

The background image shows a flooded street with a rescue team in a boat. The team consists of several members wearing yellow helmets and red life jackets. They are in a grey inflatable boat with a blue Yamaha outboard motor. The water is brown and murky. In the background, there is a brick building, a street lamp with yellow globe lights, and a white sign that says "LIMIT 25 TURN".

CWG Review: Coastal Inundation at Climate Timescales White Paper

Kirstin Dow

Co-chair, SAB's Climate Working Group
Professor, University of South Carolina

Joellen Russell

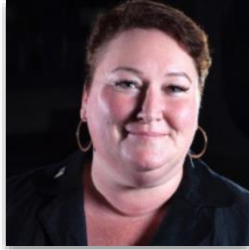
Co-chair, SAB's Climate Working Group
Professor, University of Arizona

August 25, 2021

Members, Liaisons, and Guest Reviewers



Members



Co-Chair

Joellen Russell, PhD
University of Arizona



Co-Chair

Kirstin Dow, PhD
University of South
Carolina



Michael Anderson, PhD
CA Department of
Water Resources



Kwabena Asante,
PhD, PE
GEI Consultants



Cecilia Bitz, PhD
University of Washington



Rong Fu, PhD
University of
California –
Los Angeles



Le Jiang, PhD
I.M. Systems Group



Ali Omar, PhD
National Aeronautics and
Space Administration



A.R. "Ravi"
Ravishankara, PhD
Colorado State
University



Susan Wijffels, PhD
Woods Hole
Oceanographic
Institution

SAB Liaisons



SAB Liaison
Eugenia Kalnay, PhD
University of Maryland



SAB Liaison
Everette Joseph, PhD
National Center for
Atmospheric Research

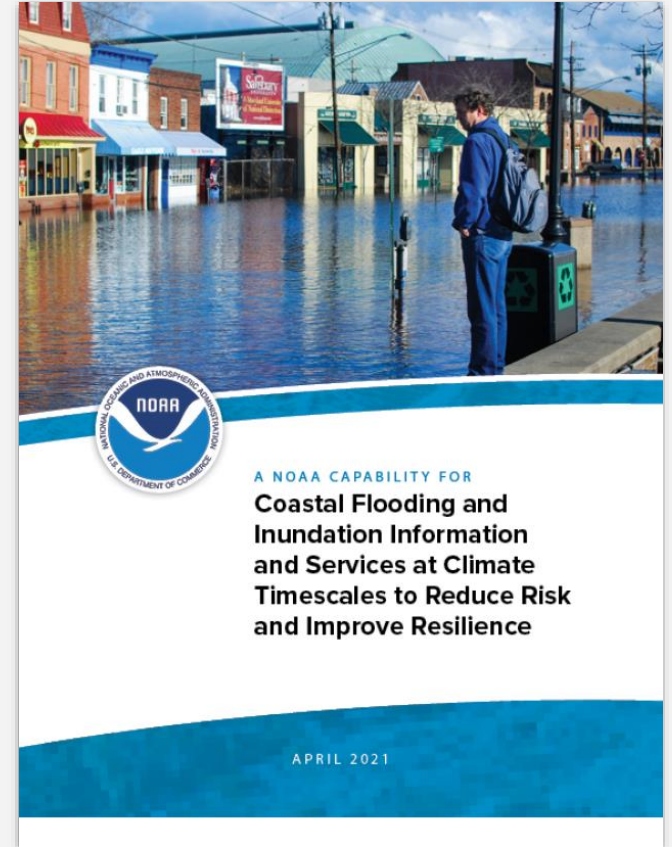
Guest Reviewer



ESMWG Member
Robert Twilley, PhD
Louisiana State University

The Request

Version 7.0 of the White Paper was distributed on May 4th for review and comment to the Climate Working Group (CWG).



CI Vision

A NOAA capability that produces and provides authoritative data, products, and services that quantify and communicate the risk of subseasonal-to-centennial coastal flooding and inundation for the United States (U.S.) and its territories. This capability will be shaped by and responsive to NOAA stakeholder needs, developed by advancing NOAA capabilities, and sustained by a dedicated research and development (R&D) program that continuously delivers the best-available science.

The Review Team

- **Dr. Joellen Russell:** Professor and Thomas R. Brown Distinguished Chair of Integrative Sciences, University of Arizona, (Co-chair of the CWG)
- **Dr. Kirstin Dow:** Carolina Trustees Professor, University of South Carolina, (Co-chair of the CWG)
- **Dr. Kwabena Asante:** Senior Hydrologist, Climate Science Lead, GEI Consultants
- **Dr. Michael Anderson:** State Climatologist, California Department of Water Resources
- **Dr. Robert Twilley:** Member of the NOAA Science Advisory Board's Ecosystem Sciences and Management Working Group, Professor, Louisiana State University

Opening comments



- Coastal communities are becoming increasingly vulnerable to coastal inundation.
- Critical infrastructure and facilities are facing escalating risks due to increases in extreme, acute events and long-term changes caused by climate change, effectively threatening the Nation's economy, national security, and public health.
- Managers and decision-makers currently lack the tools and information necessary to effectively plan, prepare, respond, and adapt for the coastal inundation challenges they are facing at local, regional, and national spatial scales.
- Given the plethora of NOAA's mandates for the Nation's coasts it is critical that NOAA work to fill these gaps.
- Outstanding vision for NOAA's capability to produce and provide authoritative data, products, and services that quantify and communicate the risk of coastal flooding and inundation for the U.S. and its territories at subseasonal-to-centennial timescales.

Recommendations

1.0 - NOAA's aspirational vision

Recommendation: Clearly state the aspirational vision at the beginning of the document. This statement should include the need, the type of tools to be developed, NOAA's capacity, and how the initiative fits with the focus of several other federal agencies in planning for a more dynamic coast.

Actions: Review and revise the opening statement of the document to clearly state the aspirational vision as it engages NOAA's commitment to protect life and property and NOAA's unique mandate to provide forecast information. This statement should address the timeframe and extent of the need, the type of tools to be developed, and NOAA's current capacity and additional needs. It should also address how the information provided by the initiative supports the efforts of other federal agencies in building the capacity of all communities to adapt to an increasingly dynamic coast.

Recommendations

Continued: 1.0 - NOAA's aspirational vision

Recommendation: Clearly state the aspirational vision at the beginning of the document. This statement should include the need, the type of tools to be developed, NOAA's capacity, and how the initiative fits with the focus of several other federal agencies in planning for a more dynamic coast.

Actions (Continued): The research plan should consider the Emergency Management Cycle (Figure on right) as an appropriate way to frame the need of NOAA's coastal inundation tools in homeland security sectors. This would also link the well-developed framework on how tools address different timelines in capabilities with the need by users from just before and after a flooding event to long-term mitigation. Forecasting exposure and consequences at immediate and climate timescales is critical to addressing the disaster cycle, and this may provide users with tools that address real problems by following the collaborative design process, which like co-production, engages decision makers in the design.

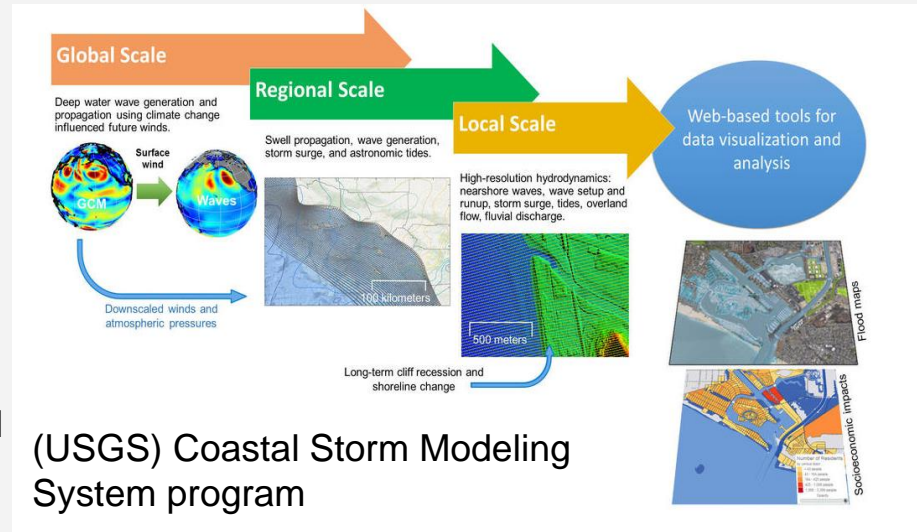


Recommendations

2.0 - Scale-appropriate decision-making information

Recommendation: Include a research plan on developing multi-scale inundation products or user-accessible downscaling tools for translating proposed coastal inundation forecasts into scale-appropriate decision-making information.

Actions: The research plan needs to develop scalable approaches for translating NOAA coastal inundation forecast products into usable, scale-appropriate information for decision makers and communities. These approaches could build on dynamic downscaling models such as those developed by the U.S. Geological Survey's (USGS) Coastal Storm Modeling System (CoSMoS) program (Figure above). Statistical downscaling approaches could also be used to downscale coarse inundation forecast products when informed by existing high resolution inundation products such as Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps or satellite-derived inundation extents for coastal areas.

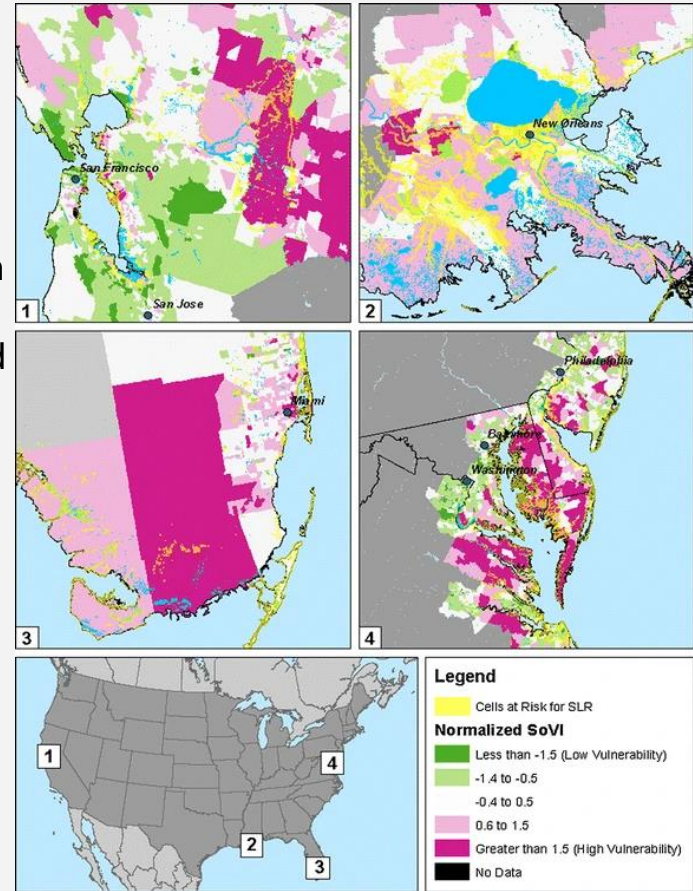


Recommendations

3.0 - Usability by underserved communities

Recommendation: Include a discussion of how the overall design of the suite of observations, models, tools, and products will provide off-the-shelf, public options that are sufficiently refined and tailored to be directly usable by under-resourced and underserved communities.

Actions: More detail on strategies and goals in meeting these needs should be reflected in detailed objectives presented in Appendix C. For example, the discussion of Integrated, Centralized, and Operational Infrastructure objectives (pg. 55) envisions a “one stop” web-based “shop” for coastal inundation as a 10-year goal. As currently described, the shop is intended “to provide users and partners baseline data and decision-support information, thus enabling value-added information and services.” In this defining statement, it is important to address how NOAA will provide usable information, tools, and products for those unable to afford value-added services.



Recommendations

Continued: 3.0 - Usability by underserved communities

Recommendation: Include a discussion of how the overall design of the suite of observations, models, tools, and products will provide off-the-shelf, public options that are sufficiently refined and tailored to be directly usable by under-resourced and underserved communities.

Actions (Continued): The goals of citizen science need further consideration and elaboration in the main body of the document. There is no mention of citizen science outside of Table 4.1. Pages 15-16 of the document contain a discussion of decision makers which may be a place for expanded discussion of needs of underserved communities and strategies, including co-production of knowledge, to meet those needs.

Developing citizen science capacity, with recognition of the constraints on under-resourced communities should be integrated into detailed objectives in Appendix C, where it might be related to topics including monitoring, building understanding of local needs, and developing partnerships and trusted relationships.

Recommendations

Continued: 3.0 - Usability by underserved communities

Recommendation: Include a discussion of how the overall design of the suite of observations, models, tools, and products will provide off-the-shelf, public options that are sufficiently refined and tailored to be directly usable by under-resourced and underserved communities.

Actions (Continued):

Current threats, losses, and needs are particularly acute in historically underserved communities and major federal initiatives to increase resilience (e.g., FEMA Building Resilient Infrastructure and Communities BRIC) are already underway. To better support the resilience of these historically underserved communities, NOAA should consider accelerating the 10-year timeframe suggested for “developing a coastal inundation partner engagement framework and capacity” (pg. 54).

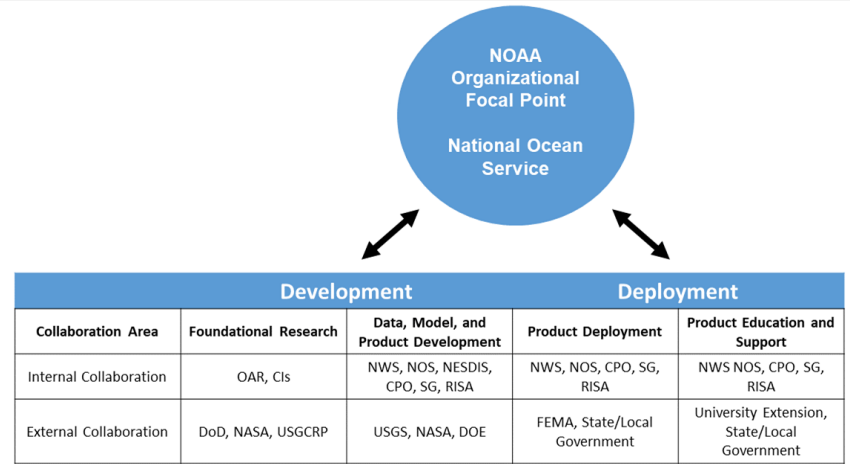
Recommendations

4.0 - Coordination necessary for success

Recommendation: Consider including, and begin planning for, the extensive coordination that will be necessary for this effort to be a success. This will include both internal, cross-line office coordination and external, interagency coordination.

Actions:

Include a section of the document with two sub-sections: (1) Internal NOAA cross-line office coordination and (2) External coordination across federal agencies. This section could describe the initial thoughts on the ‘who’ and ‘how’ to coordinate tool development, product development, and product delivery and outreach. NOAA has some fantastic resources that should be tapped for this effort; product delivery should meet the needs of fellow federal agencies that can facilitate the engagement with the communities of practice. This can be done in section 2 of the white paper and an augmented figure to figure 2.1 would be helpful. A concept is proposed above.



Questions?



Kirstin Dow

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