Remote sensing supporting the Arctic Methane and Permafrost Challenge (AMPAC)

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The Arctic Methane and Permafrost Challenge (AMPAC) is an ESA and NASA collaborative community initiative to help tackle the scientific challenges in estimating current and future methane fluxes from the Arctic region. Under this umbrella, AMPAC-Net is an ESA funded project to foster collaborations and scientific exchange on the Arctic methane challenge. The six guiding goals are: (1) Engaging the community, workshops, dialogue (2) Advancing EO products, novel methods, algorithms (3) Reconciling bottom-up & top-down approaches (4) Data catalogues, open science and data sharing (5) Summer schools, training, outreach and education and (6) Networking, including supporting scientific exchanges. The initiative is further supported through the ESA funded project MethaneCamp with focus on improvement of satellite retrievals of methane concentrations in the Arctic.

As part of AMPAC-Net, relevant already published datasets have been included into a catalogue (https://apgc.awi.de/group/about/ampac) including datasets for methane (in situ, satellite derived concentrations, airborne campaign data, inversions etc.) and landcover/wetlands.

Bottom-up estimates rely on accurate representation of Arctic landcover, especially wetlands as potential methane source. The heterogeneity of Arctic landcover requires high spatial resolution and appropriate thematic content. Existing circumpolar landcover data and a range of in situ data have been investigated with respect to wetlands and heterogeneity supporting AMPAC goals, especially the new landcover units derived from Copernicus Sentinel-1 (Synthetic Aperture Radar) and Sentinel-2 (multispectral) satellite missions (ESA Permafrost_CCI, 10 m).

Further on, the potential of new, approved European satellite missions for AMPAC goals is discussed.
https://www.ampac-net.info/
https://methanecamp.fmi.fi/