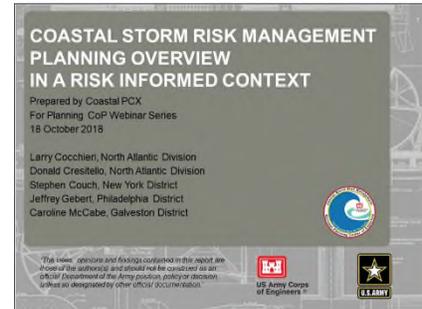


Incorporating Risk-Informed Decision Making for Coastal Storm Risk Management Studies  
Planning CoP Webinar  
October 18, 2018  
Q&A Session

Mr. Steve Couch (New York District), Ms. Carrie McCabe (Fort Worth District Regional Planning and Environmental Center at Galveston District) and Mr. Jeff Gebert (Philadelphia District) provided an overview of the Coastal Storm Risk Management (CSRM) business line, and discussed business line specific policies and guidance relevant to these studies as well as common challenges and risks.

The presentation was moderated by Larry Cocchieri, CSRM Planning Center of Expertise (North Atlantic Division). The presentation addressed conducting iterations of risk-informed planning in a CSRM feasibility study with a focus on the various areas where CSRM studies differ from other types of business line studies.



For more information about the CSRM business line:

- [USACE Coastal Storm Risk Management Planning Center of Expertise Website](#)
- [Coastal Flood Risk Management Guidance Collection on the Planning Community Toolbox](#)
- [Literature on the effectiveness of natural and nature-based features \(NNBF\) for coastal storms and sea level rise](#)
- [USACE Engineering with Nature Website](#)

This summary of the Question / Answer session of the webinar is not a transcription; questions and responses have been edited and reordered for clarity.

### CSRM Plan Selection Considerations

#### Are CSRM studies subject to the requirements of [ER 1105-2-101, Risk Assessment for Flood Risk Management Studies](#)?

Yes, ER 1105-2-101 applies to CSRM studies, although the guidance does not explicitly address CSRM projects. It should be noted that while the engineer regulation requires us to communicate level of performance and level of exceedance (annually and long-term), the Beach-fx simulation model doesn't give us those outputs. Teams should work with the CSRM PCX and Hydrology & Hydraulics (H&H) Community to meet the requirements of this regulation.

#### Is risk management against wave damage also taken into consideration, or is that included as a sub-category of erosion?

Waves are considered as a third damage mechanism, separate from erosion (*see slides 13 and 16 of the PPT presentation*).

#### Does CSRM differentiate between extra-tropical and sub-tropical storms?

Sub-tropical storms are generally considered to fall under the extra-tropical category, but there may be reason to reconsider this if it causes confusion.

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**If risk is a function of probability and consequences, and benefits of our CSRM projects are predicated upon the reduction of risk, why do we not measure wind damages as well? It seems benefits may be overstated if we do not account for the residual damages caused by wind.**

It's a good question, but wind damages are not something we consider in our analyses currently (*see slide 13*). However, many states have recently adopted more stringent building codes in order to address the potential for wind damages. Unfortunately, some areas have not yet adopted these more stringent codes, as we saw recently with Hurricane Michael (e.g., in the Florida Panhandle).

### **CSRM Study Process**

**How would you conduct a second study iteration without existing models (i.e., conducting planning just with knowledge from others)? *See slides 56 and 59.***

Without the use of existing models, you would need to look for distinct differences in performance or cost between each of the measures under consideration, as well as for meaningful uncertainties in the plans. If the level of uncertainty is too large, you may have to incorporate some modeling.

**Where did each iteration in the example (Galveston District Coastal Texas Study) discussed fall in relationship to milestones and in-progress reviews (IPRs)?**

The first iteration was held before our Alternatives Milestone, which gave us our focused array. The second iteration was between the Alternatives Milestone and the tentatively selected plan (TSP) milestone, which culminated in an IPR where the vertical team and Planning Centers of Expertise were in attendance and the technical staffed walked through each of their metrics to show data and the screening they were doing. This was not a milestone meeting, but an important iteration step. In the third iteration, we refined the analysis based on risk and uncertainty before selecting the TSP.

**Did the PDT in the example study meet the 30-day, 60-day, and 90-day iteration deadlines, or did it take longer?**

This project had a waiver for time and cost because of the complex scope and scale of the project, and also was begun before the latest planning guidance was issued with its focus on the first iteration within the first 30 days of the study, Alternatives Milestone within the first 90 days, etc. However, it's important to note that these timeframes are targets, and not every project will be able to answer the necessary questions within those periods.

**In what year was the example study conducted?**

The Alternatives Milestone for the study occurred in 2016.

**What are the general timelines for creating engineering models for a CSRM study?**

It's very site specific depending on what has already been set up. Traditionally, in order to get to a TSP these models would already need to be set up which would require long lead-times that wouldn't coincide with the new iteration timelines, and most modeling would therefore be done during feasibility level design, once the TSP had been identified. In the new 3x3x3 paradigm, there is a need to get to the TSP with less detail and more assumptions. However, if the unknowns are so great that one plan can't be

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selected as the clear national economic development (NED) plan, the vertical team and the PDT should discuss the need to collect the data necessary or model that additional level of detail in order to clearly select a TSP.

### **When will the Generation 2 Coastal Risk Model (G2CRM) be ready for use?**

The G2CRM model is currently undergoing the planning certification process, but is available for use. A full certification should be available for PDTs in early 2019, but for now approval is necessary for use of the application. Anyone wishing to use the model should coordinate with the CSRMC PCX.

### **What are the common natural and nature-based features currently being evaluated for CSRMC?**

Features that have been evaluated include oyster reefs and pulling rock offshore to fill inshore with sediment to create a substrate for intertidal marsh to grow.

### **Have we modified the spatial analysis/definition of projects? That is, looking more at back bay effects, etc., and not just the open coast exposure?**

The spatial analysis/definition of projects is dependent upon language in the study authority. In the past, many study authorities were limited to the Immediate Ocean shoreline or were for beach erosion control. With the inclusion of hurricane storm damage reduction, now referred to as coastal storm risk management, we are able to look at coastal storm risks to ocean and bay/estuarine/tidally influenced shorelines. Damage mechanisms considered include erosion, wave attack, and inundation from storm surge.

### **Has any project ever been approved on the high curve scenario for sea level change? Or have all projects been approved on the middle or lower sea level change (SLC) curves?**

We can't think of any project that used the high rate only for formulation, but in theory it would be a compliant approach (to comply with policy, it's acceptable to formulate on one of the rates and then check the TSP performance against the other two). There may be a situation where a team might want to use the high rate for formulation due to high consequences of failure and/or to better align with local sponsors that have their own sea level scenarios that are higher than ours (e.g., the States of New York and California). Certainly, there have been many projects that were approved based on all three rates.

### **[ER 1110-2-1150, Engineering and Design for Civil Works Projects](#), states that "Coastal navigation projects at the entrance to the mouth of any river or at any inlet must be assessed with respect to their effects on the adjacent shores. Particular reference shall be made to erosion and/or accretion for a distance of not less than 10 miles on either side of the entrance." How is this guidance about 10 miles on either side of the entrance applied when thinking about study areas or models?**

The boundary condition for a model can be broadened to consider other impacts, or additional modeling analysis may be necessary to assess whether scour, higher water surface elevations, or changed velocities result from the action within the river or the inlet. The tools and level of detail will vary across studies in relation to the potential risk or the magnitude of the consequences of the uncertainty.

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**Don't we need to fix the 1992 start for the climate change curves and update them for a 2018 start? The current curves don't work for the San Francisco Bay/West Coast.**

Specific concerns on the appropriateness of curves should be coordinated with the Climate Preparedness Community of Practice. For a 2018 start, the 1992 sea level must be updated to present (e.g., add the historic sea level rise rate for the number of years to get from 1992 to 2018, or basically 26 years at the historic sea level rise rate added to the 1992 sea level).

The year 1992.5 is the midpoint of the most recent National Tidal Datum Epoch, which spans from 1983-2001. Therefore, "sea level" as published by the National Oceanic and Atmospheric Administration (NOAA) for most places actually refers to sea level 1992. The only exceptions are some gages in Alaska and Louisiana where the ground is moving so quickly that NOAA had to establish a modified 5-year epoch, but that wouldn't be an issue in the San Francisco Bay.

For some areas that experience rapid subsidence, such as the southern end of the San Francisco Bay, it may not be appropriate to use MSL 1992 anymore, even though the subsidence may not be quite rapid enough for NOAA to establish a modified epoch there (or there might not be any NOAA gages in that exact location so the issue is moot from NOAA's perspective). In such cases there are at least two options: we can adjust the 1992 scenarios to align with a local estimate of sea level by "sliding" along the historic rate (or really any of the three scenarios; they are not highly differentiated until long into the future), and/or we can put that gage into our special sea level tool for non-NOAA tidegages, which presently contains only Louisiana gages; however, the Climate Change Community of Practice has indicated a willingness to add more if Districts are interested. For more information, Mark Huber and Will Veatch are the points of contact for the Climate Change Community of Practice.