

**Nutrient Criteria Development Workgroup
July 12, 2005
Meeting Summary**

Welcome and Introductions - Mark Fisher

Update on the Wadeable stream studies in East Texas - Richard Kiesling (Handout #1)

- Study conducted of streams in East Texas observed to have water quality problems associated with dissolved oxygen
- Did not characterize sediments so there is no information on sediment oxygen demand
- 48-hour DO five times at a site over 2003-2004
- Seven sites for this summer to redo. Collected fish, benthics, algae.
- Performed Habitat and algal assessments and a pilot study using light and dark bottles
- Data was divided into ponded areas, ie. Slow moving vs. shallow ie., light penetration to the bottom
- Attempt to relate fish and invertebrates back to watershed size or stream size.
- Audience suggested that information on cloud cover may be why some of the dates did not show a diurnal swing in DO
- Suggested that information on light should be included in future sampling.
- Question as to whether algae speciation was being done. It is not.
- But samples have been saved to do that work in the future.
- Richard Kiesling did indicate that assessing different pigments would also provide some additional information on the algae assemblages.

**Central Texas study of wadeable streams by USGS for TCEQ - Sidne Tiemann
(Handout #2)**

- USGS will be sampling 15 different streams locations in central Texas and perform the same data collection as for the 24-hour DO study conducted in 2003-2004-2005
- A map of proposed sites with their descriptions were included
- Sites chosen to provide a gradient of nutrient inputs

Update on Texas Water Conservation Association's Uses Study - Peggy Glass (Handout #3)

- Eight reservoirs used for the study
- Sampled water quality within each lake and at the same time surveyed users as to suitability of the lake for recreational uses
- All data from the study has been submitted for inclusion in the SWQM data base.
- Suspended solids appear to be important in use perception for recreation.
- Both organic and inorganic.
- Users don't differentiate between the two, but appear to be "turned off" by blooms.
- For recreational use chlorophyll *a* is overshadowed by suspended solids.
- Perceptions were divided into A-E for range from good to bad.
- Question is whether a C indicates that the use or the water body is impaired

- There appears to be a relationship to seasonal means and seasonal maximum
- Cedar Creek appears to have an increasing trend in chlorophyll *a*.
- Pheophyton did not improve the results, so wasn't included.
- Compared sampling crew perceptions to those of the general public and also between sampling crews.
- Perceptions indicated that the 10-20% were where people were bothered the most.
- Reservoirs were grouped based on chlorophyll *a* and perceptions.
- Audience pointed out that cloud cover could make a difference in the way the water looked.

Chlorophyll *a* sampling and testing methods - Sidne Tiemann, Patrick Roques

- Data base created from which criteria were calculated had TCEQ Houston lab data censored at a lower concentration than it is now, as found in the SWQM data base.
- The data from 1999 to 2005 that was below 10 ug/L was changed since the standards team pulled the data for nutrient analysis.
- Concentrations lower than 10 ug/L were changed to <10ug/L.
- All the calculations for trend analysis, correlations, and criteria calculations used the values reported in the SWQM data base before the change and not <10ug/L.
- Only data reported by the TCEQ Houston lab was changed.
- Data from the Clean Rivers Partners has not been affected.
- The Houston lab has new equipment and will be using the fluorometric method in the future. This is a more sensitive test and the detection limit should go down from 10ug/L.
- A new standard operating procedure for processing chlorophyll *a* samples has also been placed in force and is being used to reduce the variables during sampling and testing.
- Approximately 40% of the 1999 to 2005 data is from the Houston lab.
- Richard Kiesling indicated that if anything the values would underestimate the concentration of chlorophyll *a* because steps in the method allow for degradation of chlorophyll *a*.

TCEQ proposed criteria - Jim Davenport (Handout #4)

- Language in the Texas Surface Water Quality Standards was brought before the group.
- This language indicates how the standards could be changed to incorporate nutrient criteria and chlorophyll *a* criteria.
- A new appendix with criteria values for 55 reservoirs was also presented.
- The 55 reservoirs' criteria was calculated using deep pool sites in the main body of the reservoirs and the presented text changes were worded to only apply to the deep pool of reservoirs.
- The initial cut for the standards indicates chlorophyll *a* for the water column.
- Appendix F criteria is based on a .01 (99%) confidence interval.
- Data for all year were used instead of seasonally.
- Criteria calculations for all years were similar to those for just the summer, which was defined as April to October.

Criteria discussion

- There were concerns about setting a numerical criteria for reservoirs with increasing nonpoint source pollution. The concern was that dischargers would be targeted for reduction when non-point source loading was increasing.
- Concern about speed at which criteria are being developed.
- Felt that criteria needed to be set for reservoirs as much as possible.
- Audience felt that the narrative criteria not stringent enough and were place holders until numeric criteria could be developed.

Aging

- Is there a way to determine the difference between natural eutrophication and cultural because some of the reservoirs do show an increasing trend in chlorophyll *a* concentrations over time? Discussion that there may be some papers on it. Also papers on the aging of reservoirs.
- Audience pointed out that reservoirs retain nutrients. 70-90% are retained
- There is a change in assimilative capacity of a reservoir over time and can see an increase in chlorophyll *a* over time.
- It may be that a confidence level of 95 or 90 may be more appropriate for the reservoirs with higher concentrations of chlorophyll *a*.

Assessment

- Define the method of assessment in 307.9 and what happens if a reservoir does not meet the screening value.
- Audience pointed out that there should be consistency between the time frame used to set the criteria and the time frame used for assessment.

Seasonality

- Audience pointed out that some reservoirs in north Texas did show seasonality.
- If the criteria are use based then seasonality, might be a better approach as long as it is clearly stated in the standards.
- Area between piney woods and central Texas see a lot of drought conditions and show differences

Reservoirs of Concern

- Audience questioned, according to the historical data, which reservoirs are in bad shape
- TPWD pointed out that their proposal included a method for developing criteria on more impacted reservoirs.

EPA

- Question about how EPA will receive the presented criteria since it does not include N or P.
- Jim Davenport indicated that EPA did want states to address N and P loading.
- We are exploring reservoir groupings, and using the same criteria calculations on TP and TN when permits are evaluated.

Maximum Chl *a*

- Audience was asked if there was reservoir concentration of chlorophyll *a* that could be considered problematic.
- Suggestions were to look at the data and see if there had been changes over time.
- If the number is high, is there a use impact or is there a trend over time?
- Questioned how high chlorophyll *a* concentration would lead you to consider comparing it to a use.
- Questioned how you would determine what the use was and how it was impacted.
- Suggestion to look at State Parks, drinking water.

Trends

- Audience suggested defining what an unacceptable trend in chlorophyll *a* concentrations would be. Ex. Some standard deviation over some time frame.
- There would need to be an anchor for time frame, such as over 5 years.
- This would address some of the concerns about the narrative criteria being the only one to use.
- TPWD suggested ways to anchor time in their proposal.
- LCRA indicated that even with the controls that they have in place, they are seeing increasing trends in the Highland lakes.
- Nonpoint source is becoming a major aspect in nutrient loading.
- There are reservoir models that take non-point source into consideration.
- Modeling could then be linked to antidegradation.

Actions

- Audience seemed to think that criteria for individual reservoirs was appropriate.
- Should mean, median, or geometric mean be used in calculating criteria? Concerns with what happens with outliers.
- Audience suggested that we go ahead and calculate criteria for all reservoirs using the historical methodology instead of waiting.
- TPWD's plan included how to approach the numbers.
- High numbers may need to be reduced and TPWD's method could be used to do that.
- Suggested that uses are attained in Texas reservoirs.
- Using historical data makes sense.
- When uses are not being attained and the criteria is set to more than the ambient level, then the antidegradation could be used across the board now.
- Suggestions to use the criteria number as a screening number in the Implementation Procedures or in the 303d assessment protocols for individual reservoirs. For example, as screening is done for sediment assessment.
- Produce a screening value table. If it exceeded the screening value it would go on a list, such as a watch list that would trigger some defined action. The Action could include increased monitoring, a watershed action plan, etc. This may be an option if the presented criteria cannot be placed in the standards.
- The mean protects against high numbers, correlation between the mean and high values. If don't want the mean to increase, use the mean for assessing and 99% confidence level for the criteria.
-

- Suggestion that criteria be calculated for all reservoirs, then look at the list.
 - If a reservoir appears to be problematic, then before the criteria are adopted discuss each individual reservoir and discuss alternatives.
 - Then consider uses and the impact on the local community and get the local community involved.
 - If the number is high and there is an increasing trend, analyze the watershed and consider all loadings.
 - A waste load allocation, watershed management plan, and then a TMDL.
- If chlorophyll *a* was exceeded, then a waste load allocation could be done with a model separating out the point and nonpoint sources.
- A TMDL would allow the inclusion of nonpoint sources. However the narrative has no number so TMDL can't be done based on it.
- A WLA lets us see what nutrients are affected before a water body is listed since N and P are not as concrete as chlorophyll *a*.
- Suggestion that we calculate criteria using our data and the TPWD method.

Draft Language - Standards

- New term “aquatic recreation”. Be sure and define any new terms in the Definitions section.
- Suggested that the use of the wording “aquatic plants” implied macrophytes.
- Suggested that the word “algae” should be used when specifically talking about reservoir criteria using chlorophyll *a*.
- Should include in standards that chlorophyll *a* is for the water column and not rooted plants. Fine to leave it as is in existing standards wording for generalities.
- List of reservoirs in Appendix F was to list those with little human loading in watershed and no clear trend in chlorophyll *a*.
- Point is to hold the status quo on these reservoirs.
- The presented changes in the standards for this list of least impacted reservoirs would not apply to the remainder of the reservoirs. Narrative criteria would apply to them.

App F

- Concern about significant numbers.
- If criteria is less than 5 but assessment would only be if values exceeded 5 should be clearly stated in the standards. If so, leave the criteria number as is, that is if they are less than 5, but can do the assessment for <5 as with some toxics.
- Questions about criteria values that calculate the criteria using a mean, but do the assessment using a median.

Items to cover in the next workgroup meeting

- Run the criteria on all reservoirs
- Provide summary of the details of the criteria development
 - minimum number of samples required
 - distribution over time
 - number of data points that were used in calculating the criteria
 - how land use was determined
 -

- Run seasonal vs. annual
- An update on Chl *a* vs. TN and TP from USGS
- Look into a maximum number to compare to uses
- What types of management practices or other options could be used to deal with concerned reservoirs.
- Provide sample calculations for assessment, expand 5 year assessment presented at April 2005 meeting.
- Summary - Question on how % land use was calculated. Richard Kiesling explained this.
- Meta data file from USGS to TCEQ details this as well.
- The Nutrient Criteria Development plan also has this information in it and it is available on the TCEQ website.

Next meeting

- Summary of assumption for derivations on land use and criteria
- The work group indicated that they would prefer to meet again before criteria and language were presented to EPA.
- Next meeting will be held September 26, 2005 at TCEQ, 12100 Park 35 Circle, Austin, Texas, Room 2210, 9:00am-3:30pm.

**Nutrient Criteria Development Advisory Work Group
Attendee List
July 12, 2005**

Mark Ernst	TRWD
Jonathan Young	Alan Plummer Associates
Melissa Mullins	TPWD
Paul Jensen	PBS &J
Bryan Brooks	Baylor University
Pat Radloff	TPWD
Patricia Wise	TCEQ
Allison Woodall	TCEQ
Richard Kiesling	USGS
Mark Fisher	TCEQ
Mary S. Vann	SRA
Randy Palachek	Parsons
Allen White	USFWS
Larry Koenig	TCEQ
Chris Pasch	APAI
Peggy Glass	APAI
Clyde Bohmfalk	TCEQ
Lial Tischler	Tischler/Kocurek
Sara Burgin	Baker Botts
Rick Leopold	USDA/NRCS
Dolan McKnight	NTMWD
Dick Luebke	TPWD
Melvin Swoboda	Dupont/TCC
Larry Hauck	TIAER
Alicia Reinmund	LCRA
Chris Higgins	TSSWCB
Myron Hess	NWF
Karen Holligan	TCEQ