Workshop Thermophilization 2.0 - what to do next with the plant composition data

Can we predict the … is within species plasticity versus turnover with traits.

Current syntheses:

Control plots:

Biodiversity and composition: Criado, M.G., Myers-Smith, I.H., Bjorkman, A.D., Elmendorf, S.C., Normand, S., Aastrup, P., Aerts, R., Alatalo, J.M., Baeten, L., Björk, R.G. and Björkman, M.P., 2023. Plant diversity dynamics over space and time in a warming Arctic. https://ecoevorxiv.org/repository/view/5557/

Traits: Bjorkman, A.D., Myers-Smith, I.H., Elmendorf, S.C., Normand, S., Rüger, N., Beck, P.S., Blach-Overgaard, A., Blok, D., Cornelissen, J.H.C., Forbes, B.C. and Georges, D., 2018. Plant functional trait change across a warming tundra biome. *Nature*, *562*(7725), pp.57-62. https://www.nature.com/articles/s41586-018-0563-7

Composition: Elmendorf, S.C., Henry, G.H., Hollister, R.D., Björk, R.G., Boulanger-Lapointe, N., Cooper, E.J., Cornelissen, J.H., Day, T.A., Dorrepaal, E., Elumeeva, T.G. and Gill, M., 2012. Plot-scale evidence of tundra vegetation change and links to recent summer warming. *Nature climate change*, *2*(6), pp.453-457. https://www.nature.com/articles/nclimate1465

OTC syntheses:

Elmendorf, S.C., Henry, G.H., Hollister, R.D., Björk, R.G., Bjorkman, A.D., Callaghan, T.V., Collier, L.S., Cooper, E.J., Cornelissen, J.H., Day, T.A. and Fosaa, A.M., 2012. Global assessment of experimental climate warming on tundra vegetation: heterogeneity over space and time. Ecology letters, 15(2), pp.164-175. https://onlinelibrary.wiley.com/doi/full/10.1111/j.1461-0248.2011.01716.x

Combination (thermophilization!):

Elmendorf, S.C., Henry, G.H., Hollister, R.D., Fosaa, A.M., Gould, W.A., Hermanutz, L., Hofgaard, A., Jónsdóttir, I.S., Jorgenson, J.C., Lévesque, E. and Magnusson, B., 2015. Experiment, monitoring, and gradient methods used to infer climate change effects on plant communities yield consistent patterns. *Proceedings of the national academy of sciences*, *112*(2), pp.448-452.
https://www.pnas.org/doi/abs/10.1073/pnas.1410088112

Future projects:

- Borealization (Mariana García Criado (lead), see workshop)

- Decomposition (Katrín Björnsdóttir (lead), see workshop)
  Comment Christian: To interpret the community pattern, it would be nice to break the analysis down to individual species. Maybe you have an increase of a highly decomposable species and of a low decomposable species and the overall effect is zero. Or you have an increase of a species that is in a middle range of decomposability and the community effect is also zero.

- Thermophilization 2.0?
- Winners vs losers - are they the same winners at different sites?
  Christian: Indeed. It would be great to better define what a loser and a winner is. Are the losers the cold-loving species? The short-lived ones? The ones with a smaller range? Etc etc.
  Christian: A recent examples for drivers of thermophilisation (across different types of organisms) and drivers of thermophilisation:
  https://www.nature.com/articles/s41467-024-46282-z

  Bob: Does what happen in the OTCs predict what happens in the control plots?

- Other projects?
- Opportunities for Post-Doc
  - Are OTC's a crystal ball?
  - Are tundra communities thermopholizing?

Want to learn how to do ecological synthesis efficiently or teach this material?
There is (1) a short-course at ESA this summer; (2) a semester long-course being run through US LTER/NCEAS [that will be open only to US LTER affiliated students in the first go, but all the materials are being put online with the idea that they will be modular either for satellite versions of the course and/or teach yourself). Materials in development but I can share with people as they go if you want as I volunteered to make some. https://lternet.edu/ssecr/