



## Zooplankton/Food Web Monitoring Workshop

January 12-13, 2005

Workshop Report 1

Immediate Recommendations

The following summary represents one of two products derived from the workshop, Zooplankton/Food Web Monitoring for Adaptive Multi-Species Management held January 12-13, 2005. Specifically, products from the workshop were to include: 1) a brief document with recommendations emerging from the workshop that need to be addressed quickly by the project team, funding agencies, and possibly others, that relate to sampling design, coordination with other programs, contingencies, etc. and 2) a second document that reports the substance of the workshop discussions and sets forth a strategy and recommendations for the future.

### Program objectives and expectations

The goal of the workshop was to ensure that the project emerging from the Zooplankton/Food Web Monitoring competition is designed and implemented to meet the goals of the Chesapeake Bay Program. Paraphrasing R. Batiuk, the Bay Program needs to demonstrate that nutrient source reductions lead to enhanced water quality and that this improvement translates into beneficial habitat and food web responses that positively affect “hallmark” Bay plants and animals. The workshop was convened to determine if the currently proposed zooplankton monitoring survey can demonstrate those linkages where the conditions exist; and if not, can changes be made to the project to ensure that it will accomplish these goals.

The challenge for the workgroup quickly became clear: to bridge the gap between 1) the Bay Program’s expectation that the zooplankton project provide data and products directly useful to management decision-making and 2) the scientific consensus that the ecology and population dynamics of zooplankton, combined with current low funding levels, confound the use of zooplankton as a direct measure of ecosystem status and water quality condition.

Workshop discussions focused on the role of zooplankton as intermediate food web link and indicator of nutrient reduction benefits. It was pointed out, however, that as environmental and ecosystem indicators, zooplankton are difficult to interpret because they are simultaneously highly sensitive both to ‘bottom up’ phytoplankton (and other) effects as water quality changes and to ‘top down’ predation pressures. At the large geographic sampling scale required by the Bay Program and limited temporal sampling resolution allowed by the available resources/proposed budget, differentiating between cause and effect, and even capturing and characterizing the response of zooplankton, is likely to be difficult.

Despite these different perspectives, a consensus was eventually reached. The workshop participants agreed that, in general, the proposed sampling and analysis approaches could yield information and products directly relevant to management decisions. Specifically, scientists and managers alike agreed that the proposed sampling design could address the role of zooplankton

as an indicator of water and habitat qualities and response to nutrient level changes. It was stressed that maintenance of a long-term zooplankton data set was critical to providing the capability for explaining biological responses to major changes, including planned nutrient reductions. Further, the proposed monitoring is capable of the more specific goal of detecting general changes in zooplankton abundance and community structure that might affect zooplankton-dependent predators such as forage fish. However, it was also agreed that an analysis framework to yield these results was not yet in place and would have to be developed, likely in concert with a larger group of scientists and analysts from the community.

### Specific conclusions and recommendations for the Project Team

#### *Project objectives*

- Given the limited funding at present and the many potential intended uses for zooplankton information, there is a need to more clearly re-articulate *limited* objectives of this particular monitoring program. These objectives should be reviewed by R. Batiuk initially and eventually by the Living Resources Subcommittee and/or other appropriate or delegated Chesapeake Bay Program groups.

#### *Sampling design: Temporal and spatial coverage*

Workshop participants did not express concern over any issue with station selections and sampling frequency that must be addressed immediately. Issues that should be addressed after the project is launched will be covered in the full workshop report.

- Coordinate with water quality and phytoplankton monitoring programs to be sure correlative data are collected at the zooplankton stations that were moved (for this program) from their traditional river mouth locations. *At least one of the phytoplankton stations in the Virginia tributaries should be relocated.* Additionally, samples might be collected at the new zooplankton stations and phytoplankton speciation obtained through a sub-contract to H. Marshall, ODU. Contact R. Hoffman to initiate discussions about this topic.
- All agreed with the limited resource-dependent sampling schedule. The trigger for March-April sampling is 12°C, with three spring cruises in tidal-fresh/oligohaline spawning areas. Then monthly cruises will be conducted from May-September in meso- and polyhaline areas.
- Develop a plan and budget for adding an adaptive sampling station so that the ETM is sampled consistently under different flow regimes. Because the non-stationary ETM is a critical nursery area for fishes, ideally this sampling plan would be instituted in year-one.

#### *Sample collection and analysis*

- Conduct studies to quantify differences between past and proposed ctenophore and jellyfish sample collection and analysis methods.

- Formulate a plan for archiving year-one samples for future analyses.
- Review current methods for estimating biomass and modify proposed methods if better techniques are available. Conduct method comparability analyses as needed.
- If the Bay Program requires invasives information, additional resources will be required for exploring collaborative species identification with local invasives experts, such as G. Ruiz, SERC.
- Propose needed changes and budget required to facilitate collecting count data for mesozooplankton, microzooplankton, and whole-water zooplankton. Submit plan and budget to M. Fritz who, with R. Batiuk, will take proposal to the Budget Steering Committee.