

Attendees: Kimberly Buhl, Jose Lozano, Roxy Johnston, Bob Johnson, Liz Moran, Rich DePaulo, Jeff Myers, Steve Effler, Jim Adams, Dave Bouldin, Bert Bland, Linda Wagenet, Dooley Kiefer

- Review of June notes
 - June notes included a question about the definition of 'observation' in the data Ecologic is compiling from other sources. Liz clarified that an observation is a single sample.
 - No changes to the notes were suggested.
- Newest list of submitted data
Discussion minimal to give time for other agenda items and guest participant (Steve Effler)
- Review Monitoring Data
PAR (Photosynthetically Active Radiation)
 - Note the scale changes based on different depths of the sampling sites, notice log scale on some graphs.
 - Algae use light between 400-700 nm, available light effectively gone at around 20 m.
 - The water quality model will simulate algae growth, PAR is an important parameter.

Chlorophyll

- Almost no structure in the graphs now, earlier season data had more peaks, chlorophyll could be in the deeper water now. Expect more structure in graphs later in the season.
- No vertical heterogeneity at site 8 but there is at sites 4 and 5. This could be seiche activity but will need to see lab results before commenting. Probes are useful tools in the field but lab data is more precise.

Q: Bert – Is turbidity caused by sediment, not algae?

A: Steve - Plot the ratio of BAC and NTU to get a rough estimate of the relative amounts of sediment and algae. Higher turbidity peaks are likely inorganic (not algae), but can't say with any certainty yet.

Specific Conductivity

- Very little going on

Clarity

- NTU (Nephelometric Turbidity Unit) is an arbitrary scale, it is not based on an absolute metric. It is the 'poor man's' measure of light scatter. NTU measurements are more influenced by inorganic particles than secchi disk.
- BAC (Beam Attenuation Coefficient) is measured at 660 nm, it is equivalent to the scattering coefficient and is sensitive to differences in scattering of light from inorganic vs algal particles.

- BAC fails at the equivalent measure of <1 NTU. At lower clarity, BAC is more sensitive to changes than NTU.
 - Secchi disk is proportional to the inverse of BAC. Secchi disk depth is controlled by light scatter and gives a balanced representation of inorganic and algal influences.
 - Articles by Feng Peng discuss BAC and Secchi disk readings:
http://www.researchgate.net/profile/Feng_Peng5/publications/
 - In deep sites, clarity is lowest in the upper water. At site 5, clarity decreases in deeper water, these are nepheloid layers and could be caused by localized resuspension or seiche activity.
 - General comments on Cayuga Lake: Most of the time clay and quartz are dominant particles. Calcite is over saturated most of the summer. When calcium carbonate becomes dominant it can bind to calcite and suddenly change water clarity by forming a precipitate. This often happens for 1-2 weeks in August. For a general description see:
http://www.michigan.gov/documents/deq/deq-oea-cau-whitings_415030_7.pdf
 - Steve E. concurs w/ Dave Bouldin that water clarity is controlled by inorganic particles, particularly on the southern shelf but it is still important in the deeper water too
 - Inorganic inputs are the main management issue and are controlled mostly by the streams.
 - Picoplankton are a side interest but not a management issue.
- Dave Bouldin led discussion on clarity measures
 - Looking for a good indicator of overall water quality that is robust and simple. Suggests secchi disk

General parameters

- pH/Alkalinity relationship can be used to calculate total organic carbon
- Total organic carbon is the pool driving all growth
- SRP has changed from 12 ppb during 1968-1973 to 9-10 ppb during 1999-2005.
- Can't relate chlorophyll to srp changes over time
- Mixing patterns show numerous inputs and dynamics
- Inputs of streams are very important to lake, especially the south end of the lake. However, stream inputs 'clear' quickly.
- People don't see chlorophyll, they see clarity. Considers chlorophyll a minor problem on the shelf.
- Suggesting a ranking system for secchi readings

Ranking

1. Address measures when the bottom is visible
2. Create ranking criteria based on secchi readings
3. Create criteria that reference mid lake readings

Q: Bert – What about when algae die and take oxygen out of the system?

A: Dave – Good question but not even close to an issue, all data Dave's seen has oxygen at 80% or greater. All concerns around algae are visual/aesthetic.

Comment: Alkalinity data missing – needed to assess total organic carbon pool

Response: Steve Effler willing to add alkalinity to remaining shelf sampling

Comment: Need to know total weight of sediment and turbidity and CaCO₃.

Response: UFI is working on those measures

- Public Meeting Notes
 - Jeff – no changes suggested. Steve’s technical portion well delivered. Audience comments suggested people are looking ahead.

- DEC updates
 - Close to forming TAC. Taking extra time to get outside, independent reviewers. The TAC is not a stakeholder group.
 - Working on matrix of project due dates – will be posted to DEC website when done.
 - Jeff – finds the MP meetings useful, may include some technical staff for future meetings. Would help to have materials in front of him.

- Adjourn