MERGING WATER QUALITY STANDARDS & MONITORING AND ASSESSMENT PRODUCES BETTER MANAGEMENT OUTCOMES

Chris O. Yoder, Midwest Biodiversity Institute, Columbus

Monitoring & Assessment (M&A)

- Monitoring & Assessment should be a determinant of how water quality is managed.
- When properly designed M&A can be used to identify & characterize problems, develop thresholds, and influence programs and policies.
- *The most meaningful results are achieved when M&A is developed as an integral part of WQ management.*

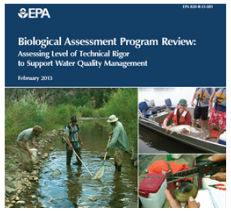
TALU Based M&A

- M&A in support of a TALU Based Approach includes tiered aquatic life uses (TALUs) based on numeric biological criteria and implementation via an adequate monitoring and assessment program that includes biological, chemical, and physical measures, parameters, indicators, and a process for stressor identification.
- M&A is conducted at a watershed or mainstem river scale ≈10-12 digit HUC – supports detecting multiple pollution gradients from point & nonpoint sources.
- *First task* is to determine if the current use designation is appropriate and attainable.
- *Second task* is to determine condition and status, including severity & extent of impairments and causal associations.
- *Third task* is assessing changes through time with multiple years of comparable data – this is key to determining trajectories of indicators.

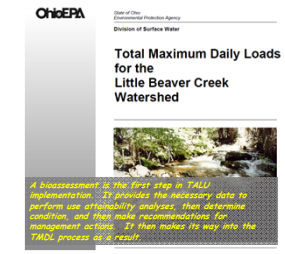
- Ohio EPA has operated a TALU Based M&A program since 1980 – 331 watershed units, 23 mainstem river units statewide.
- Direct support for "day-to-day" water quality management in addition to 305b/303d .
- Little Beaver Creek watershed assessment led to use of M&A data to trigger a total P limit at the Salem WWTP.

ABSTRACT

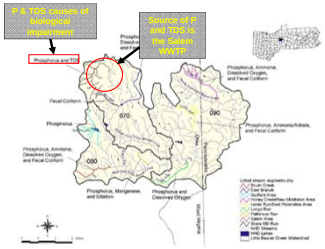
A central concept in the effort to improve the rigor of State biological assessment programs has been the integration of water quality standards and monitoring and assessment as a critical supporting framework for water quality management. Specifically this includes enhancing the descriptions of aquatic life designated uses and their measurement via numerical biological criteria and biological assessment. Known as the "TALU" approach it includes tiered aquatic life uses (TALUs) based on numeric biological criteria and implementation via an adequate monitoring and assessment approach that includes biological, chemical, and physical measures, parameters, indicators and a process for stressor identification. States that have developed the level of detail needed to have a linkage between their WQS and their monitoring and assessment programs have been successful in achieving water quality management outcomes that would not have occurred under a framework of general uses and monitoring for statewide condition. Essential components of this more developed framework include: 1) tiered aquatic life uses that are defined in accordance with how the numeric biocriteria for each have been developed, 2) a monitoring program that has sufficient spatial resolution to reveal degrees of quality along pollution continuums in rivers and streams and at the same scale at which management and regulatory programs are being applied, and 3) language in the WQS that specifically describes agency responses to impairment and attainment of tiered use biocriteria as revealed by a watershed level monitoring program. Two recent court decisions concerning the imposition of NPDES effluent limits in Ohio specifically point out the utility of the TALU framework. These results point up not only the utility of merging WQS and monitoring and assessment, but also legally defines the level of and types of data that are sufficient to implement such an approach via modernized state WQS. Attaining the level of rigor to implement such an approach is consistent with the U.S. EPA guidelines specified in *Biological Assessment Program review: Assessing Level of Technical Rigor to Support Water Quality Management (February 2013).*

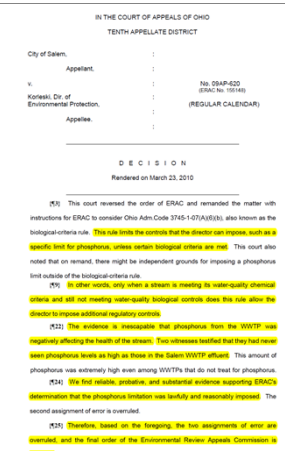


- State program evaluation process developed & tested beginning in 2002 – piloted with Region V states.
- Includes review & evaluation of bioassessment & WQS programs – 2-3 day on-site interview.
- Goal is to attain "Level 4" for bioassessment program based on four levels of rigor (1-4).
- 22 states evaluated to date. – two coordinated regional efforts (Regions 1 and 5)
- States with TALU in WQS are Levels 3+ or 4 (3) – *these states provide full CWA program support*.
- States developing TALU are Level 3 and 3+ (6) – *these states will attain Level 4 as TALU is finalized.*
- No Level 2 states are developing TALU (11) – *these states emphasize statewide 305b/303d.*
- Ohio case study presented here illustrates capacity to support & defend WQ based permitting.



The finding of biological impairment factored into the TMDL that included total P limits for the Salem WWTP




IN THE COURT OF APPEALS OF OHIO
TENTH APPELLATE DISTRICT

City of Salem,
Appellant,
v.
Koleski, Dir. of Environmental Protection,
Appellee.
No. 09AP-620 (ERAC No. 155148)
(REGULAR CALENDAR)

DECISION
Rendered on March 23, 2010

¶23 This court reversed the order of ERAC and remanded the matter with instructions for ERAC to consider Ohio Adm.Code 3745-1-07(A)(6)(b), also known as the biological-criteria rule. This rule limits the controls that the director can impose, such as a specific limit for phosphorus, unless certain biological criteria are met. This court also noted that on remand, there might be independent grounds for imposing a phosphorus limit outside of the biological-criteria rule.

¶[illegible] In other words, only when a stream is meeting its water-quality chemical criteria and still not meeting water-quality biological controls does this rule allow the director to impose additional regulatory controls.

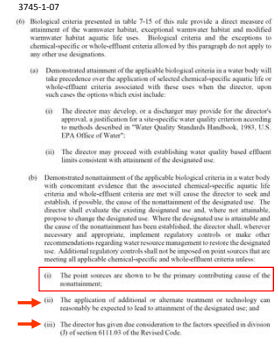
¶[illegible] The evidence is inescapable that phosphorus from the WWTP was negatively affecting the health of the stream. Two witnesses testified that they had never seen phosphorus levels as high as those in the Salem WWTP effluent. This amount of phosphorus was extremely high even among WWTPs that do not treat for phosphorus.

¶24 We find reliable, probative, and substantial evidence supporting ERAC's determination that the phosphorus limitation was lawfully and reasonably imposed. The second assignment of error is overruled.

¶25 Therefore, based on the foregoing, the two assignments of error are overruled, and the final order of the Environmental Review Appeals Commission is affirmed.

[Supreme Court of Ohio refused to hear appeal by Salem of 10th District decision.]

Ohio's Biocriteria Implementation Language is in addition to the detailed narrative aquatic life use designations.


3745-1-07

(6) Biological criteria presented in table 7-15 of this rule provide a direct measure of attainment of the warmwater habitat, exceptional warmwater habitat and modified warmwater habitat aquatic life uses. Biological criteria and the exceptions to chemical-specific or whole-effluent criteria allowed by this paragraph do not apply to any other use designations.

(a) Demonstrated attainment of the applicable biological criteria in a water body will take precedence over the application of selected chemical-specific aquatic life or whole-effluent criteria associated with these uses when the director, upon such cases the options which exist include:

(i) The director may develop, or a discharger may provide for the director's approval, a justification for a site-specific water quality criterion according to methods described in "Water Quality Standards Handbook, 1983. U.S. EPA Office of Water".

(ii) The director may proceed with establishing water quality based effluent limits consistent with attainment of the designated use.

(b) Demonstrated nonattainment of the applicable biological criteria in a water body with concomitant evidence that the associated chemical-specific aquatic life criteria and whole-effluent criteria are met will cause the director to seek and establish, if possible, the cause of the nonattainment of the designated use. The director shall evaluate the existing designated use and, where not attainable, propose to change the designated use. Where the designated use is attainable and the cause of the nonattainment has been established, the director shall, wherever necessary and appropriate, implement regulatory controls or make other recommendations regarding water resource management to restore the designated use. Additional regulatory controls shall not be imposed on point sources that are meeting all applicable chemical-specific and whole-effluent criteria unless:

(i) The point sources are shown to be the primary contributing cause of the nonattainment;

(ii) The application of additional or alternate treatment or technology can reasonably be expected to lead to attainment of the designated use; and

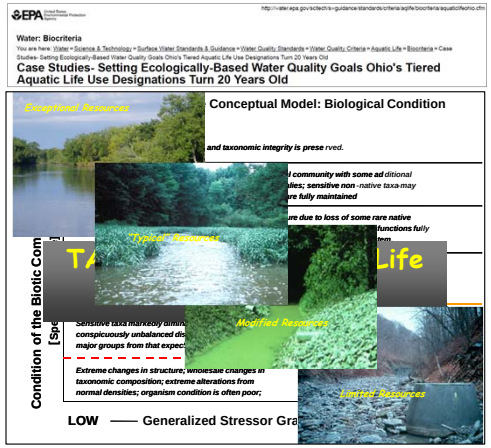
(iii) The director has given due consideration to the factors specified in division (J) of section 6111.03 of the Revised Code.

Conclusions

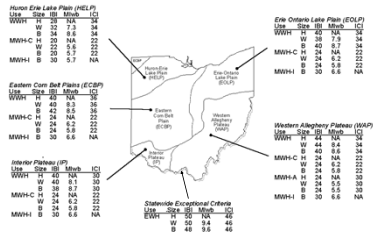
- The specificity of the Biocriteria Implementation language provided a "legal linkage" between the biocriteria impairment and developing a management response.
- The delineation of a cause of the biological impairment was legally defensible.
- The Ohio approach to merging M&A and WQS was found to be legally reasonable and defensible..

Water Quality Standards (WQS)

- WQS consist of designated uses & chemical, physical, & biological criteria.
- The specificity of the designated use narrative (or lack thereof) determines the specificity and relevance of the criteria for watershed specific applications as they relate to waterbody assessments.
- The designated use narrative should contain a definitive goal statement, quantitative thresholds for attainment, geographic applicability, & methods documentation references.
- Implementation language is needed to define the role of chemical & biological criteria, state the data requirements, & state the options for a finding of full and non-attainment.



Ohio Biological Criteria: Adopted May 1990 (OAC 3745-1-07; Table 7-14)


Huron Erie Lake Plain (HELP)

Use	Size	IBI	Mwb	IC
WWH	H	38	NA	34
	W	32	7.3	34
	B	34	8.6	34
MWH-C	H	20	NA	22
	W	22	5.6	22
	B	30	5.7	22
MWH-I	B	30	5.7	NA

Eastern Corn Belt Plains (ECBP)

Use	Size	IBI	Mwb	IC
WWH	H	40	NA	36
	W	40	8.3	36
	B	42	8.5	36
MWH-C	H	24	NA	22
	W	24	6.2	22
	B	24	5.8	22
MWH-I	B	30	6.6	NA

Interior Plateau (IP)

Use	Size	IBI	Mwb	IC
WWH	H	40	NA	30
	W	40	8.1	30
	B	38	8.7	30
MWH-C	H	24	NA	22
	W	24	6.2	22
	B	24	5.9	22
MWH-I	B	30	6.6	NA

Erie Ontario Lake Plain (EOLP)

Use	Size	IBI	Mwb	IC
WWH	H	40	NA	34
	W	38	7.3	34
	B	40	8.1	34
MWH-C	H	24	NA	22
	W	24	6.2	22
	B	24	5.8	22
MWH-I	B	30	6.6	NA

Western Allegheny Plateau (WAP)

Use	Size	IBI	Mwb	IC
WWH	H	44	NA	34
	W	44	8.4	34
	B	40	9.6	34
MWH-C	H	24	NA	22
	W	24	5.8	22
	B	24	5.8	22
MWH-A	H	24	NA	38
	W	24	5.5	38
	B	24	5.5	38
MWH-I	B	30	6.6	NA

Statewide Exceptional Criteria

Use	Size	IBI	Mwb	IC
EWH	H	50	NA	46
	W	50	9.4	46
	B	48	9.6	46

Ohio's Biocriteria were adopted in 1990 and withstood court challenges in 1991 (*NEORSD vs. Shank No. 89-1554*, Supreme Court of Ohio, Feb. 27, 1991).