



Post-seismic deformation in the Northern Antarctic Peninsula following the 2013 magnitude 7.7 Scotia Sea Earthquake

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Large earthquakes in the vicinity of Antarctica have the potential to cause post-seismic deformation on the continent, affecting measurements of displacement and gravity field change from GRACE or those attempting to constrain models of glacial isostatic adjustment.

In November 2013 a magnitude 7.7 strike-slip earthquake occurred in the Scotia Sea around 650 km from the northern tip of the Antarctic Peninsula. GPS coordinate time series from the Peninsula region show a change in rate after this event indicating a far-field post-seismic deformation signal is present. At these far-field locations, the effects of fault after-slip are likely negligible and hence we consider the deformation to be due to post-seismic viscoelastic deformation. Here we use a global spherical finite element model to investigate the extent of post-seismic viscoelastic deformation in the northern Antarctic Peninsula. We investigate possible 1D earth models that can fit the GPS data and consider the effect of including a simple 3D earth structure in the region. These results, combined with previous results showing East Antarctica is still deforming following 1998 Mw 8.2 intraplate earthquake, suggest that much of Antarctica is deforming due to recent post-seismic deformation.