**Eutrophication Subcommittee Conference Call - August 5, 2010**

**Participants:**

David Courtemanch (Maine DMR)

Chris Deacutis (URI)

Jim Latimer (US EPA)

Christine Tilburg (GOMC - ESIP)

**Canadian Embayments**

Following greetings Christine Tilburg brought the group up to date with respect to the six Canadian embayments and nutrient loading efforts. Christine stated that she has done quite a bit of digging and sent numerous messages to people at multiple levels of government to try and locate the data for calculating the loading for the embayments. Although she has found some data for the Saint John and Annapolis River, it appears that the full data needed to calculate loading is not available. She wondered if at least the Saint John might be approachable with SPARROW as part of its watershed lies in the United States. David Courtemanch stated that he believes land use changes dramatically between New Brunswick and Maine along the Saint John. The general consensus was that more information would be needed and isn't apparently available. Jim Latimer stated that it is likely the fact sheet will end up pointing out that there is a strong need to do this kind of monitoring. There was also concern on the call that the oceanic input would be quite different in the Bay of Fundy as opposed to US sites further South.

In order to make a guess for the Saint John using the SPARROW model one needs to go to the USGS SPARROW website to see it there are nodes that connect to this estuary. In order to make an estimate using flux data one would need to use the last gauge data for the river along with nitrogen concentrations. ***(Action to be taken: Christine will see if the information is available to apply SPARROW to the US side of the border for Saint John - although she is definitely beginning to resemble Don Quixote).***

It might be that some loading estimates from the literature are available for some of the Canadian embayments. The focus box pointing towards the lack of data North of the border could attempt to show where published information places the six embayments with respect to the US embayments.

**Thresholds: Chlorophyll *a* and Turbidity**

The group also discussed the use of thresholds with respect to chlorophyll a and turbidity. Jim wondered if the group wants to use a single threshold value verses ranges. For chlorophyll *a* it was pointed out the Great Bay work selected 20 µg/L for most of the bay. The group also discussed the NCA thresholds. Christine mentioned that Mike Doan wasn't able to be on the call, however he sent an e-mail stating that he likes the NCA thresholds for chlorophyll *a*. Chris stated that the NCA thresholds are reasonable. However, determination of thresholds for chlorophyll *a* is a difficult issue to address as there is not one number (or even a range) that is generally accepted. Chris also wondered if the data needed to be restricted to samples collected at certain times of the year.

Jim stated that there are two things under discussion:

1. How does one analyze the data?

2. How does one derive a threshold?

Jim stated that in an ideal world a threshold would be independently derived and have an ecological connection. Chris agreed that the threshold should indicate that if it is violated the system is in trouble. However, it COULD mean that your samples missed the event. Dave stated that it really depended on what the managers are looking for. Do you want to set a threshold that tells you when you have a problem? Or do you want a threshold that indicates when you do not have a problem?

Dave stated that he is not supportive of the NCA thresholds. He stated that the good, fair, and poor ratings were really a statistical look at the data and not related to ecological impairment of the environment (i.e., they are based on a variant of the distribution approach). David stated that just looking at the highest percentile of data really had little to do with the system’s ecological condition. Jim agreed that this has been a criticism of the distribution approach to setting thresholds. He agreed that if the goal is a useful assessment from a management/regulatory perspective then the most relevant thresholds should reflect the environmental impairment not simply the statistical distribution of the data (although there are ways to apply such an approach that provide evidence for this, for example, using a distributional approach for pristine estuaries, might give one an idea of what chlorophyll *a* levels are with limited human impacts).

There was then some discussion about using a threshold at all. Christine mentioned that numerous discussions at the ESIP Steering Committee level have touched on the desire to NOT use thresholds due to stepping on the toes of the various State and Provinces trying to tackle nutrient loading from their own angle. Christine wondered if a better way to approach this is to think about how we want to present the data.

It was generally agreed that the purpose of the fact sheet is as follows, when the data allow to:

1. assess if there are changes in the indicator over time.

2. compare between systems.

3. compare between the local level and the greater Gulf of Maine.

That said Christine wondered if presenting the highest or average chlorophyll a values for a specific time period (example: Summer/June-August) would be satisfactory. Dave liked this approach but suggested using a mean or median as opposed to average. He stated that managers are most interested in general conditions and not event conditions. He also would prefer to have the range of data available. It was decided that the best step at this point is to see what data exists. Christine agreed to make a table displaying available data.***(Action to be taken: Christine will make a table for the next call noting if the following data is available for specific embayments: median, mean, max, ranges).*** If this approach is used, there will be no need to select a threshold.

There was some discussion of how the data might be illustrated in the fact sheet with the general consensus that box-whisker plots would be the best approach. Christine stated that she has always struggled to understand these plots and Jim promised that the plots are "nifty" and he will explain them.

See example from an upcoming paper by Latimer and Rego (note that all of the relevant summary statistics are shown graphically):



**Turbidity versus Secchi**

The group then discussed whether turbidity samples or secchi depth readings would be used for the final indicator. It was stated that this choice will likely depend on which is more readily available. Christine agreed to try to summarize the sampling that is available so that a decision can be made on the next call. ***(Action to be taken: Christine will summarize the coverage and available of turbidity data versus secchi readings for the next call).***

**Next Steps**

Christine closed the call by stating that she really wants to finish up the eutrophication work/fact sheet. She thinks if the group presses hard the document could be drafted before the end of the year and released in the Spring.