

Frank Proto made opening remarks and thanked NYS Department of Environmental Conservation (DEC) for their efforts. He described the Monitoring Partnership and the Partnership's work with DEC on issues in the southern end of the lake. He stressed the importance of Cayuga Lake to the community and the importance of the study currently underway.

Diane Carlton, Region 7 DEC, took over as moderator for the meeting.

**Jeff Myers, DEC Director of Bureau of Water Assessment Management gave a recap of public comments and responses**

Jeff is the 'face' of the project but is really just 1 of a group working on the project. Diane Carlton and Sue Van Patten were in attendance and aiding in communications/outreach. Others are also working on the project.

Jeff reviewed total maximum daily load regulations (TMDL's), why a TMDL is appropriate for Cayuga Lake, the goal of modeling project, its relation to the Lake Source Cooling (LSC) permit, public comments on the permit, project status, schedules and outreach approach.

TMDL's are load allocation plans used to set discharge limits for a specific pollutant into the water body; they are used for complex systems and multiple discharge situations.

Jeff reviewed complexities of Cayuga Lake and commented that DEC will be managing the south shelf different from the main lake.

Jeff said that data from the last 10 years shows a change in water quality conditions.

Jeff explained the path to a TMDL: first the 305b list, then the 303d list where Cayuga Lake is listed as impaired by phosphorus, silt/sediment and pathogens. The focus of the proposed TMDL is phosphorus.

Question: how can a phosphorus TMDL be developed w/o looking at sediment?

1. The goal: Create a model to provide a better understanding of Cayuga Lake water quality under varying conditions in order to develop an effective TMDL plan.
2. The reality: project should answer some of the questions, but not expecting to answer them all

This permit is the manifestation of a commitment by Cornell University to fund a study of Cayuga Lake to assist DEC with TMDL development.

Reasons for DEC's approach to the draft permit:

DEC remains uncertain that focusing solely on the LSC discharge will resolve the water quality problems in Cayuga Lake. Also, this a great opportunity to do a TMDL for the south end of the lake.

Water quality impacts in the lake predate LSC.

The phosphorus content in LSC's discharge is affected by increasing phosphorus in lake, not the other way around.

Significant reductions of phosphorus from waste water treatment plants (wwtps) to date have not resulted in improved water quality. Jeff showed chart of wwtp reductions against increasing chlorophyll levels in the lake – DEC wonders what would lead us to believe that more reductions in discharges would increase water quality?

Stated uncertainty of impact of lake source cooling

Relative contributions of soluble reactive phosphorus (SRP), or bioavailable phosphorus, from sources need parsed out

Relative Timing of inputs may be important and could point to particular discharges (summer months)

What is fate of SRP in deep lake absent the LSC intake discharge – DEC wants to know what movement is naturally – does it make its way on the shelf anyway?

Comments on permit – pretty even number of comments supporting and opposing

#### Support

1. Environmental benefits of LSC
2. Need for more intensive study of south end of Cayuga Lake and support for a TMDL
3. Benefits of a focus on the whole lake and watershed to better address water quality declines in other parts of the lake

#### Opposing

1. Decline in lake water quality and timing that suggest LSC discharge is cause.  
DEC response: agrees that over last 10 years water quality has declined but it is not just at the LSC discharge, data suggests larger processes in play
2. Adequate study to date indicates LSC discharge should be reduced/eliminated.  
DEC response: disagrees
3. Interim discharge limits are too high.  
DEC response: very specific rules are used to set interim limits in absence of a TMDL or during a study or during a time given to reach final limits. Setting the LSC interim limits was done using these standard procedures.

#### **Steve and Dave: Monitoring thus far**

The Monitoring-Modeling study is targeting phosphorus and related features of water quality

5 technical elements

- Tributary monitoring for loading rates, lbs per day, underway now

- Lake monitoring for water quality measures and biological communities, underway now
- 2 dimensional water quality transport model for lake (next year)
- Watershed/land use model, establish dependence of loads on land use, just getting underway
- phosphorus/eutrophication model for lake, quantifies dependence of lake water quality on tributary and point source inputs

Phased, multi year study, guided by QAPP, 491 pgs, publicly available, describes 1<sup>st</sup> 4 elements which will guide 5<sup>th</sup> element.

#### Lake wide program

- Collect detailed data bi weekly April thru October, goal of 15 surveys. Phytoplankton, zebra, quagga, chemistry data in situ through whole water column. Increased southern shelf sampling program – detailed sampling 2x weekly during summer months at 3 locations, 2 on the shelf and 1 off Taughannock (June thru September)
- Showed 15 sites, began April 8<sup>th</sup>, on schedule so far for completion. Takes about 9 hours
- Chlorophyll is highest at thermocline. Turbidity is highest just below the surface, the deep water increase in turbidity is the nepheloid layer
- Chemistry data is not being posted until end of season –
- RUSS unit measures temperature, specific conductivity and turbidity at 15 minute intervals – it's on the shelf (site 2) – helps fill in gaps in data

#### Tributary program

- *Routine* – collect water quality samples and in situ measurements at Fall, Salmon, Inlet, Six Mile and Taughannock creeks; biweekly April thru October, goal of 15 samples
- *Capturing storm* samples on all 5 tributaries too – goal of 4 events
- *Synoptic* event chemistry – goal of 2 storm events on each tributary

#### *Bioavailable phosphorus*

- Collect and filter samples from 4 tributaries; Fall, Salmon, Inlet and Six Mile and point sources to assess proportion of phosphorus available to grow algae
- Goal 3 sampling events

Automated water quality platform on Inlet near mouth,

Measuring the same thing every 15 minutes, also measures flow and assesses load to lake – trying to capture Six Mile Creek inputs better

Salmon Creek gage reactivated for this project

Sampling began April 22, have sampled 5 times, on schedule for completion

Already have 2 wet weather events from 4 tributaries during April. Steve votes for taking more than 4 if we get more opportunities – that's a funding issue.

Captured over 20 samples during the above mentioned events

1 synoptic survey has been done on Fall Creek – in April – McLean most upstream location, sampled over several days

1 on Salmon Creek same way over April events, on schedule for completion

Tributary and wwtp plant bioavailable assessment – 2 of 3 samples collected from Ithaca Area Waste Water Treatment Facility (IAWWTF), 1 of 3 samples collected from tributaries. On schedule for completion

2013 program summary – acquisition of other data sets

- LSC
- Dave Bouldin
- CSLAP
- Joe Makarewicz, Seneca county, northern Cayuga Lake
- Community Science Institute
- IAWWTF (effluent, tributaries and lake)
- Cayuga Heights WWTP - effluent
- NYS DEC

Components of a water quality model - Information below was from a diagram explaining the relationships between the various study portions and parameters:

Meteorology and land use scenarios + watershed constitutes loading model + point sources loading all go into lake water quality model and sub models with supporting elements like data collection, analysis, hydrothermal transport development , come up with recommendations – all feed into model application by NYSDEC doing water quality projections for P and other issues. Iteratively to support TMDL development

Accessing reports on line: in situ water quality profiles from lake sites available 1-2 days after completion on DEC website, showed sample report. Commented that secchi disk was 15m on first day out.

**Jeff: Where are we headed?**

- 2013 monitoring data collection
- 2014 data analysis interpretation
- 2015 model development
- 2016 TMDL development
- Occasional public meetings scheduled around key project milestones

- Participation in WRC Monitoring Partnership (MP) monthly meetings
- Technical Advisory Committee (TAC), track and comment on monitoring model progress

This is a kick off project meeting; maybe every 6 months have follow up meetings. Next one could be in fall around wrap up of monitoring

MP meetings – Jeff enjoys them, learns from them, gives regular access to DEC and chance for give and take and asking questions

TAC is not a stakeholder group but that will happen in the future when we look more at TMDL development. Still working on charge and makeup of the TAC.

Web pages:

DEC - <http://www.dec.ny.gov/lands/88250.html>

CU - <http://energyandsustainability.fs.cornell.edu/util/clmp/>

WRC - <http://www.tompkins-co.org/planning/committees/WRC/index.htm>

List serve: <https://public.govdelivery.com/accounts/NYSDEC/subscriber/new>

DEC's 'Making Waves' e-mail list serve sends a summary e-mail weekly. Can narrow it to particular area – Finger Lakes is narrowest you can get that covers this project.

Also contacts on DEC webpage that goes to Jeff.

Frank – Cayuga Lake a community resource and wants to see it preserved, thanked everyone from DEC and UFI. Told where to find Monitoring Partnership meeting information.

### **Open up for questions**

Steve Penningroth – over 10 years worth of data, 35K of samples for all of major tributaries and lake – gave website [www.communityscience.org](http://www.communityscience.org) – and now has a Q – Steve Effler called the April event 1 double peaked event, acknowledges that the flow was only moderate for Fall Creek - will they aim for more realistic highflow events – yes, that is their intent but if they don't get them they will default to existing data sets that may fill the gaps. One of the benefits of gathering all the data sets. Can use other data sets for the long term simulations.

Aaron from Tompkins County Soil & Water Conservation District – study is focused a lot on tributaries, also mentioned waste water treatment plants (wwtp's), wondering if septic are being excluded. Steve Effler – speaking for Todd Walter – thinks there are estimates of those effects that will be included....Todd's grad students asked to comment – parameters not yet selected so hard to say at what level it will be included. Steve Effler wonders how good the inputs can be estimated.

Roxy Johnston commented that Steve P has septic data and Cayuga County also has great program

Bill Hecht wondering about farm field monitoring – capturing drain tiles – grad student says there are ways to capture those inputs. Bill hopes there are maps of tiles.

Bill would like sampling during storm events to capture farm field run off – grad student says it's not practical. Bill pushing for doing smaller tributary farm field assessments and extrapolating to the watershed. Jeff, there is the watershed modeling but there will also be an opportunity later for DEC to review the data through another lens to see if phosphorus reductions are realistic. DEC may send Environmental Conservation Officers around knocking on doors. Bill stressed the need to get out in the field more. Saying that no one goes to the farm to follow up on bmp's and other management plans to see how they are really working. Jeff says it will come back to the implementation phase of the TMDL – EPA won't approve the plan if it's not realistic that reductions will occur.....

Jeff – DEC being asked to do more with less. One of the reasons this 2.1 m dollar program didn't happen earlier. Runs state wide water quality monitoring program for year – budget went from 600k to 400k this year.

Steve Smith – Salmon creek 35k cows – Fall creek a little less – direct injection of manure can put it right into the tile to avoid smell but can put it straight into the stream – could be much worse for water quality

Elaine Quaroni – temperature change during summer on surface of water, oceans are warming, presumably the lake is too at the surface – see if there's a correlation with wwtp's reductions. Steve Effler – do use air temperature as part of model development. If temperature is systematically going up that will be captured by model. Could be algal density be going up just because the temperature is going up – not related at all to inputs? Steve Effler agrees. There are papers that say certain algae are benefitted by increasing temperatures so we may be able to parse that out. Elaine wants to know if there is temperature data for Cayuga lake far enough back to pick up a change in surface water temperature.

Walter Hang – lake on 303d since 1998 – during that time algae and weed density has migrated 1000', not any closer to cleaning up the lake now. Why doesn't DEC simply enforce the law? Erroneously thinks BACI documents show increase since LSC – per Jeff. Jeff – hoping to start clean up of lake now. Restating process for study and management decisions. One of the results could be a restriction or relocation of the LSC outfall pipe. The decision will be based on data. DEC wanted the trade off of getting the pipe potentially moved for getting a better data set for the whole lake. Steve Effler – says Walter's statements fundamentally flawed regarding plants and algae moving farther out into the lake. Jeff – no, he didn't say DEC took a pass on enforcing the permit. Says DEC was not clear that there was an impact on the lake from LSC. Thinks that the changes that we've seen since start up of the facility are not captured in the BACI, study was inconclusive. So DEC did not have a legal obligation to change permit conditions. Steve Effler – Walter seems to be confusing aquatic plants and algae – algae can get p from water column so can get it from point sources. Macrophytes get vast majority of nutrition from sediments. Those issues with regard to expansion of rooted plant growth are regulated by sediment loading, not point source inputs. Macro-algae that is mistaken for macrophytes – does get its P from

water column. Bob Johnson's data doesn't show any expansion of algae. So any expansion is not driven by point sources – established by local data and elsewhere in the literature.

Bill Foster – what biology will be studied? Nelson Hairston will focus on phytoplankton and zooplankton, zebra and quagga mussels too. Described methodology – details spelled out in QAPP. Will happen this year but has to be done when best on life cycle to get representative data.

Bill Hecht – no sediment loading data? Steve Effler – yes will capture loading to the lake. Also capturing algae and sediment to measure clarity.

Elaine Quaroni – will the north end of the lake be a control for the south end of the lake? Steve Effler – looked at Joe Makarewicz's data – ends were pretty similar so maybe not a control site. Very shallow but doesn't have big inputs from streams.....per Elaine.

Bill Hecht – north versus south end, talking about comparing sampling stations in mid lake, right? Yes. Lives on Yawger creek – asks that presenters explain that the focus of the study is on the broad pix of the center of the lake, not what is going on at personal docks.

Roxy – what if we get to the end of the study and all the data supports Dave Bouldin's assertion that nothing has changed from the 1920's and nothing is wrong.....what then? Jeff, if we get there will have to look at a Use Attainability Analysis (UAA) – there is a chance to review appropriate uses. DEC does very little of this but they have done it. Bar for doing a UAA is pretty high. It is a possibility and on the table, but not talking about it now. Would come at the end of the study. Roxy - UAA's presume a problem, what if there is no problem. Jeff understands that narrative standards and the overall ecological condition of the water body are not always in sync and this is where the role for public input/desires fits into process.

Walter – narrative standard is none in amount that impairs best uses – drinking, swimming. Walter wants it to be brought back to that. Requesting a return to the best use.

Rich DePaulo – been attending the MP meetings. His impression is that several members have preconceived notions that pathogens and swimming are not appropriate. Be that as it may – it raises a concern for the formation of the TAC – how do you form it so that it will be unbiased. Referencing his concern that Cornell University has a conflict of interest and quid pro quo history for WRC support of changes to the monitoring program. Jeff says he appreciates the concerns.

Frank – reiterated that there was no quid pro quo from CU for the Partnership's position regarding monitoring and major issues in the south end of the lake. WRC was asked because we aren't political but are science based.

Rich refuted.

The meeting was adjourned