

Return of forests to the Finger Lakes region





Where we're going

1. Return of Forests to the Finger Lakes region
2. Human modification of the landscape
3. Old Growth forests

Imagine a mile thick glacier



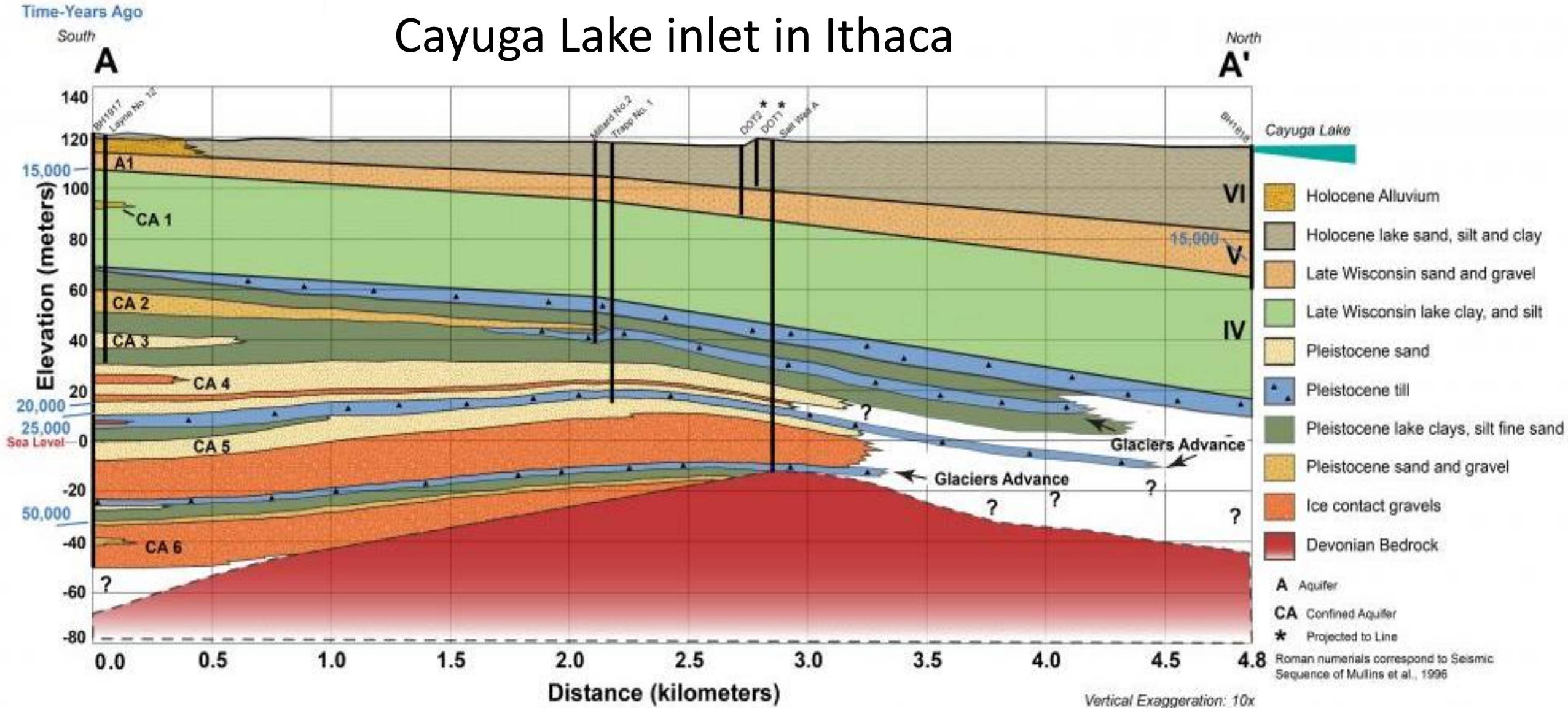






Glacial retreat is the sum of melting at the face and snow addition at the peak, but retreat is interspersed with **advance that deposits till, i.e., loose gravel**

Cayuga Lake inlet in Ithaca



Succession after glacial retreat (Glacier National Park)

Seral stage	Pioneer	<i>Dryas</i>	Alder	Spruce
Time (years) since glacial retreat	5	40	60	200

Soil depth (cm)	5.2	7.0	8.8	15.1
Soil N (g/m ²)	3.8	5.3	21.8	53.3
Soil pH	7.2	7.3	6.8	3.6
Litterfall (g/m ² /yr)	1.5	2.8	277	261



Cyanobacteria
Moss
Lichens



Mountain avens
(*Dryas drummondii*)



Alder
(*Alnus sinuata*)



Spruce
(*Picea sitchensis*)
Western hemlock
(*Tsuga heterophylla*)

NEW TUE MORNING

10
abc

5
CAMDEN

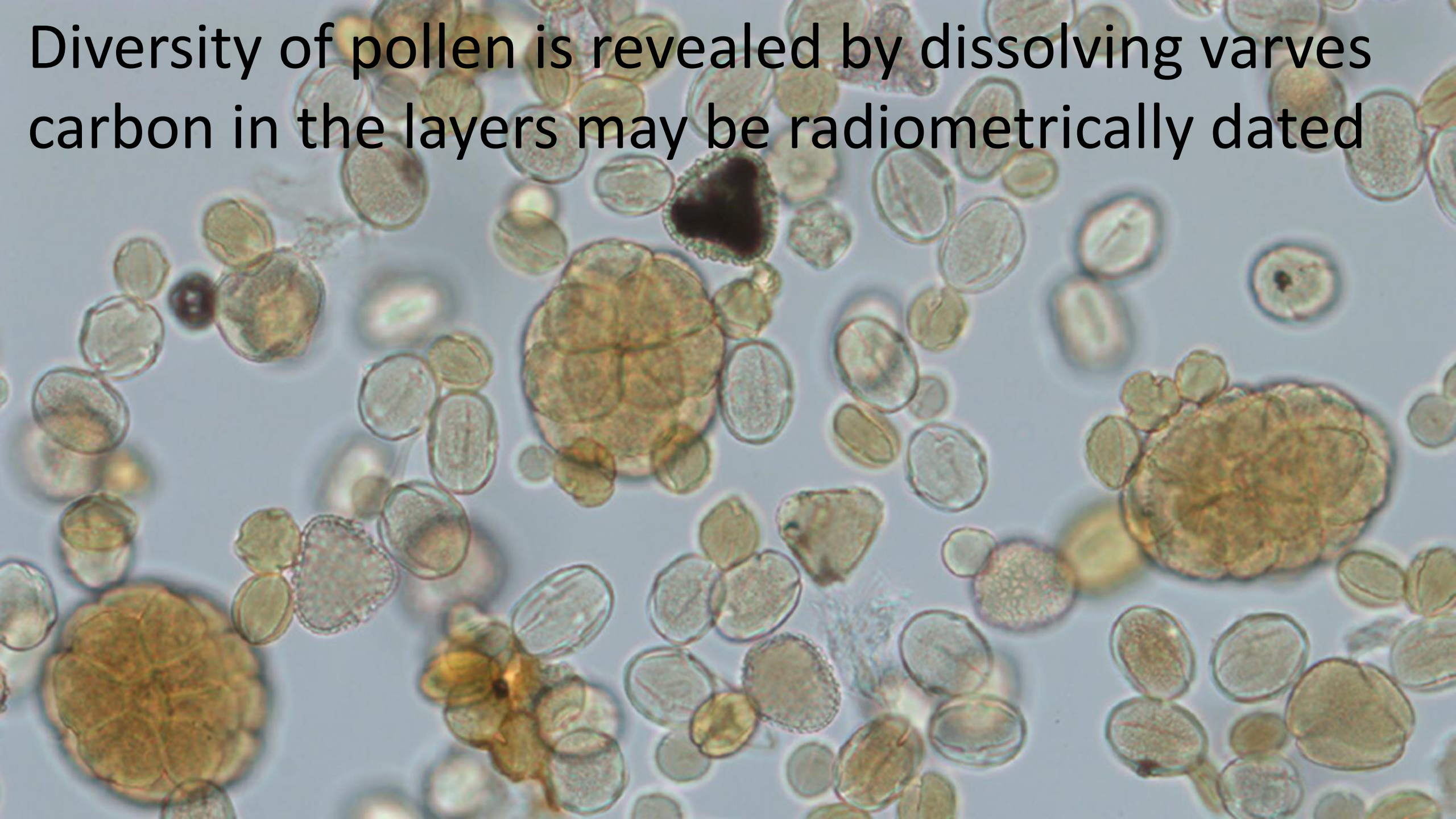


Pipe is drilled down many meters into sediment

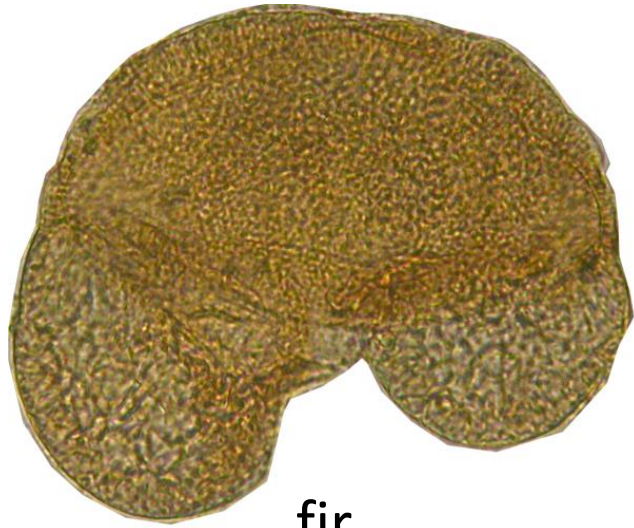


Sediment core mud is stratified into yearly varves

Diversity of pollen is revealed by dissolving varves
carbon in the layers may be radiometrically dated



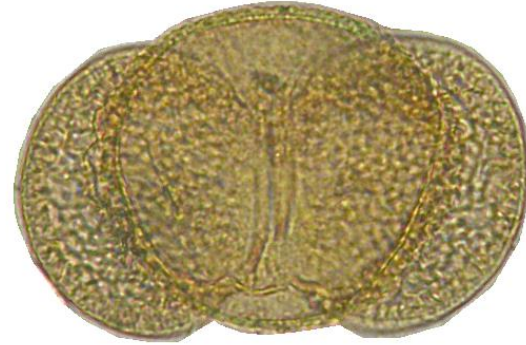
Pollen comes in all sizes and shapes



fir



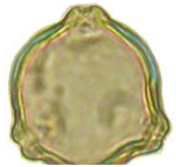
spruce



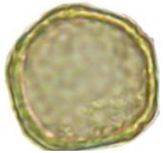
pine



hemlock



birch



elm



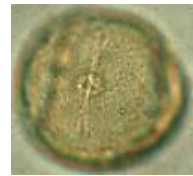
oak



willow



maple



beech



Roseaceae



heather



Asteraceae



grass

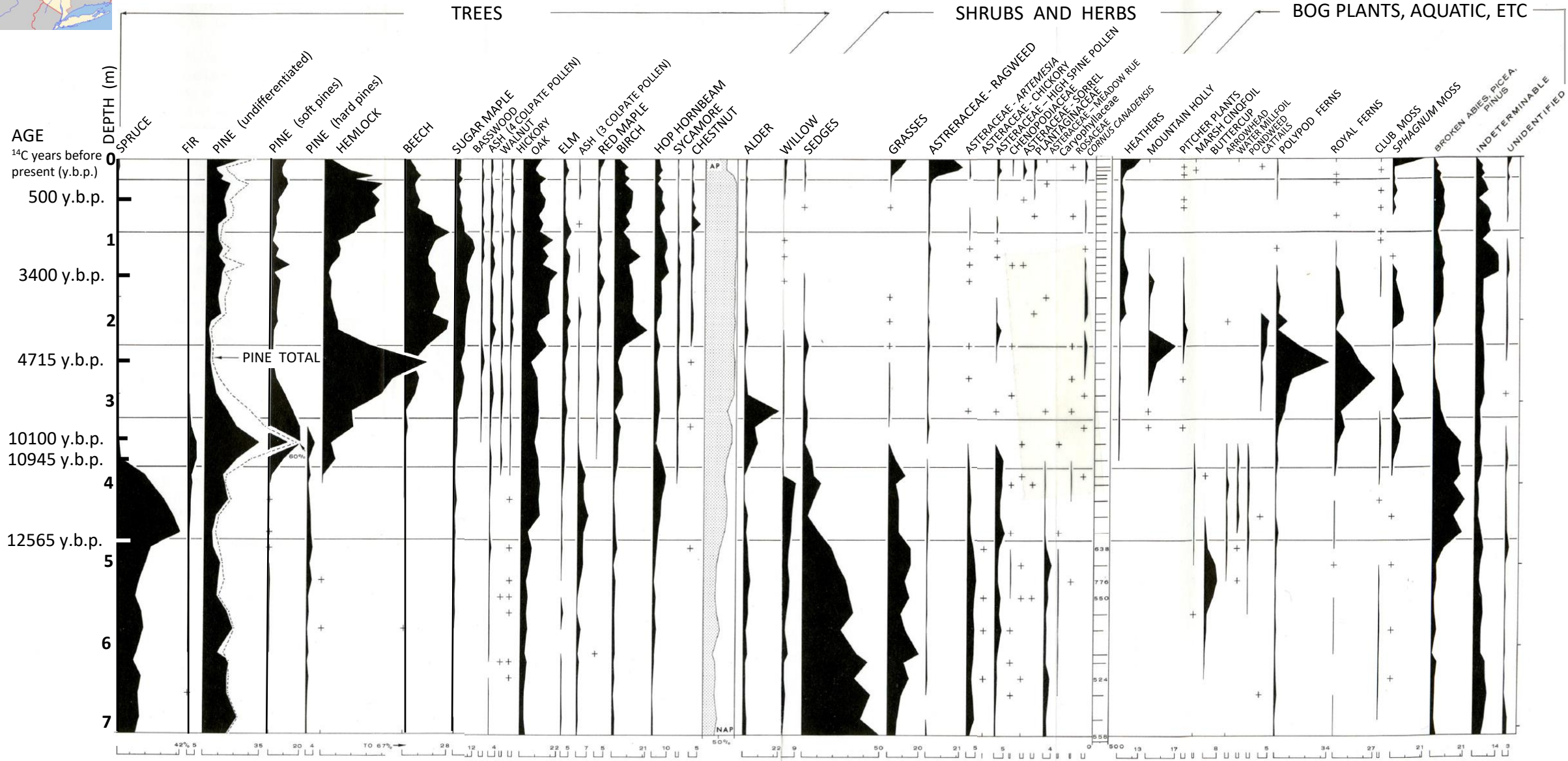


sedge

50 μ m



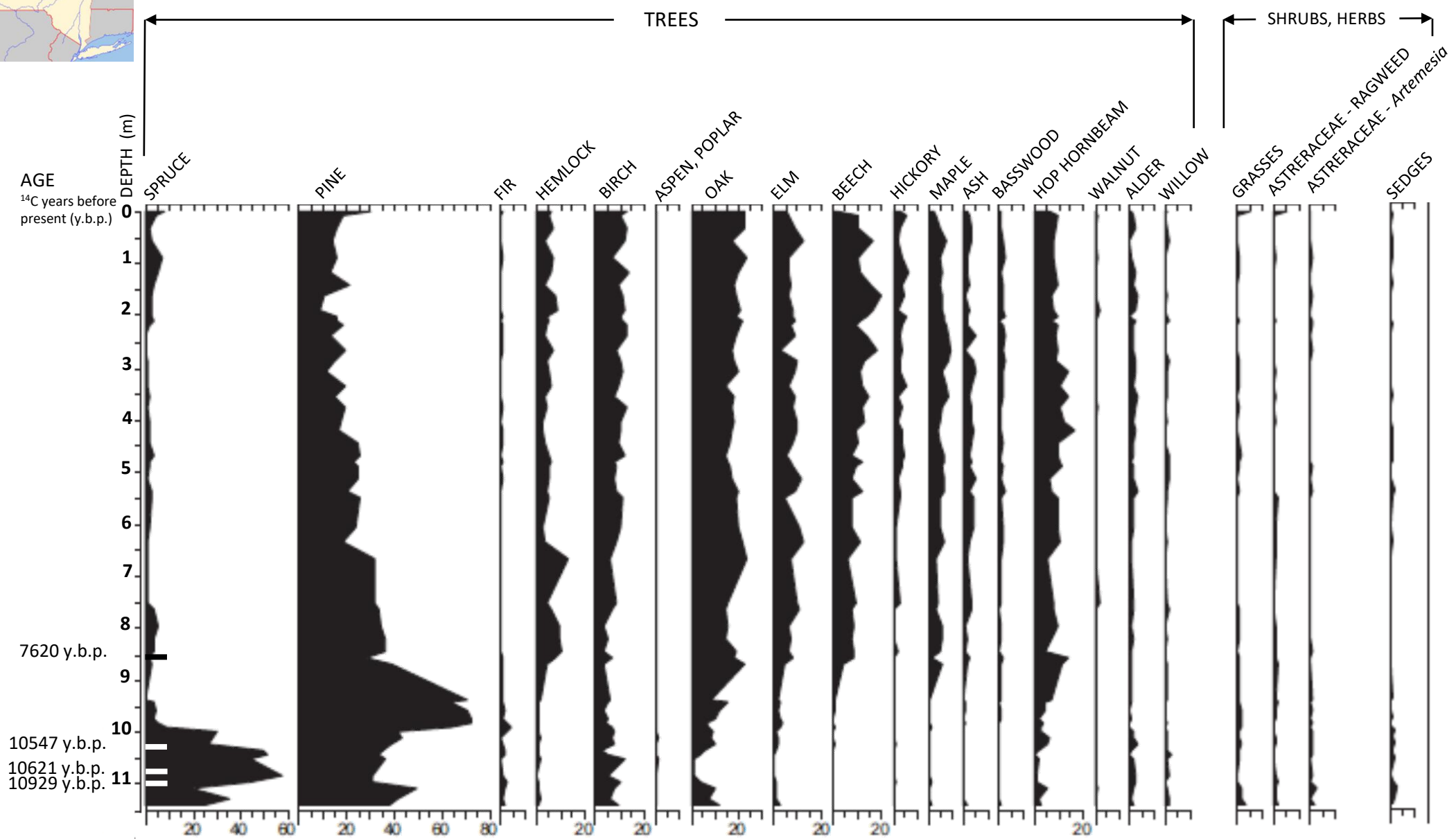
Belmont Bog (BB), Allegheny Co, New York



Relative percent of pollen at a given depth in the sediment core



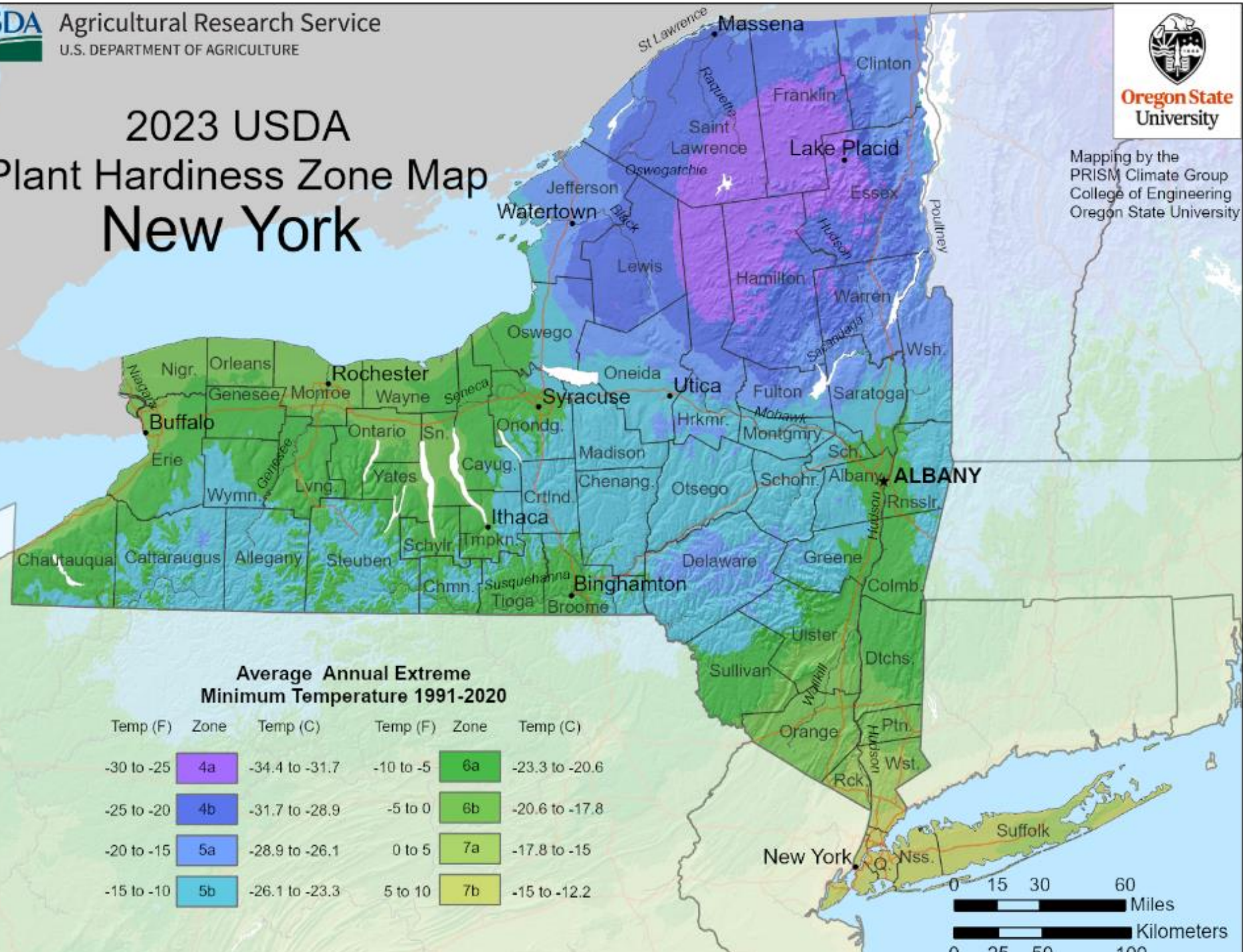
Roblin Lake (RL), Ontario



Relative percent of pollen at a given depth in the sediment core

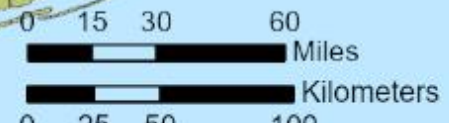
2023 USDA Plant Hardiness Zone Map New York

Mapping by the PRISM Climate Group
College of Engineering
Oregon State University

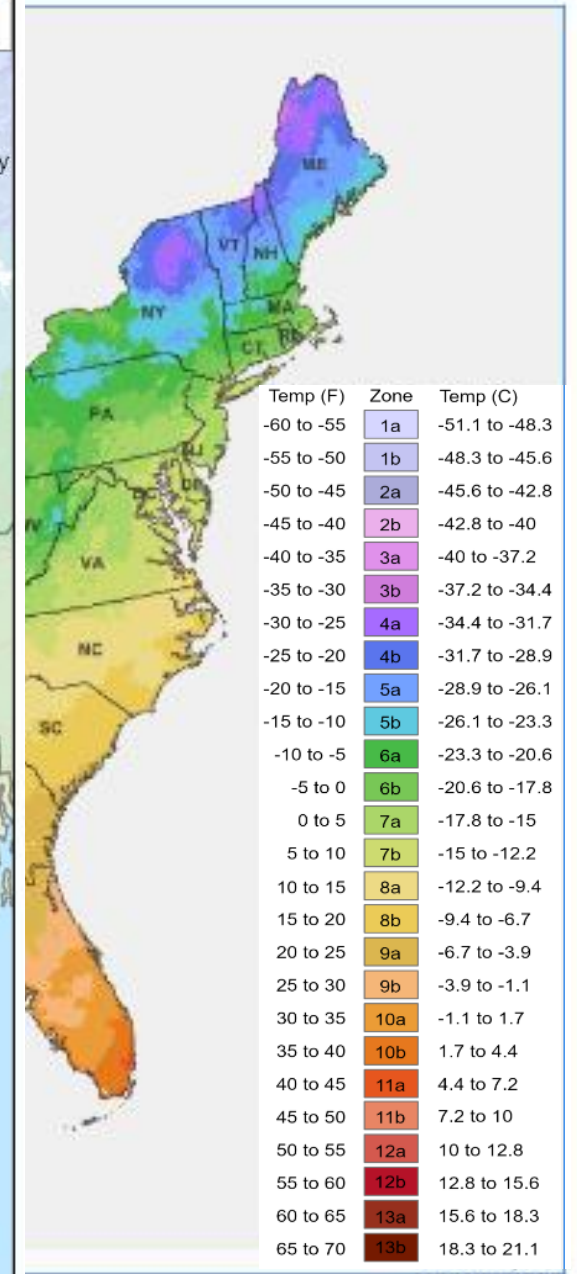


Average Annual Extreme Minimum Temperature 1991-2020

Temp (F)	Zone	Temp (C)	Temp (F)	Zone	Temp (C)
-30 to -25	4a	-34.4 to -31.7	-10 to -5	6a	-23.3 to -20.6
-25 to -20	4b	-31.7 to -28.9	-5 to 0	6b	-20.6 to -17.8
-20 to -15	5a	-28.9 to -26.1	0 to 5	7a	-17.8 to -15
-15 to -10	5b	-26.1 to -23.3	5 to 10	7b	-15 to -12.2



ern latitudes
akes and Lake Ontario



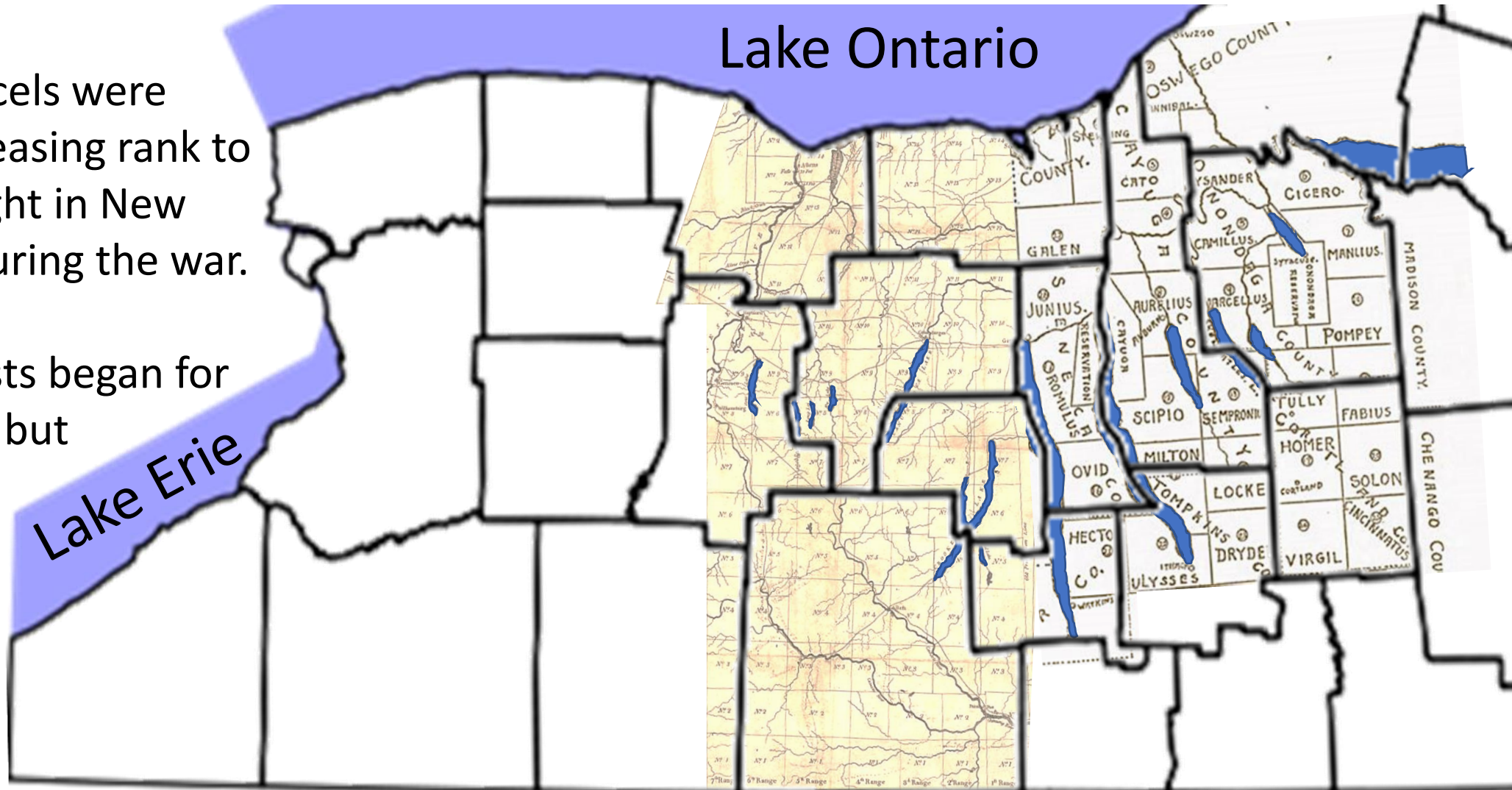


After the Revolutionary War two large parcels of land were acquired by New York

Revolutionary War Bounty Lands Act in 1781 (a.k.a. The Military Tract of Central New York) – eastern Finger Lakes
Phelps and Gorham purchase in 1788 – western Finger Lakes

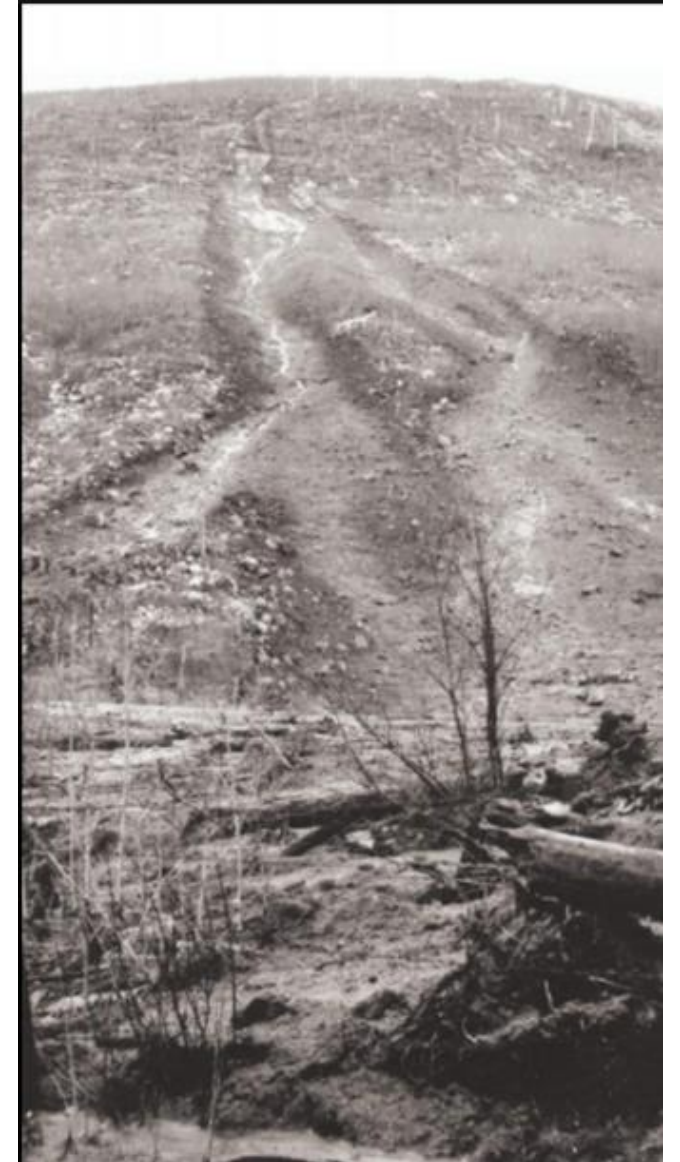
Military tract parcels were awarded by decreasing rank to soldiers who fought in New York regiments during the war.

Clearing the forests began for “improved” land, but records were not kept until 1850 when 50% of forest had been cleared.



Pennsylvania state line

Clearing the forests for agriculture continued until the peak in 1885
78% of land was under agriculture, including the Adirondacks



Old Growth Forest



Seeds of sun loving trees



oak



ash



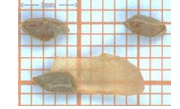
hickory

Seeds of shade tolerant old growth trees

at the same scale



birch



hemlock



white pine



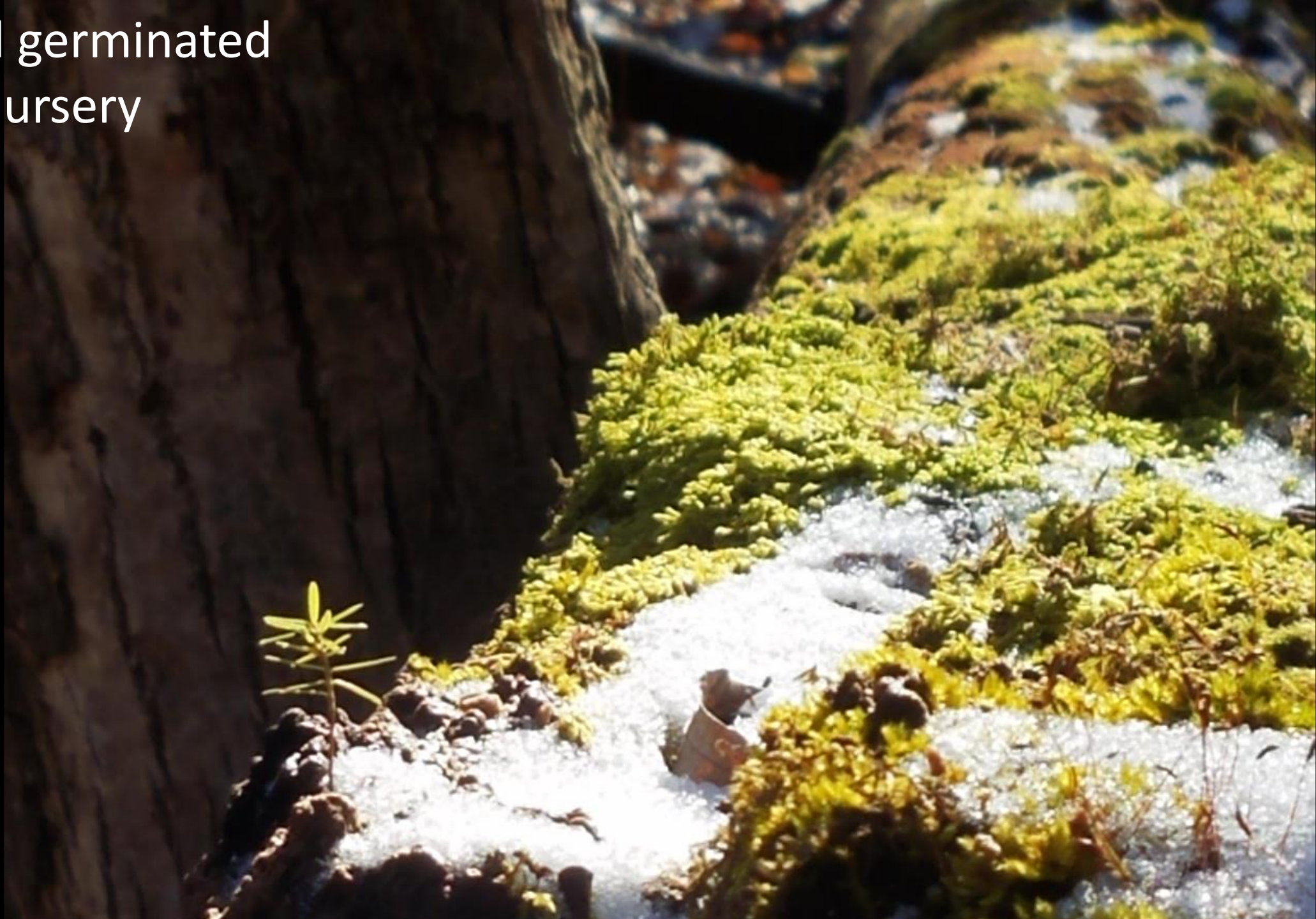
sugar maple

Sun loving seeds have a nutrient "dowry"
Old growth trees need help

Nurse trees



Hemlock seed germinated
in the moss nursery





Nurse log (or stump) finally decays leaving a hollow under the roots of the tree it nursed to maturity



Another nurse function is “hump and hole” topography







Second growth – post agriculture



