

Post-doctoral Fellowship in developing ecosystem model to support ecosystem-based fisheries management

Canadian Government Laboratory Visiting Fellow program

POST-DOCTORAL POSITION

We are seeking a talented individual for a Visiting Fellowship at the Pacific Biological Station (PBS) in Nanaimo, British Columbia (BC), Canada. The successful applicant will participate in a research project funded through the Department of Fisheries and Oceans' (DFO) Strategic Program for Ecosystem-Based Research and Advice (SPERA) to develop a spatially- and temporally-explicit ecosystem model to support ecosystem-based fisheries management. The Principal Investigators of the project are Drs. Caihong Fu and Robyn Forrest (PBS); key collaborators include Drs. Yunne-Jai Shin (Institut de Recherche pour le Développement, France) and Arnaud Grüss (University of Miami, USA).

PROJECT OBJECTIVES

Through previous funding, Dr. Fu and collaborators have developed a spatially- and temporally-explicit individual-based ecosystem model for the Pacific North Coast Integrated Management Area (PNCIMA), situated in northern BC, to explore the dynamics of six key species, i.e., Pacific Herring, Pacific Cod, Lingcod, Arrowtooth Flounder, Walleye Pollock, and Euphausiids (Fu et al. 2017). The model is based on the OSMOSE ecosystem-modelling framework (Shin and Cury 2004). The successful applicant will lead expansion of the OSMOSE-PNCIMA model to cover the entire BC coast and to extend the key species list to include Pacific Halibut (a species that supports commercial, recreational, and aboriginal fisheries, and a predator of Pacific Herring) and Steller's sea lion (a species at risk and a predator of Pacific Herring). Key tasks of the project will include: (i) investigating predator-prey dynamics and species interdependencies; (ii) exploring relative and cumulative impacts of predator-prey interactions and environmental changes on productivity parameters such as natural mortality (including predation and starvation mortalities) and growth; (iii) developing ecosystem-level biological reference points for Pacific Herring that account for its ecological role as prey; and (iv) developing an ecosystem-based management strategy evaluation approach for Pacific Herring (e.g., Grüss et al. 2016), for the purpose of evaluating alternative harvest strategies that account for non-stationarity in productivity, particularly natural mortality. The post-doctoral fellow will participate in two workshops and individual meetings with collaborators, managers, and resource users who will provide critical expert knowledge on ecosystem dynamics, modelling and ecosystem-based fisheries management.

ESSENTIAL ASSET QUALIFICATIONS

Applicants must have completed a PhD in fisheries science or a related discipline within the past five years. Candidates with experience in ecosystem modelling and scientific programming will be given priority. Experience using Java and R programming languages and GIS (or similar open-source mapping tools) is desirable. Successful candidates will have a proven capacity to publish in peer-reviewed journals. Those who are not Canadian citizens or permanent residents of Canada must satisfy Canadian immigration requirements.

POSITION DETAILS AND HOW TO APPLY

This fellowship is available to start **October 1, 2017**, and is renewable until **March 31, 2020** with a salary of \$60,000 CAD per annum. The Canadian Government Laboratory Visiting Fellow program is administered by the Natural Sciences and Engineering Research Council of Canada (NSERC). More details

about the program can be found at: http://www.nserc-crsng.gc.ca/Students-Etudiants/PD-NP/Laboratories-Laboratoires/index_eng.asp. All candidates must meet NSERC eligibility requirements http://www.nserc-crsng.gc.ca/NSERC-CRSNG/Eligibility-Admissibilite/students-etudiants_eng.asp

CONTACT

Interested applicants should email: **1) CV;** and **2) cover letter outlining the experience and skills they bring to the project** to Caihong Fu: Caihong.Fu@dfo-mpo.gc.ca and Robyn Forrest: Robyn.Forrest@dfo-mpo.gc.ca

Short-listed applicants will be invited to develop a full application through the NSERC system. CVs will be accepted until the position is filled.

REFERENCES

- Fu, C., Olsen, N., Taylor, N., Grüss, A., Batten, B., Liu, H., Verley, P., and Shin, Y.-J. 2017. Spatial and temporal dynamics of predator-prey species interactions off western Canada. *ICES Journal of Marine Science*. Doi: 10.1093/icesjms/fsx056
- Grüss A, Harford WJ, Schirripa MJ, Velez L, Sagarese SR, Shin Y-J, Verley P (2016). Management strategy evaluation using the individual-based, multi-species modeling approach OSMOSE. *Ecological Modelling*, 340: 86-105.
- Shin, Y.-J., and Cury, P. 2004. Using an individual-based model of fish assemblages to study the response of size spectra to changes in fishing. *Canadian Journal of Fisheries and Aquatic Sciences*, 61: 414-431.