

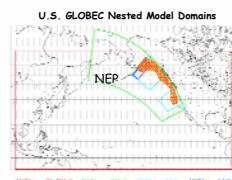
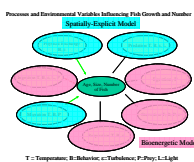
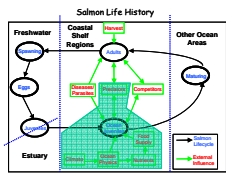


Interannual variation of spring-summer transport of plankton and juvenile salmon in coastal regions of the northeast Pacific: evaluating the physical model

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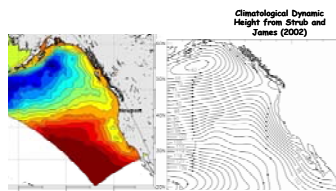


Introduction & Goals

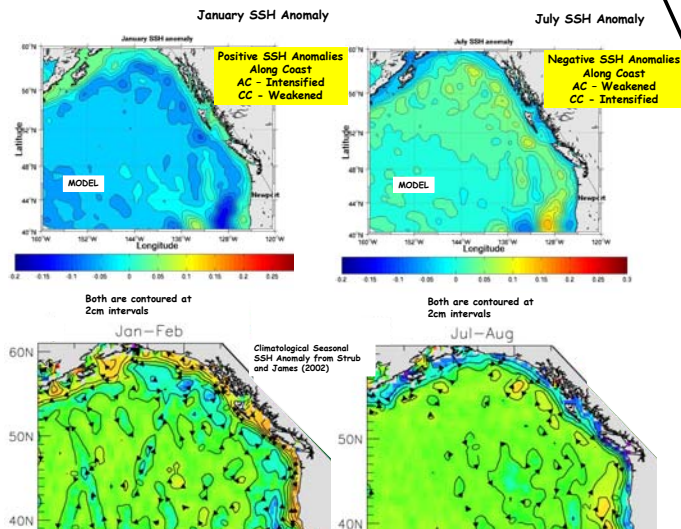


How well do the ROMS NEP physics match our perception and data from the real NEP ocean? - 5 TESTS

- 1) Compare SSH from the model with altimetry
 - 1) Large scale climatology
 - 2) Seasonality
- 2) Compare SST
 - 3) Compare Subsurface Temperatures
 - 4) Examine California Undercurrent
- 5) Interannual Variability in Strength of the Alaskan Gyre Circulation and Bifurcation of the North Pacific Current (particle tracking)



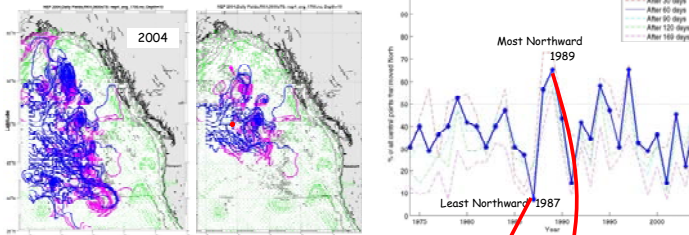
Test 1 - SSH



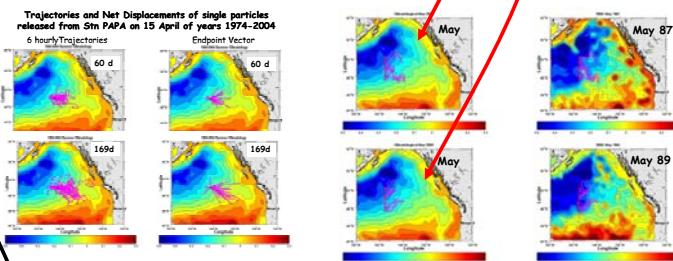
Summary

- 1) The current NEP model hindcast for 1958-2004 is a **significant improvement** over earlier simulations.
 - 1) Climatological SSH and SST **match observations** well at largest scales.
 - 2) Model shows **reasonable seasonal variation** in coastal velocities (intensified AK gyre in winter; intensified CC in summer).
 - 3) Modeled **subsurface** seasonal temperatures (at 200-600m) along Line P are ca. **2°C warmer than observations**.
 - 4) Alaska Gyre **geostrophic transport** through Line P is **weak** relative to observations.
 - 5) CUC is present and interannually variable in model; not unlike observations
 - 6) 10 m particle trajectories respond to instantaneous velocities including **substantial mesoscale velocity (eddies)**
- 2) However, **is the NEP model product sufficient** to use as the basis for coupled biophysical modeling of salmon, euphausiids, and LTL dynamics?
 - 1) **Temperature is important** for bioenergetic models, but juvenile salmon are mostly in the upper 20-30 meters (where the modeled T may be OK).
 - 2) Mixed layer depth and **stratification intensity** are important for controlling nutrient flux into the euphotic zone. Increased nutrient flux due to weak stratification may lead to early and possibly sustained phytoplankton blooms, etc.
- 3) **Next step is to evaluate model shelf properties and simulate salmon growth and transports.** For the answer to (2) come to PICES XVI in Victoria.

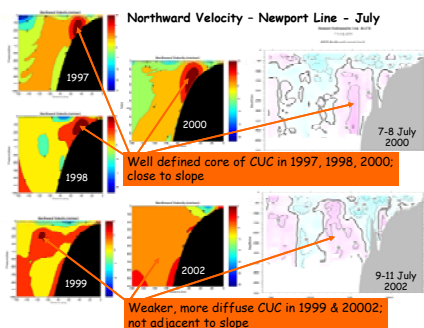
155 particles seeded into Central Region
Only 55 particles between 47.5 - 52.5 N (nearest Stn)



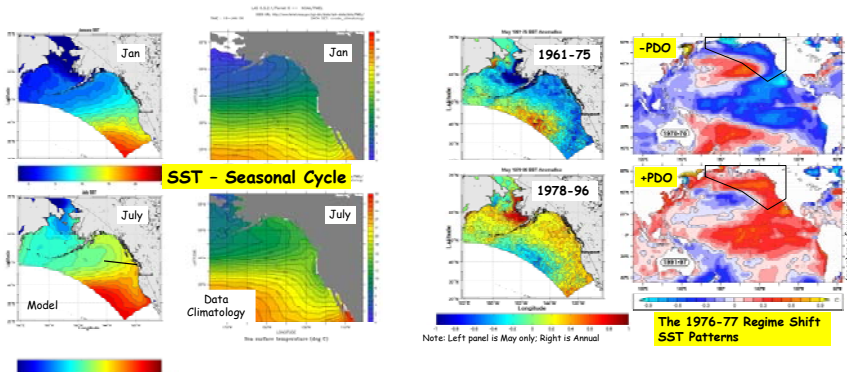
Test 5 - Bifurcation of NPC



Test 4 - California Undercurrent



Test 2 - SST Seasonality and Regime Shift Pattern



Test 3 - Subsurface Temperatures

