NEXT STEPS IN A BENEFICIAL USE PROGRAM AT THE MOUTH OF THE COLUMBIA RIVER

May 10, 2018; 8:30 am – 4 pm

Columbia Pacific Heritage Museum, 115 SE Lake Street; Ilwaco, WA

ATTENDEES

Brian Lynn, WA Department of Ecology
Bobbak Talebi, WA Department of Ecology
Rick Mraz, WA Department of Ecology
George Kaminsky, WA Department of Ecology
Penny Kelley, WA Department of Ecology
Heather Weiner, WA Department of Ecology
Matt Gerlach, WA Department of Ecology
Alex Rosen, WA Department of Ecology
Patty Snow, OR Department of Land Conservation & Development
Andy Lanier, OR Department of Land Conservation & Development
Bridgette Lohrman, US Environmental Protection Agency
Jarod Norton, US Army Corps of Engineers
Rod Moritz, US Army Corps of Engineers
James McMillan, US Army Corps of Engineers
John Hayes, US Army Corps of Engineers
Rachel Stolt, US Army Corps of Engineers
Curtis Roegner, US National Fisheries Service
Caren Braby, OR Department of Fish & Wildlife
Dan Ayres, WA Department of Fish & Wildlife
Dale Beasley, Columbia River Crab Fishermen's Association
Jim Long, Columbia River Crab Fishermen's Association
Guy Gelfenbaum, US Geological Survey
Edwin Elias, US Geological Survey
Celia Barton, WA Department of Natural Resources
Rick Schwartz, WA Department of Natural Resources
Nancy Marvin, WA Department of Natural Resources
Jonathan Allan, OR Department of Geology & Industries
Tim Crose, Pacific County, WA
Frank Wolfe, Pacific County, WA
David Hodges, WA Senator Patty Murray
Dale Lewis, WA Congresswoman Herrora Beutler
Mike Nordin, Pacific Conservation District
Hope Kytr, Salmon For All
April Silva, CREST
Steve Greenwood, National Policy Consensus Center
Jim Owens, National Policy Consensus Center
Alisha Morton, National Policy Consensus Center

WELCOME, INTRODUCTIONS AND PROGRAM BACKGROUND

Brian Lynn, Co-Convener, welcomed participants and asked for a round of introductions.

Brian then gave a brief history of the Lower Columbia Solutions Group (LCSG):

- The effort started in 2002 as a bi-state effort that was convened by the two governors at the time.
- Purpose was to focus on challenges in the Lower Columbia River, i.e. channel deepening.
- Group contains state, local and federal entities and other non-governmental groups. Ports have participated as well.
- After channel deepening, the group focused on regional sediment management and a lot of conversation led to approval by members of a Regional Sediment Management Plan (RSMP) in 2011.
- We are in the midst of implementing the RSMP. We have this clean, beautiful sand that comes out of the Columbia and we're determining what to do with that sand, how to use it in the most beneficial way possible. Sustaining beaches, reducing erosion and shoring up the jetties are the best uses.
- RSMP identifies current and future potential disposal sites to keep the sand in the system. It is built around an adaptive management process. In 2012 or 2013 we came back to this group to confirm if we are all still in this and that this is an important endeavor for LCSG. There was a resounding nod from the group that this is important work and that it's really helpful to have a neutral third party coordinating the effort.
- Governor's offices are no longer engaged like they were historically. We agreed with them to have convening delegated to the states' coastal management programs.
- Funding has never been consistent or firmly established and has varied over the years.

LCSG Video

Steve Greenwood thanked Patty Snow and Brian for their leadership and Jim for his great work to keep things organized and for facilitating the conversation. He said Brian gave a great overview on the process and asked participants to consider how far this group has come when talking today about what we want to do next. Steve has been involved since the early days and noted that some of the organizations represented here did not necessary get along very well when we started this process but somehow we had to work together to get this done. He has been involved in a lot of groups and has never seen a group come as far together as this group. Steve then showed the movie that was created to document this effort. The video can be viewed here: https://lowercolumbiasolutions.org/

Workshop Goals and Desired Outcomes

Patty Snow reviewed the *Goals and Desired Outcomes* for this workshop. The full PowerPoint Presentation can be viewed here: https://lowercolumbiasolutionsdotorg1.files.wordpress.com/2018/08/1-owens_2016-science-policy-workshop-results-direction.pdf

Discussion – Key Points

Participants suggested adding the following items:

- What we know and what we don't know at North Head.
- Unintended consequences.

Site Tour Observations

Jim Owens gave a brief overview of the site tour on May 9 and asked participants to share their observations. Dan Ayres noted that the area at the south end of the peninsula north of North Head (Beard's Hollow) appeared to have more beach and less erosion than in years past. Andy Lanier said that the 2016 winter was the third most significant in the last 40 years and that the last decade has seen below normal wave conditions creating a more stable environment.

CONTEXT – WHAT'S OCCURRED SINCE WE LAST MET / WHAT HAVE WE LEARNED

2016 Science-Policy Workshop Results / Directions

Jim Owens reviewed the *Summary of Science-Policy Workshop 2016 Actions*. The full PowerPoint Presentation can be viewed here: https://lowercolumbiasolutionsdotorg1.files.wordpress.com/2018/08/1-owens_2016-science-policy-workshop-results-direction.pdf

Update on Beach and Jetty Erosion

Jonathan Allen gave a presentation on *Clatsop Spit: Recent Coastal Changes*. The full PowerPoint Presentation can be viewed here: https://lowercolumbiasolutionsdotorg1.files.wordpress.com/2018/08/1-owens_2016-science-policy-workshop-results-direction.pdf

Discussion – Key Points

Rod Moritz said the January storm was a weird storm with the wave period at almost 20 seconds.

Curtis Roegner asked if the dunes were accreting / moving landward? Jonathan said no and that it is a highly stabilized system.

Bridgette Lohrman said Jonathan painted a positive picture about the berm working but then the root of the jetty is being eroded away. She asked for more information on that. Jonathan said part of the jetty is being undermined and needs to be addressed. Rod added that the Corps is going to rehab the South Jetty in 2019. He said they will be stabilizing the root to set a stable toe and maintain the cobble berm.

George Kaminsky gave a presentation on the *North Jetty Coastal Erosion Update*. The full PowerPoint Presentation can be viewed here: https://lowercolumbiasolutionsdotorg1.files.wordpress.com/2018/08/3-kaminsky_north-jetty-coastal-erosion-update.pdf

Discussion – Key Points

Hope Kytr said before the North Jetty was constructed, the beach was a small isthmus between two areas. George said it is a true pocket beach and it is going back. It is closest to the sediment source so it's very concerning that we're seeing massive erosion rates, acceleration rates and relatively mild winters. He said something is significantly changing to create these symptoms.

Caren Braby said from a biology standpoint it makes sense that there is more erosion and that is more dynamic near the shore. George said that along mouths you see the highest / biggest changes. But we are seeing something opposite of what we see elsewhere. He said the jetty should hold sand yet we still see loss of the beach. This is the source of sediment for the region and something disturbing is happening. Jonathan said this area is supplying the area north of North Head so it is troubling. George said it is the trend that is concerning, not the dynamics. Rod added that since 2015 this has been unraveling.

Jonathan Allan asked if there is a net gain function of sediment coming from other sources. George said this is why he wants USGS to do a study.

Bridgette Lohrman said this is the meat of the meeting. She is intrigued by the amount of accretion and erosion. She asked if we looked at California or southeast states where they really manage beaches, if these types of numbers would automatically trigger the need to put sediment on the beach. George said that is more of a policy question. He said the East Coast is typically managed and nourished and they would not allow this amount of erosion to happen without intervention. Guy agreed and said that the rate of erosion around the jetties is really high. He said looking at the volume of sediment loss makes the coast much more exposed.

Hope noted that during the last 20 years the high loss of sediment has been at the same time as the Columbia River channel deepening. George said it varies year to year and the historical source of sediment is greatly diminished. Guy said, considering long-term trends, a result of putting jetties in is that the off shore delta is getting bigger and bigger.

Jonathan said if you place material on the beach directly then it has both short- and long-term results.

Update on MCR Beneficial Use Program

What occurred / is occurring in 2016 and 2017 for Disposal and Monitoring?
Curtis Roegner gave a PowerPoint Presentation on the *Mouth of the Columbia River Benthic Impact Study*. The full PowerPoint Presentation can be viewed here: https://lowercolumbiasolutionsdotorg1.files.wordpress.com/2018/08/3-kaminsky_north-jetty-coastal-erosion-update.pdf

Discussion – Key Points
Guy Gelfenbaum asked if Curtis pulls the crab from the site, tags them and then releases back to the same site. Curtis said yes, that they trap them in crab traps, call the dump ship and then release them in the same spot where they were trapped.

Curtis indicated that tagged crabs had been found as far north as La Push. James McMillan asked how long it took for the crab to get to La Push. Curtis said it was about two months but we don't know that it's a straight line there.

Rod Moritz gave a PowerPoint Presentation on the *South Jetty site observations*. The full PowerPoint Presentation can be viewed here: https://lowercolumbiasolutionsdotorg1.files.wordpress.com/2018/08/5-moritz_norton_south-jetty-site-observations-and-present-operations.pdf

Discussion – Key Points
Jonathan said comparing 2012 and 2017 there appears to be very little difference in the amount of sediment. He said it seems small compared to nearshore with many meters change. Rod said yes, effects get concentrated as you get closer to the near edge / on shore from higher depths further out. He said the idea is that if we feed the nearshore, which is part of the overall sediment budget, the material will get swept in multiple directions while feeding the nearshore as well.

Bridgette asked regarding slide #14 "MCR SJS Bathymetric Change / 2017 Pre-Season Survey minus 2012 Base Condition" between the survey dates, how much material was the Corps disposing. Rod said 1.3 Mcy was placed in 2012 in zone one and two and only 103 Kcy can be tracked. Guy said the implication is that the rest of it dispersed away or faded away. Jonathan said the challenge is we don't know where it's going. Rod agreed and said they have some ideas about where it could be going.

James McMillan gave a presentation on the *North Head Site Study Area Baseline Surveys (September 2017)*. The U.S. Army Corps of Engineers (Corps) annually dredges around 3.5 million cubic yards (Mcy) of sand from the MCR. Chronic coastal sediment deficit in the Columbia River littoral zone at the MCR results in beach erosion. One solution to this problem is

to beneficially use as much dredged material as possible in the nearshore zone at the MCR. The MCR dredged material is placed in the Pacific Ocean at three nearshore sites (the South Jetty Site, North Jetty Site, and Shallow Water Site) and one offshore site (the Deep Water Site) jointly managed by the Corps and U.S. Environmental Protection Agency – Region 10 (EPA). To reduce the amount of material wasted at the Deep Water Site, the Corps proposes nearshore, thin-layer placement (TLP) of dredged material off the North Head (located south of Long Beach, WA). TLP has been successfully employed at the three currently operational nearshore sites.

The Corps surveyed baseline ecological and substrate characteristics in the 4.6 nmi2 North Head study area (NHSA) to support the selection of a dredged material placement site that minimizes environmental impacts and optimizes beneficial use of dredged material. A total of 23 stations were surveyed for grain size and benthic infauna; 10 stations were sampled for heavy metals. Epibenthic fauna were characterized by 4 10-min. trawl transects; Dungeness crab were surveyed at 20 stations using commercial crab pots (24-hr. soak).

Grain size consisted of fine and very fine sands (75µm to 0.25mm) throughout the study area. Fines (silt+clay <75µm) content was typically <6%, and medium sand (0.25mm to 0.5mm) was typically <8%. Grain size was coarser in the southeast portion of the NHSA and finer in the northwest part of the study area. Heavy metals concentrations were at natural background and well below regional benthic toxicity thresholds.

The 23 benthic infauna samples were sieved onboard the research vessel, and organisms were preserved for laboratory identification and enumeration. Benthic infauna densities in the north part of the NHSA were significantly greater (avg. density = 16,626 organisms/m2) than the southern portion of the study area (avg. density = 3,075 organisms/m2). Conversely, diversity in the southern portion of the study area (Shannon diversity index [H'] = 2.99) was greater than in the northern part (H' = 1.46). Annelids (worms) were the major taxonomic group in all samples.

Epibenthic densities observed in the four trawls ranged from 1,965 to 4,489 organisms/ha. Of the four trawls, the greatest density and diversity of epibenthic organisms was observed in the northeastern portion of the NHSA. Commercial crab pot surveys were highly successful, with an average of 58.4 crabs/pot/day. A total of 1,167 crabs were caught; of these, 86% (1,001 crabs) were male.

For the summer 2018, deployment of a surface current and wave buoy at two locations is scheduled. Over the next two years (summer 2018 and summer 2019), the USGS and Ecology will be performing nearshore bathymetric and beach/foredune topographic surveys to measure elevations changes in the Columbia River littoral zone. All of these data will be used by the USGS to run a Delft3D-SWAN hydrodynamic model to identify probable sediment transport patterns off of the North Head.

Biological and substrate baseline data do not favor the selection of a dredged material placement area in one part of the NHSA over another. Beach erosion and sediment transport

patterns should be the primary driver in selecting a dredged material placement site off the North Head. The full PowerPoint Presentation can be viewed here: https://lowercolumbiasolutionsdotorg1.files.wordpress.com/2018/08/6-mcmillan_north-head-site-study-area-survey.pdf

Discussion – Key Points

Dan Ayres asked if there is any data on what shell cycle the crabs were in. James said they were past the molt, no soft crabs. He said there was limited mortality in the pot such as one instance where snails had parasitized a crab, but that's it.

Rick Mraz asked about the occurrences of density north versus south. James said density could be due to grain size and even a small percentage of fines can affect benthic organisms. Rick asked if there was higher diversity closer to the entrance vs. further away. James said he did not really have any hypothesis. Caren said dynamic systems end up with higher diversity.

Edwin Elias gave a presentation on *North Head Circulation and Transport Pathways Modeling*. USGS and Deltares-USA have developed, tested, and implemented a Delft3D hydrodynamic and sediment transport model for the MCR in support of RSM and the Portland District COE. The model will be used to: (1) quantify the physical linkages between MCR and the adjacent Long Beach coastal zone by investigating sediment transport pathways and mechanisms, (2) investigate the flow circulations patterns between the North Jetty and around North Head, for the various sets of input conditions to assess the importance of tidal and fluvial contributions. We will examine the modeled transport patterns for areas of transport convergence and areas of transport divergence. Areas of transport divergence indicate regions of sediment dispersal, which may suggest areas suitable for disposal of dredged material. Through analysis of results for various forcing conditions, we investigate the relative importance of waves versus tide along different parts of the open coast, and determine the dominant wave / fluvial conditions for sediment exchange between the MCR and open coast. The full PowerPoint Presentation can be viewed here: https://lowercolumbiasolutionsdotorg1.files.wordpress.com/2018/08/7-elias_gelfenbaum_north-head-site_modelling-study-update.pdf

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Discussion – Key Points

Brian asked when the model will be ready. Guy said they think it will be another month to get the funds and then they have 1.5 years to work on it. He said the model is already set up.

What is the status of Permitting / Funding?

Jarod Norton said we had a bureaucratic disaster with funding between Corps and NOAA, but Curtis has funding as of this week. In terms of agreements they are working on seven-eight agreements for monitoring the South Jetty site with different agencies. He said to get baseline data at North Head we are going to put a buoy there. This year is a pretty big year funding wise. He said there will probably be close to $700k for monitoring funding. He said the effort is

ongoing because of the push to get the North Head site baseline information and an initial disposal project. Rod added that one of the agreements with USGS for nearshore monitoring includes a modeling element. USGS will be doing some North Head modeling.

What Have We Learned/ Still Need To Learn? How Do We Apply The MCR Experience To Regional Coastal Erosion Issues?

Brian asked panelists (Curtis Roegner, Rod Moritz, Caren Braby, Dan Ayres, Dale Beasley, Bridgette Lohrman) to share what they have learned. Key points are reflected below.

Curtis Roegner:

- Thin layer deposition itself is quite effective at minimizing impacts. Data shows that crabs can survive impacts with no negative effects so far. He remains concerned that impacts on benthic invertebrates have not been studied to the same degree. Impacts on crabs' food resources, i.e. is sand impacting what they are trying to eat, have not been addressed yet.
- Most info we have is from adult or larger crabs. Smaller crabs may respond differently. We should think about if that is going to be a problem.
- We actually saw mating crabs in some of the campods. It could be that we don't know as much as we think we do about their basic biology and reproductive cycle.
- Evidence so far is that the crabs can survive thin layer deposition.
- If proposal to do intensive dumping on North Head site goes forward, we should do a control tagging experiment there. If we put a bunch of sediment down in a 24 hour period it is an opportunity to see what happens at higher volumes of materials.

Rod Moritz:

- In the big picture, tidal inlands in the Pacific NW are volatile.
- Immediately to the south of the inlet and immediately to the north behave very differently.
- He wanted to emphasize that ebb tidal shoals are our friends.
- On shore placement – we did about as large of one as we can in the 2010 Literal Drift Restoration experiment. They dumped 10k (?) cubic yards of sand on Benson Beach. There were limitations due to equipment and funding, which still remain limitations. It is not within the Corps operating budget to do another onshore deposition. We could mobilize a third dredge from the East Coast but that adds $5 million to the cost plus another $5 million to actually place the material.
- He believes shifts in Benson Beach are related to Peacock Spit. The Corps has been monitoring Peacock Spit since 1958 and it is shifting. The underwater part is shifting and that impacts Benson Beach erosion.
- He suggested looking at Peacock Spit bathymetry in 2010 and again now in the model and see how it affects Benson Beach.

Caren Braby:

- Sharing these data sets across perspectives and disciplines has been really valuable. It has also shown that we have a lot left to learn.
- Is this really beneficial placement? She is not sure that is conclusive yet though she does feel more comfortable now than she did nine years ago, at least for crabs.
- We haven't answered all the questions regarding crabs but there are other species that are not commercially important species that are biologically important.
- She is interested in all the other questions such as where the sediment goes, is it benefiting the system, do we need to so something different i.e. put sediment directly on the beach where there is more erosion.
- Are there connections between bio-toxins in crab at Peacock Spit within the same timeframe?
- We need to continue monitoring biology, sediment and other things.
- Interested in having discussion about other sites in the region i.e. Coos Bay area where there is consideration of siting a LNG facility and dredging / deepening the channel.
- We've had this crystallization of this dramatic change at Benson Beach but have we refreshed our goals enough to capture this. Do we have enough of an explicit goal to address this issue of jeopardy of both the jetties and whether they are stable or whether there is something really urgent that needs to be done at the north side.

Dan Ayes:

- Echos most of what Caren just said.
- He is excited to see attention of the North Head site and the possibility of disposal being placed there.
- Would like more information on crab impacts at various shell cycles. Jim and Dale reminded him that there was a period earlier in the season where there was abundance of crabs but they were soft. Molting cycle is a moving target.
- Razor clams – we need the sand for them on the shore.
- There is a similar project off Grey's Harbor on the south jetty and that disposal work occurs in April when more active crab fishing is occurring. They work with crab fisherman to get equipment out of zone to continue the dredging. It is smoother to do when crab fishing isn't in process but it can be done during the season if there is close coordination with the crab fleet.

Dale Beasley:

- Working with this group has been refreshing compared to when we developed the Shallow Water site and the Deep Water site. He said part of it is that the science isn't a secret anymore and it's available to everyone as we are making decisions.
- He sent out a memo the other day so asked people to refer to that.
- There are biological windows that we can avoid impact by changing the timing of the disposal, i.e. moving some of the North Head site disposal to earlier in the year.
- In August, his fleet rebelled and they did not want to have to deal interference with their fishing operations as they did at Grey's Harbor, but if that's the best place to have the least amount of impact on crabs then he thinks we should continue looking at it.

Crabs show up at the South Jetty site first and then at the North Head at Peacock Spit. If they could be done by August 10 that would avoid a lot of the crab population that shows up later in the month and after the molt. Also the crabs in September will have had some time to harden up after the molt.

- He has lost 27 of his fellow fisherman over the years and that is his real concern. They don't have that situation at Grey's Harbor.
- They've been dumping as close as 40 feet at Half Moon Bay and it's still not having any impact on the breach. It is much more efficient if you put it directly on the beach. There was a unanimous agreement between the scientists at an earlier Science-Policy workshop that the beach was the best place to dispose.

Bridgette Lohrman:

- Agrees that it is important to bring the science to everyone and to share what we are all doing / data being collected / funding being collected by the Corps.
- We have learned what a difference being able to see impacts and see dredge material has on how we think. Curtis' work has moved our conversation dramatically. As we continue to move forward we have to continue to share findings as broadly as we can.
- We need to market the products that are being developed in this group. She has taken the work that the Corps and others have done in the MCR and the video and images back to DC and it really blows their minds. This idea of how we apply what we have learned here regionally we should absolutely be taking up and down the coast.
- We should be using the video as a tool when approaching other entities i.e. engaging the Ports again in the effort. We need to broaden the message and the list of folks that are engaged and aware of what we are doing.
- To Caren's comment about is what we are doing beneficial. Perhaps the more appropriate question is how beneficial is it. We know that if we move it closer to shore it is beneficial in an erosion perspective, but how beneficial is it.
- Going back to George's graphs and the monitoring that has occurred. Long-term monitoring is very important in telling the story about why this group is together, what we need to focus on.
- Funding is critical. Challenge to the group about how to pool our resources in a better way to accomplish our goals. From EPA's perspective it is getting more challenging to move money around. When money comes we have to move quickly. Perhaps we could set up a mechanism for this group where different entities could contribute funding to complete the needed work. A similar group in San Francisco developed an NGO to collect/hold funding for the group.

Group Discussion – Key Points

Mike Nordin said putting dredge material on the beach is more important than putting it off shore. When you put the sediment at the Deep Water site it's gone and we won't get it back. We should be putting it on the beach up and down the coast. He said the economic impact up and down the coast is greater than the $10 million it would cost for the third dredge.

Brian said the contract with PSU includes coming up with ideas for funding.

Jarod said he and Curtis have talked about renewing the Crudup (?) study from the 1980s. Curtis said the study did some modeling, mapped out resources for benthos and things and was planned out as collaborative work. He said it ended up being amazing benchmark of the state of the estuary at that time. He said we could redo that study with our new technologies and could look at all kinds of things i.e. impacts of invasive species, crab biology, where are the female crabs, where do they go to brood their young, etc. He said this is a great opportunity for a great regional study where we could create a new benchmark to look at in the future to see how things have changed.

LUNCH

Update on Lower Columbia River RSM/Channel Deepening and LCSG Engagement

John Hays gave an overview of the Lower Columbia River Dredge Material Management Plan (DMMP). Key points included:

- Still in the beginning stages of the new DMMP.
- Six Mcy dredged per year and they are running out of places to put that material.
- They held six public scoping meetings last fall to share the plan with the public. One positive result of those meetings was that a lot of people in the region have an interest in their property being used for the upland placement of dredge material.
- Removing material from the system isn't necessarily the best practice. The Corps is actively putting as much material as possible back into the river.
- Desired outcomes of the plan include how do we place dredged material in the most informed way possible, where are the best places to put material, and how do we help mitigate our dredge need by placement of dredging material more efficiently.
- RSMP and DMMP are similar, but from the federal navigation path specifically, RSMP is all about sediment and the DMMP is more navigation focused. The two plans go hand in hand and are looking at the same types of things.

Discussion – Key Points

Bridgette suggested it could be helpful to present our on going research about the loss of sediment at the MCR to the Corps.

Rod said the Deep Water site was intended, in part, to receive dredge material from the Lower Columbia. He suggested that we take Lower Columbia dredge material and place it more beneficially in the near shore or at the MCR.

George asked if some of the material could it be placed on the beach or on the near shore vs. upland sites. Jarod said you'd still be limited by equipment and it would still likely have to be nearshore vs. onshore. John said cost is a huge factor as taking material 50 miles down the river isn't the most cost-effective approach to channel maintenance.

MOVING FORWARD -- HOW DO WE APPLY WHAT WE'VE LEARNED TO MOVING FORWARD

Program for North Head Site Pilot Project Placement and Monitoring

Penny Kelly reported that a Section 401 Water Quality Certification has been filed with the state for the proposed North Head pilot project. She said that Ecology felt that there was enough of a consensus to move forward with nearshore disposal at the North Head site. The 401 Certification requires the Corps to provide Ecology with plans for monitoring and reporting. She said she will work with Jim to get the Certification out to the group. Penny said it is good for five years.

Discussion – Key Points

Patty asked what the quantity is in the permit and if it includes a Federal consistency determination as well. Penny said the 401 Certification addresses the 30-35k cubic yard pilot study, which is a starting volume. They built into the Certification the ability to make adjustments as needed. Ecology also concurred with the Corps Federal Consistency Determination. The concurrence letter applies to the North Head Near Shore site only. As part of Ecology' consistency review, Rick Mraz looked for conformance with Pacific County's Shoreline Master Plan for this activity at this location.

George reviewed the last two slides from his presentation earlier in the agenda. *Proposal: Build a detectable feature on the North Head Site seafloor in about 35-50 ft. water depth to observe sediment dispersion. A feature of 2-ft. high in about 35-40 ft. water depth.* He said this discussion started off with a 2,500-foot run of thin layer disposal, but we may want to extend that out a little further to 5,000 and to make footprint as small as possible on the sea floor. To get effective thin layer disposal, we need to spread it out further. He said they'd likely have to go up to 50k vs. 30-35k cubic yards.

Guy said he liked the idea to use this pilot as a real experiment and he asked if the Corps would be able to do two -- one on the north side and one on the south side of the North Head study area. George said he thinks that's an excellent suggestion. Penny said the 401 Certification specifically identifies only one area but it includes "unless otherwise authorized by Ecology", so there's flexibility. She said they would be able to do it through the monitoring plan requirement in the 401 Certification without having to do an amendment.

George said his initial reaction to the 35k is that the context of this site is much more active than the South Jetty site, so although it's the same amount as for the 2007 South Jetty pilot project but the dynamics are such this quantity is smaller within the context of this study area.

Rod said we learned a lot from the South Jetty site that we don't have to learn at the North Head site. He said the next step at the North Head site is to build a small feature so that we can track it in terms of how it is dispersed. He cautioned against doing two features, as we want to reliably monitor what we've created. He said our consideration for this site is that because of

conditions we have to get in there right after placement to do the survey. Monitoring two features concurrently would be difficult.

Brian said the issue is that this proposal exceeds the RSMP mounding standard. He asked how 2 feet of mounding affects amplification. Rod said at the Shallow Water site they used wave modeling to assess different aspects of shape and how high and long a feature has to be to affect wave application. They found that it would have to be four feet high in 30 feet of water. They have modeling that shows that two feet at a depth of 40 feet will not affect waves.

Jim asked what quantity is needed to obtain two feet of mounding. George said 300k would be better. Rod said ideally as they monitor and build it, they would place material until they got to two feet then stop and start monitoring. That's truly adaptively managing our experiment.

George would like to know how much we can utilize this site if we wait until September 15 or how much they can get done before August 10 without much too impact to the crab fishery.

Dale said he is glad to hear that we're talking about a 5,000 run vs. a shorter one. He said quantities are not as important to him as the individual dump thickness. He said he would hope that the practice of putting one on top of another would be a one-time thing to measure it. Dale said there will be crab gear in the area so there will need to be coordination with the crab fleet to get those moved appropriately in the right timing. He said his opinion and that of his fleet are not the same. The fleet doesn't want any in-season disposal. Earlier in the summer, there are not as many crabs in there so that reduces any potential impact. He can fight with his fleet a little bit and everyone just needs to be exactly aware of where the dredge will go so they can get their gear cleared out.

Jarod said the dredge is always going to arrive around the second or third week of August. Dale said that usually by August 10 there are larger quantities of crab in there. Brian asked if the order in which they do the dredging on the coast is changeable. Jarod said the sequencing is very planned out and most likely not able to be changed.

Brian asked how much time it would take to do a 5,000-foot run to two-foot height. Rod said 10-20 runs, so two-three days. Dale said that could probably be arranged with the fleet, as there are not that many fishing out at the North Head site. Dan said they could provide dates and locations to the fleet in advance. Penny said a minimum of seven days of notification to the crab fleet is a requirement of the 401 Certification.

Brian said it seems the next step should be to have the Technical Team flesh out the details.

Guy asked, this being a five-year permit, could we do north or south this year and next year do the other area. He said there are big questions about where the sediment will go if it's north of North Head versus south of North Head. Rod said a lot of discussion got us to this point, which is a one-time experiment to measure dispersion, but if it suggests that we need to learn more, then what Guy is suggesting could be worthwhile.

Curtis said the North Head site could be really problematic for visibility. He doesn't know how much useful data we can get, but he suggests setting up moorings and doing topographs. He said transponder tags as tracers might be an option. He said they are small but not as small as sand. Guy said it would depend how buoyant they are. Curtis said they don't float, but you'd have to figure out if they are similar in density.

James said they have grain size data from the substrate survey. He said as you go north and west in the site it is finer grain and you may not get as much movement there. He said the Benson Beach area is the hot spot and he thinks we should be funneling placement towards the south end of the site.

Jim said, from a historical perspective, the South Jetty site was a pilot project but not a one-time experiment. He said we have had five disposal events with increasing quantities and we learned each time. Whether we have two experiments or just consider it a pilot project that adapts and build on the South Jetty site information, he agrees that we should assign the details to the Technical Team.

On-Shore Placement Options / Considerations at Benson Beach and Elsewhere

Brian explained that onshore placement in the area has been limited to one large disposal on Benson Beach in 2010. There were a number of operational challenges, including pulling a dredge up alongside the jetty and off-loading through a pipe to the beach. At one point the ship crashed into the jetty. He said the only reason the onshore disposal happened was that the State provided a cost share. We got that funding because of the wide range of support from stakeholders sitting at the table. Scientists have said the easiest way to get the sand on the beach is to put it directly on the beach, but there are many constraints. Brian said he thinks it is worth exploring to see if there is anything that we can be doing.

Jarod said he sees two big constraints in the ongoing jetty work and the cost. He thinks it is going to take traction from this group and filtering up through multiple channels the message of how important it is to get the sand onto the beach. For the Corps timing is a constraint. He said the operation of placing material on the beach takes a lot longer than placing it in the water. Jarod said a second contract dredge just to pump ashore would be a significant cost and he does not know how the Corps would fund it. He said it is a big ask to the states but is a critical need. He said there may be other options that we haven't thought of ye,t such as rocks or other material left on the beach to stabilize it.

Brian said a big chunk of the added cost was the mobilization of the pipe and hooking things up. He said in some parts of the country they have infrastructure in place to pump ashore as needed. He asked if something like that is feasible. Jarod said he isn't sure something like that would last with the wave environment out there, but it is definitely worth looking into.

Jonathan asked how much material was placed in 2010. Rod said 350k cubic yards. He then asked how long it stayed onshore. George said it moved quickly into the nearshore. He said there was less erosion of the center portion of the disposal site than in other winters.

Patty asked what the timing is for the North and South Jetty work. Jarod said North Jetty work is going on right now and will be completed in two years. The South Jetty contract will be awarded next year and there will be four years of construction starting in 2020.

Dale said geologic processes take time. He said we didn't see the consequences of the jetties being built for 50 years. Sediment placed directly on Benson Beach will naturally go up the peninsula and overtime protect the entire peninsula. When Pacific County prepared their Shorelands Master Plan, they stipulated that there is no building beyond the 1968 grass line. He said that gives us a little of time to get this underway. He said if we're only placing 2-3 Mcy per year that may not be enough sediment even if we're putting it all directly on the beach. We need to look at the longer-term picture. If we never start speaking up it's never going to happen. We need to stop talking about budget constraints. Dale said he does not recall Benson Beach disposal costing much more than the Deep Water site disposal. He said if we look at the overall erosion on the Clatsop cell, that cell has lost more material than we have dredged in total at the MCR. We have to push for a solution for the long-term. He said some of our current senators are senior members of Congress and are not going to be in office much longer. He said we should address this now while we still have elected officials in office that support this effort.

Bridgette said she does not have a long-term solution but she doesn't want to lose sight of something that Jarod said about the states coming together to ask for a contract dredge and that mobilization cost is really high. She said this is not only serving Washington and Oregon but also California. She suggested that the West Coast states work together all the time. She said a joint effort to bring a dredge from the East Coast could include San Francisco and LA and could be a shared cost. Jarod said there are lot of opportunities in Grey's Harbor to use a dedicated pump ashore dredge, as well in southern Oregon at Beverly Beach and in San Francisco where there are erosion issues. He said he thinks this could be a one-time contract ask every 10 years or so. He said the ongoing cost for a dedicated dredge could be around $50 million.

Brian said the big questions are: do we have the bandwidth and where do we go next. He said to him it would be continued conversation, exploring avenues, talking with other experts and then coming back as this group for further conversation.

Mike asked if the Corps owns the dredges or if they are contracted. Jarod said the dredges with pump off capabilities would have to be contract dredges, as the Corps dredges do not have that capability.

Dale said an erosion solution is on the Washington Senate's list for consideration and we should advocate for that discussion. Brian said that we have some influential Congressional members

and this group could wield a lot of influence. He said making an ask in is a good thing, we just need to decide what the ask is.

Program For Ongoing South Jetty Site Placement And Monitoring

Curtis reviewed a slide from his earlier presentation "2018 options 10-14 additional receivers", and presented three options:

1. Repeat South Jetty site experiments with increased gates.
2. Undertake a mounding experiment at the North Jetty site; focus on cumulative impacts.
3. Employ a small impact array at the South Jetty site and place increased gates at both the north and south sites.

Jarod said another study in 2019 will use the same receivers to monitor cumulative effects. Any tagged crabs will be recorded.

Patty asked whether with the second alternative there will be a limited number of tagged crabs at the South Jetty site but more on the North Head site. Curtis said yes; over the last few years we have seen the crabs go north so he's like to monitor in the north as well.

Bridgette asked what are we trying to answer with the South Jetty site monitoring. She also asked if the focus is to get a better sense of what we think is happening to crabs. Curtis said it is still ta question of cumulative effects. With the larger arra,y we will see more data on where they end up. Bridgette then asked how much will be disposed at the South Jetty site. Jarod said 400k cubic yards.

Rick asked if Curtis is capturing data and results on juvenile crabs. Curtis said they are in the estuary. Rick asked Curtis if he thinks there is a representative sample in his study to assess effects on both juveniles and adults. Curtis said there are more smaller / younger juveniles in the estuary vs. in the ocean. He said the idea is that we could get some smaller ones from the estuary and drop them into the impact array as he thinks they go out at some point.

Patty asked participants if they have a preference among the three options Curtis presented. Jarod said the focus should really be on the North Head site and option #2 looks best. There was general agreement among participants to proceed with option #2.

IMPLEMENTING THE PROGRAM

Specifics of Program for Moving Forward

Jim recapped what he understood to be the main points from the session:

Overall Direction for Group's Work

- The question is not whether nearshore or on-shore disposal is beneficial, but rather how beneficial.

- The group's work needs to be marketed up and down the West Coast.
- Pooling of resources needs to be continually explored.

Sediment Supply -- South Side

- Relatively positive picture, with accretion generally. The exception is erosion at the root portion of the South Jetty. The Corps will address this in 2019 as part of a South Jetty reconstruction project.
- Sand accumulation on the south side may or may not be related to disposal activities.
- As identified at the 2016 Science-Policy workshop, the potential remains for breaching of Clatsop Spit's foredunes with a series of severe storms.

Sediment Supply -- North Side

- Significant change in the sediment supply is occurring, with a very strong erosion trend south of the North Head, while overall a trend of accretion north of North Head. The localized erosion trend south of North Head needs to be closely tracked and its cause(s) understood.
- A major concern is erosion moving north up the coast.

Lower Columbia River

- The group recommends the use of Lower Columbia River dredged materials for nearshore beneficial uses rather than for Deep Water site disposal.

South Jetty Site

- Five + disposal projects demonstrate that thin layer disposal causes no significant adverse effects to crabs.
- Cumulative effects to crabs and direct and cumulative effects on other species remain to be assessed.
- There is support for continued monitoring, focused on cumulative effects, as proposed by Curtis Roegner, NOAA Fisheries. Monitoring during a larger dump event (at both the South Jetty and North Head sites) to be a proxy for cumulative effects.
- The group expressed support for disposal of 400,000 cubic yards in 2018, with a buildout to 500,000 cubic yards occurring next year.

North Head Site

- There is a significant difference between the north and south portions of the North Head area in terms of benthic fauna density (north = greater numbers) and diversity (south = greater).
- The group supports the pilot project proposed by Corps/WDOE as an effort to measure dispersion of material deposited in the North Head area. The pilot project will consist of thin-layer placement along 1 transect (dump alignment) for 6-10 dumps. Each dump to be placed 2-3 hours apart. Successive placement will span about 24 hours. The pilot will be adaptively managed to ensure that two feet of mounding of dredged material in 35-50 ft. water depth will not affect wave action.

- Coordination with the crab fleet is needed to avoid impacts with gear. The earlier in the summer that the pilot is conducted, the fewer the impacts to the crab fleet.
- Recognizing the difference between the two sections of the North Head site, separate simultaneous or successive projects for the north and south portions are supported if/when feasible.
- Project details are deferred to the Technical Team.

On-Shore Disposal

- No clear direction was provided on how to proceed, other than to recognize that there are a multiple issues to explore, including the Corps' least cost standard.

Program Going Forward

- The is strong support for continuing annual science-policy workshops, with a Fall check-in following this summer's work at the North Head and South Jetty sites.
- Jim Owens is assigned to assist the LCSG in developing a workplan for 2018-2019 and identify potential funding strategies for the work.
- A Steering Committee in lieu of Management and Technical teams should be explored.
- Legislative staffers should be briefed on the project.

Jarod asked if there are critical missing agencies or entities that should be at the table:

- Port of Portland. Jim indicated that the Port is interested in participating but that staff was unable to attend today.
- WA State Parks. Staff indicated a high level of interest and has indicated that it was going to try to attend.
- Washington Coast Marine Advisory Council
- Nature Conservancy
- Surfrider
- North Coast Land Conservancy
- Corps' Seattle District (to share lessons learned from Gray's Harbor)
- Coast Guard

Brian reviewed the funding needs and opportunities:

- Funding has always been challenging and has been more so lately.
- We're a year behind schedule because of money issues.
- Jim has been tasked to come up with some funding solutions / strategies.
- There are two aspects: structural issue of how you manage the money, it's a challenge when you're trying to pool resources; how do we involve the members around this table in helping fund this work.

- It is not feasible for all organizations to contribute financially. Brian and Patty will be having a conversation about how to follow-up with some of you to ask the question about funding support.
- The contribution doesn't have to be a huge amount of money. $25k can sustain us through a year to convene the management and technical teams throughout the year to do this business that we want to carry out.

Caren suggested that we consider charging membership dues. She said she could afford $1,000 a year in her discretionary money. She said that going for a $20k grant is not worth it, but $1k discretionary money is doable. Steve said this was talked about at one point but they were financially better off back then and perhaps it's time to have the conversation again. He agreed with Caren to have a group who are sponsors and that $25k for the value of this program is really a small amount. If everyone comes up with a small amount there would be plenty of money.

Dale said legislatively funded efforts have happened in the past so maybe we need to have an educational component on beneficial uses to address coastal erosion for our Legislature especially when you look at Benson Beach, Half Moon Bay, Grey's Harbor and Washaway beach. Jonathan agreed there is opportunity there The SW Washington Littoral Drift Study was initiated by the coastal communities. Mike said at the next Legislative session they are going to be making a larger ask to deal with Washaway Beach.

Additional Comments

Caren said the value of this group is the data coming out of it. She said we need to keep supporting the science that is coming out of this collaboration and supporting the scientists providing the data.

Curtis said from the science side, if anyone needs slides or video clips from their data please let him know. He's more than happy to supply anything that is needed.

Dale said one way to show the value of this group to the Legislature and toget them committed to a few dollars is to create a poster board. Next February 25, the first annual Seafood Legislature Days would be an opportunity to share the project.

Andy said in addition to a poster a story map could be a really valuable web application that could be shared and used for fundraising and other purposes.

Bobbak said that in addition to posting the PowerPoint presentations from today he would like to post a high level summary from each presenter that goes along with the presentation. Caren said these short summaries could be boiled down into storyboard stuff or a one-pager that could be used to tell the story elsewhere.

Jim said one frustration that he has putting together an agenda for this group it hat we have much to discuss. He said it's a hard ask, but we may need to give ourselves a day and a half for these annual meetings. Jonathan agreed that would not only be appropriate but also beneficial. Brian said historically the first day was technical stuff and the second day was more policy stuff.

Meeting adjourned at 3:58 pm.