Atmospheric CO_2 observations reveal strong correlation between regional net biospheric carbon uptake and solar induced chlorophyll fluorescence

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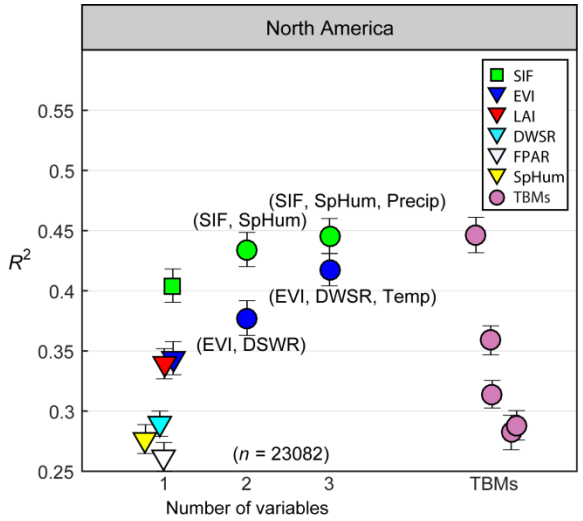
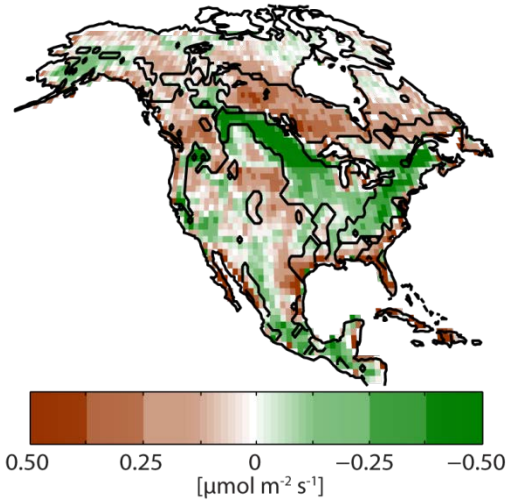
- Solar induced chlorophyll fluorescence (SIF) explains regional net ecosystem exchange over North America better than existing datasets and mechanistic models



SIF alone (green square) explains ~40% of the variability in the atmospheric data. The best linear models with SIF (green circles) explain more variability than those without SIF (blue circles).

- SIF-informed inverse estimates of NEE show consistent growing season shift from needleleaf forests to croplands in North America



Difference map of inverse estimates with and without SIF (2008-2010 growing season average). Green (brown) indicates regions where inversions with SIF show increased (decreased) uptake.