IASOA Flux Working Group

May 11, 2016

Attendees: Sara Crepinsek, Taneil Uttal, Jennifer Watts, Dave Billesbach, Chris Fairall, Eugenie Euskirchen, Andrey Grachev

Introduction of group members

Brief Overview of Updating IASOA Flux science page – description of new layout, identify how other projects (ex: ABoVE) can contribute to IASOA science page, pan-Arctic scaling project, model simulations, identifying data inconsistencies which slow inter-comparison and model processes, IASOA can guide ABoVE as far as flux integration projects and goals, working on terrestrial and sea-ice projects, getting flux data over open water in the Arctic – does this type of data exist, oceanic fluxes would be valuable, Toolik lake has a flux tower (might have been taken down already), send request to YOPP to endorse which would lead to inclusion in field data sets, is it possible to add IASOA as a formal endorsement of ABoVE project

Presentation on Integrating Tower EC, Remote Sensing and Ecosystem Modeling to Monitor Arctic-boreal CO_2 and CH_4 Fluxes – importance of monitoring rapidly changing Arctic environments, we need repeated measurements at various scales, need different perspectives for a big picture view – satellites, airborne remote sensing, flux towers, flux chambers, etc., using a suite of satellite observations to monitor change, various levels of data products, examples of satellite observations and remote sensing to monitor regional changes, tracking vegetation patterns and active layer properties, map of EC tower flux measurements: needed to calibrate and validate ecosystem models, primary research objectives: use satellite remote sensing and tower EC data to 1)Identify patterns in Arctic-boreal CO2 and CH4 fluxes, 2)Determine wetland CH4 contributions, 3)Assess regional landscape change and vulnerability, flux chambers are also very useful and also expensive so hard to install widely, goal to get high-resolution carbon maps, changes in landscape carbon sink and source activity, snow cover properties and effects on carbon cycling, vegetation start and length of season, inter-annual changes in wetland extent, regional emission magnitudes and the GHG energy budget, Integrate with ecosystem TCF modeling for regional carbon monitoring, monitoring changing Earth surface properties, overview of TCF/CO2 model: big driver is input from re-analysis, overview of TCF/CH4 model: wetland CH4 production, three flux pathways: vegetation, diffusion, ebullition, Tussock vs Wet Sedge CH4 comparison, Model scaling of Carbon maps, challenges for regional modeling: flux tower data (accessibility difficult, flux processing and QC, sparse pan-Arctic tower network, data overlap needed, limitations to tower longevity), modeling (Arctic-boreal wetland and vegetation maps, land cover classifications often are inconsistent, reanalysis data are spatially coarse, water inundation maps are course), surface flux maps vs atmospheric observations (available airborne observations limited in space and time, regional inverse modeling, gauging CH4 contributions from lakes and rivers)

Action Items:

- Endorsement objective of IASOA to ABoVE project and vice versa (Watts, Starkweather, Uttal)
- Touch on Arctic regional modeling challenges from Watts presentation at next meeting (ALL)

- Put together a plan (ABoVE, IASOA, other agencies – Canadian?) for the ideal flux site, generate a proposal (what would it look like, how much would it cost, will vary from site to site and the organizations involved) (Watts, Uttal, Starkweather, Lesins)
    - See what Russian flux tower data is available for pan-Arctic measurements (Uttal)