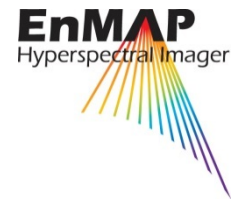


Hy-ARC-VEG II – Arctic Vegetation Phenology and Structure

Alfred-Wegener-Institute, Helmholtzzentrum für Polar- und Meeresforschung (AWI)



Abstract:

This project is a continuation of hy-ARC-VEG-I conducted between 2010 and 2013 by Dr. Marcel Buchhorn in collaboration with Skip Walker of the Geobotanical Center at University Alaska Fairbanks. hy-ARC-VEG-I examined the hyperspectral reflectance characteristics of representative Arctic tundra vegetation communities along important environmental gradients on the North Slope of Alaska (Buchhorn et al. 2013). The goal of hy-ARC-VEG-II is to build on this general characterization of tundra communities by examining canopy-level reflectance characteristics in greater temporal detail and in conjunction with vegetation colour, structure, and biomass. Using temporal reflectance data with vegetation colour and structure we will examine the potential for spectral differentiation of key vegetation phenophases (green-up, peak biomass, senescence). Hyperspectral field data and hyperspectral and remote sensing data will then be used to develop both VIS-multiband and Red edge-NIR algorithms for classifying tundra vegetation communities, phenological stage, and biophysical characteristics. The algorithms and classification will be attempted at multiple spatial scales using multiple remote sensing products and simulations. Airborne acquisitions by plane and drone using HySpex and AISA sensors are planned. Spectral simulation from field-based spectra and up-scaling will be attempted with EnMAP, SENTINEL-2, and SENTINEL-3/OLCI.

Study Site

The research will take place in Toolik Lake Alaska at the 1.2km² long-term Toolik Lake vegetation grid. Toolik Lake (68°37'N, 149°32'W) is located in the Southern Arctic Foothills on the Alaskan North Slope. The area is classified as tundra and is underlain by continuous permafrost. Within the Toolik Lake grid there are a total of 24 plant community groups derived from 81 permanent plots. We will apply representative subsampling and upscaling of the grid to accurately represent the dominant vegetation types.

Duration: 01.04.2015 – 31.03.2018

EO Data Source: Field Spectrometry, HySpex, AISA, RapidEye, CHRIS-PROBA, MODIS, (SENTINEL-2, OCO-2)

Support Program: PhD Program for EnMAP utilization preparation

Contact:

Alfred-Wegener-Institut (AWI)
 Helmholtzzentrum für Polar- und Meeresforschung
 Prof. Hans-Wolfgang Hubberten
 hans-wolfgang.hubberten@awi.de
 Dr. Birgit Heim
 birgit.heim@awi.de
 PhD Kand. Alison Beamish
 alison.beamish@awi.de

<http://www.enmap.org/>

<http://www.awi.de/forschung/geowissenschaften/periglazialforschung/schwerpunkte/experimentelle-permafrost-fernerkundung.html>