

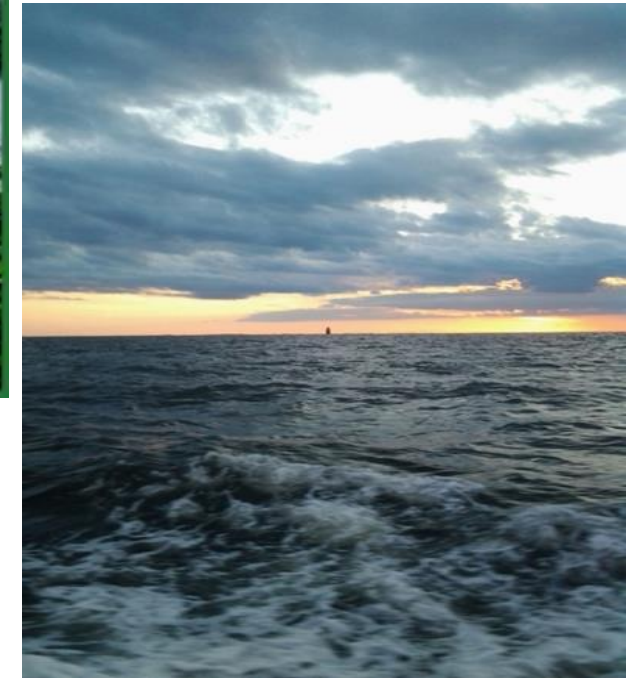
# Delaware River Basin Commission



## Water Quality Assessment Report Modernization

### Water Quality Advisory Committee

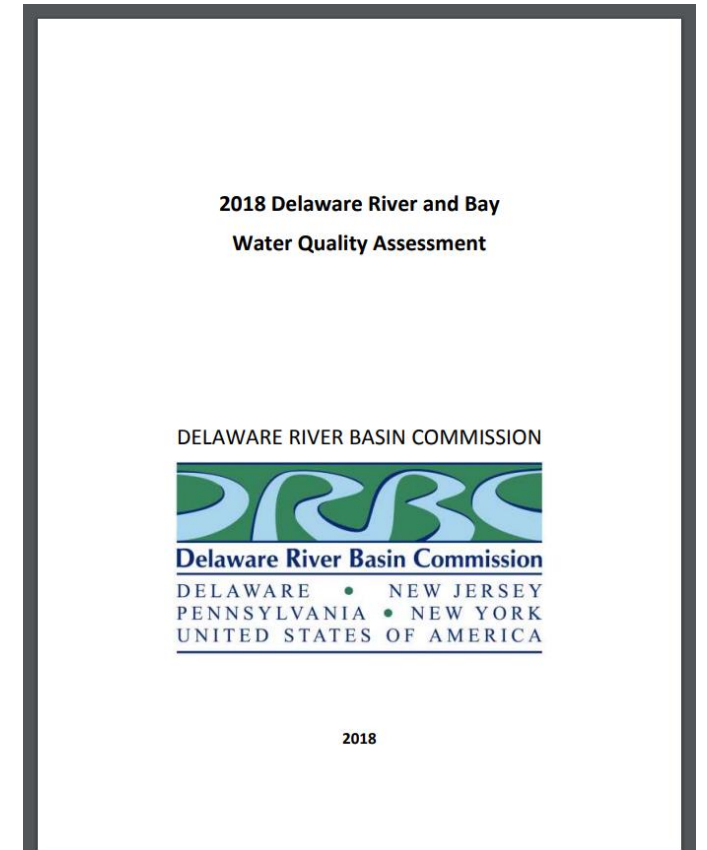
*May 14, 2019*



# Introduction



- \* Every two years, DRBC develops a Water Quality Assessment Report
  - \* The assessment involves comparison of several key water quality parameters with applicable DRBC water quality criteria.
- \* DRBC is currently in the process of modernizing this report and the processes used to create it



# Report Modernization



- \* Multi-pronged approach
  - \* Automation of data retrieval and analysis using R scripts
  - \* Development of a web-based interface for public access to the report
  - \* **Evaluation of current thresholds for triggering excursions/exceedances**
- \* This presentation will discuss the third bullet point above

# Why re-evaluate threshold triggers?



- \* DRBC currently uses a trigger of one exceedance plus one confirmatory exceedance during the 5-year assessment window
- \* This evaluation method is stringent for certain large datasets
- \* Delaware River assessment units rarely meet aquatic life use standards using this methodology

Zone (Assessment Unit)	DO	pH	Turbidity	Temperature	TDS	Alkalinity	Toxic Pollutants	Biological Assessment	2018 Assessment	2016 Assessment
1A	- <sup>A</sup>	- <sup>A</sup>	-	N/A <sup>C</sup>	- <sup>A</sup>	NC	+ <sup>F</sup>	+	NS	NS
1B	- <sup>A</sup>	-	+	N/A <sup>C</sup>	- <sup>A</sup>	NC	- <sup>F</sup>	+	NS <sup>E</sup>	NS
1C	+	- <sup>A</sup>	+	N/A <sup>C</sup>	+	NC	+ <sup>F</sup>	+	NS <sup>E</sup>	NS <sup>E</sup>
1D	+	- <sup>A</sup>	+	N/A <sup>C</sup>	- <sup>A</sup>	NC	- <sup>F</sup>	+	NS <sup>E</sup>	NS <sup>E</sup>
1E	+	-	- <sup>A</sup>	N/A <sup>C</sup>	- <sup>A</sup>	- <sup>A</sup>	- <sup>F</sup>	-	NS	NS
2	- <sup>A</sup>	- <sup>A</sup>	+	- <sup>A, B</sup>	+	+	- <sup>G</sup>	NC	NS <sup>E</sup>	NS <sup>E</sup>
3	+	+	+	- <sup>A, B</sup>	+	- <sup>A</sup>	- <sup>G</sup>	NC	NS <sup>E</sup>	NS <sup>E</sup>
4	+	+	+	- <sup>A, B</sup>	N/A <sup>D</sup>	+	- <sup>G</sup>	NC	NS	NS <sup>E</sup>
5	- <sup>A</sup>	+	- <sup>A</sup>	- <sup>A, B</sup>	NC	+	- <sup>G</sup>	NC	NS	NS
6	- <sup>A</sup>	- <sup>A</sup>	- <sup>A</sup>	- <sup>A, B</sup>	NC	- <sup>A</sup>	- <sup>G</sup>	NC	NS	NS

# Why re-evaluate threshold triggers?

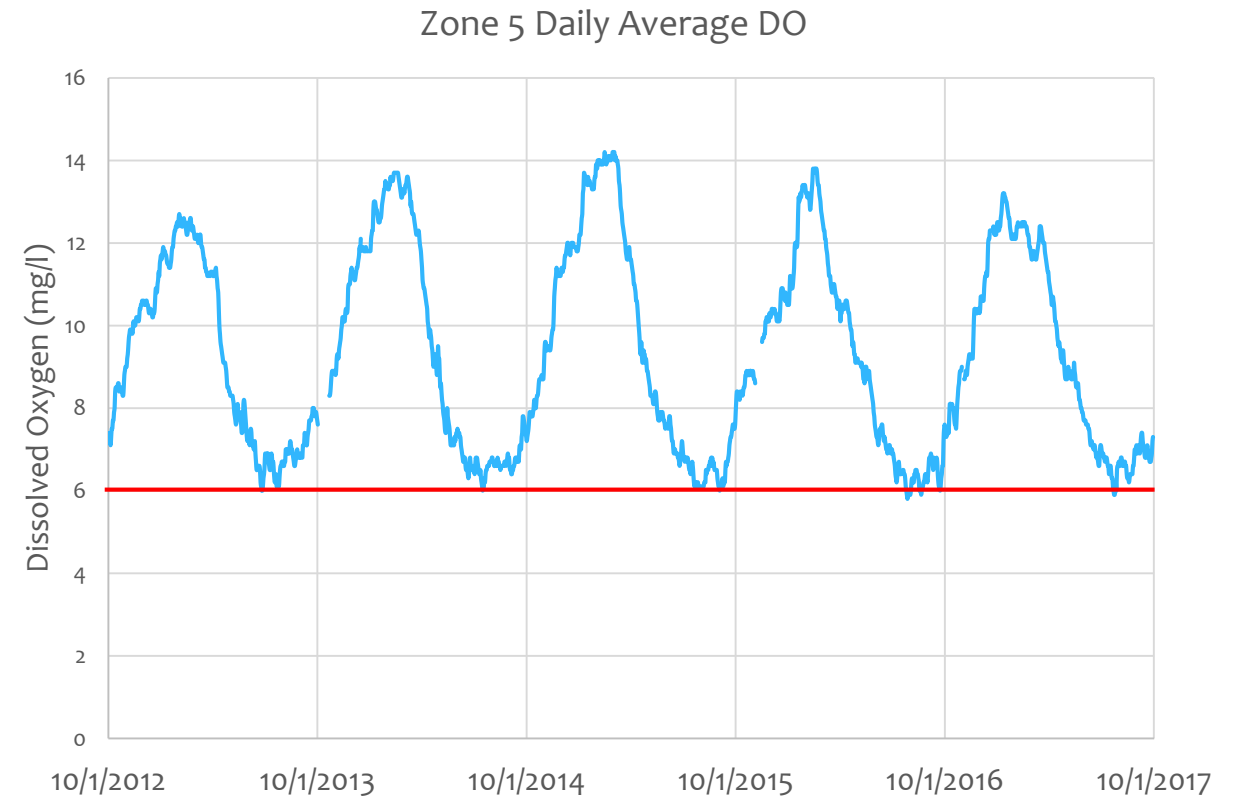


- \* The types and amount of data we use in the assessment report has changed
  - \* The majority of the assessment data comes from continuous monitors
    - \* Lots of data points!
    - \* 5 years \* 365 days \* 24 hourly readings = 43,800 data points
  - \* If just two of those points do not meet criteria, than we fail to meet aquatic life use for that parameter
    - \*  $2 / 43,800 = 0.000046\%$

# Why re-evaluate threshold triggers?



- \* Zone 5 daily average DO
- \* Reedy Island USGS Gage
  - \* 1826 data points
- \* 8 excursions from daily average minimum of 6 mg/l
  - \* 99.6% met criteria
  - \* Excursions are just below the minimum
- \* Using current methodology this assessment unit fails to meet aquatic life use



# Process for Evaluating Thresholds



- \* Review methods used by other basin states for assessing large datasets
- \* Compare these methods to current DRBC methods
- \* Consult with EPA
- \* Solicit input from WQAC

# Potential Methods for Revision



- \* Separate thresholds depending on types of data or type of parameter
  - \* DRBC already uses a separate methodology on some parameter like toxics and biomonitoring
  - \* Potentially institute a separate methodology depending on the size of the dataset
    - \* Use one threshold for small data sets (spot measurements)
      - \* Current 1+1 methodology is likely still appropriate
    - \* Use a separate threshold for large data sets (continuous monitors)
      - \* Compare to other states



# Potential Methods for Revision



- \* Some examples of how other states use continuous data
  - \* Extended exceedance period and multiple exceedances during monitoring window
    - \* An exceedance must last at least X hours and there must be at least Y exceedances during the monitoring period
  - \* Use a percentage threshold instead of a count
    - \* Must meet minimum value at least 99% of the time
  - \* Use confidence limit or percentile on large datasets to compare to criteria
    - \* Assessment unit is in compliance if the X percentile of available data is above criteria
    - \* Assessment unit is in compliance if the upper confidence limit of the data is above criteria

# Next Steps



- \* Determine which methodology is best for Delaware River
- \* Consult with EPA
- \* Consult with PA on web-based interface of assessment results
- \* Continue development of automated assessment approach using R
- \* Publish methodology by August 2019 for public review and comment

# Questions



## Contact

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