleans, those are where
6 most of the pipelines are in the US.

7 So we're really pushing its testing,
8 and that should be completed by the end of this
9 fiscal year, so just in a few weeks. And then
10 we'll write the operations orders and the policy
11 required to make it an enterprise tool and have
12 it deployed nationally.

13 I expect since everybody's doing it
14 differently, it will take a little bit of time to
15 get it fully utilized, but it does have a lot of
16 national interest at headquarters, national
17 priority at headquarters. So we're hoping that
18 it moves into application very quickly.

19 It's not intended to be a public
20 database because of the information that's
21 contained in it. But it is intended to be able
22 to make sure that we're collecting all of the

1 information, we're able to provide that
2 information to the dredging industry as we do
3 normally now.

4 When we award a contract, we tell them
5 what we know about is crossing the channel. And
6 we provide that information to NOAA. And so this
7 will allow us to do it much more standard, much
8 more simply we hope, much more consistently.

9 So I think that's my last slide, and
10 I would be glad to take any questions.

11 CHAIR HANSON: I think we might want
12 to wait for Captain Brennan and we'll do
13 questions together if you don't mind.

14 MR. LILLYCROP: Okay.

15 CHAIR HANSON: And it's not that Jeff
16 doesn't have a lot more to talk about. We cut
17 him off at this timeframe.

18 MR. LILLYCROP: He told me ten
19 minutes. I was like are you kidding me. I have
20 lots of opinions.

21 CHAIR HANSON: The standard 50 slide
22 Corps deck. That's tough to cut it down there.

1 So appreciate all that work. The PLOVER as you
2 know is very important to us.

3 And as a dredger who started on my
4 very first contract hitting a water pipeline
5 under LA Harbor because it was poorly marked,
6 finally after all this timeframe we might have a
7 better solution. So glad to see that. Captain
8 Brennan?

9 CAPT BRENNAN: Good morning. So while
10 I'm waiting for the slides to come up, I was
11 asked to brief on two topics. One was on the
12 fleet replacement plan, and the other was just on
13 our precision navigation effort.

14 So I've got really only three slides,
15 one of which is this one. So just to touch base
16 on the fleet plan, we currently have received two
17 installments, an initial \$80 million and a follow
18 up of \$50 million to begin the process of
19 regenerating and reinvigorating NOAA's
20 shipbuilding program.

21 So currently this is the, you know,
22 the status of where we are at with that. So we

1 have established an interagency agreement between
2 NOAA and the Navy because in the past it was the
3 Navy who actually did the building of our ships
4 and administered that program through the Navy
5 with liaison from NOAA to the Navy.

6 Well, the Navy didn't build it, I
7 guess to be clear. But they administered those
8 contracts for us. They were built by private
9 industry.

10 So right now, getting that interagency
11 agreement completed was the first step on that.
12 The second step is finalizing the request for
13 proposals for the preliminary design.

14 And so there right now, the platform
15 acquisition division within OMAO is expecting to
16 complete that process somewhere late this year,
17 early next year, calendar year.

18 And once they get those proposals
19 back, they expect to select two, and those two
20 will go forward developing preliminary designs.
21 And then at some point after the review of those
22 preliminary designs, the Government will down

1 select to one.

2 And so we're looking at for that
3 second phase, you know, to be occurring between
4 2019 and 2020. So if anything, that should show
5 you the relatively slow pace that shipbuilding in
6 America takes today because it's a very long,
7 very process driven process within the federal
8 government.

9 So none of this is going to happen too
10 quickly right now just because of that process to
11 get the agreements in place to review the
12 proposals and to move forward. So on that,
13 that's the current status of that. And well,
14 after we're done I guess I'll take questions on
15 that.

16 Precision navigation, if I could I
17 would like to just recap precision navigation, at
18 least from the Coast Survey perspective. And I
19 think this is, I think the other offices would
20 agree. And I'm sure if they don't, they'll
21 comment.

22 But you know, precision navigation in

1 my mind is as much a way of thinking as it is a
2 national program. Right? So really we're
3 talking about higher accuracy, high accuracy,
4 high precision data products and quantifying the
5 uncertainty of those measurements in the data so
6 that they can be used.

7 And we just had an underkeel clearance
8 workshop on Friday with some underkeel clearance
9 software vendors. And that's really what they're
10 looking for.

11 And that was the key of the Long Beach
12 project that we did was not only having, you
13 know, tide measurements or bathymetry
14 measurements, but having those measurements have
15 a quantified uncertainty with it because
16 ultimately they're doing a statistical analysis
17 for every passage of that ship to see what the
18 probability of grounding is.

19 And driving that probability towards
20 a, you know, 97.8 percent probability of not
21 grounding that vessel. And so that's where they
22 go. And you only get there by knowing what the

1 uncertainty of all of your various measurements
2 are.

3 So in the world of hydrography, I
4 think that's a fairly standard understanding
5 because that's what we do with all of our
6 measurements. But I think in the world of
7 commercial mariners, that's a new concept for
8 them.

9 And so that's where I think we as the
10 professionals and the service providers and the
11 data providers need to be moving forward.

12 And then the other guiding principle
13 for precision navigation is really that the whole
14 is greater than the sum of the parts. Right? So
15 when I take Rich's operational forecast systems
16 and tide measurements and I marry that with our
17 bathymetry.

18 The mariner has something better than
19 what they have right now because they're able to
20 get both forecast and real time actual water
21 depths, not just water depths relative to data,
22 which is a big thing.

1 Whether you're having less water or
2 more water, being able to know that and plan for
3 that is what we currently hear from mariners and
4 where we want to go.

5 So moving forward with our current
6 funding, we are moving out on a couple of
7 initiatives. So one of those, we're maintaining
8 the existing project that we have in Long Beach
9 right now.

10 We're getting new data in occasionally
11 from the port. We're adding that in to the
12 database that we're maintaining for Long Beach
13 and providing new products and refining those
14 products.

15 So it's taking a while, but I think
16 the pilots there, you know, just got a new
17 portable pilot unit system, and they're actually
18 utilizing the data more than they were within the
19 first two or three years that that project was
20 underway.

21 And so we're actually just now
22 beginning to get feedback from them on, you know,

1 does this look better or does that look better
2 with regard to the data that we're supplying.
3 And so we've actually been tweaking that
4 deliverable to them to help it get to that point
5 where they really like what they see.

6 And actually, we'll be having a
7 meeting on that this week to talk about that. So
8 that's one that's been in play and it's
9 continuing.

10 The other one is moving to the
11 Mississippi, the largest port complex in the
12 world, and certainly the most congested waterway
13 in America right now.

14 And so we're going to be surveying
15 that. To the Corps of Engineers, as we found out
16 this year, surveys the Mississippi River every
17 ten years. And that's for their hydrodynamic
18 modeling purposes.

19 And so what we are going to endeavor
20 to do, you know, funding permitting is to try and
21 do the same thing, survey it every ten years, but
22 interleaved in between the Corps' ten years.

1 So ultimately, that very critical
2 waterway would never be out of date by more than
3 five years, and that data would be interoperable
4 with the Corps of Engineers.

5 So that would be a win-win for that
6 waterway, and both of our agencies if we could
7 make that data available to each of us and use it
8 for navigation.

9 So to that end, we're going to begin
10 this next field season with mapping from Baton
11 Rouge South. We believe right now that we can
12 probably get about half of that done with, you
13 know, under existing funding and task orders.

14 If that funding were to be increased,
15 we could theoretically do it in a year. But we
16 think at the current rates that we can probably
17 get about half of that surveyed.

18 And so the intent is to not only do
19 the bathymetry but also try and get shoreline
20 infrastructure through laser scanners and other
21 techniques to provide a full re-baselined
22 assessment of the river for use and then we can

1 put that into navigation products.

2 And then the other project that we've
3 got that we're just beginning, and this is on the
4 heels of new surveys, there is in the Port of New
5 York re-scheming the whole chart scheme. That's
6 going to begin in New York.

7 And so what we are doing is to build
8 a bathymetric database for the mapping and
9 charting divisions, production branch c, which is
10 basically the New England region. So from south,
11 just south of Sandy Hook all the way to the
12 Canadian border.

13 So building a database within that
14 region that would support high resolution
15 navigation products, and also support the re-
16 scheming of our chart scheme and getting higher
17 resolution bathymetry into that as we do so.

18 It also lays the foundation for
19 providing S102 which is IHO wonky speak for
20 gridded data products to the mariners in the
21 future. So we can't provide gridded data
22 products or that next generation of S57, S100

1 product without having that in a database. So
2 we're beginning that now in this region that we
3 currently are sitting in.

4 And let's see. I think I've hit
5 everything. I think that's it on the precision
6 navigation. Yes.

7 CHAIR HANSON: Okay.

8 CAPT BRENNAN: Done. I'll give you
9 your time back. Same issue with Captain Brennan.
10 He has a lot more to say, but we cut him off.
11 And the idea here is to have the panel ask a lot
12 of questions and engage. Admiral Smith, do you
13 have something you want to start off with?

14 RDML SMITH: Yes, if you don't mind.
15 Thank you. Thank you to both of you,
16 particularly to Jeff. I get to listen to Rick a
17 lot. But I really appreciate you making the trip
18 up and reflecting back on our joint meeting with,
19 which is really an ongoing engagement around
20 these issues.

21 The high point of the focus meeting
22 with General Jackson, we really appreciate the

1 time that he took personally to engage with that
2 and to make the trip to Silver Spring to do that.
3 So we're excited about such a great partnership
4 going forward to work on some very tricky issues.

5 If you don't mind, I would like to
6 reflect a little bit on some of the, some of your
7 points. First of all, we couldn't be more
8 excited about eHydro.

9 It's the critical foundation, although
10 it was designed for to support the charting
11 practices in place at the time when MacFarland
12 first envisioned it with you, it is also the
13 foundation for future charting practices and
14 better ways of charting channels.

15 One of the real themes here is that,
16 you know, the old channel tabs which is the way
17 we did it on paper charts a number of years ago
18 are really not very well optimized to support,
19 you know, nuanced navigation choices in our
20 ports.

21 And so we want to come up with a
22 better way of doing it. You know, consistent and

1 regular access to channel condition information
2 is the absolute foundation of that. So we are
3 really excited about the possibilities of the
4 future and improving charting as well. So thank
5 you for that.

6 So internally as far as one of the
7 challenges we've had is can we get these channel
8 updates published fast enough. And we're also
9 really excited about eHydro for that because, you
10 know, as we get closer to nationwide use, we can
11 begin to automate on our side.

12 You know, simplify our processes and
13 automate down to a single type of source goes out
14 in maybe a short list of different ways to as it
15 gets incorporated in the charts and published out
16 within the week. So we're very excited about
17 that.

18 On PLOVER, I can't even read my own
19 handwriting here. Oh, that's a four. You
20 probably know we're envisioning building a whole
21 new suite of larger scale charts, mostly in
22 coastal areas. And those are the same areas

1 where this type of permitted infrastructure is
2 most prevalent.

3 Again, a stable database will allow us
4 to go back not just to our original
5 interpretation which was in the context of a
6 particular suite of charts, but go in in a larger
7 scale and to capture that infrastructure in a
8 navigationally meaningful way for anchorages and
9 other things. So we're very excited about that.

10 And we would also invite the Army
11 Corps to help us figure out the best way of
12 charting that information. You pointed out that
13 there's the nature of that information is if we
14 do it too precisely it actually makes us
15 vulnerable, makes that same infrastructure
16 vulnerable.

17 Or it could have false precision.
18 Well, you said it, it was right here. I'm going
19 to anchor right here, right? And that's not what
20 we want either. That's an invitation the Army
21 Corps to let's figure out how this really ought
22 to be charted, when and in what circumstances.

1 The last thing I wanted to comment on
2 is it's worth noting, and you touched on it a
3 little bit, the survey standards are a topic of
4 discussion that was a real concern of this panel.
5 And sort of consistency of survey standards was
6 also a live topic for our conversation.

7 I don't want to, correct me if I
8 mischaracterize but it's really clear that the
9 Army Corps surveys for a lot of different
10 reasons. And sometimes those reasons aren't
11 completely compatible with a navigation, you
12 know, survey which is fully suitable for
13 navigation. Sometimes it's not. It's a quick
14 and dirty we just want to check this and that
15 sort of thing.

16 And we're jointly committed to being
17 clear about what we consider to be the proper use
18 of that data and being clear in the way that we
19 distribute it so that users can understand what
20 it is that the surveys are intended to be used
21 for and what we think is reasonable. So thank
22 you, Jackie.

1 MR. LILLYCROP: Okay to comment? Okay
2 to comment?

3 CHAIR HANSON: Please.

4 MR. LILLYCROP: Okay. Yes. Thank
5 you. And I didn't say anything about the
6 surveying just because that's more a work in
7 progress. I understand we're trying to get you
8 together with our new chief of operations, Tom
9 Smith who will help us continue those
10 discussions.

11 We did go back and check all of our
12 district offices own multi beam systems. But
13 that doesn't mean that every project gets
14 surveyed with a multi beam.

15 Our goal obviously for most of our
16 surveys is to identify where shoaling is
17 occurring in a channel and estimate a volume so
18 that we can budget for a dredging activity? And
19 so as you say, not all of them are conducive to
20 some of the surveying data collection that would
21 be needed to identify a hazard or remove a
22 hazard.

1 But we're looking at how we can do
2 that effectively and try to be involved in those
3 activities, and do it from a, obviously as
4 efficient a process as possible because every
5 dollar that is spent surveying is a dollar less
6 spend dredging.

7 And so that was one of the nuances of
8 being project funded, all the money goes into one
9 pot. And so if we survey it takes funding from
10 the dredging. And our goal is to keep the
11 channels as close to authorized as possible.

12 The other activities, we are trying to
13 reinforce. And it is a change in requirement in
14 the first activities behind the development of
15 the eHydro.

16 And I think a lot of it is educating
17 our workforce to understand that the requirement
18 has changed, that they play an important role in
19 overall marine transportation and to understand
20 what is happening with their data when they, you
21 know, push that go button.

22 And I think we'll get there. It's

1 General Jackson's commitment, but it's Mr.
2 Smith's and everybody involved in the eHydro
3 application. It just takes a lot of inertia
4 sometimes, or a lot to overcome some of the
5 inertia. And we'll get there.

6 On the PLOVER, I really do think that
7 we've got an opportunity to be more comprehensive
8 in our understanding of what is there. And one
9 of the problems we've had is that again, these
10 have been done by the navigation managers in each
11 district.

12 They keep track of what's in their
13 channels and what's crossing them. And when they
14 retire, a lot of times that knowledge disappears.

15 The information does get sent to the
16 contractors, but that's in a contract and it says
17 this is what we know. A lot of times it's cut
18 and pasted so it may be a couple of years old and
19 not truly the most up to date.

20 So we're trying to improve the process
21 to make sure everything that's new is getting
22 recorded, and also record what we know before a

1 lot of our senior workforce moves on to their
2 golden years or wherever.

3 But it's been, it's really been a very
4 interesting social engineering experiment to get
5 some of these things going. And we'll continue
6 moving things forward. And I appreciate your
7 talking to General Jackson because I think that
8 got things moving again. So thank you, sir.

9 CHAIR HANSON: Other panelists?

10 VICE CHAIR MILLER: I have a question
11 for Rick. Rick, I'm assuming you said the AGOR
12 design. I'm assuming they're using the basic
13 ride Armstrong design, is that correct?

14 CAPT BRENNAN: They're using the basic
15 specifications. So that's the distinction is
16 that we don't own that, NOAA does not own that
17 design. They own the specifications for it. And
18 so there could be multiple different designs that
19 meet that specification. And so that is an
20 interesting nuance that, you know, that I think
21 is certainly worth pointing out because we don't
22 own that design that was, you know, that resulted

1 in the Sally Ride and the Armstrong.

2 VICE CHAIR MILLER: And a follow up.
3 Has there been any more clarification of what the
4 ship is replacing, or, you know, what the end
5 usage for the ship will be.

6 CAPT BRENNAN: At this point I don't
7 believe that it has, they have named a ship that
8 is going to be decommissioned and replaced by
9 this first vessel.

10 But what was clear is that it was, it
11 really didn't meet the needs for our hydrographic
12 program because it would not have the capability
13 to carry launches.

14 And we would not, at this point given
15 the funding and the timelines that we needed to
16 move out on that we would not be able to change
17 those in any, you know, those requirements in any
18 meaningful way to incorporate the carrying of
19 launches on that.

20 So it has to go forward as-is which
21 means that it's going to most likely replace, you
22 know, one of the other vessels like the Sette.

1 MEMBER MCINTYRE: This is more of a
2 comment than a question. But for Jeff, I really
3 wanted to thank you for your work on the Columbia
4 River. We live and die by the Army Corps
5 surveys.

6 And to speak to what Admiral Smith
7 says, it's a lot of times those surveys really
8 aren't calculated for navigation. But that's
9 what we use them for, so I'm excited to hear that
10 the agencies are working together to improve and
11 also just clarify what information that we're
12 using right now.

13 I won't say that we cobble together,
14 but we look to a lot of different sources for
15 information, and to our PPU units in order to
16 navigate. And it would be really nice to see
17 that streamlined, and then again just verified so
18 that we really do know what we're working with.

19 And also just wanted to reiterate that
20 we really value our relationship with the Army
21 Corps of Engineers in the Columbia River region.
22 That's a fantastic group of people that we work

1 with.

2 CHAIR HANSON: Okay. Well, without
3 other panel questions, I have a couple, I have
4 one. Could you guys each give us a quick update
5 on what's going on with the disaster response
6 maybe in Florida. Or in the southeast, in the
7 Gulf.

8 MR. LILLYCROP: Lots.

9 CHAIR HANSON: Okay, so that saves a
10 lot of time. Thank you.

11 MR. LILLYCROP: No, in Houston we've
12 got, I think all the channels are open now.
13 There was a lot of surveying, a lot of Corps and
14 NOAA surveying, contractors.

15 So that was really a great response.
16 I think in Florida it's a much bigger problem,
17 certainly much more geographically spread out.

18 And they were beginning already
19 yesterday, we were getting calls. I know JABLTX
20 is looking at, has already been called to fly the
21 Florida coasts to look at the amount of erosion
22 from the federal projects.

1 And so I mean, it's spun up there. At
2 headquarters we're now working 24 hours. It was,
3 after Harvey it was more like 12 or 16. But now
4 they've gone to a full 24 hour schedule.

5 So the main thing is identifying the
6 hazards in the channels and getting the channels
7 open, the fuel, getting the fuel to south Florida
8 and the Keys.

9 You know, then just the regular
10 assessment of federal projects and all of the
11 debris and ice and water and sometimes blue roof
12 missions that the Corps is involved in. And
13 that's all worked through FEMA and the multi-
14 agency organization. So we're really support to
15 FEMA.

16 CAPT BRENNAN: So we've wrapped up our
17 initial response to Harvey in Texas. We will
18 have a longer term response because the initial
19 response, you know, was to support the Corps of
20 Engineers in opening the federal channels, and it
21 was necessarily focused on shoaling.

22 But there's also an object detection

1 requirement that we feel is necessary, and that's
2 a longer effort to do that because it's a, you
3 know, the resolution that we need to survey those
4 channels to is significantly greater.

5 And so TJ is bound for the Houston
6 area anyway was going to be surveying the
7 approaches. And we're working on retasking that
8 right now to go back and ensure that we've got
9 object detection coverage in those channels to
10 support that longer term initiative.

11 With regard to Florida, we've got NRTs
12 on the ground. We had a team that was
13 transported via a Coast Guard C-130 into Miami
14 yesterday, and we're out mobilizing a mobile
15 survey kit on to a, I'm not sure E.J. was a
16 police, a sheriff's vessel.

17 And they were out helping to survey
18 the approaches to Miami and the harbor yesterday.
19 We've got other NRTs that are moving in as
20 weather permits. And we had a number of contract
21 assets that were standing by, some that were
22 already slated to be working in Florida.

1 So we had an eTrack task order that
2 was just getting ready to get underway down in
3 the Fort Meyers area anyway. So they were going
4 to be going in, and I have no doubt that that,
5 you know, that the original project area that
6 they were going to be doing is going to be
7 retasked and retooled to do some response efforts
8 in that area because, as we know, that was an
9 area hit particularly hard with storm surge, et
10 cetera.

11 And so we've got at least two NRTs
12 down there now, and we're waiting to get the
13 final assessment from the Corps of Engineers
14 before we send any contractors in.

15 But we have at least five contractors
16 with available money left on their existing task
17 orders. So no new money required that we are
18 standing by and ready to recommit to recovery if
19 needed.

20 CHAIR HANSON: Well, certainly
21 appreciate all your joint efforts and your
22 collaborations. Certainly disaster response is

1 when you find out how well you're set up. And
2 lessons learned from those efforts afterwards are
3 always helpful as well.

4 So thanks for -- oh do we have -- go
5 ahead.

6 MEMBER HALL: So quick follow up,
7 Rick. So that money you said that we have to --
8 is that taken away from other tasks that they
9 were going to be working on, or is that just left
10 over on the contracts? So, are we losing out on
11 other charting or other, I'm sorry, survey
12 because they're now going to be doing disaster
13 relief?

14 CAPT BRENNAN: Yes, that is not new
15 money. So that is basically us redirecting our
16 existing funding away from the other priority
17 areas that we were surveying to do the disaster
18 relief --

19 (Simultaneous speaking)

20 MEMBER HALL: Just wanted to clarify.
21 Thanks.

22 CHAIR HANSON: Okay. All right, well

1 thanks to both of you for your discussions, and
2 look forward to future comments and discussion,
3 joint discussions as well. Thank you. We'll let
4 you go.

5 So did we get anywhere with the next
6 issue papers? Are we going to defer?

7 (Off-microphone comments)

8 CHAIR HANSON: Okay, fair enough. Fair
9 enough, we've got another day. So now it's time
10 for public comment. As always, open for comment
11 from the audience present, or from those
12 listening in on the webinar.

13 (Off-microphone comments)

14 CHAIR HANSON: Do you need a
15 microphone? We do have a question from the
16 audience.

17 MR. NOLL: I'm going to step back from
18 the speaker. This is Guy Noll. I would like to
19 make a comment related to the Navigation Ready
20 Nation that was kind of the theme I saw
21 underneath the discussion about recreational
22 boaters in particular, and how the robotic

1 systems, the autonomy of navigation could help
2 recreational boaters be more safe.

3 I think that's a really valid concern,
4 and something that would be helped by better
5 infrastructure, relating back to Larry Mayer's
6 comment yesterday about how port infrastructure
7 should be part of the discussion of what makes
8 autonomy ready.

9 And I think connecting that to what
10 recreational boaters are doing would be very
11 similar in an incremental fashion to what the
12 automobile manufacturers are doing with say lane
13 keeping or automatic braking, that sort of thing.

14 And I would like to hear what the
15 panel and maybe Captain Brennan say about how
16 that could help push the focus forward for
17 autonomy in general.

18 CAPT BRENNAN: Well, I think if we can
19 get our ports instrumented to provide us the
20 information that we need to just get the commerce
21 moving, I think that would be a good first step.

22 And certainly, if there was any way to

1 get some sort of a network positioning system put
2 in, even better because I think the same thing
3 that could serve to position and track unmanned
4 vehicles, you know, that are out doing some
5 tasking in support of mapping the ports and
6 maintaining the ports, that that could certainly
7 be used as well for pleasure boaters to the
8 extent that some common standard of positioning
9 them was adopted.

10 RDML SMITH: I would also like to
11 respond, and not to, there's actually a lot to
12 pick apart usually in Guy's comments, but he
13 referred to Navigation Ready Nation which is
14 really a comparison of the challenge that's
15 before the navigation community to what the
16 weather service took on a few years ago with what
17 they're calling the Weather Ready Nation.

18 And I think there's a body of thinking
19 that the weather service did that is really
20 relevant to our community. And I guess I will
21 work with our staff to circulate a couple of
22 those thought pieces from the weather service

1 because, you know, if you did a search and
2 replace for a few key words in those, it would
3 read really true for particularly with coast
4 survey, but I think all the navigation services.

5 So thank you, thank you Guy, for
6 bringing that up.

7 CHAIR HANSON: Other questions,
8 comments? Rumbling stomachs, okay. Very good.
9 We'll close the comment period and we'll go ahead
10 and adjourn for lunch. HSRP members will have a
11 working lunch, and we will adjourn here at 1:30
12 p.m. for updates from Rich Edwing, Juliana
13 Blackwell, and Admiral Smith.

14 This afternoon's session will end at
15 2:30 when the panel will then visit the U&H
16 research vessel. So bon appetite.

17 (Whereupon, the above-entitled matter
18 went off the record at 11:52 a.m. and resumed at
19 1:35 p.m.)

20 CHAIR HANSON: Well, since our
21 panelists are ready, without keeping you guys
22 longer than we need to, why don't we go ahead and

1 get started on this part.

2 Good afternoon, welcome back. In the
3 next hour, Rich Edwing, the Director of Center
4 for Operational Oceanographic Products and
5 Services, Juliana Blackwell, the director of the
6 national geodetic survey, and Admiral Smith, the
7 Director of the Office of Coast Survey will
8 provide us brief updates on the projects and
9 services their offices provide and recent
10 progress.

11 Rich, I believe you're up first.

12 MR. EDWING: Okay. All right, good
13 afternoon, everyone. So I'm going to just talk
14 about some of the accomplishments from this past
15 year and where we're going in '18. Good time of
16 year to do that given we're getting ready to
17 change fiscal years.

18 And I'm using the NOS roadmap, the
19 priorities, first two priorities to kind of group
20 these.

21 So under safe and efficient
22 navigation, and you may recall from the Cleveland

1 meeting which was two years ago I talked in some
2 depth about the updated, the international Great
3 Lakes datum, so I won't go into real detail on
4 that.

5 But that is a seven year project, and
6 we did begin it this year. We've got a kind of
7 bilateral plan kind of in place. And I think a
8 big improvement this time around over last time
9 around was I think I mentioned, back then it was
10 no seasonal gauging done, you know, during the
11 last update.

12 The NLON that exists kind of reached
13 a national requirement to seasonal occasion helps
14 extent it to the local ports and harbors.

15 But we were fortunate to get some
16 funding through the Great Lakes restoration
17 initiative. You do five gauges up there. And so
18 those are in place right now. This is the
19 location in, where is this, this is Manistique,
20 Michigan. And there is four other locations
21 scattered around the lakes.

22 So TCOON in Galveston. You probably

1 recall hearing about the Texas Coastal Ocean
2 Observing Network, that's a somewhat unique
3 partnership that involves federal, state, and
4 local partners.

5 But that partnership had been
6 disrupted because of some issues with funding
7 mechanisms, and the network had largely gone
8 unmaintained in 2014 and most of 2015. Things
9 got figured out.

10 But in that process we became, our
11 role changed in that we became the operator of
12 the network. We get transferred funds to operate
13 that network, and we got that network back up and
14 going by the end of fiscal year, actually by the
15 end of 2016 calendar year.

16 And one kind of big enhancement that
17 happened during that timeframe was four new
18 Sentinels of the Coast were established. There's
19 actually six of them along the Texas coast. I'm
20 going to point out that after Katrina and Rita,
21 we established four of them along Mississippi and
22 Louisiana.

1 Those went into operation just in time
2 for Ike and Gustav to hit and collected data
3 during those. And so when a couple of Corps
4 Engineer stations, TCOON stations got wiped out
5 in northern Texas, they funded the establishment
6 of two of these stations to our standards, and
7 they became joint stations.

8 And then actually the Texas General
9 Land Office got a federal grant to build these
10 four new ones along the southern Texas coast.

11 But the Corps puts in a lot of funding
12 for these because right now, for each of the six
13 major federally maintained channels in Texas,
14 there's a Sentinel of the Coast standing at the
15 entrance to each one of those.

16 And then I've spoken about this in the
17 past. We continue to transition our primary
18 water level sensor technology away from acoustic
19 to microwave. That's acoustic on the left,
20 microwave on the right.

21 We did 15 this year. That actually
22 exceeded our plans by about three. And we're up

1 to about 50 Enron stations that have been
2 converted to date.

3 You've seen this graph before, and
4 most recently in Seattle where it was very
5 relevant. We just completed, just really just
6 recovered the last deployment of current meters
7 up in the Puget Sound.

8 And then the green dots just show you
9 the progression. This was the largest survey
10 we've ever done, 138 instruments. I'll embarrass
11 Carl Kammerer back here. He's one of our
12 instrumental people who's always involved in the
13 planning and execution of these surveys.

14 And I'm just going to, when we
15 reinvigorated this program in 2006 we had an,
16 I'll say, unacceptable attrition rate of current
17 meters. We put a lot out there and wouldn't get
18 back as many as we would have liked. And it was
19 a lot of lessons learned and engineering
20 development that went on.

21 And out of the 138, Carl told me,
22 there's one less lingering one that we're hoping

1 to get back. But if we don't, we will have only
2 lost one out of 138 deployments which I think is
3 very, very good.

4 And so again, this data will update
5 tidal current predictions in some new locations,
6 or in old locations for navigation and safety,
7 and also for informing models. And here's just a
8 picture of one of the deployments. That current
9 meter looks pretty clean, so it's not a recovery.

10 Another improvement was down in Tampa,
11 the Weather Forecast Office, the Weather Service
12 a number of years ago kind of started an
13 innovation research effort, and funded them to
14 give them some additional resources to do a
15 number of things.

16 But one thing they did is they came up
17 with this model overlay if you will that we've
18 now integrated into our Tampa Bay hydrodynamic
19 model. And what it adds to our already existing
20 forecast information is specialized weather
21 forecast information at these points along the
22 navigation channels.

1 It provides waves and visibility
2 forecasts where that's unique to our suite of
3 models, no one else has that done. And so it's a
4 very nice example of integration of capabilities
5 between the Weather Service and the Ocean
6 Service.

7 And I can tell you particularly the
8 visibility forecast, wherever I've gone, ports
9 are asking for visibility forecasts because fog
10 is a big issue in a lot of locations. And of
11 course we provide visibility sensors through our
12 PORTS program. But this is a new capability
13 they're very interested in.

14 Our PORTS program, I'm allowed to say
15 that word, right? So we actually -- one time?
16 It's like twice. Anyway, we added one new port
17 to Matagorda Bay, Texas, and actually it's going
18 live this week. It did make it through the
19 storm, so that's good news because that one has
20 been in there under development for a number of
21 years, had its ups and downs.

22 But then a number of major

1 enhancements to some other ports. We added air
2 gap sensors to Charleston and Delaware Bay, we
3 also added salinity sensors to Delaware Bay and
4 Chesapeake Bay port systems.

5 And just to make the point, you know,
6 we're adding more ports but there's always a lot
7 of work going on to maintain the existing suite
8 of systems.

9 So under the preparedness and risk
10 reduction theme of the roadmap, last year we had
11 put out beta, beta versions if you will of our
12 dashboard, our Coastal Inundation Dashboard. We
13 operationalized them this year in these three
14 different regions showing on the bullet here.

15 Again, the inundation dashboard is a
16 way to show past, present, and future conditions
17 when a storm is coming. It's a static graphic,
18 but when a storm is approaching the coast, those
19 little balloons there will start pinging when we
20 start to detect water level starting to rise.

21 But then you can go in and you can go
22 back and you can get past information like what

1 was the record water level ever set at that, you
2 know, what's the nuisance flooding rate, what are
3 sea water trends, all that sort of information.

4 It's going to show you what, you know,
5 the realtime data, and we'll also bring in the
6 hydrodynamic models. At one point, or at some
7 point down the road we're going to integrate the
8 quick look project into this because that's what
9 gives you the real time conditions.

10 So we're continuing to enhance this.
11 This past January we realized, NOAA released a
12 sea level report. It was an interagency report
13 with Dr. Billy Sweet in my office was the lead
14 author on it. But it kind of broke new ground in
15 two different ways.

16 This was the first report to kind of
17 lay out ways of doing regional sea level
18 estimates whereas in the past, people were
19 waiting to see how the nearest tide gauge to get
20 the trends from. If it wasn't nearby, you didn't
21 have the information you needed.

22 This marries up tide gauge and

1 satellite information to provide regional efforts
2 of sea level rise. And it also updated the, you
3 know, the ranges of sea level rise going into the
4 future because they didn't want to put out this
5 information without updating the extremes that
6 were, you know, the signs are just starting to
7 see.

8 And then a year or two ago we put out
9 these high tide bulletins. Somebody mentioned,
10 this is HSRP where I learned about in King Ties,
11 that's kind of the common term for the, or
12 perigean tides, the more technical term if you
13 will.

14 But these are predicted, these are
15 normal occurrences of high tides. But this is
16 when the highest ties are occurring if you will,
17 and they always seem to take people by surprise,
18 and we get a lot of calls and stuff.

19 So we started putting out a product to
20 try to, you know, alert people in advance that
21 these are coming. And actually it's been a
22 really big, it's been a very popular website and

1 seems to be, you know, helping with that issue.

2 And then also there's an annual high
3 tide flooding outlook that we do for kind of that
4 recurrent tidal flooding, the nuisance flooding
5 that I've spoken to you before in the past.

6 Again in Cleveland, you know, I noted
7 I think back then we had just released our,
8 updated our hydrodynamic model, and I had noted
9 that that was needed to put out the harmful algal
10 bloom burden. And that occurred this year where
11 that was fully transitioned over from National
12 Centers for Coastal Ocean Science which kind of
13 developed the model. It's being supported by
14 GLERL with observations.

15 But that went live this July. It
16 immediately did detect a balloon that was
17 occurring. I think there had been a seasonal
18 forecast by NCCOS had forecasted a very
19 significant season this year, not necessarily
20 record setting but significant.

21 I don't think that's quite turned out
22 that way, but however if it happens, they're

1 well-protected with, or well-formed I should say
2 with the bolt.

3 And so a big thing we've been doing in
4 recent years is trying to enhance our ability to
5 do with patterns by building some tools and stuff
6 for ourselves, but also for our partners. And
7 this is to expand the NLON, you know, the ports,
8 all sorts of things.

9 So one thing we did, and this was in
10 conjunction with NGS, we did water level
11 training. This was when it was at the
12 Smithsonian facility right in Chesapeake bay. But
13 this was to the Research Reserves association.

14 Up until now we've been kind of
15 working with him individually, trying to help
16 then with their geospatial data needs. It's been
17 pretty inefficient. And so now we've kind of
18 signed some agreements with a research reserve
19 systems to do a train to trainer sort of approach
20 and let them kind of, train key people and let
21 them kind of then take care of the entire
22 network. And it was over 35, I thin, research

1 reserves in existence.

2 And then also we put out online data
3 calculations too. And this allows people to take
4 their own data and put it calculate tide datums.
5 That data doesn't necessarily have to be to our
6 standards, which was kind of an obstacle before.
7 So this is now available as well, and we've been
8 providing training on this as well.

9 So I thought talk a little bit about
10 Hurricane Harvey, this is just one piece of the
11 quick look tool, I mean, if you can't really show
12 the whole thing on a slide. This is partway
13 through the storm.

14 You know, again, thanks to the TCOON
15 Network, very dense network of gauges along the
16 coast there. TCOON ports and Enlon together.

17 And one thing we started last year,
18 during last year was we came up with a graphic to
19 kind of display what were the highest water
20 levels observed because that's information that
21 people want, like, right away.

22 And it's actually won, a good

1 government tweet award because this got tweeted
2 out. But you can see here Manchester Texas which
3 I'll try not to take Jeff's head off here.

4 (Off-microphone comments)

5 MR. EDWING: Yes, right there. So
6 that experienced the highest water level. And
7 here's the graph from there. And you can see
8 that water level, just it rose, just hung up
9 there.

10 And of course this was due a lot to
11 the heavy range and a lot this is flood induced
12 flood, you know, elevation. Not so much storm
13 surge.

14 And then I kind of have a bit if a
15 neat video one of our IT people put together. And
16 all of those numbers or things streaming across
17 from left to right, these are data requests to
18 our website. Okay?

19 This is one minute during Harvey. And
20 on the right column, that's all of our different
21 products and services. You can see ports in
22 quick look and things.

1 And every time you see is number, I
2 think it's 200 pops up, that means that request
3 has been successfully, you know, delivered.

4 So we talk a lot of data management.
5 It's kind of hard to visualize sometimes, so I
6 thought this was kind of a pretty cool, you know,
7 visualization of that and I thought I would share
8 it with the panel.

9 So every once in a while you'll see a
10 304 in there which means there was some issue.
11 That was probably Bill Hanson trying to use the
12 website.

13 (Off-microphone comments)

14 MR. EDWING: Asking for port
15 information, no doubt. So, segueing to looking
16 forward to '18. And again, up in the Great
17 Lakes, so we've had some minor success with
18 getting some outside funding, and we did get a
19 little more GLRI funding to do some additional
20 gauging up there.

21 But we're really going to make a big
22 dent in seasonal gauging up in the Great Lakes

1 for both IGLD and VDatum, is using some of the
2 VDatum money for gauging to do, you know, the
3 Great Lakes at the same time.

4 And I have to extend my thanks to
5 Juliana and my co-directors or tri-directors. And
6 actually it was I can't give the credit to Shep,
7 I have to give it to Gerd.

8 At the time they agreed to accelerate
9 the Great Lakes because the Great Lakes were kind
10 of far down the road. But by accelerating the
11 gauging we were able to kill two birds with one
12 stone. So that's going to be the big deal.

13 Current surveys, you saw we're just
14 finishing up a really large one. Moving forward
15 we're having to trim down a little bit on our
16 current surveys because of, you know, level
17 funded budget.

18 But we have a nice small project up
19 here in Kachemak Bay, a partnership project with
20 the National Center for Coastal Ocean Science.
21 You know, probably some moderate navigation
22 benefits. It's obviously not a big commercial

1 area, but recreational and fishing certainly.

2 But they needed information to run
3 some models there because they're having issues
4 with harmful algal bloom breaks, outbreaks and
5 needed hydrodynamic information to better
6 understand that.

7 So we're going to be conducting that
8 survey with them, in conjunction with them,
9 sharing some costs and things. That's at
10 Kasitsna Bay Lab.

11 And then we have a survey planned for
12 south Texas. You can see the locations here,
13 kind of a moderate sized one. We're actually
14 probably going to have to revisit whether we can
15 do this one or not because we always do a recon a
16 year in advance.

17 And given how much conditions have
18 changed, we're not certain whether our recons are
19 still valid. So we're kind of reevaluating this
20 one.

21 Ports, five new ports, Miami in FY
22 '18. Miami you're already well aware of. Corpus

1 Christie, and the nice thing about Corpus
2 Christie is that's the last of the top ten
3 seaports in the US to have a port system.

4 Port Everglades which is just right up
5 the coast from Miami. Kind of a nice little
6 story there. The Port Authority is funding this
7 for marine transportation purposes, but it was
8 also put in by, it was a lot of support from the
9 South Florida Compact to get this in for sea
10 level rise and resilience efforts. So it was a
11 collaboration down there between those entities.

12 Kings Bay, Georgia is for the US Navy.
13 They have, they bring nuclear subs in and out,
14 and we want to make sure that happens safely.

15 And again, going back to the Cleveland
16 meeting, you heard there was a lot of concern
17 about three current meters. We've been operating
18 up there as a legacy with an earmark about those
19 going away.

20 And at that meeting we announced that
21 one of them had been made into a ports courtesy
22 of Cary's association. So that one found

1 sustainable funding. Now Toledo, Ohio has found
2 a home with the pilots up there. And so we're
3 down to getting one moved over.

4 For modeling, and again this is
5 another nice collaboration story. We're
6 upgrading our New York, New Jersey forecast model
7 and actually bringing in the very good
8 hydrodynamic model developed by the Stevens
9 Institute at NIHOPs I think it's called.

10 But you can see there's our kind of
11 image that we've been using forever, kind of to
12 kind of show a whole estuary. It's very
13 outdated. You can see the vast improvement that
14 folks will see in the delivery of that model and
15 as we implement that next year.

16 And then also we're going to be
17 transitioning to Gulf of Maine hydrodynamic
18 model. I don't have a graphic of that, but
19 that's another case where that's needed to enable
20 a potential harmful algal bloom forecast model up
21 in that area as well.

22 So I think this is my last slide. And

1 again, there's a lot of things going on right now
2 in NOAA, kind of bringing some things together.

3 Something called the Integrated Water
4 Initiative, and that's where when we talk to
5 people about water levels that we're talking
6 about total water level. So tides, that's the
7 storm surge if that's going on, that's waves,
8 that's freshwater input.

9 And so a lot of work we're doing here
10 in CON-OPS is being picked up and brought into
11 that. One specific example is this capability
12 we're doing through the Coastal Inundation
13 Dashboard where you can go in and show what
14 people, here's a location before flooding and
15 then there's a location at a certain level of
16 flooding showing you what it might look like
17 because again, even getting people the above
18 ground forecast that the Weather Service is now
19 using it, maybe hard for them to visualize that.

20 We're continuing with a lot of
21 training courses. And again, this is in
22 conjunction with NGS. So very appreciative of

1 that. And then there's a, kind of a big modeling
2 unification effort. There's a lot of planning
3 going on here, but the first step is a CON-OPS
4 concept of operations as we're looking to add
5 river forecast models to our hydrodynamic models,
6 some of the off shore weather service models. So
7 that's in progress.

8 So I think that's it. I think we're
9 holding questions to the end, is that correct,
10 Bill? All right.

11 MS. BLACKWELL: Turn mine on. Okay,
12 if we can load up the NGS slide deck. First of
13 all, just start off as this is loading up, just
14 to recognize a couple of NGS employees who are
15 not able to be here today, one being Mike
16 Aslaksen who we normally have here at the HSRP
17 meetings. He's back in Silver Spring busy
18 overseeing the emergency response damage
19 assessment, imagery, operations that are ongoing.

20 NGS was tasked by FEMA through a
21 mission assignment to collect imagery over
22 Florida or along the Florida coast as well as

1 Georgia and Alabama.

2 So we started doing this collections
3 yesterday. I had up on the screen when you came
4 into the room the image of an area there that's
5 been collected by operations are underway.

6 Imagery is being posted on our webpage
7 and made available to FEMA and others. So I'll
8 have some slides of some of the previous imagery
9 from other storms in my presentation. But I
10 wanted to make sure that you're aware that we are
11 working on that.

12 Also, Dan Martin is our geodetic
13 advisor for the northeast region. He's based out
14 of Vermont and he had planned on being here this
15 week. But a project of ours got delayed in
16 Colorado and he had to go back out there to
17 finish his operations up this year.

18 So he was not able to be here. But
19 there is an advisor for the northeast. And
20 hopefully get to meet him next time we're up this
21 way.

22 So some updates for what we've

1 accomplished in FY '17. It's one of the
2 highlights I'll go through quickly and then as
3 Rich did, just some outlooks for priorities for
4 FY-18.

5 The first thing I want to say is we
6 continue to work on our outreach and education
7 and communication for the scientific work that
8 we're doing. One of the things that was in badly
9 need of repair of update was our homepage.

10 And so we've taken a first draft of
11 reorganizing our web content and bringing the
12 homepage up to date to help orient new web users.
13 We know that the folks that come to our website
14 regularly know where to find things, so we're
15 probably irritated them a little bit by changing
16 things. But hopefully having things grouped
17 differently will bring some new users in and
18 enable them to find information easier.

19 Under our science and education or
20 training and education depending on where you
21 click on it here in our webpage, there's a whole
22 lot of information that is available that I just

1 want to let the members know that it's out there.

2 I want to also say there's an optional
3 homework assignment because we've were talking
4 about datums tomorrow morning bright and early.

5 If you want to get a jump start, you can go under
6 the science and education or training and
7 education areas and look for science and
8 education, you look at educational videos.

9 Okay, these are five minute type
10 videos on datums, why are we changing the datums,
11 all sorts of cool little things. So even if you
12 don't have time tonight to do that, please take a
13 look and do some, give us some feedback on the
14 videos too. So I hope that those are helpful.

15 Other big outreach event that we had
16 this year was our geospatial summit back in
17 April. I know that I've mentioned this in the
18 past HSRP meetings. I just want to follow up and
19 say if you weren't able to make it or if you're
20 interested in seeing what that was about, the
21 information, the presentations, the videos of the
22 presentations and a summary report are all going

1 to be available on our website if they're not
2 already.

3 We had over 400 people attend, a
4 number of individuals from federal agencies as
5 well as state and local agencies and private
6 sector. We had a number of speakers that
7 reported to us, you know, what they thought the
8 good things were about the new datums as well as
9 some of the concerns that they had.

10 So we got both, you know, we got all
11 sorts of feedback there during the event as well
12 as afterwards from a wide range of stakeholders.

13 We're going to continue to use that
14 information to help us with our outreach and
15 education, and maybe some pilot projects to help
16 particular agencies with their workflow data
17 question issues as they come up as we move
18 forward with their NSRS modernization effort and
19 update to the datums.

20 You've also heard me talk about GRAV-D
21 a number of times. So I'm going to give you a
22 quick update on that just as a refresher for

1 those who are not familiar with it.

2 GRAV-D, Gravity for the Redefinition
3 of the American Vertical Datum is a project that
4 is underway and began in 2010, to be completed in
5 2022. It will be the basis for the update of the
6 vertical datum that we are currently proceeding
7 with.

8 This new gravity based vertical datum
9 will be accurate to about the two centimeter
10 level where possible. And this is something
11 again that we're replacing NAVD 88, the current
12 vertical datum of the United States and hope to
13 be able to have that available by the end of
14 2022.

15 We did have some preliminary
16 socioeconomic studies done on our efforts, and we
17 have been told that this new vertical datum will
18 result in an estimated \$522 million benefit to
19 the nation once it's implemented. And those are
20 old numbers.

21 So the beauty of this is that being
22 able to use GPS or GNSS equipment to get an

1 accurate height, a relevant height for folks to
2 use for their surveying and mapping efforts is
3 something that is really going to transform the
4 way that we do elevation, collect heights on all
5 sorts of things geospatially.

6 I want to mention in keeping with the
7 theme of unmanned or autonomous vehicles, some of
8 the things that we're doing on the gravity side
9 which is this, what you see pictured here, the
10 Aurora Centaur is a optionally piloted aircraft.

11 And we used this operationally for the
12 first time this year to collect airborne gravity
13 data. The project lasted about one month. We
14 flew out of Winston-Salem, North Carolina and
15 collected data over western North Carolina and
16 eastern Tennessee.

17 And this data were used to fill in
18 with the GRAV-D effort again, you know, marching
19 along, collecting all the coverage over the
20 United States and our territories as it showed on
21 the previous slide. We're about 63 percent
22 complete with our data collection efforts and are

1 on track to finish by 2022.

2 Also want to mention that the Aurora
3 Centaur was basically came out of a small
4 business research innovation effort. And we have
5 now completed Phase 1 and Phase 2. So now we are
6 in this operational aspect of using this craft
7 for collecting GRAV-D.

8 It really has the potential to
9 increase our efficiency, to reduce costs, and
10 also to improve the data quality. We were really
11 concerned about whether or not we would get good
12 data on a craft of this size, and we found that
13 it really performed extremely well. So we were
14 very pleased with the product from that data
15 collection.

16 Also as part of our GRAV-D effort is
17 validating what we're doing from the air. And so
18 one of the ways that we're doing that is through
19 these Geoid Slope Validation Surveys.

20 It's a combination of geodetic
21 surveying techniques that we perform in a
22 particular area and do all of our, you know,

1 geodetic wizardry to it to make sure that when we
2 look at everything, we do see and can validate
3 what we're getting from our airborne gravity.

4 This is the third of three planned
5 surveys. This is almost complete. This is the
6 project that's underway in Colorado that's
7 keeping Dan Martin from being at this meeting
8 today. But it again is giving us that competence
9 and ground-truthing of our GRAV-D results.

10 This project is in the most
11 challenging topographic area. Again, anything,
12 just about anything in Colorado is going to give
13 you some challenges with the elevations out
14 there. But over 221 miles of survey project area
15 and 4,000, over 4,000 elevation, 4,000 foot
16 elevation change, and we've had great success in
17 collecting the data.

18 We still have a lot of number
19 crunching to do, but we're most hopeful that
20 we'll get some good results out of that.

21 We know that the GRAV-D and the
22 accuracy that we get for the new datum may be not

1 as great in the higher elevations as it will be
2 in the flatter areas along the coast.

3 But really, where the elevations count
4 the most is where things are most flat, as we've
5 seen most recently in the Houston area and now in
6 southern Florida and along the Gulf. So I'll
7 give you some more updates on that after we get
8 that information processed.

9 This is just a number slide to give
10 you an idea that we're on track with doing our
11 standard operations for collecting shoreline
12 information, making sure that we are able to get
13 ports updated and in analyzing the changes in
14 other ports and continuing to update our
15 shoreline product.

16 You know, most of this is for the
17 benefit of the nautical chart, but all this data
18 is available, whether it's the imagery data or
19 the lidar data, it is available through our
20 website and through Digital Coasts. So there's a
21 lot of other uses for the data that's being
22 collected.

1 So anyhow, we're basically meeting our
2 metrics or exceeding them from what we had
3 planned for this year. Kind of the standard
4 numbers that we do every year.

5 In addition to those operations,
6 there's always opportunities for something new
7 and unique. This past year we did some lidar
8 work in the Florida Keys. This was in support of
9 the US Coast Guard Navigational Safety request,
10 safety for their fleet and also for updating of
11 the nautical charts in the region.

12 Some of these areas had not been
13 surveyed since the 1900, 1930 timeframe. So we
14 were able to collect near shore information using
15 the lidar, topography lidar. And I think I would
16 say about 258 square nautical miles, it seems
17 like it's probably more than that but that's the
18 numbers that I have, but that information has
19 been delivered to Digital Coast.

20 It's not going to change by itself.
21 There we go. For the first time NGS has been
22 able to resolve some imprecisely positioned

1 charting dangers using the topography lidar. So
2 you know, for water to be surveying in, the
3 ability to see where some of these things are and
4 to work with Office Coast Survey to help resolve
5 exactly where these things are based on the old
6 charts and where they should be plotted on new
7 charts.

8 So you can also see the types of
9 resolution that you get on the dry side as well
10 as the wet side and using this capability. So
11 some beautiful images here of the Fort Jefferson
12 and the lighthouse on Loggerhead Key and Dry
13 Tortugas.

14 And I know you can't see it very well,
15 but being able to look at the water side and pick
16 out that, those objects whether they're wrecks or
17 whether it's vegetation, et cetera, to create
18 opportunity to use this system and be able to
19 update information and make that data available
20 for others who are using it.

21 For example, for looking at coral
22 related habitat mapping work, et cetera. So

1 there's still I think some lidar data that's
2 being processed. We're hopefully going to
3 complete that here soon and make that also
4 available through Digital Coast.

5 And now just a few slides on the
6 emergency response imagery. Earlier in this
7 fiscal year, back in October of 2016, hurricane
8 Matthew was a late, later in the season hurricane
9 that we responded to, tried to match up some of
10 the imagery here of the before and after.

11 So dramatically you can see where the
12 change in the shoreline was and what was there
13 before and is no longer there.

14 I know it's a little bit difficult to
15 see on the large screen, but I do have the URL
16 that's here where you can find all of the NGS
17 imagery. If you go on that webpage you'll see
18 it's listed by storm, by hurricane.

19 If you click on that, brings up a nice
20 little viewer and you've got to kind of zoom in
21 to the areas that you're looking for. And if you
22 keep zooming in and click on some of those

1 buttons there, it will show you different
2 information. You'll get a good view of whatever
3 area you're looking for in that part of the
4 country.

5 So the few pictures here for hurricane
6 Harvey, again this is, well it was the latest
7 hurricane when I put the presentation together.
8 It's been superseded obviously. And so that's
9 information there, the before and the after, kind
10 of toggle back and forth.

11 So this is, having that before imagery
12 really brings home, you know, what's changed.
13 And so we've done the aerial oblique imagery and
14 collecting things, you know, in blue skies and
15 then having that available and have it all geo-
16 referenced so that we can do the comparisons to
17 what's changed afterwards.

18 That's another before and after type
19 of thing. And on our website, you're able to see
20 the before imagery as well.

21 So the information for Irma is also
22 posted in our storms webpage, so you can click on

1 that and it will get updated on a daily basis for
2 what's been collected.

3 Switching gears a little bit, just to
4 talk about some decisions that have been made in
5 collaboration with our international partners as
6 well as through our stakeholders here in the US,
7 we've come up with a framework for modernizing
8 our new reference frames.

9 When I say reference frames, you can
10 think datums so it makes it easy on you because
11 we all know that, you know, datums are us, datums
12 are NGS. So I don't want to confuse it too much,
13 but we're calling them reference frames. In some
14 cases a datum and another, and I'll explain that
15 some more tomorrow.

16 But for the purposes of the
17 modernization effort, we are actually creating
18 new reference frames in four different, on four
19 different plates, the North American plate, the
20 Caribbean plate, the Pacific plate, and the
21 Mariana plate.

22 And so we have four different names

1 for those reference frames. And if you think
2 back to the whole tectonics thing and how things
3 move over time, they're moving in different
4 directions slightly and at different rates.

5 And this becomes important when you're
6 trying to position things over time and trying to
7 compare things that were positioned in different
8 epics, in different years and different survey
9 projects. And just to see what the change is,
10 what are the changes and what you think it will
11 be like in the future.

12 The other datum that we are changing
13 is the vertical datum. We've got this whole area
14 that we are looking at as far as creating a new
15 geo-potential datum. Think of vertical and NAVD-
16 88.

17 But we're doing this for the US as
18 well as all the territories. And so we're
19 expanding this. We'll have a model that's
20 available for us to be able to use for this
21 entire area.

22 The areas that are outlined in white,

1 yes I know it's hard to see here, but those are
2 the GRAV-D areas that have been collected.
3 Again, GRAV-D being the base new data set that's
4 being used for this effort.

5 And we've got a name for this one as
6 well, the North American Pacific Geopotential
7 Datum of 2022. Again, we'll talk about that
8 just, you know, briefly tomorrow. But the idea,
9 this is the replacement data for NAVD-88.

10 And then I have one slide here just to
11 talk about what are our priorities for FY'18,
12 some of them at least. The big outreach event we
13 have planned for next year is really an industry
14 day talking with vendors, you know, in the GPS
15 side as well as the GIS side and other entities
16 about how do we work together to get the best
17 roll out for the 2022 datum, the modernization
18 efforts and other ways that we can partner.

19 We've got a plan for updating the
20 VData in the New York Bight/Long Island Sound
21 area. There's work underway now, but the FY '18
22 we expect to be able to have that model released.

1 We've got a project underway right now
2 in Guam and the Northern Marianas to collect some
3 additional data so that we can help define the
4 movement on the Marianas plate for 2022.

5 And then we're taking a fresh look at
6 our CORS program and redoing our project plan for
7 that, or program plan for CORS. So we've got
8 that effort underway and expect to have that
9 complete in FY '18.

10 We are also conducting a socioeconomic
11 study of our regional advisor program. And then
12 our current ten year strategic plan that we're
13 five years through, we're doing a five year
14 refresh on that. So that might be something that
15 we will ask the HSRP to weigh in on when we get
16 to a, you know, second draft stage to share with
17 you all to see if there's anything in there that
18 you think we could improve or clarify.

19 And then lastly I have here to perform
20 a 3D nation study. It's a joint effort.
21 Ashley's going to talk about that some tomorrow.
22 So just if you wanted to let folks know that

1 we're involved in that effort. And with that, I
2 am finished. Thank you.

3 RDML SMITH: Pretty straightforward.

4 MS. BLACKWELL: Yes.

5 RDML SMITH: They do what they think
6 they would like to do. All right, well I'll go
7 ahead and get started because my first slide is
8 just a title slide anyway.

9 But I did want to, in my presentation
10 today I'll start off as my colleagues did, with a
11 little bit of an update on Irma and Harvey. And
12 then I'm going to touch on the progress we've
13 made on the four major areas that we've talked
14 about for the last few meetings for coast survey,
15 the National Charting Plan External Data Source
16 Policy, the Autonomous Roadmap, and the
17 Hydrographic Survey Priorities.

18 In a sense we've already talked about
19 some of those, so I may be able to go fairly
20 quickly. And then I'm going to introduce two
21 additional topics which probably won't be ongoing
22 but I did want you to be aware of these programs

1 or they're across NOAA. And it's with the Now
2 Coast and Total Water.

3 So let's see. Working? Yes. All
4 right, well that was that. So hurricane Harvey
5 response, we had a number of NRTs down there and
6 focused primarily on Corpus Christie and Houston
7 Galveston. They did a few other side trips for
8 specific, not wholesale resurveying but for
9 specific reported problem areas in some other
10 ports and the intercostal waterway.

11 But the main effort was in Corpus and
12 in Houston Galveston. So we had NRTs there. And
13 we also were redirected the David Evans and
14 Associates and their vessel, the Blake, to from a
15 routine survey that they were doing for us to go
16 over and help in Houston Galveston. And they
17 were there for a week or two contributing greatly
18 with a little bit larger vessel to some of the
19 approach work.

20 As we discussed earlier, that was a
21 redirection from an existing contract. We didn't
22 have any additional money that we were able to

1 bring to bear for that.

2 Hurricane Irma, this was now ancient,
3 but this was at the time I was putting the slide
4 together this was what was happening in real
5 time. And clearly, huge impacts on Florida.

6 This is more or less up to date. I
7 think there's been a couple of movements since
8 then. But this is essentially right as the storm
9 was hitting. The ports that were closed, and
10 they were closed all the way from Panama City all
11 the way around to Savannah, and where we had the
12 NOAA assets and our contractors positioned.

13 And I don't know, you can probably see
14 the little, do I have a pointer? We staged most
15 of our folks out of the DRC, Disaster Response
16 Center in Mobile where it seemed early on as if
17 they were going to be really far away.

18 And we're really happy actually that
19 they were that far west because they were clearly
20 outside of the path of the storm, but not as far
21 as we thought they were going to be.

22 We had the day after the passage in

1 Miami we got a C-130 flight with our MIST kit and
2 a team to go down and they staged on that police
3 boat down in Miami. And today they're on their
4 second day of survey work already in Miami.

5 And since it's a fairly small port,
6 you know, it's going to be, we'll be able to make
7 a pretty big difference there.

8 The two NOAA ships that we're working
9 in the southeast, they were working off of
10 Savannah and Jacksonville. They went back to
11 Norfolk to get out of the path of the storm, and
12 the Thomas Jefferson got underway this morning
13 and will be, and is steaming south to work
14 approaches to Brunswick.

15 We also have an NRT as of this morning
16 in the interior parts of Brunswick, and another
17 NRT in Tampa. The Army Corps, I don't think we
18 know the full extent, maybe Jeff does, of where,
19 oftentimes the Army Corps had their people in
20 their boats are right in the path of the storm.

21 And so they sometimes are affected
22 themselves in their ability to respond just as

1 the rest of the port is. But I do know that in
2 Tampa, one of their larger vessels is available
3 and is doing a bunch of the approach work in the
4 outer channel there.

5 And I understand there are Army Corps
6 survey units working in some of the other ports
7 as well. But that part doesn't trickle to me as
8 much as where the NOAA folks are.

9 But at this point it looks as though
10 we're going to have between our in-house assets
11 and what we can redirect from contractors that
12 are in the area, we should have enough capacity
13 to meet the survey demand this week, as we
14 understand it today.

15 I did want to pass on a little note
16 that we got from one of our absent members. This
17 is from Sal Rassello. He wrote and said just to
18 give you an update, Miami has been tremendously
19 hit by Irma. I'm sure you're watching the news.

20 On a positive side, I am fine, running
21 a backup operation center from Philadelphia with
22 a small group of people. So he's not down there,

1 he's in Philadelphia.

2 We have all the ships outside Port of
3 Miami, Port Everglades, Port Canaveral waiting
4 from NOAA for a complete survey. People are
5 desperate to go home if they will find it. I
6 hope NOAA completes the job soon. Sal.

7 (Off-microphone comments)

8 RDML SMITH: You got a new one?

9 (Off-microphone comments)

10 RDML SMITH: All right.

11 MEMBER HALL: He wants to know if it's
12 going to be clear today.

13 RDML SMITH: All right, well maybe we
14 won't do this in real time. So yes, okay. I
15 think that's enough on Irma.

16 The National Charting Plan, thank you
17 all for your 13 pages of comments on the National
18 Charting Plan. We're counting that as one
19 response, but clearly the most thorough of any of
20 the ones that we got because it was aggregated.

21 But we did get 280 other comments as
22 well to our open comment period, which is great.

1 Many of them were responding to really a
2 misunderstanding or a rumor that got started that
3 this was, we weren't going to do what we said we
4 were going to do, this was a stealth effort and
5 we were going to cancel all the paper charts next
6 year, as soon as the final ECDIS requirements
7 came into place.

8 That was just a rumor. And really we
9 had never had that intention. But we did end up
10 having to do a lot of sort of PR damage control
11 as a result of that. And some of you helped with
12 that, so thank you.

13 Let's see. So ultimately on that
14 particular issue, our thinking right now is we
15 have a suite of charts. It is serving its
16 intended purpose and we plan to maintain it until
17 they're no longer necessary.

18 On the other hand, we don't probably
19 plan on making any new paper charts from here on
20 out, designing and laying out new paper charts.

21 For our work going forward, we'll be
22 re-scheming and building a lot of new coverage in

1 ENC and perhaps in raster-derived formats. But
2 it will be all for electronic purposes and not
3 for paper use, direct paper use.

4 Now we also will be demonstrating
5 soon, it's sort of already out but in a sort of
6 soft release a method to be able to take direct
7 from our database and make something that looks
8 an awful lot like a paper chart from directly in
9 the area in scale and blue tint level and units
10 that you want.

11 So that's not going to take the place
12 of real paper for some time. But that is a
13 method by which you could get something on paper,
14 and we'll be demonstrating and getting feedback
15 on that soon.

16 So this is based on product on demand
17 technology from Esri. So quick hat tip to guy in
18 the back of the room for that.

19 The next, we currently plan to have a
20 revised final draft by the end of September on
21 the national charting plan which will incorporate
22 all of your comments. And we will be discussing

1 that in public at the industry day that we have
2 planned for the Annapolis Boat Show.

3 So I hope you can come to that, Susan.
4 This is something we've done in the past where we
5 will bring in not end users but all the chart
6 systems manufacturers and repackagers and that
7 sort of thing.

8 So everybody from MapTech to Garmin,
9 et cetera, who use our charts and build value
10 added sort of products and services on top of
11 that. So we're excited about that and we expect
12 that to be a lively discussion as well.

13 Externally sourced data, we have been
14 making great progress on this. We challenged
15 ourselves at the beginning of this fiscal year
16 performance cycle that we would have 30 percent
17 of the surveys that we put on the chart would
18 come from external source.

19 That is they were not commissioned or
20 paid for by NOAA or Coast survey. They may be
21 other parts of NOAA. And where it looks like
22 right now we're going to make that at 32 percent.

1 So we're almost here at the end of the
2 fiscal year, and Captain Brennan will be
3 providing an update on that tomorrow I believe,
4 and so I don't want to steal his thunder. But we
5 are, we've very excited about that and we're
6 planning on, you know, perpetuating that in years
7 to come.

8 Unmanned systems, we got a great brief
9 on this yesterday, so I think I will not belabor
10 it any further.

11 Let me comment just briefly on the
12 sail drone because I don't think we talked about
13 that. And that's really a partnership with the
14 Pacific Marine Environmental Laboratory, PMEL in
15 Seattle and with the sail drone company
16 themselves.

17 We didn't put a hydrographic system on
18 there, but there was a fisheries echo sounder
19 which the sound went all the way to the bottom
20 and came back. And so we're able to get some
21 level of bathymetry out of it in just a single
22 beam sense, which is fine for that type of

1 reconnaissance.

2 But that sail drone did a, I can't
3 recall how many day but full season --

4 (Off-microphone comments)

5 RDML SMITH: How many?

6 (Off-microphone comments)

7 RDML SMITH: Three month deployment to
8 the Arctic. And they were not doing, they didn't
9 lay out their track lines for bathymetry that
10 would be relevant for navigation.

11 But there are some places where that
12 could go that would be helpful to us. And so
13 we're going to continue that partnership with
14 PMEL. We don't need to take it over, they're
15 doing a great job.

16 But we're just, you know, sort of one
17 mission area that they're looking at for that
18 type of platform technology.

19 Unmanned systems, this was another
20 we're not only doing things ourselves but really
21 engaging with technology and industry. And this
22 is a picture from the industrial consortium day

1 that was here at UNH associated with our annual
2 review. And got a great turnout of some of the
3 best thinkers in the industry and some
4 challenging topics and challenging conversations
5 and again, helping to figure out where we are and
6 what we need to do next.

7 Hydro surveys priorities. We are
8 continuing to refine the hydro health model which
9 we are using to inform some of our near term
10 choices for where we survey.

11 We haven't released it fully yet,
12 partly because we haven't fully documented it
13 yet. And until we expect a lot of questions, and
14 until we can have a good documentation set to go
15 with it, we're not releasing it.

16 But it's, that's really about a risk
17 model for AIS carrying deep draft traffic. And
18 that's not the only reason to survey. So we have
19 in a sort of complimentary way looking at
20 discrepancies. And then looking at a broad
21 interdisciplinary mapping, finish mapping the
22 USEEZ as a big challenge.

1 I was listening this morning during
2 the brainstorming to see whether you all would,
3 were interested in supporting big ocean mapping
4 like that.

5 And I didn't hear, and I was curious
6 to hear that I didn't hear it. But it's
7 something that's worked, working, and it clearly
8 needs to be a big, interdisciplinary effort to
9 out together a challenge, sort of a challenge
10 mapping campaign at that scale.

11 And then lastly we're, we've got a lot
12 of effort through precision navigation and
13 similar efforts for not only surveying but also
14 delivering some next generation navigation
15 products in ports and approaches so that we can
16 make better use of this full resolution multi
17 beam that we have available to us that it's
18 simply not honored in even a comical way in the
19 channel tabulations that we put out now for
20 ports.

21 So Now Coast. Quick show of hands,
22 who's ever typed in Now Coast and used it? Got

1 about half around the table here, about half back
2 there.

3 So that's your second half of your
4 homework when you get on the internet is to take
5 a look at what's in Now Coast. It is, we've been
6 doing it for 15 years or so, yes about 15 years.

7 So this is one of the earliest sort of
8 portals if you will for information, and one of
9 the most mature. It is maintained out of the
10 Coast Survey Development Lab. And in fact the
11 programmers for it are stationed here in Durham
12 at the Joint Hydrographic Center. And they're
13 well integrated.

14 There's a huge amount of weather
15 information that is now in some cases best
16 portrayed and best disseminated through this
17 portal. And so the Weather Service is a huge
18 partner now for this.

19 And as a result, it's gotten really,
20 you know, top priority billing at the Integrated
21 Dissemination Program, IDP, and has really high
22 priority with the Weather Service.

1 And so anyway, it's a sort of
2 bewildering amount of information available
3 there. But it has proven to become to be really
4 popular. So this is historical web statistics.

5 Oh, and there's a mariner view as well
6 that brings up the charts and other things that
7 are more relevant for navigation.

8 Clearly this is the same type of
9 exponential curve that you see for many things on
10 the internet. But it's certainly very clear for
11 Now Coast. And given where the peaks are, we can
12 get a little bit of an idea of when people are
13 using it and why.

14 You know, clearly all the storms and
15 wildfires and, you know, earthquakes, eclipse
16 even they saw a bump associated with the eclipse.
17 So that's anything else I should cover on that,
18 you know, think, E.J.?

19 CAPT VAN DEN AMEELE: There's a
20 comment that Sunday was the busiest day ever, and
21 yesterday was the second busiest day ever in
22 terms of traffic.

1 CAPT ARMSTRONG: I was on it about
2 eight times.

3 RDML SMITH: And the numbers are what,
4 20 million page views a day?

5 CAPT VAN DEN AMEELE: Yes. During
6 Irma it was about 25 million per day, 450 a
7 minute.

8 (Off-microphone comments)

9 RDML SMITH: We do see it excerpted on
10 the media sometimes, but I don't know that
11 there's an active promotion for it. Go ahead,
12 E.J.

13 CAPT VAN DEN AMEELE: I don't have a
14 microphone but, there are a lot of state and
15 local emergency management-type agencies that
16 actually, they built their system using input and
17 feeds from nowCOAST. So they might not be using
18 nowCOAST directly, but they link into it --

19 RDML SMITH: I'll summarize. A lot of
20 emergency managers are using it.

21 MS. MERSFELDER-LEWIS: I'm so sorry,
22 but we are at the end of our time. There are

1 other things going on this afternoon and tonight.

2 RDML SMITH: Total Water? We're doing
3 that too.

4 CHAIR HANSON: Yes, sir. Mr. Kelly?

5 MEMBER KELLY: I've got one aimed at
6 Rich. I am a huge fan of everything coops does.
7 I mean, and just your talk just emphasized what
8 you're doing for safety and navigation and
9 societal issues.

10 Can we expect to continue expansion of
11 what you are doing considering that every time
12 you add a new system, you're taking on
13 maintenance and support obligations, or is there
14 some place where we hit the wall, where we can't
15 continue to proliferate these types of things,
16 because I'm thrilled with the way it's going but
17 I'm just concerned.

18 Are you going to get internal funding
19 or support, or can this continue to move forward
20 is really what I'm asking.

21 MR. EDWING: Okay. Well, thank you
22 Ed. And just for everybody's context, it's a

1 cross share program, public/private partnership.

2 MEMBER KELLY: I love everything
3 except the funding program.

4 MR. EDWING: Yes, I know, I know. But
5 where the partner pays for the establishment and
6 maintenance of the local observing infrastructure
7 and then we're funded through the President's
8 budget to do the program, administration, and
9 data management.

10 And so I'm going to say the Ports
11 program is becoming a bit of a victim of its own
12 success. We've seen over the past few years a
13 very steep increase in the number of ports
14 requests, just not for new ports but for
15 expanding existing ports because in a lot of
16 these port office, one and two centers but they
17 keep adding on.

18 And you've heard me say in some past
19 HSRPs that I could see the day coming when we
20 might reach, you know, the limits of our
21 capacity. And that's really where we're at now.

22 You know, you saw there was, well, it

1 was really just one this past year, but that's
2 because a couple of these other ones slid over to
3 the right. But we're at the point now where as
4 new partners approach, and even for the major
5 enhancements existing ports we're having to say
6 well, we're kind of putting a pause on those
7 because our capacity, there's an internal O&M
8 tail for me as well in terms of contracts and
9 agreements and even just the data management end
10 that we're really at the point where we need to
11 get some things figured out before taking on
12 more.

13 Things have gotten out of balance
14 internally with the budget. So thank you.

15 MEMBER KELLY: Because they're a huge
16 success and there's obvious economic and societal
17 impact that these programs bring to the table.
18 So I think we'll have to take a look at, you
19 know, how we can continue to move that project
20 forward. It's just huge public exposure. And
21 again, it's worth a lot of money to the safety of
22 life and to economic stimulus.

1 CHAIR HANSON: All right, we're out of
2 here, guys. We got a 2:45 catch a bus. And we
3 will reconvene the public meeting tomorrow
4 morning at 0830.

5 (Whereupon, the above-entitled matter
6 went off the record at 2:38 p.m.)
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C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Hydrographic Services Review Panel
Public Meeting

Before: National Oceanic & Atmospheric Administration

Date: 09-12-17

Place: Portsmouth, New Hampshire

was duly recorded and accurately transcribed under
my direction; further, that said transcript is a
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Court Reporter

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