

Delaware Estuary Benthic Inventory (DEBI) Program



FACT SHEET
August 2008

WHY CONDUCT AN INVENTORY OF BENTHIC COMMUNITIES IN THE DELAWARE ESTUARY?

The science and management community in the Delaware Estuary region has identified a fundamental need for a benthic ecosystem assessment that would inventory the physical and biological conditions of the bottom of the open water tidal system. This priority need was articulated in early 2005 when the Partnership convened a two-part science and management conference. The Science Conference brought together more than 250 scientists, managers and science-interested people to summarize the current state of science and to identify and prioritize science and management needs for the Estuary. Consensus views from the conference were summarized in the "*White Paper on the Status and Needs of Science in the Delaware Estuary*" (Kreeger, et al 2006) that called for a better understanding of benthic conditions.

Estuarine benthic communities are made up of organisms that live in and on the bottom of the estuary floor. These organisms play an important role in the Delaware Estuary's food chain as food for more than 200 migrant and resident finfish species that use the Estuary for feeding, spawning, or nursery grounds (Dove and Nyman 1995). They are also important in maintaining water and sediment quality by cycling nutrients and contaminants between sediments and the water column. For instance, hard-bottom shellfish reefs deliver multiple ecosystem services such as providing habitat for a diverse array of species, improving water quality as they filter algae for food, and protecting shorelines from wave energy and erosion.

WHAT ARE THE BENEFITS OF BENTHIC COMMUNITY MAPPING IN THE DELAWARE ESTUARY?

A qualitative and quantitative inventory of benthic communities and habitats will have broad utility for addressing challenges confronting environmental resource managers in addition to strengthening our basic scientific understanding of the DE Estuary ecosystem.. For example:

- **Monitoring and Assessment.** Programs that track environmental health often look to benthic community conditions as a leading indicator of environmental conditions, and DEBI will provide detailed information on best approaches and locations to monitor.
- **Environmental Protection.** DEBI will describe and pinpoint where key natural resources and biological communities exist so that they can be prioritized for conservation and safeguarding during emergency response and for natural resource damage assessment.
- **Fishery and Shellfishery Management.** Benthic communities help to support secondary production, and a better understanding of where and when benthic communities are most productive will inform ecosystem and fisheries modelers.
- **Restoration.** By comparing current information on the location of "biological hot spots" and ecologically significant species or habitats to projections on past and future conditions, DEBI will help prioritize restoration such as oyster reef revitalization.

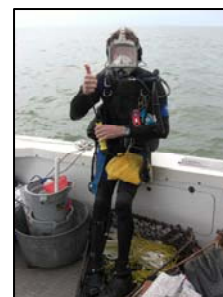


WHAT IS THE DELAWARE ESTUARY BENTHIC INVENTORY (DEBI) PROGRAM?

The overall objective of DEBI is to develop a comprehensive inventory and description of the benthic ecosystem in the tidal portion of the Delaware Estuary, extending from the mouth of Delaware Bay up the most upper tidal reaches of the Estuary. Ultimately, this benthic characterization is envisioned to consist of a complete bathymetric image of the Estuary's bottom conditions, including spatial and temporal distributions of principal physical and biological components. For example, maps and descriptive keys of bottom habitats would be developed that consider attributes for substrate conditions, biological communities, dominant flora and fauna, functional processes, and locations of species or habitats of special concern. This benthic community inventory and mapping effort represents an expansion of the Partnership's ongoing efforts to characterize, map and assess natural capital value for the principal terrestrial and aquatic resources of the Delaware Estuary ecosystem.

WHAT IS THE CURRENT STATUS OF DEBI?

The Partnership held a workshop in March 2007 to outline needs and craft a plan for raising resources and implementing DEBI. Beginning in July 2008, DEBI got off the ground with the launch of a major new bottom survey. With funding and provided by EPA Regions 2 & 3 through ORD's Regional Applied Research Effort (RARE), the Partnership worked closely with EPA and more than ten other federal, state, nonprofit and academic institutions to devise a sampling strategy to study biota, targeting up to 250 stations representing soft-bottom habitats throughout the tidal estuary from the mouth of Delaware Bay to the head of tide at Trenton. Sampling will be according to a random stratified (probabilistic) design based on salinity and sediment classes.



In July, 2008, the Partnership and EPA held a technical training workshop for more than 30 monitoring volunteers at the University of Delaware in Lewes. The boat survey was launched the next day, beginning the planned 9-week research cruise on the RV Lear, which is being co-led by EPA R3 and Partnership science staff. EPA is providing in-kind support in the form of staff time, ship time, divers for an exploratory hard-bottom sampling effort, and some sample analyses. Sampling will yield geospatial-referenced information on macroinvertebrate species presence and biomass, hydrographic conditions, and sediment chemistry (metals, organics) and grain size. Furthermore, the Delaware River Basin Commission will analyze sediments for PCBs. The Partnership will continue to work with regional stakeholders to build on current efforts and fully implement the DEBI program as resources become available.

WHO IS INVOLVED?

This initiative is an excellent example of collaborative partnerships in action. Besides the Partnership, principal investigators and funders include representatives from Delaware Department of Natural Resources and Environmental Control, Delaware River Basin Commission, EPA Regions 2 and 3, EPA's Atlantic Ecology Division and Office of Research and Development, New Jersey Department of Environmental Protection, Rutgers University and the University of Delaware. For more information, please contact the Partnership, OManager@DelawareEstuary.org, or by phone at (800) 445-4935.



The Partnership for the Delaware Estuary, a National Estuary Program based in Wilmington, leads collaborative and creative efforts to protect and enhance the Delaware Estuary, and its tributaries for current and future generations. We envision everyone working together to make the Delaware Estuary the most inviting, prosperous and healthy natural recourse of its kind in the nation

