The February 6, 2013 M_w 8.0 Santa Cruz Islands earthquake and tsunami

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Supplementary Material

Two Figures and two Animations.

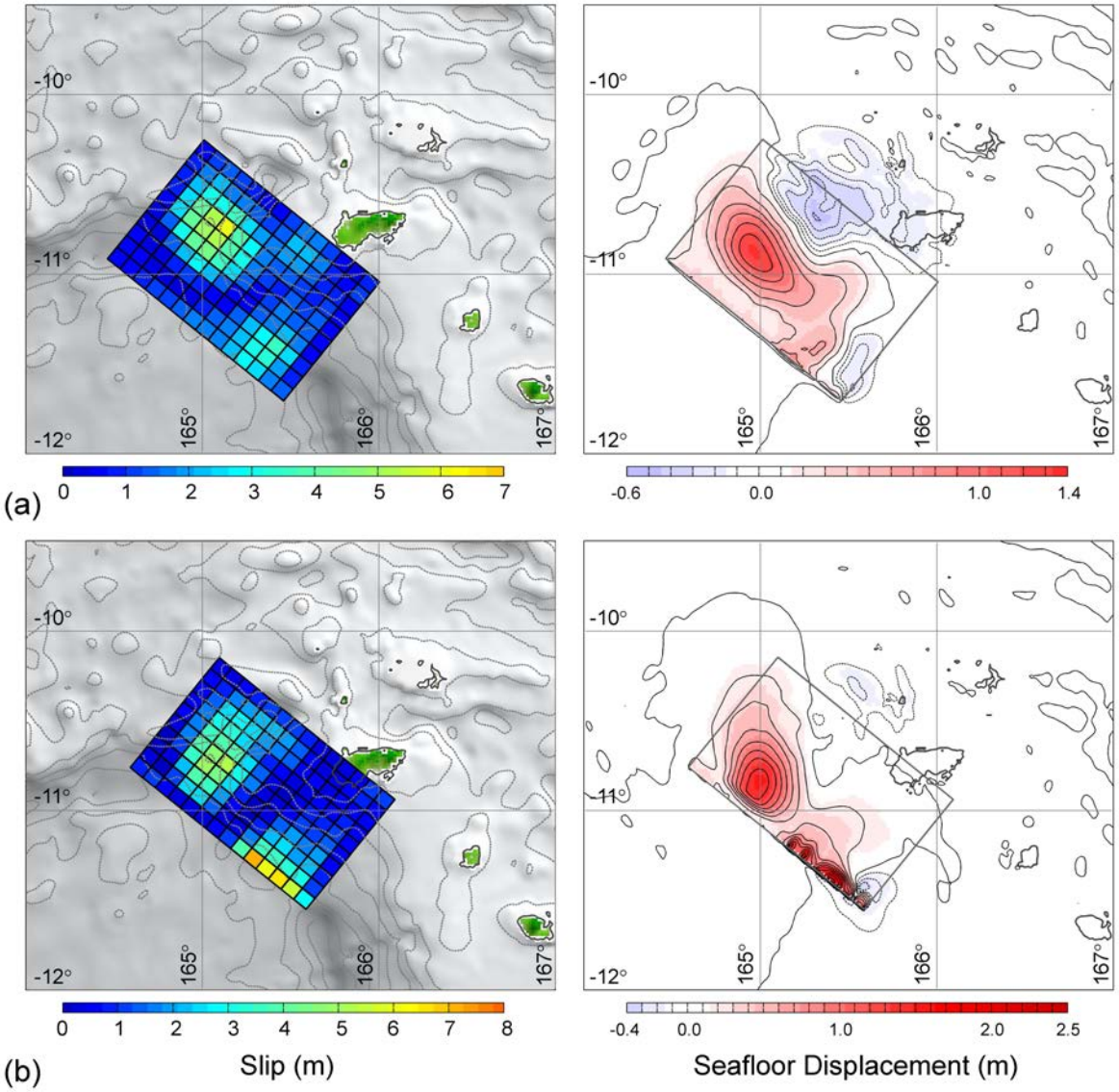


Figure S1. Initial rupture models for the February 6, 2013 Santa Cruz Islands earthquake obtained by inversions of teleseismic P waves. Maps of the fault slip (left) and rock surface displacement (right) for (a) rupture model A, which assumed a hypocentral depth of 25.5 km at the initial USGS epicenter, and a fault model dip of 18.4° based on our optimal W-phase inversion solution (similar to the USGS W-phase solution); the seismic moment for this model is 1.24 x 10^{21} Nm (M_w 8.0), and (b) rupture model B, which assumed a hypocentral depth of 25.5 km at the initial USGS epicenter, and a fault model dip of 29° based on the USGS CMT solution; the seismic moment for this model is 1.04 x 10^{21} Nm (M_w 7.9). In the left figures, the solid lines indicate the 2000-m depth contours. In the right figures, the solid lines indicate the 0.2-m uplift contours, and the dashed lines indicate the 0.1-m subsidence contours. Predicted DART waveforms are compared with data for these two models in Figure S2.

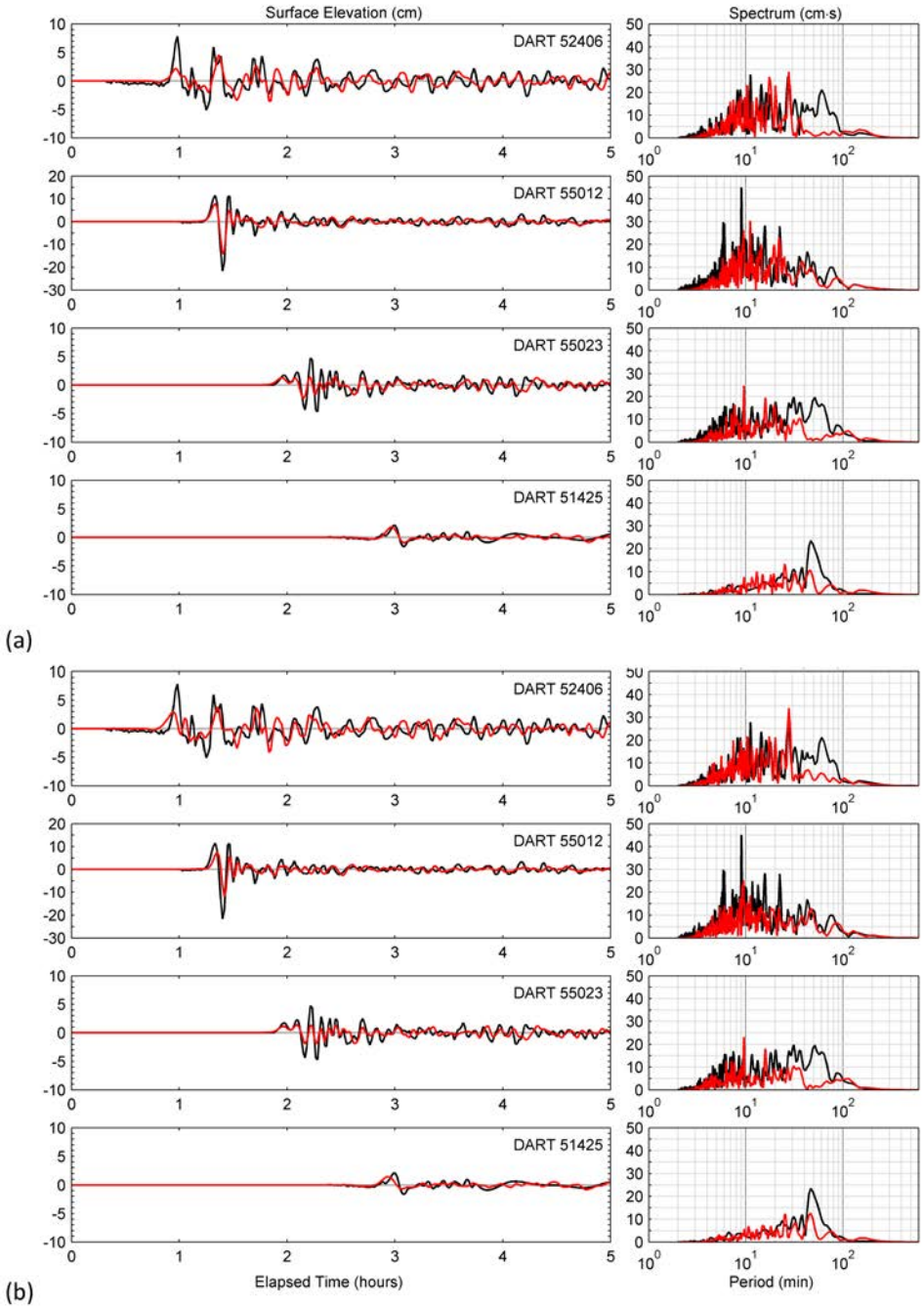
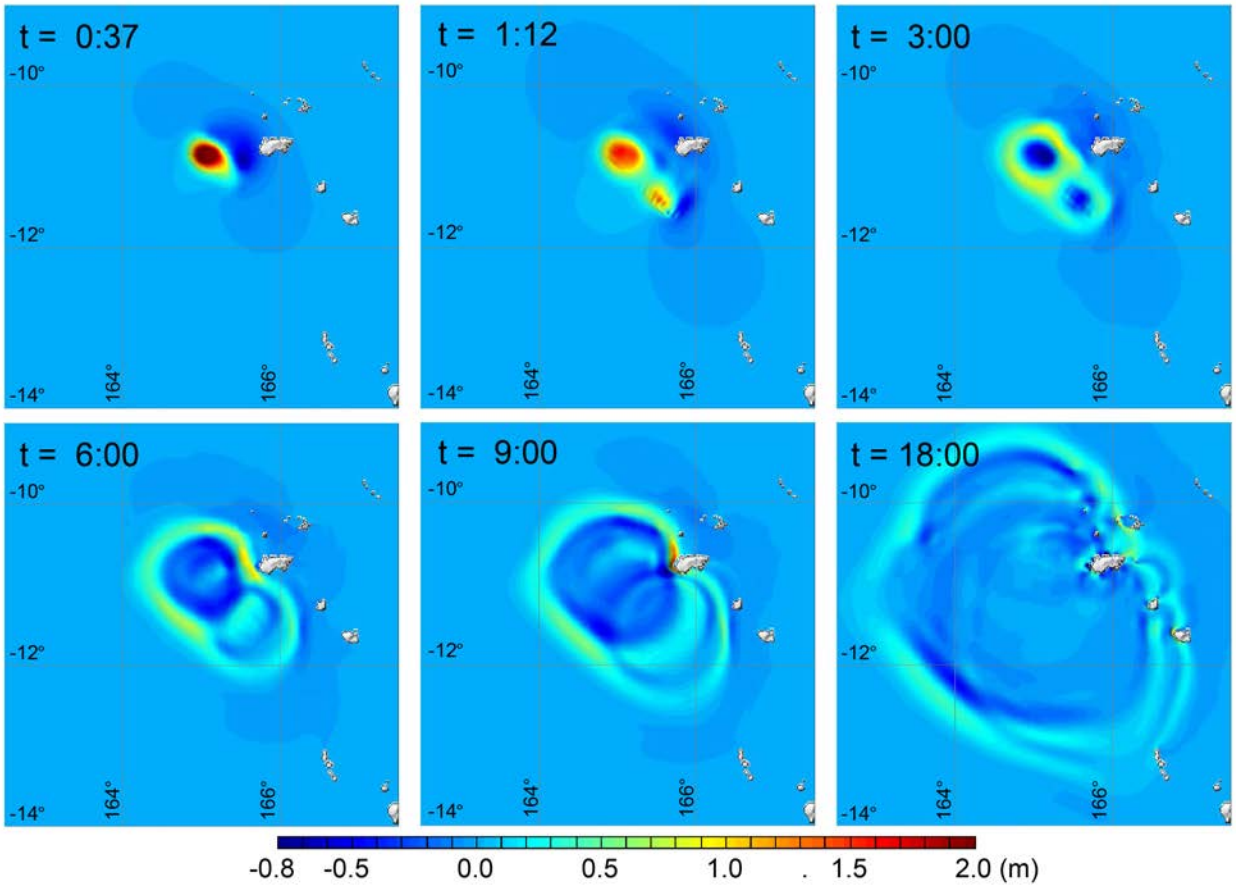
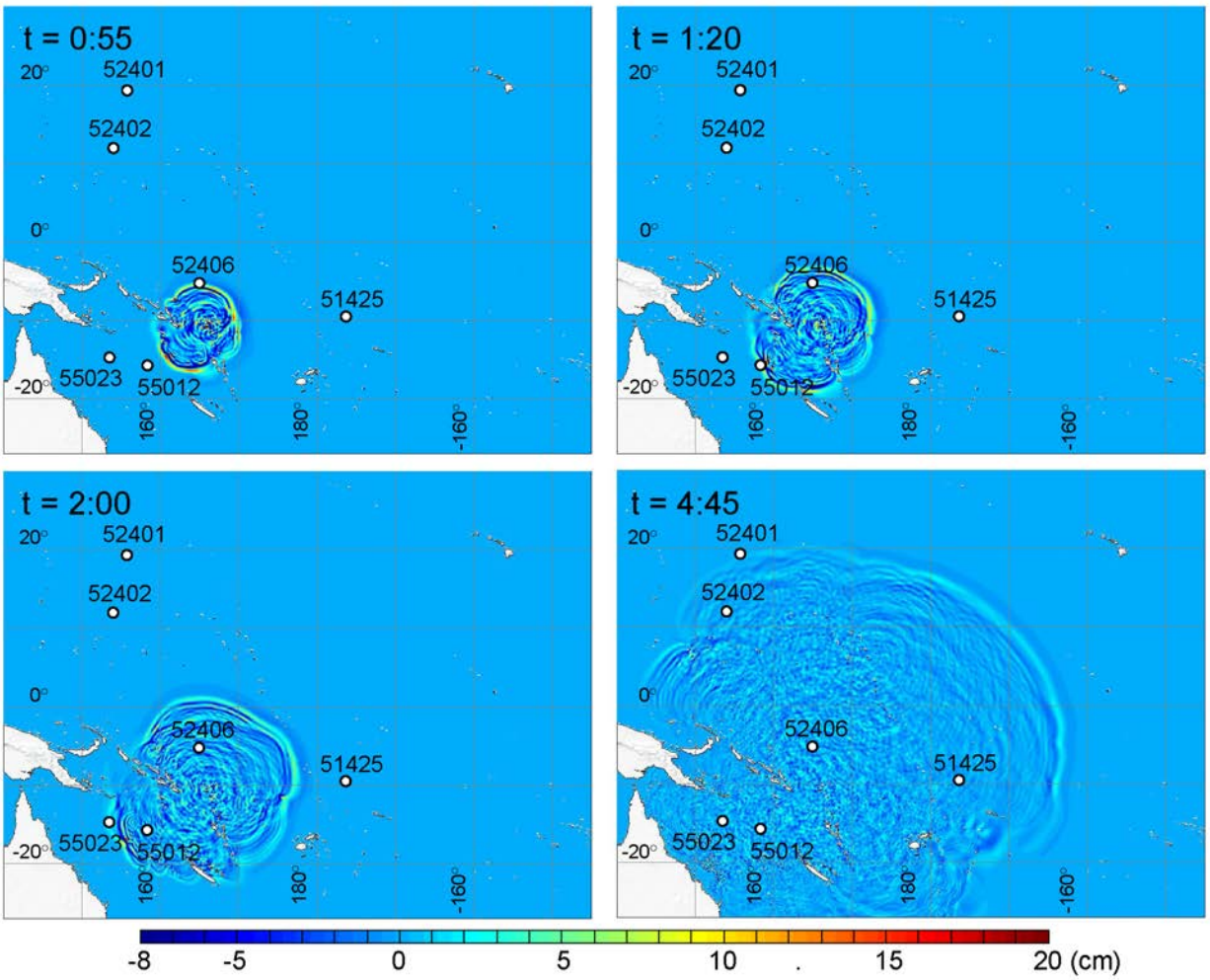


Figure S2. Comparison of observed (black) and computed (red) DART sea surface elevation time series (left) and spectra (right) for the rupture models A and B shown in Figure S1. The position of the DART buoys relative to the source and the pattern of peak tsunami amplitudes are shown in Figures 10 and 11. The poor fit to the observations at DART 52406 and 55023 is improved in the final model shown in the main text, indicating the value of the tsunami modeling for constraining the rupture model.



Animation S1. Time evolution of the computed sea surface elevation showing tsunami generation and propagation near the rupture area.



Animation S2. Time evolution of the computed sea surface elevation showing tsunami propagation across the Pacific. White circles indicate DART water level stations.