G11A-1058: Glacial Isostatic Adjustment Along the Pacific Coast of Central North America

We consider recently compiled late glacial and Holocene relative sea-level (RSL) data (*Engelhart et al., Quaternary Science Reviews, 113, 78-92, 2014*) to constrain the glacial isostatic adjustment (GIA) signal and it's uncertainty along the North-America coastline from northern Vancouver Island to central California. A primary motivation for this work is to include the GIA signal into regional RSL projections for this coastline. GIA model parameters were optimized over a large parameter space, consisting of ~400 1-D Earth viscosity models and 25 North American ice histories, by comparing the model-derived sea-level changes to the historical RSL data. The results suggest that mantle viscosity is lowest in the northern region: $< 0.2\times10^{21}$ Pas in the upper mantle and $< 10\times10^{21}$ Pas in the lower mantle. These low values are consistent with previous studies and reflect the influence of structure associated with the Cascadia subduction zone (e.g. *James et al., Journal of Geophysical Research, 114, DOI: 10.1029/2008JB006077, 2009*). For the southern part of the coastline, viscosity values are larger and reach up to 3×10^{21} Pas and 90×10^{21} Pas in the upper and lower mantle, respectively. Our results indicate variability of Earth model parameters along the coastline which is compatible with the transition of the plate boundary from subduction in the north to strike-slip motion in the south. Given the importance of lateral structure in this region, we are currently developing models of 3-D viscous structure that explicitly incorporate the subducted lithosphere as well as low-viscosity material in the so-called "mantle wedge." We aim to demonstrate that the lateral variability in the observed RSL response is consistent with subduction-related structure north of Cape Mendocino, California.

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