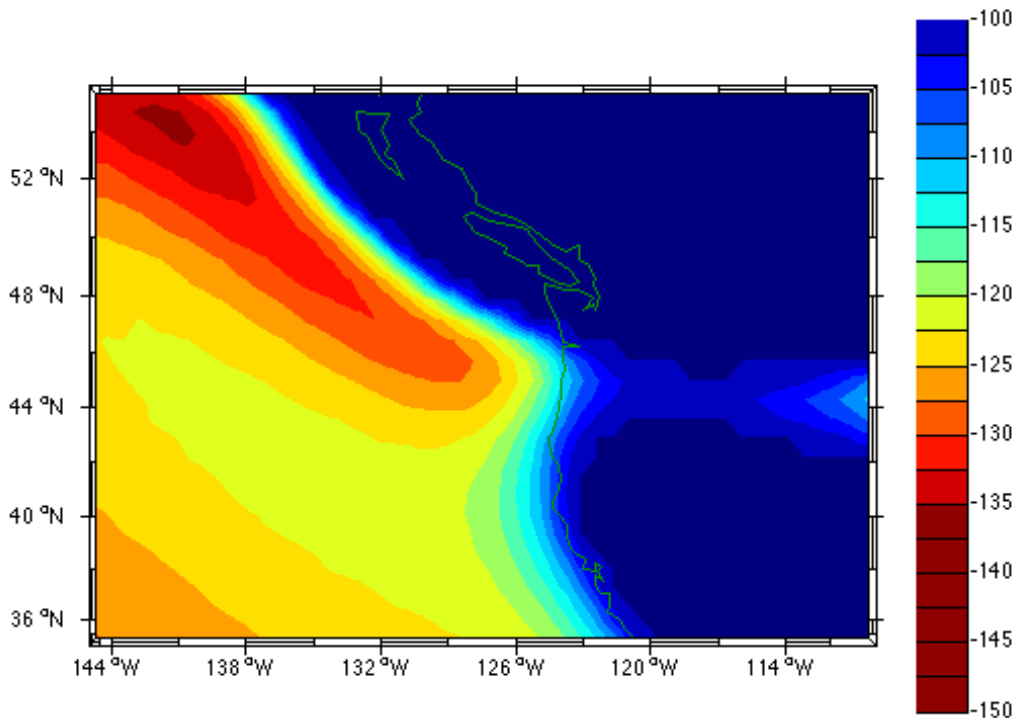




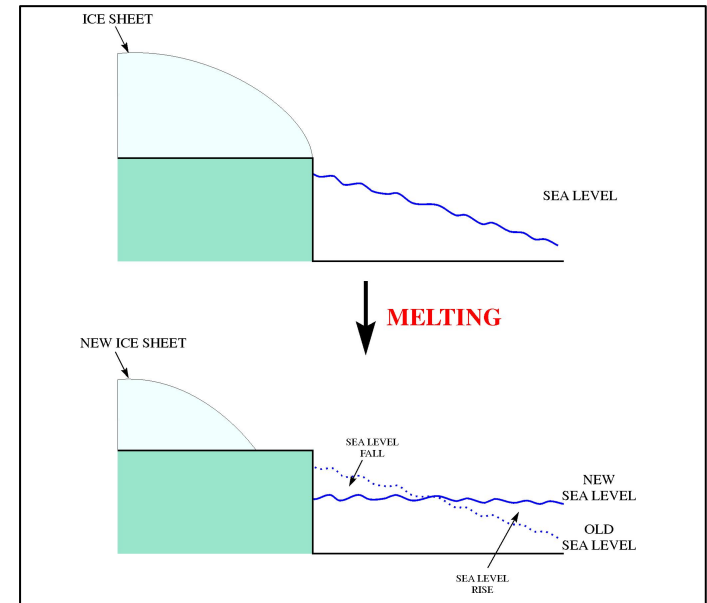
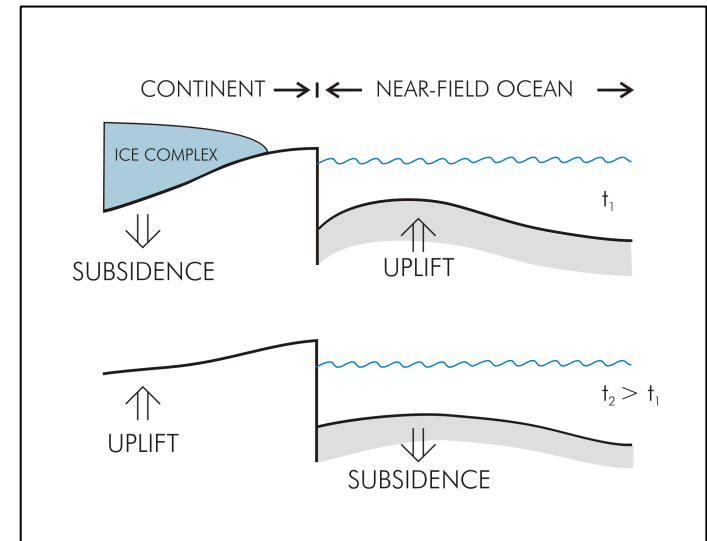
Some Predictions of Ice Age Sea Level Change

Glacial Isostatic Adjustment

Numerically Predicted Sea Level Change Since LGM

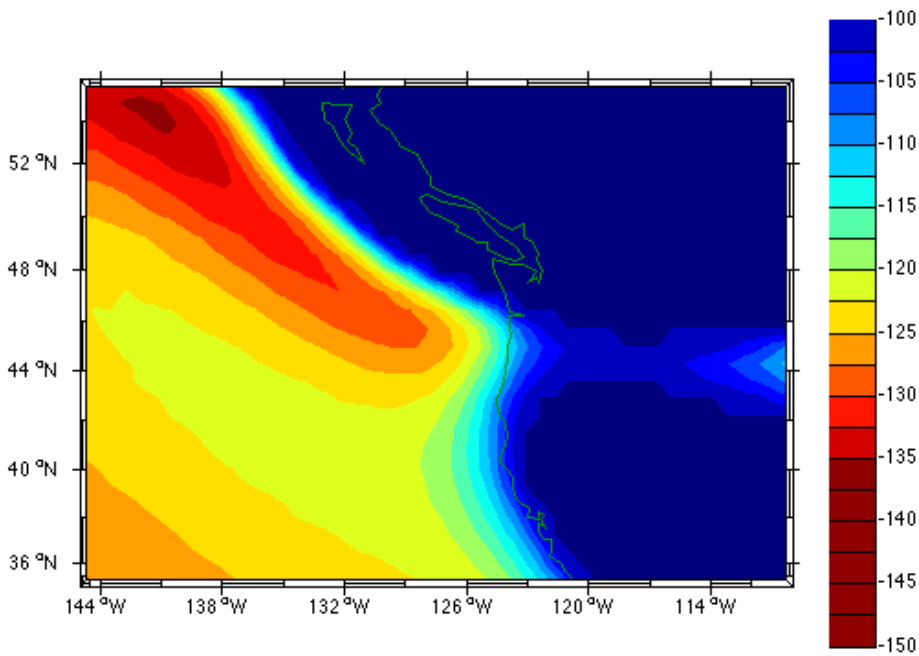


ICE-5G/VM2

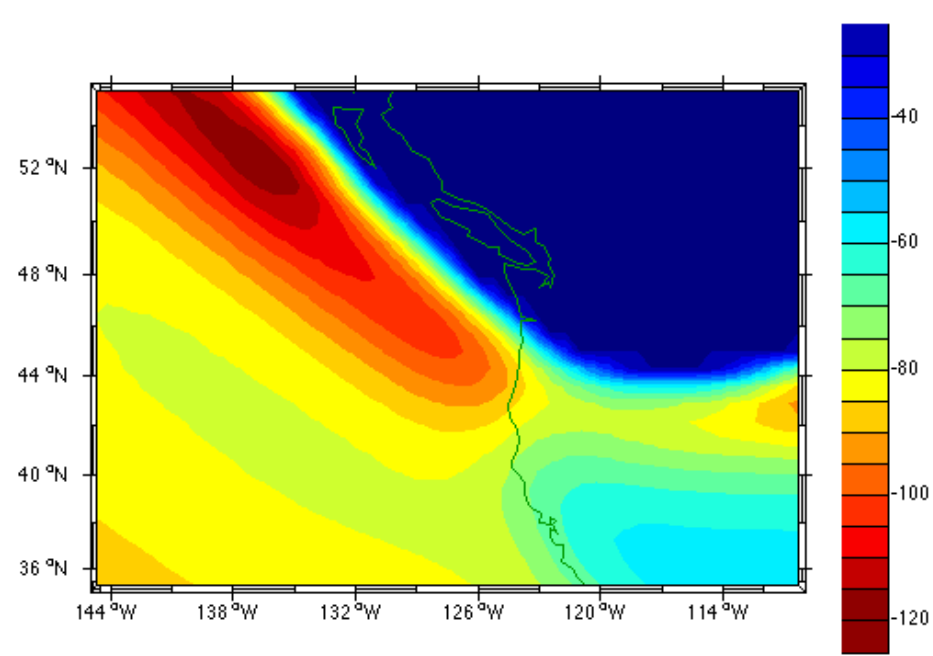


Glacial Isostatic Adjustment

Numerically Predicted Sea Level Change Since LGM



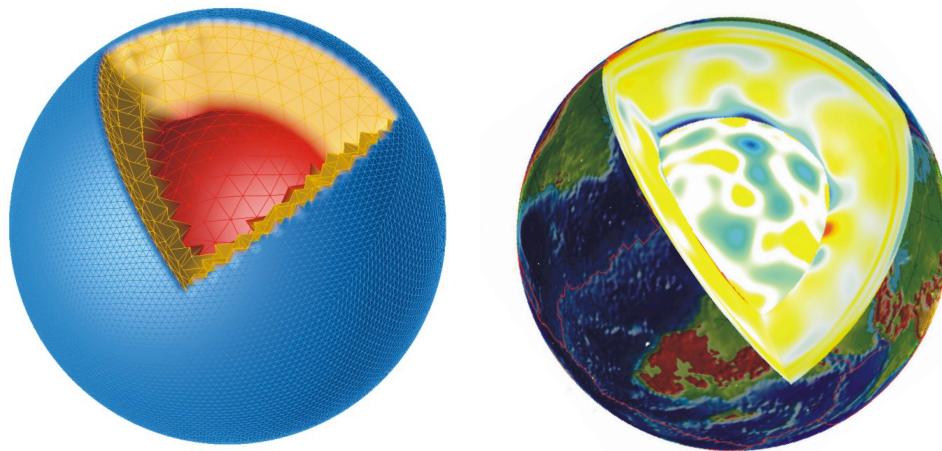
ICE-5G/VM2



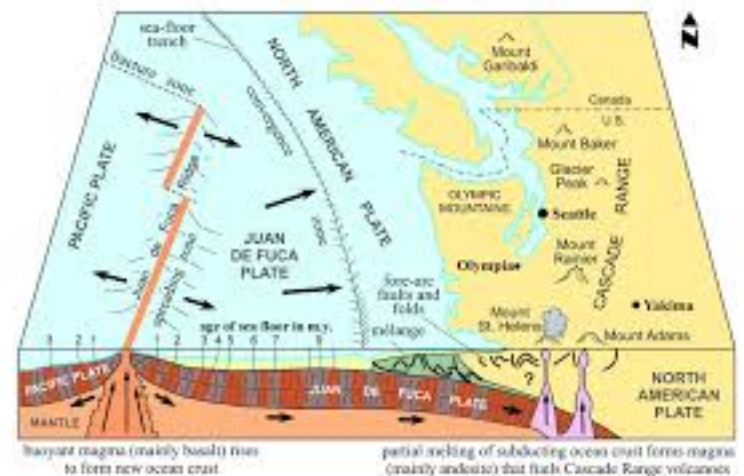
SADDLE/LM

Barbados-based estimate of ice volume at Last Glacial Maximum affected by subducted plate

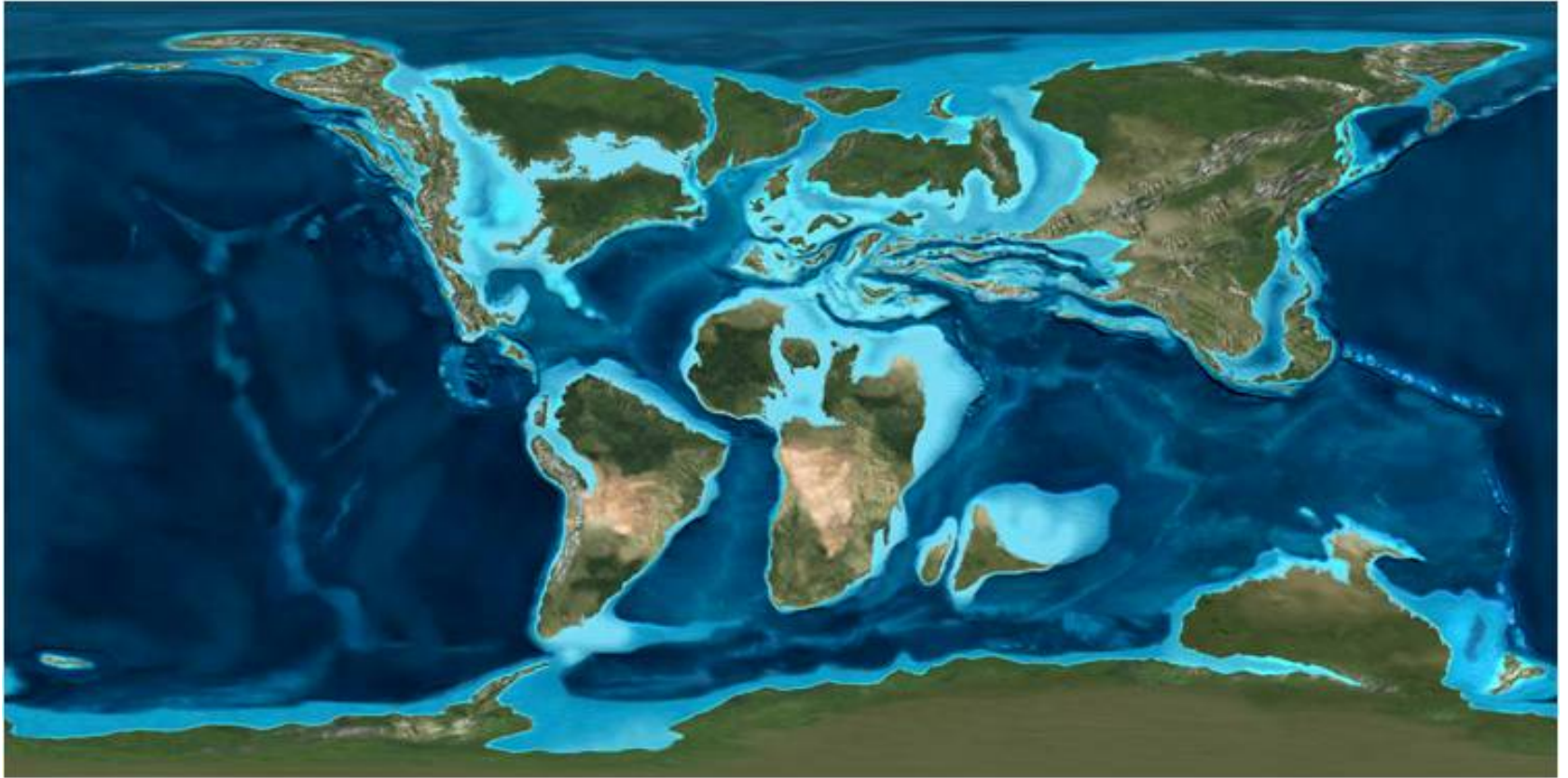
Jacqueline Austermann^{1*}, Jerry X. Mitrovica¹, Konstantin Latychhev² and Glenn A. Milne³



Finite Volume Numerical Predictions of Post-Glacial Sea Level Change



Dynamic Topography



Late Cretaceous Paleomap, (R. C. Blakey, NAU)

Modeling Mantle Convection with Seismic Tomography

Seismic Tomography

$$\frac{\delta v(r, \theta, \phi)}{v(r)}$$

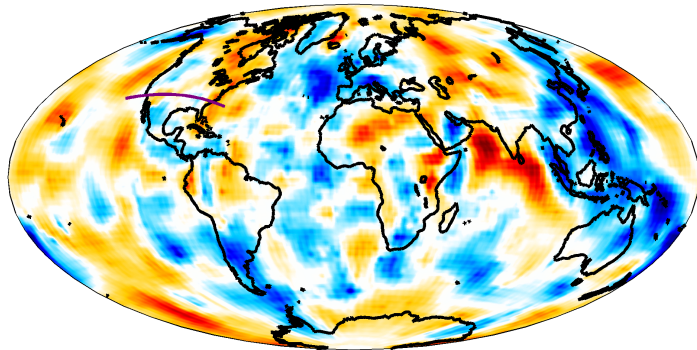
Density-Velocity Scaling

$$\frac{\delta \ln(\rho)}{\delta \ln(v)}$$

Density Contrast

$$\frac{\delta \rho(r, \theta, \phi)}{\rho(r)}$$

Depth 525 – 650 km

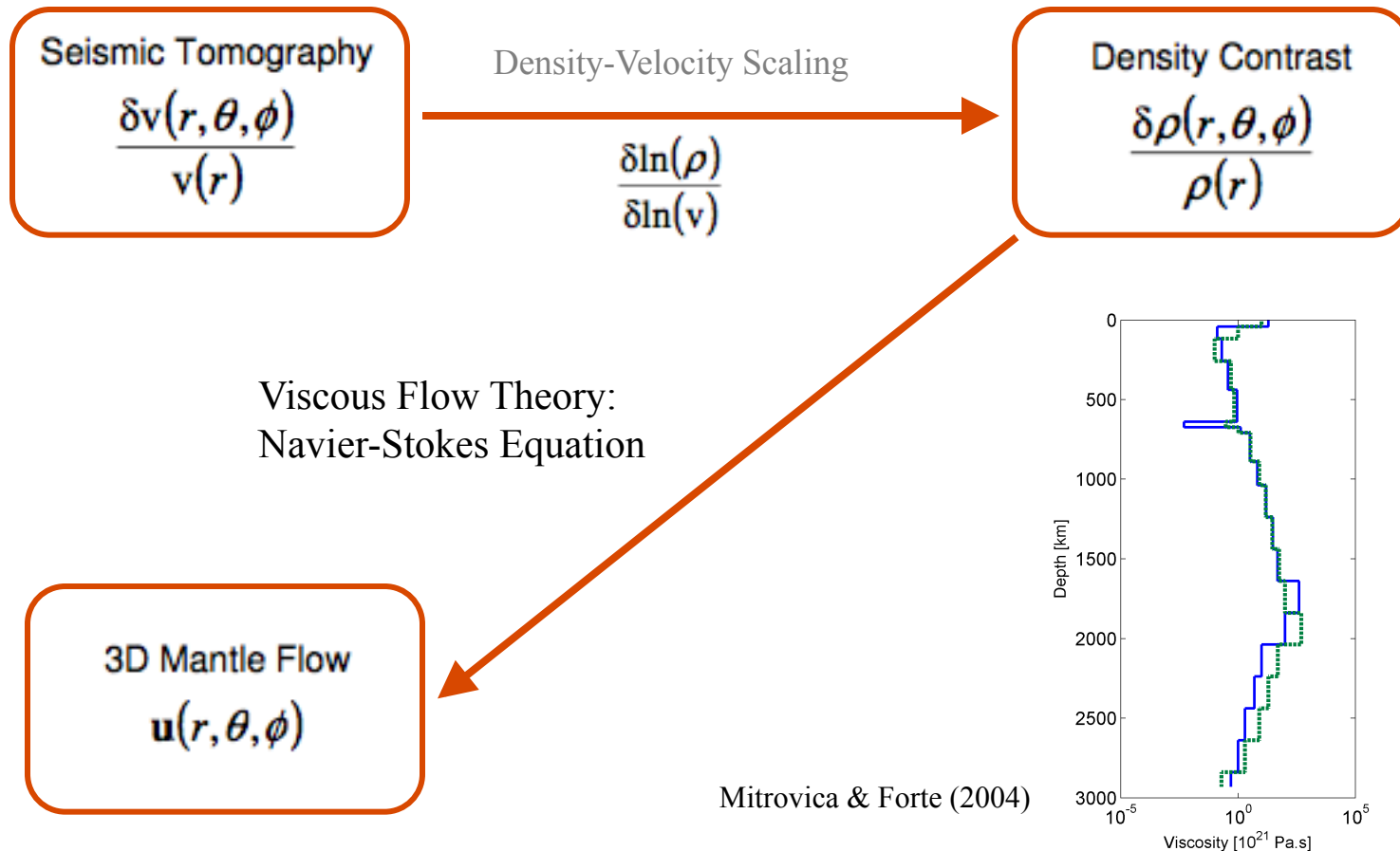


% $\delta V_s / V_s$

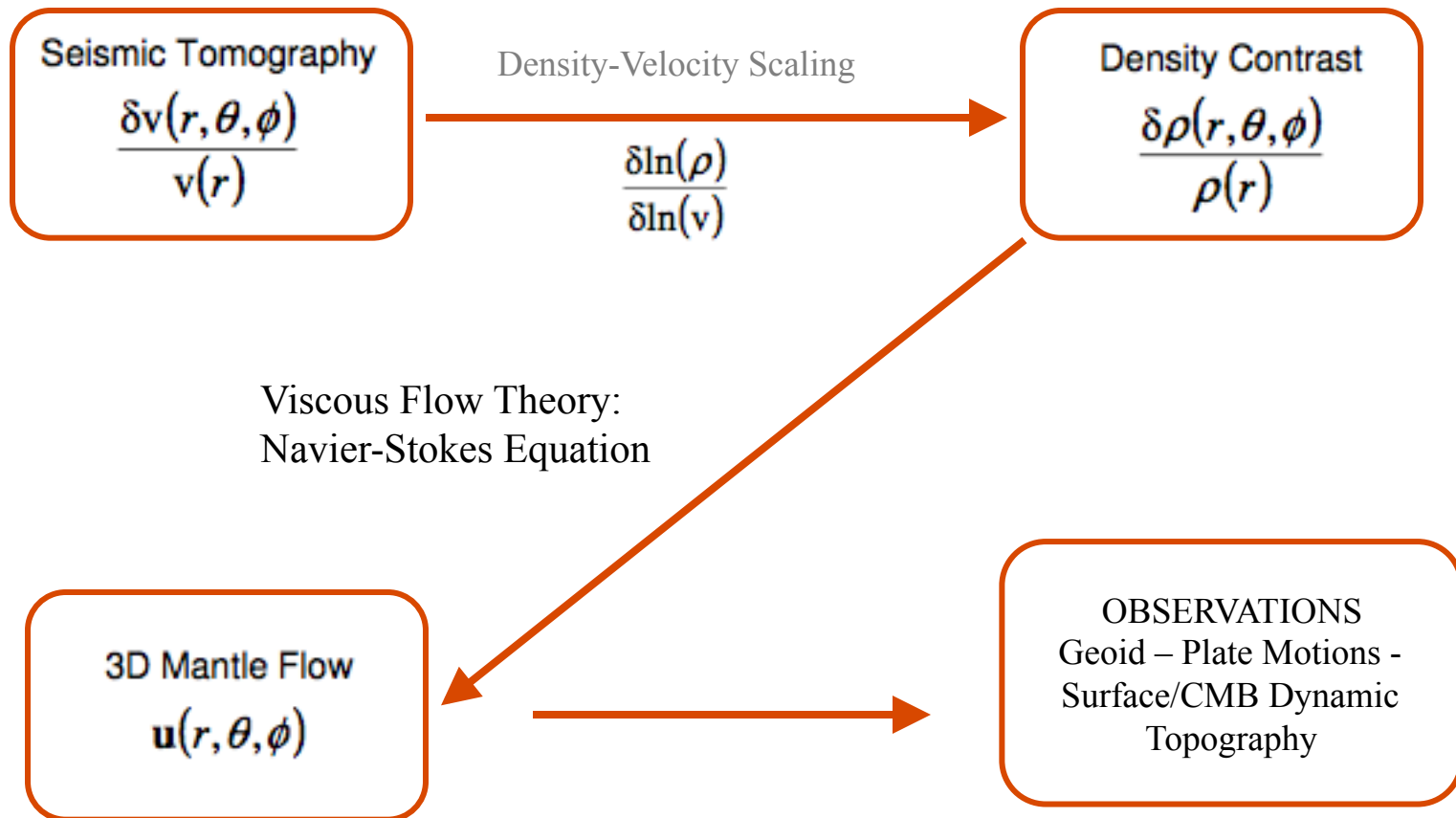
Seismic data: ~46,000 shear wave travel times (multi-bounce S-waves, shallow-turning triplicated phases, core reflections and phases traversing the outer core)

Simmons et al. [GJI, 2009]

Modeling Mantle Convection with Seismic Tomography

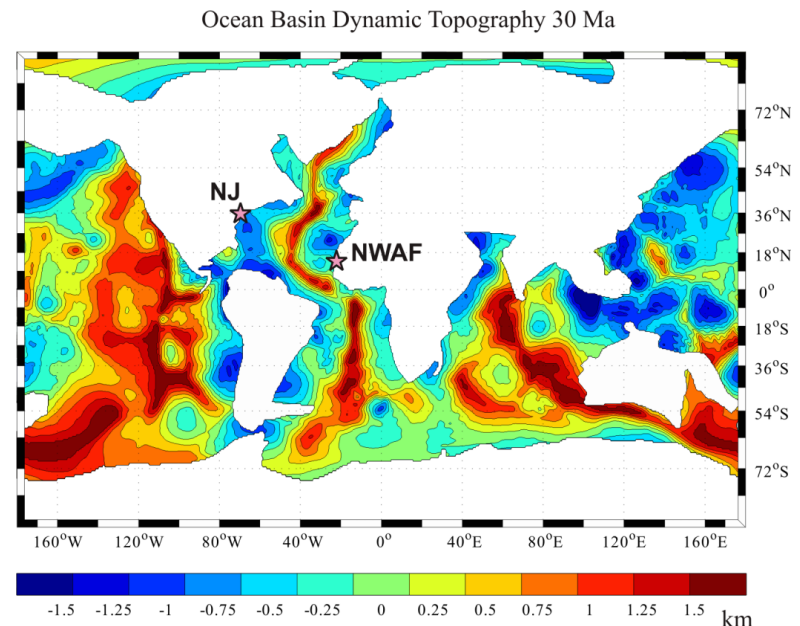
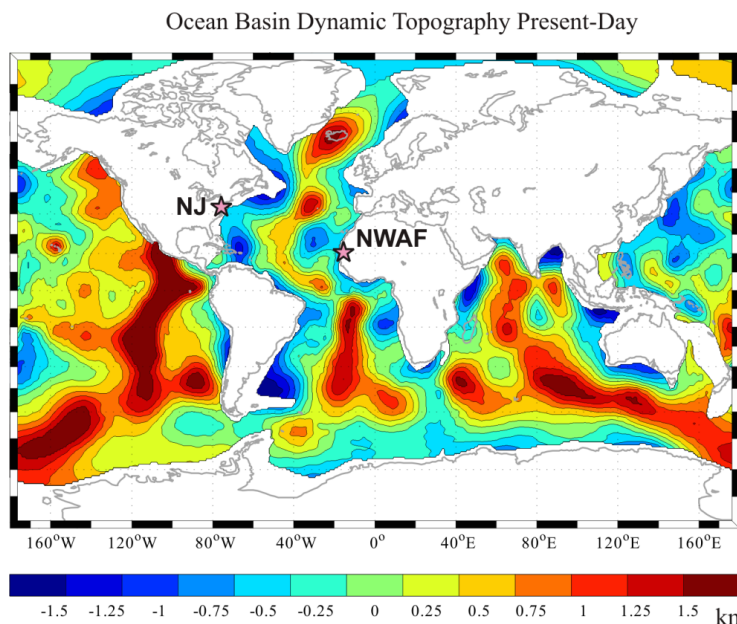


Modeling Mantle Convection with Seismic Tomography

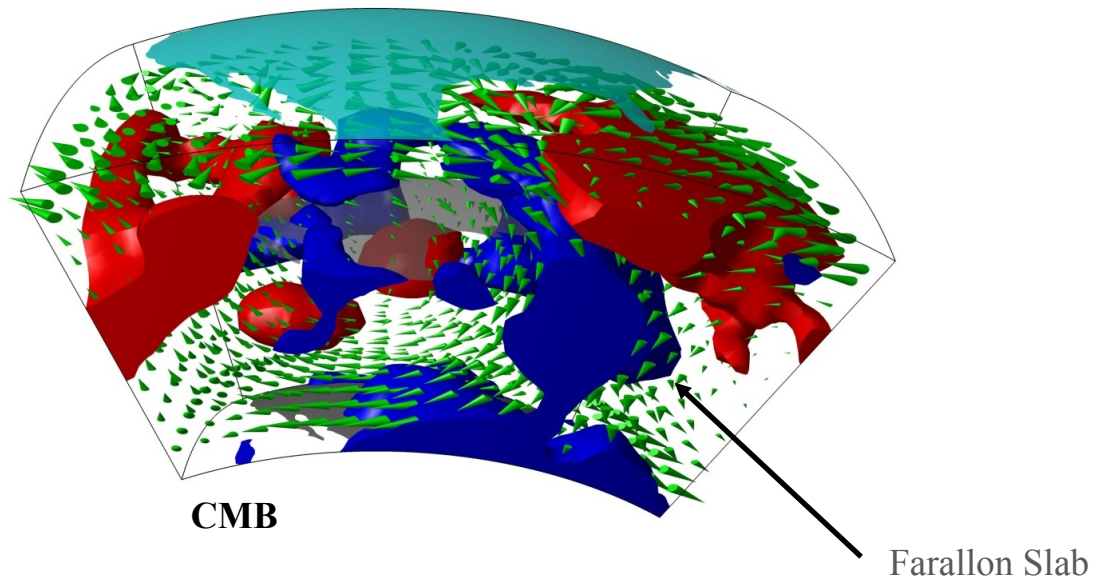


Backward Mantle Convection

- Backward simulation of mantle convection is done by reversing the time in the conservation of energy (advection only)
- Boundary conditions are consistent with plate reconstructions in the Indo-Atlantic frame of reference



Simulation: The U.S. East Coast



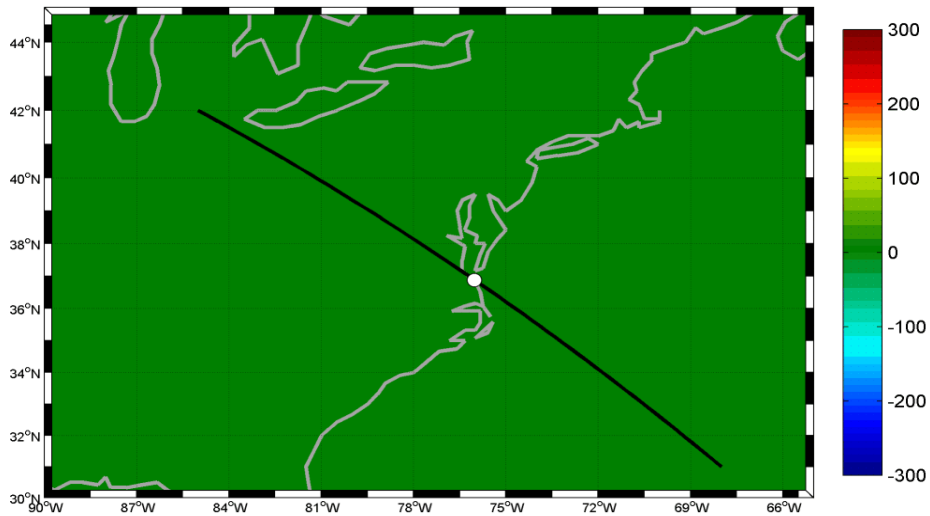
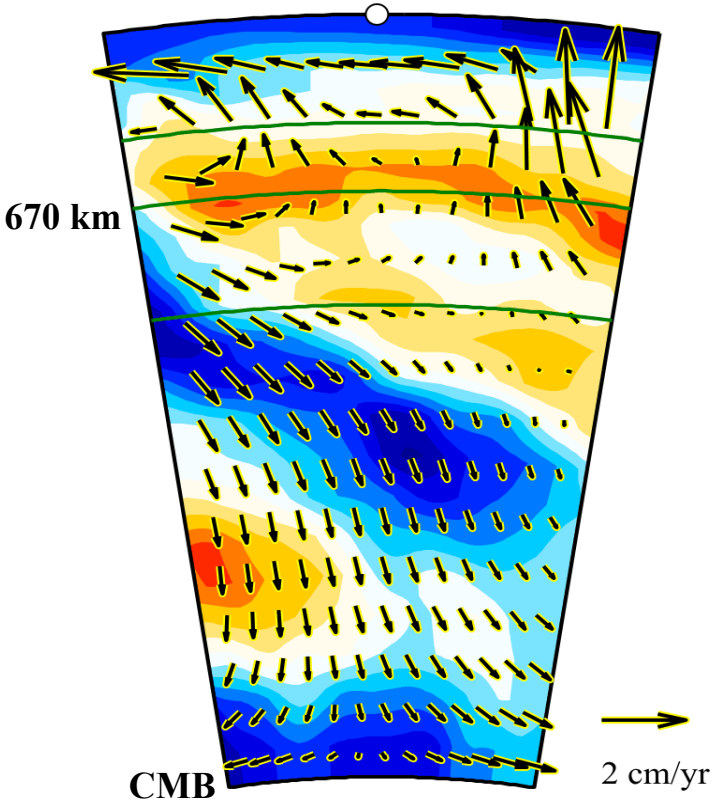
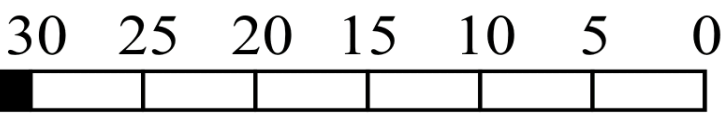
$$\delta\rho/\rho \leq -0.1\%$$

&

$$\delta\rho/\rho \geq 0.1\%$$

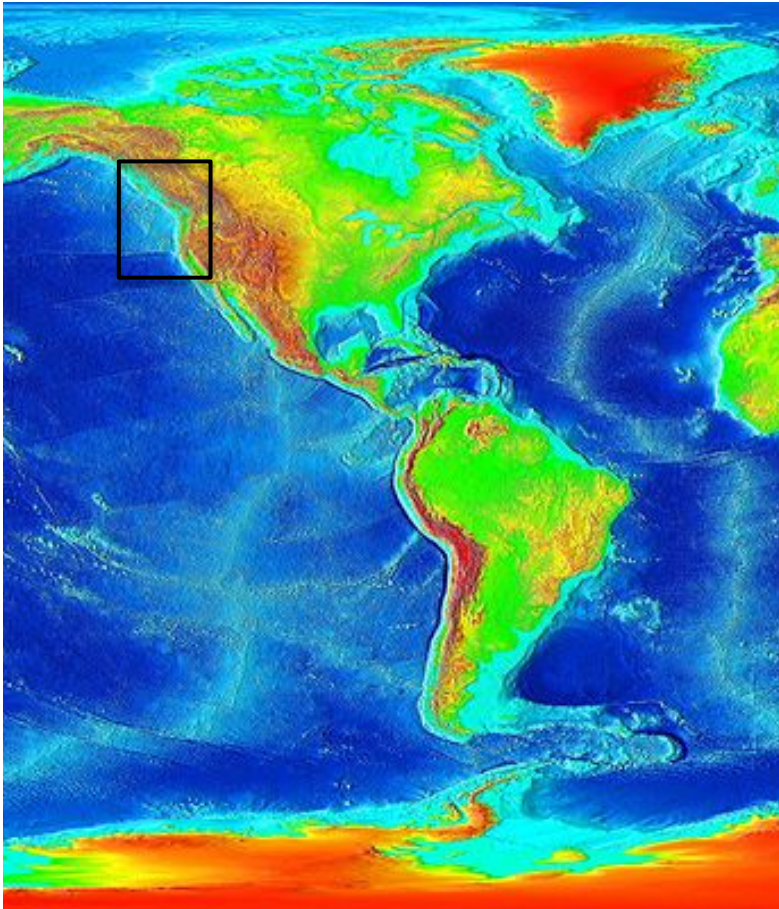
Dynamic Topography

Simulation: The U.S. East Coast

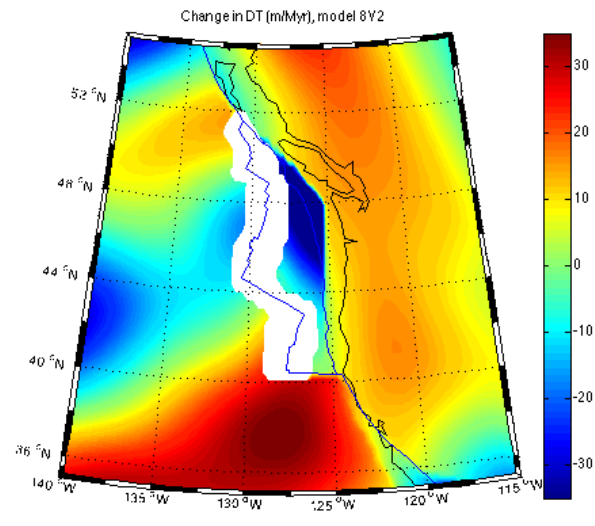
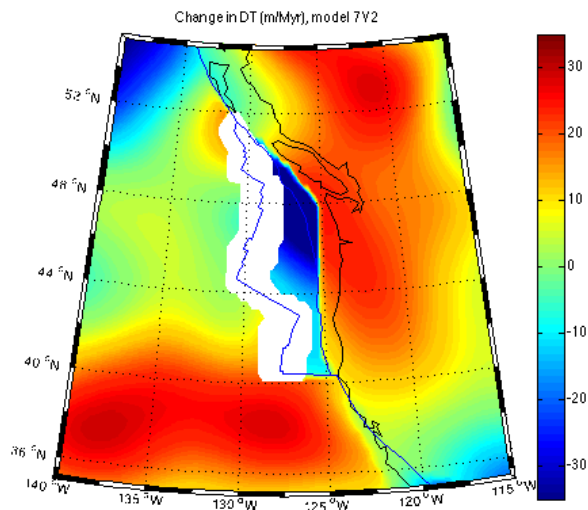
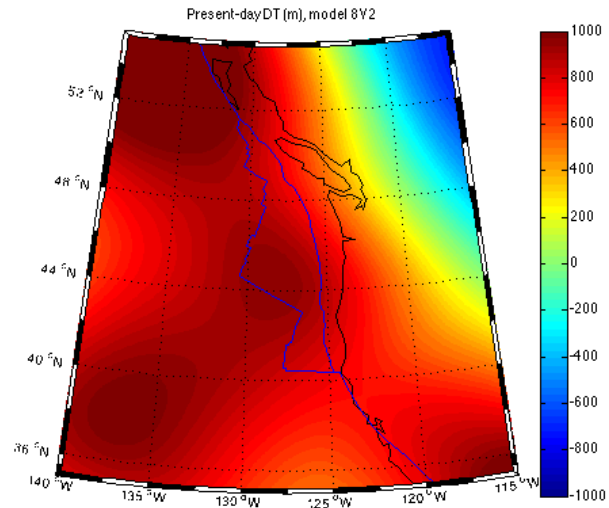
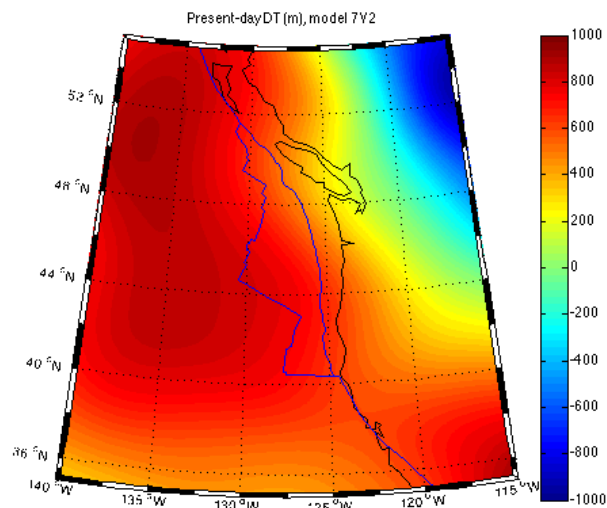


Change in Dynamic Topography Since 30 Ma

Dynamic Topography

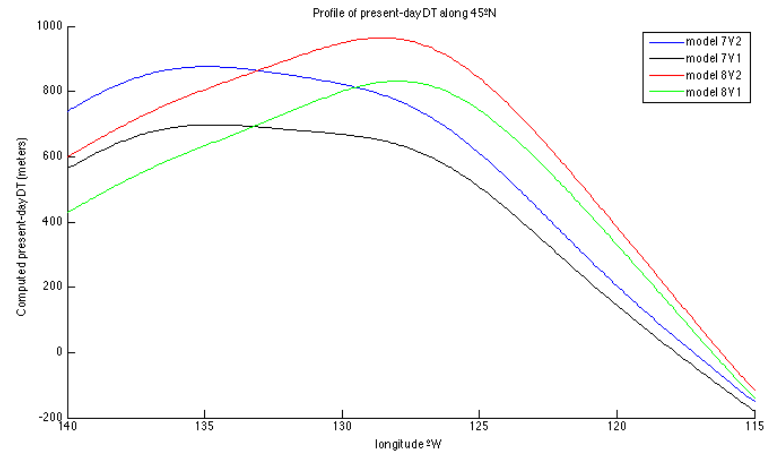


Dynamic Topography



Dynamic Topography

Present-Day
Dynamic
Topography



Change in
Dynamic
Topography
Over Past 3Myr

