

# Cold-season gas exchange of arctic plants - resolving winter carbon and water balances of Alaskan arctic tundra.

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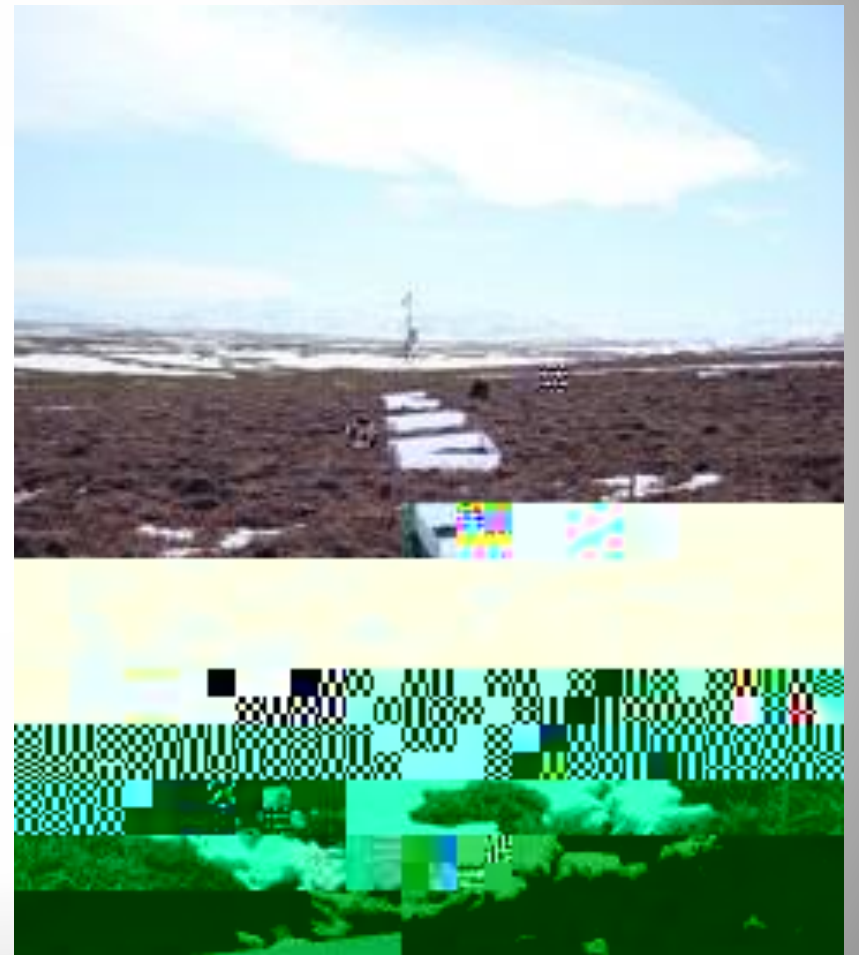
# Primary Questions

1.A. *What are the rates and controls on plant respiration during the cold season? B. How will respiratory rate change with moderate changes in temperatures below freezing?*

2.A. *What are the retention times for carbon within the individual plants and the system as a whole? B. What portion of the yearly physiological activity contributes to the carbon retention (i.e. spring physiology, peak growing season, or fall or winter)?*

3.A. *How important is photosynthesis of evergreens and mosses in late fall and under the snow. B. How does the fringe season physiological activity counter respiratory losses? C. How do evergreens and mosses protect against high light during cold conditions?*

4. *How do evergreen plants manage water loss and water uptake during*



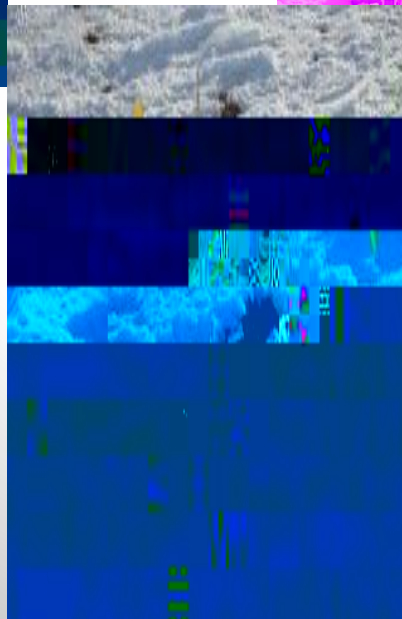
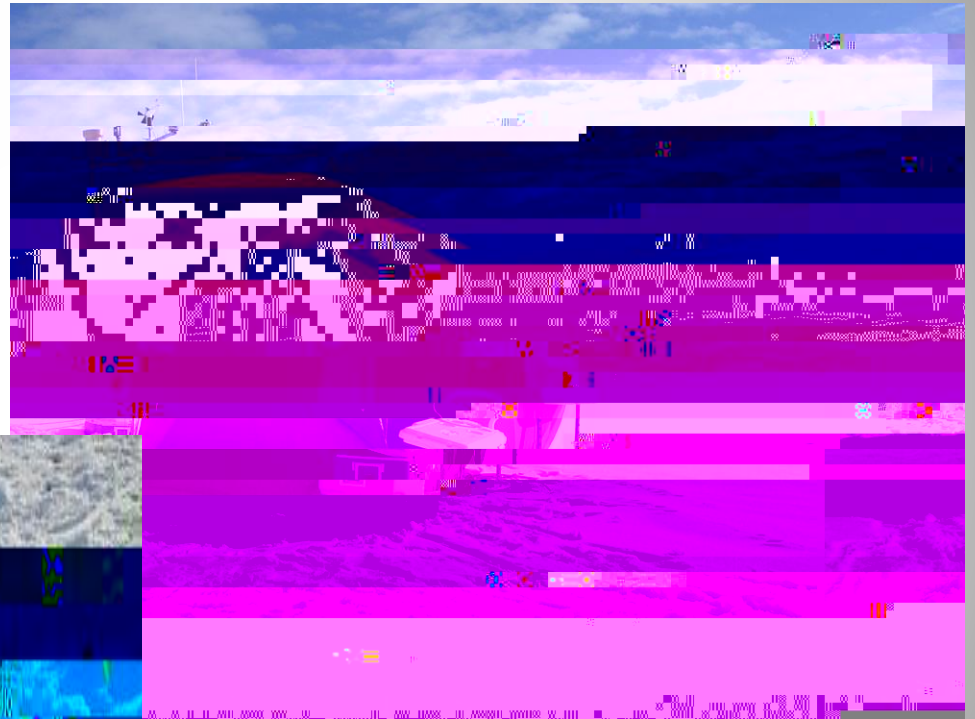
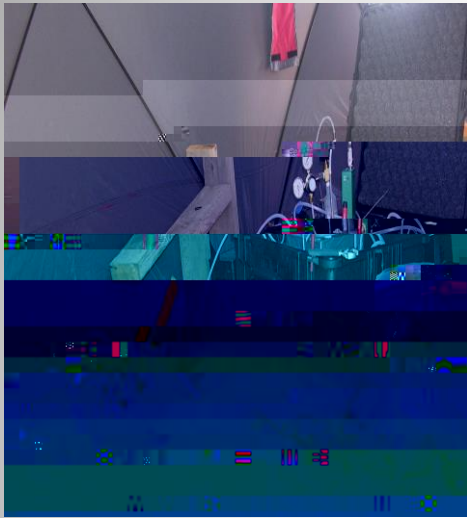
# The Studies

2009-11 Labeling  
experiments

Winter  
physiological  
measurements

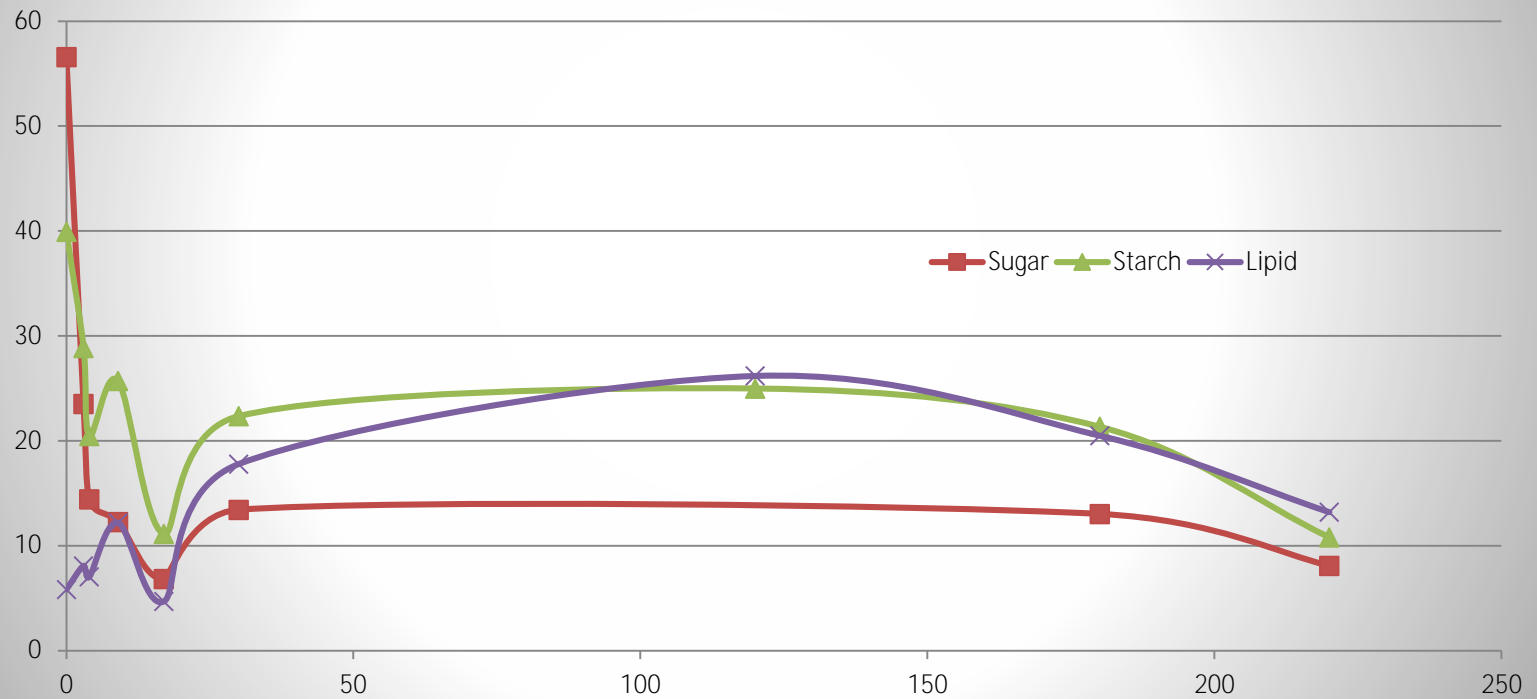
Growth chamber  
studies

# Shoulder Season Labeling





# Some of the findings





# Where is the research going?

We want to expand our studies by incorporating active warming (power needs)

Greater integrated studies (scales and disciplines).

Aquatic vs. Terrestrial (more integration)

Coupling of all systems.

# Winter conditions, relative quick fixes

need to have an absolute failsafe way of insuring warm storage stays warm.

food situation is not very good, especially lunch and breakfast

the moving equipment to another lab is a big problem. in cold soaked labs plastic and wire insulation are extremely brittle and easily damaged while moving. I have had to have things repaired for this very issue

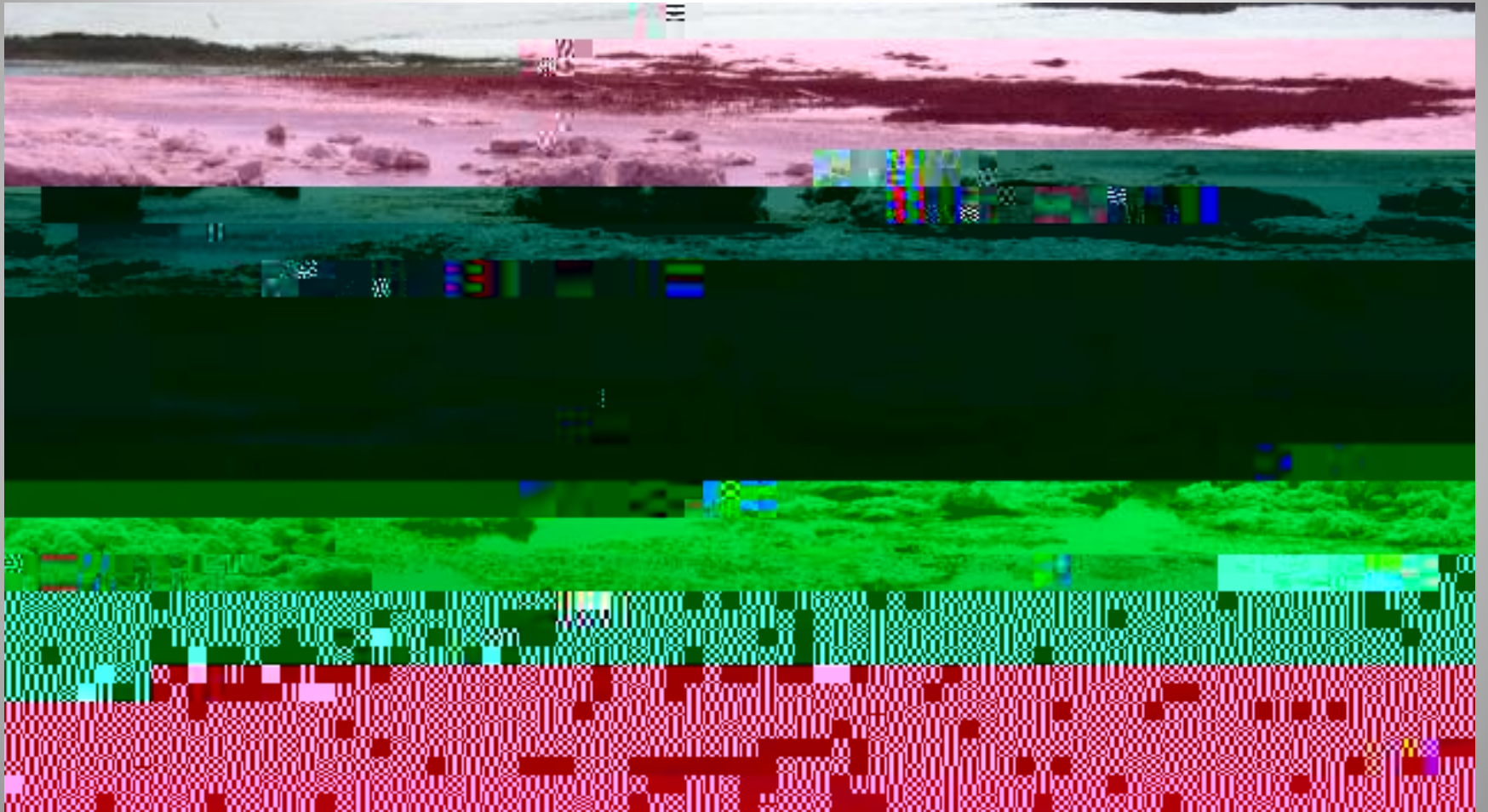
# Winter conditions, relative quick fixes cont.

Items needs secure storage over winter since material disappears.

Safety during sorties in winter



# 2011 Spring



# Suggested Needs (low cost)

Needs for additional freeze drying capacity

Need for additional -80 freezer space

Industrial movement and supply of liquid nitrogen

# Suggested Needs (high cost)

Need for Garage and staging

Extremely important for winter studies

Increased Winter laboratories that will limit the risks of associated with moving equipment. (increase scientific productivity and costs).

Scientific Community is changing (dual career couples) Family Housing.

# Education

Use what we know  
from other stations  
Distinctions between  
research and  
education





# Need for Increase Safety to reduce Liability

A chemistry professor at UCLA and the regents of the UC system are facing felony charges in the death of Sheri Sangji, a young research associate who died after a chemical fire. The university had been



# Questions/Comments?

