

Meeting Minutes
Water Resources Adaptation to Climate Change Workgroup of the
Advisory Committee on Water Information
October 19, 2017: 1:00 – 2:30 Eastern Time

Call-in Number for audio and web link for presentation slides:

Calling from USGS & DOI offices - 703-648-4848

Calling from non-USGS/DOI locations (toll free) - 1-855-547-8255

Access code is: 53700#

When it is time to attend the meeting, please visit this link to view the presentations:

<https://usgs.webex.com/usgs/j.php?MTID=m088fe45a6e116cdedd1b1794f0216fb2>

Attendees:

Paul Freedman, WEF	Dennis McCauley, NALMS	Lisa Engelman, AWRA
Eloise Kendy, TNC	Ken Nowak, BOR	Marla Stelk, ASWM
Mary Musick, GWPC	Stacey Archfield, USGS	Noel Gollehon, USDA
Karen Yacos, Ceres, Inc.	Eric Loucks, ASCE	Nancy Turyk, NALMS
Aris Georgakakos, NIWR	Heather Cooley, Pacific Inst.	John McShane, ASFPM
Jimmy Hague, TNC	Jeff Manning, ACWA	Nancy Beller-Simms, NOAA
Karen Metchis, EPA	Janet Cushing, NCCWSC	Wendy Norton, USGS-ACWI
Adam Carpenter, AWWA	Ron McCormick, BLM	

Presenters/Guests:

Steven Chapra, Tufts University
David Arctur, University of Texas

I) Introductions and Agenda Review

II) Approval of Notes from Previous Meeting (see draft: http://acwi.gov/climate_wkg/index.html)

III) Co-chair succession, nomination and approval

- Incoming Non-Federal Co-Chair: Jerad Bales, Executive Director, Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI)
- Incoming Federal Co-Chair: Kathleen White, Lead Climate Preparedness and Resilience Community of Practice, U.S. Army Corps of Engineers

IV) Presentation: Journal Article, “Climate Change Impacts on Harmful Algal Blooms in U.S. Freshwater: A Screening-Level Assessment,” June 2017 *ES&T*: Professor Steven Chapra, Tufts University

- Presentation slides available here:
https://acwi.gov/climate_wkg/minutes/chapra_webinar_oct-2017_habs_final.pdf
- HABs are either salt water, red tides, or blue-green algae (cyanobacteria)
- HABs can make water undrinkable and can kill livestock
- This is an intentionally simplified screening assessment that uses well established process formulations, while keeping the model simple. It's not intended to inform

managers about individual water bodies, but rather to support more general evaluations of a geographically diverse problem.

- The model reflects work done by MIT and EPA over the past 20 years.
- QUALIDAD is an "educated guess" model; it will be incorrect for any specific location, but will be generally correct across a wide geographic area
- Factors that can facilitate or inhibit growth of cyanobacteria: temperature, nutrient limitation, grazing or lack of grazing by zooplankton, settling/buoyancy.
- The models give us seasonal predictions of cyanobacteria cell counts for a standard lake.
- Regional analyses project cyanobacteria growth for 2050 and 2090 (see presentation slides). We can expect to see growth in diverse areas, regardless of cultural and political differences.
- *Comment:* Nutrient management can be a key factor in slowing or preventing growth of cyanobacteria; this fits into our workgroup's focus on climate adaptation.
- *Question:* How/when will you be rolling out the regional models? We in the Great Lakes would be very interested. *Answer:* I would be glad to do a demonstration for your region of the country (Great Lakes), as long as you don't expect a demonstration on a specific lake.
- *Question:* When you're talking about nutrient management, are you looking at the component that's coming into streams from groundwater discharge? *Answer:* Yes, but in a very rough, lumped basis; the groundwater impact is included.

V) Presentation: Brief Overview of Hurricane Harvey Response and the Emerging Texas Flood Response System: David Arctur, University of Texas

- Presentation slides available here: https://acwi.gov/climate_wkg/minutes/darctur-tfrs_overview-acwi-wracc-20171019.pdf
- We had done a lot of preparation that helped when Hurricane Harvey hit, but Harvey also revealed some gaps in our planning.
- Comment re: floodplain mapping - Many of these areas were remapped in response to Trop Storm Allison and Hurricane Hermine.
- Esri story map dashboard was used to expose relevant maps for emergency response; this is the first time Texas Department of Emergency Management (TDEM) has responded to an emergency without using paper maps. Public safety officials needing access to the maps were given logins to the story map.
- National Water Center model, Corps of Engineers model, and other tools were used. But modeling didn't show full extent of flooding because a good deal of flooding in some areas came from ponding, rather than from streamflow (and these models don't address pond impacts).
- Inundation demographics helped give first responders a good idea of who was likely to be stranded or in distress (elderly, children, etc.).
- Before and after maps help to assess impacts, though flood inundation polygons took a while to put together. Daily inundation maps take hours to generate; starting now to build a library of web-servable inundations at 1'-interval depths, for real-time response mapping in future events.
- Interagency barriers to cooperation and communications must be overcome, to reduce duplication of effort and competition over resources.

- HydroShare.org: CUAHSI-affiliated project funded by NSF, collecting all possible inundation, precipitation, elevation (Lidar), and related data from Harvey and Irma events for academic and public research. This will be used to validate & improve the National Water Model.
- *Question*: We have good tools to provide early warning; do these systems open opportunities for management actions that can help prevent flooding from extending into populated areas? *Answer*: There are some mitigation actions that can help. TDEM seems to feel that we need diversion structures in place to prevent the type of inundation that occurred during Harvey. A portion of FEMA post-event recovery funds is dedicated to flood mitigation efforts. What we can do to model and mitigate ponding is a difficult question, however.
- *Question*: You didn't talk about how the dashboard was distributed to the public. Was it available in real time to industry or the general public? *Answer*: The dashboard was available to the public safety community; but it was not available more widely due to time- and security sensitivities, eg, shelter availability can change rapidly, and preliminary flood maps need to be ground-truthed.
- *Question*: Is there any discussion of revising floodplain mapping? *Answer*: Research will be done to compare flood models to actual high water marks. Harris County doesn't have zoning restrictions; it's hard to say if they'll reconsider after Harvey. Longer term effects remain to be seen, in terms of policy or floodplain management.
- *Question*: Can the data or tools you presented be used to assess how well the mitigation efforts worked or didn't work? *Answer*: Yes, we are collecting considerable inundation and precipitation data (to be hosted on Hydroshare) that can be used by future researchers to make that assessment.
- *Question*: After Harvey hit, the news media talked about how much of Houston was paved. It would be interesting to look at what the impact would have been if there was less paved area. Is that something that we could model? *Answer*: Yes, those kinds of studies can be done now. Part of the problem is subsidence & loss of wetland buffer areas, so studies about the impact of improving green areas would be helpful as well.
- *Comment*: Appreciate your presentation, and especially appreciate that people are thinking about the question "what can we do to adapt to storms like this?"
- *Comment*: Texas has a lot of resources helping them, and Puerto Rico is in much worse shape; can we look into ways to augment power, Wi-Fi, and other infrastructure so that it's more resilient when the next big storm hits? It's something we need to think about.

VI) Discussion: Initial Discussion on 2018 priorities, to incorporate into the 2018 Work Plan which a draft will be presented to WRACC in November.

Charge to the Workgroup: In preparation for our November 30 discussion, please think about what we need to tackle in 2018: more data, better tools, more/better policy, discussion about insurance, FEMA activities? In the past we have focused heavily on info dissemination, but we have also commented on plans and priorities established by the last Administration. Our mandate is fairly broad, and we could choose which topics we want to engage on during the upcoming year. Where are the gaps that we need to address? **If you have ideas in addition to those listed below, mail them to wenorton@usgs.gov.**

- It would be helpful to have some insight into where priorities are for science and decision support.

- Costs and benefits of adaptation:
 - With respect to barriers to moving forward with creating resilient communities, good floodplain management, etc. – we often talk about actual costs of flooding (direct and indirect, economic and environmental). These costs are enormous and might get the attention of government and the private sector if the estimates were made more publically visible.
 - Ecosystem services benefits – we need a better way to estimate and explain the benefit side of the equation.
- Ceres has been talking about moving utilities toward best practices; we need to collect available data and model various water management approaches, to assist with this discussion and help utilities and municipalities understand the benefits of best practices that are still relatively new and untested.
- AWRA 2017 Summer Specialty Conference on Climate Change Solutions:
 - Highest priority concerns included understanding and communicating uncertainty, including what is not uncertain; the need to better work across discipline silos; a better understanding vegetation patterns and shifts, impacts on agriculture, associated water needs vs. availability, and food security; when to make investments and quantifying the costs of inaction; sea level rise and effects and mitigation of saltwater intrusion, infrastructure, weather events, supply scarcity, and a science-informed approach to the policies of building and rebuilding in flood-prone areas; the need for localized to regional climate models; and methods for identifying, selecting, and using the magnitude of data and tools available.
 - Communication themes emerged around the need for long-term thinking, planning, funding, and managing; challenges reaching diverse communities; messaging, branding, and social media usage; developing and leveraging local, regional, and state collaborations for program development and implementation; information sharing between small communities; understanding of rates development, needs, and decisions; and highlighting impacts of climate change that are already being felt.
 - The fuller write up (which includes paragraphs) can be found in *Water Resources IMPACT*, Vol 19, Number 5, page 36-37.

VII) Round Robin Reports from Workgroup Members (a brief highlight of your organization’s activities related to climate change and water)

- Report by US Water Alliance: http://uswateralliance.org/sites/uswateralliance.org/files/publications/uswa_waterequity_FINAL.pdf
- NRDC flood report: <https://www.nrdc.org/sites/default/files/climate-smart-flood-insurance-ib.pdf> Rob Moore
- Union Concerned Scientists report: SLR impacts: <http://www.ucsusa.org/global-warming/global-warming-impacts/when-rising-seas-hit-home-chronic-inundation-from-sea-level-rise#.WZSeIWZMq1t>
- Climate and HABS: <http://pubs.acs.org/doi/full/10.1021/acs.est.7b01498>
- Colorado River: <https://www.adventure-journal.com/2017/06/climate-change-shrinking-colorado-river/>

- Washington Post article Tampa Bay: https://www.washingtonpost.com/graphics/2017/health/environment/tampa-bay-climate-change/?utm_term=.30f79b91ecb6
- Coastal adaptation bill: <https://www.congress.gov/bill/115th-congress/house-bill/3533/text?r=100>
- Climate and hazard mitigation planning: http://www.sciencedirect.com/science/article/pii/S2212096316300869?mc_cid=dff7b9055a&mc_eid=a1543f4543
- NYC buy-out program: http://www.cakex.org/case-studies/quantifying-success-buyout-programs-staten-island-case-study?mc_cid=dff7b9055a&mc_eid=a1543f4543
- Senate Hearing on large watersheds: <https://www.energy.senate.gov/public/index.cfm/hearings-and-business-meetings?ID=7A8EBF69-61E6-481F-86FD-858E967A6E71>
- USGS report drought science: <https://www.energy.senate.gov/public/index.cfm/hearings-and-business-meetings?ID=7A8EBF69-61E6-481F-86FD-858E967A6E71>
- EPA report Green Infrastructure in parks: https://www.epa.gov/nps/green-infrastructure-parks?utm_medium=email&utm_source=govdelivery
- Weather Channel climate page: <http://features.weather.com/us-climate-change/about/>
- New York Magazine; The Uninhabitable Earth: Famine, economic collapse, a sun that cooks us: What climate change could wreak — sooner than you think: <http://nymag.com/daily/intelligencer/2017/07/climate-change-earth-too-hot-for-humans.html>
- Climate Change and National Security: <https://www.eenews.net/eenewspm/2017/06/28/stories/1060056745>
- USGS research; High Temps, Low Water - Inland Fish Face an Uncertain Future: <https://wildlifemanagement.institute/outdoor-news-bulletin/june-2017/high-temps-low-water-inland-fish-face-uncertain-future>
- Podcast on responding to climate change: <https://steppinguppodcast.org/episodes/>
- The Beaver Restoration Guidebook; Working with Beaver to Restore Streams, Wetlands, and Floodplains:
 - https://www.fws.gov/oregonfwo/Documents/BRGv.2.0_6.30.17_forpublicationcomp.pdf
- Climate change in the American mind (results of climate change polling): <http://climatecommunication.yale.edu/publications/climate-change-american-mind-may-2017/>
- Climate Bonds, water standard: <https://www.climatebonds.net/standard/water>
- **Managing for Drought in the Red River Valley:** <https://nccwsc.usgs.gov/content/managing-drought-red-river-valley>
- **Story Map: Can We Conserve Wetlands Under a Changing Climate?:** <https://fws.maps.arcgis.com/apps/MapJournal/index.html?appid=f9dcd2bf5cc649a7b1d6681a8c811c01>
- **Webinar: Modeling Water and River Management Strategies in the Rio Grande/Bravo Basin** – In the water-scarce Rio Grande/Bravo Basin, climate change and population growth have potentially serious implications for drinking water, ecosystems, and livelihoods. On **Monday, October 23 at 3 PM CDT**, researchers with the South Central CSC will present their work to develop a multidisciplinary model that explores future scenarios of the Basin and how different management strategies and human uses may affect outcomes.

VII) Adjourn

Next meeting: Thursday, November 30, 2017, 1:00 – 2:30 pm Eastern Time