

A synoptic view of subduction zone earthquakes and geophysical processes from GRACE/GRACE-FO

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The Gravity Recovery and Climate Experiment (GRACE) was a joint satellite mission of NASA and the German Aerospace Center that measured the Earth's static and time-variable gravity field between 2002 and 2017. During the GRACE era 19 earthquakes of magnitude ≥ 8.0 occurred, with 5 events of $M \geq 8.5$; all of these great earthquakes were at, or near, subduction zones. GRACE measurements enabled a unique, synoptic view of these great earthquakes, especially when the region of highest slip was offshore. As summarized in our 2016 UJNR presentation, for the largest of the 19 great earthquakes we were able to invert for earthquake source parameters [*Han et al.*, 2013] and for most of the events we were able to characterize the post-seismic response and to infer the regional rheological response on the time scale of years. Although most studies have focused on the gravity changes during (coseismic) and following these great earthquakes, *Panet et al.*, 2018 reported variations in Earth's gravity field *prior to* the great 2011 Tohoku-Oki earthquake as well. In our poster presentation we will provide an update to our great earthquake studies and highlight future opportunities to further our understanding of subduction zone earthquakes and processes with the launch of the GRACE-Follow On mission.