INTERDEPARTMENTAL COMMITTEE FOR METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH

(ICMSSR)

WORKING GROUP FOR COASTAL ACT SUPPORT

(WG/CAS)

Record of Actions 2020-1 Meeting
April 4, 2020 Virtual Meeting

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

Role	First Name	Last Name	Agency/Office
CoChair	Nicole	Kurkowski	NOAA/NWS
CoChair	Tony	Niles	USACE
CoChair	Robert	Mason	USGS
Federal Coordinator	Michael	Bonadonna	OFCM
Executive Secretary	Mark	LaJoie	OFCM
Member	Ali	Abdolali	NOAA/NWS
Participant	Amante	Christopher	NOAA
Member	Mike	Biggerstaff	Oklahoma U
Member	Athena	Clark	USGS
Member	Steve	DelGreco	NCEI
Member	Danny	Flack	Riverside
Rapporteur	Floyd	Hauth	OFCM/STC
Participant	Maoyi	Huang	NOAA OSTI
Participant	Sims	James	OFCM
Member	Anil	Kumar	NOAA/NWS
Member	Marc	Levitan	NIST
Member	Zaizhong	Ma	NOAA/NWS
Member	Stacy	Mackell	NOAA/NWS
Member	Hassan	Mashriqui	NOAA NWS
Participant	Floyd	Masters	Univ Florida
Member	Ed	Meyers	NOAA/NWS
Participant	Mark	Miller	NOAA/NWS

Role	First Name	Last Name	Agency/Office
Member	Saeed	Moghimi	NOAA/NOS
Member	Tony	Ramirez	OFCM
Member	Jamese	Sims	OFCM
Member	Jane	Smith	USACE
Member	Roshan	Shrestha	NOAA/NWS
Member	John	Sokich	NOAA/NWS
Member	Kelly	Stroker	NOAA/NCEI
Member	Beheen	Trimble	NOAA
Member	Andre	Van der Westhuysen	NOAA/NWS

1. ADMINISTRATIVE REMARKS:

Mark LaJoie (OFCM), serving as Executive Secretary, made administrative remarks, reviewed the meeting agenda, and conducted roll call.

Action Item review: 2019-1.1, 1.2, 1.3, and 1.4 are being addressed during the DIAP presentation today. 2019-1.5, 1.6, and 1.7 are closed.

2. OPENING REMARKS:

Group Leaders Anthony Niles (USACE), Athena Clark (USGS) and Nicole Kurkowski (NOAA/NWS) provided welcoming remarks and stated the goals of the meeting.

Anthony Niles noted the challenging times related to the COVID19 pandemic. The FEMA member today was unable to participate today because of high priority pandemic response work. USACE has additional work plus their regular mission. Over fifty gauges in their primary projects or waterways are in flood stage. Working from alternate office locations adds to their complications.

Athena Clark reported that USGS is expanding their storm-tide sensor network to the Pacific West Coast, Alaska, and Hawaii and their efforts to monitor tsunamis surges.

Nicole Kurkowski remarked that she appreciated today's agenda and the opportunity to cover the status of NWS progress on projects for the Coastal Act and the funding status to complete their work.

3. NOAA UPDATE:

Nicole Kurkowski provided a technical update on NOAA activities related to the Coastal Act. She summarized the background on 2012 legislation known as the Consumer Option for an Alternative System to Allocate Losses (COASTAL) Act. The intent of the ACT is to help FEMA determine the extent to which wind vs. water damage in cases of "indeterminate losses". A loss is indeterminate when little tangible evidence beyond a building's foundation remains for the proper adjustment of insurance claims for homes totally destroyed by a tropical system (water

damage is covered by NFIP; wind damage is covered by private insurers). NOAA's post-storm assessments data will enable a more-timely claims adjustment process, by avoiding litigation over the cause of the damage.

The COASTAL Act requires NOAA to produce detailed "post-storm assessments" (PSA) following certain named tropical systems that impact the U.S. and its territories. NOAA deliverables include a data collection plan, a data collection protocol, the Coastal Wind and Water Event Database (CWWED), and the Named Storm Event Model (NSEM). GAO must audit NOAA's data collection efforts, including the cost-effectiveness of the approach. FEMA must develop the COASTAL formula and NAS will evaluate the formula's effectiveness.

Ms. Kurkowski described the status of FY16-20-Funded COASTAL Act sub-projects. There were some delays due to the 2019 government shutdown but NSEM and CWWED will be completed in 2021 and implemented in 2022.

- The general challenges ahead include:
- Observations density for wind analysis and water level, insufficient mobile sensor network, and durability of sensors in destructive hurricanes.
- Reaching 90% accuracy requirement in all locations at all times.
- Response capability of agency partners to meet requirements.

Next Steps:

- Establish data agreements with data providers.
- Advance internal policy directives; Update Annex to NPDIA.
- NOAA/FEMA coordination on formula, 90% accuracy requirements, and CWWED.
- NOAA/USGS coordination on sensor placement/accuracy.

4. WG/DIAP UPDATE:

Tony Ramirez (OFCM) provided an update on the Working Group for Disaster Impact Assessments and Plans (WG/DIAP) activities.

OFCM has a Working Group/Disaster Impact Assessments and Plans (WG/DIAP) that provides for data collection and archive procedures to support the COASTAL Act. These data are provided to the Coastal Wind and Water Events Database (CWWED) for support to the COASTAL Act Named Storm Event Model (NSEM). WG/DIAP data are hosted in CWWED's AWS Simple Storage (S3) to support the NSEM suite of Post Storm Assessments. The DIAP data from deployed mesonets will be used to help conduct an "end to end" PSA pilot for Hurricane Florence

Steve DelGreco (NOAA) described planning for the Hurricane Florence exercise and displayed and discussed a DIAP Spreadsheet for 2018 Hurricane Florence Data Call.

Data agreements are needed to move from Ad-Hoc verbal agreements with the Digital Hurricane Consortium members to formal agreements with WG/DIAP.

Concerns were raised by members about access to and use of proprietary data and limitations on the use of real time versus retrospective data. A simple procedure to obtain data for use in Coastal Act support is needed.

NOAA feedback on the Hurricane Florence exercise would be useful. See Action Item 2020-1.1.

Information about the July Workshop should be sent to NOAA. See Action Item 2020-1.2.

5. UPDATE ON INTERAGENCY MODELING DEVELOPMENTS:

Jane Smith (USACE) presented the status of the U.S. Coastal Research Program (USCRP) and During Nearshore Event Experiment (DUNEX).

The goal of the U.S. Coastal Research Program is to develop a national coordinated science research program to address societal needs along the coast. USCRP is a collaboration of Federal agencies, academics, and stakeholders that aims to identify research needs, foster research opportunities, enhance funding for academic programs, and promote science translation.

DUNEX is a multi-agency, -academic and -stakeholder collaborative community experiment to study nearshore processes during coastal storms. The multi-phase experiment, taking place on the Outer Banks of North Carolina, began with a Fall 2019 pilot study, followed by the full experiment Fall 2020 through Winter 2021.

By collaborating and leveraging research efforts from different groups to collect and analyze data from the same region prior to, during, and following coastal storms, DUNEX aims to improve the basic understanding, predictive capabilities, and observational technologies for extreme storm processes and impacts within the coastal environment.

The USCRP has 37 academic studies funded including modeling, long term coastal evolution, extreme events, and human ecosystem health.

USGS requested that a similar presentation be given to their stream teams. See Action Item 2020-1.3.

Wave Watch III: Ali Abdolali (NOAA) provided an update on the status of Wave Watch III and related NOAA modeling efforts.

The Consumer Option for an Alternative System to Allocate Losses (COASTAL) Act requires an accurate modeling of flooding due to hurricanes. The wave model chosen as part of developing this modeling system is the WAVEWATCH III wave model – a State-Of-the-Art community wave modeling system whose development is managed by NOAA. The wave model is a sophisticated modeling system with numerous developments that have been added in recent years (wave – hurricane interaction physics, unstructured grid formulation, new wave growth and dissipation physics packages, wave – mud and wave – bottom interaction physics to name a few) that make this model attractive for this project. Being a community model with a very active international team of wave developers also allows partnerships and resource leveraging.

In this project NOAA partners with the USACE towards the development of a more efficient numerical solver for the WAVEWATCH III model that will make it possible to carry out wave simulations in very high resolution domains with extensive computational grids – a necessary condition for accurate simulations of total inundation. The USACE has a common interest in developing the WAVEWATCH III model as a coastal wave model and thus resources will be pooled for this development. Development of the numerical engine can be done in parallel with the wave – surge coupling work with incremental improvements to the numerical engine being provided to the coupled system for testing at regular intervals.

This project will use the coupled ADCIRC-WaveWatch III modeling system in a test case to validate the model performance in representing total water level as a combination of storm surge, tides, and wave activity. The model system will be validated for previous hurricane events for which (1) damage from the storm's inundation led to incidents of buildings being destroyed to their foundation (i.e. "slab" scenarios), and (2) more data on total water level recordings are available to validate the model performance, and (3) pre-existing unstructured triangular grids are available for use, with little or no modifications, in the hindcast simulations. For this project, skill assessment techniques and criteria will be determined that will be consistent with the goal of the COASTAL Act to have models that are 90% accurate. This project will also support coupling to WAVEWATCH III on an unstructured grid system, critical to achieving the 90% requirement for water levels. The two modeling systems will be dynamically coupled to exchange physical processes to obtain accurate estimates of total wave–surge induced inundation. Coupling strategy will be based on long term aligning with overall NOAA plans for coupled modeling as well as being cognizant of deliverable schedules. At those locations where data are available for the hurricane hindcast scenarios, the performance of the coupled model will be evaluated using the skill assessment techniques. While an updated Hurricane Surge On-Demand Forecast System (HSOFS) grid is in development, separate pre-existing grids with higher local refinement and overland coverage will also be used in this assessment to fully evaluate the model resolution requirements for the COASTAL Act.

His conclusion and outlook:

- The memory management in WW3, mostly relying on Global Arrays, are now localized throughout the source code to be efficiently used within the domain decomposition parallelization concept. This provides the needed flexibility on different HPC architectures and provides the possibility to run 2-way coupled within ESMF & ADCRIC multi-million grid points unstructured grids.
- Near shore physics (Vegetation Source Term, Adapted Triad Interaction and Depth Breaking Source terms) should be improved in parallel to the model performance.
- Validation for Laboratory Cases and Large-Scale Application for Hurricane Irma 2017, and Florence 2018 need to be conducted with the new code.

Challenges and 90% accuracy wind products validation:

Anil Kumar presented information from an FSU Research Study to determine surface winds from Doppler Radar data during hurricane passages over Florida. A technique was used to estimate small scale surface wind speeds in hurricanes crossing Florida. Radial velocity and reflectivity variables were used by identifying the location of the eye and then using radial

velocities and an assumed symmetric wind field about the eye to estimate the total wind field over the entire radar scan area. The total wind field is computed along a scan and reduction factors are used to transpose the winds at the varying beam altitudes down to the surface using similarity theory.

Results (based on 5 hurricane cases) show that the algorithm can be used with some confidence (not 90%) to diagnose the damage potential for embedded tornadic cells located within the land-falling hurricane.

Every hurricane case bring new challenges – Florence evaluation is ongoing and will be evaluated against station data. 90% accuracy will be concluded based on all 10 storm cases.

Comments noted the need for multiple radar networks to provide sufficient data to meet Coastal Act requirements. Additional briefings would be useful to improve understanding of interagency modeling efforts and set the environment for future interagency modeling collaborations. See Action Item 2020-1.4.

6. OPEN DISCUSSION:

No further discussion.

7. CLOSING:

The Working Group leaders thanked all the participants and presenters and noted that the collaboration and sharing among agencies in developing Coastal Act support is commendable. A draft Record of Actions and Action Items will be sent to members for review and comments/changes/updates. The next WG/CAS meeting will be scheduled to be held in about six months. The meeting adjourned at 3:00 p.m.

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Action Items

WG/CAS Action Item 2020-1.1. NOAA COASTAL Act team will provide feedback to OU (POC: Mike Biggerstaff) on the observational data (e.g. format, resolution, etc.) provided for the Hurricane Florence exercise.
Responsible Office: NOAA Coastal Act Team
Due Date: May 01, 2020

WG/CAS Action Item 2020-1.2. NIST will provide information about the National Windstorm Impact Reduction Program's (NWIRP) windstorm data collection workshop, currently planned for the end of July.
Responsible Office: NIST (POC, Mark Levitan)
Due Date: May 01, 2020

WG/CAS Action Item 2020-1.3. Coordinate USCRP presentation to USGS stream teams
Responsible Office: USACE (POC, Jane Smith)
Due Date: May 01, 2020

WG/CAS Action Item 2020-1.4. Schedule presentations on interagency modeling efforts for next WG/CAS meeting, tentatively scheduled for October 2020.
Responsible Office: OFCM
Due Date: September 1, 2020

WG/CAS Action Item 2020-1.5. Solicit topics for next CAS meeting.
Responsible Office: OFCM
Due Date: September 1, 2020.

WG/CAS Action Item 2019-1.1. Provide information to WG-CAS members regarding availability of wave sensors (coordinates for sensor deployment locations along the coast) and the process for requesting shipment to areas under hurricane threat, if applicable (e.g. USGS).
Responsible Office: DHC/data providers
Due Date: September 1, 2020.

WG/CAS Action Item 2019-1.2. (a) OFCM to coordinate a review/update of the COASTAL Act Data Protocol annex to the Federal Plan for Disaster Impact Assessments to ensure membership and data tables are up-to-date. (b) POCs for all member organizations are provided to NOAA to coordinate on data agreements.
Responsible Office: OFCM
Due Date: September 1, 2020.

WG/CAS Action Item 2019-1.3. OFCM to assist in coordination between DHC/data providers and NOAA in the provision of storm data for (a) the following 2017 and 2018 storms: Irma, Harvey, Maria, Michael, Florence, and Lane and (b) the 2019, 2020, and 2021 hurricane seasons.

Responsible Office: DHC/data providers
Due Date: September 1, 2019

WG/CAS Action Item 2019-1.4. DHC/data providers to provide information to WG-CAS members regarding what data error information is available for their respective data, sensors, post processing, etc.
Responsible Office: DHC/data providers
Due Date: September 1, 2020.