

The Salish Sea MEOPAR Project

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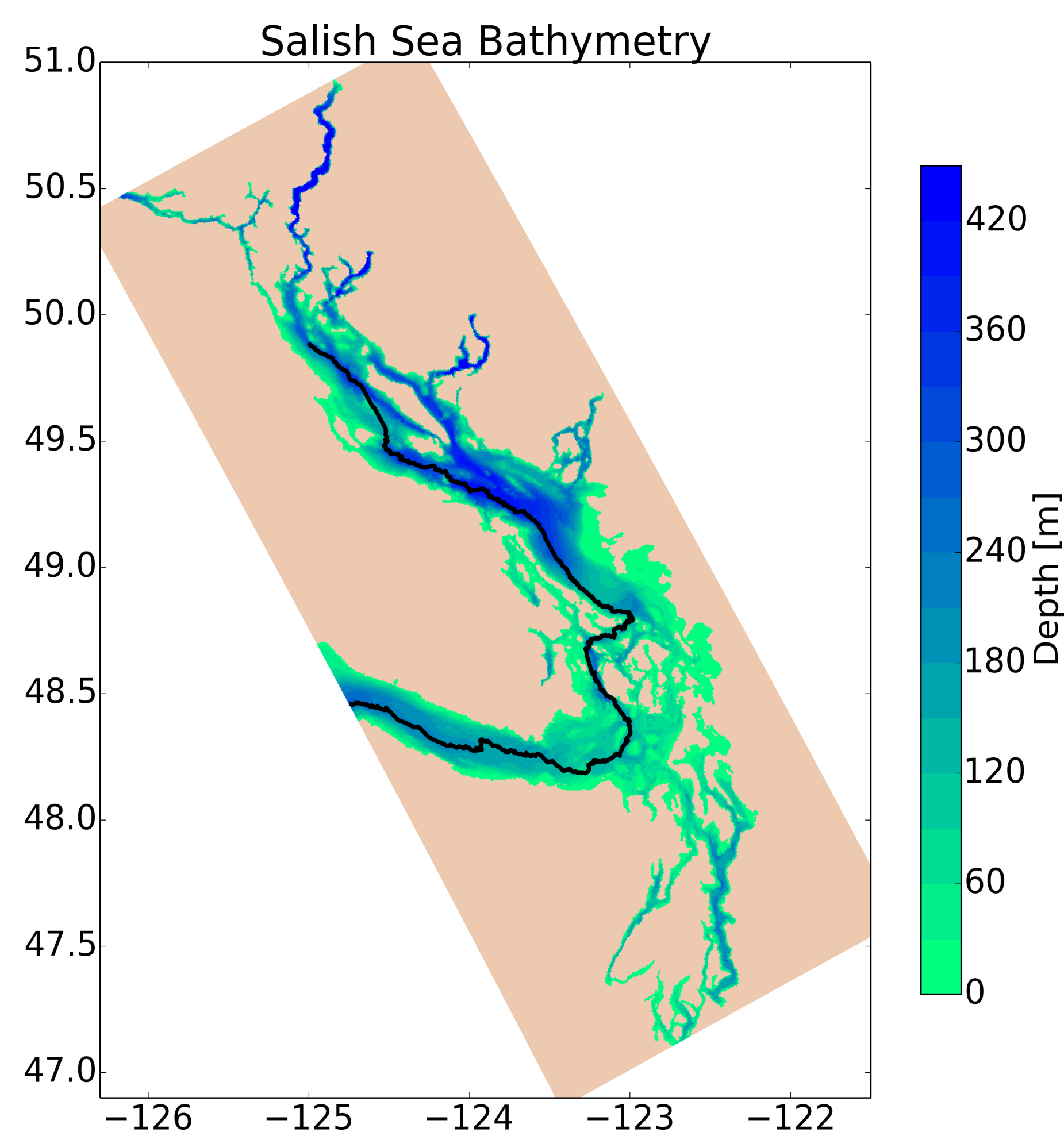
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The Project

The Salish Sea is home to a large population of Canadians living in coastal communities at risk to ocean related hazards. There is an ongoing need to assess the impact of these hazards on human and marine environments through a multidisciplinary approach involving Canadian oceanographers, biologists, and social scientists. The Marine Environmental Observation Prediction and Response network (MEOPAR) provides a platform to accelerate this type of research.

The Salish Sea MEOPAR project team is developing a three-dimensional ocean model for the Strait of Georgia and Salish Sea. Using the NEMO modelling architecture the Salish Sea model will be used to evaluate storm surge risk in coastal communities. Long term goals include data assimilation from the VENUS network and a coupled biogeochemical modelling component.



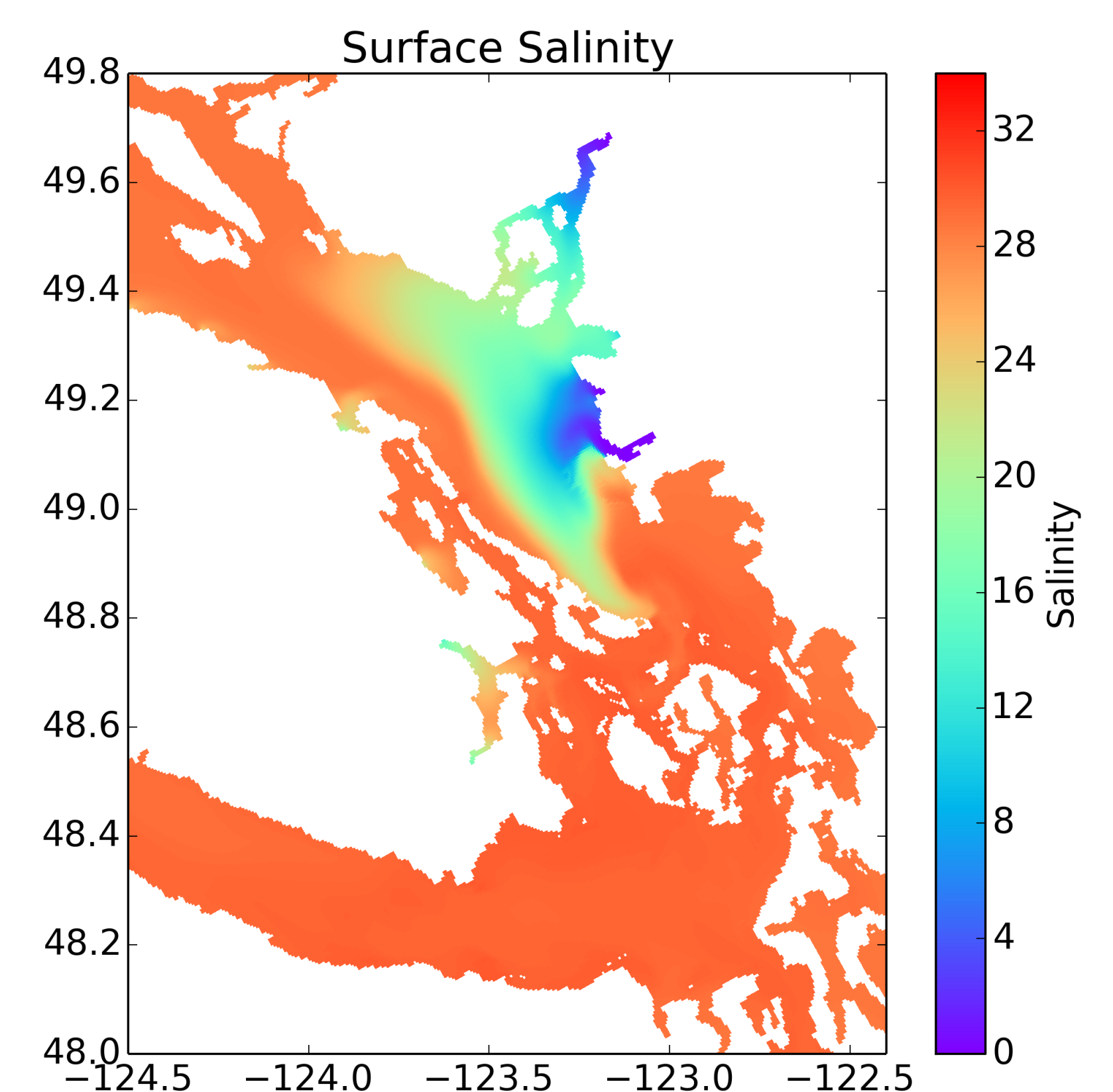
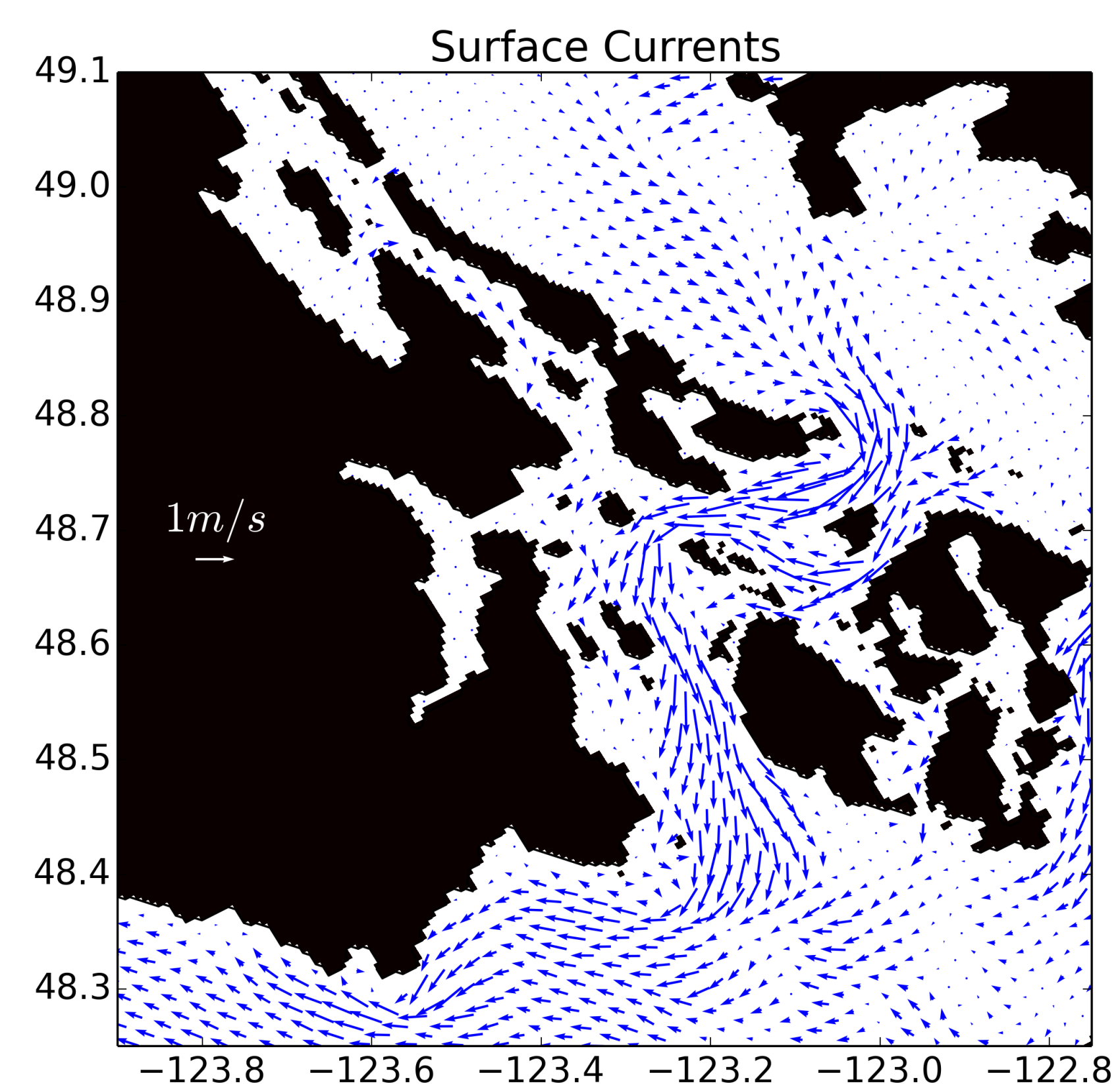
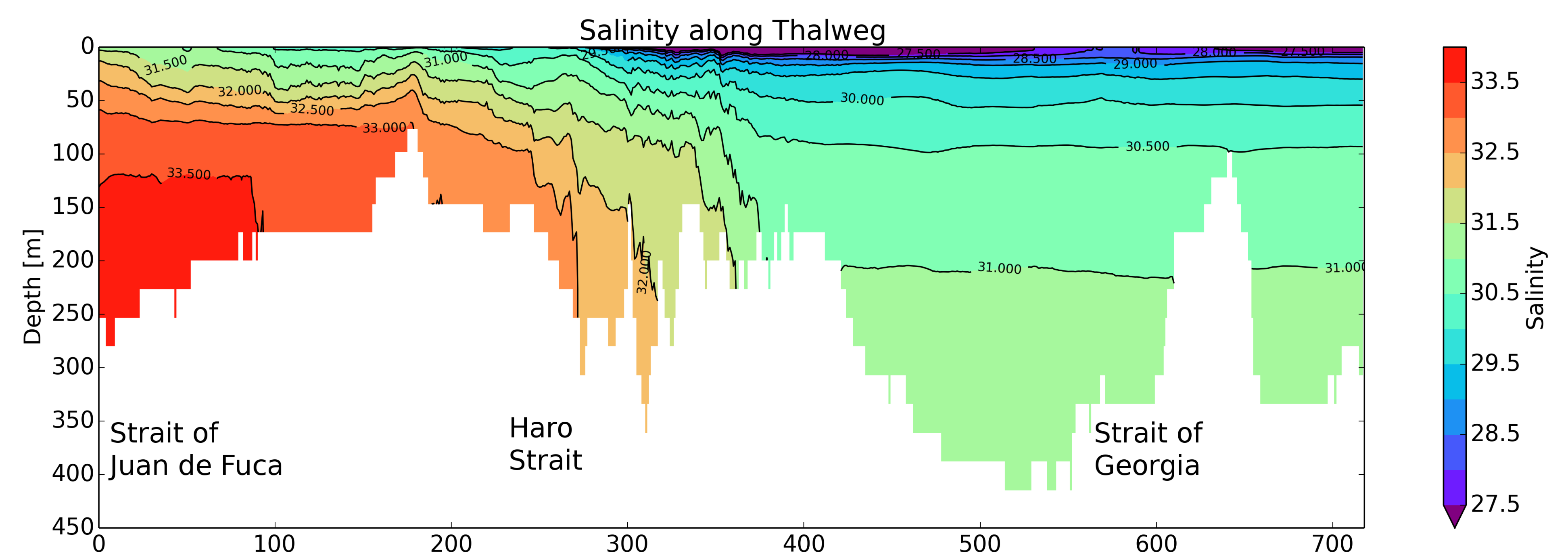
The Tools

To facilitate collaboration, the team uses a combination of the IPython Notebook, distributed version control, and the Notebook Viewer service (nbviewer.ipython.org). This set of tools enables sharing of model output, including visualization and analysis of results. Several examples are highlighted in the figures below.

Top: Salinity field along the thalweg after several weeks of spinup. The thalweg is indicated by the black curve in the bathymetry image on the far left.

Bottom left: Surface currents during the ebb tide.

Bottom right: Surface salinity field demonstrating the evolution of the fresh water plume from the Fraser River.



The Domain

The model domain includes the Strait of Juan de Fuca, Puget Sound, and the Strait of Georgia, as displayed in the figure above. The computational domain is divided into 900 by 400 by 40 grid cells. The model includes fresh water input from 150 rivers, forcing by eight tidal constituents, open boundary conditions at the Juan de Fuca and Johnstone Strait boundaries, and atmospheric wind and pressure forcing at the ocean surface.

The Details

This multidisciplinary project funded by MEOPAR involves collaboration among scientists across Canada. The Salish Sea modelling component is led by Dr. Susan Allen in the Department of Earth, Ocean, and Atmospheric Sciences at the University of British Columbia. Up-to-date model details can be found here: <http://salishsea-meopar-docs.readthedocs.org>



This project has been developed in collaboration with the Dr. Youyu Lu group at the Bedford Institute of Oceanography and the Dr. Keith Thompson group at Dalhousie University.