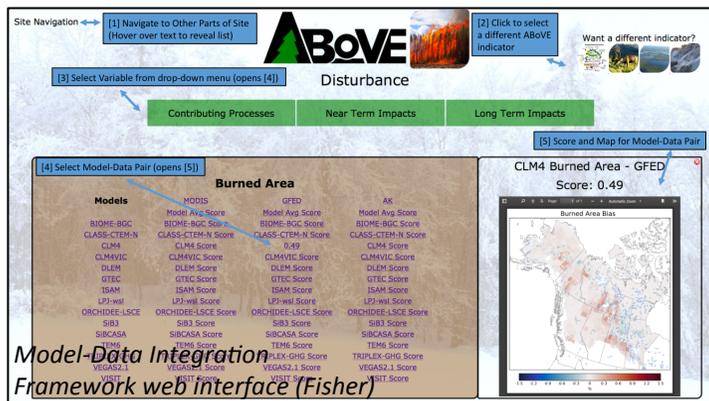


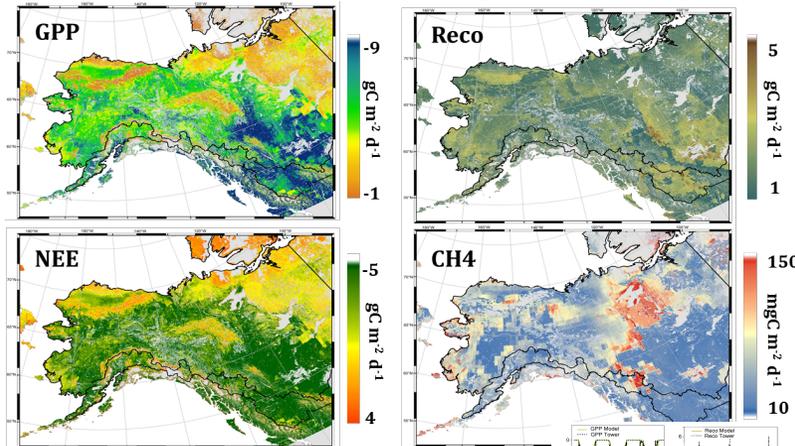
Model-Data Integration Framework

- **Model-Data integration and benchmarking system software for ABOVE** under development in conjunction with the International Land Model Benchmarking (ILaMB) framework and the ABOVE Science Cloud *Fisher Project*
- Survey distributed to 23 modeling groups around the world to collate national and international remote sensing and other **data needs for model improvements** in the ABR *Fisher Project*
- **Model uncertainty maps** for the ABOVE domain produced and distributed to the ABOVE Science Cloud to target data acquisitions *Fisher Project*
- **Existing ABOVE datasets collation**; interfacing with the Permafrost Carbon Network *Fisher Project*



Model Development

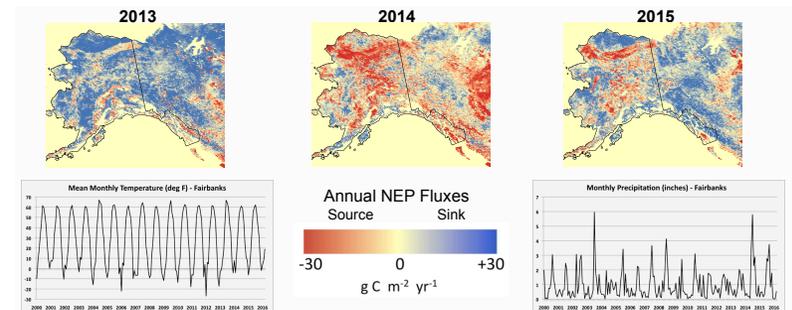
- **UVAFME model development:** changing temperature thresholds for tree growth; mortality sensitivity to fire; mortality-type indicators; species traits parameterization *Shugart Project*
- **TEM model development:** fire effects on carbon cycling; permafrost dynamics; changes in net primary productivity with climate change; thermokarst mapping *Fisher Project*
- **TCF model development:** incorporation of SMAP, MODIS, AMSR-E, and MERRA2 data; evaluation with in situ sites in AK and CN *Kimball Project*



ABOVE Domain Flux Simulations from TCF model (Kimball) (Aug. 2003-15)

Latest Modeling Results

- **Thermokarst mapping** *Fisher Project*
- **Thermal conductivity, CO₂ flux response to active layer depth** *Kimball Project*
- **CO₂ fluxes (GPP, Rh, NEE), CH₄ emissions, and soil organic carbon stocks** at 1 km resolution *Kimball Project*
- **Fractional open water inundation** at 5 km, 10-day resolutions from 2002-2015 (Du et al. 2016: *RSE*) *Kimball Project*
- **Freeze-thaw classification** at 6 km, daily (AM, PM) resolutions *Kimball Project*
- **Net Ecosystem Production** for 2013-2015, sensitivity to fire, temperature, and moisture from CASA model *Potter Project*



Reference: Potter, C., S. Klooster, and V. Genovese, 2013, Alaska ecosystem carbon fluxes estimated from MODIS satellite data inputs from 2000 to 2010, *Carbon Balance and Management*, 8:12. <http://www.cbmjournal.com/content/8/1/12>