Characterizing the Southeastern Appalachian Margin Via Integrated Potential Field and Structural Modeling

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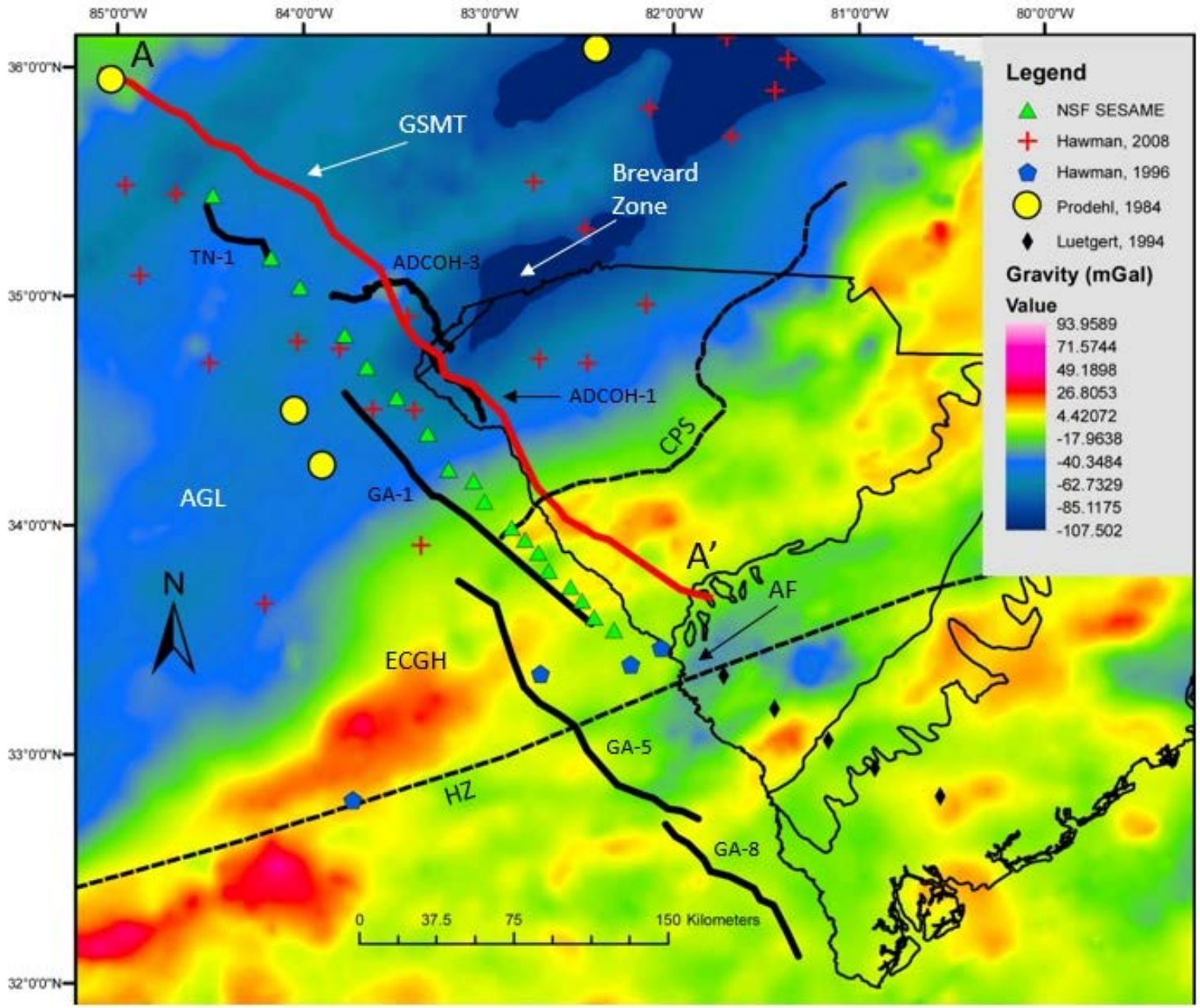
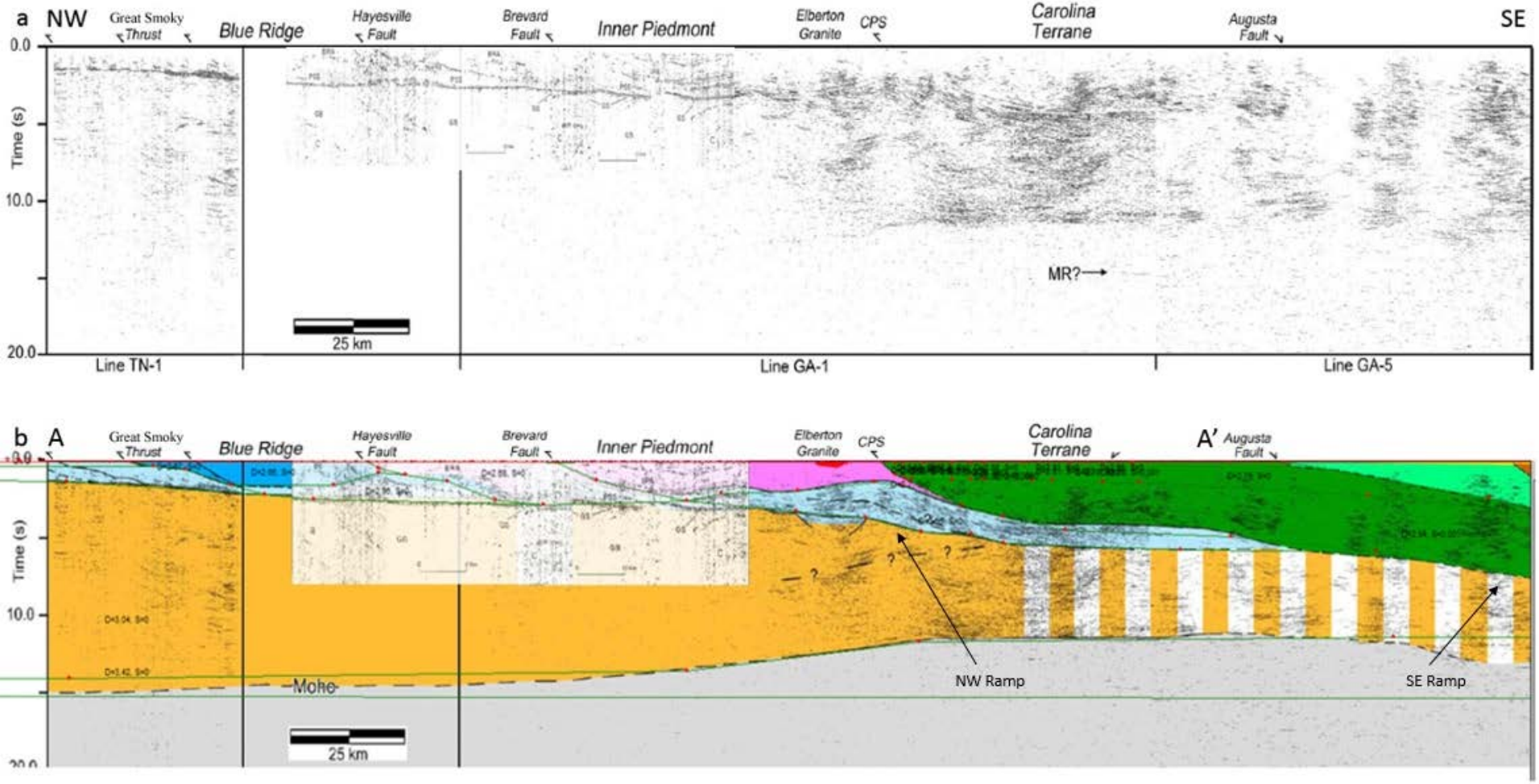
Model profile (A-A'), major structural features, and other geophysical data over Bouguer gravity

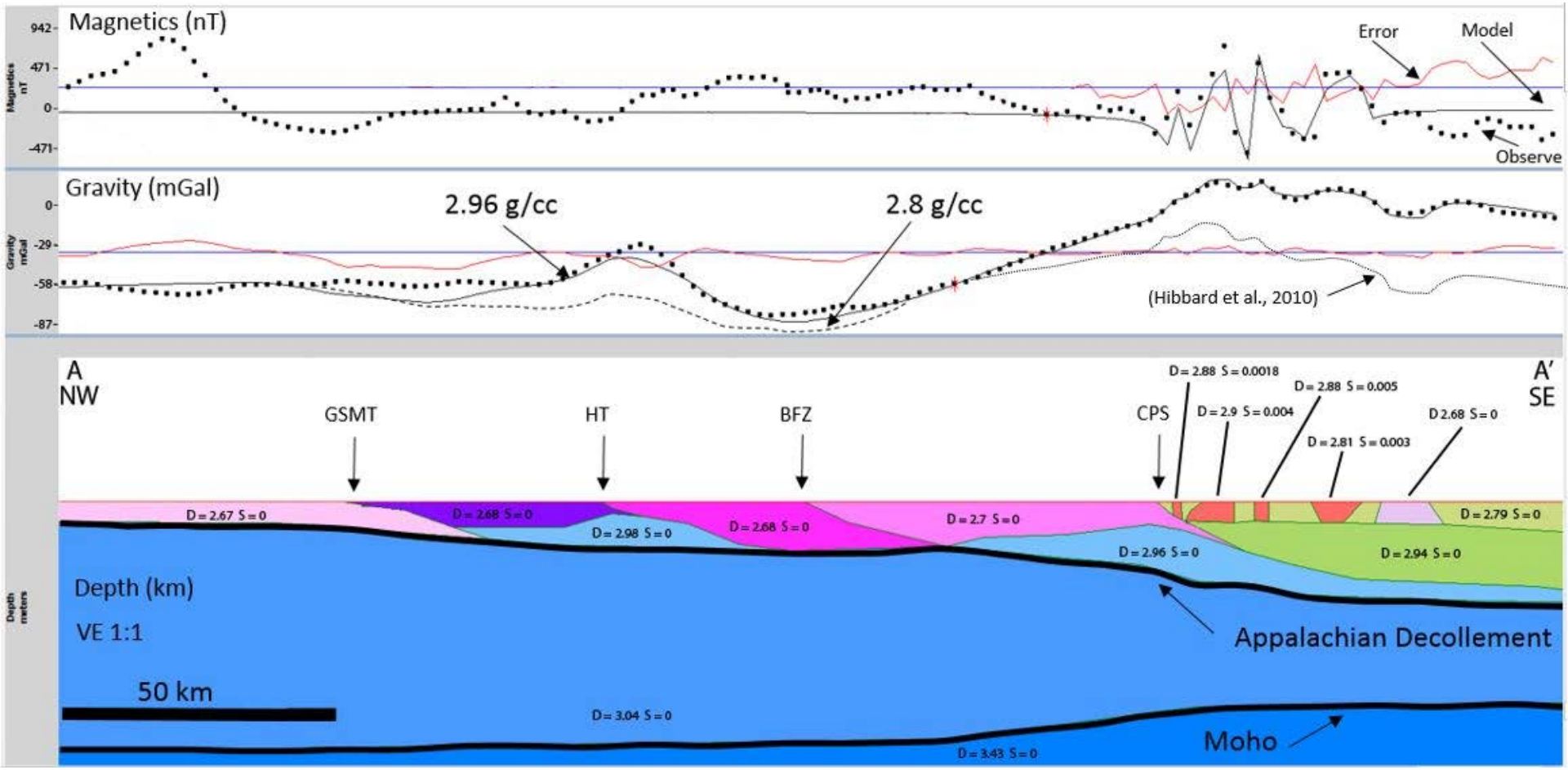


Merged COCORP and ADCOH seismic data



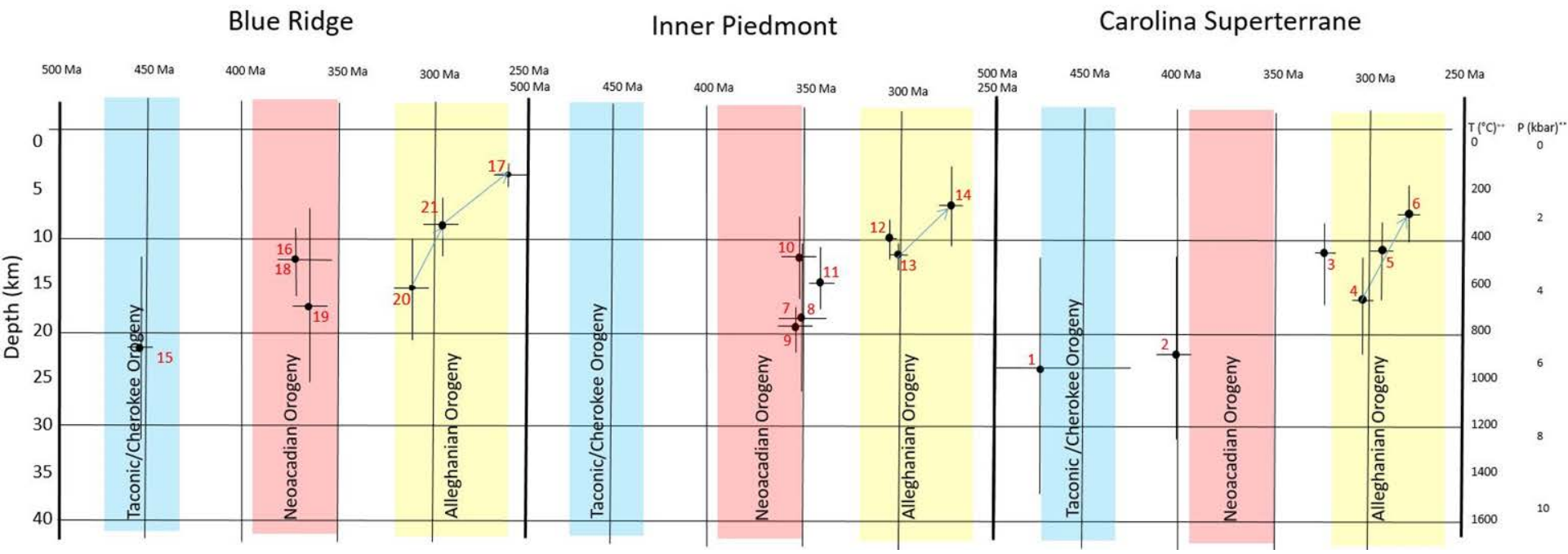
- COCORP and ADCOH seismic is merged, depth approximated (6.5 km/sec (Hawman, 2008)), and projected along structural strike/potential field anomalies
- Note NW dipping seismic reflectors on COCORP data and footwall anticline of interpreted platform sediments beneath Hayesville fault and CPS
- Forward model polygons come directly from seismic reflection data

Integrated potential field forward model profile



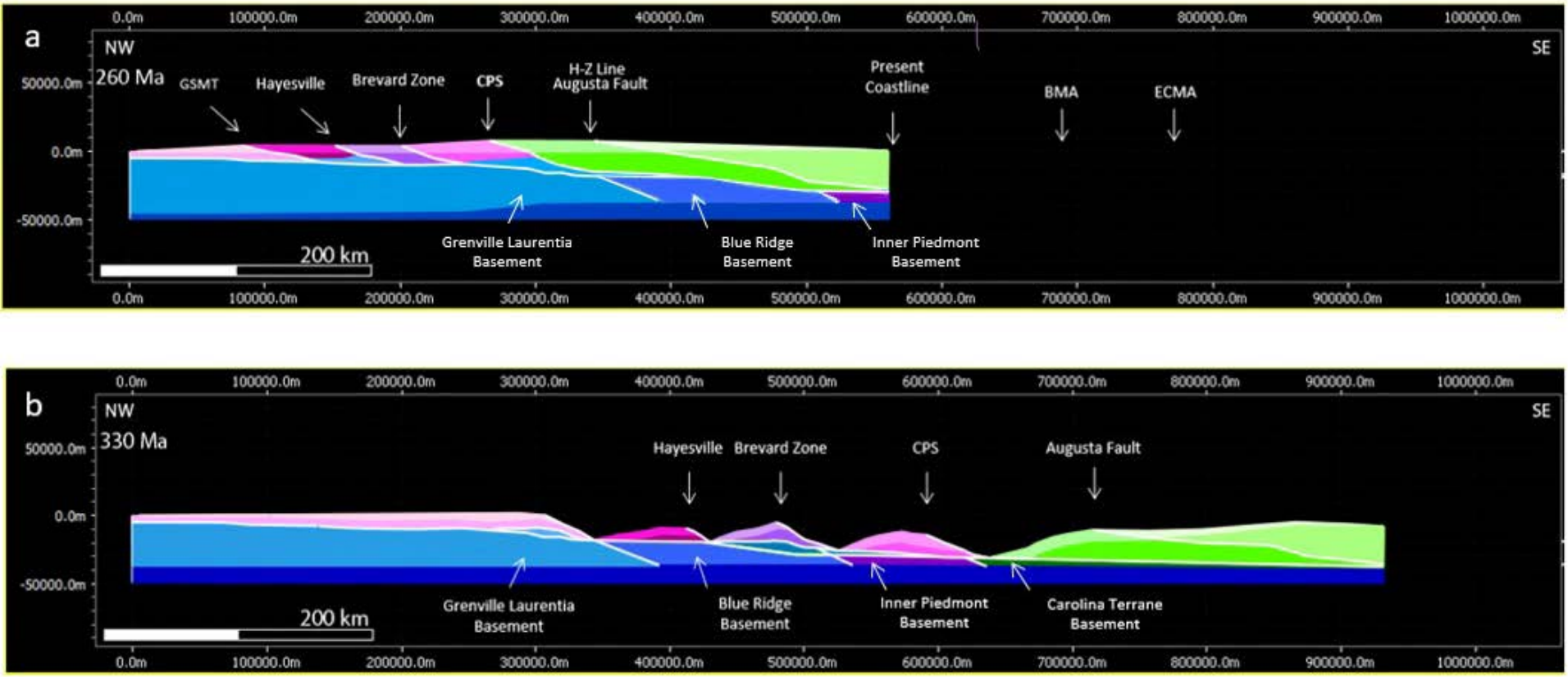
- Modeling APGA does not require change in lower crustal density → Carolina Terrane likely does not span full thickness of crust → Grenville basement extends farther eastward at least to Agusta fault
- Footwall anticlines are imbricate structures of remobilized Grenville basement → Laurentian platform sediments do not everywhere underlie the Blue Ridge and Inner Piedmont

Uplift from compilation of P-T-t geochemical data



Can low angle faults produce observed regionally consistent Alleghanian uplift of 5-10 km?

Retrodefomed structural model from integrated potential field model



- Retrodeformation = 210 km of shortening in FTB (Hatcher et al., 2007) + minimum displacements on 4 basement involved faults (Smokey Mtn, Hayesville, Brevard, CPS) = at least 370 km of total shortening

- Observed 5-10 km of uplift can easily be accommodated on these low angle faults