



Delaware River Basin Commission

25 Cosey Road

PO Box 7360

West Trenton, New Jersey

08628-0360

Phone: (609) 883-9500 Fax: (609) 883-9522

Web Site: <http://www.drbc.net>

Steven J. Tambini, P.E.
Executive Director

Minutes

Water Quality Advisory Committee

March 23, 2023

Members & Alternates:

NYS DEC

Sarah Rickard

EPA

Greg Voigt

NJDEP

Frank Klapinski

Environmental Professional

Maya van Rossum

Regulated Community Industrial

Scott Northey

National Park Service

Peter Sharpe

DNREC

Bhanu Paudel

PADEP

Josh Lookenbill

Academia/Science

Not Represented

Local Watershed Organizations

Erin Landis

Regulated Community Municipal

Jay Cruz (PWD)

Other Attendees:

Steve Tambini (DRBC)

Sarah Beganskas (DRBC)

Elba Deck (DRBC)

Elaine Panuccio (DRBC)

John Yagecic (DRBC)

Namsoo Suk (DRBC)

Jake Bransky (DRBC)

Chad Pindar (DRBC)

Jeremy Conkle (DRBC)

Sara Sayed (DRBC)

Amy Shallcross (DRBC)

Karl Heinicke (DRBC)

Kate Schmidt (DRBC)

Patricia McIsaac (Eurofins)

Christina Ryder (FWS)

Emma Bast (PennFuture)

Andy Weber (NPS)

Shawn Rodier (Jacobs)

Garrett Herigan (PADEP)

Pam Bush (DRBC)

Samantha O'Connor (PWD)

Kristen Bowman Kavanagh (DRBC)

Chris Main (DNREC)

Colleen Walters (River Network)

Garret Kratina (PAFBC)

Brent Gaylord (EPA)

Kuo-Liang Lai (EPA)

Jim Hagy (EPA)

Nicole Lick (EPA)

Bart Ruiters (Chemours)

Kristen Schlauderaff (PADEP)

Kimi Artita (CDM Smith)

Erik Silldorff (DRN)

Timothy Maguire (ANS)

Ben Lorson (PA Fish & Boat)

Helen Pang (NJDEP)

Stephen Seeberger (NJDEP)

Bill Brown (PADEP)

Sheila Eyler (USFWS)

Biswarup Guha (NJDEP)

Stephen Williams (DNREC)

Carol Collier (ANS)

Bryan Lennon (Wilmington)

Maggie Reilly (Aqua)

Preston Luitweiler (WRADRB)

Lisa Pfeifer (Pepco Holdings)

Abby Jones (Penn Future)

Marissa Rossi (USGS)

Wayne Jackson (EPA)	Michelle Stevens (NPS)
Thomas Amidon (DRBC)	Stefanie Kroll (Riverways)
Fanghui Chen (DRBC)	Eileen Murphy (NJ Audubon)
Michael Thompson (DRBC)	Leslie McGeorge (retired NJDEP)
James Ray (EPA)	Karen Moore (NYC DEP)
Kevin Pregent (DRBC)	Robert Tuttle (PWD)
Kurt Cheng (PDE)	Jean Malafronte (Andris)
Jessica Brooks (PWD)	Irene Fitzgerald (DELCORA)
Kelly Anderson (PWD)	Kaitlin Morrison (Eastern Environmental)
Melanie Murphy (PWD)	Lavanya Ramasubramanian (DELCORA)
Ashley Ebrahimi (PWD)	Jason Fagel (NYDEC)
Vincent DePaul (USGS)	Meg McGuire (Delaware Currents)
Alex Ridyard (Sage Services)	Eileen Althouse (CDM Smith)
Andy Thuman (HDR)	Brenda Gotanda (Manko, Gold, Katcher & Fox)
Jacob Metch (HDR)	Robert Tallon (Crafts Creek Watershed Assoc.)
Scott Hinz (LimnoTech)	Ken Warren (Warren Environmental Counsel)
Paula Kulis (CDM Smith)	Hedeff Essaid (USGS)
Kinman Leung (PWD)	Michelle Gannon (ANS)
Katie Lavallee (Woods Hole Group)	Rachel Davis (Water Spirit)
Michelle Vetterlein (Dow Chemical)	Doug O'Malley (Environment New Jersey)
Denise Hakowski (EPA)	Carl DuPoldt (Green Buildings Solutions)
Raffaella Marano (EPA)	Steven Unger (PADEP)
John Dabback (GCUA)	Carrie Feuer (Hamilton)
J. Boring (GCUA)	Greg Wacik (USACE)
Frank Borsuk (EPA)	Jason Fry (CCMUA)
Tom Schevtchuk (CDM Smith)	Greg Cavallo (CES)
Scott Schreiber (CCMUA)	Stuart Leigh (Trout Unlimited)
Sean McKelvey (PWD)	

Welcome and Call to Order

The meeting was called to order by Jay Cruz at approximately 9:35AM. Voting members were asked to introduce themselves.

Membership Updates

John Yagecic indicated that in February 2023, DRBC sent letters reappointing to the WQAC the following members:

- Dr. John Jackson (Academia/Science)
- Jay Cruz (Regulated Community Municipal)
- Scott Northey (Regulated Community Industrial)
- Maya van Rossum (Environmental Professional)

Bart Ruiten announced that he would be retiring shortly from Chemours. Namsoo Suk and Maya van Rossum offered thanks for his service and congratulations on his retirement.

Review of WQAC Minutes from Previous Meetings

The group reviewed draft minutes from the November 15, 2022 meeting and re-reviewed minutes from the September 13, 2022 meeting, approval of which had been deferred.

For the September 13, 2022 minutes, Jay Cruz made a motion to accept the minutes and Frank Klapinski seconded. All voted in favor and the minutes were accepted.

There was extensive discussion surrounding the November 15, 2022 draft meeting minutes. Maya van Rossum indicated that the minutes, as drafted, preferentially cited threshold values for Atlantic Sturgeon preferred by DRBC while failing to cite other threshold values discussed during the meeting. Concerns specifically surrounded the section of the minutes recapping a brief update given by Greg Voigt of EPA regarding EPA's coordination with researchers Edwin Niklitschek and David Secor regarding interpretation of their various research publications.

Maya van Rossum recommended that the first sentence from that section be removed and a 2nd sentence be added indicating that the experimental study also provides results from trials of different temperatures. Greg Voigt commented that significant effort had been expended since the November meeting and that more comprehensive work had been performed. John Yagecic asked Greg Voigt if the paragraph accurately describes what was discussed during the meeting. Mr. Voigt responded that the paragraph is broad and that there doesn't seem to be a concern about boxing in a number. Erik Silldorff commented that the minutes go too far in capturing specific numbers. Preston Luitweiler suggested that the last 3 sentences capture the deliberative nature of the statement.

Ms. van Rossum requested that DRBC amend the minutes to include an accurate characterization of the problematic paragraph. Peter Sharpe seconded Maya's recommendation. Erin Landis, Josh Lookenbill, and Steve Williams supported tabling the minutes. There was tentative agreement that Greg Voigt and Delaware Riverkeeper Network would compare their notes from the November meeting and offer alternative wording.

Status of DRBC draft AA reports

Multiple DRBC staff presented on the status of Analysis of Attainability (AA) reports. Slides from that presentation are posted on the DRBC web site at https://www.nj.gov/drbc/library/documents/WQAC/032323/Status_DraftAA_Reports_DRBC.pdf

Tom Amidon started the presentation and reminded the group that five documents were drafted in support of DRBC's efforts surrounding the Aquatic Life Use project. These documents included reports on:

- Hydrodynamic model
- Water Quality model
- Socioeconomic evaluation
- Linking aquatic life uses & DO conditions and
- Analysis of Attainability

In general, all reports were responsive to Resolution 2017-4 and supportive of the Commission's effort to develop new dissolved oxygen (DO) criteria. Of these, the linking aquatic life uses & DO conditions and analysis of attainability reports may be published as independent documents and serve as background for EPA's rule proposal.

Dr. Li Zheng briefly reviewed the hydrodynamic model report including coordination with the model expert panel and its role in the overall effort. Dr. Zheng reviewed high level comments submitted on the draft report surrounding model parameter values, grid resolutions, salinity intrusion results, and water temperature results as well as updates to the model and updates to the report to address the comments. Dr. Zheng showed results of the updated hydrodynamic model demonstrating improved agreement especially in the area of water temperature.

Dr. Zheng also reviewed comments on the water quality model report in the areas of sediment oxygen demand (SOD) & benthic flux specification, nitrification rates, the model's ability to simulate phytoplankton blooms, and time periods for model-data comparisons. Again comments were addressed through updates to the model and the report. Dr. Zheng showed results of the updated water quality model demonstrating some degree of improved agreement in simulation of dissolved oxygen.

John Yagecic briefly reviewed comments on the socioeconomic evaluation report including comments pertaining to assumptions, costs for other regulatory mandates, Monte Carlo analysis, disagreements with aspects of the cost estimation prepared by Kleinfelder, inflation / affordability over time, diverse impacts across service areas, consideration of other indicators, availability of affordable financing, cost mitigation options, and updating from 2019 to current dollars.

Jake Bransky briefly reviewed comments on the relationship between fish & DO report. Themes of comments on that report included identification and presentation of scientific literature, presentation of physiological and ecological concepts and terminology, use of graphical presentations and analyses, and analysis and evaluation of DO effects on Sturgeon. Mr. Bransky indicated that comments are being addressed to reflect not only the DO gradient but also the basis for WQS revision and revised use. Mr. Bransky said that the final report may be merged into a basis and background document as part of water quality standards revision.

Tom Amidon reviewed the Analysis of Attainability report and comment themes. Reviewers submitted comments on conservatism of baseline conditions, whether the highest attainable dissolved oxygen (HADO) should form the basis for criteria, relationship between waste load allocations and water quality-based effluent limits (WQBELs), attainability, classification of discharges, criteria implementation, and facility-specific comments. Mr. Amidon indicated that comments are being addressed within the report. DRBC expected that the final report may be merged into a basis and background document as part of the water quality standards revision.

Jay Cruz requested a recap for the AA report deliverables process and asked if there would be an opportunity for WQAC to review. Dr. Namsoo Suk commented that commission staff are working on finalizing a subset of the draft reports as indicated. Mr. Cruz indicated that PWD provided substantive comments and suggested that a response-to-comments document would be helpful. Dr. Suk responded that DRBC did not anticipate generating a formal response-to-comments document but noted that there would be a chance to comment as part of the rulemaking process.

Kleinfelder effluent DO Addendum

John Yagecic provided a very brief update on a DO addendum cost estimate commissioned by DRBC and being prepared by Kleinfelder. DRBC requested that Kleinfelder estimate costs to

achieve effluent DO concentrations of 4, 5, and 6 mg/L DO at 7 of the 12 Tier 1 facilities. Once finalized, that addendum will be distributed to the WQAC.

EPA Presentation: Bioenergetics Model of Juvenile Atlantic Sturgeon

Dr. James Hagy with the US EPA Office of Research and Development, Center for Environmental Measurement and Modeling presented EPA's work on an Atlantic sturgeon cohort model for the tidal-fresh Delaware River. Slides from that presentation are posted on the DRBC web site at https://www.nj.gov/drbc/library/documents/WQAC/032323/FishModelingTool_USEPA.pdf

Dr. Hagy indicated that EPA made use of the EFDC/WASP model from DRBC and utilized Chester and Penns Landing continuous DO and water temperature data to build a tool to translate observed and predicted water quality conditions into predicted growth and survival of juvenile Atlantic sturgeon. Dr. Hagy created a bioenergetics-based model to predict biomass based on DO saturation, temperature, and location in the Delaware River using available exposure and response data from Nikiltschek and Secor and others.

Dr. Hagy indicated that laboratory studies had quantified effects of temperature and low oxygen on growth (Niklitschek and Secor 2009), survival (Secor and Gunderson 1998; Campbell and Goodman 2004; Niklitschek and Secor 2009a), and habitat selection (Niklitschek and Secor 2010). From these, a model was developed that combines temperature, salinity, and DO effects on several bioenergetic rates to predict growth and instantaneous mortality rates. The resulting model was used to simulate cohort growth and survival for conditions over time at USGS sondes, over each "cell" of the DRBC model, and for overall water quality in zones 3 and 4 for a cohort of juvenile sturgeon from July 1 to November 1.

Dr. Hagy reviewed results of the model and provided the following conclusions:

- The cohort model, although grounded in laboratory data, produces results consistent with field observations and is a useful tool for interpreting these data in the context of spatial and temporal water quality variability.
- The effect of low DO on survival was quantitatively larger than its effect on growth. When evaluated in relation to field data collected by DNREC, catch per unit effort data were correlated with model estimates of survivorship, and the model predicted fish sizes that were consistent with the observed fish sizes.
- Simulations highlight differences between the calibration and HADO management scenarios at the scale of Zones, showing increased Atlantic sturgeon growth and survival under HADO.
- Diagnostic simulations suggest that DO still limits Atlantic sturgeon in some of the more favorable of recent years (e.g., 2018), and that it would likely continue to limit Atlantic sturgeon in Zone 3 and 4 under the HADO scenario.
- Simulations highlight spatial structure of low DO in all model scenarios and their implications for growth and survival of juvenile Atlantic sturgeon.
- Model predictions highlight that interannual variability in water quality observed at Chester and Penn's Landing would be expected to cause large differences in Atlantic sturgeon growth and survival, consistent with juvenile abundance data.

Jay Cruz asked if EPA had looked at Fulton's K value, a factor dependent on fish weight and length, in the model. Dr. Hagy replied that he would consider what information might be available to predict fish condition, but otherwise had not evaluated Fulton's K value. Jay Cruz & Peter Sharpe both asked if the slides would be available, and John Yagecic confirmed they would be.

Status of WQS-ALU Co-Regulator Workgroup

Dr. Namsoo Suk of DRBC and Greg Voigt of EPA jointly presented the status of the Water Quality Standards Aquatic Life Use co-regulator workgroup. Slides from that presentation are posted on the DRBC website at https://www.nj.gov/drbc/library/documents/WQAC/032323/WQS-ALU_workgp-updates_DRBC.pdf

Mr. Voigt indicated that EPA worked collaboratively with DRBC and member states so that uses and criteria will be updated within the Federal Rulemaking Process. EPA reaffirmed key findings in the draft AA report. Mutual Findings included:

- Propagation of native fish species is attainable.
- Criteria to support propagation must be established.

Dr. Suk indicated that the workgroup had been expanded by adding staff from different organizations to focus on WQ standards development. Dr. Suk described the rulemaking schedule and expected the technical process to wrap up in summer 2023, followed by commissioner review. Expected DRBC and EPA timelines were reviewed, culminating in an anticipated EPA public process spanning approximately from December 2023 to February 2024.

Discussion

Peter Sharpe asked if December 1, 2023 was the deadline for federal register notice. Greg Voigt replied that signature is scheduled December 1, 2023 but anticipated a few days or weeks for the action to officially be published in the Federal Register. The group discussed whether the comment period could be extended. Mr. Voigt said the 45-day period could be extended if there is sufficient reason to do so.

Participants in the chat feature asked about the expected relationship between DO and fish viability. Dr. Hagy replied that the models show that if DO is higher, fish grow faster, become larger, and their mortality rate is lower. Thus, by late fall, in good years the fish are larger and more numerous than in less favorable years. Dr. Hagy also indicated that water temperature varies substantially from year to year, and although that was not presented in the meeting, EPA has examined the implications of that separately.

Carol Collier asked if increased salinity due to sea level rise would negatively affect the viability of sturgeon. Dr. Hagy responded that the optimal salinity for juvenile Atlantic sturgeon is 9 ppt and thus higher salinity could benefit mature sturgeon. However, immature sturgeon have lower tolerance for salinity, so higher salinity could dislocate their ideal habitat from near Marcus Hook to sites further upstream. Dr. Hagy also acknowledged monitoring can have inherent survivorship bias.

Jay Cruz indicated that PWD had been looking at the observed data including the relationship between weight and length of the fish collected and preliminarily concluded that Delaware

Estuary sturgeon appear to be growing within the normal range for Atlantic sturgeon. Cruz said there are unfortunately very few samples from 2012 or 2013 which would represent the worst recent DO years.

Preston Luitweiler asked what efforts were underway to develop robust baseline data for sturgeon presence and propagation against which to measure success from the regulatory action to increase DO. Jake Bransky replied that there was not much effort underway in that regard, but that Ian Park at DNREC samples every winter to monitor young-of-year (YOY) recruitment in the Marcus Hook area and he believed that Mr. Park intended to develop a juvenile sturgeon index. Chris Main of DNREC mentioned that as part of the potential expansion of the port of Wilmington, DNREC was embarking on performing eDNA analysis for sturgeon in the general area of discussion. While that analysis would not provide information on the age of fish, it would yield information on presence and absence.

In regard to meeting structure, Maya van Rossum expressed concern that if DRBC transitioned back to in-person advisory committee meetings there may be problematic inequity in meeting interactions. Steve Tambini indicated that DRBC was testing meeting structures in an attempt to make things work for everyone and that feedback is valuable.

Adjournment

Greg Voigt motioned to adjourn. The meeting was adjourned at 11:23 AM.