

Jan. 19, 2010 Science Panel Meeting – Terminal Groin Study

Panel Members in Attendance:

Steve Benton, DCM retired
Bill Berkemeier, USACE ERDC
Stan Riggs, ECU
Rob Young, WCU
Tom Jarrett, CP&E
Pete Peterson, UNCCH IMS
Greg Williams, USACE
Spencer Rogers, NC SeaGrant
Bill Cleary, UNCW
Margery Overton, NCSU
Beth Sciaudone, NCSU adjunct / consultant

Panel Members not in Attendance:

Dave Mallinson, ECU
Tony Rodriguez, UNCCH IMS

DENR/DCM/CRC in attendance:

Robin Smith, DENR
David Knight, DENR
Jim Gregson, DCM
Ken Richardson, DCM
Guy Stefanski, DCM
Steve Underwood, DCM
Michele Walker, DCM
Bonnie Bendell, DCM
Scott Geis, DCM
Bob Emory, CRC
Joan Weld, CRC

Margery Overton opened the meeting at 10 a.m., a final agenda was passed out, and introductions were made.

Paul Tschirky of Moffatt & Nichol began with a presentation on an update of progress on the terminal groin study, looking at preliminary results for each of these categories:

- Coastal Engineering Analysis and Physical Effects
- Environmental analysis and impacts
- Construction techniques, costs, locations
- Economic impacts

Coastal Engineering analysis:

- Physical processes
- Geologic setting
- Structural characteristics
- Pre- and post-construction shorelines
- Shoreline change and volume changes

Shoreline change analysis was done using historic shorelines, surveys and aerials to assess shoreline change pre- and post-construction in 50 m segments on both sides of inlet; summaries of shoreline change were presented in .25 mile increments.

The panel discussed how the segments and starting point were chosen, and the dates that were used.

M&N used the longest pre-set and post-set dates they could find that covered a distance of at least 3 miles on both sides of the inlets.

The Fort Macon site at Beaufort Inlet was used as an example of the analysis and preliminary result values discussed.

More discussion of how to separate the effects of the terminal groin from all the other intervention in Beaufort Inlet, including dredging. Margery Overton noted that this is one of the sites the Science Panel chose to look at for this study.

Tom Jarrett noted that we need to look at inside portion of the inlet east of the groin to see impacts on the inlet. One of the things we're trying to determine is how to design to allow sediment to move through the structure. He wanted to spend more time looking at impacts on shoreline immediately inside the terminal groin, rather than the other side of the inlet. Stan Riggs noted that the legislation requires the study look at both sides of the inlet.

Tschirky noted that M&N are trying to use common data sets for all five sites; other available information will be included in the final report.

Much further discussion about the details of Oregon Inlet and processes and outside forces that affect it.

Volumetric change, nourishment and dredging:

- Examine survey profiles (USGS, DCM, etc.) – need to note where and when each was taken, whose data
- Calculate volume changes
- Look at dredging/nourishment data

Discussion of methods of calculating differences, problems inherent in that calculation; adjustments that must be made to compensate for beach fill, near shore sand placement, etc.

Discussion of beach nourishment and its impact on volume of beach change Tschirky noted that M&N used beach nourishment records, including volume and placement location. Divided to get approximate cubic yards per year of impact on shoreline. M&N then netted out beach nourishment from volume change based on shorelines, to try to get a sense of how the shoreline has changed without impact of beach nourishment. Shows that some areas that were accreting now are eroding slightly when discounting the effect of beach nourishment.

Stan Riggs suggested coming up with a better way to present this data for the general public so it is more understandable. Rob Young asked if it would be more appropriate to convert those numbers back to shoreline change rather than using volume. Shoreline change is more often used to express these concepts. Spencer Rogers warned that using that approach would likely overestimate effects.

Physical setting:

Study report will present the physical data for each of five sites—tide, waves, storm activity (NOAA storm tracks info), sediment transport

Geological setting:

Can impart a strong signature on the physical processes affecting erosion. Historical geologic features, inlet migration, delta and channel patterns will be examined for each site.

Clery noted that the CRC needs to recognize that all the human intervention in Oregon Inlet has had a drastic effect on this inlet. Terminal groin effect is small compared to other interventions such as dredging, nourishment, changes to the tidal delta, etc. Noted that he did not see how to pull out only the effect of the groin in this area. How to compare this to other inlets that have not been manipulated to this degree?

Tschirky noted that the last question asked by the legislation is looking at natural inlets vs. those that have been affected by man-made processes. That is part of the study, to look at the applicability of these structures in inlets with varying degrees of human intervention.

Discussion of how to determine the degree to which a groin is having an effect, negative or positive, on downdrift shorelines, in addition to whether the structure is fulfilling its original purpose (to protect a bridge or fort, etc.). The scale of the inlet vs. the scale of the structure will make a difference, as will the effect of other interventions such as dredging.

Structure characteristics:

- Structural drawings – available for all sites except Captiva Island
- Dimensions, materials, etc.
- Engineering activities log – when each was constructed, dredging of channel, beach nourishment, etc.

Margery Overton called a lunch break at 12 p.m., asking panel to return by 1 p.m. since the discussion is well behind schedule. Need to limit questions this afternoon. Delay discussion of construction techniques until last, to be cut for time if needed.

Environmental Impacts Discussion

Dawn York of Dial Cordy and Assoc. began the discussion of environmental impacts analysis. Dial Cordy conducted an extensive review of impact of terminal groins on the physical environment, interviewing about 240 people over the last few months. They reviewed EIS, biological assessments, any document required for permit processes.

Based on their review, evaluated various resources including infaunal communities, shorebirds and waterbirds, fisheries, coastal habitats, water quality, federally protected species, and public access.

Dial Cordy looked at a broad picture of general marine resources, and will give an introduction to the reader of what these resources are. York noted that there is limited information on biological effects from terminal groins. She presented some data on seagrass, shorebirds and loggerhead turtles for each of the five sites, as an example of the type of data that has been collected.

There was discussion of how to compare data from each site to the wider region, and how to discount the effects of other external forces such as storms and beach nourishment. Also discussion of how changes in habitat in a managed system affects wildlife habitat.

York noted that in some cases, no wildlife data is available pre-construction.

Economic impact discussion

Dr. Dumas was unable to be at the meeting; Johnny Martin of M&N presented the economic impact preliminary information. The chosen method is to identify properties at risk using proposed Inlet Hazard Areas for all developed NC inlets, and assemble current property location and value data from County parcel data, NCDOT, utilities, etc.

The study will:

- Identify individual properties at risk over 30-year period, as a baseline condition
- Identify properties at risk with a terminal groin in place, using an average rate of erosion from the five study sites
- Assess property losses for each case

Young asked why not look at loss of property at inlets over the last 30 years to give us a baseline? Cleary and Rogers noted that the current level of development wasn't the same 30 years ago.

Spencer Rogers presented new risk lines being developed within the IHAs by the Science Panel and DCM. A subcommittee came up with a way to define inlet hazards – a line that is comparable in risk to 30-year setback in oceanfront areas. This line is being proposed as a way to capture potential economic loss in IHAs within the next 30 years.

Peterson noted that this approach assumes that all the development in front of these lines will be lost; maybe should use a probability instead. Young said he does not think we have the knowledge to do that. This is looking at potential loss; not projecting that every single inlet will erode back to that point.

Panel agrees that using this line is currently the best way to proceed with economic study in the time we have available.

Several panel members noted that the legislation does not direct the CRC to look at what could potentially be saved by terminal groins, and questioned why that is part of the study.

Johnny Martin noted that the next logical question would be how a terminal groin would impact those potential losses.

Discussion of whether or not the study should include an analysis of what might be protected by a terminal groin or what might be impacted negatively. The Science Panel agreed that using an average change based on the five study sites may not represent the behavior at the NC inlets, could be misleading, and should not be used in the study. Further discussion of whether economic impacts should be reported on a statewide total, or by inlet.

Margery noted draft report will be released on Feb. 1, and the science panel will next meet in Raleigh on Feb. 8. Final draft to CRC on March 1.

Meeting adjourned at 3:05.