GLOBEC/PICES/ICES
Workshop on **Forecasting Ecosystem Indicators** with **Process-based Models**

P I C E S

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BACKGROUND

The GLOBEC program has advanced our understanding of the response mechanisms of the marine ecosystem lower-trophic levels to climate variability. This improved knowledge allows us now to formulate climate-driven process model of low order (e.g. low number of dimensions) to hindcast and forecast ecosystem species and indicators.

During 2011 the North Pacific Marine Organization (PICES) established two new international working groups (WGs), WG27 on climate variability & change and WG28 on the development of ecosystem indicators. While WG27 is developing quantitative approaches to evaluate how large-scale climate variability & change impacts physical and biogeochemical variables (e.g. sea surface temperature, ocean circulation, seasonal timing, nutrient fluxes, acidification, hypoxia, upwelling and mixing), WG28 is developing ecosystem indicators that best characterize the ecosystem responses to these multiple stressors.

Several workshops have been conducted in recent years to advance the scientific basis for implementing forecasting models for ecosystem indicators (e.g. Indicators of Status and Change within North Pacific Marine Ecosystems: A FUTURE Workshop, Hawaii 2011; CINAR Workshop on Climate and Ecosystem Change in the NW Atlantic, Woodshole 2011). Also, efforts like the Indicator of the Seas Project (IndiSeas), which was launched in 2005 under the auspices of the EUR-OCEANS Scientific Programme as a follow-up to the SCOR/IOC Working Group 119 on Quantitative Ecosystem Indicators, now provide us with more robust frameworks for isolating and selecting ecosystem indicators. However, examples of low order climate-driven process models that forecast ecosystem indicators are still rare.

GOALS OF THE WORKSHOP

Building on these previous/ongoing efforts and bringing together scientists from the North Pacific and North Atlantic sector, the goal of this workshop is to select a set of ecosystem indicators for both the North Pacific and North Atlantic large marine ecosystem and implement through an interaction between physical/climate scientists and marine biologist four examples of climate-driven process based models that forecast the ecosystem indicators.

The workshop will be held in Friday Harbor (WA) for a period of 3 days. During the first day we will have a plenary session with short review talks on (1) known physical mechanisms of variability in the North Pacific and North Atlantic, (2) the targeted ecosystem indicators, and (3) existing attempts to model

the indicators. In the afternoon of the first day and during the entire second day four working groups will be establish to discuss prototypes of climate-driven process models to hindcast and forecast the targeted indicators. The third day the groups will reconvene to present and discuss the findings, and plan future directions of research.

The hosting site will be equipped with suitable computers to allow both the testing and implementing activities of the workshop. The relevant datasets (e.g. timeseries of physical and biogeochemical forcing), methods (e.g. linear inverse modeling computer codes) and targeted ecosystem indicators will be prepared prior to the workshop. We anticipate that some level of coordination and scientific planning among the participant will be necessary before the workshop.

DELIVERABLE

A synthesis article that summarizes the challenges and successes of the workshop's four working groups activities, and a set of peer-reviewed papers that document the examples of low order climate-driven ecosystem process models developed as part of the workshop activity. The target journal is a special issue in *Oceanography* with papers due by February 2013.

TRAVEL & LODGING INFORMATION

The workshop will take place at the Friday Harbor Labs (FHL, http://depts.washington.edu/fhl) located close to Seattle WA, USA. Please visit the FHL page for travel information on how to reach the lab. **Plan to arrive on September 7th and leave on September 11th.** The meals and lodging will be provided at no cost to you at the FHL facilities (including dinner on September 7th). Reservations for lodging have already been made for a single room in the FHL dorms. If you would like to share a room with someone please email E. Di Lorenzo (edl@gatech.edu).

A registration fee for $65 USD will be collected (please bring cash if you can or checks). This registration fee is needed to cover some of the social events.

TRAVEL SUPPORT & REIMBURSEMENT PROCEDURE

We have sufficient funding to support the travel expenses (e.g. airfare, ferry, registration fee) for the participants to the workshop. We have on average about $700 USD per participant. We ask that you purchase your airfare or other travel arrangements as soon as possible in order to minimize the costs of late ticket purchases. If you anticipate travel expenses in excess of $700 USD please contact E. Di Lorenzo (edl@gatech.edu). **We will not be able to reimburse travel expenses for government employees** (e.g. NOAA) **and foreign scientist**, although we will be able to provide lodging and meals at no cost.

Reimbursement will be handled by the GLOBEC office through Ms. Karen McGowan (mcgowan@marine.rutgers.edu, phone: +1-732-932-3409) at Rutgers University. You will need to complete and send a Travel and Business Expense form (TABER-FORM.doc) to Ms. McGowan. Make sure to **keep your receipts and tickets** (e.g. boarding pass).