SAC pH Proposals

June 14, 2018
Review of NC’s Existing pH Criteria

• North Carolina’s existing pH criterion for Class C freshwaters, 15A NCAC 2B .0211 (14):

  pH: shall be normal for the waters in the area, which range between 6.0 and 9.0 except that swamp waters may have a pH as low as 4.3 if it is the result of natural conditions.

• Best uses for Class C freshwaters

  ...aquatic life propagation and maintenance of biological integrity (including fishing and fish), wildlife, secondary recreation, agriculture, and any other usage except for primary recreation or as a source of water supply for drinking, culinary, or food processing purposes.
Proposed pH Criteria

• Option #1:

The one-hour median pH shall be between 6.0 and 9.5 S.U.

*Duration*: 1 hour but with no explicit requirements to require 1 hour monitoring period by DWR.

*Spatial considerations*: None

*Magnitude*: 6.0-9.5 S.U.

*Frequency*: Current DWR assessment method of no more than 10% exceedance with 90% confidence
Proposed pH Criteria

• Option #2

Arithmetic average for pH shall be between 6.0 and 9.0 for waters with a dissolved oxygen concentration greater than or equal to 4.0 mg/L.

*Duration*: Short duration for the time needed to run pH profile of water column.

*Spatial Considerations*: Averaging pH measurements for the portion of the water column with sufficient dissolved oxygen.

*Magnitude*: 6.0-9.0 S.U.

*Frequency*: Current DWR assessment method of no more than 10% exceedance with 90% confidence
Basis of Proposals

• Scientific literature
  • Upper limit of existing standard (9.0) protective of salmonids, no salmonids in HRL.
  • Warm water fish more tolerant in general to higher pH

• Site-specific conditions at HRL
  • Ammonia toxicity increased with high pH, but no observed ammonia concentrations of concern in HRL
  • Current pH levels above 9.0 with no observed deleterious impacts to fish
Minority Report
Critique of Option #1

• Disagreement on health status of HRL
• Conclusions of the literature not fully addressed in proposal regarding fish species in HRL
• Literature values based on laboratory work and do not fully consider the synergistic effects of pH and other stressors
• Ammonia toxicity risk increases at two monitoring stations on HRL (YAD152C AND YAD169B)
Critique of Option #2

• Disagreement on health status of HRL
• Allowance of elevated pH levels above 9.0 is affected by same critiques for Option #1
Next Steps

• SAC is looking for comments that would indicate a preference between the options.
• What questions does the CIC have regarding the proposals?
• Is there additional information needed from the SAC?
• Is there additional information needed to provide feedback on social and fiscal impacts of the proposals?
• What time frame will the CIC need to respond to the SAC?