Supplementary materials

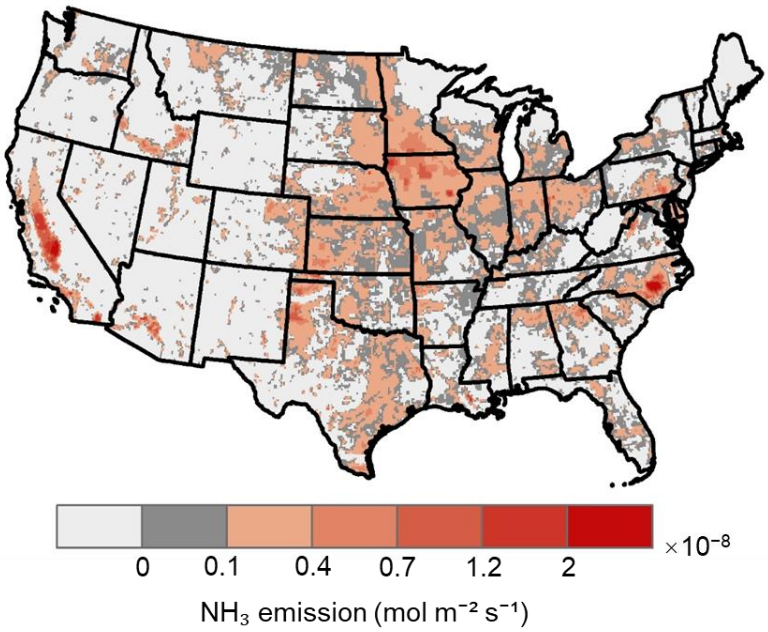

Figure S1. NH_3 emissions from bottom-up inventories over the CONUS.

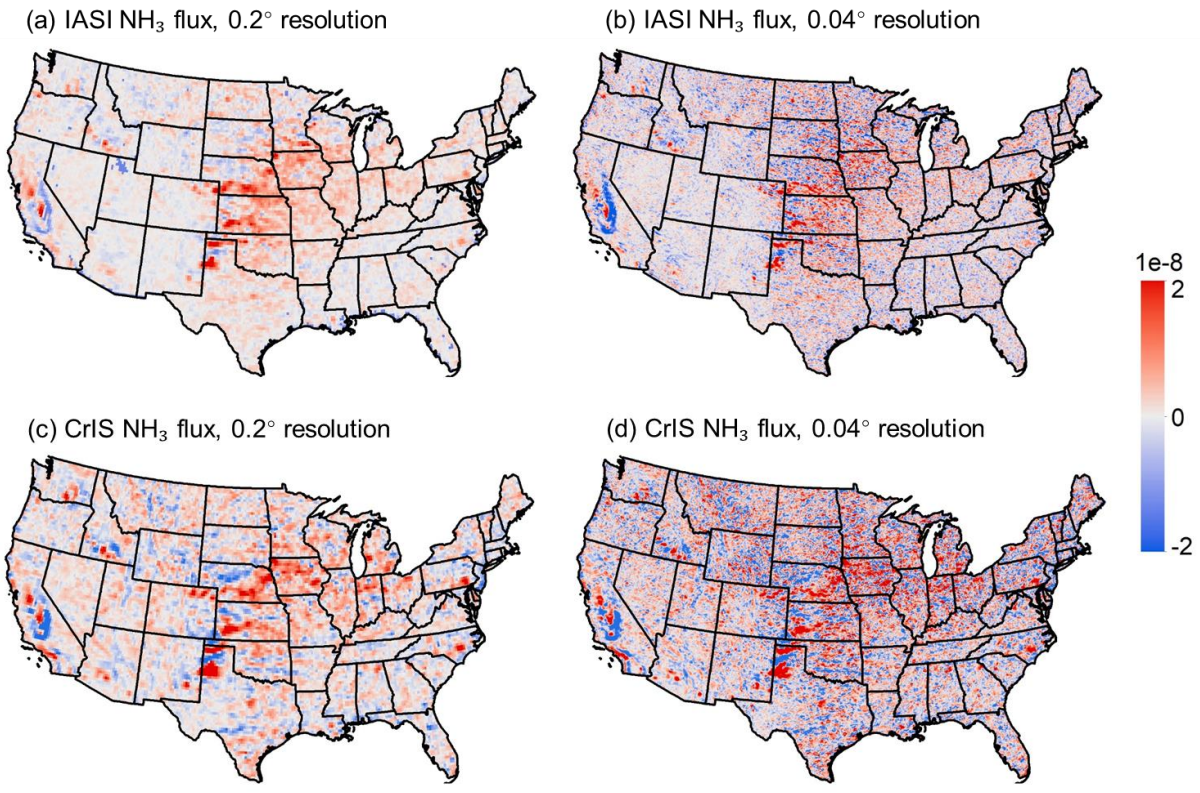

Figure S2. IASI- (a, b) and CrIS- (c, d) derived NH_3 $\boldsymbol{DD\_topo}$ fluxes averaged from Sep 2019 to Apr 2021 over the CONUS on a 0.2° (a, c) and 0.04° (b, d) grid.

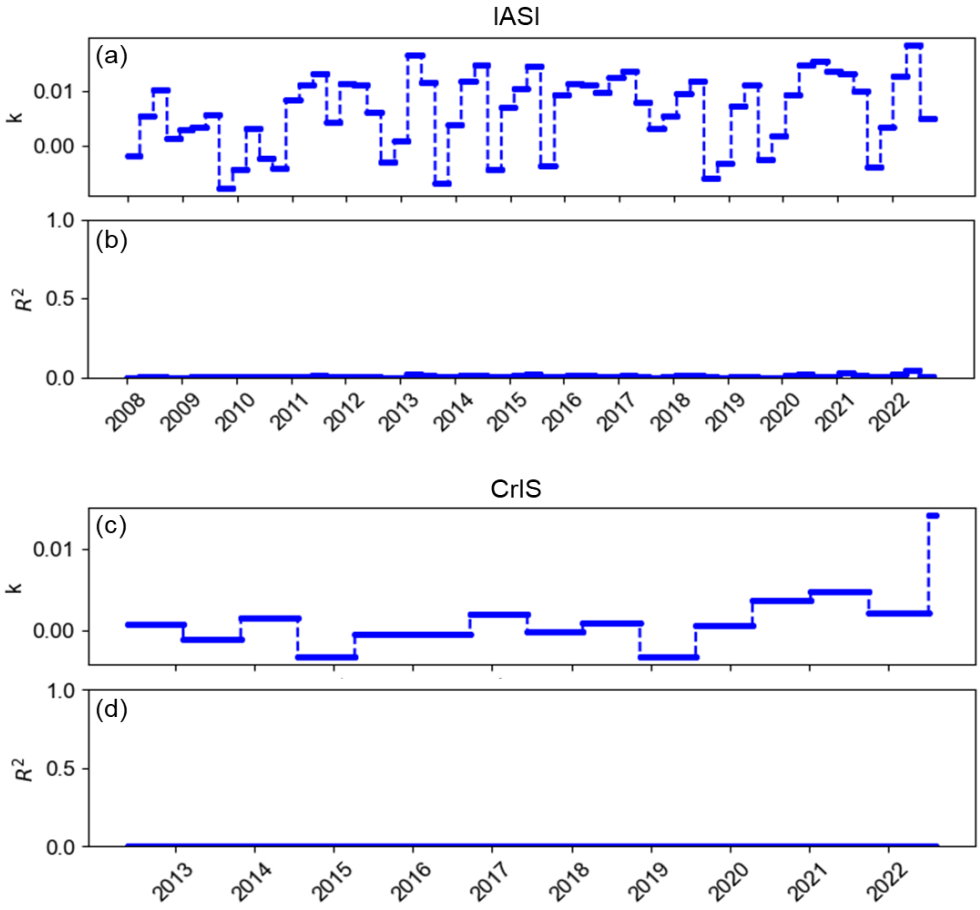

Figure S3. Fitted inverse chemical lifetime ($\boldsymbol{k}$) and its fitting R^2 for IASI (a, b) and CrIS (c, d) records over the CONUS.

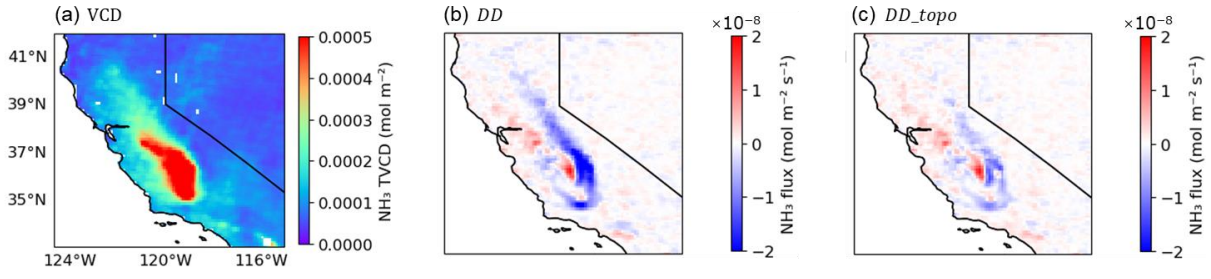

Figure S4. VCD, DD, DD_topo terms in the San Joaquin Valley from IASI over 2008 to 2022.

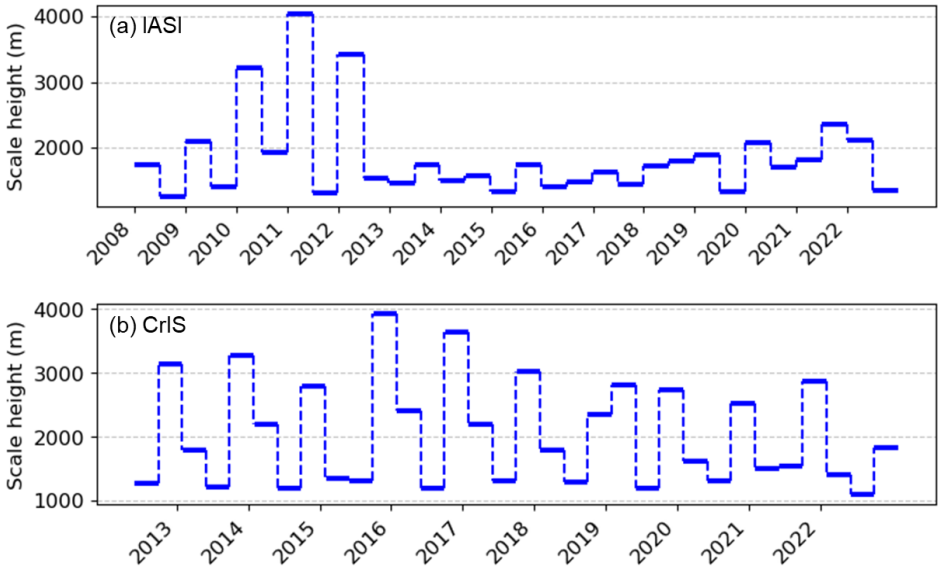

Figure S5. Fitted scale heights for IASI (a) and CrIS (b) records over the CONUS.

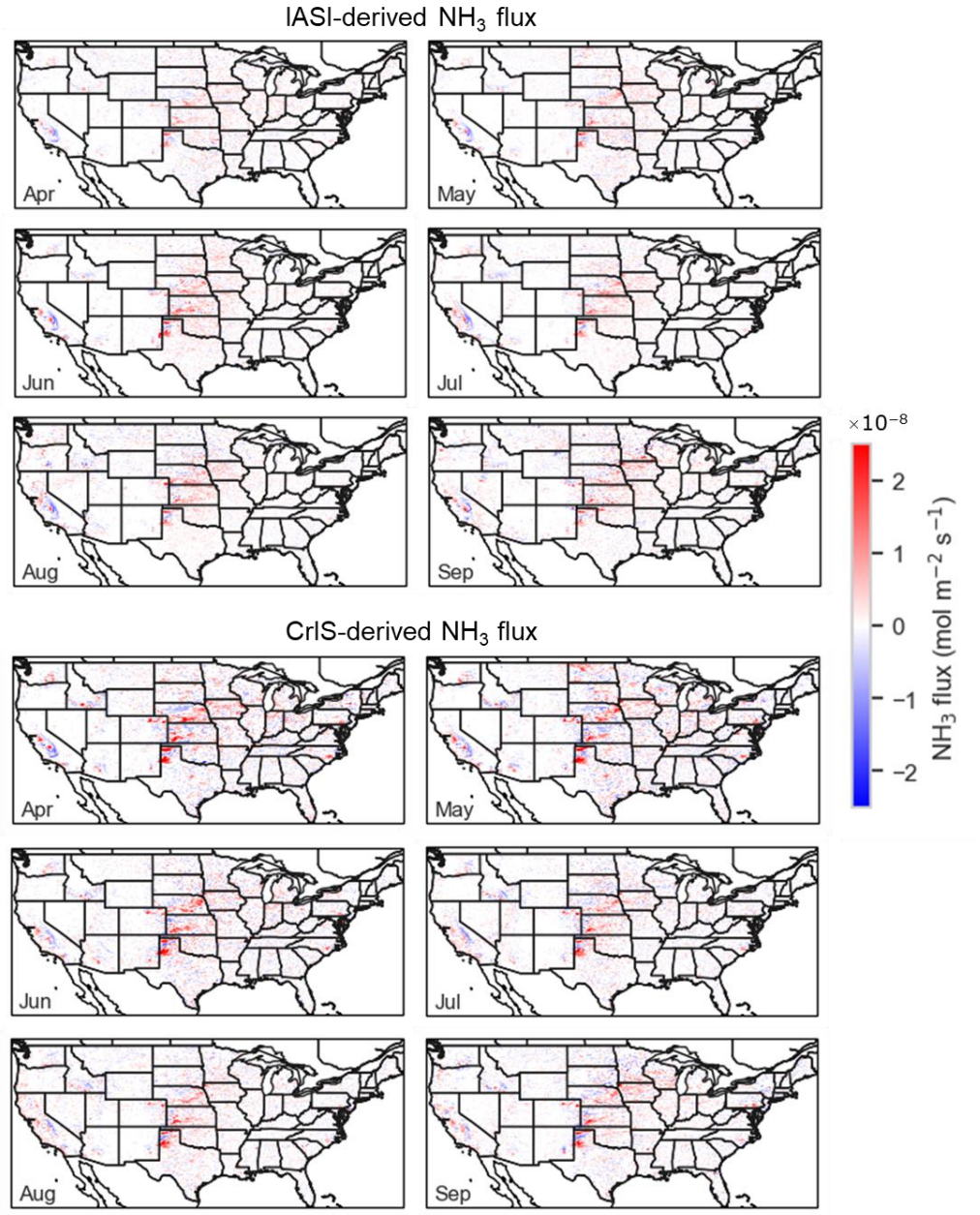

Figure S6. IASI- and CrIS-derived NH_3 flux for April-September over the CONUS, monthly averaging from IASI (Jan 2008 to Dec 2022) and from CrIS (Jun 2012 to Dec 2022).

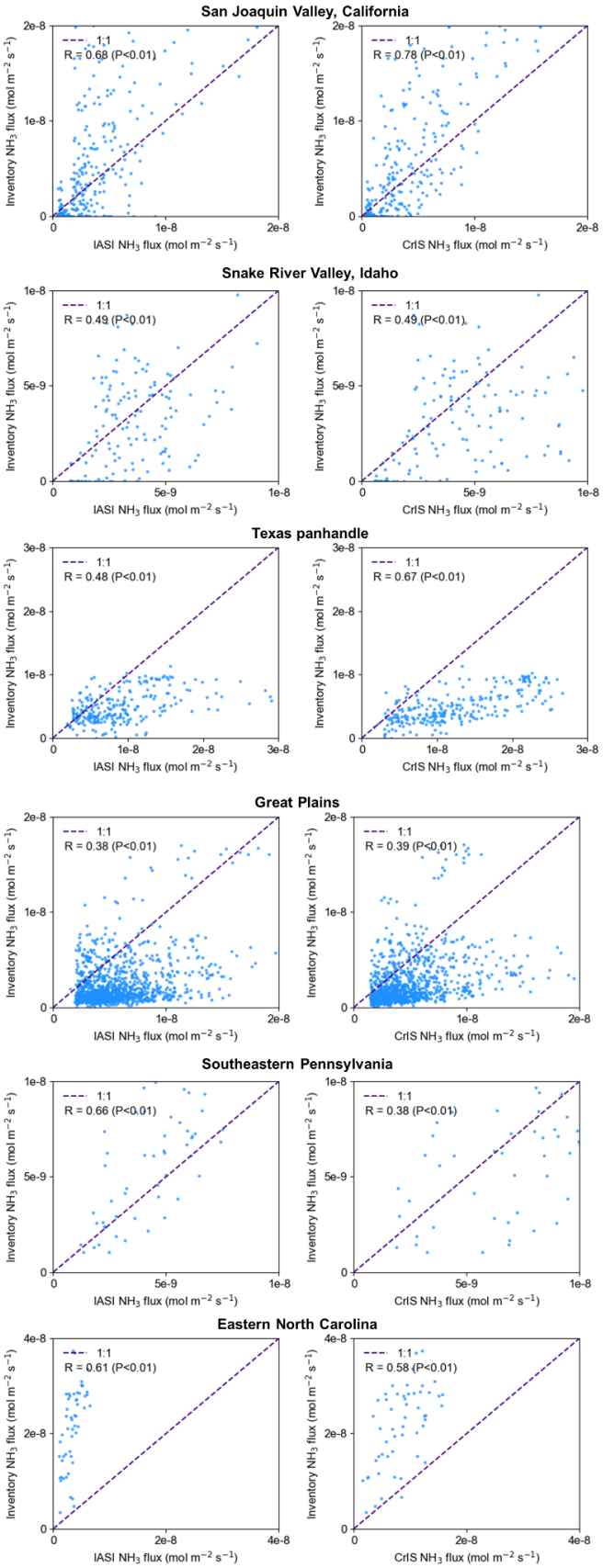

Figure S7. Satellite-based NH_3 fluxes from IASI and CrIS and inventory NH_3 fluxes in the San Joaquin Valley in California, Snake River Valley in Idaho, Texas panhandle, Great Plains, Southeastern Pennsylvania, and Eastern North Carolina.

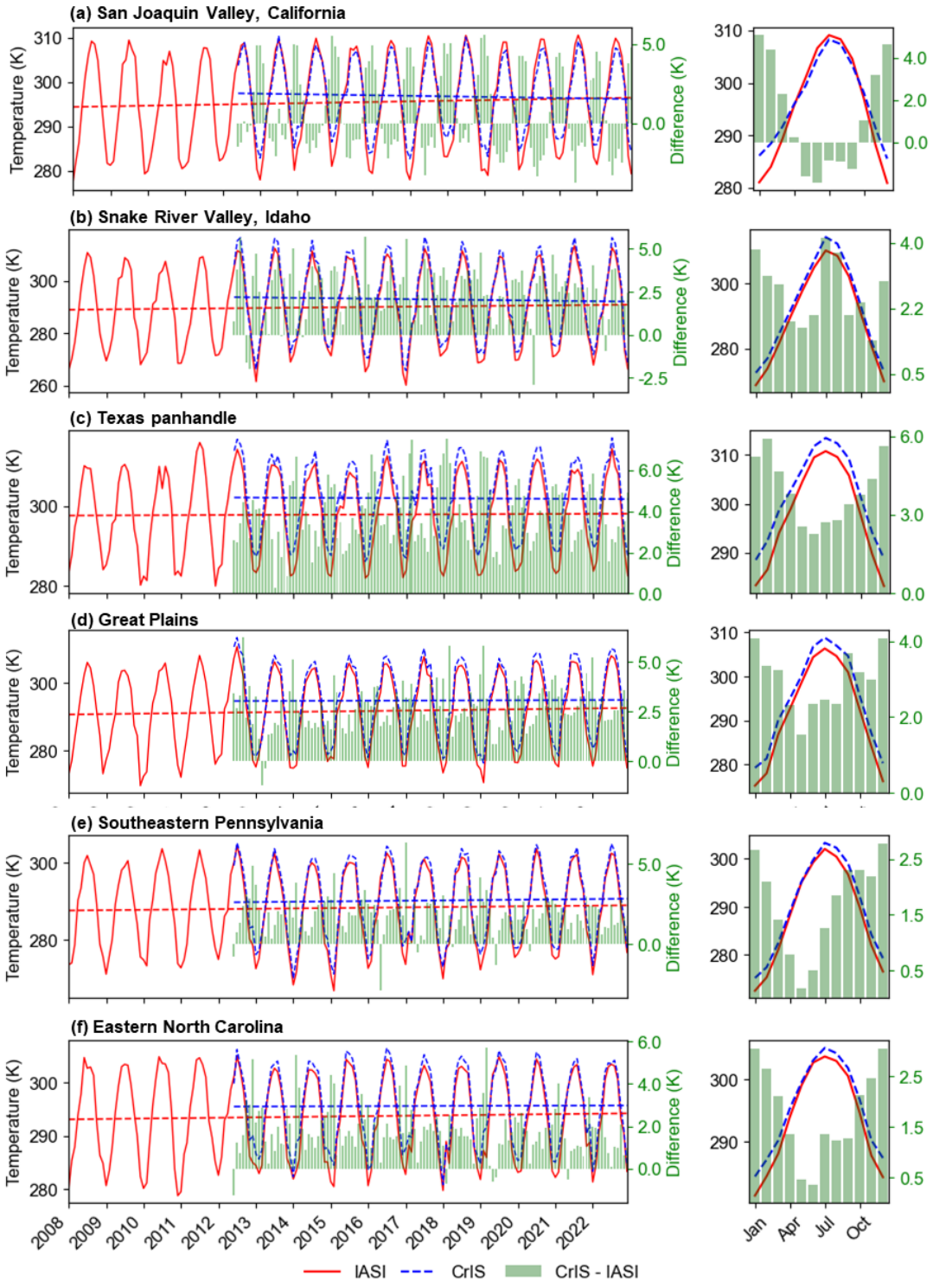

Figure S8. Surface temperature during the IASI (red solid lines) and CrIS (blue dashed lines) overpass in the San Joaquin Valley in California (a), Snake River Valley in Idaho (b), Texas panhandle (c), Great Plains (d), Southeastern Pennsylvania, and (f) Eastern North Carolina.