

IASOA Arctic Flux Working Group Jan 28, 2015 Meeting Notes

Participants

NOAA: Sandy Starkweather, Chris Cox, Andrey Grachev, Elena Konopleva, Lori Bruhwiler, Gijs deBoer
Phone: Glen Lesins, Taneil Uttal, Eugenie Euskirchen, Mika Aurela,?

1. Building on the previous meeting

There are 3 general areas where our working group expressed interest:

i. Standardization Across Sites

- instrumentation comparisons and observational procedures
- site characterization

ii. Flux Analysis Methodologies

- best procedures for high Arctic (cold) analysis
- possible use of the "Gold" files from Ameriflux
- how do we connect with modelers and how will they use the data

iii. Interdisciplinary Aspects

- work with other disciplines to develop closure experiments and other science projects

Discussion

Site characterization has already been done at most sites involving ecosystem analysis; there didn't seem to be one standard that was followed. The general process typically involves identifying the vegetation and estimating carbon inventories. Measuring below the frost level in the ground is not feasible. There was a suggestion that soil scientists should be included in the broader collaboration in order to understand soil carbon better. There is not a standard approach but this is not surprising considering the large differences between sites.

It did strike the group as useful to consider how standards could be developed. FMI did do detailed survey plot at Tiksi and developed a land cover map. This is similar to how they survey their Finnish sites. It would be beneficial to compare this with what Euskirchen has done to see what the commonalities are.

Another suggestion related to the use of UAVs, which allow detailed landscape characterization and measurements regionally. They could, also easily measure variables like skin temperature or NDVI at a more useful resolution than satellite products. It should be a valuable tool when upscaling of tower measurements and probably a better although more expensive approach to satellite remote sensing. There are likely region by region limitations on how this can be applied. All agreed it was a valuable topic for follow up.

Crepensik has been looking at heat flux spatial variability at Tiksi. Tiksi has 5 levels of soil thermistors which are yielding interesting heat flux measurements. We need to follow up on this. Crepensik has volunteered to give the group a presentation on her work.

There are challenges in separating horizontal from vertical gas fluxes. The horizontal transport can be either advective or turbulent. One also needs to identify the appropriate surface footprint contributing to the measurements. This is a strong function of wind speed, wind direction and stability, and needs

numerical model output to compute. Several approaches were discussed for handling this. It also seems like a valuable topic to include in regional land surface characterizations.

2. Developing a workshop proposal for the IASC-Toyama meeting

The concept of a joint atmosphere-terrestrial-cryosphere workshop to advance techniques and data exchange was raised. The previous discussion suggestion that IASC support and timing with Fairbanks 2016 ASSW meeting would be advantageous.

Sandy and Eugenie agreed to lead the initiative and develop a brief write up on the proposal. This could then be used to contact IASC national reps from US, Canada, Finland and other IASOA-relevant partner countries.