

National Aeronautics and  
Space Administration

**Goddard Space Flight Center  
Wallops Flight Facility  
Wallops Island, VA 23337**



Reply to Attn of: 250.W

February 12, 2010

Mr. David O'Brien  
Habitat Conservation Division  
National Marine Fisheries Service  
7580 Spencer Road  
Post Office Box 1346  
Gloucester Point, Virginia 23062 01930

Dear Mr. O'Brien:

In accordance with the National Environmental Policy Act of 1969 (NEPA), as amended, and the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (MSA), the National Aeronautics and Space Administration (NASA) has prepared a Draft Programmatic Environmental Impact Statement (DPEIS) and Essential Fish Habitat (EFH) Assessment for the proposed Shoreline Restoration and Infrastructure Protection Program (SRIPP) at its Goddard Space Flight Center's Wallops Flight Facility (WFF) on Wallops Island, Virginia.

As the project sponsor, NASA is serving as the lead agency for NEPA and EFH consultation with the National Marine Fisheries Service. The U.S. Department of the Interior, Minerals Management Service (MMS) and the U.S. Army Corps of Engineers (USACE) would undertake actions connected to the SRIPP and are participating in NASA's NEPA process and EFH consultation. The effects of their actions are considered in all project-related environmental documentation, including the enclosed DPEIS and EFH Assessment (Appendix H of the DPEIS). As such, please include all three action agencies in future correspondence regarding the SRIPP.

In cooperation with MMS and USACE, NASA has determined that the proposed SRIPP would adversely affect EFH but the impacts would not be significant. NASA respectfully requests that you review the enclosed DPEIS and EFH Assessment and provide Conservation Recommendations within 60 days of receiving this letter.

If you have any questions or require any additional information please contact me at (757) 824-2319, or Ms. Shari Silbert at (757) 824-2327.

Sincerely,

A handwritten signature in black ink, appearing to read "Joshua A. Bundick", with a long horizontal flourish extending to the right.

Joshua A. Bundick  
WFF NEPA Program Manager

Enclosure

cc:

228/Mr. P. Bull

250/Ms. C. Turner

MMS/Mr. D. Herkhof

USACE /Mr. R. Cole

## Meeting Minutes

Meeting at USFWS office in Gloucester, Virginia: March 30, 2010

Shoreline Restoration and Infrastructure Protection Program EIS

### Attendees (in person)

MMS – Dirk Herkhof  
NASA - Carolyn Turner  
NASA - Joe Mitchell  
NASA - Josh Bundick  
NASA - Paul Bull  
NMFS - Dave O'Brien  
URS - Angela Chaisson  
URS - Jeff Reidenauer  
URS – Shari Silbert  
USACE - Gregg Williams  
USACE - Mark Hudgins  
USACE – Robert Cole  
USFWS – Cindy Schulz (briefly)  
USFWS - Kim Smith  
USFWS - Mike Drummond  
USFWS - Tylan Dean

### Attendees (via phone)

EPA III - Barbara Rudnick  
EPA III - Carol Petrow  
EPA III - Elaina DeGeorgio  
NMFS - Danielle Palmer  
NMFS - John Nichols

### **EFH Discussion:**

John Nichols – Response to draft PEIS is partially written. Main concern is borrow action on Shoals A & B and the open-endedness of action.

Read draft MMS document by Mark Byrnes (permission granted by Coleen Finnegan in Leasing Office to share the draft) – preliminary recommendations include:

1. Limit or set a threshold on the amount of sand removed, especially from Shoal A (smaller shoal than B with greater relief); greater topography equates to greater fish value.
  - a. Recommends setting a 5% cumulative removal over life of the project as a threshold (e.g., Great Gull Bank)
  - b. Initial fill for SRIPP = 3.9Mcu yd of a ~40Mcu yd shoal or ~10% required.
  - c. Larger concern for Shoal A than B (higher fish value); worried about recovery of the shoal
  - d. Don't want another Sandbridge; that shoal has lost +25% of its volume

2. Method of dredging – leading edge of shoal will recover more quickly because it is a depositional area; dredging a static or erosional edge should be avoided (harder to recover).
3. Striping – shallow cuts removed in a slow progression; parallel cuts separated by furrows that promote faster benthic recovery
4. Crests can be removed on the leading edge of the shoal but remove a minor amount or shoal will only minimally recover.

Josh - Promoting sand management plan that could involve a retention structure; possibly even a north groin. We will know better after monitoring. Possibly install a temporary geotextile groin and monitor effects. Any additional structures will have additional NEPA.

Dave O'Brien – Look at hot spots of erosion after the initial fill for where retention structures may need to go.

Josh - How do we handle consultation?

1. How much sand can we get from shallow striping on the western side of Shoal A?
2. How shallow is a shallow stripe? Unknown now – John
3. Will you share draft recommendations before formal consultations go out? Yes – John and Dave

Dredging in a striped pattern will lengthen time on the shoal, slow down dredging, burn more fuel, cause more emissions, and may cause more entrainment. Weeks Marine, Inc. is a dredging contractor that has performed this type of action with Baltimore Corps (talk to Chris Spaur at USACE Baltimore).

EPA – fisheries impacts may be more critical than air impacts from steaming to Shoal B and slower dredging.

Danielle - Risk to turtles is greatest when draghead is off the bottom and lowest when draghead in contact with sediment. She will talk to sea turtle biologist about potential for creating more turtle habitat with dredging in a striped pattern and causing more impacts.

Danielle - NMFS may need to reissue Take Statement – increasing habitat through striping may increase population and require an increase in Take. Takes are given over the life of the project not per cycle.

John - Remainder and renourishment volumes can all be taken from Shoal B if we follow the same dredging management techniques. Striping is a function of scale: deeper and further apart vs shallow and closer. The more shallow will infill and “heal” more quickly.

## **Section 7**

Josh, summary of prior consultation – 2007: 1 sea turtle/2M cu yd (28 loggerheads & 3 Kemps Ridley over project life) based on borrowing sand inside 3 miles of Wallops Island.

**NMFS** - Danielle

1. Based on turbidity effects, dredge process, and entrainment, the current Take Permit will be MUCH lower than the 2007 Permit.

- a. Longer times on a shoal may increase Take
  - b. Quicker in/out the better for turtles
  - c. Furrows creating habitat/stripping may increase Take – will consult with turtle biologist
2. Whale and marine mammal impacts are still the same – dredge speeds will remain under the 10 knots, whale watchers will be on board all vessels.
  3. Dredge noise is a bigger issue – out to 120dB level for harassment. Haven't dealt with it before. Other offices do not consider this a big concern. Unknown level of impacts. Two studies that Danielle will send us to review (Greene and 1 from Kyle Baker).
  4. 120dB extends to 147km – How/Would this impact our Take Statement?
  5. Draft BO by end of April.
  6. How do Navy & shipping acoustics compare to dredging and limits?
  7. The concern arose due to the Noise section in our DPEIS
  8. What do we do if EFH recommends something that is in direct conflict with a Protected Species recommendation? EFH & Protected Species go up the chain for one Take Statement and Letter of Recommendations.
  9. Seasonal restrictions – NMFS is not going to suggest seasonal restrictions because it's not feasible for the project proponent. Takes will be calculated based on worst case time of year scenario.
  10. Current Take may read – 1 turtle/2M cu yd x 50 years w/ less material needing to be dredged = 7 loggerheads & 1 Kemps Ridley – NOT FINAL!!!
  11. Cumulative impacts include other dredging projects, water quality, etc.
  12. Global warming and rising sea temps may increase turtle populations in the Mid-Atlantic and is addressed BRIEFLY in the BO. Changes noted in new research may warrant new consultation. Can be initiated by NMFS if large changes are noted or otherwise by the proponent during tiered NEPA consultation.

#### USFWS - Tylan

1. Recommended including leatherbacks and greens.
  - a. NMFS –considered but non-existent entrainment or turbidity plumes impact to leatherbacks and greens. No seagrass beds for greens, no concentration of jelly fish on shoals for leatherbacks.
  - b. NMFS - No nesting leatherbacks or greens in area.
  - c. Separate Take Statement from USFWS for nesting turtles will be issued
2. Programmatic vs. defined project consultation
  - a. Lack of boundedness or specificity of the program (e.g., north groin)
  - b. Suggested proceeding with informal consultation for programmatic vs. formal consultation at this point
  - c. What does USFWS consider Programmatic vs. Finite?
    - i. Pre-authorize incidental programmatic takes?
    - ii. Can USFWS authorize the proposed actions and state that follow-on actions will require further Section 7 consultation?
  - d. No constraints on seasonality – look at worse case time frames to yield a Take Permit

- e. NASA stated that all the details/specifics of the initial sand placement activities have been provided in the DPEIS.
- f. NASA stated that for sand placement, qualified monitoring staff will search for turtles and Plovers before sand placement
- g. Paul - Possibly work in open water in front of seawall during nesting season and in the existing beach areas in non-nesting season.
- h. Tylan - Will get a reply/BO back as soon as possible or request more information on the programmatic side. He has all the information he needs at this point.
  - i. Paul - No additional information is available for future actions until monitoring has been conducted

### **Action Items**

- NASA – track Chris Spaur (Baltimore District for OC project) and talk about their dredging methodology
- NASA/USACE – identify and map dredging areas on the Shoals based on constraints suggested by NMFS
- NMFS EFH and NASA – estimate how much volume we can get using recommended methods from Shoal A
- NMFS EFH – define depth for shallow dredging?
- NMFS Protected Species- will consult with turtle biologist on impacts from furrows creating turtle habitat
- NMFS Protected Species – will research underwater acoustic impacts
- NMFS Protected Species– sending acoustic research
- NASA/USACE – will collect post dredging bathymetry data (as required by MMS lease agreement) and include in any future tiered NEPA
- NASA/USACE – will conduct pre renourishment dredging monitoring for bathymetry and include in tiered NEPA

From: Bundick, Joshua A. (WFF-2500)  
Sent: Monday, April 05, 2010 8:39 AM  
To: 'John Nichols'; 'David L. O'Brien'  
Cc: Bull, Paul C. (WFF-2280); 'Dirk Herkhof'; 'Wikel, Geoffrey L'; Williams, Gregory G NAO; Mears, George H NAO; Silbert, Shari A. (WFF-200.C)[EG&G, Inc. (WICC)]; 'Jeffrey\_Reidenauer@URSCorp.com'; 'Robert Cole'; 'Roger Amato'  
Subject: EFH Meeting

Importance: High

Gentlemen,

If possible, I would like to schedule a meeting next week to discuss (in more detail) the Wallops Shoreline Program EFH consultation. The project team, consisting of representatives from NASA, MMS, and USACE, would like to discuss its concerns regarding the potential conservation recommendations prior to their being officially issued by NOAA-HCD. In speaking with those familiar with the recently released MMS report, it appears that there are some inherent issues with the modeling that we would like to discuss, especially regarding the striping dredge technique. We also would like to discuss the proposed 5% limitation.

We all feel that it would be mutually beneficial to meet in person to discuss such important issues. At this time I propose that we meet in Annapolis at the NOAA office, which would be a good mid-point for those traveling from Herndon and those of us in the Wallops area. John, would this be OK with you?

Please advise on availabilities. Thanks.

Josh

-----  
Joshua A. Bundick  
Lead, Environmental Planning  
NASA Wallops Flight Facility  
Code 250.W  
Wallops Island, VA 23337  
Phone: (757) 824-2319  
Fax: (757) 824-1819  
Email: Joshua.A.Bundick@nasa.gov

From: John.Nichols@noaa.gov  
Sent: Monday, April 05, 2010 12:27 PM  
To: Bundick, Joshua A. (WFF-2500)  
Subject: Re: EFH Meeting

Josh:  
That is fine. I obviously have no problem with holding a meeting at my office, since it minimizes my travel requirements.

I will be working on completing the NOAA EFH response this week. I realize that there are issues regarding some of the tentative recommendations on harvesting sand from Shoal A. Striping may be an issue within NOAA, since our Protected Resources staff still has concerns regarding turtle impacts.

However, NOAA is firm on limiting the amount of sand harvested by this project; especially on Shoal A.

The 5% rule is an approximate bench mark; if we agree to you taking 3 MCY, you have exceeded it slightly. We will not change our recommendations that harvest be restricted to the west and southwest leading edge of the shoal, and that the majority of the crest be conserved. Our agency takes the conservative route in making recommendations (conservative in protecting the resource). We will not accept a wait and see approach to affecting these shoals. Impacts from this project also have precedent setting issues for opening up other ridge/swale complexes for borrow activities in the future.

What happen to the conference call with Chris Spaur? Is it still on?

## Meeting Minutes

### Teleconference Regarding Essential Fish Habitat Consultation: April 7, 2010

#### Shoreline Restoration and Infrastructure Protection Program PEIS

#### Participants

MMS – Roger Amato  
MMS – Dirk Herkhof  
MMS – Geoff Wikel  
NASA - Josh Bundick  
NASA - Paul Bull  
NMFS - John Nichols  
URS – Alan Niedoroda  
URS - Jeff Reidenauer  
URS – Suzanne Richert  
URS – Shari Silbert  
USACE Baltimore – Chris Spaur  
USACE Norfolk - Gregg Williams

#### EFH Discussion:

- NASA representatives explained a recent geospatial analysis that had been performed. The analysis concluded that dredging an area covering approximately 25% of Shoal A to a depth of 2 meters would likely yield the sand volume necessary to complete the initial beach fill phase of the project.
- Participants then discussed the additional cost that would be incurred if Shoal B were used for initial fill. It is estimated that the additional \$3 million would result in a substantial reduction in sand placement as the construction budget is fixed.
- John Nichols mentioned that NMFS is using MMS guidelines to recommend Shoal B as the preferred borrow site as it is a larger shoal with gentler slopes.
- NASA representatives questioned the origin of the percentage threshold limitation for dredging projects. Chris Spaur explained that the five percent figure that was developed for the Atlantic Coast of Maryland project was a product of consultation among members of his Project Delivery Team and that it was not necessarily based on computer modeling. He also mentioned that the financial implications from employing a conservative dredging plan would have limited effects on project implementation.
- The discussion of modeling continued. Geoff Wikel explained that the CSA International study employed a half-plane spectral wave model (i.e., a spectral wave model generally handles wave directions of up to 45 degrees relative to the orientation of grid) that may have inherent limitations with accurately predicting wave direction in the presence of complex topography and slopes (i.e., sand ridges represent severe condition for accurate refraction and wave focusing prediction), versus the Baird report that uses full-

plane modeling. He also suggested that shoal height is likely a more important factor to consider than a numerical threshold.

- John Nichols expressed his concern regarding the cumulative effects of the project. He explained that NMFS must be conservative in its recommendations and that despite the fact that there may be numerous shoals within the Mid-Atlantic Bight; each one is an important habitat.
- Josh Bundick asked whether NMFS considered the sand that would be lost overboard at the dredge site as permanently removed from the shoal. Following discussion between John Nichols and Gregg Williams, it was decided that this material was rather coarse, and following a relatively short time in suspension, it would likely settle in the same general vicinity of the shoal. As such, only the material that would be placed on the beach would be considered when calculating removal volumes.
- John Nichols suggested considering shortening the length of beach fill so that Shoal B could be used. NASA representatives explained that not only would this result in more frequent future renourishment, but it would also not provide the recommended level of storm damage reduction as recommended by USACE designers. John explained that project cost is not a driving factor when developing EFH Conservation Recommendations.
- Jeff Reidenauer mentioned that the project team had already factored in consideration of Essential Fish Habitat when deciding to remove Blackfish Bank from the list of potential borrow sites.
- Gregg Williams asked John Nichols if NMFS had assigned a monetary value on offshore shoal habitat. John responded that the agency had not.
- NASA representatives inquired about the differing effects on how a shoal is dredged, especially in light of the concept of dredging in a striped pattern to foster quicker infaunal recovery.
- John Nichols re-emphasized the value of the shoals to the marine food web, and that maintaining a shoal's morphometry (by avoiding crests and erosional areas) was a more important consideration than stripe dredging.
- Geoff Wikel mentioned that when comparing the effects on benthic infauna with shoal morphometry, the benthic community will likely recover on a shorter timescale.
- John Nichols mentioned that NMFS is not likely to include stripe dredging as a Conservation recommendation, and that dredging to a depth between 2-2.5 meters would likely be acceptable. John also mentioned that NASA should avoid dredging the highest parts of the shoal crests.
- The discussion concluded with John Nichols requesting several informational items from NASA.

## **Action Items**

- NASA – Identify areas proposed for dredging on Shoal A by Friday, April 9, 2010, and provide a map to John Nichols
- NASA – Estimate how much sand could be obtained from Shoal B given the current cost constraints and provide summary to John Nichols.
- NMFS EFH and NASA – estimate how much volume we can get using recommended methods from Shoal A

From: John Nichols [John.Nichols@noaa.gov]  
Sent: Wednesday, April 07, 2010 4:04 PM  
To: Bundick, Joshua A. (WFF-2500)  
Subject: Wallops Conference Call

Josh:

Just to clarify the NOAA current position, we are still considering Shoal B as the primary source for initial re-construction of the beach.

That is why I requested the figures on the amount of sand that could be obtained, under your project cost ceiling, if Shoal B was the sole source for the initial phase of the project.

Another information request also came to mind; if we were to recommend that only 5% of Shoal A total volume be used for this project (i.e., 2 MCY), and the remainder of sand for the initial phase of the project were to come from Shoal B (1.2 MCY), would this reduce cost, and provide more sand under your cost ceiling?

If our agency goes with Shoal A as the sole source of sand for initial beach re-construction, the 3.2 MCY would be our recommended threshold for removal.

From: Bundick, Joshua A. (WFF-2500)  
Sent: Tuesday, April 13, 2010 4:46 PM  
To: 'John.Nichols@noaa.gov'; 'David L. O'Brien'  
Cc: Bull, Paul C. (WFF-2280); Mears, George H NAO; Williams, Gregory G NAO;  
'Wikel, Geoffrey L'; Silbert, Shari A. (WFF-200.C)[EG&G, Inc. (WICC)];  
Jeffrey\_Reidenauer@URSCorp.com  
Subject: Requested info - SRIPP EFH  
Attachments: Shoal A Volume Analysis 3D Map\_Rev1.pdf; Shoal A Volume Analysis 3D  
Map\_Onetoone.pdf; Shoal A Volume Analysis Map.pdf

Importance: High

Good Afternoon,

As requested by John at our last telecon regarding the Wallops SRIPP EFH consultation, I am providing information regarding Shoal A volume, proposed depth of cut, and a map depicting the proposed dredge area. Also is information regarding impacts to the project if Shoal B were used for the initial fill cycle. Please see below and attached.

**Shoal A Volume:** Based upon analysis above the 72' depth contour, there is approximately 68 MCY on the shoal. This pans out to about 4.7% of the shoal's total volume for the initial fill cycle. The attached map presents these results graphically. Also, please keep in mind that there is a 35:1 vertical exaggeration. To put this into perspective, I have also included a 1:1 image.

**Proposed Depth of Cut:** We have calculated that we can remove the needed volume of material from Shoal A with a 2-meter cut from within the southwest quadrant depicted on the map entitled "Shoal A Volume Analysis Map."

**Project Impacts:** If we were to obtain all initial fill sand from Shoal A, we would be short approximately 310,000 CY of fill. If we were to remove 2.0 MCY from Shoal A and 1.2 MCY from Shoal B, we would be short approximately 115,000 CY of fill. Clearly, these are substantial impacts to our proposed project and design template.

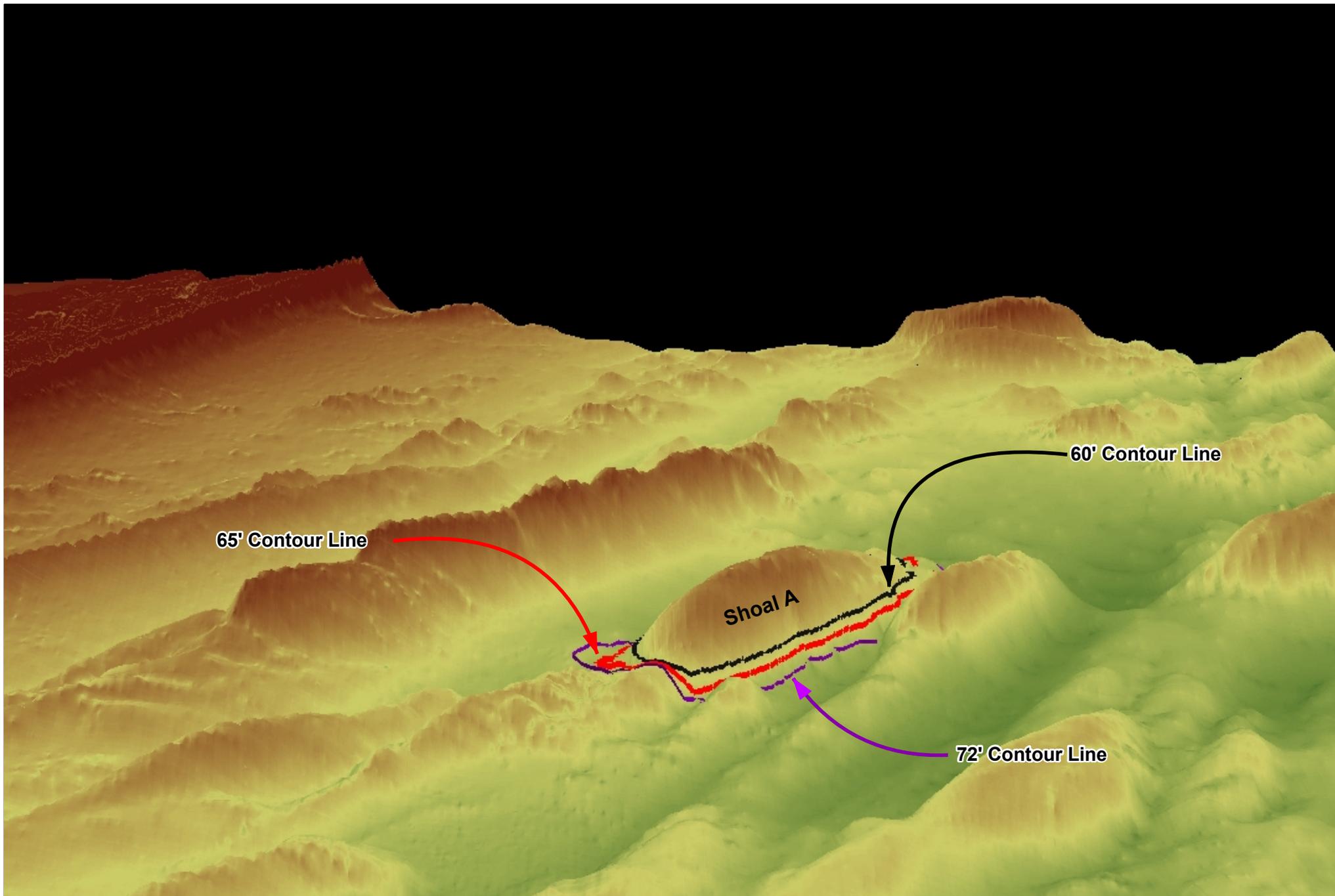
Finally, I would like to try to set up a call with Mark Byrnes of Applied Coastal Research and Engineering to discuss his thoughts on the percentage threshold limitation and how what was applied to the ACM project does not necessarily apply to ours. I have left a message with him and he will be in the office on Thursday. I will let you know what we are able to work out. Based on the volumes that we have calculated, it seems that the 5% limitation might not be an issue for the initial fill, but it could still drive renourishment costs up substantially, and I think it would be worthwhile to have Mark share his thoughts and educate the larger group.

Anyway, I think this is all of the requested information. Please don't hesitate to let me know if you have any questions. We look forward to continued coordination on the project.

Thanks,

Josh

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Joshua A. Bundick  
Lead, Environmental Planning  
NASA Wallops Flight Facility  
Code 250.W



Vertical Exaggeration: 1:35

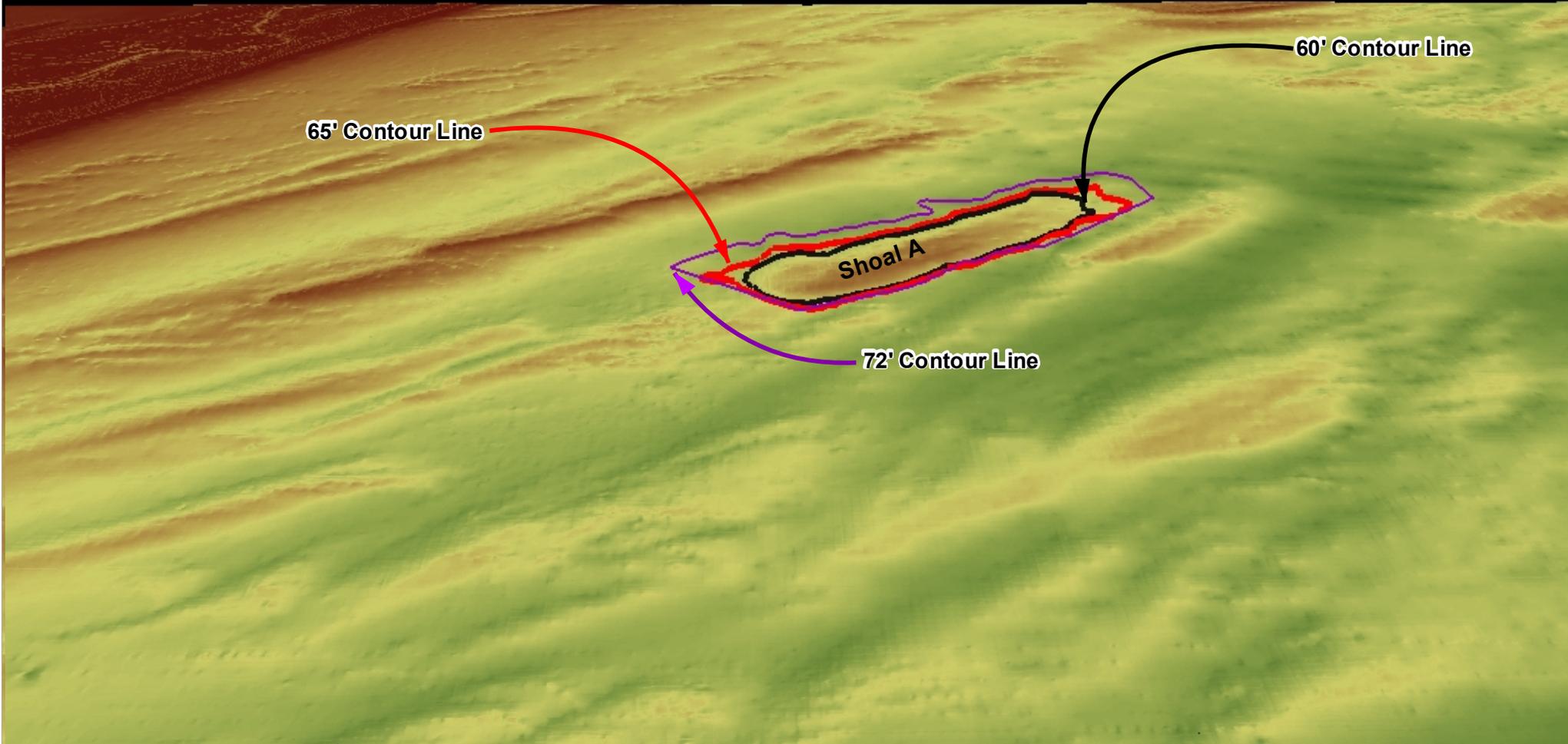
### Shoal A Volume Analysis 3D Map

Z Unit Conversion: Meters to Feet, 3.2810

**Volume Calculations Based Upon:**

NOAA Ocean City, MD 1/3 arc-second MHW Tsunami Inundation DEM  
DEM Development Report: [http://www.ngdc.noaa.gov/mgg/inundation/tsunami/data/ocean\\_city\\_md/ocean\\_city\\_md.pdf](http://www.ngdc.noaa.gov/mgg/inundation/tsunami/data/ocean_city_md/ocean_city_md.pdf)

Volume Above 60' Depth Contour: 30,544,000 Cubic Yards  
Volume Above 65' Depth Contour: 44,371,000 Cubic Yards  
Volume Above 72' Depth Contour: 67,845,000 Cubic Yards



Vertical Exaggeration: 1:1

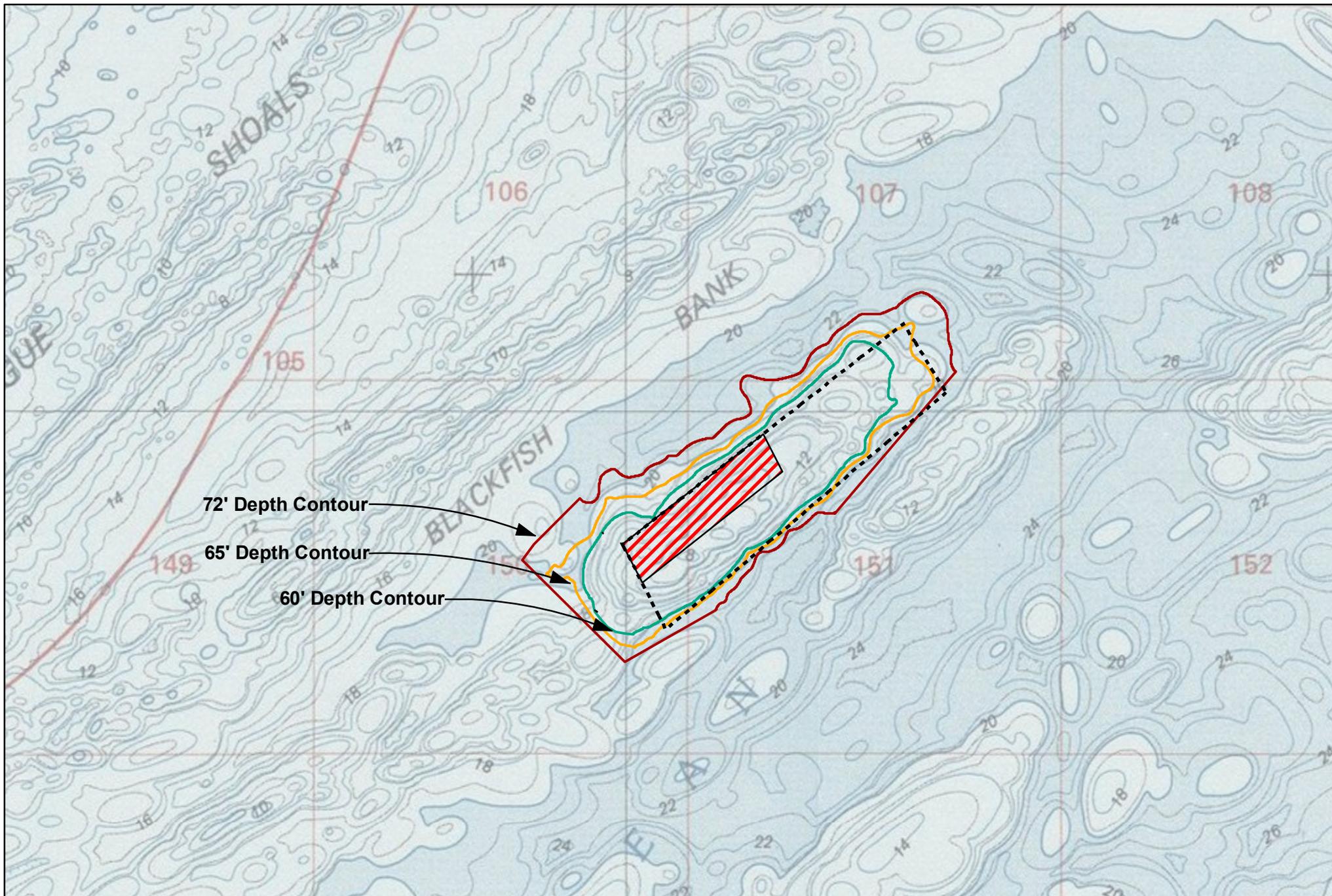
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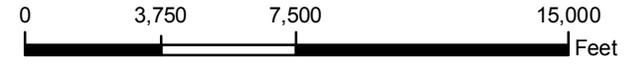


72' Depth Contour  
 65' Depth Contour  
 60' Depth Contour

### Shoal A Volume Analysis Map

-  Shoal Study Limits
-  Proposed Dredging Area
- Dredge Volume= 3,200,000 Cubic Yards

|                                 |                        |
|---------------------------------|------------------------|
| Volume Above 60' Depth Contour: | 30,544,000 Cubic Yards |
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From: Bundick, Joshua A. (WFF-2500)  
Sent: Wednesday, April 14, 2010 8:34 AM  
To: Bundick, Joshua A. (WFF-2500); John.Nichols@noaa.gov; David L. O'Brien  
Cc: Bull, Paul C. (WFF-2280); Mears, George H NAO; Williams, Gregory G NAO;  
Wikel, Geoffrey L; Silbert, Shari A. (WFF-200.C)[EG&G, Inc. (WICC)];  
Jeffrey\_Reidenauer@URSCorp.com  
Subject: RE: Requested info - SRIPP EFH

The third bullet should read "SHOAL B" and that would make us come up short due to our inability to afford that quantity of sand from the more "expensive" shoal.

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Joshua A. Bundick  
Lead, Environmental Planning  
NASA Wallops Flight Facility  
Code 250.W  
Wallops Island, VA 23337  
Phone: (757) 824-2319  
Fax: (757) 824-1819  
Email: Joshua.A.Bundick@nasa.gov

From: Bundick, Joshua A. (WFF-2500)  
Sent: Tuesday, April 13, 2010 4:46 PM  
To: 'John.Nichols@noaa.gov'; 'David L. O'Brien'  
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Silbert, Shari A. (WFF-200.C)[EG&G, Inc. (WICC)]; Jeffrey\_Reidenauer@URSCorp.com  
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on Thursday. I will let you know what we are able to work out. Based on the volumes that we have calculated, it seems that the 5% limitation might not be an issue for the initial fill, but it could still drive renourishment costs up substantially, and I think it would be worthwhile to have Mark share his thoughts and educate the larger group.

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Thanks,

Josh

-----  
Joshua A. Bundick  
Lead, Environmental Planning  
NASA Wallops Flight Facility  
Code 250.W  
Wallops Island, VA 23337  
Phone: (757) 824-2319  
Fax: (757) 824-1819  
Email: Joshua.A.Bundick@nasa.gov

National Aeronautics and Space Administration  
**Goddard Space Flight Center**  
Wallops Flight Facility  
Wallops Island, VA 23337-5099



May 17, 2010

Reply to Attn of: 250.W

Mr. Peter Colosi  
Assistant Regional Administrator  
Habitat Conservation Division  
National Marine Fisheries Service  
55 Great Republic Drive  
Gloucester, Massachusetts 01930-2276

Dear Mr. Colosi:

On April 19, 2010, the National Aeronautics and Space Administration (NASA) received your Essential Fish Habitat (EFH) Conservation Recommendations for the Wallops Flight Facility Shoreline Restoration and Infrastructure Protection Program. NASA will give your recommendations full consideration as we develop the Final Programmatic Environmental Impact Statement for this project. Pursuant to section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), NASA is required to respond to your EFH Conservation Recommendations within 30 days of receiving them. However, the final decision on this project will not be made until all public comments have been reviewed and appropriate changes made to the document. We anticipate that this will occur by July 2010. At that time, NASA will provide the response required by the MSA, which will be given to you at least 30 days before the Record of Decision is signed if the response is inconsistent with any of your EFH Conservation Recommendations.

Thank you for your interest in this worthwhile project. If you have any additional questions, please don't hesitate to contact me at (757) 824-2319 or at [Joshua.A.Bundick@nasa.gov](mailto:Joshua.A.Bundick@nasa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Joshua A. Bundick". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Joshua A. Bundick  
Lead, Environmental Planning

cc:

MMS/Mr. D. Herkhof  
NMFS/Mr. J. Nichols  
USACE/Mr. R. Cole  
USACE/Mr. G. Mears

From: Bundick, Joshua A. (WFF-2500)  
Sent: Tuesday, May 18, 2010 3:52 PM  
To: 'John.Nichols@noaa.gov'  
Subject: Examples

John,

Hope all is well. We are currently working on a response to your EFH Conservation Recommendations.

Quick question—

Can you point me to other, similar projects, where NOAA Fisheries has specified threshold limitations for sand removal from offshore shoals? We are having difficulty tracking down representative examples, and any that you could provide would be helpful.

Thanks,

Josh

-----  
Joshua A. Bundick  
Lead, Environmental Planning  
NASA Wallops Flight Facility  
Code 250.W  
Wallops Island, VA 23337  
Phone: (757) 824-2319  
Fax: (757) 824-1819  
Email: Joshua.A.Bundick@nasa.gov

From: John Nichols [John.Nichols@noaa.gov]  
Sent: Tuesday, May 18, 2010 3:59 PM  
To: Bundick, Joshua A. (WFF-2500)  
Subject: Re: Examples

One example that I was involved in was the Atlantic Coast of Maryland shoreline stabilization project, and the Great Gull Bank borrow site. We put limitations on the % of borrow to be removed (in total) from the shoal, and specific locations where material could be removed on the shoal.

From: Bundick, Joshua A. (WFF-2500)  
Sent: Wednesday, May 19, 2010 11:27 AM  
To: 'John Nichols'  
Cc: Silbert, Shari A. (WFF-200.C)[EG&G, Inc. (WICC)]  
Subject: RE: Examples  
Attachments: Requested info - SRIPP EFH

John,

Are you aware of any others in the NER, perhaps others in other regions?

Also, never heard back from you regarding the re-calculated shoal volumes, sent via email on 4/13/10, and attached to this email. Have you had a chance to review those images, and if so, could you share your thoughts on the volumes?

Thanks,

Josh

-----  
Joshua A. Bundick  
Lead, Environmental Planning  
NASA Wallops Flight Facility  
Code 250.W  
Wallops Island, VA 23337  
Phone: (757) 824-2319  
Fax: (757) 824-1819  
Email: Joshua.A.Bundick@nasa.gov

From: John Nichols [John.Nichols@noaa.gov]  
Sent: Wednesday, May 19, 2010 4:56 PM  
To: Bundick, Joshua A. (WFF-2500)  
Subject: Re: Examples

Josh:

I am not aware of other examples of limiting sand ridge borrow throughout the NER. That does not mean there aren't any. You could try contacting Karen Greene of our Sandy Hook, NJ office, (732) 872-3023, since she reviews sand borrow projects off NJ and Delaware. Nationwide, I suggest looking to the Southeast Region Habitat offices, for I am sure they have similar projects along the Atlantic and Gulf Coasts. I would suggest accessing the NOAA home website for locations and contacts on Southeast Regional Habitat Offices.

NMFS does not have a nationwide policy on sand ridge borrow. Those policies that may exist within Regions likely differ between Regions. Remember that scientific literature on the ecological values of sand ridges is brand new, as are borrow methods for sand ridge conservation. There is always a lag in the development of government policies in the face of new information. Unfortunately, development of nationwide policies often come too late; i.e., after specific habitats are threatened with complete loss of resource value by human activities. It is not acceptable to allow un-restricted borrow activities to continue until habitats and resources are threatened. MMS guidance, which we used in our comments, although rudimentary, exists now for up-front protection of mid-Atlantic sand ridge/swale complexes.

Your re-calculated shoal volumes were taken into consideration in our Regional comments. We are concerned that the re-calculated volumes may be inflated, and incorporate areas that extend beyond the actual basal foot print of the shoal. Additionally, our primary concerns pertain to the shoal crests and maximum shoal elevations. Because of the potential for post-borrow slumping, the borrow volumes and areas we recommend are also based on shoal morphometry, and provide conservative measures to better ensure that shoal elevations will remain unchanged following borrow for this project by keeping your actions a sufficient distance from the crests.

National Aeronautics and  
Space Administration

**Goddard Space Flight Center  
Wallops Flight Facility  
Wallops Island, VA 23337**



June 25, 2010

Reply to Attn of: 250.W

Mr. Peter Colosi  
Assistant Regional Administrator  
Habitat Conservation Division  
National Marine Fisheries Service  
55 Great Republic Drive  
Gloucester, Massachusetts 01930-2276

Dear Mr. Colosi:

I would like to thank you and your staff for the thorough review of our February 2010 Draft Programmatic Environmental Impact Statement (PEIS) and Essential Fish Habitat (EFH) Assessment for the Wallops Flight Facility (WFF) Shoreline Restoration and Infrastructure Protection Program (SRIPP). We are in receipt of your April 19, 2010 letter that contains the National Marine Fisheries Service's (NMFS) EFH Conservation Recommendations regarding the proposed project. In accordance with Section 305(b)(4)(B) of the Magnuson-Stevens Fisheries Management and Conservation Act (MSA), NASA and its Cooperating Agencies [Minerals Management Service (MMS) and U.S. Army Corps of Engineers (USACE)] offer responses to your Recommendations.

#### Overall Project Direction

Our project team has made it a priority to protect and preserve EFH while balancing the need to protect mission-critical assets. In the early planning stages of the SRIPP, we evaluated the possibility of dredging sand from several offshore shoals including Chincoteague Shoal and Blackfish Bank. Both shoals are substantially closer to the Wallops Island project site than Shoals A and B and each shoal likely has enough sand of compatible grain size to meet the needs of the SRIPP.

However, given its proximity to shore, Chincoteague Shoal was eliminated as a sand source due to the possible negative impacts to the Assateague Island shoreline from dredging and lowering the shoal height. Because Blackfish Bank was identified as an important fishing ground during a survey of commercial and recreational fishermen, and due to potential impacts to the Assateague shoreline, NASA also eliminated this shoal from further consideration. Consequently, NASA evaluated Shoals A and B, both of which are further offshore but still contain an adequate volume of sand with compatible grain size for placement along the shoreline. These shoals are not ideal locations as the increased distances from the sand placement site will certainly result in

higher project costs, increased fuel consumption, longer construction periods, and increased air emissions.

### Offshore Shoals in Context

The offshore shoals evaluated for the SRIPP are not unique habitats, but part of a complex of shoals that are present on the inner shelf off the Delmarva coast (Swift and Field, 1981). A recent study by Dibajnia and Nairn (2010, OCS Study MMS 2010-xxx) identified and examined 181 shoals between Delaware and Chesapeake Bays. However, many more shoals are present in the region, as the study was limited to offshore (shore-detached) shoals between the 10 and 40 meter (m) (33 and 131 feet [ft]) depth contour and greater than 2 kilometers (1.2 miles) in length.

The ecological value of the shoals of the mid-Atlantic, and in particular their value as EFH, is inconclusive due the limited number of studies conducted, sampling design limitations, and narrow geographic scope. CSA International, Inc. et al. (2009, OCS Study MMS 2010-010) reports that; “For most managed species relatively little is known regarding the use of shoals and ridges as EFH” (page 134), and “The role of shoals as potential settlement habitat remains not well known for many species” (page 135). The paper by Vasslides and Able (2008) cited in your April 19, 2010 letter used one transect across one shoal off southern New Jersey. While the authors did report 61 species, only 6 were Federally-managed species. In addition, Able et al. (2006) acknowledge the limitations of their study: (1) the data analyzed and reported were from only one year of data and that “Recent analysis suggests that longer-term changes such as climate effects may influence settlement habitats...,” and (2) different gear was used between the estuary and ocean samples “...that could bias results.” For their 2-year study on the inner continental shelf of the Mid-Atlantic Bight, Slacum *et al.* (in press) stated that “There was a trend of greater abundance, species richness, and species diversity in flat-bottom habitats than shoal habitats...”

### Dredging Techniques and Effects on Shoals as EFH

We know of no published reports or studies that recommend specific dredging thresholds for offshore shoals. Additionally, published reports do not recommend avoiding the shoal crest when dredging. For example, CSA International, Inc. et al. (2009, OCS Study MMS 2010-010) recommend that “Excavation should occur on shoal crests and higher areas of the leading edge rather than lower areas of the shoals because of greater exposure to wave-generated turbulence and greater sediment mobility, which potentially results in more rapid sediment reworking and site infilling, and likely would induce the benthic community to recover more rapidly” (page ES-8). Slacum *et al.* (in press) suggest that “...the crests of shoals where species diversity appears relatively lower could be targeted for mining.” In addition, guidelines contained in Dibajnia and Nairn (2010, OCS Study MMS 2010-xxx) do not provide recommendations for avoiding dredging of shoal crests.

In summary, we do not concur with all of your EFH Conservation Recommendations. Below, we provide a specific response to each Recommendation in your April 19, 2010 letter.

**Recommendation 1:**

*NMFS will not object to limited amounts of sand being removed from each shoal. However, because Shoal B has a larger total volume than Shoal A (70 MCY vs. 40 MCY), and has more-gently sloped walls (resulting in less slumping of material following dredge excavations), more material can be removed from Shoal B over the life of this project without affecting its elevations and geomorphic features. Removal of sand borrow from Shoal B should not exceed 5.6 MCY (8% of its total volume), for the life of the project.*

Response: The volumes of the shoals presented in the DPEIS and EFH Assessment were estimates. Since issuing the Draft, we have performed detailed computer-based volumetric analyses of Shoals A and B. Furthermore, we undertook an analysis of the shoal parameters similar to the evaluation presented in Dibajnia and Nairn (2010, OCS Study MMS 2010-xxx). Based on the surrounding bathymetry, we estimate a Base Depth for Shoal A of approximately 22 m (72 feet [ft]) and 25 m (82 ft) for Shoal B. Cross shelf profiles generated through the shoals indicate our rationale for selection of these depths (Figures 1 and 2). With these subsequent analyses, it is evident that the total volumes of sand for Shoals A and B that were presented in the Draft PEIS and EFH Assessment were underestimated at 40 million cubic yards (MCY) and 70 MCY, respectively. The revised analyses indicate that the shoals contain approximately 68 and 132 MCY, respectively.

In developing the SRIPP, we are balancing economic, environmental, and engineering considerations. For example, the potential use of Blackfish Bank and Chincoteague Shoals was eliminated from the project due to environmental concerns at a substantial cost to the SRIPP budget over its lifetime. We understand NMFS's mandate to protect EFH but we do not agree with shoal dredging thresholds that create an imbalance in the economic and environmental considerations. In addition, the relative value of these specific shoals to fish, fisheries, and EFH is not that clear—shoals may be an important habitat but they are not a rare habitat in the mid-Atlantic. We assume that the thresholds presented were based on the Atlantic Coast of Maryland (ACM) project which was also faced with balancing economics, engineering, and the environment. For ACM, the USACE was able to find the necessary volume within close proximity to the project area and maintain a conservative volume threshold while keeping the project within budget constraints. Given different project factors for the SRIPP, these thresholds are unnecessarily conservative and do not give consideration to all factors dictating the success of the project.

We agree that it is important to maintain the geomorphic integrity of the shoals and would implement dredging best management practices such as shallow dredging (further detailed in response to Recommendation 5, below). However we cannot concur with a recommendation that could have millions of dollars of implications in the near and long term and would not provide adequate volume requirements needed for the SRIPP. We plan to use Shoal A for the entire initial fill volume and would evaluate the potential use of either Shoal A or B for renourishment in the future.

**Recommendation 2:**

***Borrow from Shoal A should not exceed 2 MCY of material (5% of its total volume), for the life of the project. If Shoal A is used for Phase 1 (beach re-construction), the remainder of the material needed for Phase 1 (1.2 – 1.9 MCY) should be taken from Shoal B.***

Response: As expressed in our response to Recommendation 1, we are concerned that assigning a removal threshold without appropriate justification is unwarranted. We plan to obtain the entire initial fill volume (approximately 3.2 MCY) from Shoal A and would consider revisiting Shoal A for renourishment only after survey and analyses of post-dredge shoal recovery, and subsequent consultation with your agency.

**Recommendation 3:**

***On both Shoal A and B, sand should be removed only from the depocenters of the shoal (active accretional features), generally located on the southern or southwestern downdrift wall of the shoal. These areas should be definitively demarcated on a bathymetric map of each shoal, to be approved by NMFS prior to release of the final EIS; and understood by the dredge contractor prior to sand harvest.***

Response: We agree that targeting active accretional shoal features will likely minimize long term effects to geomorphology and habitat value. Figure 3 depicts the long term accretional and erosional areas of the shoals based on bathymetric changes from 1934 to 2002 (the most recent available) using bathymetric data from NOAA. As indicated on Figure 3, over the long term the southern and eastern portions of Shoal A are accreting. The southern part of the landward side of the shoal is shown as eroding over the long term. These patterns are consistent with the observations on Fenwick Shoal presented in USACE (2008, Figure 2-7, modified from Hayes and Nairn (2004)). We plan to avoid dredging the erosional area within the 2-square-mile study area shown on Figure 3 to the extent practicable. Since we are only targeting Shoal A for initial fill, we will evaluate the use of Shoal B for renourishment events in the future as needed.

**Recommendation 4:**

***Under no circumstances should sand be removed from the erosional or static features of each shoal, including the seaward or east walls, and upper crests. Sand excavation by the dredge should occur only on the downdrift wall of the shoal below the minus 10 meter (MLL) contour on the crest of Shoal A; and below the minus 12-meter MLLW contour on the crest of Shoal B.***

Response: We concur that removing sand from erosional shoal features would have a more detrimental effect to the long term maintenance of shoal geomorphology. However, regarding the avoidance of shoal crests, Dibajnia and Nairn (2010, OCS Study MMS 2010-xxx) state that there is potential for recovery of shoal crest height provided that dredging cut depth is not excessive. Therefore, we do not concur with your recommendation to avoid shoal crests.

Based on our analysis of the bathymetric changes in Shoal A from 1934-2002, the seaward or east flank is accreting. As a result, we will target these areas for dredging to the extent practicable, but will also dredge material from the crests. According to geotechnical sampling of the shoals, the crests of the shoals contain coarser sediments compared to the east (seaward)

flank thereby reducing the total volume needed for the project, the duration of activities, and the associated environmental impacts.

**Recommendation 5:**

*Excavation should be shallow in depth on both shoals, not extending below 2 meters on the existing bottom.*

Response: We agree that providing a shallower excavation over a larger surface area will minimize adverse effects to shoal geomorphology; however, shallower dredge cuts translate into a larger dredge area which would cause more direct impacts to benthic habitat, benthic communities, and trophic impacts to fish communities. We will avoid dredging deep pits and will strive for a uniform cut depth to the greatest extent practicable. Provided we can obtain the volume necessary, we will restrict the dredge cut depth to 2 m during the initial dredge event. We will evaluate the depth of dredge cuts for renourishment events in the future as needed.

**Recommendation 6:**

*Pre- and post-borrow bathymetric maps of each shoal should be provided to NMFS for review and comment (post-borrow map corresponding to the period immediately following borrow for Phase 1 of the project).*

Response: We concur and will provide NMFS pre- and post-borrow bathymetric maps of the dredged areas. The post-borrow survey will be performed soon after dredging is completed, likely not more than two weeks following completion of the initial fill phase of the project. We will follow standard USACE bathymetric survey procedures as stated in USACE survey manual publication number EM 1110-2-1003 (USACE, 2002).

**Recommendation 7:**

*We recommend that re-construction of the NASA beach during Phase I of the project be done in long-shore sections (e.g., beach and dune reconstruction be completed in 2,000 linear foot sections, with one section completed before moving to the next adjacent section), to reduce project cost, and increase the feasibility of using both shoals as borrow sources for Phase I (Rick Schmidt, Weeks Marine; 2010 personal communication; (985) 875-2500).*

Response: We appreciate your recommendation for reducing project costs; however, we will defer to the contractor that is ultimately selected to implement the most cost effective method for beach fill.

**Recommendation 8:**

*NASA should develop a beach monitoring protocol and sand management plan, to be implemented following Phase I construction of the restored beach. The plan should include the following components:*

- *Delineation of areas of significant sand loss (vertical and spatial loss) from the nourished beach, with estimation of annual CY of sand loss*
- *Identifying/constructing of structural components (groins, offshore parallel stone breakwaters), as prescribed by the sand management plan, to minimize sand loss*

Response: We have developed a beach monitoring plan as part of the PEIS, which includes your recommended components. Regarding identification and construction of rock sand retention structures, we feel that our adaptive design and management philosophy for the project will enable us to make informed decisions in the future regarding such construction based on empirical data obtained from our monitoring efforts.

**Recommendation 9:**

*The proposed dune covering the existing and new seawall should be planted with native dune community vegetation (e.g., American beachgrass [Ammophil spp.], saltmeadow cordgrass [Spartina patens]) to stabilize dune material. The dune plant community should be re-planted/maintained, as needed.*

Response: We agree that planting the created dune with native plants would be an effective measure for stabilizing the feature and capturing wind-blown sand to perhaps increase its size over time and reduce renourishment requirements. As such, we will include dune planting as a contractual requirement for the project. Maintenance of the plantings will be performed as funds allow.

**Recommendation 10:**

*NOAA strongly supports the use, and expansion (where feasible) of the North Wallops Island borrow site for beach re-nourishment, and to reduce borrow requirements from Shoal B for the life of the project.*

Response: We appreciate your comment regarding the backpassing of sand from North Wallops Island for renourishment fill; however at this time we are unable to accurately define the extent of that activity. Substantial concern has been raised by other resource agencies (e.g., U.S. Fish and Wildlife Service, Virginia Department of Game and Inland Fisheries, and U.S. Environmental Protection Agency) regarding the effects of this proposal as it could detrimentally affect habitat valued for its continuing support of federally and state listed species. We may implement this borrow site alternative in the future, but would only do so after undertaking a much more detailed evaluation of its potential effects on project economics and the environment.

**Recommendation 11:**

*NOAA recommends that NASA implement a long-term program for increasing the integrity and elevation of the existing and proposed seawall to improve protection of NASA infrastructure. Improved seawall design may ultimately reduce the continued need for sand fill on the beach.*

Response: We will continue to maintain the integrity of the existing seawall as funds allow.

Again, thank you for your interest in this project. If you have any additional questions regarding our responses, please do not hesitate to contact me at (757) 824-2319 or at [Joshua.A.Bundick@nasa.gov](mailto:Joshua.A.Bundick@nasa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read 'J.A. Bundick', with a long horizontal flourish extending to the right.

Joshua A. Bundick  
Lead, Environmental Planning

Enclosures

cc:

200/Ms. C. Massey  
220/Mr. W. Phillips  
228/Mr. P. Bull  
250/Ms. C. Turner  
MMS/Mr. D. Herkhof  
MMS/Mr. G. Wikel  
USACE/Mr. R. Cole  
USACE/Mr. G. Mears

## **Literature Cited**

Able, K.W., M.P. Fahay, D. A. Witting, R.S. McBride, and S.M. Hagan. 2006. Fish settlement in the ocean vs. estuary: Comparison of pelagic larval and settled juvenile composition and abundance from southern New Jersey, U.S.A. *Est. Coast. Shelf Sci.* 66: 280 – 290.

CSA International, Inc., Applied Coastal Research and Engineering, Inc., Barry A. Vittor & Associates, Inc., C.F. Bean, L.L.C., and Florida Institute of Technology. 2009. Analysis of Potential Biological and Physical Impacts of Dredging on Offshore Ridge and Shoal Features. Prepared by CSA International, Inc. in cooperation with Applied Coastal Research and Engineering, Inc., Barry A. Vittor & Associates, Inc., C.F. Bean, L.L.C., and the Florida Institute of Technology for the U.S. Department of the Interior, Minerals Management Service, Leasing Division, Marine Minerals Branch, Herndon, VA. OCS Study MMS 2010-010. 160 pp. + apps.

Dibajnia, M. and R.B. Nairn. 2010. Investigation of Dredging Guidelines to Maintain and Protect the Integrity of Offshore Ridge and Shoal Regimes. U.S. Department of the Interior, Minerals Management Service, Leasing Division, Marine Minerals Branch, Herndon, VA. OCS Study MMS 2010-xxx. 150 pp. + apps.

Hayes, M.O. and R.B. Nairn. 2004. Natural maintenance of sand ridges and linear shoals on the U.S. Gulf and Atlantic continental shelves and the potential impacts of dredging. *Journal of Coastal Research*, 20(1): 138 – 148.

Slacum, Jr., H.W., W.H. Burton, E.T. Methratta, E.D. Weber, R.J. Lanso, & J. Dew-Baxter. (*in press*). Assemblage Structure in Shoal and Flat-bottom Habitats on the Inner Continental Shelf of the Middle Atlantic Bight, U.S.A. *Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science*.

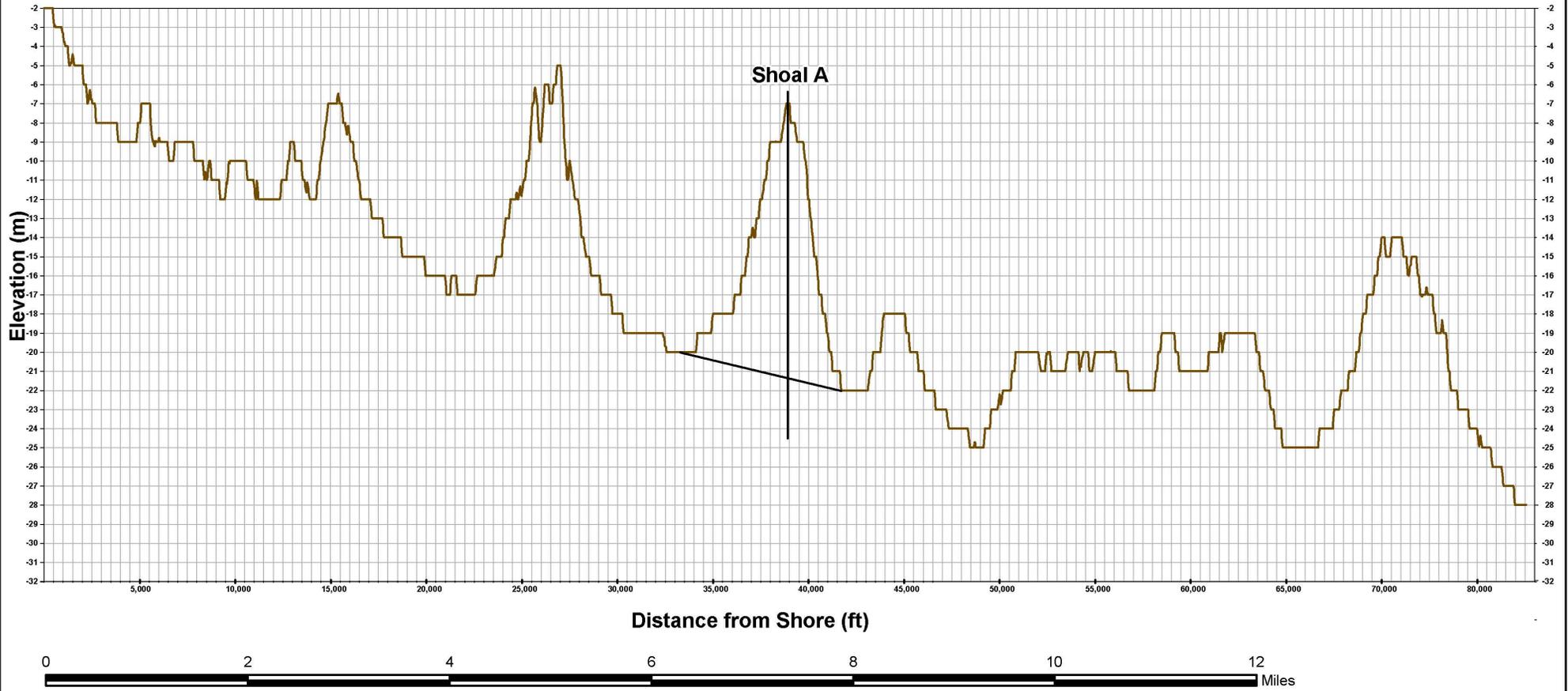
Swift, D.J.P. and M.E. Field. 1981. Evolution of a classic sand ridge field: Maryland sector, North American inner shelf. *Sedimentology* 28: 461 – 482.

USACE. 2002. Engineering and Design – Hydrographic Surveying. EM 1110-2-1003.

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Vasslides, J.M. and K.W. Able. 2008. Importance of shoreface sand ridges as habitat for fishes off the northeast coast of the United States. *Fish. Bull.* 106: 93 – 107.

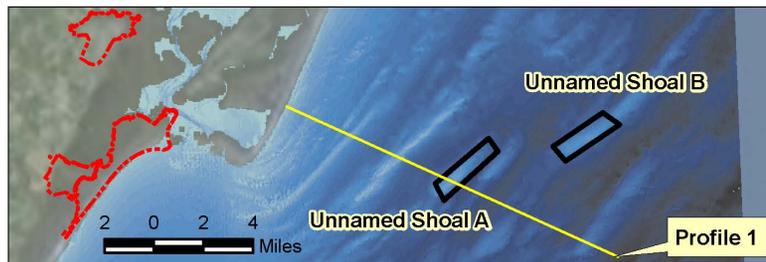
# Profile 1



 Bathymetric Surface Along Transect

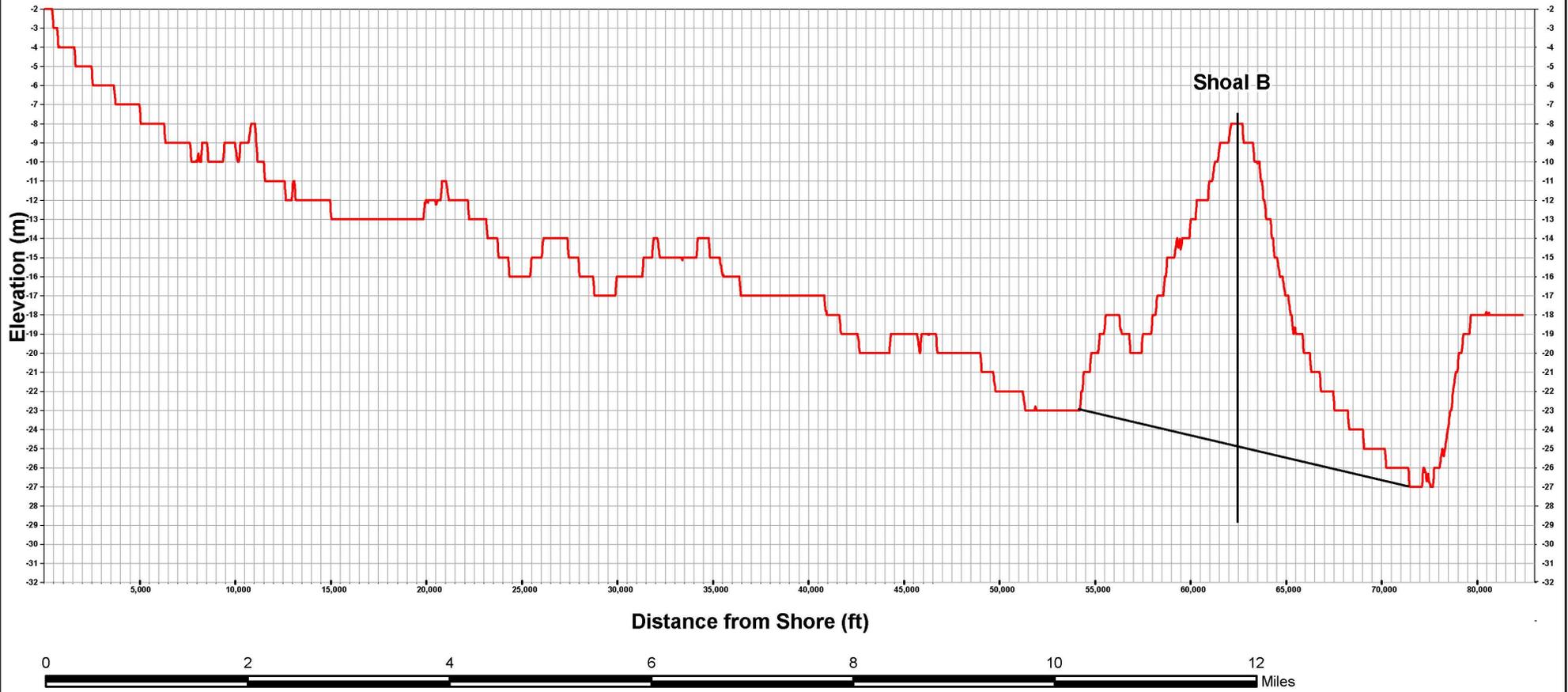
Vertical Exaggeration = 1000x

-  Shoal Location
-  WFF Boundary



|   |                       |
|---|-----------------------|
| Title: Profile 1  |                       |
|  | URS Proj No: 15301785 |
|   | Figure: 1             |
| Client : NASA   |                       |
| Shoreline Restoration Environmental Impact Statement                                  |                       |

# Profile 2



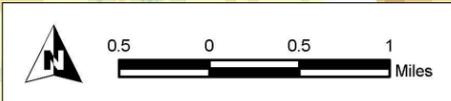
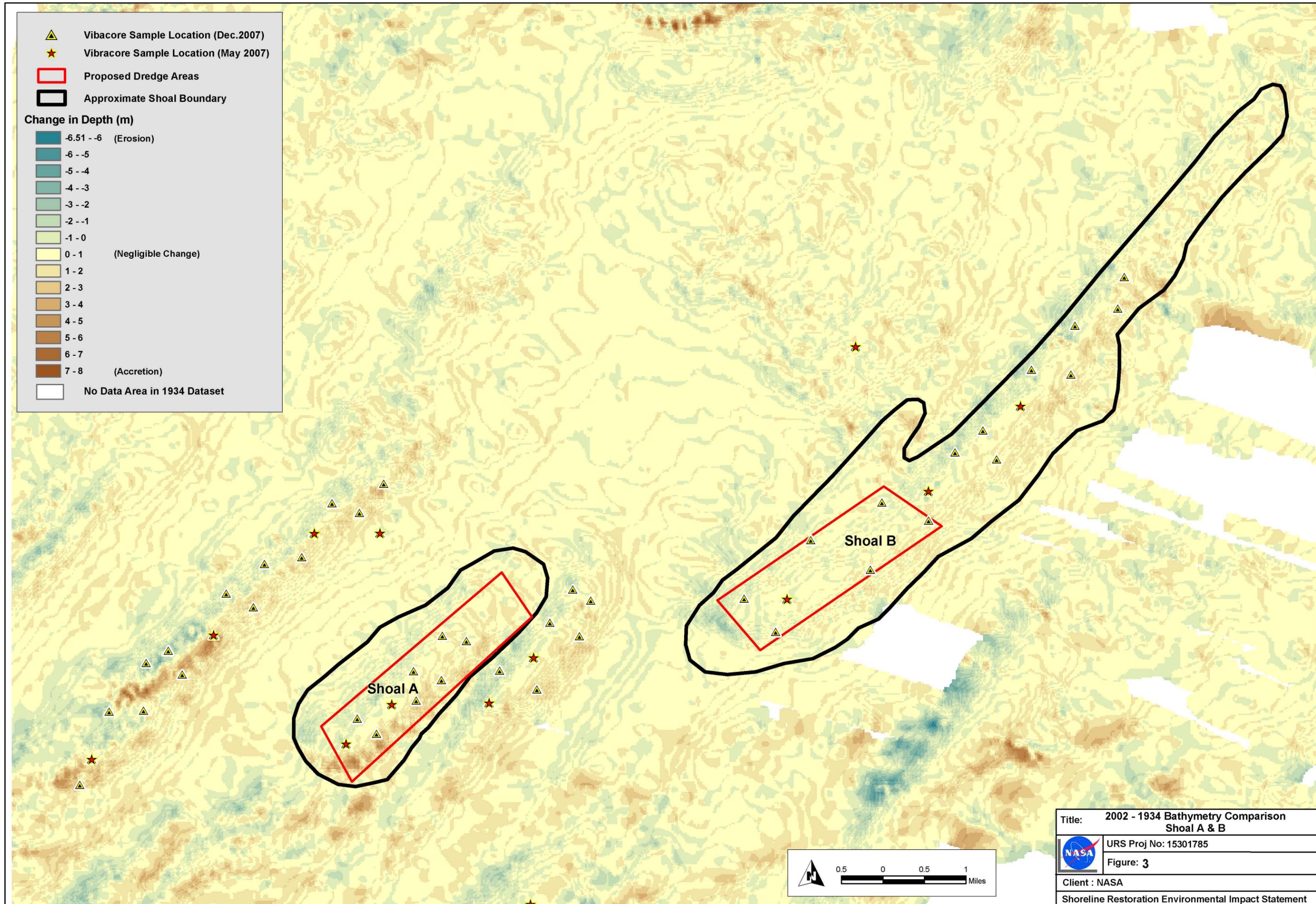
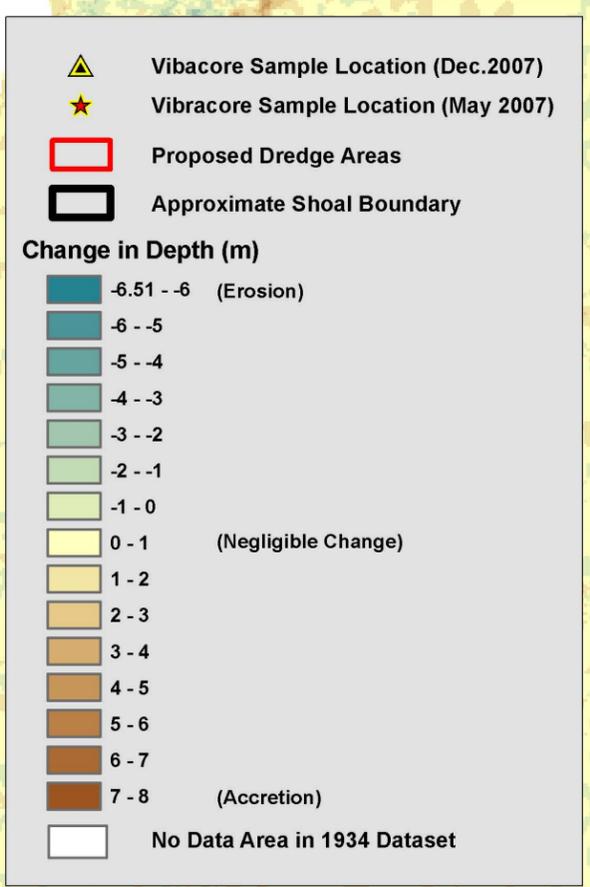
Bathymetric Surface Along Transect

Vertical Exaggeration = 1000x

- Shoal Location
- WFF Boundary



|  |                       |
|--|-----------------------|
| Title: Profile 2                                     |                       |
|  | URS Proj No: 15301785 |
| Figure: 2  |                       |
| Client : NASA  |                       |
| Shoreline Restoration Environmental Impact Statement |                       |



|   |  |
|---|--|
| Title:  | 2002 - 1934 Bathymetry Comparison<br>Shoal A & B |
|  | URS Proj No: 15301785                            |
|   | Figure: 3  |
| Client :  | NASA   |
| Shoreline Restoration Environmental Impact Statement                                  |  |

From: Bundick, Joshua A. (WFF-2500)  
Sent: Tuesday, July 13, 2010 2:27 PM  
To: 'John Nichols'  
Subject: EFH Response

Importance: High

John,

I just wanted to check in with you to inquire as to whether NMFS would like to have additional discussion about the Conservation Recommendation responses that we sent regarding the Wallops SRIPP.

Please advise.

Hope all is well.

Thanks,

Josh

---

Joshua A. Bundick  
Lead, Environmental Planning  
NASA Wallops Flight Facility  
Code 250.W  
Wallops Island, VA 23337  
Phone: (757) 824-2319  
Fax: (757) 824-1819  
Email: Joshua.A.Bundick@nasa.gov

From: John Nichols [mailto:John.Nichols@noaa.gov]  
Sent: Tuesday, July 13, 2010 2:56 PM  
To: Bundick, Joshua A. (WFF-2500)  
Subject: Re: EFH Response

I skimmed through your response, but need to review it more thoroughly before identifying discussion points. I also want to discuss your response with Mineral Management Services before our discussion. Finally, I would also like to have my first line supervisor on the line (Stan Gorski) to discuss rejection of many of our Conservation Recommendations.

If you need to finalize by the end of July, I could plan on a conference discussion next week

## Meeting Minutes

### Teleconference Regarding Essential Fish Habitat Consultation: July 26, 2010

#### Shoreline Restoration and Infrastructure Protection Program PEIS

#### Participants

MMS – Dirk Herkhof  
MMS – Geoff Wikel  
NASA - Josh Bundick  
NASA - Paul Bull  
NMFS – Stan Gorski  
NMFS - John Nichols  
URS - Jeff Reidenauer  
URS – Shari Silbert  
USACE – George Mears  
USACE - Gregg Williams

#### EFH Discussion:

- NASA representatives explained that the purpose of the meeting was to discuss the EFH Conservation Recommendation responses that were provided to NMFS.
- Josh Bundick and Jeff Reidenauer provided a brief description of the topographic change analysis that was performed to identify accreting and eroding areas on the shoals, and that the accreting areas identified differed from what NMFS had suggested in its Conservation Recommendations.
- John Nichols stated that it is important to preserve the topographic integrity of the shoals. He also requested that the northeast sections of the shoal be conserved as they are likely eroding, and consequently are the primary source of sand for maintaining other parts of the shoal. Both he and Stan Gorski emphasized the importance of the offshore shoal habitats as fish habitat.
- NASA and USACE participants explained the cost constraints on the project and how the sand removal threshold limitations would not enable a complete project to be built.
- NASA and USACE participants asked NMFS if the Conservation Recommendations offered for the SRIPP would be precedent setting. John Nichols stated that they would likely set precedent for future projects.
- The discussion then focused on NMFS priorities for mitigation of impacts to offshore sand shoals. NMFS stated that the priorities could be ranked in the following order:
  - 1) Dredging should target areas on the shoal that are accreting and should avoid erosional areas;
  - 2) Dredging should not take place along the entire longitudinal axis of a shoal, rather it should be along the southern half or third of the shoal;

3) Portions of the crest should remain intact; and

4) There should be a long-term cap on how much material is removed from a shoal during the lifetime of a project.

- NASA indicated its reluctance to bind the entire 50-year project at such an early stage and that establishment of a long-term cap at this point would not be possible. Josh Bundick explained that tiered or supplemental NEPA documentation would be prepared for each renourishment cycle and that additional EFH consultation would occur at that time. NASA would provide NMFS pre- and post-dredge bathymetric survey data to enable such consultations.
- At the end of the meeting, NASA and NMFS agreed that NASA would provide NMFS additional information regarding the proposed dredging plan.

#### **Action Items**

- NASA – Identify revised areas proposed for dredging on both shoals and provide a map to John Nichols

From: Bundick, Joshua A. (WFF-2500)  
Sent: Thursday, July 29, 2010 8:17 AM  
To: 'John Nichols'; 'Stanley W Gorski'  
Cc: Bull, Paul C. (WFF-2280); Silbert, Shari A. (WFF-200.C)[EG&G, Inc. (WICC)];  
Jeffrey\_Reidenauer@URSCorp.com; 'Wikel, Geoffrey L'; 'Williams, Gregory  
G NAO'; 'Mears, George H NAO'; Valdes, Sally J; 'Cole, Robert H NAO'  
Subject: SRIPP map w/ volumes  
Attachments: Dredging for NMFS 20100727.pdf

Importance: High

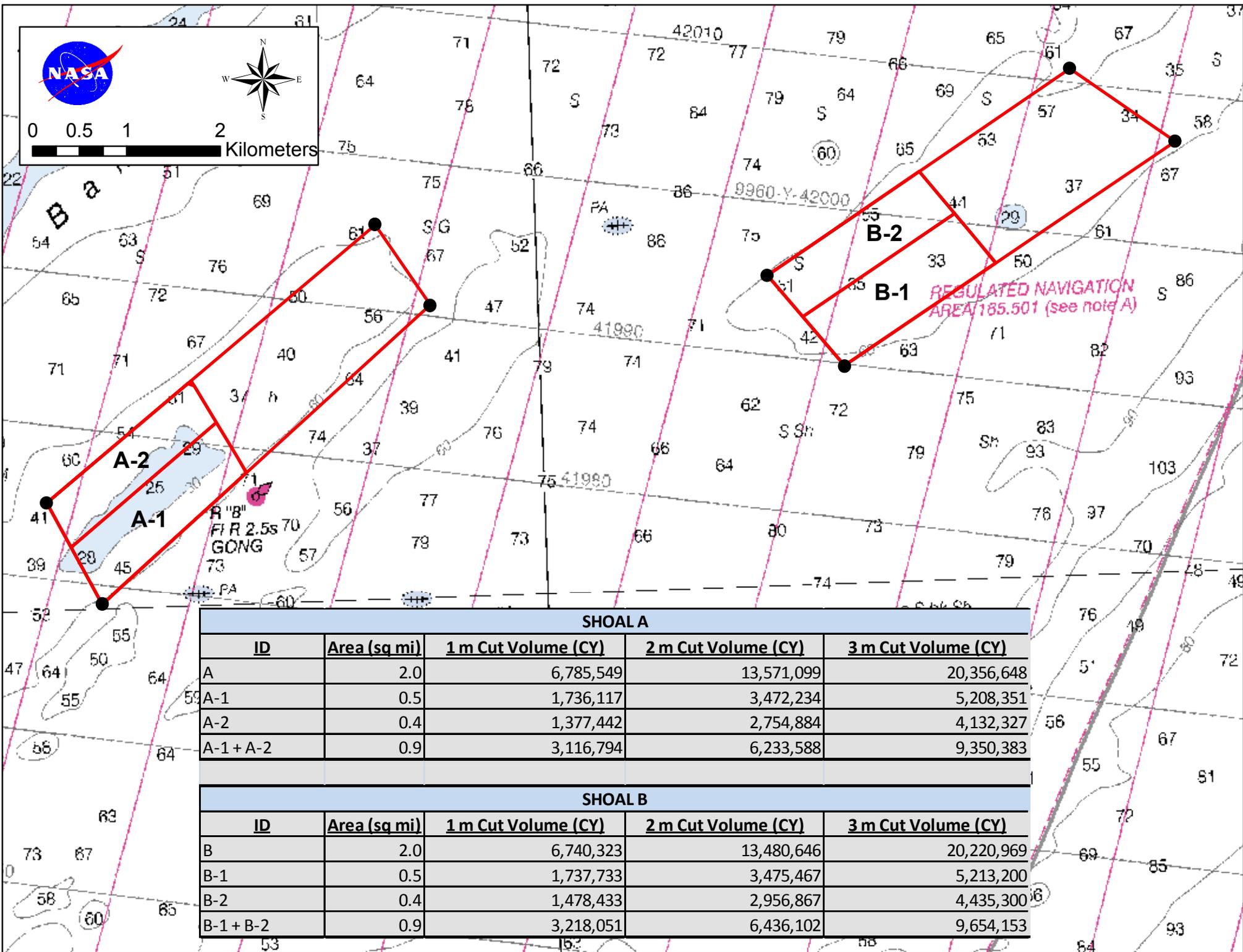
John,

Attached is a map that I put together to depict what we talked about Monday. For initial construction of the project, it seems reasonable that we would target A-1 with a 2 m cut depth, and provided that we got what we needed, that's where we'd stay. We would only cut deeper within A-1 or go to A-2 only in an off-nominal case.

Please let me know your thoughts.

Thanks,

-----  
Joshua A. Bundick  
Lead, Environmental Planning  
NASA Wallops Flight Facility  
Code 250.W  
Wallops Island, VA 23337  
Phone: (757) 824-2319  
Fax: (757) 824-1819  
Email: Joshua.A.Bundick@nasa.gov



| SHOAL A   |              |                     |                     |                     |
|-----------|--------------|---------------------|---------------------|---------------------|
| ID        | Area (sq mi) | 1 m Cut Volume (CY) | 2 m Cut Volume (CY) | 3 m Cut Volume (CY) |
| A         | 2.0          | 6,785,549           | 13,571,099          | 20,356,648          |
| A-1       | 0.5          | 1,736,117           | 3,472,234           | 5,208,351           |
| A-2       | 0.4          | 1,377,442           | 2,754,884           | 4,132,327           |
| A-1 + A-2 | 0.9          | 3,116,794           | 6,233,588           | 9,350,383           |
| SHOAL B   |              |                     |                     |                     |
| ID        | Area (sq mi) | 1 m Cut Volume (CY) | 2 m Cut Volume (CY) | 3 m Cut Volume (CY) |
| B         | 2.0          | 6,740,323           | 13,480,646          | 20,220,969          |
| B-1       | 0.5          | 1,737,733           | 3,475,467           | 5,213,200           |
| B-2       | 0.4          | 1,478,433           | 2,956,867           | 4,435,300           |
| B-1 + B-2 | 0.9          | 3,218,051           | 6,436,102           | 9,654,153           |

From: John.Nichols@noaa.gov  
Sent: Thursday, July 29, 2010 10:44 AM  
To: Bundick, Joshua A. (WFF-2500)  
Subject: Re: SRIPP map w/ volumes  
Attachments: ATT00001..txt; ATT00002..htm

Thanks for the quick input. However, it is difficult for me to relate the depicted borrow areas with the shoal features (i.e., crest, flanks, etc.). Could these delineated areas be transcribed onto a map showing shoal depth contours (in meters)? Thanks.

From: Bundick, Joshua A. (WFF-2500)  
Sent: Monday, August 02, 2010 1:00 PM  
To: 'John.Nichols@noaa.gov'  
Cc: Bull, Paul C. (WFF-2280); Silbert, Shari A. (WFF-200.C)[EG&G, Inc. (WICC)];  
'Jeffrey\_Reidenauer@URSCorp.com'; Williams, Gregory G NAO;  
george.h.mears@usace.army.mil; Hudgins, Mark H NAO; 'Herkhof, Dirk';  
'Wikel, Geoffrey L'; Valdes, Sally J; 'Stanley W Gorski'  
Subject: RE: SRIPP map w/ volumes  
Attachments: Dredge Optimization Calcs 20100802.xls; Dredging for NMFS SHOAL B w  
contours 20100802.pdf; Dredging for NMFS SHOAL A w contours  
20100802.pdf

John,

Additional information attached as requested. Please note that we have performed some additional analysis for optimizing length of dredge pass and have adjusted the map accordingly. The back-up calculations are attached.

I have discussed this proposal this morning with our colleagues with the Corps of Engineers, and we are all in agreement that this presents a reasonable approach for obtaining the material needed in a cost-effective and environmentally-conscious manner.

As proposed before, for initial fill we would target area A-1, and would only direct the contractor to A-2 in an off-nominal case.

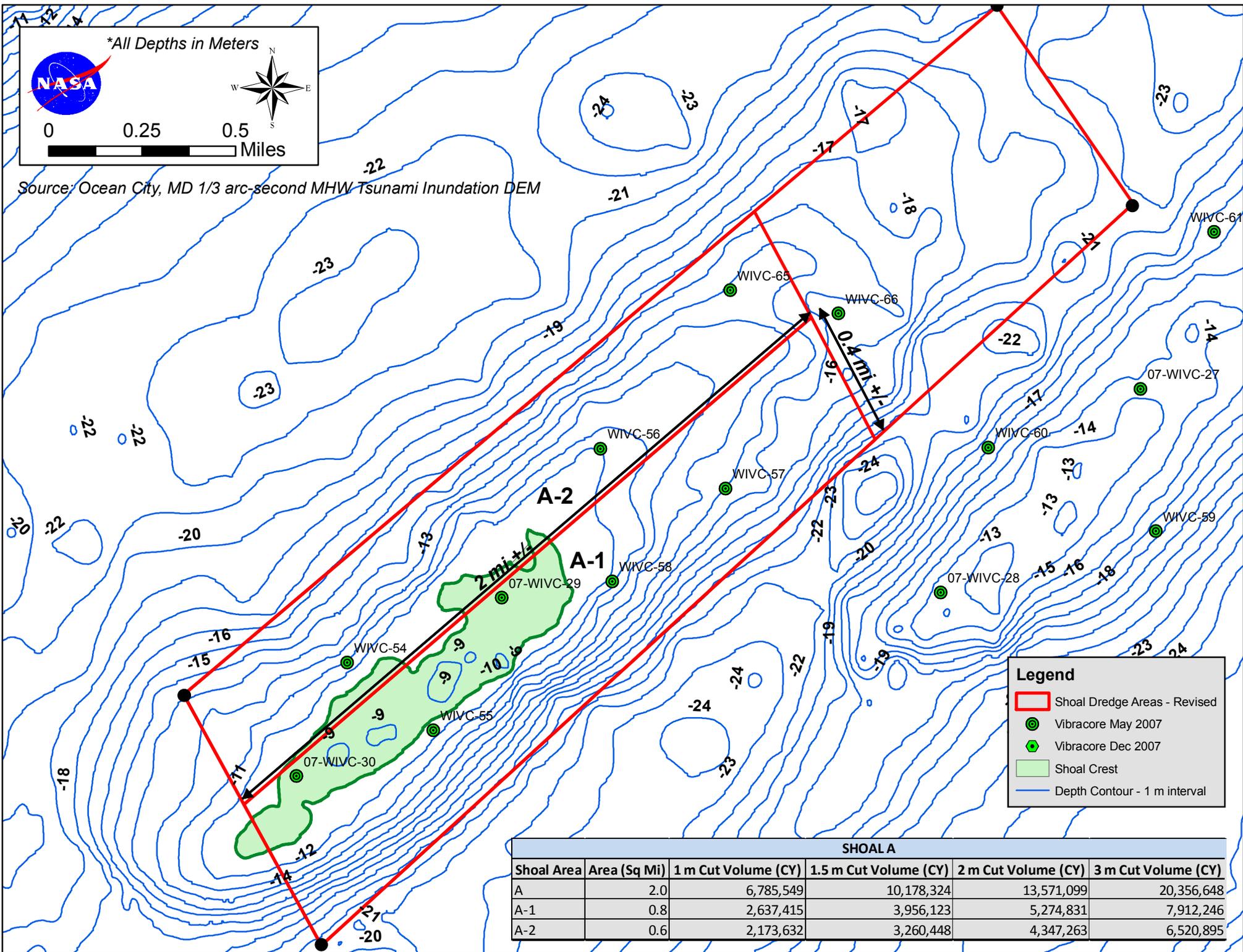
Please let me know your thoughts on this, as we would like to solidify our dredging plans so that we can complete the EIS on schedule. Look forward to hearing from you.

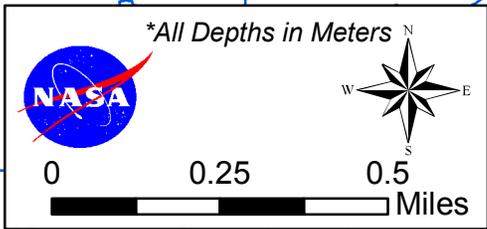
Josh

-----  
Joshua A. Bundick  
Lead, Environmental Planning  
NASA Wallops Flight Facility  
Code 250.W  
Wallops Island, VA 23337  
Phone: (757) 824-2319  
Fax: (757) 824-1819  
Email: Joshua.A.Bundick@nasa.gov

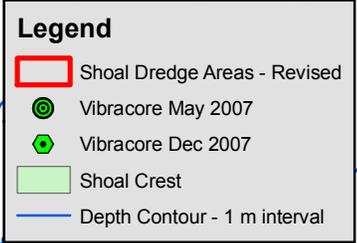
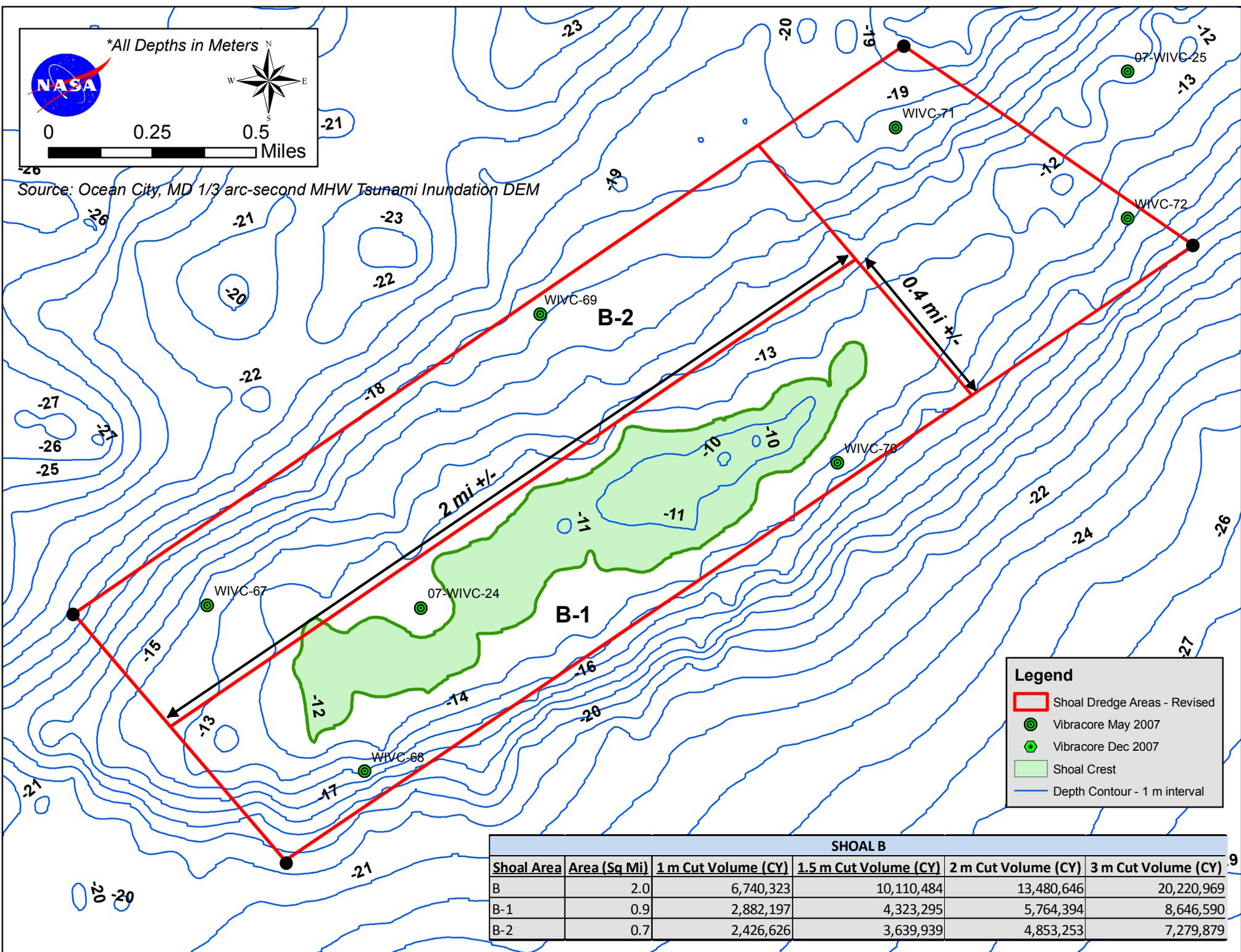
NASA WFF SRIPP  
Dredge Operation Optimization Calculations  
Aug-10

|  |                        |                 |
|--|------------------------|-----------------|
| Dredge Capacity:   | 3,000 CY               |                 |
| Width of Draghead:   | 4 feet                 |                 |
| Depth of Cut:  | 0.5 feet               |                 |
| Number of Dragheads  | 2                      |                 |
| Production per linear foot:  | 4 Cubic Feet/Foot      |                 |
|  | 5,280 feet/mile        |                 |
| Production per linear mile:  | 21,120 Cubic Feet/mile |                 |
|  | 27 Cubic Feet/CY       |                 |
|  | 782 CY/mile            |                 |
| Miles to fill hopper:  | 3.8 miles              |                 |
| <b>Optimal Length of Dredge Pass for "up and back" fill cycle:</b> |                        | <b>~2 miles</b> |





Source: Ocean City, MD 1/3 arc-second MHW Tsunami Inundation DEM



| SHOAL B    |              |                     |                       |                     |                     |
|------------|--------------|---------------------|-----------------------|---------------------|---------------------|
| Shoal Area | Area (Sq Mi) | 1 m Cut Volume (CY) | 1.5 m Cut Volume (CY) | 2 m Cut Volume (CY) | 3 m Cut Volume (CY) |
| B          | 2.0          | 6,740,323           | 10,110,484            | 13,480,646          | 20,220,969          |
| B-1        | 0.9          | 2,882,197           | 4,323,295             | 5,764,394           | 8,646,590           |
| B-2        | 0.7          | 2,426,626           | 3,639,939             | 4,853,253           | 7,279,879           |

From: John.Nichols@noaa.gov  
Sent: Monday, August 02, 2010 3:33 PM  
To: Bundick, Joshua A. (WFF-2500)  
Subject: Re: RE: SRIPP map w/ volumes

Josh:  
Having trouble opening your first attachment (Dredge Optimization Calcs). If you can, please FAX to (410) 295-3154.

Attachments two and three depict borrow areas that do not differ much from what were proposed in your response letter of June 2010. For both shoals, you are borrowing along most of the long axis of the shoals, and borrowing from the entire crest. A portion of each shoal crest should be left intact (untouched) to allow for recovery of the crest to pre-existing elevations.

The boxes depicting borrow areas should favor the southern third of the shoal (southwest and southeast sections), and extend down the flank of the southern ends. Tomorrow when I return to my office, and will FAX you a diagram from the MMS study on the Maryland coastal protection project, depicting location of borrow areas for Isle of Wight Shoal, similar to that which should be used on Shoals A and B. If borrow must taken to a depth deeper than 2 meters below existing bottom, we are willing to agree to borrow down to 3 meters, in order to protect the static/erosional features of each shoal.



**UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE**

Northeast Region  
Habitat Conservation Division  
410 Severn Avenue, Suite 107A  
Annapolis, MD 21403

Commercial Phone: (410) 267-5675 *295-3134*  
FAX#: (410) 267-5666 *(410) 267-5666*

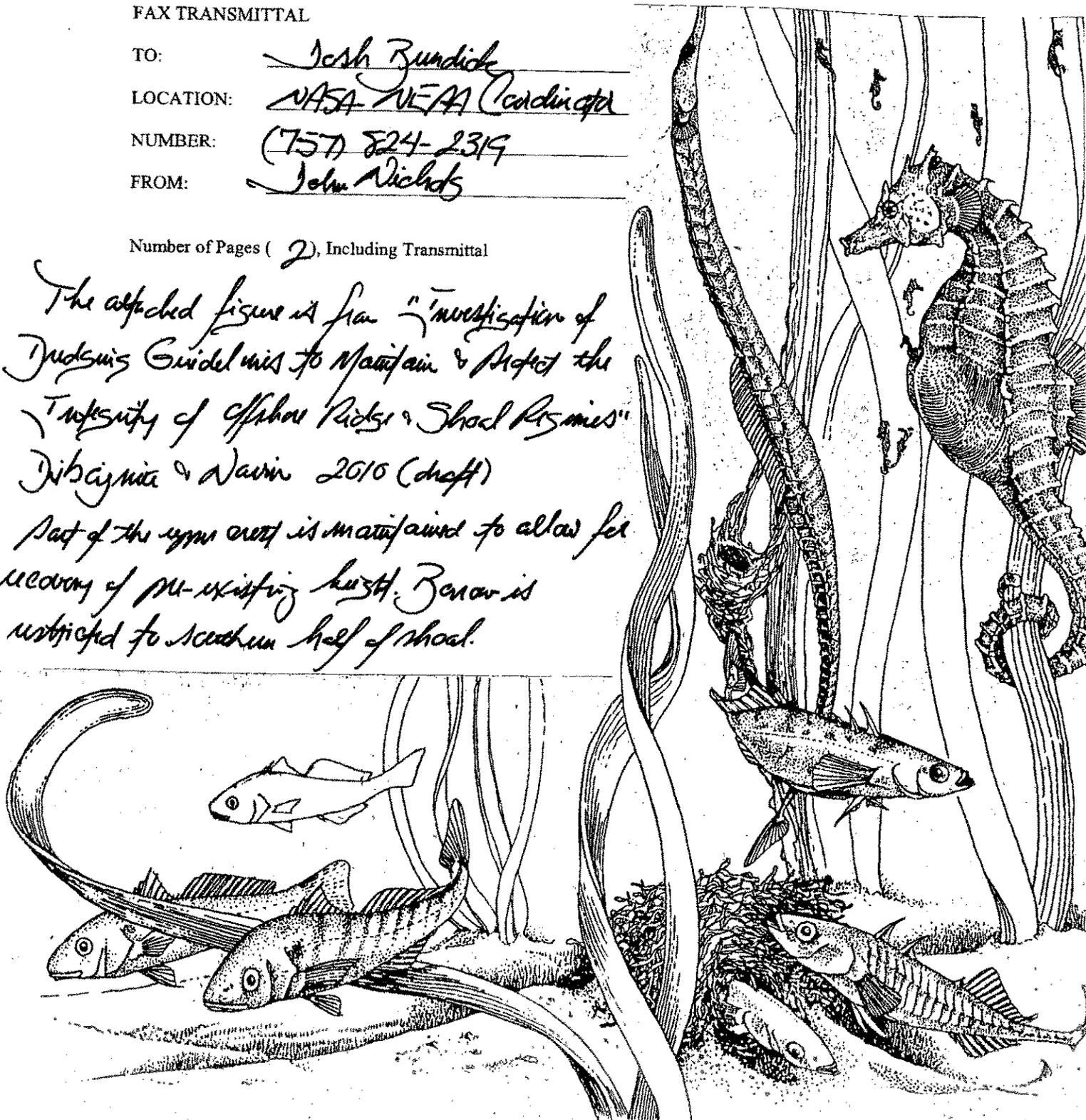
FAX TRANSMITTAL

TO: *Josh Ruddle*  
LOCATION: *NASA NEA Condingo*  
NUMBER: *(757) 824-2319*  
FROM: *John Nichols*

Number of Pages ( *2* ), Including Transmittal

*The attached figure is from "Investigation of  
Judging Guidelines to Maintain & Protect the  
Integrity of Offshore Ricks & Shoal Regions"  
Dibajnia & Navin 2010 (draft)*

*Part of the rick crest is maintained to allow for  
recovery of pre-existing hush. Renov is  
restricted to southern half of shoal.*



Baird &amp; Associates

### Scenario 3

In this scenario the southwestern half of the crest of Isle of Wight is dredged to -10 m contour, as shown in Figure 7.11, to provide about 1.8 million m<sup>3</sup> of sand.

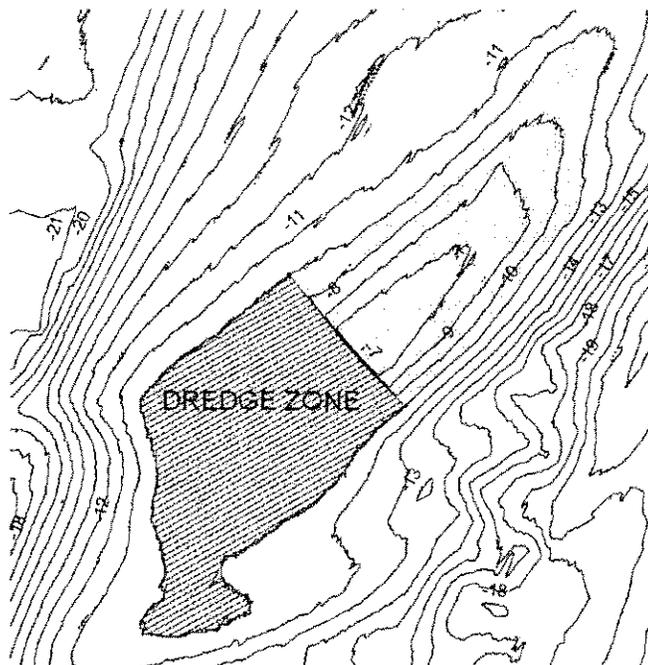


Figure 7.11 Dredging Scenario 3.

Figure 7.12 shows the initial and predicted future bathymetry for the Scenario 3 dredging configurations. IOW is reintegrated into a shoal with shorter crest length than the pre-dredge conditions. Figure 7.13 shows the initial and final depth contours as well as a map of change in bottom elevations. There is considerable accumulation over the northeast half of the dredged part. The rest of the dredged platform stays nearly unchanged. Comparisons at selected transects presented in Figures 7.14 and 7.15 show that the reformed shoal crest has the same height as the pre-dredge shoal. The new crest, however, is shorter and does not extend far beyond Transect 7 towards southwest. Therefore, this dredging scenario is expected to result in a shoal with the same height but with a shorter crest length than the pre-dredge conditions.

From: Bundick, Joshua A. (WFF-2500)  
Sent: Thursday, August 05, 2010 11:48 AM  
To: 'John.Nichols@noaa.gov'  
Cc: 'Stanley W Gorski'; Bull, Paul C. (WFF-2280); 'Herkhof, Dirk'; 'Wikel, Geoffrey L'; Valdes, Sally J; Mears, George H NAO; 'Williams, Gregory G NAO'; Hudgins, Mark H NAO; 'Cole, Robert H NAO'; Silbert, Shari A. (WFF-200.C)[EG&G, Inc. (WICC)]; Jeffrey\_Reidenauer@URSCorp.com  
Subject: Additional EFH Information: NASA WFF SRIPP  
Attachments: NASA SRIPP EFH Follow up Paper FINAL.pdf; NASA SRIPP EFH Follow up Paper ATTACHMENTS FINAL.pdf

Importance: High

John,

Please find attached a point paper and supporting documentation regarding the EFH Consultation for the NASA WFF SRIPP.

As you will see when you read the document, we have taken a hard look at the issue, and this is our final decision. Please let me know if you have any questions or require additional clarification.

Thanks,

Josh

-----  
Joshua A. Bundick  
Lead, Environmental Planning  
NASA Wallops Flight Facility  
Code 250.W  
Wallops Island, VA 23337  
Phone: (757) 824-2319  
Fax: (757) 824-1819  
Email: Joshua.A.Bundick@nasa.gov

## NASA WFF SRIPP

### *Summary of Consistency with Recently Developed Dredging Recommendations* Supporting Essential Fish Habitat Consultation August 2010

#### Purpose:

The purpose of this document is to clearly demonstrate the consistency of the Wallops Shoreline Restoration and Infrastructure Protection Program (SRIPP) with the number of recently published dredging considerations. Recent discussions with the National Marine Fisheries Service (NMFS) regarding Essential Fish Habitat (EFH) are also summarized, and conclusions are drawn regarding the National Aeronautics and Space Administration's (NASA) final plan for dredging sand from SRIPP Shoal A<sup>1</sup> for the initial project fill.

The two most recent publications, which will be the primary focus of this document, are *Analysis of Potential Biological and Physical Impacts of Dredging on Offshore Ridge and Shoal Features*, prepared in 2009 by CSA International, Inc. in cooperation with Applied Coastal Research and Engineering, Inc. Barry A. Vittor and Associates, Inc., C.F. Bean, L.L.C., and the Florida Institute of Technology (CSA et al., 2009), and the 2010 *Investigation of Dredging Guidelines to Maintain and Protect the Integrity of Offshore Ridge and Shoal Regimes* prepared by Mohammad Dibajnia and Robert Nairn of Baird and Associates (Dibajnia and Nairn, 2010). Both reports were prepared under contract with the U.S. Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE). Presented below are the individual recommendations from the two reports and a response demonstrating how the SRIPP is consistent with each.

#### From CSA et al., 2009:

1. Recommendation: *Extract sand from a depocenter, or leading or downdrift margin of a shoal, to avoid interrupting natural shoal migration and potentially reduce the time required for site refilling.*

**Response: According to the Geographic Information System (GIS)-based analysis performed by URS, NASA's contractor, the depocenters on SRIPP Shoal A are along the southern half of the east flank. Consistent with the above recommendation, a large portion of the area targeted for initial fill will be along the east flank.**

2. Recommendation: *Avoid dredging in erosional areas that source downdrift depocenters, which also may be slow to refill after dredging.*

---

<sup>1</sup> Note that there are two different "Shoal As" discussed in this document. As such, the shoal under consideration for the SRIPP is identified as "SRIPP Shoal A" and the shoal considered for the Atlantic Coast of Maryland (ACM) project is referred to as "ACM Shoal A."

**Response:** According to the GIS-based analysis, the target area for initial fill will almost completely avoid areas identified as erosional.

3. Recommendation: *Shallow dredging over large areas rather than excavating small but deep pits.*

**Response:** The dredging proposed would be shallow with a targeted cut of approximately 2 meters. However, due to the inherent inaccuracies in open ocean hopper dredging (the tolerance is estimated to be about 0.6 meters), it is likely that actual dredged depths could be closer to 3 meters in some areas.

4. Recommendation: *Dredge in a striped pattern to leave sediment sources adjacent to and interspersed throughout target areas, leading to a more uniformly distributed infilling process.*

**Response:** At the current time NASA has no plans to implement stripe dredging as its effects on efficiency as well as environmental resource areas has yet to be proven. It is also expected that implementing such a methodology would add significant cost, thereby prohibiting the project from being constructed as designed.

5. Recommendation: *Excavation should occur on shoal crests and higher areas of the leading edge rather than lower areas on the shoals because of greater sediment mobility, which potentially results in more rapid sediment reworking and site infilling.*

**Response:** At least one quarter of the proposed dredge area on SRIPP Shoal A is on the shoal crest and areas of higher elevation along the leading edge. At least one third of the proposed area on Shoal B is on the shoal crest and areas of higher elevation.

From Dibajnia and Nairn, 2010:

1. Recommendation: *Only those shoals located in less than 30 m depth have the potential to re-grow after dredging, and therefore, shoals with a Base Depth of greater than 30 m should not be dredged if it is determined to be important to maintain the pre-dredge shoal height from an ecological perspective.*

**Response:** Both shoals under consideration have base depths less than 30 meters. The measured base depths are 22 meters (SRIPP Shoal A) and 25 meters (Shoal B).

2. Recommendation: *Shoals with Relative Shoal Height (defined as H/BD) of less than 0.5 are not likely to recover after dredging. Therefore, shoals with Relative Shoal Height of less than 0.5 should not be dredged if shoal recovery to its pre-dredge height is desired from an ecological perspective.*

**Response:** Using the shoal cross-sections presented in our June 2010 EFH Conservation Recommendation response letter, both SRIPP Shoals A and B have Relative Shoal Heights (RSHs) of approximately 0.68. Lowering either shoal by 2 meters yields RSHs of 0.59 and 0.60, respectively. Removal of an additional meter (totaling 3 m) would still yield values above the 0.5 RSH threshold identified in the referenced report.

3. Recommendation: *The maximum Relative Shoal Height,  $(H/BD)_m$ , varies from 0.5 at 10 m depth to 0.75 at 20 m depth. A shoal that has reached the maximum relative shoal height corresponding to its Base Depth may be considered as a fully grown shoal at that depth. A fully grown shoal (in height) can potentially re-grow and rebuild itself to the same height upon being dredged. Therefore, if shoal recovery to its pre-dredge height is desired, shoals that have reached their maximum relative shoal height are recommended for dredging. For the present study area, maximum Relative Shoal Height at a certain Base Depth (BD) may be estimated as:  $(H/BD)_m = (BD-5)/BD$ .*

**Response:** Using the formula provided to estimate maximum shoal growth potential, SRIPP Shoal A has a value of 0.77 with Shoal B at 0.80. Based on this metric, neither shoal has yet reached its maximum at approximately 0.68. However, cross-sectional evaluation of nearby shoals indicates that Blackfish Bank, by this definition, is a fully grown shoal at approximately 0.74. Although Blackfish might meet this definition of a recommended shoal for dredging, it clearly has other properties that outweigh this consideration, including commercial and recreational fishing value and sheltering Assateague Island from incoming wave energy. Clearly, this demonstrates the need to look at the larger picture and consider the importance of numerous factors and the trade-offs associated with each.

4. Recommendation: *Sand should not be removed from the entire length of the shoal. Longitudinal dredging (i.e. dredging all along the longer axis) is not preferred because it affects wave focusing processes and the shoal does recover to the same pre-dredge height.*

**Response:** As presented in the maps sent to NMFS on August 2, 2010 (attached), the areas targeted for dredging on either shoal do not run the entire lengths of the shoals. Additionally, the areas are sized lengthwise to maximize dredging efficiency, a cost-saving benefit to the project.

5. Recommendation: *Dredging from shoal flanks below the -10m contour over the SW half of the shoal is expected to have little effect on shoal integrity and little change is anticipated to happen to the dredged area. This dredging option is thus recommended if it can provide sand suitable for nourishment.*

**Response:** Approximately 75 percent of the area targeted on SRIPP Shoal A for dredging is below the -10 m contour. Approximately 95 percent of the area on Shoal B is below this contour.

### NMFS Recommendations:

A recent discussion on July 26, 2010 with NMFS indicated the agency's top priorities for mitigating the effects of dredging on long-term maintenance of shoal morphometry, particularly with regard to shoal height. These priorities include:

- 1) Targeting the accretional leading edge of shoal;
- 2) Avoiding longitudinal dredging;
- 3) Maintaining shoal crest;
- 4) Not dredging to excessive depth; and
- 5) Not removing excessive volumes from a given shoal

With respect to the above five recommendations, the SRIPP's consistency with them has been described under the responses to the BOEMRE report recommendations with the exception of numbers 3 and 5. Regarding NMFS recommendation 3, although the shoal crest would be dredged, it still would be maintained in that it would not be completely eliminated. The dredge would employ the "contour method," which would essentially leave the crest in place at a slightly lower (approximately 2-3 meters) elevation. Avoiding the shoal crest altogether would seem to conflict with CSA 2009, which suggests that dredging from higher elevations, including crests, could have less of a long term impact due to greater sediment mobility, which could potentially result in more rapid sediment reworking and site infilling. Given the geographic location of the SRIPP Shoal A crest (on the southwest half of the shoal immediately adjacent to the leading edge), leaving a substantial portion of the crest untouched (as could be done for other shoals) would not only be operationally inefficient, but it would also require dredging material from either the trailing edge of the shoal or increasing the cut depth. Additionally, it would result in the dredge removing nearly all of the fill material from areas on the shoal which have limited sediment analysis and could likely have finer sediment.

Regarding NMFS recommendation 5, the initial fill cycle would remove approximately 5 percent of SRIPP Shoal A's total volume, which the project team considers to be very conservative. As discussed on the July 26, 2010 phone call, NASA cannot commit to restricting itself to volumetric thresholds at this time in the SRIPP. Consideration of removing additional material from the shoal for renourishment would only take place after appropriate pre- and post-dredge bathymetric survey work has been completed and NASA has performed additional consultation with NMFS, the U.S. Army Corps of Engineers (USACE), and BOEMRE.

Additional e-mail correspondence with NMFS indicates that dredging should be performed in a manner similar to what has been developed for the Atlantic Coast of Maryland Project and more specifically, Isle of Wight (IOW) Shoal. A fax sent by NMFS on August 3, 2008 (attached), indicates that Scenario 3 of the Baird Report is preferable. Further NASA review of the abovementioned reports and the NMFS recommendations in the context of the Wallops project suggests that the two shoal areas (SRIPP Shoal A and IOW) are different and that implementing this same dredging scenario may not be appropriate. An explanation and scientific justification (per (50 CFR 600.920(k))) is provided below.

### Scientific Justification:

The eastern half of the entire longitudinal axis on SRIPP Shoal A is accretional over the time period 1933/4 to 1978/82 (Figure 1). The same trend is clearly seen in the shoal immediately west of SRIPP Shoal A. On IOW, the northeastern half of the shoal is erosional (Figure 2). The footprint and magnitude of long-term accretion on the southern terminus of SRIPP Shoal A and IOW are also different (Figures 1-2). The accretional footprint on IOW is larger and wraps further west/southwest. Between 1929 and 2002, IOW accreted a maximum of 3.5 m. SRIPP Shoal A accreted upwards of 4-6 m along its leading edge over a fifty year period.<sup>2</sup> The morphologic behavior of the leading edge shoal is an important factor in shoal crest height recovery. Over the inter-centennial timescale, IOW appears to better fit the wave-dominated shoal evolution paradigm of Hayes and Nairn (2004) on which most of the above recommendations are premised. It should also be noted that the principal patterns of morphologic change vary over shorter time scales (i.e., inter-centennial (Figure 2) vs. decadal (Figure 3)), as well as between adjacent shoals. A comparison of bathymetric change maps for ACM Shoal A, Weaver, and IOW shoals illustrates notable variability in physical behavior of the same time frame (Figures 3-5).

The orientation (relative to true north) of ACM Shoal A, Weaver, and IOW shoals varies between 30-40 degrees (Dibajnia and Nairn, 2010); whereas the orientation (relative to true north) of SRIPP Shoals A and B is approximately 50 degrees (Dibajnia and Nairn, 2010), suggesting again the former are more sensitive to waves, whereas the later waves and currents. Correspondingly, SRIPP Shoals A and Shoal B are comparatively elongated. ACM Shoal A, Weaver, and IOW have relatively wide and gently sloped trailing edges that are actively being eroded across their entire width. There are other notable differences in shoal properties, such as asymmetry, which in part dictates wave transformation and refraction across shoal bodies. Because of these different geometries despite similar water depths, incident waves and currents will interact differently with the shoals and contribute to differences in sediment transport. The differences in morphologic evolution may also relate to the fact that IOW is the most seaward and a comparatively isolated large, shallow shoal. SRIPP Shoal A is located in a complex of shoals that are physically linked. In the case of SRIPP Shoal A, and in contrast to IOW, the more seaward shoals may modify the approach of waves, which ultimately influences shoal morphodynamics.

### Conclusion:

NASA is confident that the dredging plan for the initial fill cycle of the Wallops SRIPP is consistent with nearly all recommendations presented in the latest BOEMRE-funded studies and in discussions with NMFS. However, NASA and its Cooperating Agencies (BOEMRE and USACE) share a different opinion than NMFS regarding the applicability of the ACM project to the SRIPP and the literal interpretation of the guidelines within the recently published studies. The primary concern is that rigidly applying guidelines developed for other shoals might not be the most appropriate means of ensuring the long-term maintenance of shoal geometry following

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<sup>2</sup> Note that the SRIPP Shoal A isopach has not been corrected for sea level rise (~20 cm).

a dredging project. Moreover, given the relatively new state of the science behind the recently developed recommendations, NASA feels that the guidelines should not be interpreted literally at this point, but rather should be given consideration as guidance for planning a project. Regarding any disagreement with NMFS about how the shoals would be dredged under the SRIPP, NASA feels that it has provided sufficient scientific justification for its position in both its June 25, 2010 EFH response letter and in this document as required by 50 CFR 600.920(k).

In conclusion, targeting Area A-1 shown on Figure 6 employing the methodology described in this document is NASA's final decision regarding how SRIPP Shoal A would be dredged for the initial fill cycle. Specifics regarding the use of either SRIPP Shoal A or B for renourishment would be considered in supplemental EFH consultation during the planning for that phase of the project.

Literature Cited:

CSA International, Inc., Applied Coastal Research and Engineering, Inc., Barry A. Vittor & Associates, Inc., C.F. Bean, L.L.C., and Florida Institute of Technology. 2009. Analysis of Potential Biological and Physical Impacts of Dredging on Offshore Ridge and Shoal Features. Prepared by CSA International, Inc. in cooperation with Applied Coastal Research and Engineering, Inc., Barry A. Vittor & Associates, Inc., C.F. Bean, L.L.C., and the Florida Institute of Technology for the U.S. Department of the Interior, Minerals Management Service, Leasing Division, Marine Minerals Branch, Herndon, VA. OCS Study MMS 2010-010. 160 pp. + apps.

Dibajnia, M. and R.B. Nairn. 2010. Investigation of Dredging Guidelines to Maintain and Protect the Integrity of Offshore Ridge and Shoal Regimes. U.S. Department of the Interior, Minerals Management Service, Leasing Division, Marine Minerals Branch, Herndon, VA. OCS Study MMS 2010-xxx. 150 pp. + apps.

Hayes, M.O. and R.B. Nairn. 2004. Natural maintenance of sand ridges and linear shoals on the U.S. Gulf and Atlantic continental shelves and the potential impacts of dredging. *Journal of Coastal Research*, 20(1): 138 – 148.

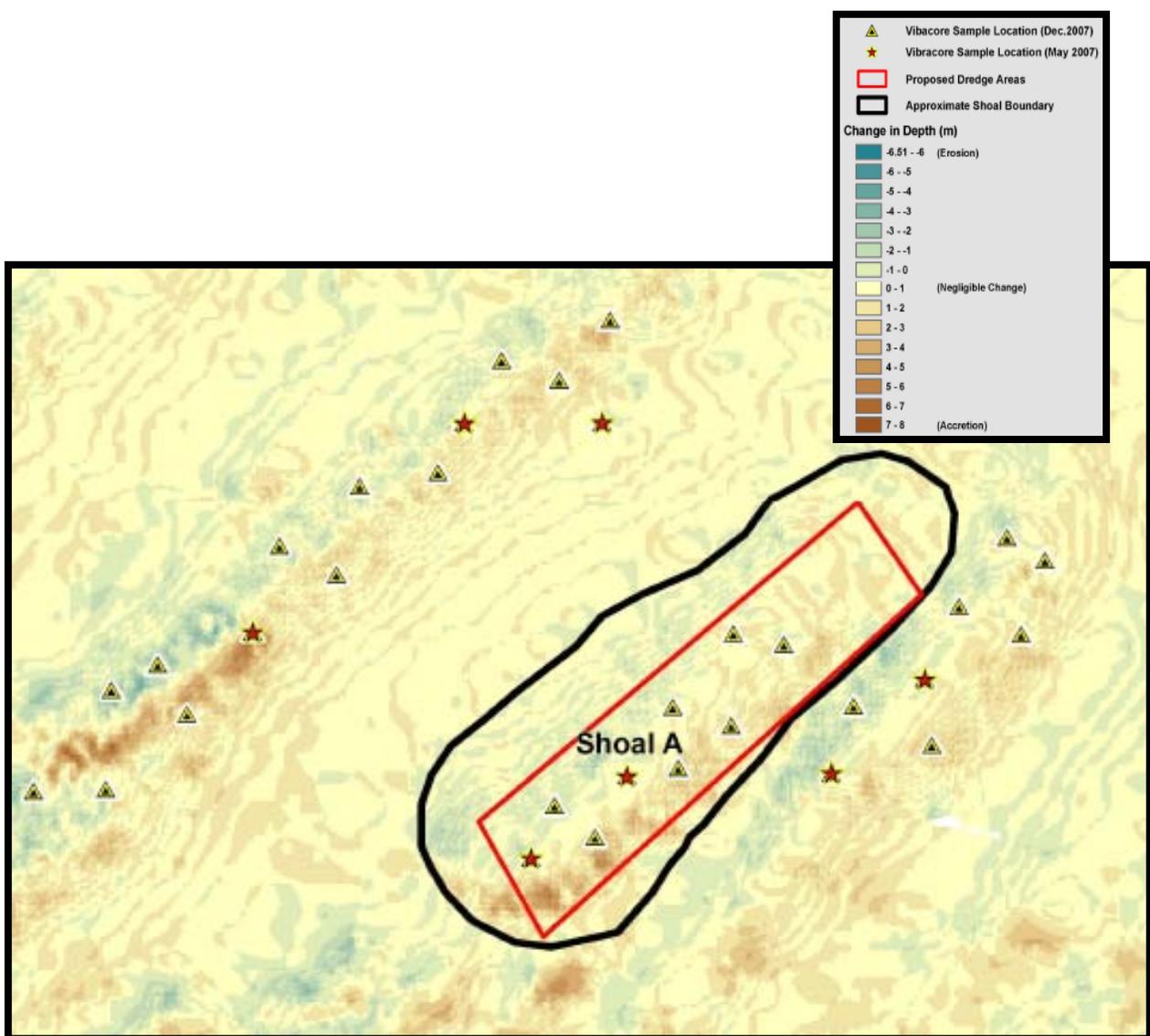


Figure 1: Bathymetric isopach for Shoal A (1933/34 to 1978/82). Maximum accretion within shoal footprint (black) and dredge area (red) is 6 m. Maximum erosion within shoal footprint (black) and dredge area (red) is 3 m.

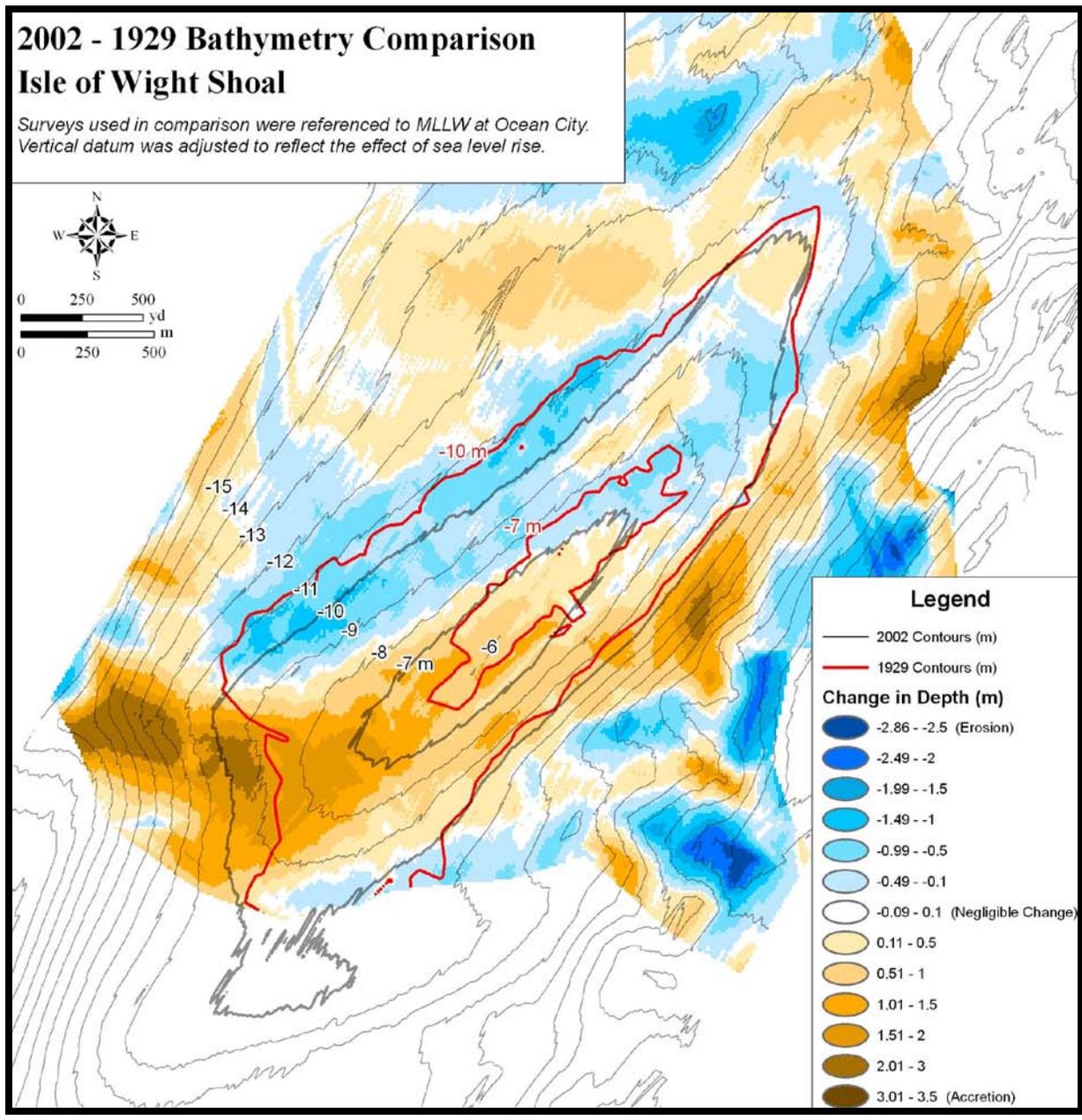


Figure 2: Bathymetric isopach for Isle of Wight Shoal (1929 to 2002) (Dibajnia and Nairn, 2010)

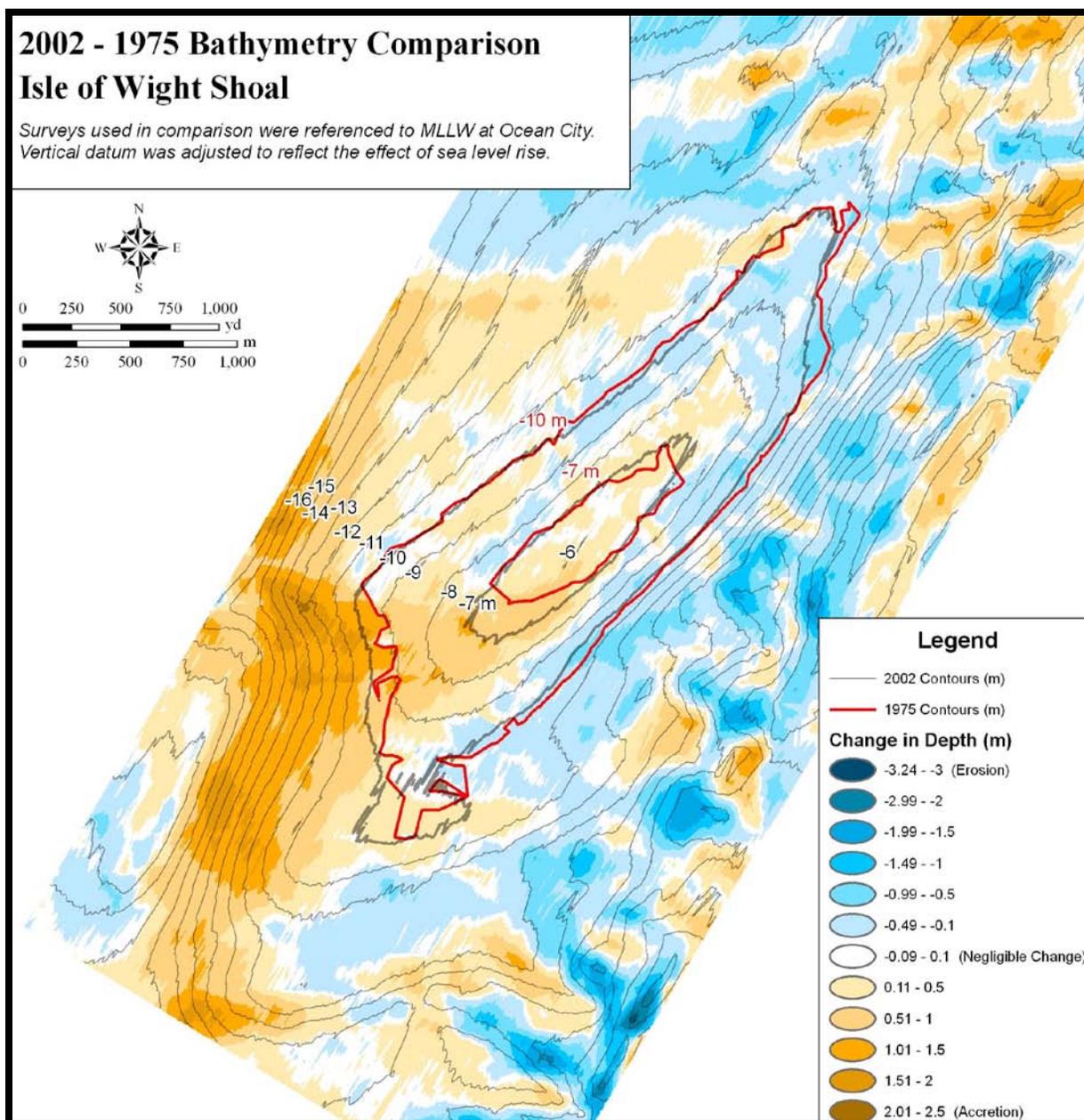


Figure 3: Bathymetric isopach for Isle of Wight Shoal (1975 to 2002) (Dibajnia and Nairn, 2010)

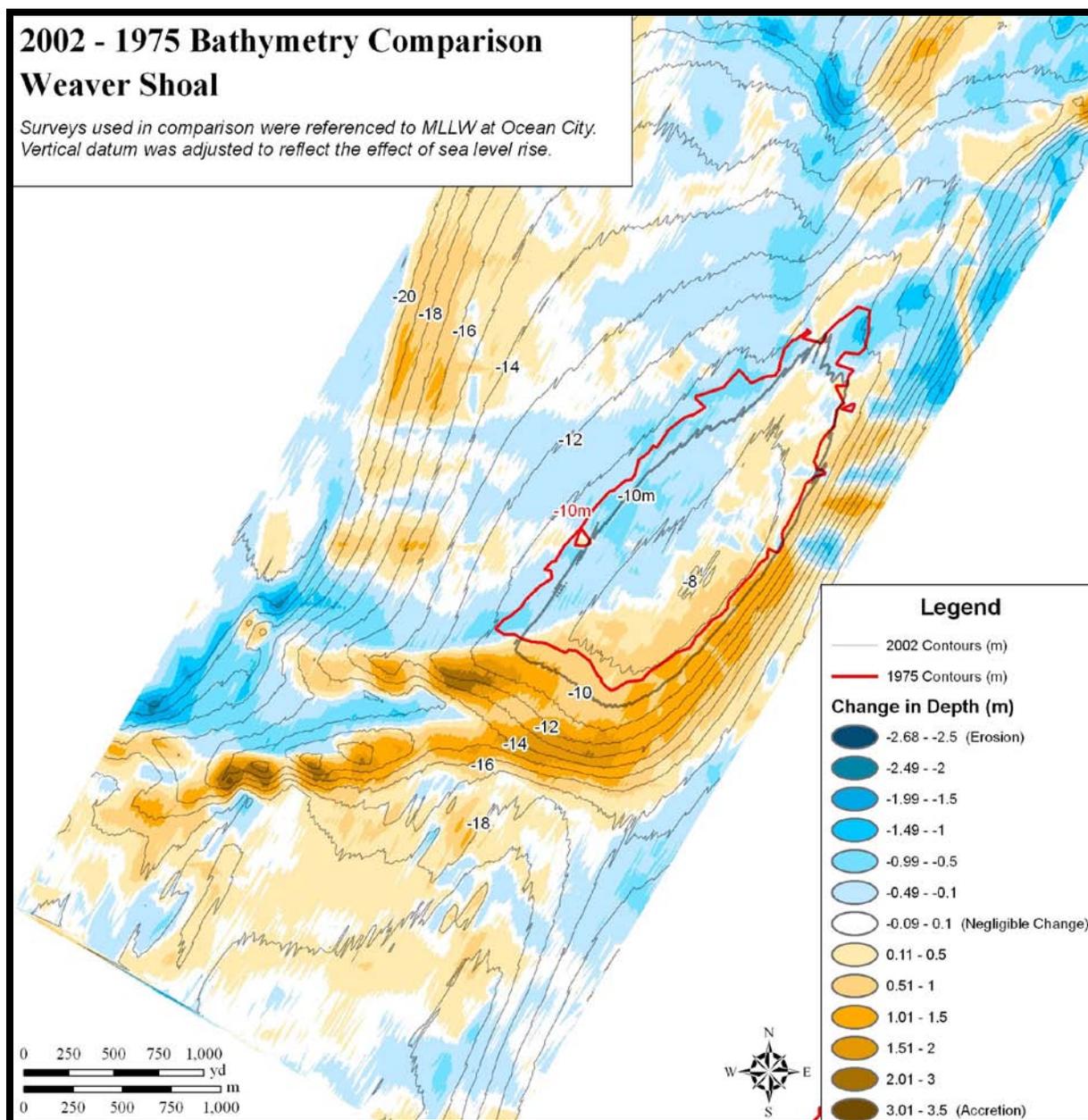


Figure 4: Bathymetric isopach for Weaver Shoal (1975 to 2002) (Dibajnia and Nairn, 2010)

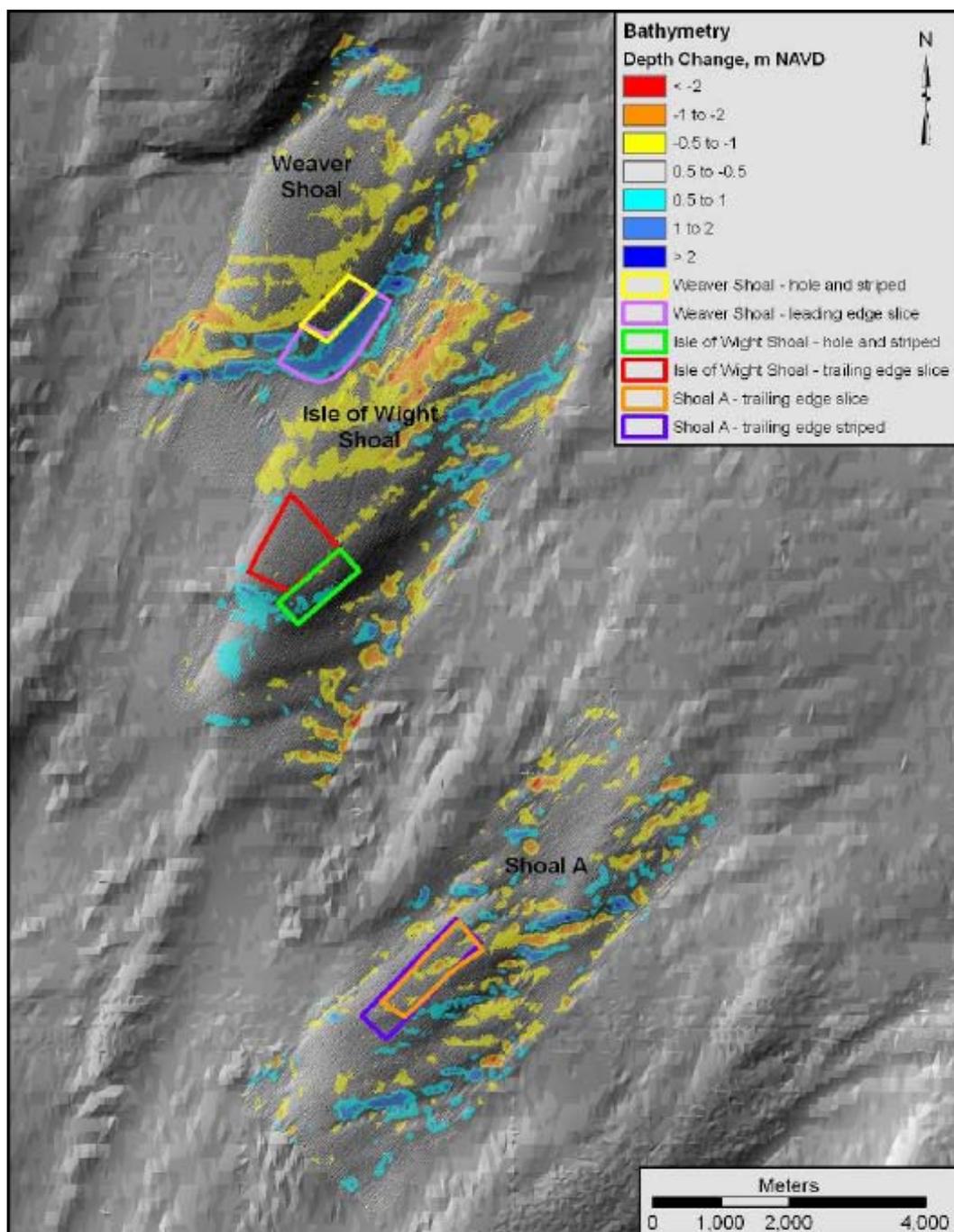


Figure 5: Bathymetric isopach for Fenwick, Isle of Wight, and ACM Shoal A (1975 to 2002) (CSA et al., 2009)

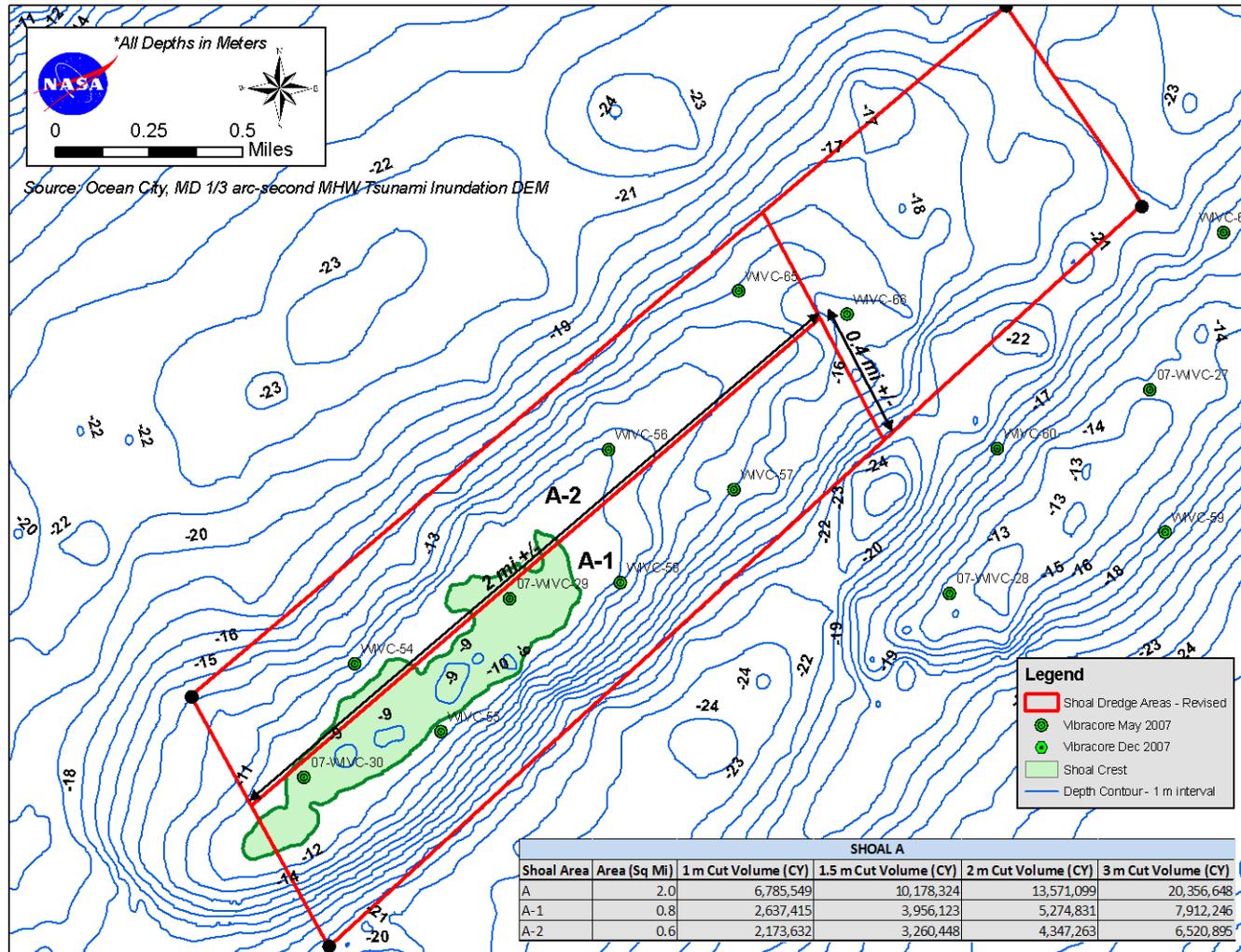


Figure 6: SRIPP Shoal A Dredge Areas

From: John.Nichols@noaa.gov  
Sent: Thursday, August 05, 2010 5:32 PM  
To: Bundick, Joshua A. (WFF-2500)  
Subject: Re: Additional EFH Information: NASA WFF SRIPP  
Attachments: ATT00001..txt; ATT00002..htm

Josh:

I have reviewed the borrow delineation figures for Shoals A & B, sent earlier this week, and the consistency report received today.

NMFS continues to have major concerns regarding long term impacts NASA will have on these Shoals A & B.

Cut estimates of available material within the delineated sections of both shoals appear to have much greater amounts of material than what you need to complete the various phases of this project. For example, you estimate that Section A1 has 3.9 MCY for a 1.5 M cut. You stated that Phase I of this project required 3.2 MCY. This leads us to believe that the borrow sections extend for a longer length along the long axis of the shoals than necessary, and/or that you will be cutting to depths deeper than necessary. The borrow sections should not be treated as NMFS-approved areas for repeated returns over the 50-year life of the project. Once material is removed from a section of shoal during Phase I, or subsequent renourishment, effects should be tracked, and it should be given time to recover to pre-existing conditions.

Lowering the upper crest of each shoal by 2-3 meters does not conserve the morphometry of the shoal, if the shoal does not recover its pre-existing height. Borrow should be taken in a manner that facilitates recovery of pre-existing shoal height. A portion of the southern crest of Shoal B should also be maintained, to facilitate shoal height recovery.

Your consistency statement is also very inconsistent with conservation measures recommended in the two MMS studies cited.

NMFS intends to provide a written response to the revised borrow plans next week, addressing these and other issues. The letter will be signed by either Stan Gorski, or our Regional Office. This may be your final action, but we want to be on the record regarding our concerns, and the inconsistency issues.

From: Bundick, Joshua A. (WFF-2500)  
Sent: Monday, August 09, 2010 1:04 PM  
To: 'John.Nichols@noaa.gov'  
Cc: 'Wikel, Geoffrey L'; 'Herkhof, Dirk'; Cole, Robert H NAO; 'Mears, George H NAO'; Williams, Gregory G NAO; Hudgins, Mark H NAO; Bull, Paul C. (WFF-2280); Silbert, Shari A. (WFF-200.C)[EG&G, Inc. (WICC)]; 'Jeffrey\_Reidenauer@URSCorp.com'; 'Stanley W Gorski'  
Subject: RE: Additional EFH Information: NASA WFF SRIPP

John,

It is unfortunate that NMFS and the three action agencies involved in the SRIPP cannot reach resolution regarding the dredging methodology. Among the members on our team, we feel that what we have proposed not only works to minimize effects on EFH consistent with the two latest publications, but at the end of the day we still have a project that is buildable as designed. I recall that our decision to leave Blackfish Bank alone (due in part to fisheries concerns) added substantial cost to the project, so any optimization that we could incorporate into the dredging plan at Shoals A & B (such as the 2-mile-long cut longitudinal cut lengths), we did. However, that major decision to head further offshore never seemed to receive any consideration from NMFS, especially regarding how the increased fuel costs would drive our need for maximum efficiency.

Regarding your concerns about cut length--the calculation spreadsheet that I provided to you explains why we are targeting a 2-mile long section of the shoal--it's about efficiency--and it also happens to be mostly within the areas found to be accreting on the shoal, and not along the entire length of either shoal, consistent with your recommendations. Regarding depth--we will be working in the open ocean and the bathymetric data that we have been using thus far during the EFH consultation is more than 25 years old. That being said, for us to say right now that we can absolutely maintain a 1.5 or 2 meter cut and get what we need, we would be knowingly tying our hands. If, in the field, we were to encounter unforeseen conditions and need to cut deeper than presented in the EIS, would we then be inconsistent with our NEPA analysis? I would say yes. What do we do then? Tell the contractor to stand down until additional analysis and consultation is performed...? We don't want to be faced with that issue.

Furthermore, I do not want to paint an unreasonable picture in the EIS. At the end of the project, if all goes well, as you mention below, the cut depth may only be 1.5 meters, but for us to say so right now is impractical. So as we're presenting in the EIS, the cut depth will be targeted at 2 meters, but due to some expected inaccuracy, cuts in some areas could approach 3 m...again, so that what's presented in the document (as an upper bound of environmental effects) and what actually happens aren't inconsistent. There needs to be a margin of error considered, and we have done just that.

Regarding shoal monitoring, we plan to conduct pre- and post-dredge surveys to monitor shoal recovery. Only after assessment of the survey data and subsequent consultation among NASA, MMS, USACE, and NMFS would we consider detailed options for dredging on the shoals. The shoal recovery that you mention below may take some time, so that will obviously be a factor to again

consider when we get to that point.

Finally, I am surprised that you found the latest submittal to be inconsistent with the two papers. We enlisted more than 5 contributors and reviewers, several of whom had substantial involvement with the two BOEMRE-funded reports, and we were all in agreement regarding the document's contents. We felt that we made it very clear regarding our consistency with the two new papers, and any differences were supported with scientific analysis. I apologize for some of this being repetitive, but I feel that over the past couple of years, we have taken a hard look at the issues using the best available data consistent with NEPA and M-SA and are making an informed decision regarding economics, engineering, and environment--and by judging by the responses we have received from NMFS thus far (including below), you would think we had not--so I just wanted to make it clear that we have.

Thank you again for your continued coordination regarding the project, and we look forward to receiving your letter in the near future.

Sincerely,

Josh

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Joshua A. Bundick  
Lead, Environmental Planning  
NASA Wallops Flight Facility  
Code 250.W  
Wallops Island, VA 23337  
Phone: (757) 824-2319  
Fax: (757) 824-1819  
Email: Joshua.A.Bundick@nasa.gov

From: Bundick, Joshua A. (WFF-2500)  
Sent: Tuesday, October 05, 2010 1:21 PM  
To: 'John.Nichols@noaa.gov'  
Cc: 'Stanley W Gorski'  
Subject: FW: EFH telecon minutes  
Attachments: 20100726 EFH Telecon Minutes.docx; 20100407 EFH Telecon Minutes.docx;  
Re: Additional EFH Information: NASA WFF SRIPP

John, just wanted to follow up with you regarding the below. Also, when was NMFS planning on providing the formal written response that you mentioned in your 8/5/2010 email (attached)?

Just wondering as we are planning on issuing the Final PEIS in the month of October.

Thanks,

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Joshua A. Bundick  
Lead, Environmental Planning  
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Code 250.W  
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Phone: (757) 824-2319  
Fax: (757) 824-1819  
Email: Joshua.A.Bundick@nasa.gov

From: Bundick, Joshua A. (WFF-2500)  
Sent: Thursday, September 30, 2010 7:51 AM  
To: John.Nichols@noaa.gov  
Cc: Bundick, Joshua A. (WFF-2500)  
Subject: EFH telecon minutes

Hi John,

We are in the process of completing the administrative records for the Shoreline EIS before releasing the Final. Attached please find drafts of minutes from the two different teleconferences that we held among NMFS, NASA, BOEMRE, and USACE.

Please let me know if you have any comments regarding the contents of the minutes or if your notes show that anything was left out. Any edits are requested by next Tuesday, 10/5.

Hope all is well.

Thanks,

Josh

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Lead, Environmental Planning  
NASA Wallops Flight Facility  
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Phone: (757) 824-2319  
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From: John Nichols [John.Nichols@noaa.gov]  
Sent: Wednesday, October 13, 2010 6:47 PM  
To: Bundick, Joshua A. (WFF-2500)  
Subject: Re: EFH telecon minutes

Josh:

I was sick with a flu-like bug during most of the latter half of September. I have not had a chance to put together my referred to response from our Regional Office.

Essentially, unresolved issues that remain between us pertain to impacts to the crests of Shoals A and B. In both cases, too little of the existing upper elevations of the shoal crests will be untouched by borrow. This may not allow the shoals to recover their pre-existing elevations. More of the west and north portions of the crests should remain untouched. Estimated sand volumes from each shoal indicate that all of the upper crests need not be disturbed to obtain the necessary borrow for Phase I; or, that borrow can extend to a shoaler depth (i.e., 1.5 meters), to obtain the desired 3.2 MCY. If NASA is willing to negotiate further of this issue, we can reach agreement.

From: Bundick, Joshua A. (WFF-2500)  
Sent: Thursday, October 14, 2010 8:37 AM  
To: 'John Nichols'  
Subject: RE: EFH telecon minutes

John, after talking to the project team, it appears that the plan, as proposed, will remain. However, please note that as you mention, we don't need a 3m cut over the entire area to get the requisite fill volume, so in all actuality, the cut will likely be shallower, but we are hesitant to completely restrict the contractor to such a shallow depth as in some areas the cut could be deeper and we didn't want to mislead anybody by portraying an absolute limiting depth in the EIS that we felt could not be guaranteed.

As such, are you going to provide a response upon receipt of the Final EIS? That way you would have a chance to review how the information is presented...

Also, do you have any input regarding the two sets of telecon minutes that I attached to the below email?

Thanks

Josh

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Joshua A. Bundick  
Lead, Environmental Planning  
NASA Wallops Flight Facility  
Code 250.W  
Wallops Island, VA 23337  
Phone: (757) 824-2319  
Fax: (757) 824-1819  
Email: Joshua.A.Bundick@nasa.gov

From: John Nichols [John.Nichols@noaa.gov]  
Sent: Thursday, October 14, 2010 12:38 PM  
To: Bundick, Joshua A. (WFF-2500)  
Subject: Re: EFH telecon minutes

It may be that NMFS and NASA will have to agree to disagree on the remaining outstanding issues. My Regional Office has left it up to me whether a response will be forthcoming. I will try to provide a response to the Final EIS.