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Airborne observation of turbulent fluxes

The objective of the airborne observations is provide regional-scale heat and GHG flux estimates and evaluate the representativeness of stationary monitoring sites in the Arctic

The AWI research aircraft Polar 5 is used to collect a range of atmospheric data during campaigns in the Arctic. For this study the aircraft data provided spatially extensive temporal snapshots of surface-atmosphere heat and GHG fluxes. The data were processed into gridded flux maps in combination with in-situ data, numerical simulations, satellite remote sensing data and machine learning [1,2].

Figure 1. Research aircraft Polar 5 (AWI)

The gridded maps of sensible and latent heat flux, CO_2 flux, and CH_4 flux were produced in 100 m x 100 m resolution for discrete periods in the summers of 2012, 2013, and 2016 (Fig. 2).

The airborne data are important for field researchers and modelers to analyze and evaluate field site or grid cell spatial heterogeneity, patterns, and representativeness.

Data access: https://catalog-intaros.nersc.no/dataset?q=GFZ

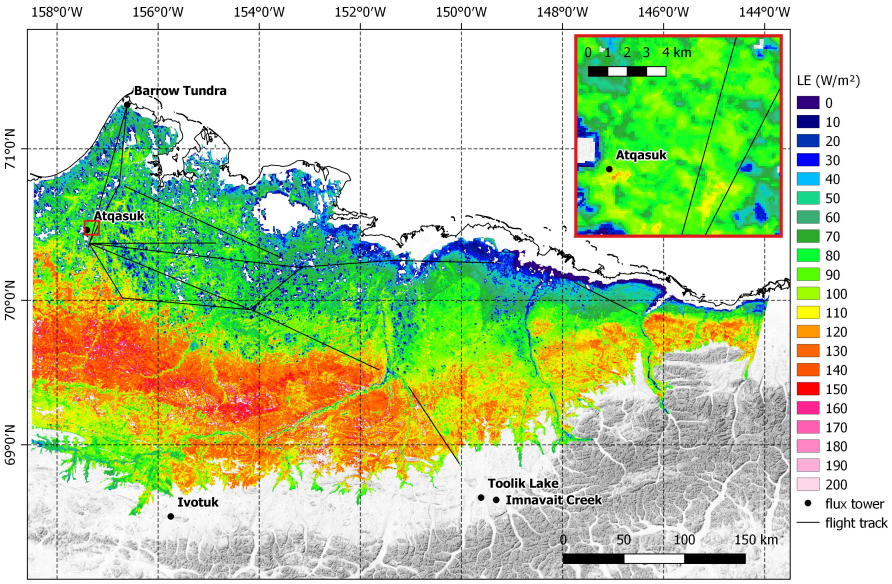

Figure 2. Latent heat flux on the North Slope of Alaska at the end of June / beginning of July 2012 as derived from airborne eddy covariance flux measurements.

References:
[1] Hartmann et al. (2018), Atmos. Meas. Tech. https://doi.org/10.5194/amt-11-4567-2018
[2] Serafimovich et al. (2018) Atmos. Chem. Phys. https://doi.org/10.5194/acp-18-10007-2018

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