Future Directions in Arctic Research

Science Support Needs

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Arctic springs are warmer & snow is melting earlier

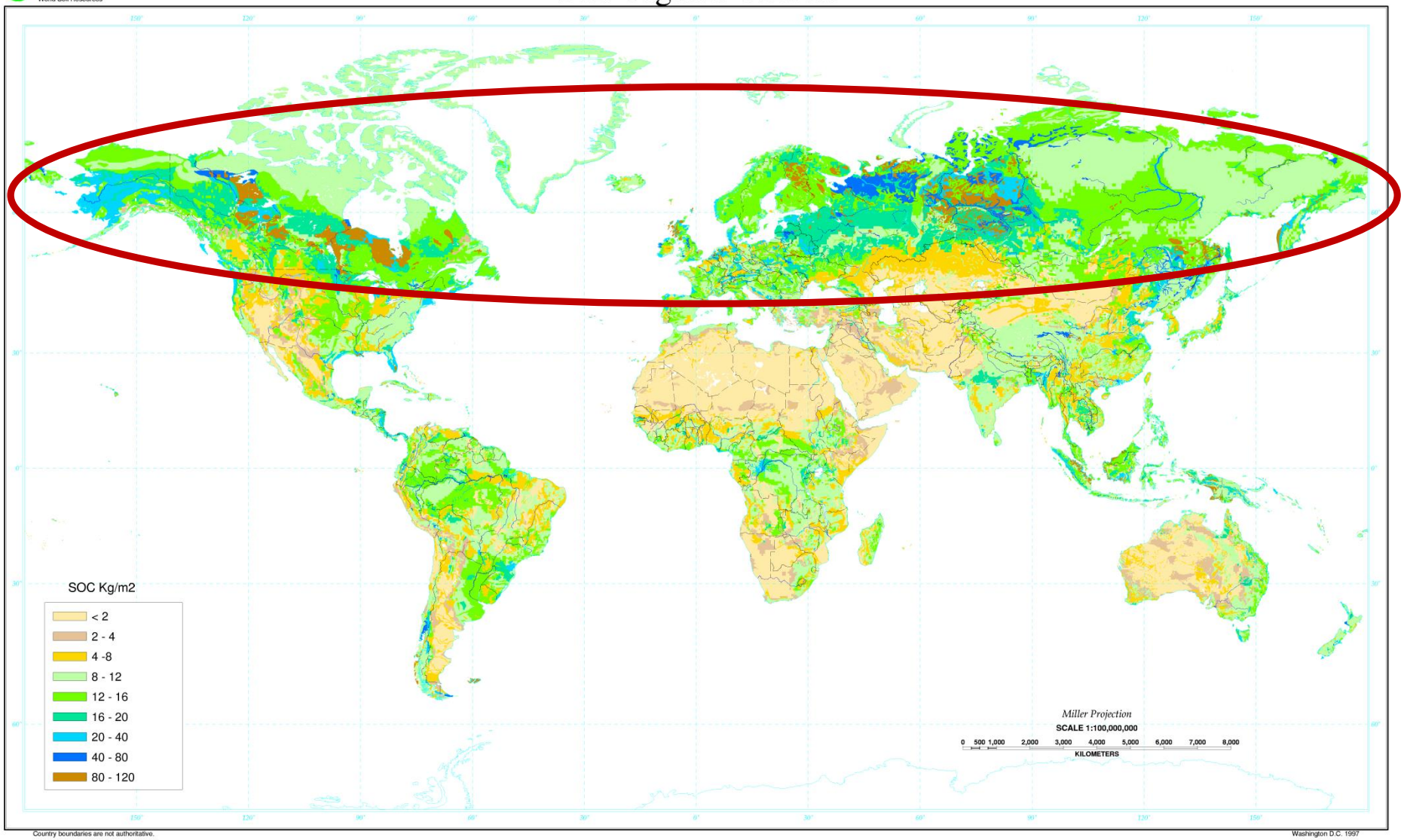
Arctic Report Card 2011:

- Strong trend from 1966 - 2011 of less spring snow cover due to earlier melt
- The start date of snow cover over the Arctic has been stable
- Similar trends in declining spring snowmelt for Eurasian & N. American arctic

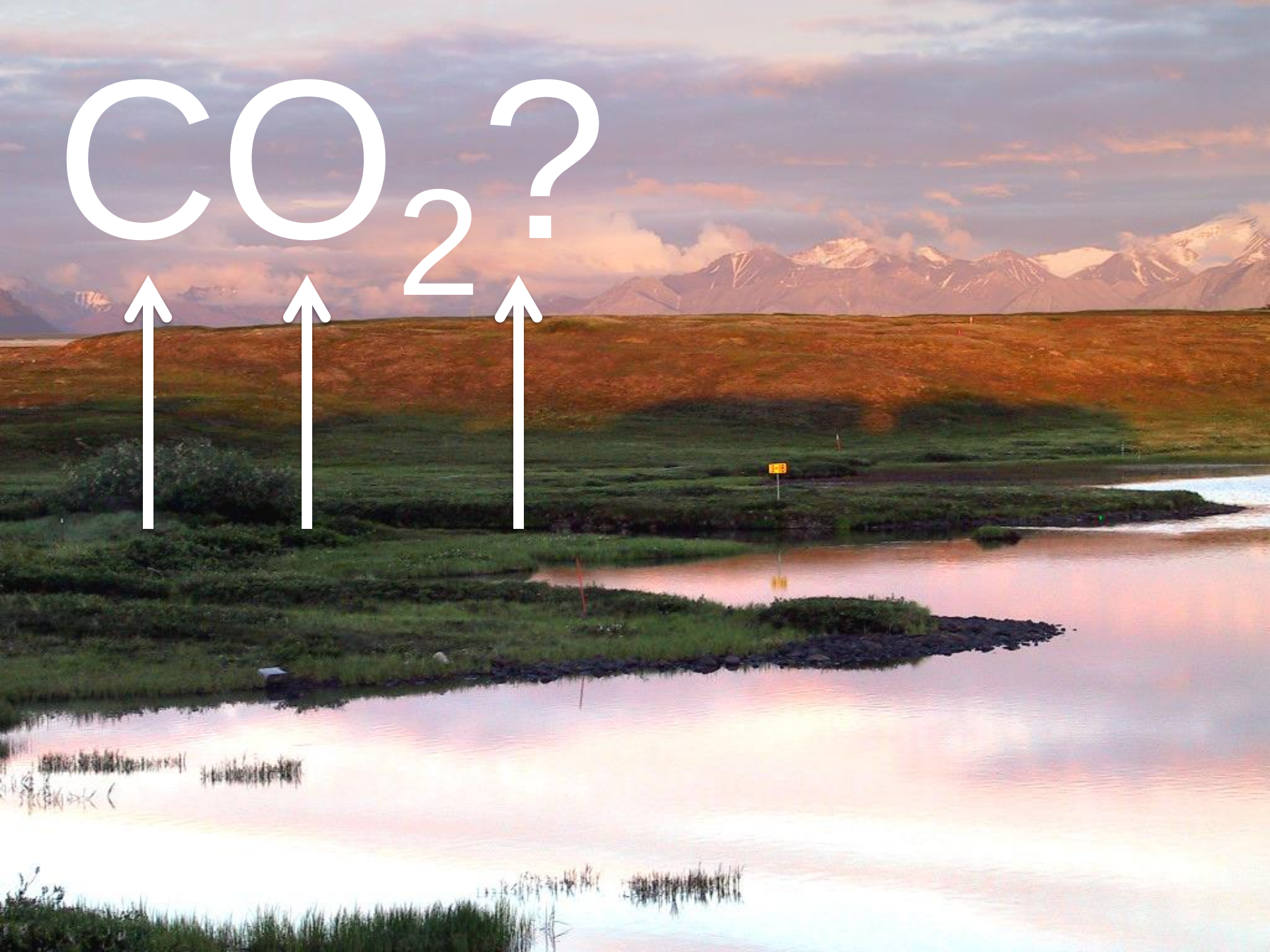
http://www.arctic.noaa.gov/reportcard/snow.html

U.S. Department of Agriculture
Natural Resources Conservation Service
Soil Survey Division
World Soil Resources

Soil Organic Carbon



Source: FAO-UNESCO, Soil Map of the World, digitized by ESRI. Soil climate map, USDA-NRCS, Soil Survey Division, World Soil Resources, Washington D.C.


CO_2?

Climate change will continue to be the focus of terrestrial ecosystem ecology

With emphases on:

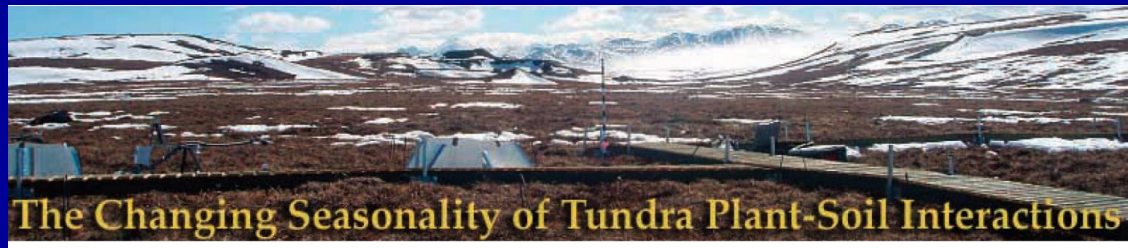
- Changes in plant productivity and community composition
- Soil C losses due increased SOM decomposition
- The impacts of disturbances such as thermokarsts

Future Research Needs

More large multi-investigator projects

Associated Needs:

- More complex logistics
- Transportation
- More on site support
- More lab space per group – more people and more measurements
- Office space for students and teachers



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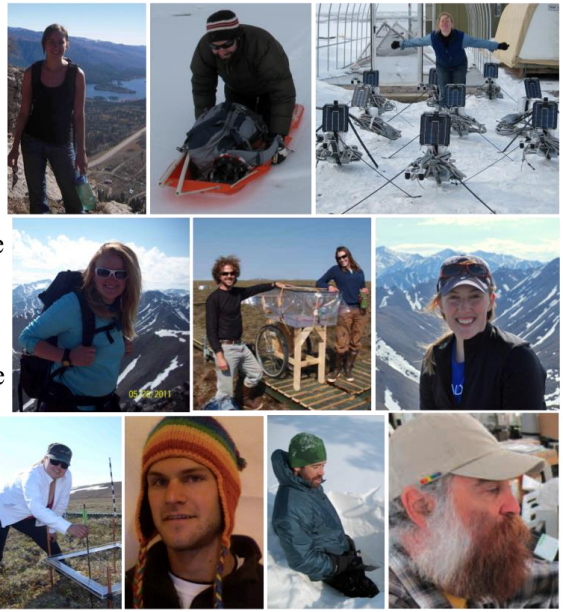

More large manipulative field experiments

- More complex logistics
- Deploying heavy equipment to field sites
- More lab space at TFS
- Protecting the tundra
- Paying attention to the legacy of field manipulations after projects end

Protecting the Tundra

- Moveable Boardwalks, etc –improvements and innovations are needed to protect areas away from more permanent boardwalks

Greater Reliance On Automated Sensors & Chambers

- Data management & archiving
- Deploying heavy equipment to field sites
- Power (sometimes)
- Remote data downloading
- Data archiving – Advanced - Cooperative Arctic Data and Information Service?
- Winter warm storage (sometimes)

Broader Geographic Distribution Of Research Sites

- More complex logistics
- Greater transportation needs
- Deploying equipment to more field sites
- Power (sometimes)
- Protecting more tundra

Data & Monitoring Needs from TFS

GIS

- Maintaining long term records of research across the landscape
- Assistance with site selection, mapping

EDC

- Climate Monitoring, including soil temperature and moisture
- Active layer depth
- Monitoring phenology