

# Aquatic Life Designated Use

## Water Quality Standards for Delaware River Estuary

### Status of DRBC draft AA reports

### Water Quality Advisory Committee

March 23, 2023

This content is draft, preliminary and for discussion at the March 23, 2023 WQAC Meeting. Content may not be published or re-posted in whole or in-part without the DRBC's permission.



**Delaware River Basin Commission**

DELAWARE • NEW JERSEY  
PENNSYLVANIA • NEW YORK  
UNITED STATES OF AMERICA

# DRBC DELIVERABLES (Supplemental Documents)

- Hydrodynamics model calibration report
- Water quality model calibration report
- Socioeconomic evaluation study report

} Independent Document Form  
by Summer of 2023

- Linking aquatic life uses & DO conditions report
- Analysis of attainability report

} Independent Document Form or  
Merged into the draft Basis and  
Background Document by Summer  
of 2023

Note: Implementation Strategy will be addressed in the B&B document with a generalized guideline. Detailed individual wasteload allocations will be developed after the adoption of the Rule.

# WQAC Comments on Modeling Reports

## Why Develop a Hydrodynamic/WQ Model?

- a) input from expert panels on modeling the water quality impacts of nutrient loadings and the dissolved oxygen requirements of aquatic species;  
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- d) development and calibration of a eutrophication model for the Delaware River Estuary and Bay;
- e) determination of the nutrient loadings from point and non-point sources that can be discharged while maintaining the levels of dissolved oxygen identified by the expert panel as those necessary to support key aquatic species;  
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- g) evaluation of the physical, chemical, biological, social and economic factors affecting the attainment of uses, as described in EPA's water quality standards regulations at 40 CFR 131.10(g)(1)-(6);

- Responsive to Resolution 2017-4
- To provide information on physical and chemical factors affecting dissolved oxygen

# WQAC Comments on Hydrodynamic Model

## Commentors

- PWD

## Nature of the comments: technical & editorial, e.g.,

- Model parameter values
- Model grid resolutions
- Salinity intrusion results
- Water temperature results

## Comments addressed one of two ways

- Update to model (e.g., water temperature)
- Update to report

## Revisions under review by DRBC's consultants

# WQAC Comments on Water Quality Model

## Commentors

- DELCORA
- EPA
- PADEP
- PWD

## Nature of comments

- Uncertainty in SOD & benthic flux specification
- Nitrification rate used
- Underestimate of phytoplankton bloom
- Shorter time period for model-data comparisons (e.g., summer)

## Comments addressed one of two ways

- Update to model (ongoing)
- Update to report

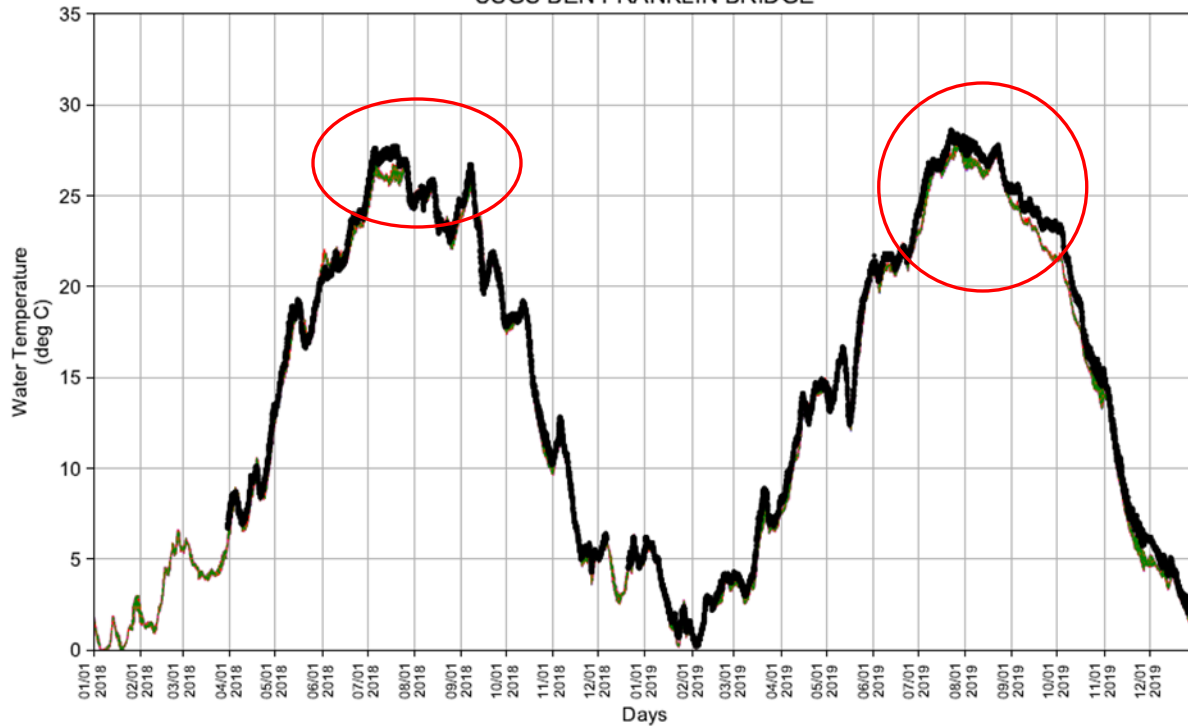
## Revisions to be reviewed by DRBC's consultants

# Water Temperature at Ben Franklin Bridge

Previous

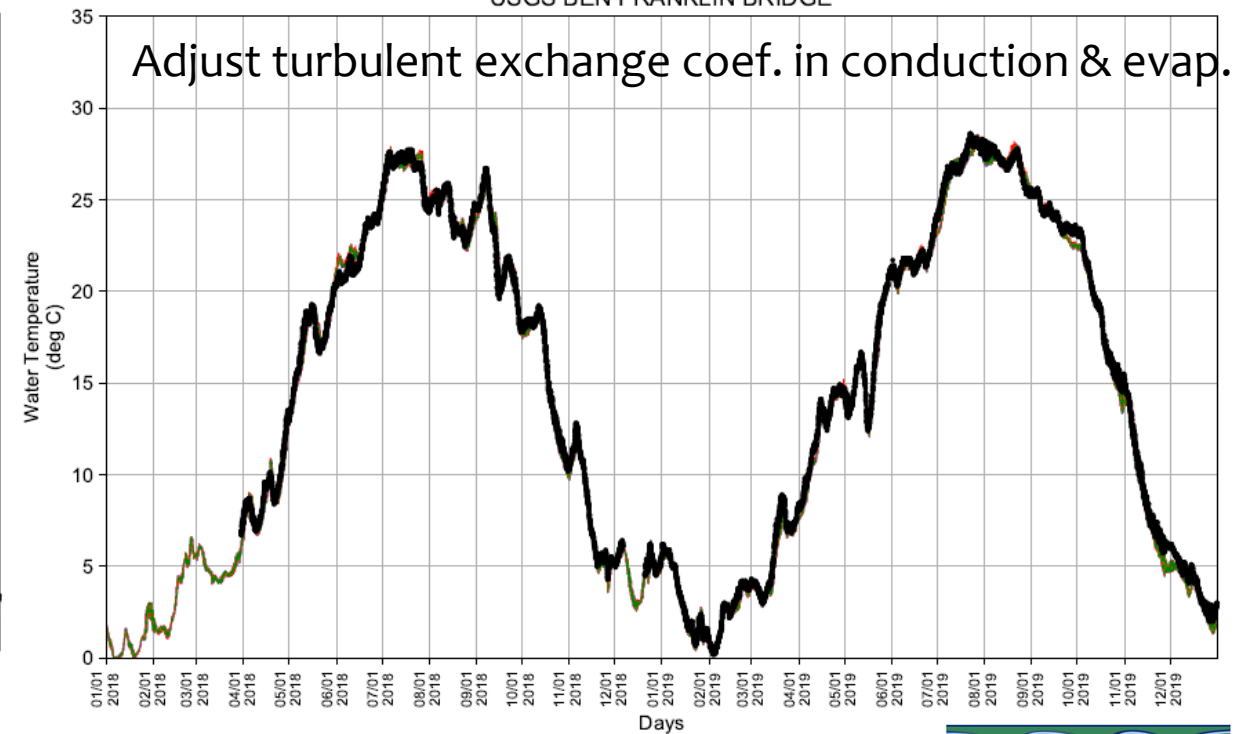
Updated

USGS BEN FRANKLIN BRIDGE



USGS BEN FRANKLIN BRIDGE

Adjust turbulent exchange coef. in conduction & evap.

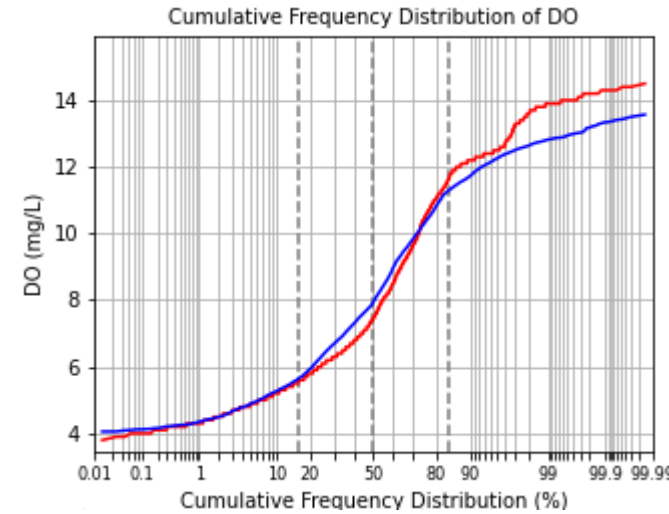
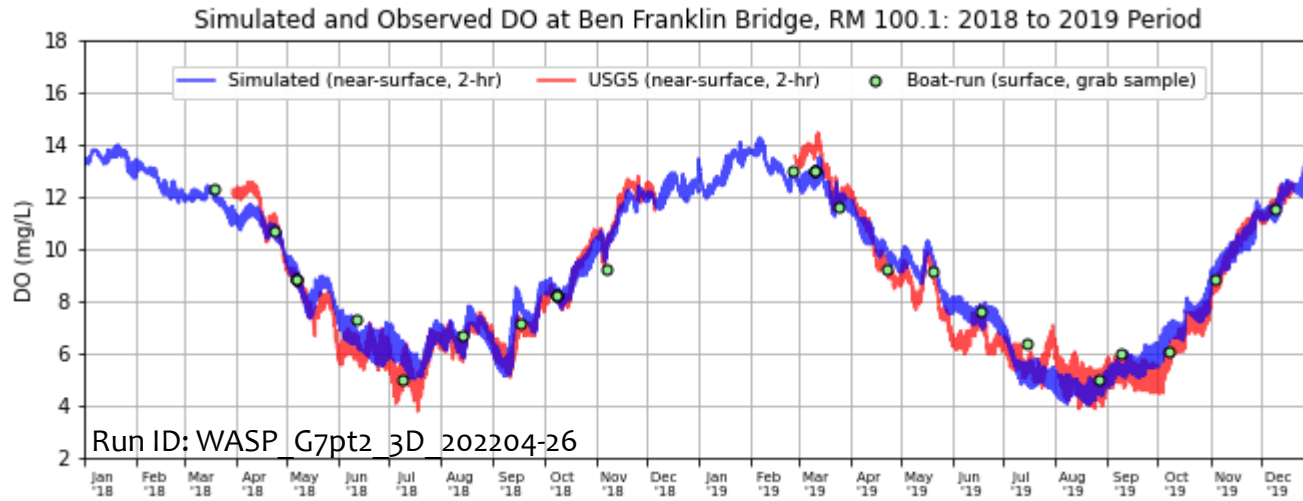


- Model Prediction (bottom)
- Model Prediction (surface)
- - - Model Prediction (second to surface)
- Data

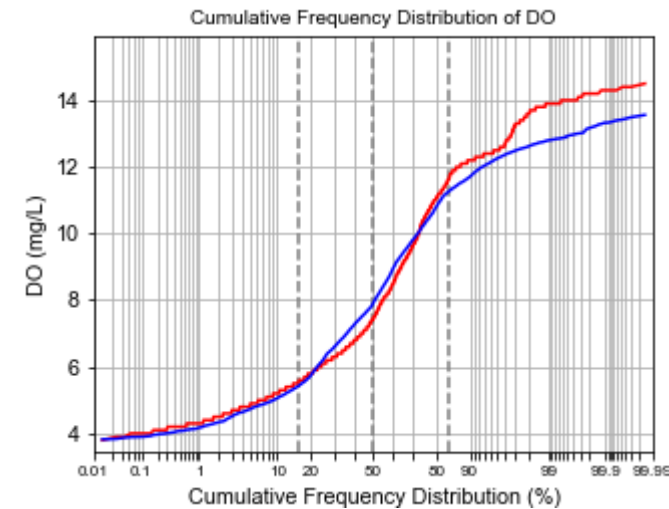
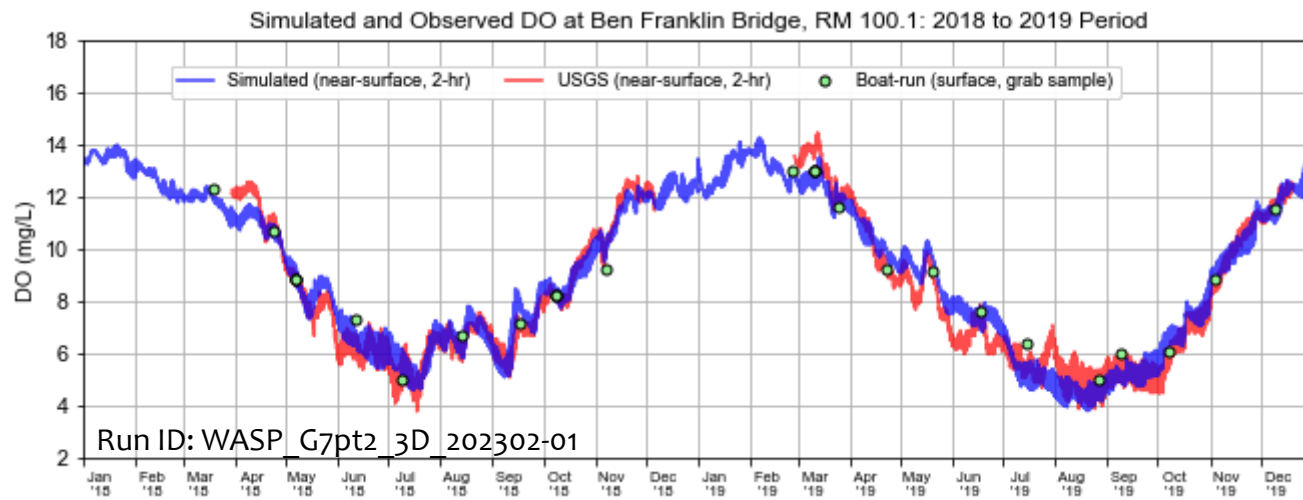




# DO at Ben Franklin Bridge, RM 100.1



Previous



Updated

# WQAC Comments on Socio-Economic Report

## Why Consider Socio-Economic Factors?

- (g) evaluation of the physical, chemical, biological, **social and economic factors affecting the attainment of uses**, as described in EPA's water quality standards regulations at 40 CFR 131.10(g)(1)-(6); and
- Responsive to Resolution 2017-4
  - To provide information on social and economic factors affecting the attainment of uses



# Comment Themes

## ☐ Commentors

- CCMUA
- DELCORA
- EPA
- PWD

- Reconsider certain assumptions
- Add costs for other regulatory mandates
- Provide additional detail on and justification for Monte Carlo analysis
- Disagreed with aspects of Kleinfelder report
- Consider inflation / affordability over time
- Diverse impacts across service area / equity
- Add other indicators
- Doubt the availability of affordable financing
- Expand cost mitigation discussion

# Comment Themes (Continued)

## ☐ Commentors

- CCMUA
- DELCORA
- EPA
- PWD

- Pick one guidance document
- Triple bottom line assessment
- Use more current Census data
- Utilities should have opportunity to affirm census tracts
- Provide computations in excel, not R
- More detail on QC
- Utility computed a cost-per-household that was higher
- Guidance documents were not finalized
- Evaluate phased implementation
- DELCORA -> PWD-SW flow split
- 2019 dollars should be updated

# WQAC Comments on Linking Aquatic Life Uses with Dissolved Oxygen Conditions in the Delaware River Estuary

## Why Consider the Relationship Between Fish & DO?

- a) input from expert panels on modeling the water quality impacts of nutrient loadings and the dissolved oxygen requirements of aquatic species;
- b) additional field studies of the occurrence, spatial and temporal distribution of the life stages of Delaware River Estuary fish species;
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- g) evaluation of the physical, chemical, biological, social and economic factors affecting the attainment of uses, as described in EPA's water quality standards regulations at 40 CFR 131.10(g)(1)-(6);

- Responsive to Resolution 2017-4
- To provide information on biological factors affecting the attainment of uses

# Comment Themes

## ☐ Commentors

- DELCORA
- DNREC
- EPA
- PADEP
- PWD

- Identification and presentation of scientific literature
- Presentation of physiological and ecological concepts and terminology
- Use of graphical presentations and analyses
- Analysis and evaluation of DO effects on endangered sturgeons
- Duration and frequency of potential dissolved oxygen criteria

# How Comments Will Be Addressed

- Comments are being addressed within the report
- Report will reflect not only the DO gradient but also the basis for WQS revision
  - Revised use
  - Specific DO criteria to protect the use
- Final report may be merged into basis and background document as part of water quality standards revision

# WQAC Comments on Analysis of Attainability

## Why Develop an Analysis of Attainability?

- g) evaluation of the physical, chemical, biological, social and economic factors affecting the attainment of uses, as described in EPA's water quality standards regulations at 40 CFR 131.10(g)(1)-(6); and
- h) preparation of a draft report and after soliciting input from the WQAC and other stakeholders, issuance of a final report containing findings and conclusions.

- Responsive to Resolution 2017-4
- To evaluate the attainability of improved dissolved oxygen in the Delaware River Estuary

# Comment Themes

## Commentors

- CCMUA
- Concerned citizen
- DELCORA
- PADEP
- PWD

- Baseline condition is overly conservative
- HADO should not form basis for criteria
- WLAs should be based on WQBEL analysis
- Conclusion regarding attainability is premature
- Basis for classifying discharges as Class A', Class A, or Class B
- Implementation concerns and ideas
- Facility-specific issues



# How Comments Will Be Addressed

- Comments are being addressed within the report
- Report will clarify that HADO analysis is for the purpose of determining attainability
- Final report may be merged into basis and background document as part of water quality standards revision