

Supplementary Information for “Atmospheric observations of Arctic Ocean methane emissions up to 82° north”

FigureS1.pdf: Flight tracks for 5 Arctic flights in fall, winter, and spring over fractional sea ice coverage. 2.7 MB

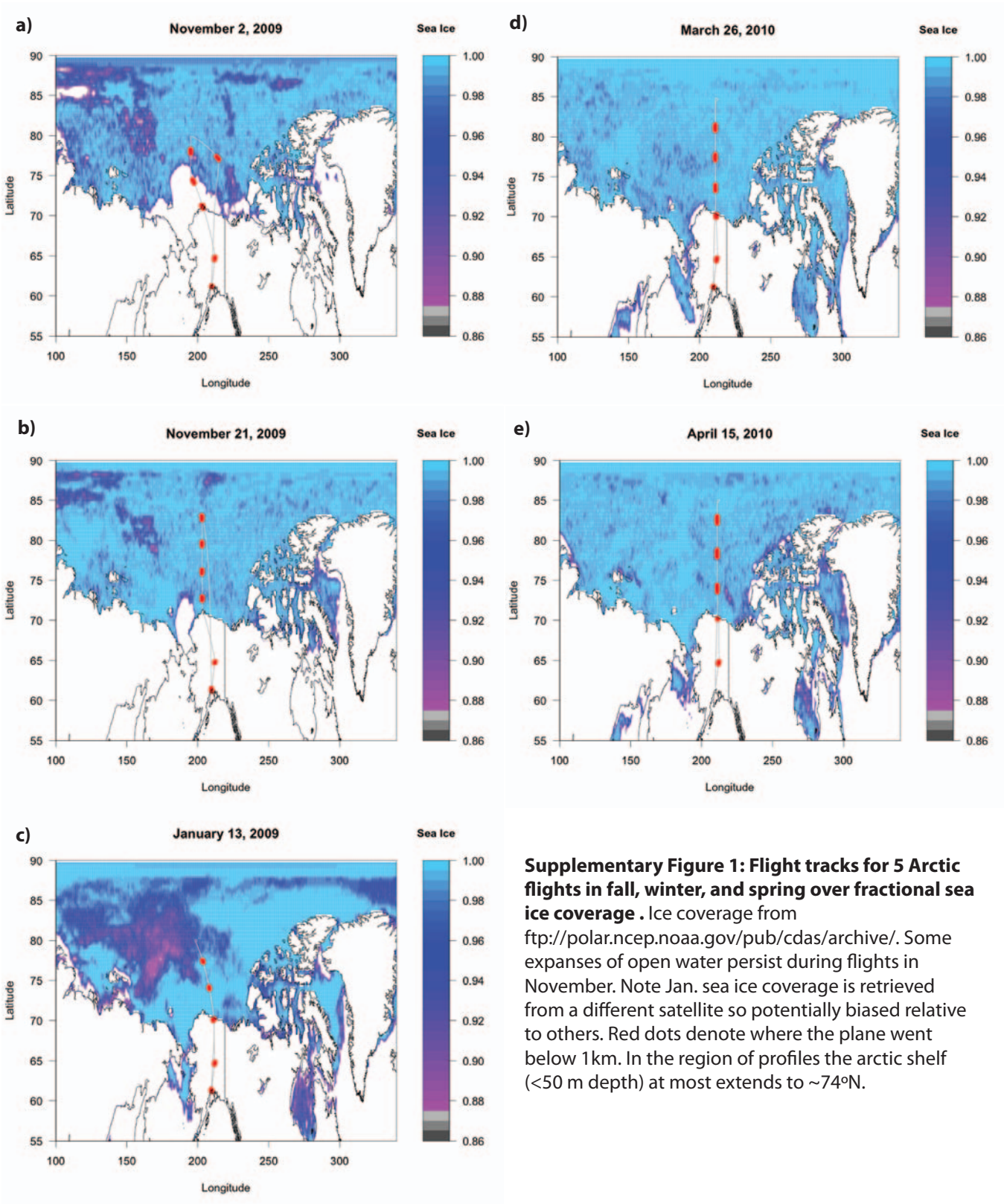
FigureS2.pdf: Multi-species correlations. 201 KB

FigureS3.pdf: CH₄:O₃ relations. 127 KB

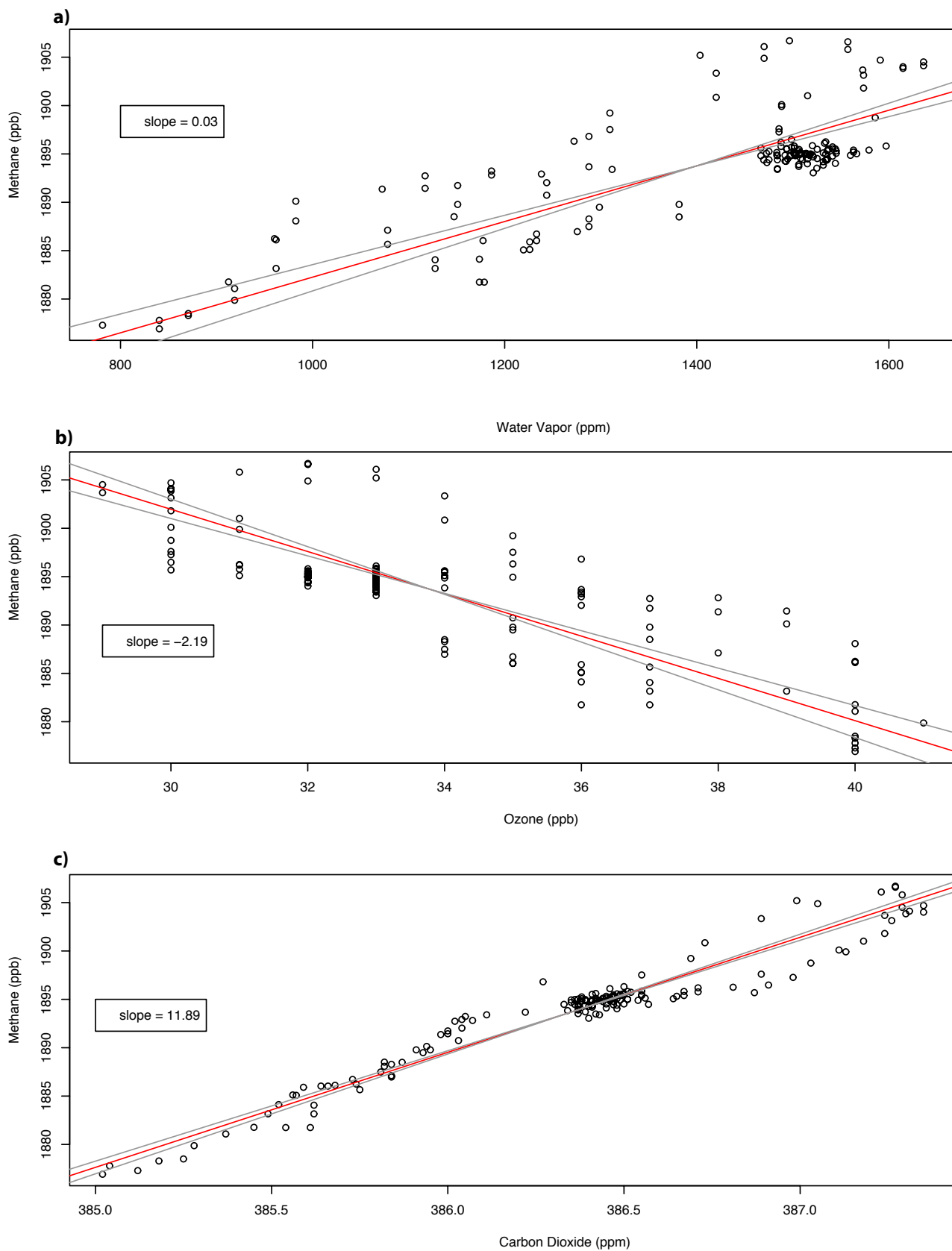
FigureS4.pdf: Time-series of methane and water vapor observations at 79.6N. 168 KB

FigureS5.pdf: 1-hz observations from profile at 82N on April 15, 2010 (fig. 3d). 418 KB

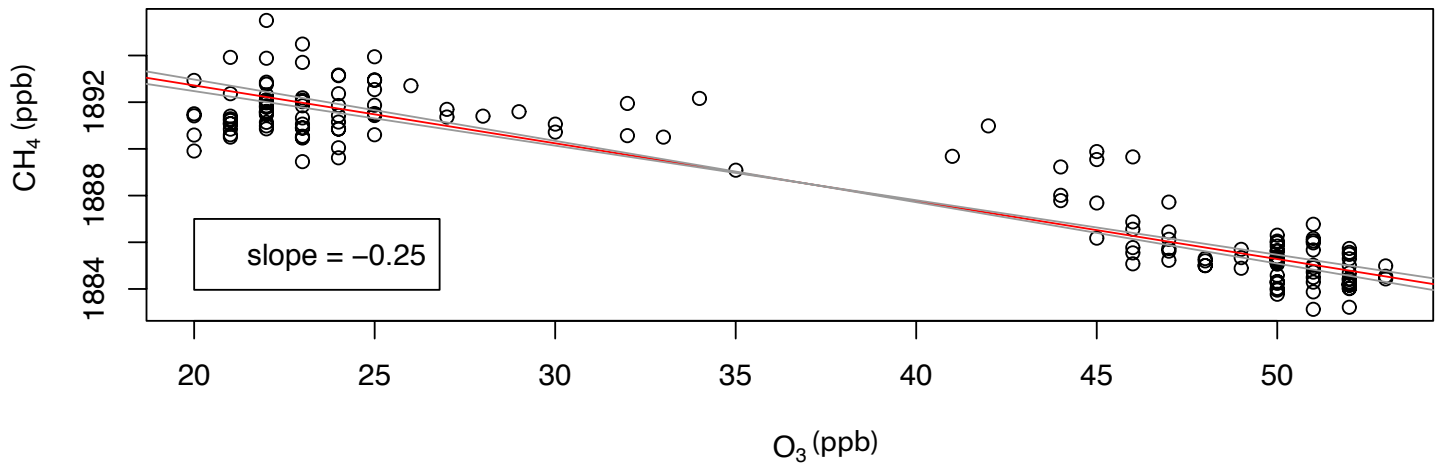
FigureS6.pdf: Meteorological parameters. 205KB



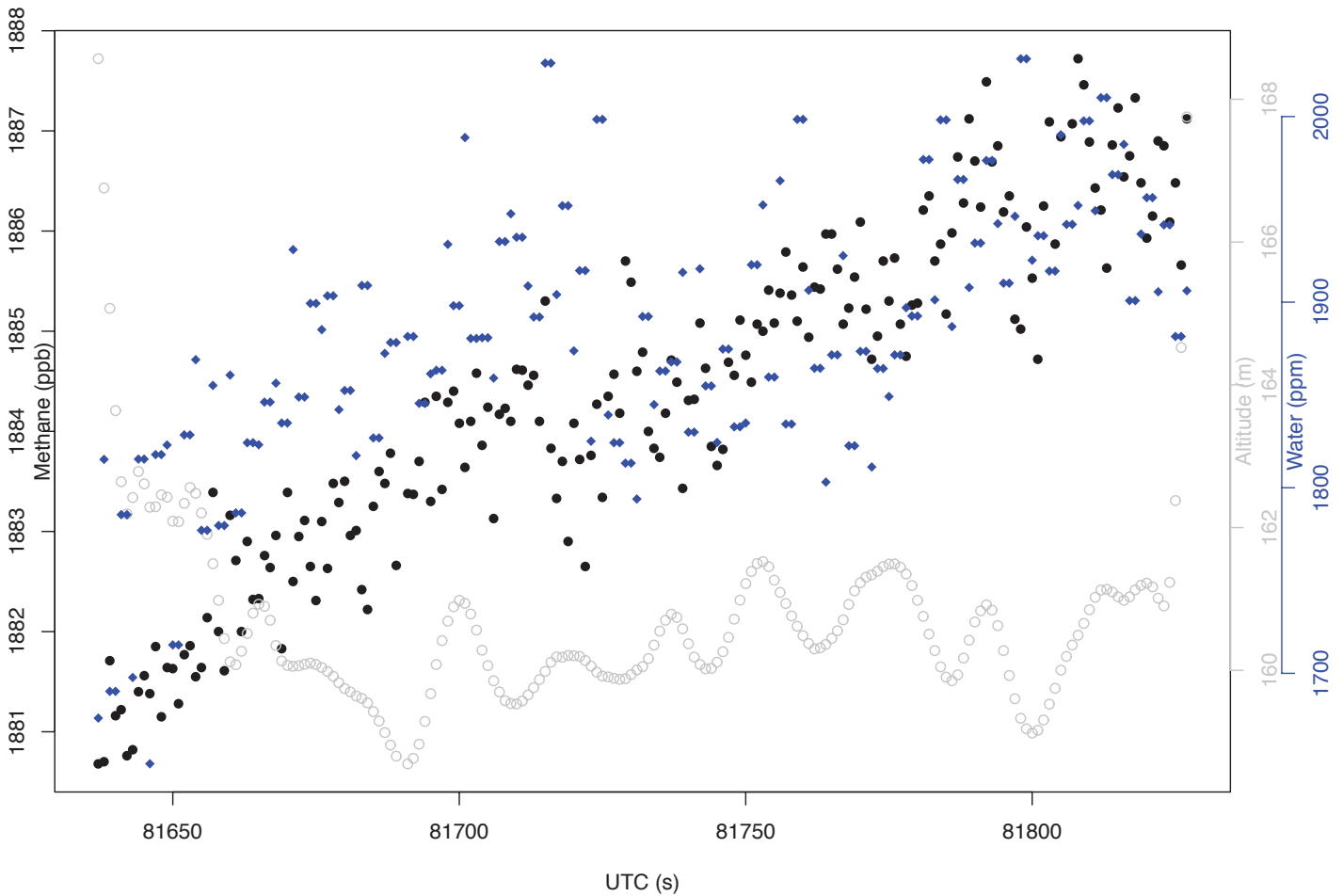
Supplementary Figure 1: Flight tracks for 5 Arctic flights in fall, winter, and spring over fractional sea ice coverage . Ice coverage from <ftp://polar.ncep.noaa.gov/pub/cdas/archive/>. Some expanses of open water persist during flights in November. Note Jan. sea ice coverage is retrieved from a different satellite so potentially biased relative to others. Red dots denote where the plane went below 1km. In the region of profiles the arctic shelf (<50 m depth) at most extends to ~74°N.



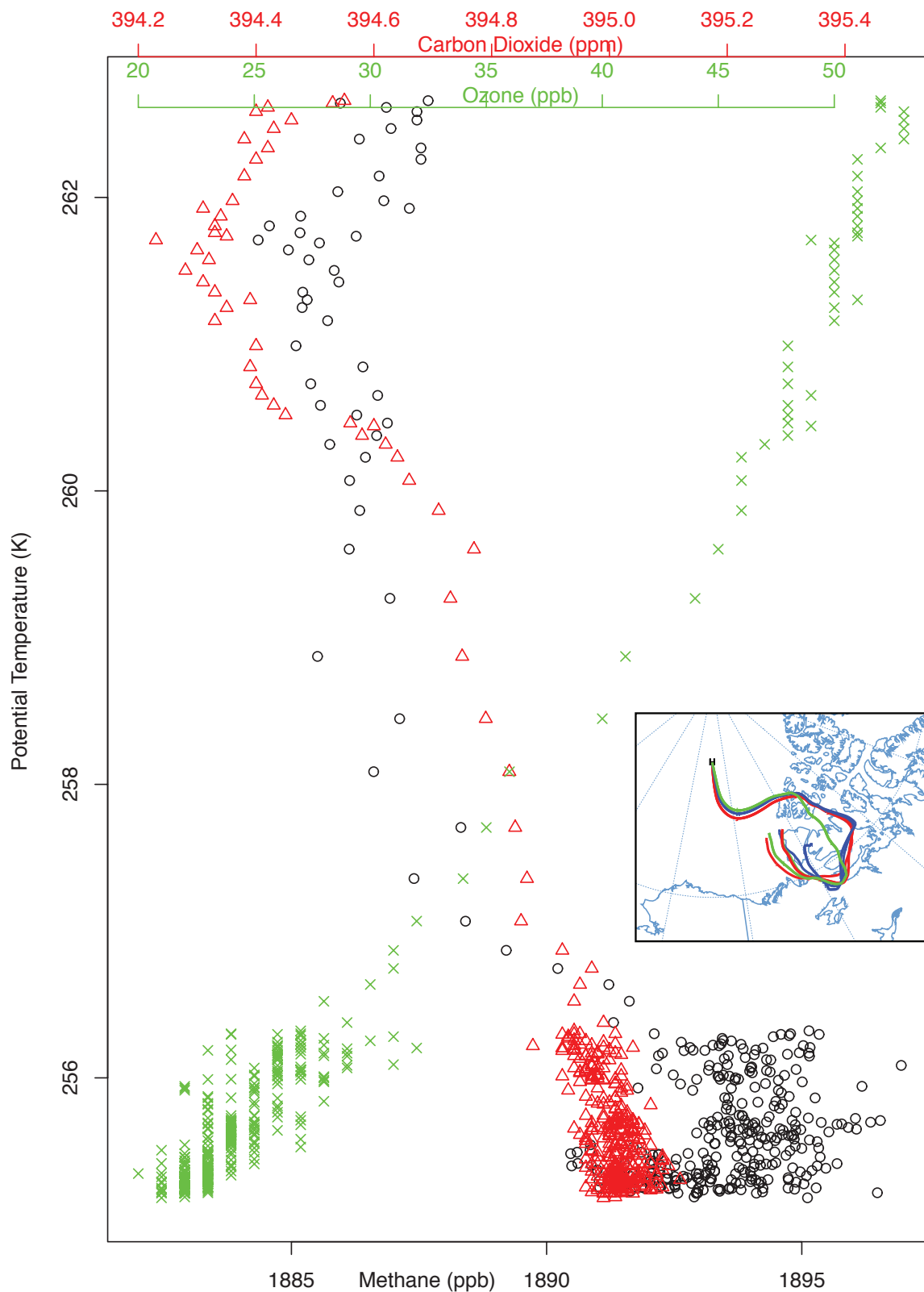
Supplementary Figure 2: Multi-species correlations. Data from below 600 m for a profile observed on Nov. 2, 2009 at 78° N.



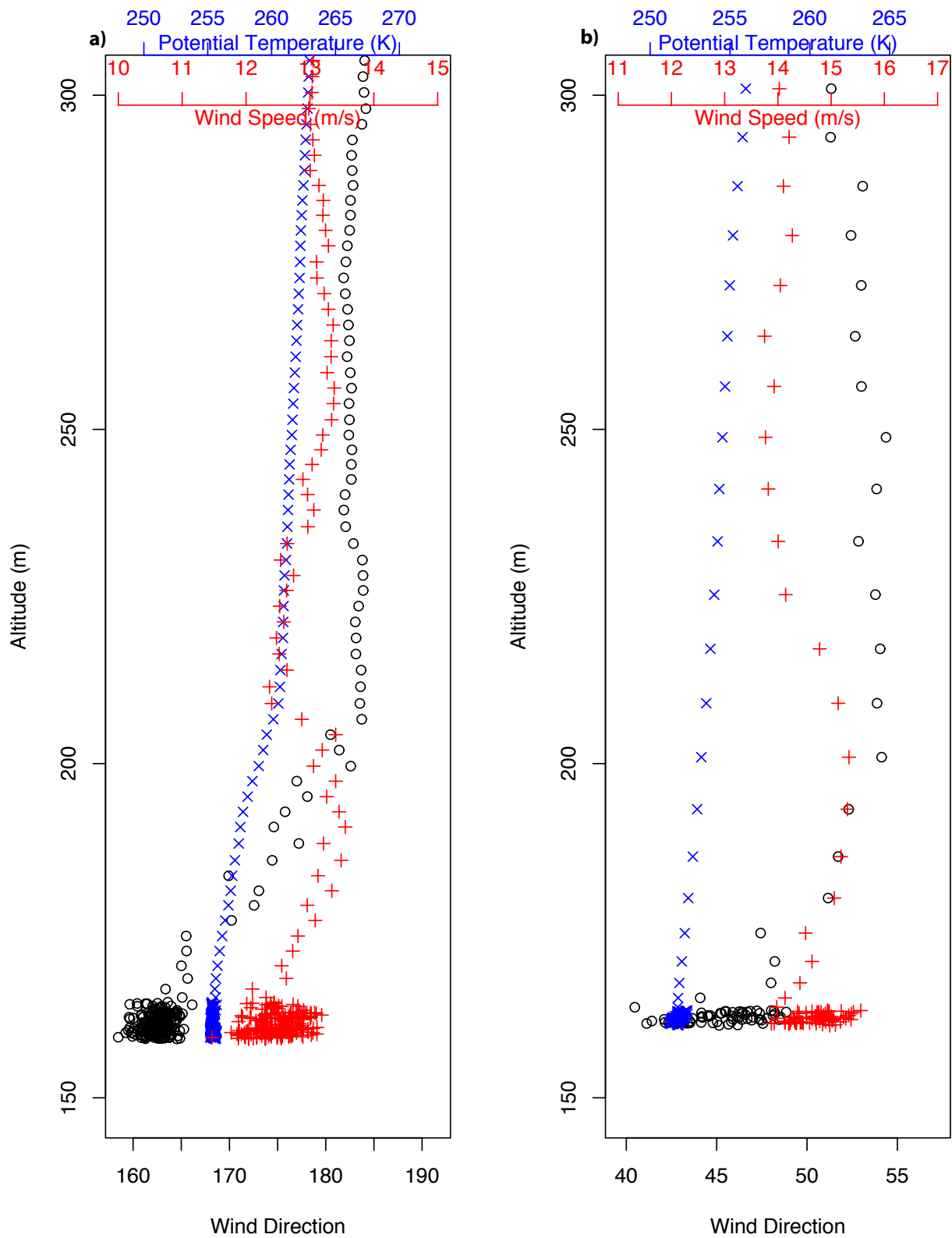
Supplementary Figure 3: CH₄:O₃ relations. Data from below 200 m in spring for profile displayed in fig. 2d.



Supplementary Figure 4: Time-series of methane (black) and water vapor (blue) observations at 79.6°N. The notable, correlated variability is indicative of a nearby common source.



Supplementary Figure 5: 1-hz observation from profile at 82°N on April 15, 2010 (fig. 3d). Notice the variability in the enhanced methane at lower theta values, and the correlation with other trace gases, indicative of a local source. Inset shows HYSPLIT back trajectories (8 days) demonstrating this air mass does not originate in an anthropogenic source region.



Supplementary Figure 6: Meteorological parameters. These match profiles shown in fig. 2b (a) and fig. 2d (b), evidence of an Ekman spiral up to ~200 m.