September 3, 2009

Summary

SQO - RMP Benthic Work Group Meeting 2

Monday, August 24, 2009
San Francisco Estuary Institute, Oakland, CA

Participants

Ananda Ranasinghe, Steve Weisberg, Steve Bay, SCCWRP
Bruce Thompson, Sarah Lowe, Meg Sedlak, SFEI
Chris Beegan, SWRCB
Karen Gehrts, Heather Fuller, DWR
Michael Kellogg, Heather Peterson, CCSF
Mike Johnson, UCD

Please note that the slides used in the presentations at the meeting are available at:
http://www.sfei.org/rmp/rmp_minutes_agendas.html#exposure

Introductions and Goals

Bruce reminded the group of the project, and meeting goals:

Work Group Goals:
Review, revise, and create benthic assessment methods for several SF Estuary and Delta assemblages.

- mesohaline (San Pablo -, South Bay)
- oligohaline (Suisun Bay)
- limnetic (Delta)

It was agreed that the benthic assessments in the oligohaline habitats would be very challenging and the work group would focus on mesohaline and limnetic assessments.

Goals for this meeting:

- Orient and establish the benthic work group
- Review spatial and temporal extent of benthic assemblage in SF Estuary
- Discuss options for mesohaline benthic assessment methods

Classification Analysis and Benthic Assemblage Identification

Ananda summarized the classification analysis results from meeting 1 and reviewed the tasks and results of re-analysis to date.

1) Are the classification groups real?

This was largely accomplished by examination of tables of taxa frequencies and abundances for the dendrogram groups by:

- Examination of R^2 within a smaller number of groups.
- Examination of obvious breaks in abiotic patterns that corresponded with site groupings.

Bruce provided a table showing that groups 1-3 generally had similar abiotic ranges, but TOC had higher values in group 3. Groups 6 and 7 also had somewhat different ranges: group 7 had deeper sites, with more silty sediments, and higher salinities.

For this analysis, only the taxon Tubificidae was used to represent the oligochaetes. However, there are numerous species of oligochaetes in the Delta (that are different from other habitats) which were not included in the analysis. It was agreed to make a classification run using only groups 1 -3, and to include all to the oligochaetes at lowest practical taxon, to see if it changed the site groupings.

2) Did the analyst's choices affect sample groupings?

a) Data transformations. The classification analysis was rerun using 4th root, square root, and presence/absence values for taxa. Ana explained that transformations are applied to reduce the influence of very high abundances for some taxa.

In general, there was very little difference in results between the different transformations, and it did not seem to be an issue. This shows that the method is robust. It was agreed to use the cube root transformation as the basis for the analysis.

b) Monthly DWR station selection; does dominance of the DWR samples make a difference?

To test the DWR monthly station selection effect, Ana ran one month at a time with all other data, as well as a random sample of monthly samples. The results showed no effect on the results for samples between July and October. It was agreed that the analysis should include all available DWR samples during that period.

3) Are group patterns stable?

- within the analysis: is there consistency of response?
- when seasonal samples are included.

Ana ran a random subset of 323 samples and the groupings were the same as those with all 501 samples. Seasonal data and new DWR data from 2000, 2007, 2008 were added to the analysis (n=934 samples). The results showed the same groupings, indicating that the groups are persistent seasonally. However, it was noted that some sites were assigned to different groups, in different seasons or years, probably because of differences in salinities.

Several work group members wanted to examine the seasonal dendrograms and two-way tables, particularly to observe what happened with groups 1 – 3, and 6 and 7.

Finalizing the classification analyses

Overall, none of the re-runs identified new classification groups, or recombined / split groups previously identified. The work group agreed that the assemblage groupings appeared to be robust and persistent over time.

There was general agreement that the best assemblage designations at this time are as follows:

Assemblage	Locations	Cluster Groups
Polyhaline	Central Bay	8, 9
Estuary sand	Central-, San Pablo Bay	5
Mesohaline	San Pablo-, South Bay	6,7
Oligohaline	Suisun Bay	4
Limnetic	Delta	1, 2, 3

However, the final decision will await a few more minor evaluations. Ananda will complete the classification analysis with a few more runs:

- Ananda will provide the seasonal dendrogram for inspection, to include labels for season and water-year type.
- Run groups 1-3 using lowest practical taxon data for oligochaetes, to see if it changes the groupings.
- Run without NOAA 00-01 samples, to see if it resolves groups 6-9 differently.

Sarah will take a final look at taxonomy differences between the 37 WEMAP and NOAA samples to verify that the taxonomic differences were not important enough to omit that data.

Bruce will organize an outline of the final classification analysis results for a Technical Report and possible subsequent publication. It was suggested that the Draft West Coast Assemblage manuscript could be used as a model. Co-authors are welcome. The goal is to prepare a Technical Report by the end of 2009

Best Professional Judgment Exercise

Bruce presented a summary and status of the BPJ exercise. A few more 'experts' are needed for the Delta panel.

It was agreed that selected panelists should be familiar w/ assessment method as well as taxa. We need to discuss with them how confident they are of their ability and resulting evaluation.

Sarah summarized how benthic data to be used in the exercise was assembled. In general, the mERMq (a sediment contamination index) was used to create an impact

gradient within each assemblage. Then, sediment toxicity, salinity, sediment grain-size, TOC, and geographic locations were examined to create as 'representative' set of samples.

It was agreed that the BPJ exercise would be based on dry weather samples from July to October. Sarah will reduce the number of samples for each assemblage to 20, for the exercise.

Options for Benthic Indices

The group did not have time to discuss this item.

Next Steps

Work assignments were noted above for each task.

- The next meeting will be scheduled sometime in January 2010, when the BPJ exercise is completed, and options for the indices are formulated.
- The work group will be kept informed of interim results via email.
- The current goal for having benthic indices formulated and tested is summer 2010.