Senescence Timing: Thermal Periodicity in High Arctic Plants

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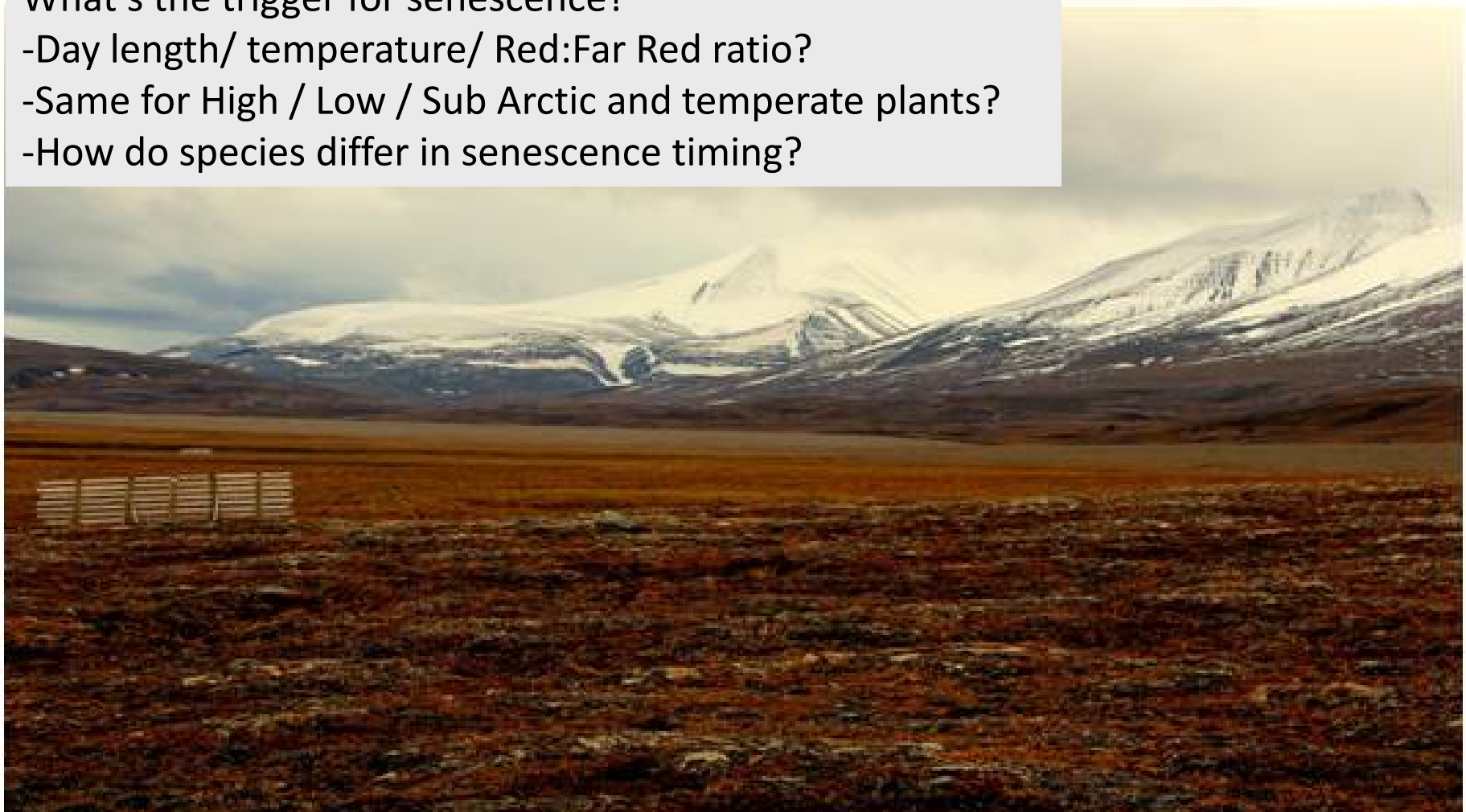
Senescence timing: not well understood & very little studied.

What's the trigger for senescence?
-Day length/ temperature/ Red:Far Red ratio?
-Same for High / Low / Sub Arctic and temperate plants?
-How do species differ in senescence timing?



Green-up / Growing Season start determined by snow melt timing.

Could the timing of Senescence also be affected by snow melt date?

Manipulated snow melt dates using snow fences on Svalbard

8 year average melt date:

Shallow 28 May, *Ambient* 2 June, *Medium* 12 June, *Deep* 18 June

Data collected:

Date of snowmelt
Air & Soil Temperature
Soil moisture
% Senesced for each species in each plot
c 200 plots

Treatments: *Shallow, Ambient, Medium, Deep*, 20d range in snowmelt

Weekly observations:
8 years: 2007-13, 15

Species studied:

Alopecurus magellanicus
Bistorta vivipara
Cassiope tetragona
Dryas octopetala
Luzula confusa
Pedicularis hirsuta
Salix polaris
Stellaria longipes

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What effect do OTCs have on Senescence?

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Is the timing of Senescence affected by snow melt date? -yes !

-Our data from snowfence and OTCs indicate that cumultive temperature sums trigger Senescence.

-Thermal periodicity => implications for forage availability and C balance at end of season. May eventually lead to outcompetition by plants from Southern areas.

- Can the ITEX phenology dataset be checked for this across sites and species?

-what is the role of soil moisture?

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