**IASOA Flux & Radiation Working Group**  
**January 18, 2017**

**Attendees:** Sara Crepinsek, Taneil Uttal, Elyn Humphreys, Eugenie Euskirchen, Lori Bruhwiler, Andrey Grachev, Allison McComiskey, Nate Miller, Ted Shuur, Chris Cox, Thomas Haiden, Sandy Starkweather, Von Walden, Bob Stone, Chris Fairall, Chuck Long, Luca Belelli Marchesini, Matthew Shupe, Diane Stanitski

**Introduction of group members** – both radiation and flux groups present

**Presentation: Model Evaluation in Central Greenland Using a Comprehensive Set of Atmospheric and Surface Measurements (Nate Miller)** – ICECAPS project at Summit station, overview of instruments and site location (broadband radiometers, fluxtower, subsurface temps (10m, 2m), above surface temperatures (10m, 2m), detailed list of instrumentation at used during analysis, temperature profiles/gradient contour plot from July 2013-July 2014, surface energy budget overview, positive flux = warming of the surface, fluxes analyzed: net shortwave, conductive heat flux, longwave downwelling, longwave upwelling, sensible heat, latent heat, heat storage, all components are available during the one year time period from 2013 – 2014, SEB = SWdown – SWup + LWdown – LWup + SensibleHeat + LatentHeat + ConductiveHeat + HeatStorage, residuals of the SEB don’t show seasonal cycle, could be due to sampling, latent and ground heat fluxes are relatively small, summer has most diurnal variability, sun angle impacts this variability, sensible, latent, conductive fluxes are anti-correlated with total radiative flux, high year round cloud fraction (86%), ice-clouds are important to cloud radiative forcing (CRF), LW CRF magnitude corresponds to the presence of liquid-bearing clouds, surface albedo important for CRF and central Greenland is a unique Arctic location, influence of liquid-bearing clouds and insolation, forcing terms = DWLW + netSW, compare values both with sun above and below the horizon, increase in forcing terms means increase in temperature, difference between forcing term cases are greater than what is reflected, sun’s influence contributes to unstable conditions, response to forcing terms, forcing and response are anti-correlated, forcing changes through the year, annual responses, responses of energy fluxes to LWdown and SWnet, increasing forcing terms = increase in LW term, SEB responses to CRF, increase in radiation of clouds impacts each component of SEC, see how each term is compensating, ERA interim comparisons, compare observations to ERA, winter = much more variability, model doesn’t capture as much variability and cold temps, SEB components, forcing term comparisons show differences in observations and ERA, ERA-1 responses from 2010 – 2016 show ground heat flux dampening surface temperature variability, Community Earth System Model, Beta07 – CAM6, CLM5, ground heat flux better reflected but could be due to other responses, Climate Forecast System Reanalysis, ground heat flux response is lowest in this model, conclusions: highly emissive GIS corresponds to a large response of the surface temperature, response of the non-radiative SEB terms, process-based relationships indicate where there are deficiencies in representing GIS surface temperature variability, data is available: https://arcticdata.io/catalog/#view/doi:10.18739/A2Z37J

**Presentation: Permafrost Carbon Network (Ted Shuur)** – presentation in relation to upcoming Flux workshop in Finland, objective of PCN: produce knowledge through research synthesis to quantify the role of permafrost carbon in driving future climate change, Activities: meetings and working groups, consortium of interconnected researchers, network website, enhance early career scientists, big Q: what is the magnitude, timing, and form of permafrost carbon release to the atmosphere in a warmer world?
permafrost carbon published literature increase, knowledge pyramid: building blocks, technical synthesis, conceptual synthesis, summaries, briefs, success of workshops: revisiting science questions and outcome goals: break into working groups to discuss: carbon quantity, carbon quality, An/Aerobic, Thermokarst, Model Integration, submit publications, permafrost carbon emissions to review article to answer big science Q’s, network building lessons learned: developing the human network a critical component of adding value to data observation networks, network engagement facilitated by a clear coherent science questions, network production facilitated by engaging a range of scientists and stakeholders, built network is poised to ingest new observations and deliver results on the timeframe needed by decision makers, pan-Arctic flux synthesis (agenda item for flux workshop), flux workshop: challenges in obtaining measurements, processed base understanding, difficulty in groups coming up with action items and accomplishing tasks: success defined by individuals/leads to champion through each task, each person can contribute somehow, use the workshop to define group leads, unify science questions along with one big overarching question to be answered, funding a potential post-doc to take a lead position and move along action items so workshop continues momentum afterward, PEEX resources, IASOA goal to find flux lead for their working group

**Action Items:**

- IASOA to find a Flux Working Group chair and co-chair (Uttal, Crepinsek)
- Create a scoping document for Flux Workshop (Euskirchen, Starkweather, Uttal)
- Investigate development of key science questions that Flux Workshop can answer (Euskirchen, Starkweather)