

ROMS implementation for the Pacific Coast of Canada

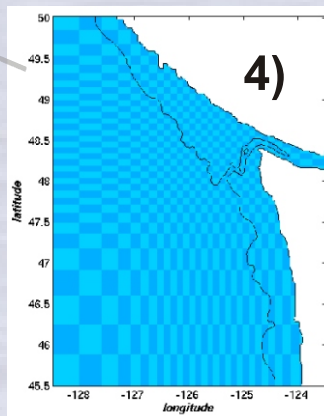
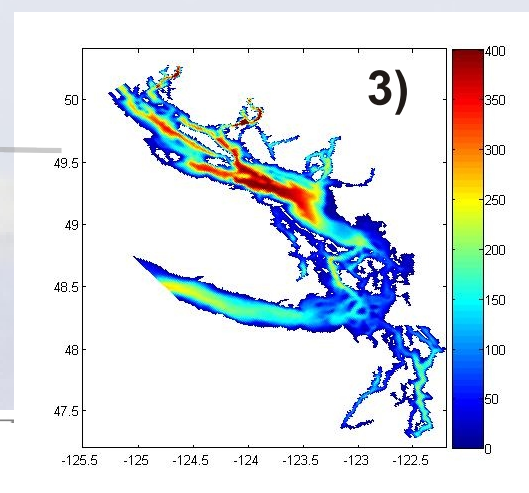
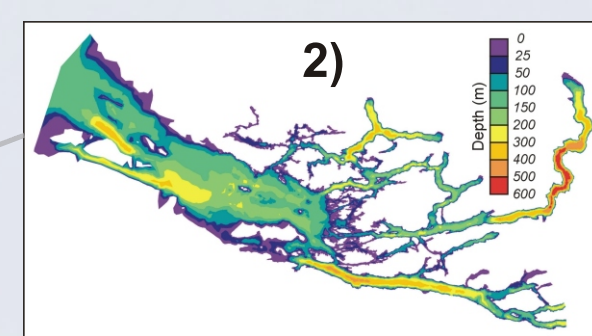
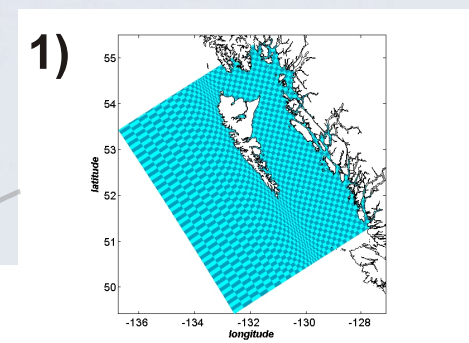
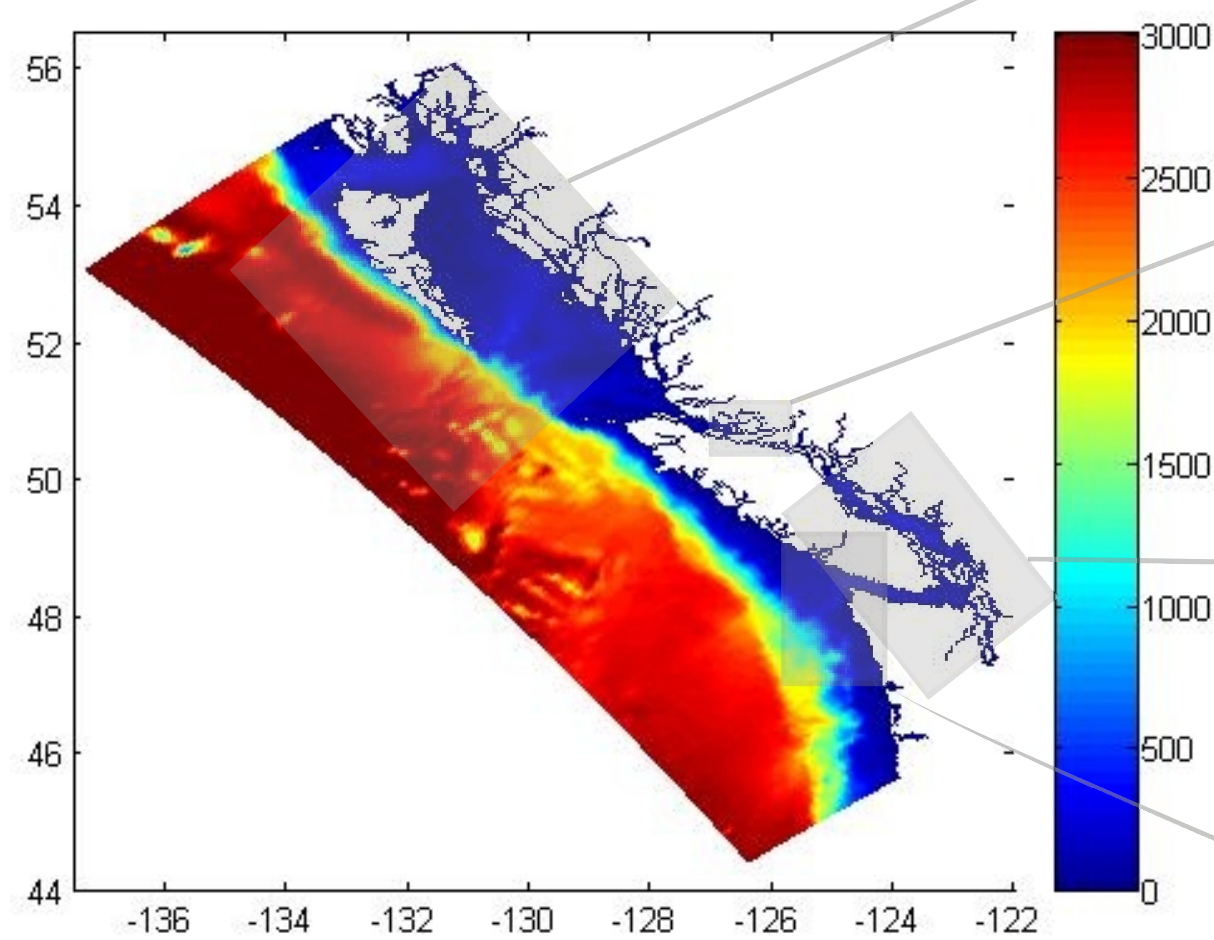
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1. PROJECT OBJECTIVES

Simulate circulation on the Canadian Pacific Coast and address issues such as:

- seasonal variability; upwelling/downwelling
- biophysical coupling and impact on ecosystem
- climatic time scale variability
- coupling with smaller regional grids

2. ROMS APPLICATION



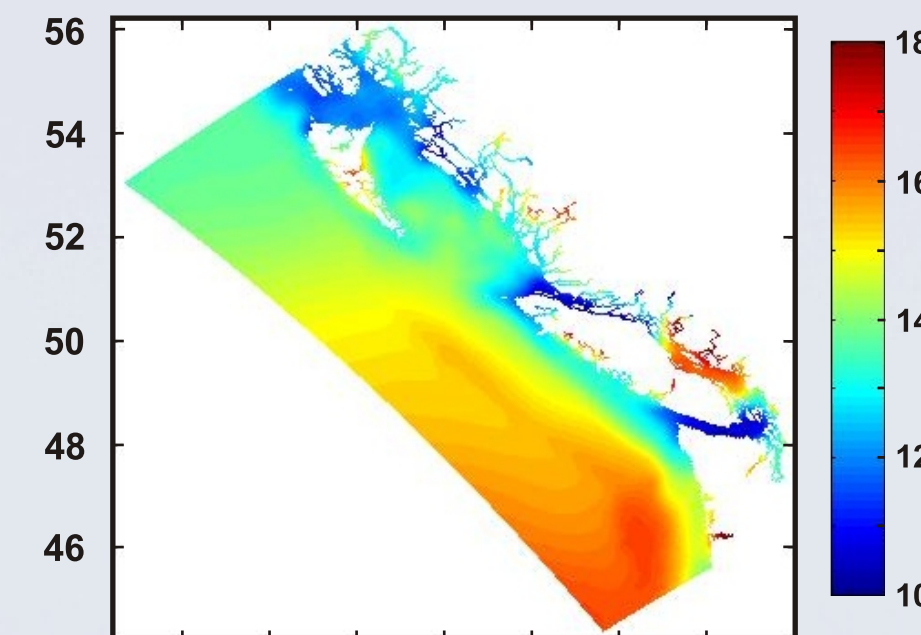
3. LOCAL MODELS

Within the coastal domain, a series of smaller regional models are in development for future coupling:

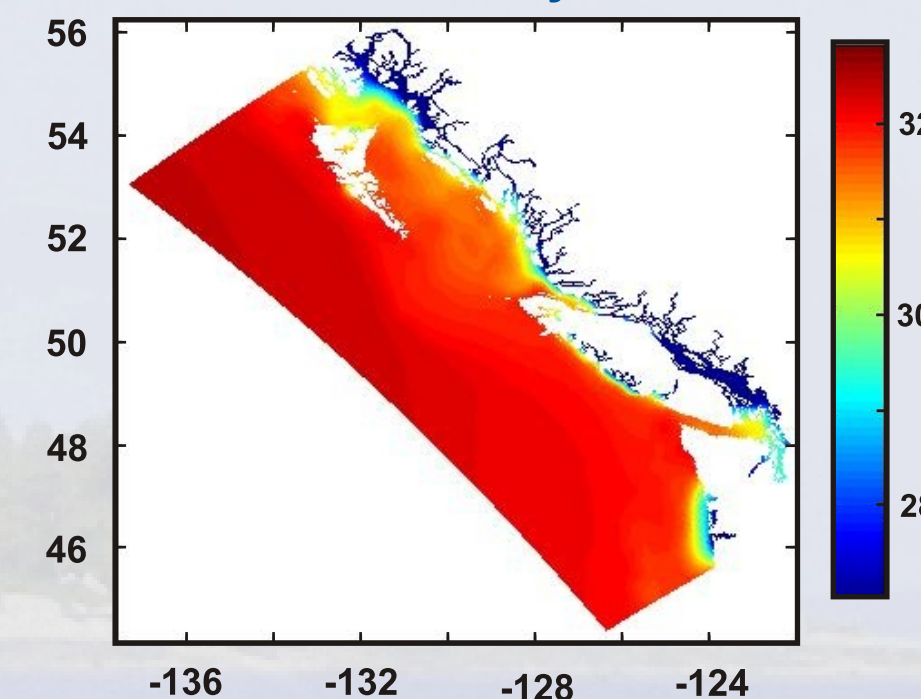
- 1) North Coast
- 2) Broughton Archipelago
- 3) Strait of Georgia/Juan de Fuca Strait
- 4) Juan de Fuca eddy region (ECO HAB)

4. INITIAL CONDITIONS & FORCING

Climatology
 Surface summer conditions
 Temperature (°C)

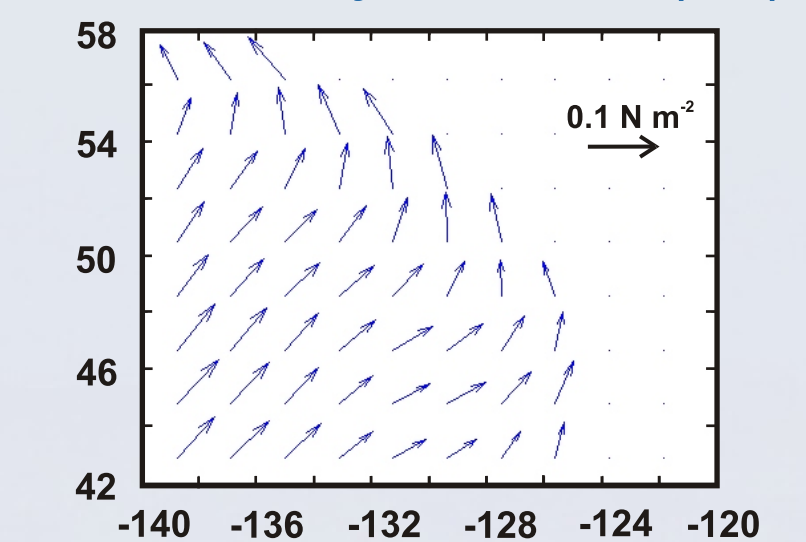


Salinity



- Initial temperature & salinity profiles from winter/summer climatology
- Average annual discharge from rivers
- M_2 & K_1 tides from larger domain model
- NCEP wind stress

NCEP monthly wind stress (Jan)

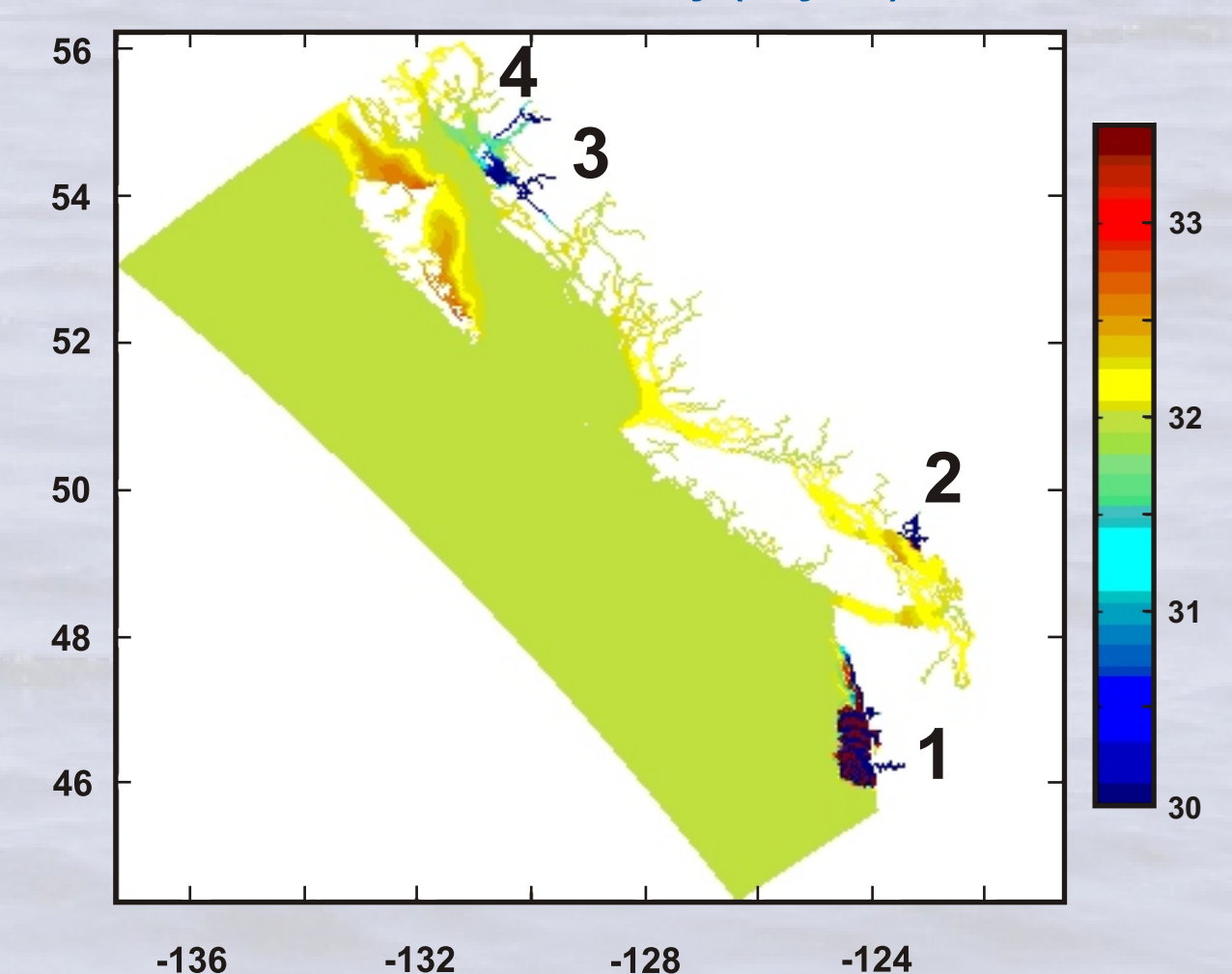


5. PRELIMINARY RESULTS

Results (surface salinity) after 20 days integration of a test run:

- Horizontally uniform initial stratification (at OBCs too)
- January wind stress
- M2 tide
- Forcing with major rivers: 1)Columbia 2)Fraser 3)Skeena 4)Nass

Surface salinity (day 20)



6. SUMMARY & FUTURE WORK

- Coastal-wide model in early stage of development
- Initialization from climatology and various forcings need to be examined further.
- Simulation of the seasonal variability (Winter / Summer) will be done first.
- The model will be used initially as a “process study” tool (upwelling, flows driven by fresh water discharge, barotropic and internal tides, etc).
- Coupling with biophysical model will be an essential component of future work.

- 3 km horizontal resolution, 178 by 410 grid points
- 30 S-coordinates
- OPEN-MP on IBM PS570 32 processor machine
- $\Delta t=60$ sec, NDTFAST=50
- OBCs: from a 50 year run of northeast Pacific
- forced by river discharge, tides, wind stress, and heat flux