



Two-year postdoctoral fellowship opportunity at Fisheries and Oceans Canada (DFO)

Geostatistical approaches to integrating data from multiple surveys to assess trends in stock abundance and climate-driven range shifts

Background: Geostatistical or spatiotemporal models are increasingly being used to calibrate fish survey data for assessing trends in species abundance and evaluating possible distribution shifts with climate change. Such spatial approaches can increase precision compared to design-based approaches and have the potential to account for common survey problems (e.g., gear changes, partial coverage) in calculating indices used in stock assessment. Furthermore, geostatistical models provide a framework for integrating data from contiguous surveys, meeting an urgent need to track species across survey domains and geopolitical borders as changing ocean conditions cause distributional shifts. However, skepticism about such approaches remains. Simulation testing has typically been under ideal conditions (e.g., self-testing with the same underlying model) or non-existent. Complications exist such as differing length-selectivity and spatiotemporal coverage.

This postdoc will lead a project with a team of DFO scientists from across Canada joining two major software development efforts at DFO: (1) [SimSurvey](#), a tool for simulating trawl surveys, and (2) [sdmTMB](#), a tool for fitting geostatistical models. This cross-coast collaboration offers the opportunity to develop and test spatial approaches to integrating survey data to (1) make the best use of costly data, (2) account for changes or inconsistencies in survey implementation, (3), incorporate changing ocean conditions, and (4) address concerns with species on the move with climate change.

Essential asset qualifications: Applicants must have graduated with a PhD in fisheries science, ecology, statistics, or a related discipline and have demonstrated expertise in statistical modelling and the R programming language. Prior experience with spatiotemporal modelling, R package development, Template Model Builder (TMB), the R-INLA package, Git, and/or reproducible research would be an asset. Successful candidates will be self-motivated and have a proven track record of publishing their research in peer-reviewed journals. The position is available for candidates of all nationalities but those who are not Canadian citizens or permanent residents of Canada must satisfy Canadian immigration requirements.

Location: Remote work is an option, particularly during the COVID-19 pandemic. Ideal in-person locations would be DFO's offices in Nanaimo, British Columbia or St. John's, Newfoundland.

Start date and funding: An ideal start date would be around September 2021 with completion in September 2023. Funding includes a salary starting at ~\$66,000 CAD/year and increasing ~3,000 CAD/year each April, medical and dental benefits, 4 weeks/year vacation, retirement contributions, moving budget, and travel and equipment support. We are committed to employment equity and encourage applications from women, visible minorities, indigenous peoples, and persons with disabilities.

Contact: Applicants should email a CV and a brief cover letter outlining their interest in the project and their experience and skills to Sean Anderson <sean.anderson@dfo-mpo.gc.ca> and Paul Regular <paul.regular@dfo-mpo.gc.ca>. Short-listed applicants will be invited to develop a full application through the Natural Resources Canada system. Applications will be reviewed beginning May 17th, 2021.