OAK RIDGE National Laboratory

Shrub Damage in the Spring of 2025

Kyle Pearson and Mark Guilliams

With contributions from Verity Salmon, Andrew Richardson, and Francisco Campos Arguedas

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U.S. DEPARTMENT OF ENERGY

Apparent shrub damage noticed during weekly phenology

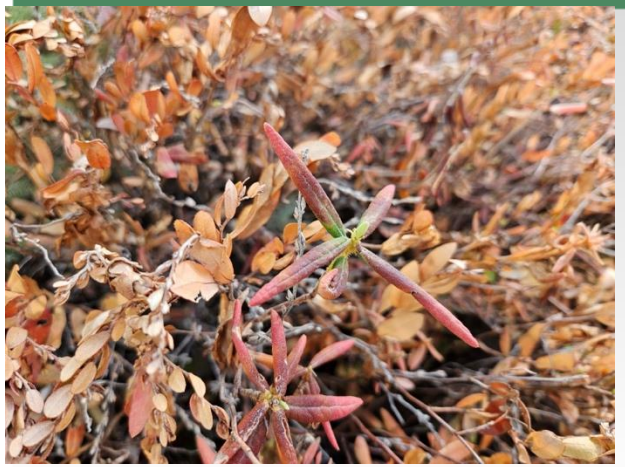
Ambient

Pictures taken morning of 25 April

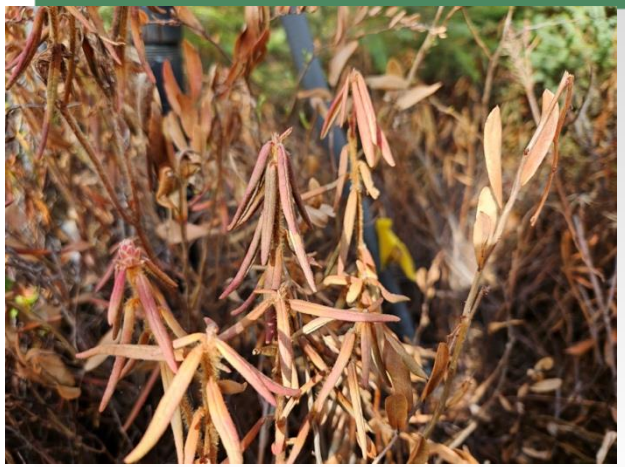
P19 (+0, eCO_2)

Apparent shrub damage noticed during weekly phenology

P13 (+4.5, aCO_2)




P17 (+9, aCO_2)

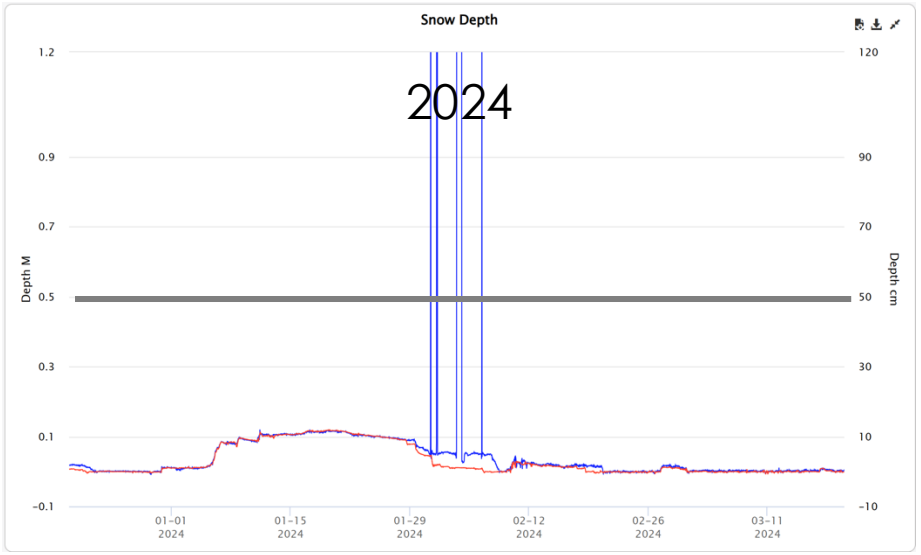


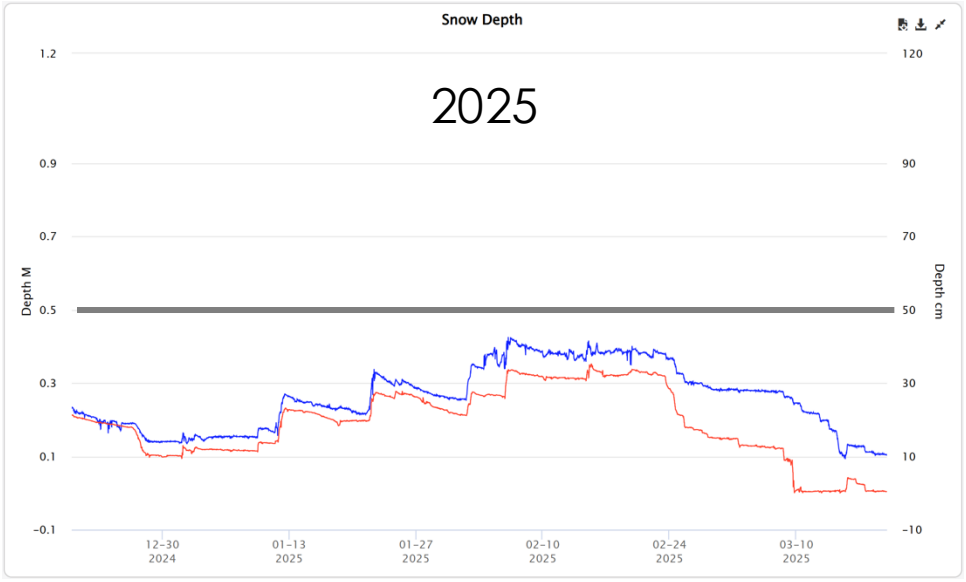

By normal phenology, CHCA flowers should be open by now

From Verity and Andrew:

- "The damage certainly looks like the shrub diebacks I have seen in the tundra from where snow has been removed, either by wind redistribution, road scraps, or digging by large herbivores."
- "The potential for increased winter damage as a result of reduced snow was a major discussion point in my recent JGR paper, 10.1029/2023JG007833"

How deep was the snow cover?





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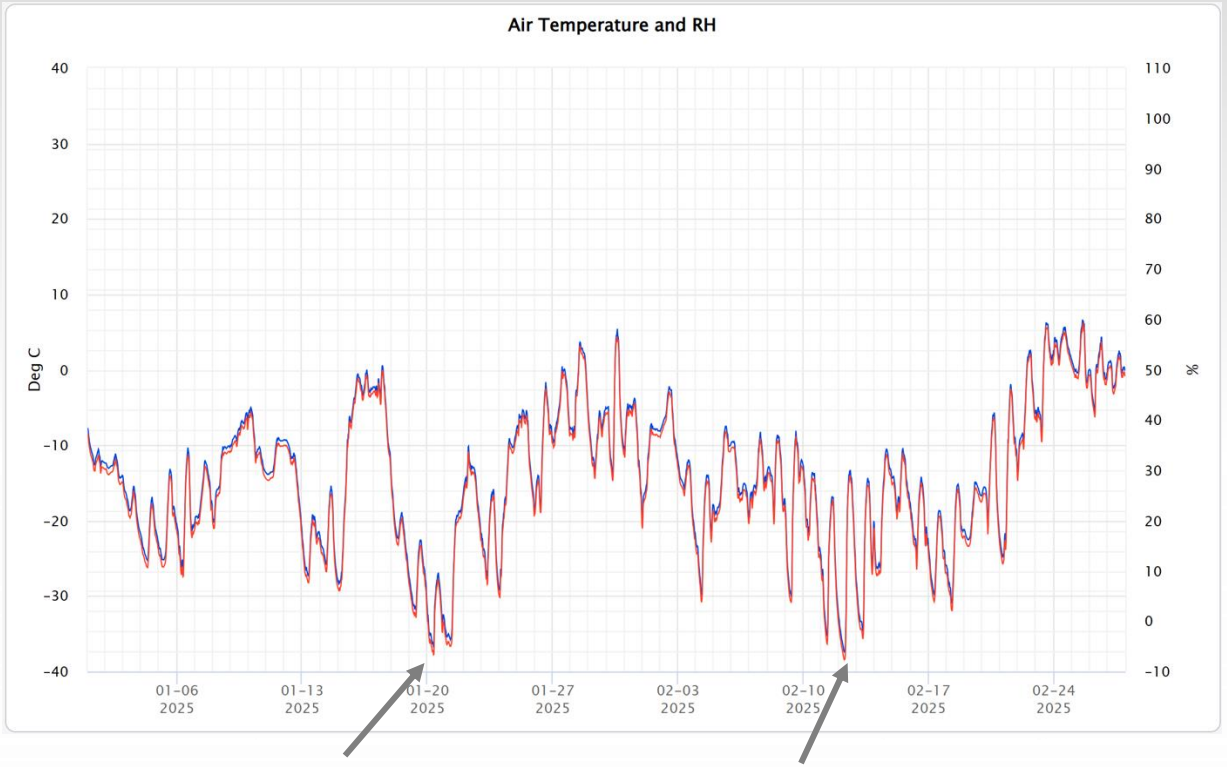
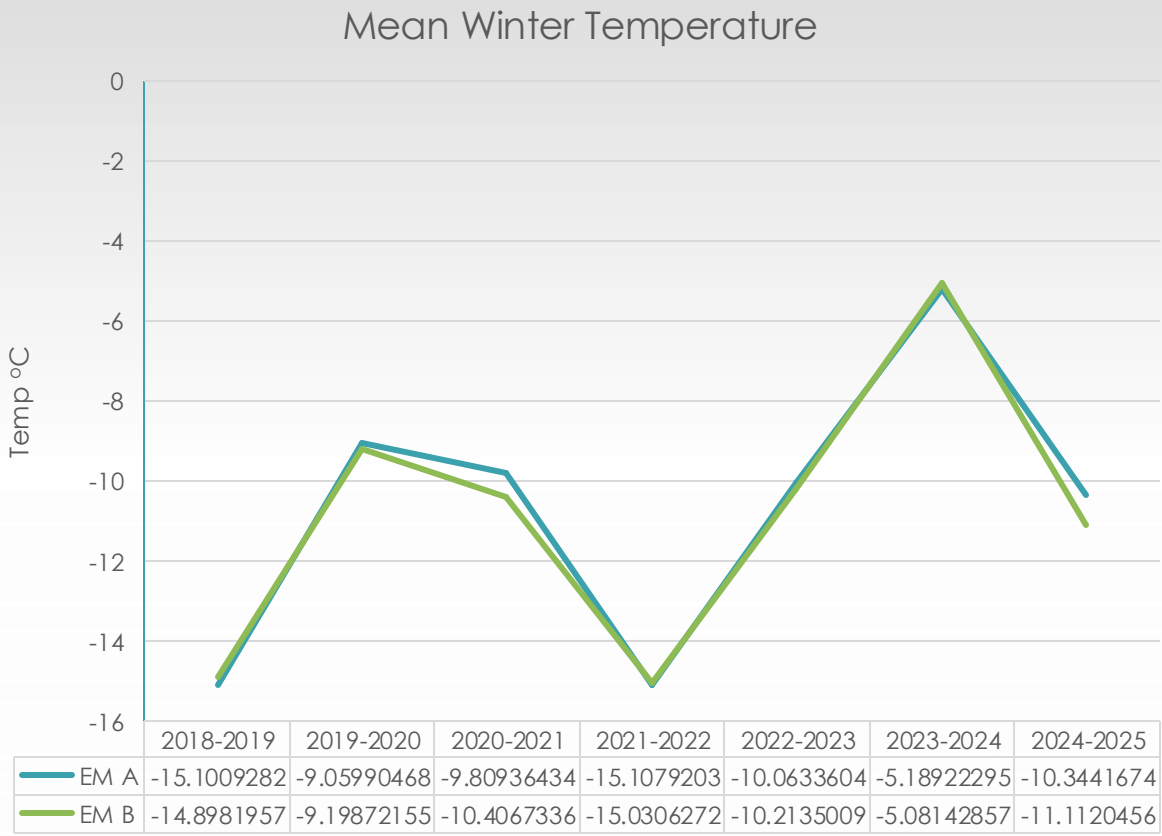
How cold was it?

Lowest temps on 20 Jan and 12 Feb, down to -37 °C



Not an exceptionally cold winter



	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025
EM A	-15.1009282	-9.05990468	-9.80936434	-15.1079203	-10.0633604	-5.18922295	-10.3441674
EM B	-14.8981957	-9.19872155	-10.4067336	-15.0306272	-10.2135009	-5.08142857	-11.1120456

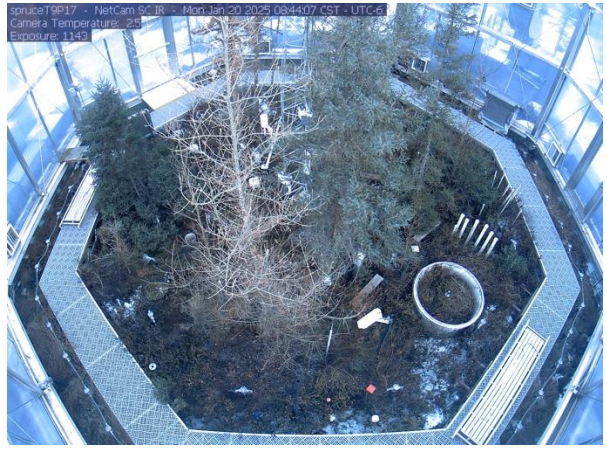
From the Phenocams, 20 January 2025

EM (Ambient)

P19 (+0, eCO_2)

P13 (+4.5, aCO_2)

P17 (+9, aCO_2)



From the Phenocams, 20 January 2023

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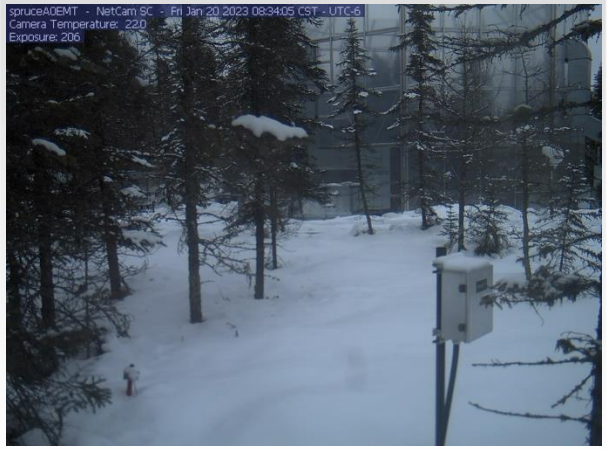

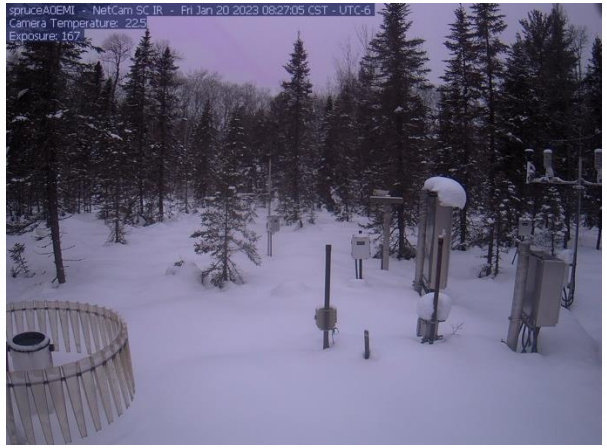

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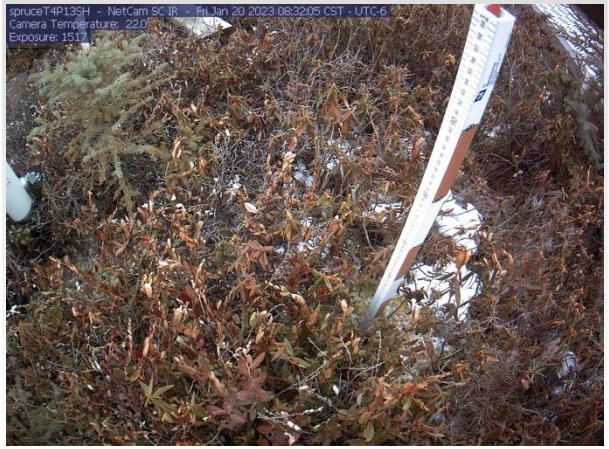
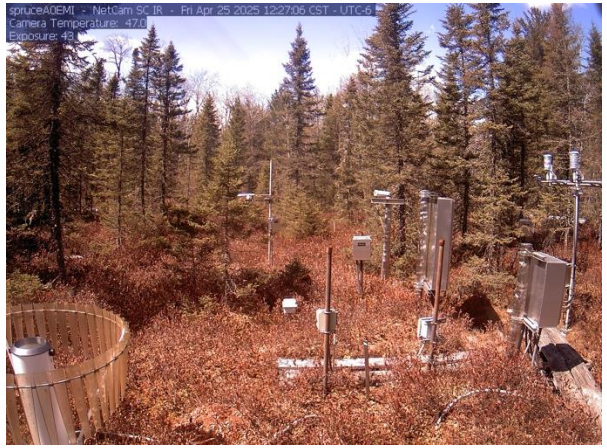


P17 (+9, aCO_2)

From the Phenocams, 25 April 2025

EM (Ambient)



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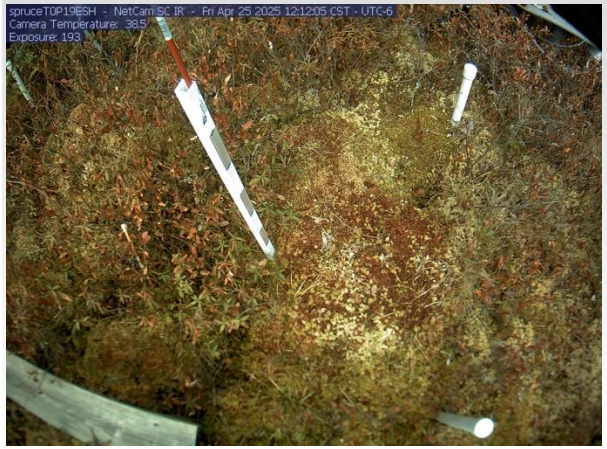

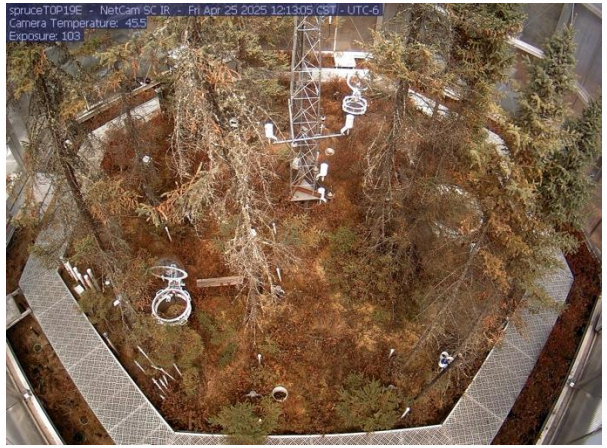

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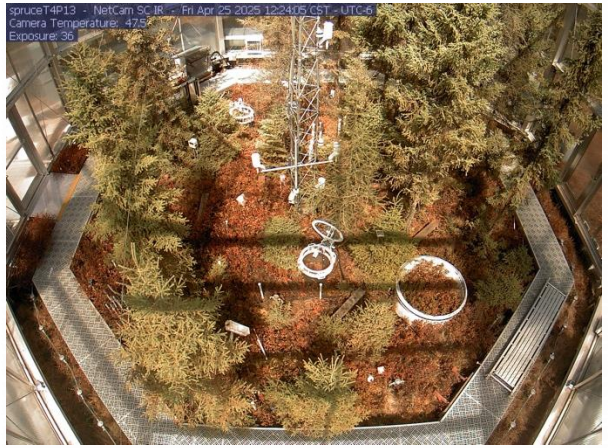

P17 (+9, aCO_2)

From Francisco:

- "This winter, I've had a lot more difficulty getting clear cold hardiness signals in the shrubs compared to previous years. Normally, even if the responses are messy, I can still detect some trends, but this year there was almost no clear signal at all."