

Blouin_BenneryLake.txt

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To: Tony Blouin
Subject: Bennery Lake

Basically at the minimum for the modelling you need the following: -

- 1) Local as well as upstream watershed areas.
- 2) Upstream lake areas (Bennery may be a headwater lake though, cant recall!!!).
- 3) Major soil classification (e.g. Halifax, Wolfville..... series).
- 4) Land use stats: #s of onsite septic systems within 300-metres of lakes as well as of streams upstream, calculated separately (streams is in the worst case scenario). If any urban use is present, entire urban area in the watershed (not just w/in 300-metres) is needed.
- 5) Future zoning is required for the "Future" scenario!
- 6) Any recent (relative) TP data and Cha as well as SD data. At least one sampling event per season is sufficient, 3-4 events per year is okay based on past experience. For a shallow lake, arm's depth to a 2-metre depth sample is enough (no need for depth sampling). For a deep lake (i.e. with deep stations), 3 depth sampling depths preferable, first @ 1-2 metre, second @ approx the bottom of the epilimnium (as established in the field right then by a DO-Temp meter), and the last depth to be around 1-2 m from bottom.

I found this procedure gave excellent reliable results. Indeed, when I calculated the non-dimensional Carlson's TSIs, very surprisingly, the TSIs for all three variables, TP, Cha as well as for SD came bang-on, with only around 2-4 points different. The TSI for SD was a total surprise to me, but for half decent results around 6 to 8 events spread so that it spans 2 precipitation seasons was preferable rather than during a single calendar year. If \$\$ are tight, there is NO need to collect from 1-2 m from the bottom, it does not play too much a part in most lakes due to the volume of the hypolimnium in most of our lakes though it would give some indication of internal loading (for TP!).

Further, even in dystrophic lakes, I found the above results held true! When scrutinizing consultants' work, one of the things I do is calculate the TSIs for TP, Cha and SD. for the basic sampling stuff, for eg. 3 surface samples in a 12-month period, you will not have too good a correspondence, it was around 60% of the time. With higher sampling frequency, like what I did for some lakes during 1991-93 (sampled different depths spread out over 2 years, approx 8-12 events), I had almost 100% correspondence in the TSIs, even for highly coloured lakes! And this experience of mine I saw that OECD found the same as well even in dystrophic lakes (Janus & Vollenweider.....)!

- 7) While one can model without any field sampling, nevertheless, for a high confidence, it will be good to have field data from around the time that land use stats are established.