Interdepartmental Committee For Meteorological Services And Supporting Research (ICMSSR)

Working Group for COASTAL Act (WG/CA)

Record of Actions: 2018-1 Meeting
May 2, 2018, 12:00 p.m. EDT
Room 7224, SSMC2

Office of the Federal Coordinator for Meteorology
Suite 7130, SSMC2
1325 East West Highway
Silver Spring, MD 20910

PARTICIPANTS

See attached roster for a complete list of meeting attendees

Date of Issue: May 11, 2018

1. ADMINISTRATIVE AND OPENING REMARKS:

   Michael Bonadonna (OFCM), serving as Executive Secretary, made administrative remarks, reviewed the meeting agenda, and took roll call. Working Group Cochairs Nicole Kurkowski (NOAA/NWS), Anthony Niles (USACE), and Robert Mason (USGS) provided welcoming remarks. They stated the goals of the meeting to review progress being made by their agencies to meet the requirements of the COASTAL Act, identify any issues impeding progress, and determining the next steps for the Working Group.

   M. Bonadonna stated that the Interdepartmental Committee For Meteorological Services And Supporting Research (ICMSSR) had approved establishing a permanent Working Group to succeed the Joint Action Group for COASTAL ACT Post Storm Analyses (JAG/CAPSA).

   The Executive Secretary will draft a Terms of Reference (ToR) document for the new Working Group for COASTAL Act. **(Action Item 2018-1.1)**

   M. Bonadonna reviewed the Actions Items. NWS was still working AI 2017-1.2 regarding High Water Mark discussions. Regarding AI 2017-1.4, FEMA stated that the COASTAL Formula could not be reviewed by the interagency government partners until they had completed testing with environmental data sets.

2. NOAA UPDATE:

Nicole Kurkowski and Mike Bilder (NOAA/NWS) as well as a number of other NOAA representatives described progress on the development of Named Storm Event Model (NSEM), Coastal Wind & Water Event Database (CWWED), and operational issues.

a. Introduction. M. Bilder thoroughly described the Phase 1 Data collection and Phase II Post Storm Assessment process for which NOAA is responsible. He reviewed the time-phased deployment of U.S. government assets as well as Digital Hurricane Consortium (DHC) capabilities to support Phase 1. M. Bilder then described the sequence of events to conduct the Post Storm Assessment in Phase 2. He discussed the hand- off for the environmental data from the Post Storm analysis to FEMA for use in the COASTAL Formula and concluded by mentioning pending legislation revising the COASTAL Act to align with current agency implementation efforts.

   N. Kurkowski provided an overview of progress on the various elements of the Coastal Wind and Water Event Database (CWWED) and Named Strom Event Model (NSEM) and how each part worked together. She described numerous accomplishments achieved by the NOAA project team and a number of technical and programmatic challenges to be addressed. The issue of determining and certifying 90% accuracy of the post storm analysis data continues to be particularly challenging. Additionally, development of the NSEM and CWWED requires sustained funding over a five year period of which only first three years have been secured. Further sustained operations and maintenance (O&M) funding is required to execute the COASTAL Act process, once it is implemented. She introduced the various project leads who are working together to develop the coupled wave-surge-freshwater model, wind analyses and downscaling simulations, Digital Elevation Models (DEMs), and Coastal Wind and Water Event Database (CWWED).

b. André van der Westhuysen (NOAA/NWS/NCEP) and Saeed Moghimi (UCAR at NOAA/NOS/CSDL) provided updates on wave-surge coupling development and validation. Andre described coupled model schema, the NUOPC layer, the components and configuration of the NSEM, and several case studies. Saeed then described coastal inundation modeling efforts, High Water Mark analysis and surface wave effects. Andre concluded with a discussion on 90% accuracy determination methods.
c. Trey Flowers (NOAA OWP) briefed the group on NOAA's Office of Water Prediction support of NSEM requirements. He provided plans for coupling the National Water Model (NWM) with the ADCIRC-based ESTOFS model, as well as results from case studies of the Delaware Bay and River 1D and 2D modeling.
d. Mike Sutherland (CIRES CU-Boulder at NOAA/NCEI) presented the status of efforts to improve Digital Elevation Models (DEMs) for use in the COASTAL Act post storm analyses, namely to support storm surge grid development and upgrades. NCEI developed an inventory and gap analysis of available DEMs and found very little consistency among models (datum, resolution, etc.). Seamless DEM coverage is needed for the nation to support the COASTAL Act and many other applications. The DEM developers are applying several numerical tools to improve consistency and coverage along the Atlantic and Gulf coasta. They are also working to estimate the uncertainty of the DEMs, as well.
e. Zaizhong Ma (NOAA/NCEP/EMC) presented information on high-resolution hurricane reanalysis and reforecasts using the state-of-art operational HWRF model. For

COASTAL Act support, HWRF will be used to generate wind and surface pressure analyses from HWRF retrospectives for the selected land falling tropical cyclones and provide background fields for the Un-Restricted Mesoscale Analysis (URMA) / Real-Time Mesoscale Analysis (RTMA) which will perform mean wind, gust, pressure and air-sea temperature difference (atmospheric stability, AS) surface analysis over the area impacted by a land-falling tropical cyclone. To date they have completed HWRF simulations for three selected land-falling storms and are working on multiple experiments for Hurricane Sandy (2012) simulations.

Roshan Shrestha (NOAA/NCEP/EMC) presented the COASTAL Act wind analysis project to provide accurate wind analysis and starting point for wind downscaling using the NCEP Unrestricted Mesoscale Analysis (URMA) / RTMA system along with HWRF reforecasts, generating 2.5 km datasets of surface weather elements taking advantage of NCEP's latest tanks of observations along with highest resolution topography and land surface datasets. He described positive results from a test case on Hurricane Ike. HWRF input guess blend codes are being developed while the scripts are complete. Once the Hurricane Ike test case is complete, the team will analyze Superstorm Sandy.
Anil Kumar (UCAR CPAESS at NOAA/NCEP/EMC) presented the COASTAL Act wind downscaling project. This effort aims to estimate the strength and timing of damaging winds at a given "parcel-scale (10-30 meters)" over-land location in the area impacted by the tropical cyclone and to drive surge and wave models for estimating the water damage. This is being achieved using the Weather Research and Forecasting (WRF)- Advanced Research WRF (ARW) Large Eddy Simulation (LES) technique.

f. Del Greco (CIRES CU-Boulder at NCEI) briefed on the status of the Coastal Wind and Water Event Database (CWWED). The federated database will provide access to "Covered Data" received and archived at NCEI. FEMA has 30 days from landfall to request post-storm assessment (d+30). Snapshots will be archived, accessible, and provided to NSEM. The Post-storm Assessment (PSA) will be received by CWWED (archived at NCEI). This will provide FEMA access to inform the "FEMA Formula" for adjudicating claims. It will also provide GIS-based UI tool for public access and visualization. The CWWED will be a federated, virtual, cloud-based database. The project also includes work to develop a CWWED web page with supporting content for Covered Data and NSEM/PSA and to provide access to "snapshots" of these products.

3. US ARMY CORPS OF ENGINEERS UPDATE:

Anthony Niles (U.S. Army Corps of Engineers) provided an update of the USACE Coastal Hazard System database, which includes storm surge and wave models, as well as some other impact prediction tools. The update also discussed the Gridded Surface-Subsurface Hydrologic Model (GSSHA). The USACE Engineering Research and Development Center has high-fidelity models for coastal storm and hydrology modeling including:

- The Coastal Storm Modeling System (CSTORM-MS): tropical & extratropical coastal storm surge, wind, waves, tide, currents; 2D and 3D; wetting and drying
- The Coastal Hazards System (CHS): Pre-calculated storm databases

- The Gridded Surface-Subsurface Hydrologic Model (GSSHA): overland & stream flow, groundwater, vadose zone, storm and tile drains, wetlands, erosion, constituent transport

Coupling of Coastal & Hydrology models is an area of active R&D and have been demonstrated for several applications. The Total Watershed Decision Support (TWDS) system represents ongoing R&D linking hydrology, hydraulics, coastal waves & surge to impacts (environmental, ecological, fragility curves for infrastructure).

ERDC Civil Works & Military R&D is advancing the capability for Coastal Act services by:

- Coupling coastal storm, wind, wave, pressure calculations with inland surface, groundwater, and precipitation models
- Incorporating infrastructure vulnerability and decision-support metrics through TWDS
- Pre-calculated coastal storm databases have been advantageous for rapid preparations & response (NACCS; Coastal TX and South Atlantic (ongoing))

They are also interested in initiating an inland analog for a pre-calculated inland database for pilot urban cities.

4. USGS UPDATE:

Robert Mason (USGS) introduced USGS topics including continued development of the USGS storm-tide deployment process and other USGS storm-response activities, activities during the 2017 hurricane season, and USGS total water predictions (tide, storm tides, waves, and run-up and dune erosion/overtopping.)

USGS had a busy year in 2017. FEMA mission assigned the USGS to deploy instruments for Hurricanes Harvey, Irma, and Maria. The USGS also deployed for Hurricanes Jose and Nate. Equipment was deployed into two different networks: The SWaTH -Pre-identified and surveyed deployment sites from Maine to North Carolina and Opportunistic site selection in southeast and Gulf (trying to extend SWaTH). Three different “instrument types” were deployed: Highwater Marks (2857 measurements), and 472 instrument packages including Storm-tide sensors providing wave and water elevation required as rapid as ¼ second frequency, and Rapid Deployable Gages (RDGs) delivering real-time water elevation and selected meteorological data. The USGS has developed a powerful deployment planning and data-delivery database (Short-Term Network). Data include peak water-surface elevations, hydrographs of water, temperature, and barometric pressure.

Joseph Long (USGS) provided a briefing on plans for a national, operational model for wave runup and coastal change hazards. The basic inputs needed to predict coastal erosion & flooding hazards are: tides, surges, off-shore waves, wave runup, and coastal elevations. With these USGS provides probabilistic forecasts of storm-driven coastal erosion on their Coastal Change Hazard portal for dune erosion, overwash, and inundation. USGS collaboration with NOAA is facilitating improved model inputs & guidance as well a public notification and awareness through NWS Weather Forecast Offices. FY 16 & 17 Accomplishments include: a development of a framework and Real-time forecasts for more

than 3500 locations (1km spacing). Future Expansion includes: Complete coverage of Gulf and Atlantic WFOs and Extended validation of wave runup and coastal erosion hazard prediction.

5. FEMA UPDATE:

Jim Sadler, Flood Insurance SME and Thomas Pennebacker provided an update on FEMA activities during the 2017 Hurricane Season and how COASTAL Act requirement have been addressed. They emphasized that COASTAL Act services were not an academic exercise in environmental analysis and modeling. Each data point can have enormous impact to individual homeowners. There will be "Winners" and "Losers" from litigation based on COASTAL Act required post storm assessments.

Although they are proud of the work that has been accomplished, the current COASTAL Formula is to be considered draft and predecisional. FEMA needs complete post storm analysis datasets in order to test and verify the validity of COASTAL Formula results. FEMA can be held accountable legally for these results.

Generally, indeterminate loss were quickly adjudicated as resulting from flood and therefore covered by the NFIP up to $300K. FEMA considered these determinations to be "low hanging fruit" ie. quick and easy to resolve. Requirements of the COASTAL Act change this paradigm, delaying adjudication and perhaps shifting responsibility from the government NFIP to private insurers.

Since FEMA cannot share the draft COASTAL Formula a meeting will be held to ensure NOAA is developing the CWWED, NSEM, and Post Storm Analyses to provide the exact input required by the COASTAL Formula. Additionally, the meeting will address the methodology NOAA plans to adopt to certify COASTAL Act datasets and analyses 90% accurate. **(Action Item 2018-1.2)**

6. NEXT STEPS and CLOSING:

Mike Bonadonna (OFCM) reviewed Action Items noted during the meeting and discussed options for the next meeting. They agreed the next meeting should be in about six months. **(Action Item 2018-1.3)**

The Group leaders thanked the participants for meeting and their willingness to cooperate in the future. The meeting adjourned at 3:45 pm.

PREVIOUS OPEN ACTION ITEMS

Action Item 2017-1.2: Initiate one-on-one technical discussions with agencies involved in High Water Mark (HWM) discussion to learn each agency's methodology and HWM observation requirements.
Responsible Office: NOAA/NWS
Due Date: August 30, 2018
Status: Open.

Action Item 2017-1.4: Obtain the report on the COASTAL Formula and forward it to the JAG/CAPSA.
Responsible Office: CAPSA ExecSec
Due Date: June 16, 2017
Status: CLOSED. See AI 2018-1.2

ACTION ITEMS – MEETING 2018-1
May 2, 2018

Action Item 2018-1.1: Draft a Terms of Reference document for the newly formed Working Group, secure WG approval, and forward it to the Secretariat, Federal Meteorological Coordination for signature. The new WG will be called either:

- Working Group for COASTAL ACT (WG/CA)
- Working Group for COASTAL ACT Response (WG/CAR)
- Working Group for COASTAL ACT Services (WG/CAS)

  or

- Working Group for COASTAL ACT Support (WG/CAS)

Responsible Office: OFCM
Due: 27 June 2018

Action Item 2018-1.2: Arrange a meeting between FEMA, appropriate COASTAL Formula engineering personnel, and NOAA COASTAL Act project personnel to agree upon required input for the COASTAL Formula and NOAA's method for determining 90% accuracy of environmental data fields from the NSEM and CWWED.
Responsible Office: NOAA, FEMA
Due: 27 June 2018

Action Item 2018-1.3: Schedule the next WG/CA meeting on/about 2 November 2018
Responsible Office: OFCM
Due: 1 October, 2018

The Executive Secretary maintains a complete list of JAG/CAPSA Action Items and status.

Working Group for COASTAL Act (WG/CA) Roster

Attended	First Name	Last Name	Agency	Organization
X	Nicole	Kurkowski	NOAA	NWS
X	Robert S.	Mason	USGS	
X	Tony	Niles	USACE	
X	Michael	Bonadonna	NOAA	OFCM
	Tony	Ramirez	NOAA	OFCM (STC)
	Becky	Baltes	NOAA	NOS
	Jonathan	Berkson	USCG	
X	Michael	Bilder	NOAA	NWS
	Philip	Callahan		
	Arun	Chawla	NOAA	NWS
X	Steve	DelGreco	NOAA	NESDIS/NCEI
	Claudia	Hoeft		
	Victor	Hom	NOAA	NWS
X	Maria	Honeycutt	NOAA	NOS
	Paul	Huang	FEMS	NFIP
	Harry	Jenter	USGS	
	Ming	Ji	NOAA	NWS
	Kaitlyn	Kalua	NOAA	NWS
	John	Kuhn	NOAA	NWS
X	Anil	Kumar		
X	Marc	Levitan	NIST	
	Stephen	Lord	NOAA	NWS
	Audra	Luscher	NOAA	NOS
X	Stacy	Mackell	NOAA	
X	Hassan	Mashriqui	NOAA	NWS
X	Avichal	Mehra	NOAA	NWS
X	Ed	Meyers	NOAA	NWS
X	Thomas "Chris"	Pennebaker		OCC
	Jamie	Rhome	NOAA	NWS
	Elizabeth	Rohring	NOAA	OAR Sea Grant
X	James	Sadler	FEMA	
	David	Sallis	NOAA	NESDIS/NCEI
X	Hugh	Schratwieser	NOAA	OGC
X	William	Schulz	NOAA	OFCM
	Karsten	Shein	NOAA	NESDIS/NCEI
	Jane	Smth	USACE	
X	Kelly	Stroker	NOAA	NESDIS
X	Mike	Sutherland	NOAA	NESDIS
	Russell	Tinsley	FEMA	
X	Andre	Van Der Westhuysen	NOAA	NWS
X	Sergey	Vinogradov	NOAA	NWS
	Amanda	Wallace		
X	Scott J.	Weaver	NIST	Engineering Laboratory
X	Mike	Biggerstaff		DHC
	Bill	Coulbourne		DHC
	Andrew	Kennedy		DHC
	Dave	Kriebel	US Naval Academy	DHC
	Forrest	Masters		DHC
	John	Schroeder		DHC

Attended	First Name	Last Name	Agency	Organization
	Doug	Smith		DHC
	Sim	James	NOAA	OFCM
	Floyd	Hauth	NOAA	OFCM (STC)