



Hydrodynamic and Hydrologic Modeling Intern

Synopsis

NOAA seeks an intern to help evaluate the impacts of improved freshwater inflow modeling on the [Chesapeake Bay Operational Forecast System](#) (CBOFS) salinity simulations. The results of this evaluation could then be used to help design improvements to NOAA's operational watershed-estuary forecast systems. *Because of the skills needed for this position, we will consider graduate students or students who have completed their undergraduate degree, in addition to current undergraduates.*

This internship is sponsored by the [Mid Atlantic River Forecast Center](#) (MARFC), [NOAA Chesapeake Bay Office](#) (NCBO), and the [Chesapeake Research Consortium](#).

Project Description

An important part of the National Oceanic and Atmospheric Administration's (NOAA) mission is to understand and predict changes in weather, water, climate, oceans, and coasts. Two NOAA line offices, the National Weather Service (NWS) and the National Ocean Service (NOS) provide complementary services when it comes to predicting changes in the Chesapeake Bay. NWS provides meteorological forecasts to drive the NOS CBOFS, a 3D hydrodynamic model of Chesapeake Bay developed by the Coast Survey Development Laboratory (CSDL).

There is increasing interest in using CBOFS predictions to drive ecological models. In particular, salinity is a variable which strongly influences biological processes in the Bay with important human impacts, such as harmful algal blooms and oyster growth. However, the accuracy of CBOFS salinity predictions are currently unsatisfactory for ecological modelers and to fully support ecosystem management decisions. NOS modelers have concluded that not accounting for all freshwater inputs is a likely cause for inaccurate salinity predictions. The NWS MARFC routinely predicts freshwater inflows to the Chesapeake Bay but inflow forecasts from 100% of the Chesapeake Bay drainage area are currently not available to CBOFS.

Opportunities:

Working side by side with scientists from multiple NOAA offices, this internship offers a unique opportunity to work with and improve an operational model. Specifically, the intern will:

- Run a distributed hydrologic model for a selected historical period and format the outputs so they can be ingested by CBOFS
- Run CBOFS remotely on a high performance computing cluster for the same time period,
- Run programs to evaluate the skill of salinity predictions with relevant freshwater inflow scenarios,
- Document and present the results to stakeholders in NOAA's North Atlantic Region

Requirements

- Motivated self-starter with ability to work independently
- College level coursework in physics, mathematics, and basic statistics. Coursework in hydrology, environmental science, hydraulics, and/or fluid mechanics desired, but not required.
- Strong computing and numerical analysis skills (e.g., experience with spreadsheets or statistical software). Experience using Unix/Linux operating systems a plus.
- Knowledge of GIS and basic computer programming a plus, but not required.
- Must be a U.S. Citizen and willing to undergo a security background check
- Must currently be enrolled in an undergraduate or graduate institution pursuing a degree in science or engineering, or have recently completed (within the last 2 years) an undergraduate degree.

Work Location and Duration

The MARFC will host the intern in State College, PA, and provide guidance on the hydrologic modeling, model evaluation, and documentation, as well as arrange for high performance computing access. The intern will make 2-3 visits to Silver Spring and Annapolis Maryland to get hands-on training on how to run CBOFS remotely and meet with scientists at NCBO to learn more about how salinity can affect the Bay ecosystem. The existing infrastructure and expertise at all three NOAA Offices will support completion of this project during the anticipated internship period. The position will begin in mid-May and conclude in mid-August (12 weeks). Computer and phone services will be provided.

Compensation

The intern will be reimbursed at the end of each month, for a total of up to \$4,500 for the equivalent of 12 weeks of full-time activities (480 hours). Funds are available to compensate interns for required work-related travel. Candidates should expect to follow a normal weekday work schedule (roughly 9-5, M-F) with occasional variations for possible field work or other activities. No benefits are provided. A small housing stipend is available for those needing it, and we offer assistance in arranging local housing.

Application Instructions

Applicants are instructed to register with the Chesapeake Jobs online application website: <http://communitymodeling.org/bayjob/> to apply. You will be instructed to submit a resume and cover letter, along with three references. The deadline for applications is February 19, 2016.