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Steven J. Tambini, P.E.
Executive Director

Advisory Committee on Climate Change
MEETING SUMMARY
Tuesday, 4 August 2020
1:00 pm – 3:30 pm

MEETING ATTENDEES

Members and Alternates (19):
Delaware - Robert Scarborough, Ph.D.; DNREC
New Jersey - Nicholas A. Procopio, Ph.D., GISP; NJDEP
New York - Mark Lowery; NYSDEC; and Alternate Riobart Breen; NYSDEC
Pennsylvania - Scott R. Perry; PADEP
United States Government - Amanda L. Babson, Ph.D.; NPS
United States Government - Arthur DeGaetano, Ph.D.; NOAA NRCC
New York City - Alan Cohn, NYC DEP
City of Philadelphia - Julia Rockwell, PWD
Partnership for the Deleware Estuary - Danielle Kreeger, Ph.D.
William Brady III, P.E.; Exelon Corporation
Elizabeth Koniers Brown; Audubon Pennsylvania
John Callahan; Delaware Geological Survey, University of Delaware
James J. Chelius, P.E.; American Water, Inc.
Marjorie B. Kaplan, Dr.P.H.; Rutgers Climate Institute, Rutgers University
Upmanu Lall, Ph.D.; Columbia Water Center, Columbia University
Christopher Linn, AICP; Delaware Valley Regional Planning Commission
Howard Neukrug, P.E.; The Water Center at Penn, University of Pennsylvania
David Velinsky, Ph.D.; Academy of Natural Sciences of Drexel University, Drexel University

DRBC Staff (15):
Amy Shallcross, Anthony Preucil, David Kovach, Elba Deck, Elaine Panuccio, Eric Engle, Evan Kwityn, Fanghui Chen, John Yagecic, Kristen Bowman Kavanagh, Li Zheng, Pamela Bush, Stacey Mullholland, Steve Tambini, Thomas Amidon

Other Attendees (20):
Brenan Tarrier (NYSDEC)
Brian Chalfant (PADEP)
Ellis Foley
Gracie Todd
Herb Conaway
Hoss Liaghat
Isaac Katz
Jen Orr-Greene
Kelly Anderson
Matthew Konfirst
Nick Troutman
Steven Jandoli

Plus eight (8) additional participants were identified by phone number only.

MEETING SUMMARY

Call to Order – Meeting was called to order at approximately 1:00 pm by Kristen Bowman Kavanagh, DRBC Deputy Executive Directive, and held with remote attendance only using GoToMeeting and its call-in capabilities.

Opening Remarks – Steven J. Tambini, DRBC Executive Director, made opening remarks including highlighting the purpose of the newly established ACCC per DRBC Resolution 2019-08 and the Delaware River Basin's unique challenges, as well as acknowledging the need for and thanking the expert committee for their help.

Committee Member and DRBC Staff Introductions – Committee members each provided 2-3 minute introductions of themselves; Ms. Kavanagh read bios of committee members John Callahan, Marjorie Kaplan, and David Velinsky who were having audio difficulties. DRBC Directors and Managers introduced themselves.

Election of Committee Chair – Kristen Bowman Kavanagh presided over election of the inaugural committee chair for a term ending August 31, 2021. James Chelius moved to nominate Howard Neukrug, Nick Procopio seconded the motion, and the motion passed with unanimous approval. The new chair presided over the remainder of the meeting.

Presentations – Kristen Bowman Kavanagh gave a presentation titled *DRBC Water Resources Programs Overview*, and Amy Shallcross, DRBC Manager of Water Resource Operations, gave a presentation titled *DRBC Climate Studies To-Date*. Both presentations are posted on the DRBC web site at: https://www.nj.gov/drbc/about/advisory/ACCC_aug2020.html

Questions and Public Comments – After the presentations, committee members and DRBC staff engaged in a discussion on various topics including sea level rise (SLR), salinity modeling in the estuary, and the focus of the committee. DRBC staff indicated they are looking for input at a future meeting on the range of SLR to use in their modeling and planning efforts. Alan Cohn suggested work by the NYC Panel on Climate Change as an additional reference on uncertainty and SLR; and Nick Procopio indicated that the New Jersey Science and Technical Advisory Panel (STAP) on Sea-Level Rise and Changing Coastal Storms had updated their SLR esimates in the 2019 STAP report. Danielle Kreeger asked about whether DRBC's 3-D estuary modeling of SLR effects on salinity in current oyster breeding areas was planned for other aquatic species; and whether DRBC's 3-D model of SLR could address impacts to bathymetry. DRBC staff indicated the model can be applied to other aquatic species, although more information on species needs (e.g., salinity and temperature) is needed to make modeling results more meaningful. Staff also indicated that the model does account for wetting and drying cells from tides. Scott Perry suggested that the committee should be focused on preventing/reducing climate change rather than just adaptation. Steven Tambini responded that the scope of the ACCC in the Resolution is focused on water resources planning. Additional questions posed in the virtual chat, but unable to be addressed within the scheduled time, are briefly addressed in an attachment to this meeting summary beginning on Page 3.

Closing Remarks – Committee Chair, Howard Neukrug, provided closing comments.

Adjournment – The meeting was adjourned by Howard Neukrug at approximately 3:30 pm.

ATTACHMENT TO ACCC MEETING SUMMARY

DRBC Advisory Committee on Climate Change

Staff Responses to Questions from the Chat Log of August 4, 2020 Meeting

The Committee Charge is posted here: https://www.nj.gov/drbc/library/documents/Res2019-08_EstablishesACCC.pdf

Documents for the Committee and all meeting materials will be posted here: https://www.nj.gov/drbc/about/advisory/ACCC_index.html

Have you been looking at paleoclimate as well as climate change scenarios as you look at drought related issues:
We are aware of a few paleoclimate studies for the basin; however, we have not yet incorporated them into our analyses. It is clear that there have been worse droughts than that of the 1960s, although there is discrepancy among researchers as to when they occurred.

For climate change analyses we have used the WATER model developed by the USGS under the Secure Water Act in conjunction with our Flow Management Planning Support Tool (DRB-PST) to assess the impacts of climate change on drought management. We were able to investigate impacts using simulations from four downscaled GCMs, the four RCP (Representative Concentration Scenarios) and land use for three periods: near future (~2030), mid-century (~2060) and end-of century (~2088). The general conclusions from the WATER/DRB-PST analyses indicated that the seasonality of flows will shift due to changes in accumulation of snowpack (decreased volume and duration) and the increase in precipitation and evapotranspiration. The impact on the frequency and duration of drought periods was inconclusive. The impact of predicated land use changes was limited considering macro-scale flow management but may be impactful in local areas. Due to the inability to include the drought of record in the analysis, DRBC and the USACE are working together to refine a hydrologic model of the basin for use with longer duration historic and future climate change simulations. DRBC will seek input from the ACCC about which model/scenario/land use/time frame combinations to evaluate further. Results from the initial phase of the model refinement and test scenarios should be available next year.

Previous studies have indicated that sea level rise will have a much greater effect on salinity intrusion in comparison to changes in flow. Given the potential devasting impacts of sea level rise on management of salinity intrusion, DRBC is using a three dimensional model, developed as part of the designated use study to examine the impacts of sea level rise on salinity and our ability to manage it under multiple scenarios, including different values of sea level rise, future hydrology and land use. DRBC will be looking to this committee and other experts for suggestions on boundary conditions and scenarios that should be evaluated.

The Compact makes allocations to NYC and others and has requirements for flow maintenance. In the context of efficiency of use and reliability (by use) across the system, has the DRBC looked at water market-like instruments that would allow transactions from storage or physical transfers across different parties? Would these be a useful additional measure that could help achieve performance in climate exigencies? and to address aging infrastructure replacement.
Market strategies, such as basin transfers and water use replacement from remote sources, already occur in the basin. There are inter-basin transfers to the Susquehanna, Raritan and Southern New Jersey River Basins. Power utilities are required to replace their consumptive use during drought conditions with Merrill Creek, the Point Pleasant Pump Station and the Wadesville Mine Pool as examples. Water trading or other market-based strategies are some examples of strategies available to address water resource stress and issues related to climate change and emerging contaminants (such as PFAS). However, careful consideration must be given to the local impacts of transferring water among basins and sub-basins.

To what extent does DRBC interact with communities to scope wastewater treatment and reuse as a conservation measure, and distributed storage, rain/storm water harvesting, treatment for potable/non-potable use, or for environmental restoration/salt water intrusion control:
The DRBC supports innovative conservation measures such as treated wastewater (reuse), stormwater repurposing, and lowest-quality source for purpose. DRBC works with docket holders and applicants to evaluate opportunities at facilities for better water resource management to the extent allowed by applicable state laws and regulations.

Have you compared sea level rise projections with those issued by the NYC Panel on Climate Change?
DRBC has reviewed the literature on climate change and determined a range of SLR estimates to evaluate. The values (0.3 m, 0.5 m, 1.0 m and 1.6 m) use to-date reflect a range of estimates and encompass all but the high estimate for 2100 and the Advanced Rapid Ice Melt scenario for 2080 and 2100 presented in Chapter 3 of the NYC Panel on Climate Change report[1]. DRBC is evaluating additional sea level rise values to present ot the comment for future input.

Does the 3-D model consider the volume changes associated with retreating shorelines (horizontal), in addition to the volume change from added depth (vertical)?
DRBC has developed two versions of the model: one with the floodplain area (more conservative) and one without. The volume changes based on assumptions in the model and the model configuration (bathymetry/lidar) can be calculated and provided.

PWD has developed a 3D model studying salinity and have presented our model at the RFAC and will continue to utilize that DRBC committee for updates on the salinity model and studies evaluating flow policies
The DRBC has invited PWD to present on their 3D salinity model to RFAC. The presentations have been well received, informative and much appreciated. We look forward to PWD's continued engagement in RFAC as well as the technical expertise PWD staff bring to this committee.

In addition to oysters, there are many other fish, mussel and wetland plants that are uniquely adapted to habitats in the large freshwater tidal zone of the Delaware. A good question might be whether these resources are tolerant of even minor salinity increases, which could constrain their habitat range?
Once the sensitivity of individual species to salinity changes are determined, the change in habitat can be estimated using the three-dimensional hydrodynamic salinity model.

Have the SLR estimates been compared with NJ STAP, 2019 report?
DRBC has reviewed the literature on climate change and determined a range of SLR estimates to evaluate. The values (0.3m, 0.5m,1.0m and 1.6m) reflect a range of estimates and encompass all of the SLR-percent change exceedance estimates (greater than 95 percent to less than 5 percent for the low medium and high emission scenarios) through 2070 and most of the probability-emission scenario SLR estimates for 2100 in the 2019 STAP report[2].

What is the source for the SLR estimates?
DRBC chose to use a range of SLR estimates from a variety of sources. As time and resources allow, additional SLR estimates can be evaluated.

Has DRBC has looked to the climate change work of other similar groups? We may be able to learn from the modeling work and adaptation discussions of other groups such as the Colorado River states.
DRBC has reviewed a variety of studies from other organizations. DRBC developed the Advisory Committee on Climate Change to advise the Commission on various avenues of investigation, including those similar to others' and original ideas.

[1] https://nyaspubs.onlinelibrary.wiley.com/doi/epdf/10.1111/nyas.14006, PDF pages 7 and 13.
[2] https://climatechange.rutgers.edu/images/STAP_FINAL_FINAL_12-4-19.pdf see pdf page 4.

What are the next steps for the AC3? How do we get fully up to speed? What is our schedule for meetings? How do we ID a vice chair? What are our primary objectives over the next year?
DRBC staff will work with the chair and the Commissioners to determine the next steps for the Committee, including the committee structure, by-laws, draft work plan and meeting schedule. DRBC will be providing the Committee with several white papers documenting some of our existing work along with reference to other climate change and sea level work in the Delaware River Basin (DRB). It is anticipated that over the next year or so, the committee will provide advice on avenues of investigation, assumptions for analyses, and focus topics among other things.

The work and the questions you are asking are more related to adaptation. Your focus should be on fighting climate change.
DRBC's mission is to encourage and provide for the cooperative planning, utilization, conservation, development, management and control of the water resources of the basin. DRBC's authorities over water resource projects must come from the Water Code and other DRBC regulations. While DRBC can encourage and support reducing carbon footprints, use of reclaimed wastewater, managing stormwater for beneficial purposes and development and use or renewable energy, DRBC does not currently have the authority or regulations to mandate such actions.

Living resource section of SOTB[3] could be a good start for species to consider.
DRBC agrees that this is a good source along with others. It is anticipated that the Committee will be able to provide advice on habitat and vulnerable species.

Going forward how does the DRBC plan to account for not just changing climate (including forecasts) but changing demands and ecological conditions to revise the Flexible Management program is there a strategy being thought of that is adaptive and is not locked into specific climate change scenarios?
The Flexible Flow Management Program an adaptive program, based on hydrologic conditions. The program is implemented through agreements among the four basin states and New York City. Currently, DRBC is performing the technical analyses to be completed during the period of the current agreement[4]. The studies being conducted must consider climate change and sea level rise and are intended to inform future programs. The DRBC is also performing a separate study, Water Sustainability 2060, which will be used to evaluate impacts of climate change and future demands throughout the basin.

The NJ STAP Report can provide information on climate change scenarios and SLR.
https://climatechange.rutgers.edu/images/STAP_FINAL_FINAL_12-4-19.pdf

In regards to existing resources, PDE and DRBC work with dozens of groups to prepare a technical indicator-based State of the Delaware Estuary and River Basin Report every 5 years. It has a chapter on climate change, as well as sections on important living resources and habitats. It exists here:
http://www.delawareestuary.org/data-and-reports/state-of-the-estuary-report/

I could support quarterly meetings...that seems like a necessary cadence considering all of the analysis that is underway and needed.
DRBC would support quarterly meetings given the breadth of work that needs to be completed. It should be noted that the resolution specified two meetings per year.

Presentations will be available to the committee and public.
https://www.nj.gov/drbc/about/advisory/ACCC_index.html

[3] https://www.state.nj.us/drbc/about/public/SOTB2019.html
[4] https://webapps.usgs.gov/odrm/documents/ffmp/FFMP2017.pdf see pdf pages 5 and 7.