

New Research

Maine Department of Environmental Protection, with assistance from the Penobscot Nation, is reconstructing their water quality model for the Penobscot River for the purpose of allocating waste loads and discharge licenses. The model had to be revised because of changes in industry along the river and to support development of a TMDL. The TMDL is required by EPA because some sections of the river do not meet water classification standards. Sampling took place in July 2007, by teams led by the Penobscot Nation water resources department staff, for a range of water quality parameters. The EPA assisted with sampling for sediment oxygen demand in August. The draft model and report are expected in December 2007. Contact Don Albert, don.j.albert@maine.gov, 207-287-7767.

<http://www.maine.gov/dep/blwq/docmonitoring/modelinganddatareports/index.htm>

A group of UM faculty will be looking at **alternative futures modeling** and shoreland zoning issues in the lower Penobscot this fall via a seminar course. Also, five pilot projects that address the ecological, social, and economic dimensions of changing land use in the watershed have been funded through the Environmental Solutions Initiative.

http://www.umaine.edu/waterresearch/esi/funded_projects.htm

A team led by Adria Elskus of the U.S. Geological Survey and University of Maine collected (and archived) **juvenile fish and mussels** (Eastern Elliptio) from above Milford Dam and below Veazie Dam for contaminant analysis. Her goal is to determine contaminant baseline and variability in biota and track contaminant movements, if any, with changes in river use and shoreline development, including dam removal.

<http://www.gulfofmaine.org/esip/>



USGS Maine Water Science Center has started collecting **water quality** data on the Penobscot River at Eddington, approximately 2,000 feet downstream from the Veazie Dam and upstream from most tidal influence (this is the same site of the historic NASQAN water quality data collection from 1979 to 1994).

Turbidity data will be used to develop continuous suspended sediment fluxes. More funding is needed to support the continuation and expansion of this water quality data collection. Real-time data on

stream height, velocity, temperature, specific conductance, dissolved oxygen, pH, and turbidity from mid-channel are now available.

http://waterdata.usgs.gov/nwis/nwisman/?site_no=01036390&agency_cd=USGS

In a related project, USGS has laid down the necessary groundwork towards constructing **two-dimensional hydraulic models** of the dam-removal reaches of the Penobscot River

at Veazie and Great Works dams. Once detailed bathymetry and sediment data (as collected by CR Environmental for the PRRT) are available and incorporated into the models, USGS will provide the necessary hydraulic and hydrologic information to Conte Anadromous Fish Laboratory for velocity-barrier fish-passage evaluation.

Collin Roesler of the University of Maine School of Marine Sciences is leading a team of scientists who are studying **optical properties of Penobscot river water** in relation to land coverage and terrestrial inputs of organic carbon. Chlorophyll, solar radiation, ocean color, and particle scattering are measured at GoMOOS buoy F. Sensors in the lower river and estuary monitor dissolved and particulate organic carbon, particulate C:N, and fluorescence. These data are supplemented with grab samples from throughout the watershed. The project, funded by NASA, will continue through 2009.

Research Updates

Volunteers and staff with the road crossing study spearheaded by USFWS and the US Forest Service surveyed **over 1,000 road crossings and culverts** in the Marsh Stream watershed this summer. The project moved on to other sub-basins while volunteers continued the Marsh Stream inventory by traveling sections of the stream by foot and canoe in September to look for dams and natural barriers to fish passage such as waterfalls and beaver dams.

Gayle Zydlewski, Mike Kinnison, and Steve Fernandes (UM) have received funding from NOAA and The Nature Conservancy to continue their study of Atlantic and shortnose **sturgeon in the Penobscot** for three more years. Since June 2006, 155 shortnose sturgeon (listed as endangered under the Endangered Species Act) and 36 Atlantic sturgeon have been captured. All sturgeon were externally and internally tagged for later identification to estimate population size, and ultrasonic tags were fixed to a subset of fish to determine specific migratory patterns in the river. The new funding will allow the investigators to refine population estimates for the Penobscot River and determine whether or not spawning is occurring in the Penobscot. Also, NOAA and USGS began a striped bass tagging project and they hope to continue in the spring. According to Gayle Zydlewski, a coordinated network of receivers is being developed along the East Coast.

New Publications

Annotated Bibliography of Case Studies and other Publications on the Economic and Social Aspects of Dam Removal. Prepared by the NOAA Coastal Services Center Human Dimensions Program for the Deschutes Estuary Feasibility Study. 2006 (?). http://www.csc.noaa.gov/cms/human_dimensions/

Science in the News

Maine Maritime Academy has obtained a permit from the Federal Energy Regulatory Commission to study the feasibility of **tidal power development in the Bagaduce River**. The study will include an evaluation of the state of the river and potential impacts of tidal power infrastructure. (Bangor Daily News, 10/13/07).