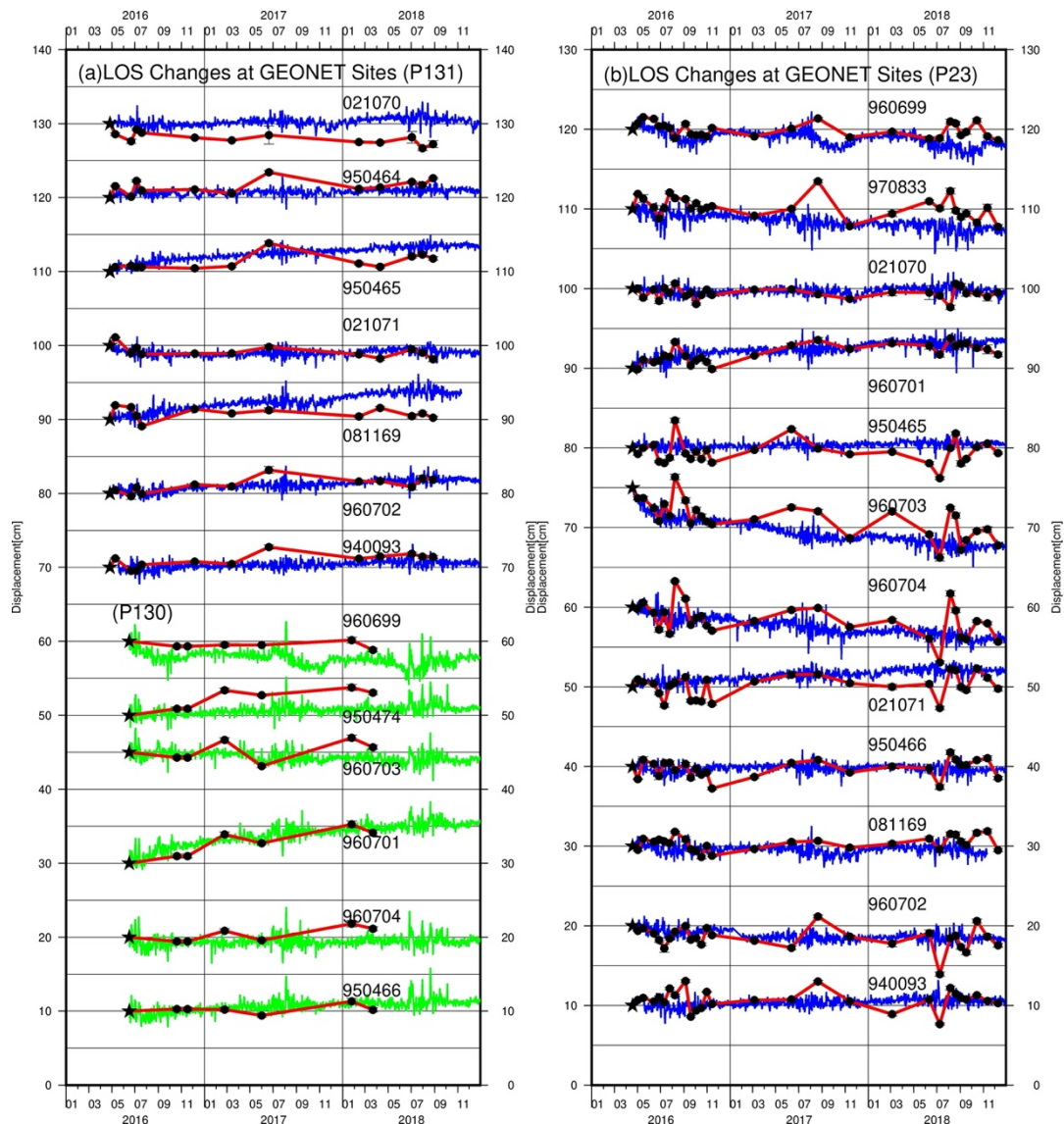
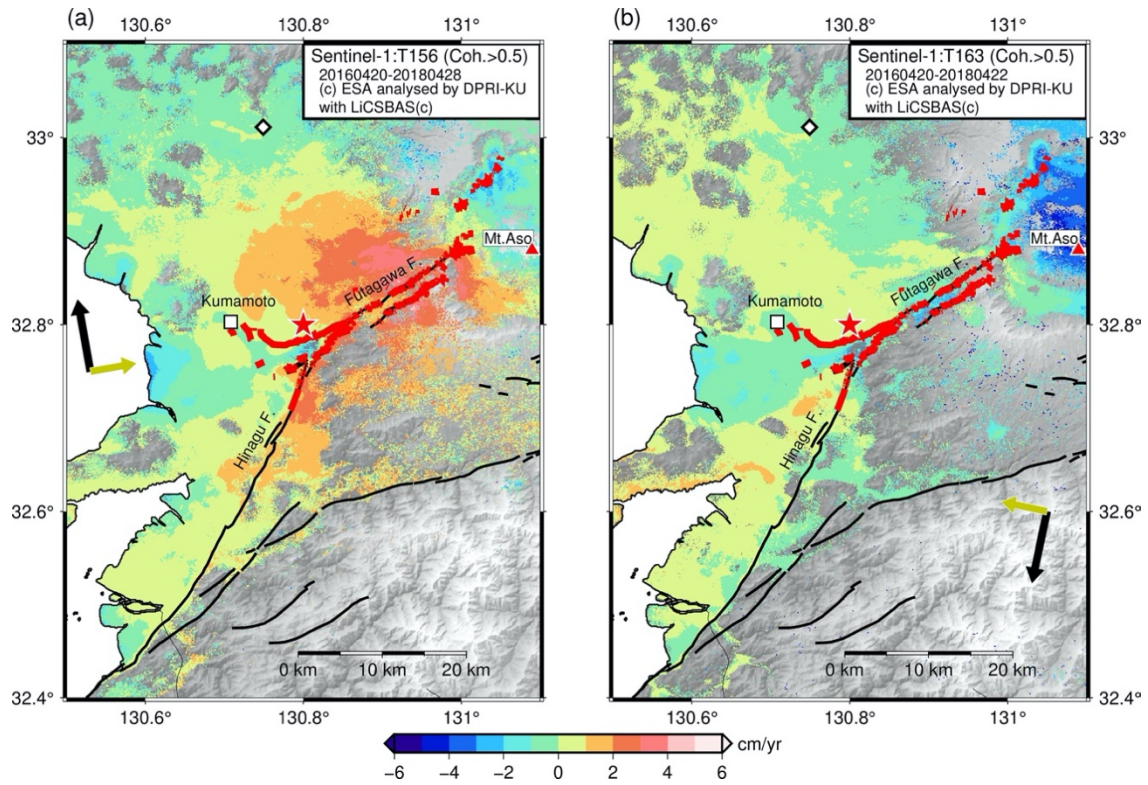
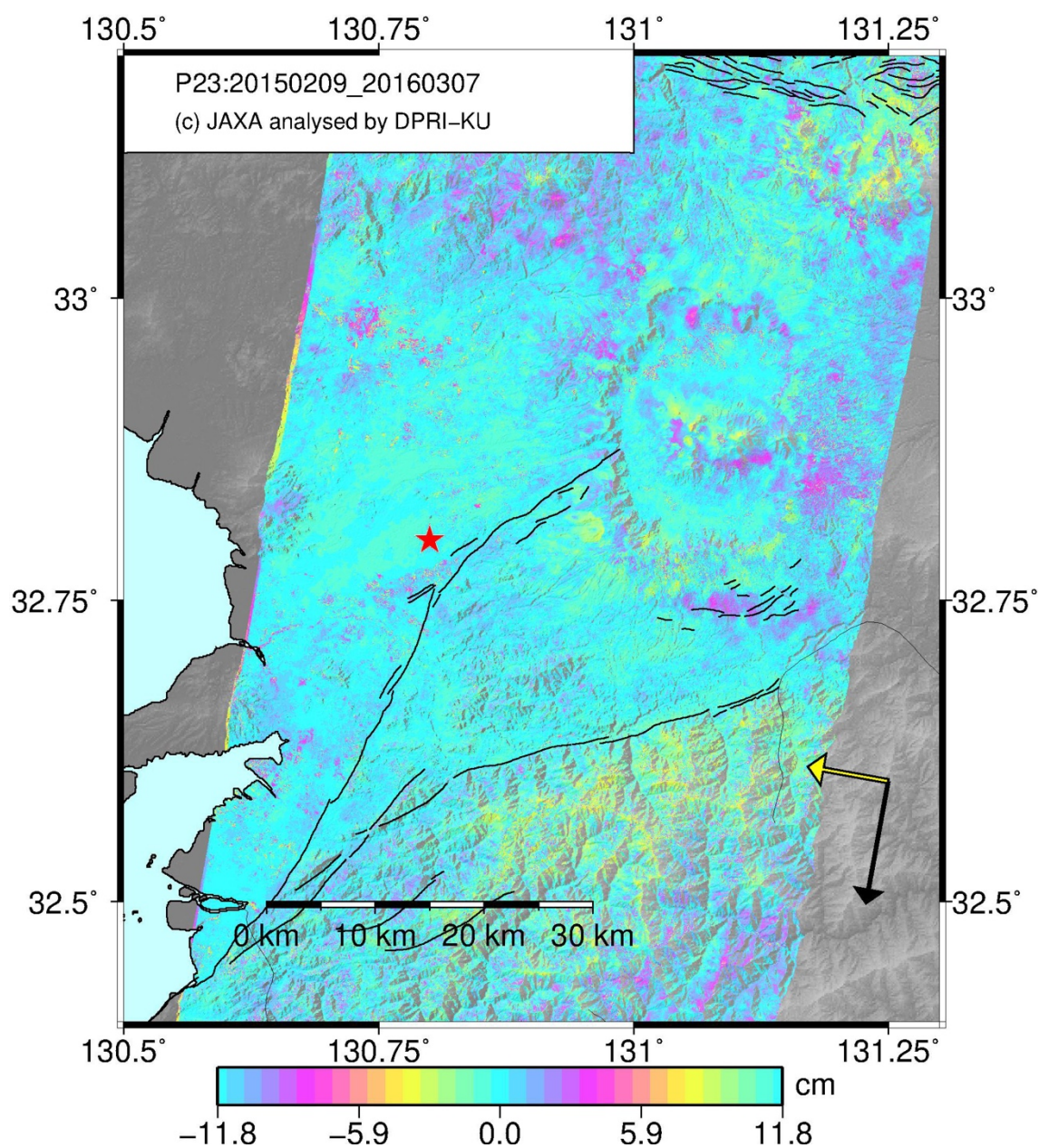




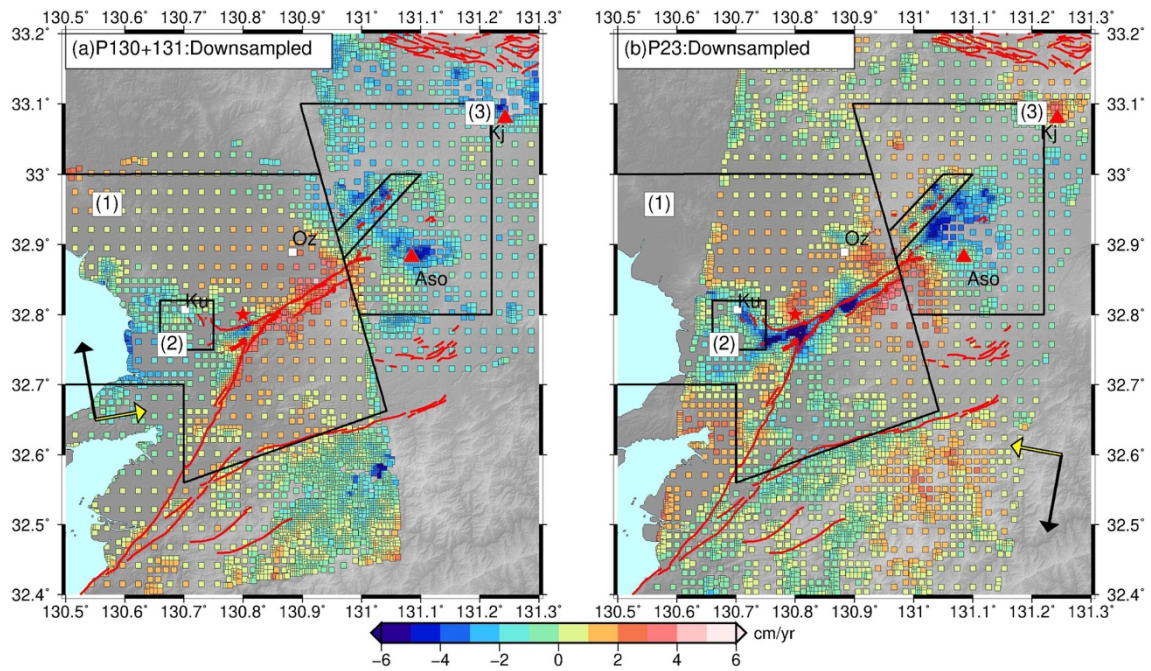
Supplementary Figure S4. Comparison of observed LOS changes and those calculated from coordinate changes at GEONET stations. Red lines and black dots are observed LOS changes. Stars indicate the first observations for each path (04/26/2016 for P131, 06/16/2016 for P130, 04/18/2016 for P23). All changes are relative to these dates, except 940093. For 940093, LOS changes are relative to data on 05/18/2016, because of trimming of branches of nearby trees right before this date. (a) LOS in ascending images. Blue and green lines are calculated LOS changes of GEONET stations w.r.t. 960700 and 970833 for paths 131 and 130, respectively. (b) LOS in descending images. Blue lines are calculated LOS changes of GEONET stations w.r.t. 960700.



Supplementary Figure S5. Average LOS velocity map deduced from Sentinel-1 images. Analyses were made with LiCSBAS [Morishita et al., 2020]. (a) Ascending track T156. Subswath IW1 (incidence angle  $\sim 33.8^\circ$ ). (b) Descending track T163. Subswath IW2 (incidence angle  $\sim 39.2^\circ$ ). Yellow and black arrows indicate direction of emission of microwave and flight, respectively. See also legends of Figures 2 and 5.



Supplementary Figure S6. Interferogram of P23-F2950-2960 before the 2016 Kumamoto earthquake. Master: Feb. 9, 2015. Slave: Mar. 7, 2016.



Supplementary Figure S7. Distribution of downsampled LOS velocities. (a) Ascending image (P130-131). (b) Descending image (P23). Solid lines are boundaries of regions in which data are used in inversions. (1) Futagawa and Hinagu faults. (2) Suizenji fault. (3) Aso. Data in small rectangle in region (3) was excluded.