

Constraints on the Structure of the Border Ranges Fault System, South-Central Alaska from Integrated 3-D Inversion of Gravity/Magnetic Data

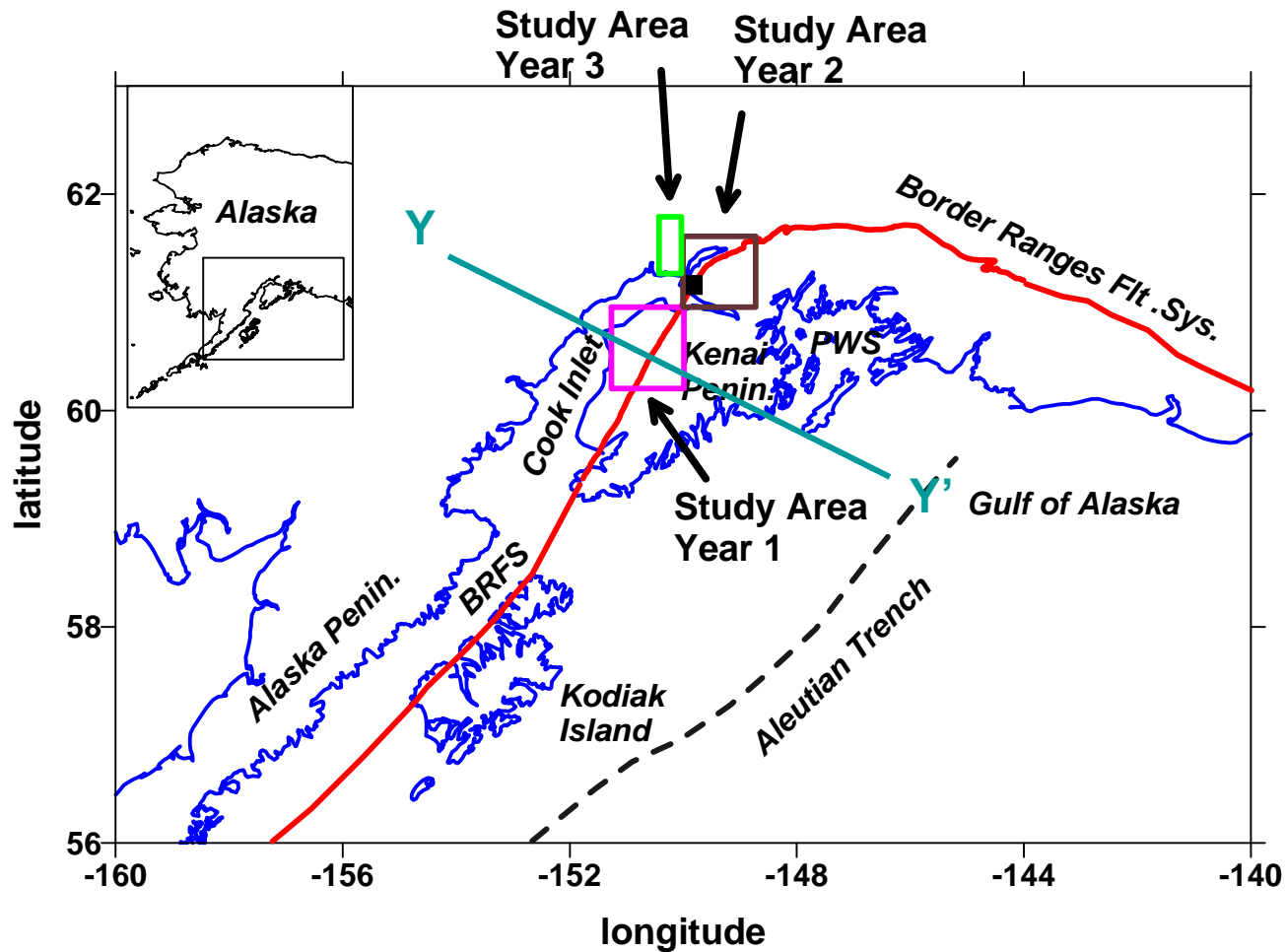
(grant 48312-AC8)

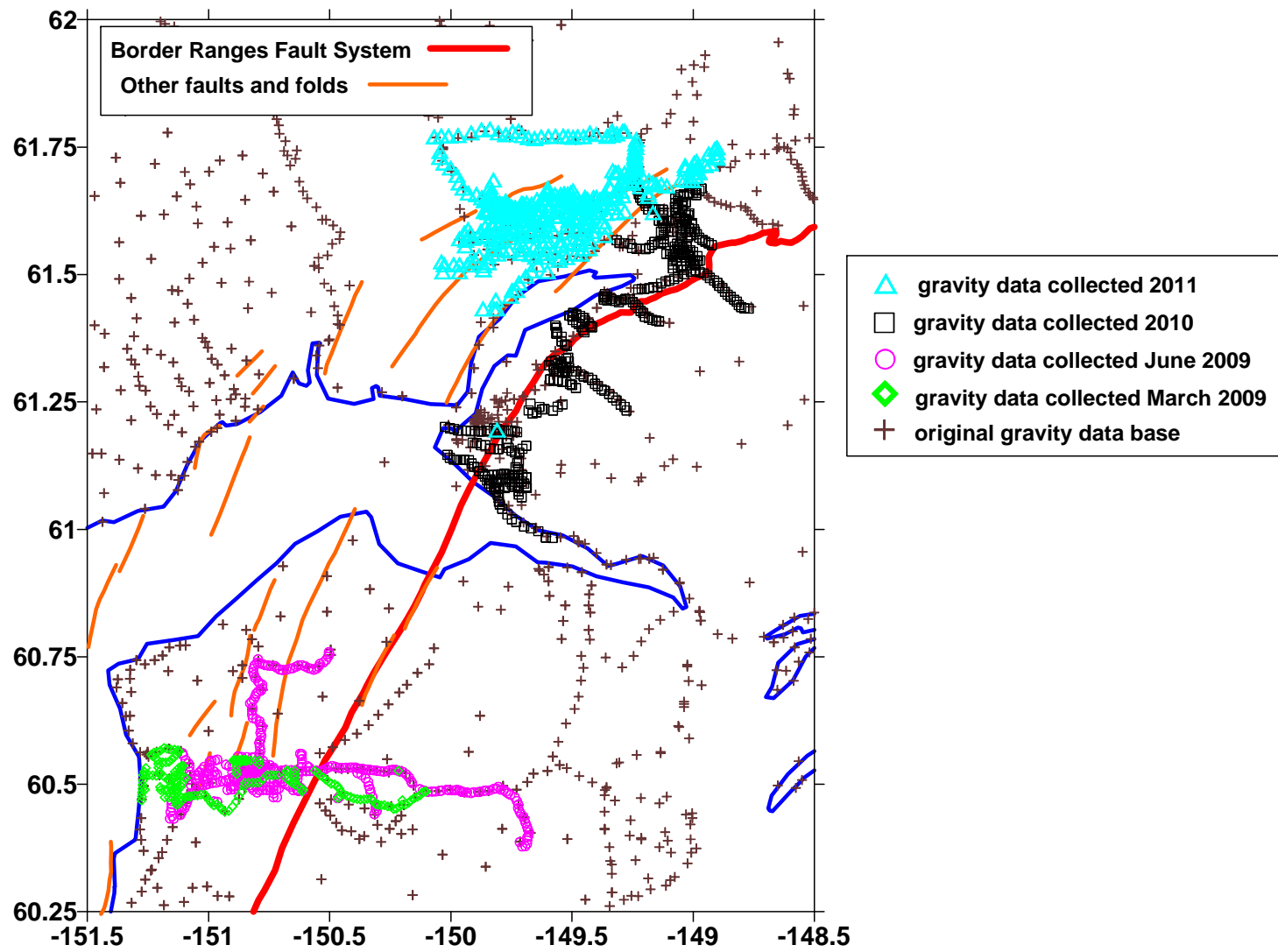
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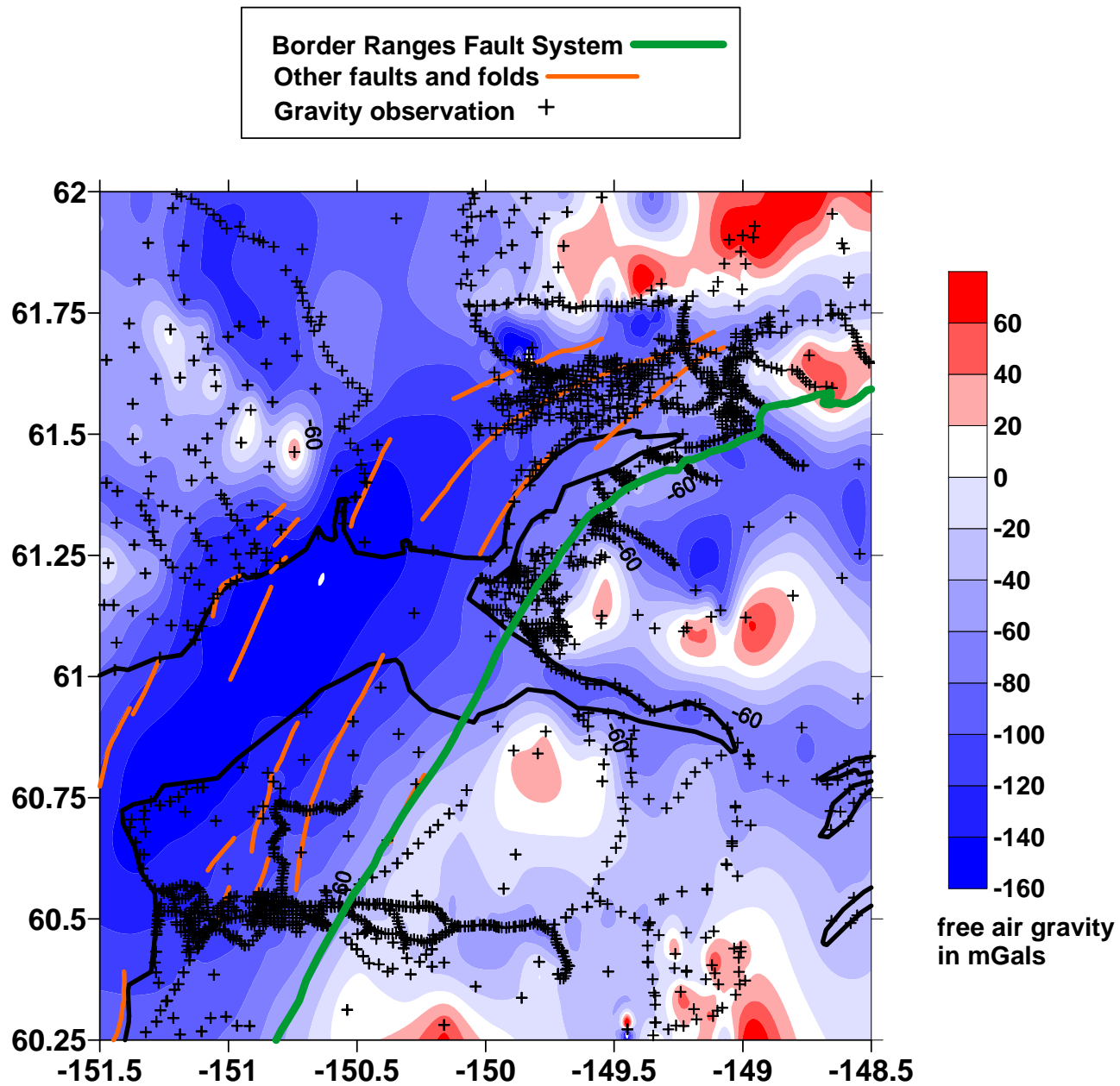
Significance

- The Border Ranges Fault System (BRFS) bounds the major petroleum producing region of Cook Inlet Basin
- The geometry, timing, sense and amount of movement along BRFS and its influence on basin formation are poorly known
- We will test models of BRFS structure and basin evolution using a novel 3-D inversion of gravity and magnetic data

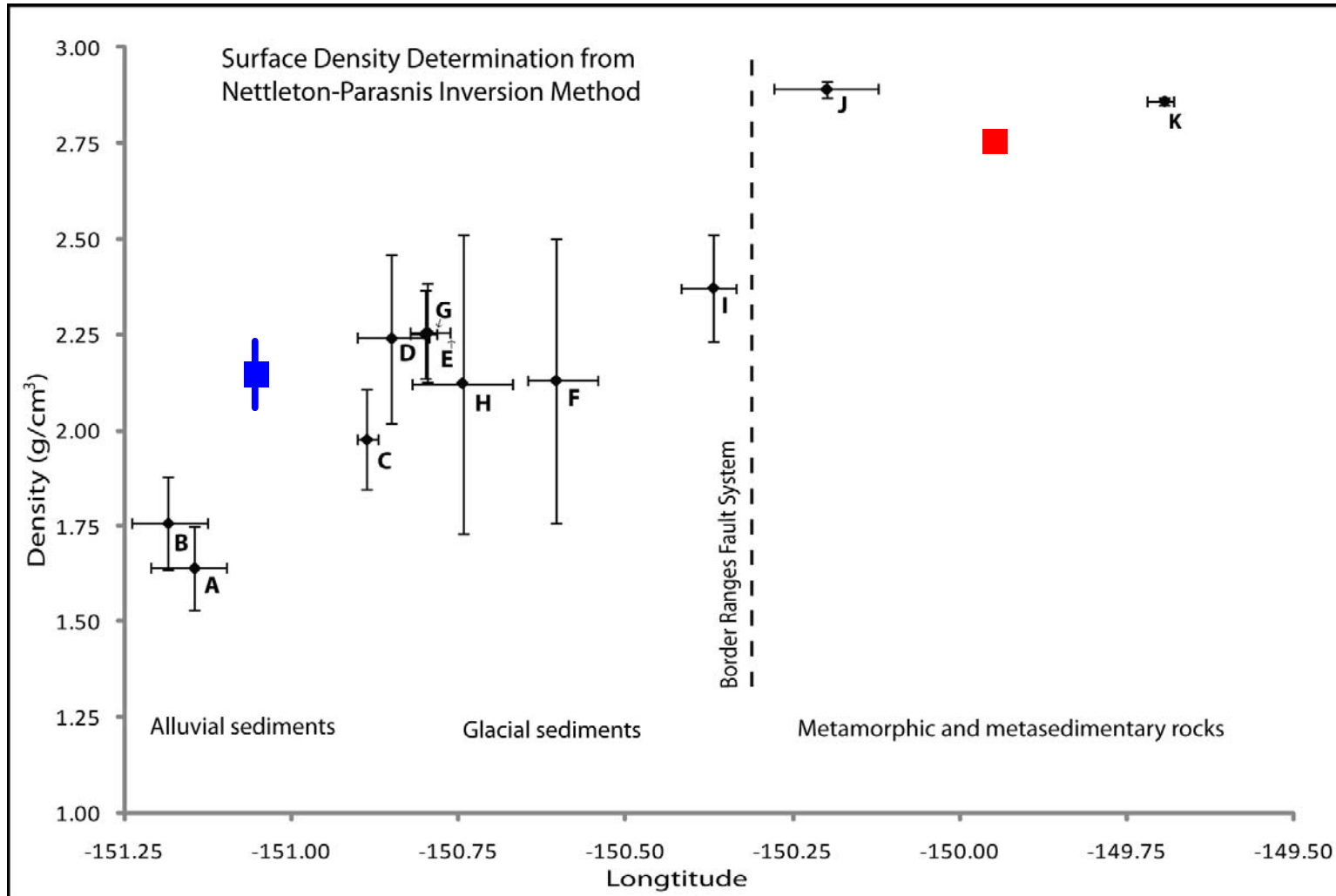




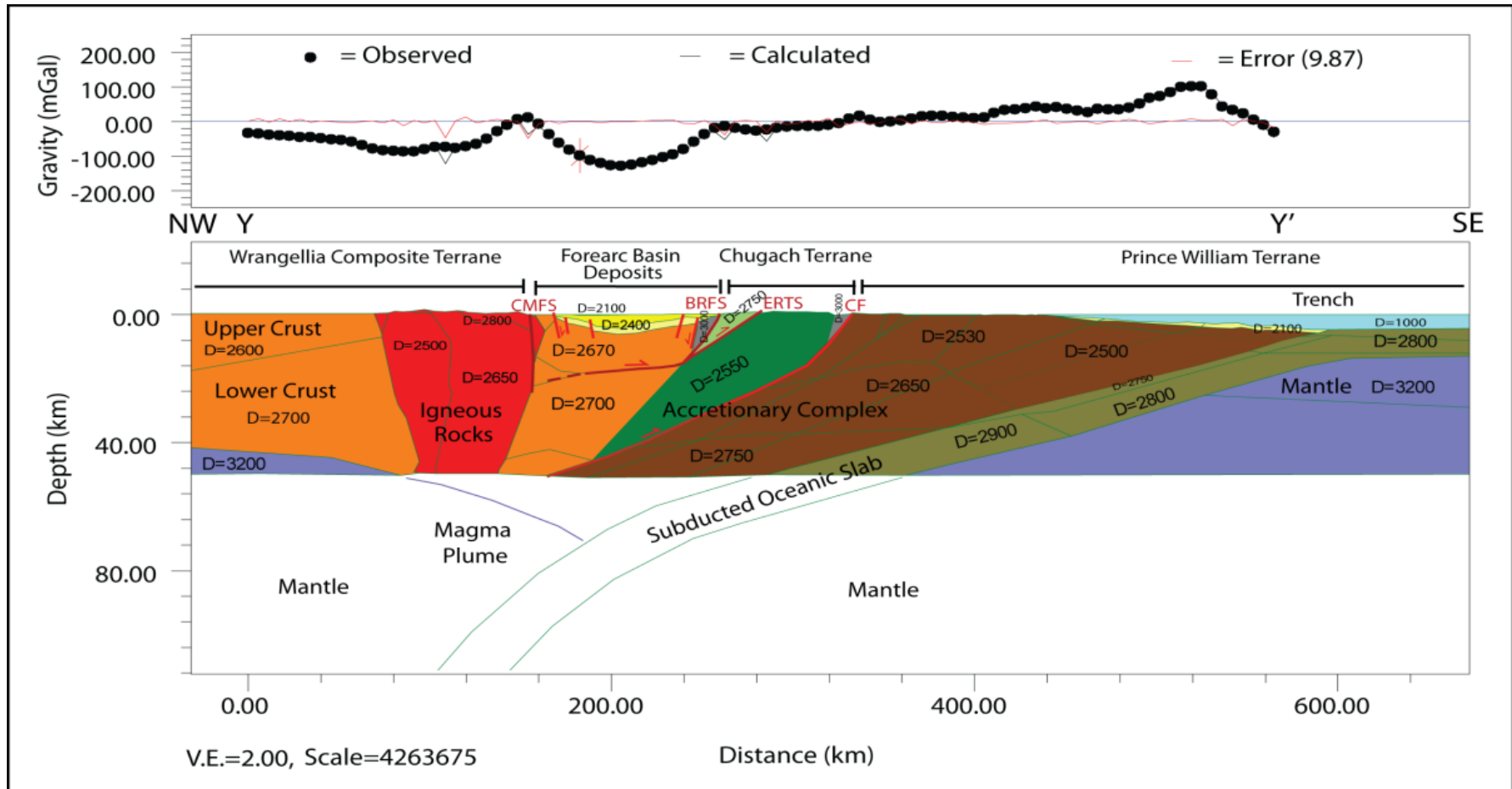
Between 2009 and 2011 we have collected over 1200 gravity observations (green, magenta, blue, and black symbols) to help constrain our models of the BRFS. Note sparseness of original data (brown plusses).



Our latest map of variation in gravitational acceleration across the BRFS.



We have collected gravity observations in subregions to estimate variations in near-surface densities. These are comparable to estimates from well logs (blue box) or surface samples (red box).



Cross section along Y-Y' (see first figure) showing observed gravity (black dots), calculated gravity (black line) and error (red line). Preliminary geologic/density model shown below. Model is based on well log, seismic reflection, surface geology and other information.