Attendees: Sara Crepinsek, Gijs de Boer, Alexander Makshtas, Dave Billesbach, Mathias Goeckede, Ted Shuur, Lori Bruhwiler, Sue Natali, Roisin Commane, Eugenie Euskirchen, Andrey Grachev, Taneil Uttal, Elyn Humphreys, Ola Persson

Introduction of group members – role call

Several Mini-Presentations on Outcome of Flux Workshop in Finland in February:

Carbon Flux Synthesis (Euskirchen): Question – Based on newly available flux data do we see patterns and trends in Arctic carbon fluxes?, pay attention to vegetation type and permafrost type in tundra/boreal ecosystem, may consider integrating with both lake and marine flux tower data, data availability, focus on just CO2 and CH4?, data: newly available datasets to include may consist of those from: PAGE21, US UAF AON, previously updated flux data, sites in Russia, Canadian sites (Humphreys, LaFleur, Sonnentag) and continue to investigate and build this list further, first step to explore data availability, make sure efforts don’t overlap with any other ongoing syntheses, different goals will use different data sets, different questions can be addressed with different and overlapping data sets, define/determine one universal database for submitting flux data sets, multiple people wanting similar data sets, need to organize data sets (public v. private data sets) and syntheses, universal database is great so that all data is in one location (Fluxnet and Ameriflux as examples, sometime databases are difficult to deal with in regard to updating/contact info on datasets) however data can be missed since databases can have strict restrictions on the types of data submitted, IASOA can help with this as we can point to several databases so that all types of data are represented for use, not all datasets post data in timely manner (sometimes only post yearly), bring people into the process of submitting data and also discuss working with PI’s directly, Ameriflux/NACP meeting coming up in two weeks (http://www.nacarbon.org/meeting_2017/index.html) – possibly bring up issues of timeliness and quality of data submitted, Ameriflux is internally changing how data is submitted/processed/displayed to the public, IASOA can help to push AmeriFlux/Fluxnet in a direction of re-defining database needs

Representativeness (Bruhwiler/Natali): are currently measured fluxes representative to the Arctic only, using remote sensing to see how fluxes shift across the Arctic, major question(s) to answer: are Arctic fluxes changing over time and how? What types of fluxes should be included in this discussion?, scale fluxes top-down and bottom-up, it is important to have both approaches so that we can recognize when the estimates don’t agree and suggest some other process not being accounted for, need to define a flux database to increase data access, important not to duplicate efforts and collaborate instead, discuss length of time series currently available and the importance of making sure these measurements exist in the future, efforts being made by other sources (NEON, etc.), microclimates are important and impact energy fluxes (and maybe others) and should be considered in categorical process (including satellite images/maps of microclimates, cost of these images can be high), WorldView Map – discuss having these made for all IASOA sites (cost upward of $2000/site), important to include view of what instruments are seeing directly below them, tools for defining representativeness of fluxes on the Arctic scale (discuss with Mathias if interested in joined this type of working group that plans to map areas and see if specific types of land are represented by current measurements, project is just beginning and starting to put together a site list)
Best Practices/Flux Challenges (Goechede): advantages: have excellent data resource currently, but there are still technical issues to be addressed to output best possible flux product, issues: mitigating ice buildup on sensors (sensor performance for Arctic conditions), instrument self-heating, general flux data quality control consistency, Methane emission patterns violating EC assumptions, logistical challenges (power supplies, instrument performance in the Arctic), continuous heating has minor effects on carbon flux but more tests are needed on heating activation strategies, instrument self-heating shows significant effect and needs to be corrected, flux data quality assessment needs common protocols to be well developed with decoupling near the surface to be integrated, Methane flux signals demonstrate need for closer investigation of intermittency effect

Energy Fluxes (Grachev): overview of Tiksi and Eureka energy budget results, these sites are very interesting and it is important to maintain these measurements in the future, found that all fluxes depend on large scale terms from solar radiation and surface energy balance equation, correlation very high and can be used for parameterization, the primary driver of variation in temp and other parameters in the Arctic is the seasonal varying pattern of incident sunlight, solar radiation at the top of the atmosphere is determined by well-known orbital parameters being a function of latitude and time of year, higher latitudes generally receive the least cumulative amount of incoming solar radiation over the entire year but more total daily amount of the incoming solar radiation throughout the summer months than lower latitudes, the noon maximum of the downwelling SW radiation in summer is larger at Tiksi but the midnight minimum is larger at Eureka, importance of latitudinal location of these sites and how they affect fluxes

Action Items:
- Discuss working group science questions via email (ALL)
- Summary report of flux workshop: different sections (Euskirchen)
  - Anyone who would like to be involved and attended the workshop should contact Eugenie