



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
441 G STREET, NW
WASHINGTON, DC 20314-1000

NOV 20 2018

CECW-ZA

MEMORANDUM FOR Chief of Engineers

SUBJECT: Results of the Board on Coastal Engineering Research; 95th Meeting, Providence, RI

1. The Board on Coastal Engineering Research (CERB) held its annual full meeting on 7-8 August 2018 in Providence, RI. The theme of this meeting was *Coupling Coastal Engineering Solutions with Social & Ecological Predictions* with a purpose to identify U.S. Army Corps of Engineers (Corps) coastal research priorities related to the physical, biological, and chemical processes impacting human and ecosystem health. This selected theme was one of three critical needs identified by the U.S. Coastal Research Program (USCRP), which is an initiative of the CERB.

2. Federal, state, academic, and non-governmental representatives discussed the close linkage of human and ecosystem health to Corps Flood Risk Reduction, Navigation, and Ecosystem projects and how together they help to create long-term community resilience. We heard from five Corps and eleven non-Corps speakers about the impacts of short-term tropical and extra-tropical events, of long-term geomorphic and climatic drivers, and on the state of our knowledge and capabilities to predict future risk-based conditions to respond to today's challenges. A briefing on a 2018 National Academy of Sciences study validated the need to be proactive in addressing the coupled coastal, ecosystem, and human challenges of coastal communities over decadal-to-century scales. Technical site visits to Corps projects including the hurricane barrier at Fox Point, the harbor of refuge at Port Judith, and the Galilee Salt Marsh ecosystem restoration project focused these coastal challenges.

3. During the Executive Session following the meeting, we summarized key outcomes to discuss further at the winter 2019 CERB Executive Session. These outcomes and future actions are summarized below, and are related to our Corps Campaign Plan Objectives 2b *Deliver the Civil Works Program using innovative solutions* and Objective 4a *Maintain and advance DoD and Army critical enabling technologies*. These topics are:

a. **Capture Regional Benefits of Corps Projects to Coastal Resilience.** We discussed that for communities and coastal regions to be resilient and sustain healthy humans and ecosystems, we must look at them as systems of systems. Our flood risk reduction, navigation, and ecosystem projects are interwoven and contribute significantly to long-term sustainability. We have made strong advancements in our knowledge and applying the concepts of resilience to Civil Works since hurricanes

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Katrina and Sandy. The 2017 hurricane season highlighted how urban coastal regions are increasingly vulnerable to combined impacts from coastal and inland storms, which affect human health, ecosystems and the national economy. Our new capabilities to use science and engineering for risk-based designs has improved, but much more is needed to accurately predict life-cycle performance, calculate non-structural benefits, and integrate these capabilities into existing process-based tools and models. We will discuss this topic in greater detail at the winter 2019 CERB Executive Session to ensure our coastal research has a clear roadmap and strategy based on Corps requirements and priorities.

b. Infuse Innovative Technologies into Supplemental Execution. The CERB wants to ensure the Corps is using the best tools and capabilities as we execute the 2018 Supplemental and use the opportunity to link our most challenging studies and projects with the latest research and technology to address uncertainties early and develop innovative solutions. The Supplemental creates opportunities to expedite technology transfer and use of the latest ERDC tools then, through feedback, evaluate performance of these tools developed through our Civil Works (CW) research program. Through this process, we will continue to improve the tools as well as learn about project successes and areas for adaptive management of coastal systems. Evaluating our capabilities to build increased project resilience for rapid recovery and adaptation will improve project performance in future events. Hurricane Katrina provided the opportunity to leap ahead with our risk and resilience-based technology; the 2018 disaster supplemental is another opportunity to improve our capabilities for future events. We will explore best practices for coupling our coastal research, development and technology with our challenging projects during the winter 2019 CERB Executive Session.

c. Examine the Corps' Investment in Coastal Research. The Board is concerned our coastal research investment is low, especially compared with total research investment levels by the Army and DoD, which are >6% and >13% of their total budgets, respectively. For comparison, the Administration's Fiscal Year 2018 (FY18) CW R&D investment is 0.7% of the CW budget and coastal research investment is on the order of 0.2% of the total Corps CW budget. We recommend a deeper examination of the Corps strategy for R&D investment, including a better value system for understanding the payoff of research investment and a review and recommendation for more rapidly applying R&D innovations into Corps practice. Are we causing long-term damage to our future capabilities in the name of short-term budget management? This topic crosscuts our CW program that the CERB sees as a possible issue to delivering the program. We see significant coastal challenges on the horizon that need risk-based tools based on the highest state of knowledge.

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4. The CERB discussed the need to make certain we address the Corps highest priority coastal challenges. To this end, I invite you to attend our winter 2019 Executive Session tentatively planned for Gulfport, MS, where many of the concepts of coastal system resilience were implemented following Hurricane Katrina. This region was the birthplace of the Corps' Regional Sediment Management program and is in the center of our 2018 Supplemental Heat Map. The Mississippi coast provides an excellent example of success as we begin rebuilding the projects and coasts of Texas, Florida, and Puerto Rico. Periodically, the Chief of Engineers gives the CERB a charge, "Chief's Charge", to address a coastal topic and provide recommendations. Perhaps you could provide a Chief's Charge at the Executive Session. I have several ideas we can discuss at your convenience.

5. We received an update on the CERB's USCRP collaboration with the American Shore and Beach Preservation Association, other federal agencies, academia, and stakeholders. They requested we champion and support the Corps' participation in the During Nearshore Event Experiment (DUNEX). The CERB discussed the initiative and value of the large-scale experiment then unanimously recommend DUNEX become a priority. We will also make this recommendation to the CW R&D Steering Committee.

6. The DUNEX execution is in FY20 with preliminary and follow-up activities during FY19 and FY21, respectively. It will be based at our Coastal and Hydraulics Lab's Field Research Facility at Duck, NC, to proactively address Corps coastal challenges on storm processes and community flooding models, assess thresholds for natural & nature-based feature variability, and evaluate performance & adaption of aging structures, to name a few topics. The DUNEX organizers are also incorporating a coastal engineering training opportunity with a mix of course work and fieldwork for district personnel. This is an excellent opportunity to transfer technology and increase our workforce competency in coastal engineering and science. Both activities are in direct alignment with UPC objectives 2c: *Deliver the Civil Works Program using Innovative Solutions*, 4a: *Maintain and advance DoD and Army critical enabling technologies* and 4d: *Build ready and resilient people and teams through innovative talent management and leader development strategies and programs*.

7. On a personal note, this was my first CERB meeting as it was also for MG Jeff Milhorn and BG Kim Colloton; our veteran military member, BG Diana Holland had attended only one previous Executive Session last March. I learned more about the Corps interconnected coastal mission in two days than I learned in two years as Division Commander. We discussed the value of this Board and interacting with coastal community leaders and experts as we gain an understanding of the challenges we face in the coastal zone. Our coastal navigation, flood risk reduction and ecosystem projects are clearly integral to healthy communities and their economic stability. They are a

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system of systems that together help provide community and regional resilience. This meeting provided independent voice to the same argument we have for keeping the CW program together.

A handwritten signature in black ink, appearing to read "Scott Spellmon". The signature is fluid and cursive, with the first name "Scott" and last name "Spellmon" clearly distinguishable.

SCOTT A. SPELLMON
Major General, USA
President, Board on Coastal
Engineering Research