CLIMATE CHANGE
where WE live

Curt Stager
Natural Sciences

Paul Smith's
COLLEGE

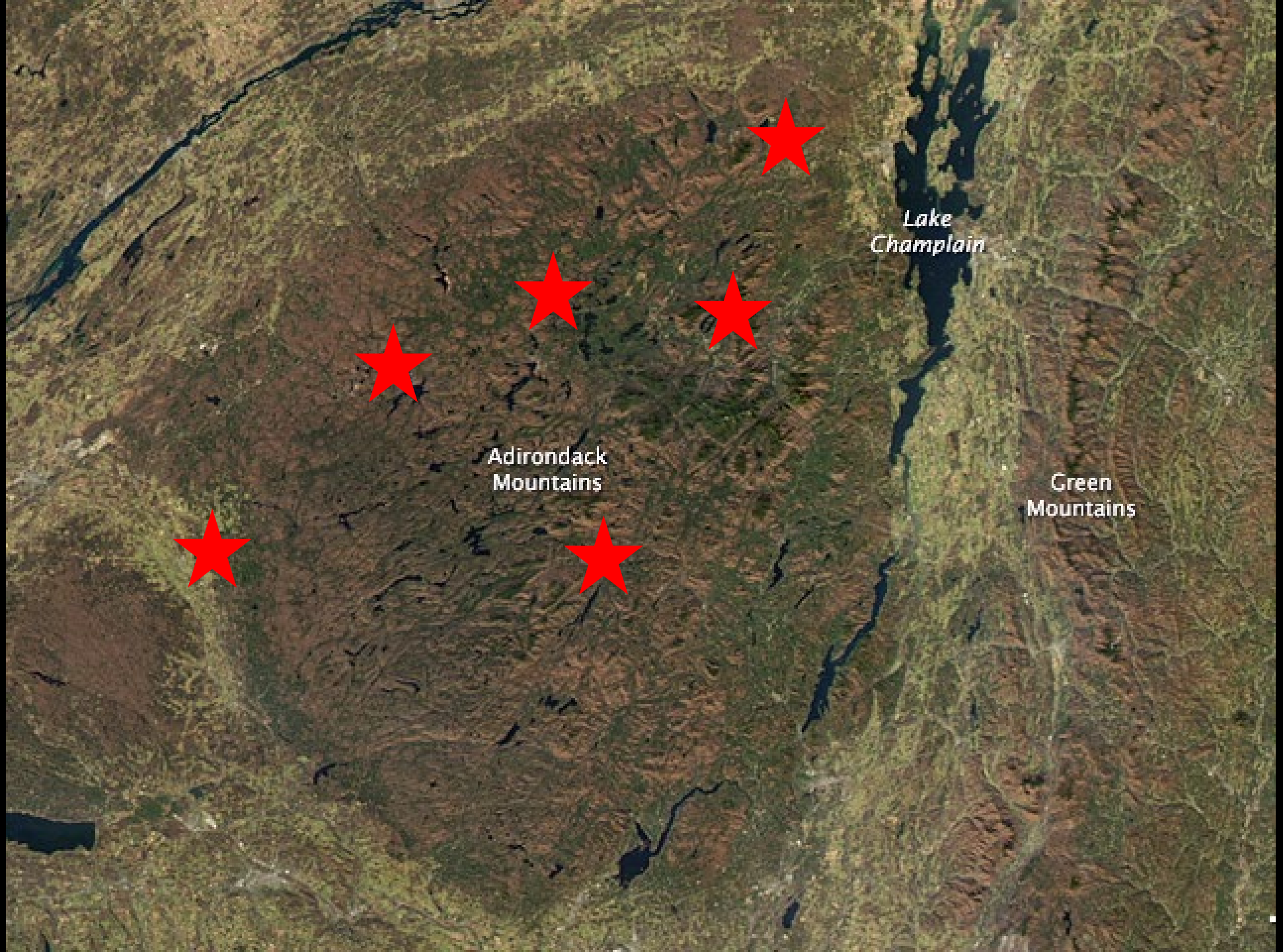
“I noticed, while observing the country, some very high mountains on the eastern side, on top of which there was snow…”

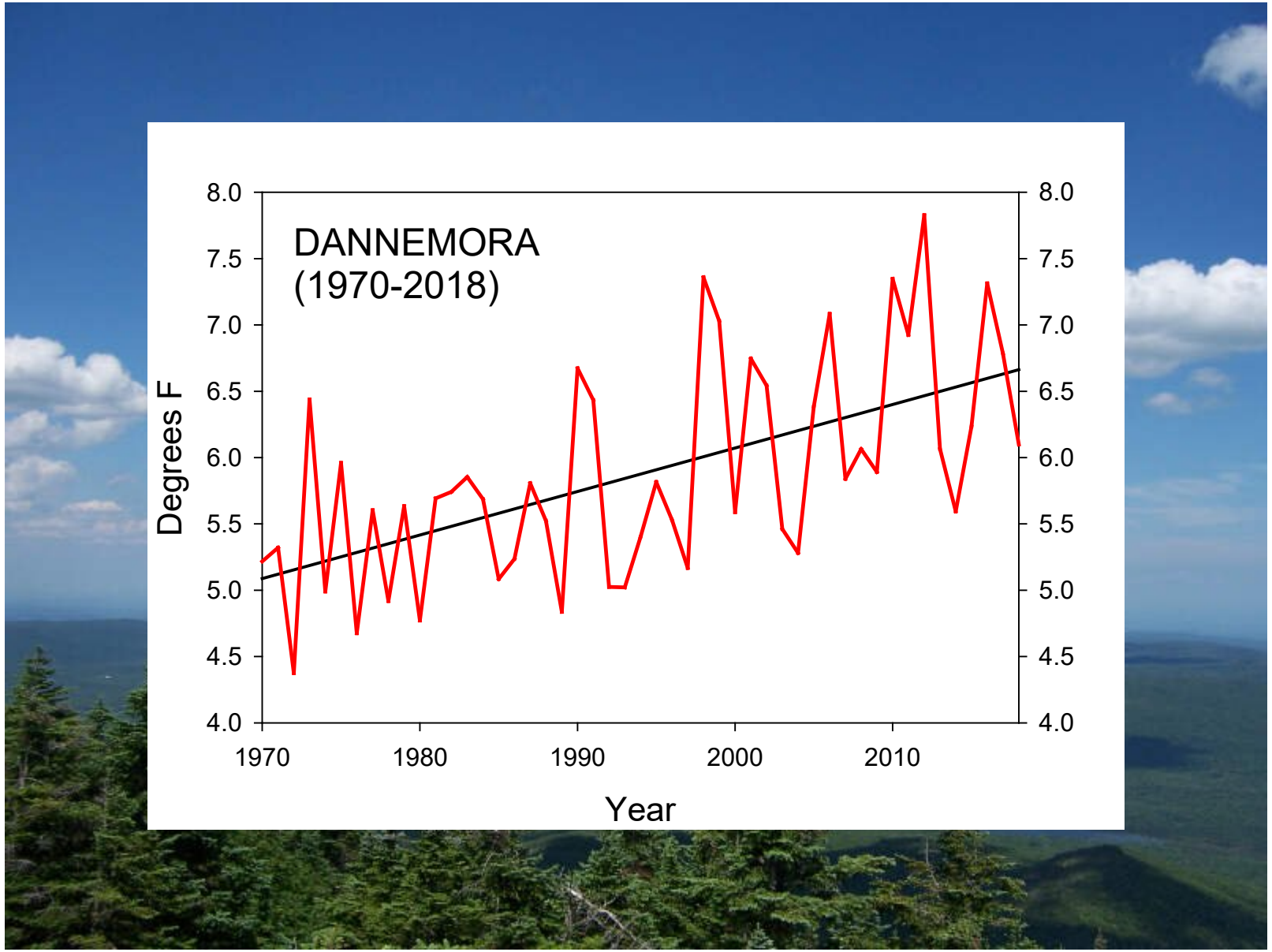
<u>SAMUEL</u>
<u>de CHAMPLAIN</u>
From his visit to the North Country 400 years ago…

"I noticed, while observing the country, some very high mountains on the eastern side, on top of which there was snow…"

<u>SAMUEL</u>
<u>de CHAMPLAIN</u>
From his visit to the North Country 400 years ago…

… in *<u>JULY</u>*, 1609


Lake
Champlain
Adirondack
Mountains
Green
Mountains



OVERALL WARMING

1.6 F

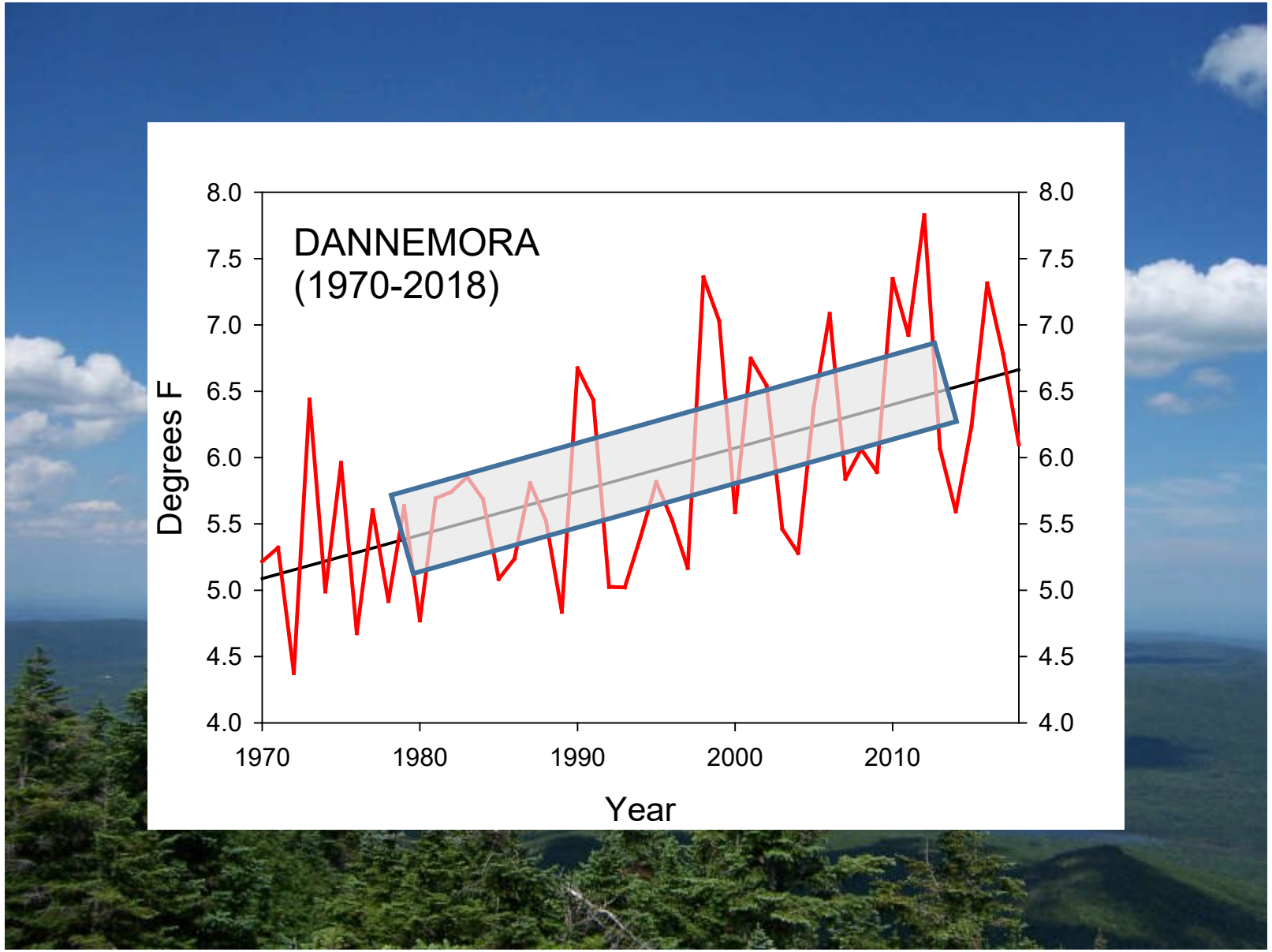
STRONGEST WARMING:

SEPT (3.2 F)

DEC & JAN (2.6 F)

NO SIG TREND:

Feb through July (except May)



OVERALL WARMING

1.6 F

STRONGEST WARMING:

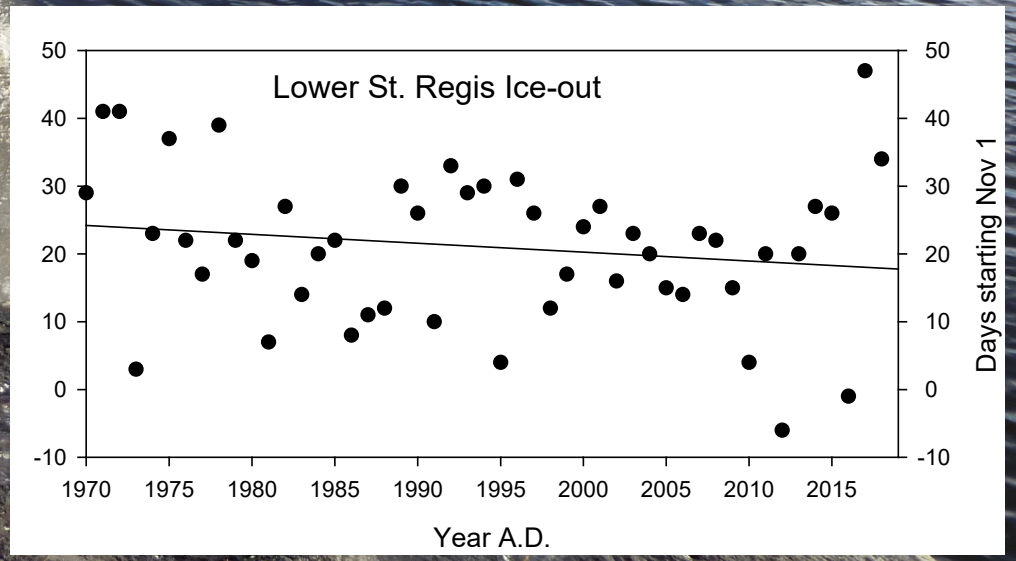
SEPT (3.2 F)

DEC & JAN (2.6 F)

NO SIG TREND:

Feb through July (except May)

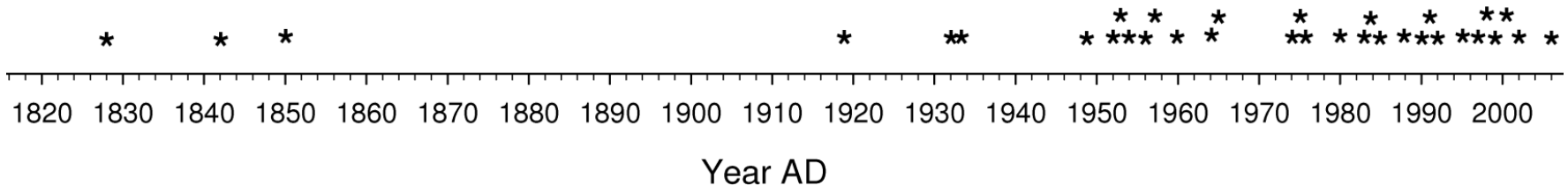
LOWER ST. REGIS LAKE
1970-2019



LATER FREEZE-UPS
7 days since 1988

EARLIER ICE-OUTS
7-8 days since 1970

LAKE ICE IN RETREAT



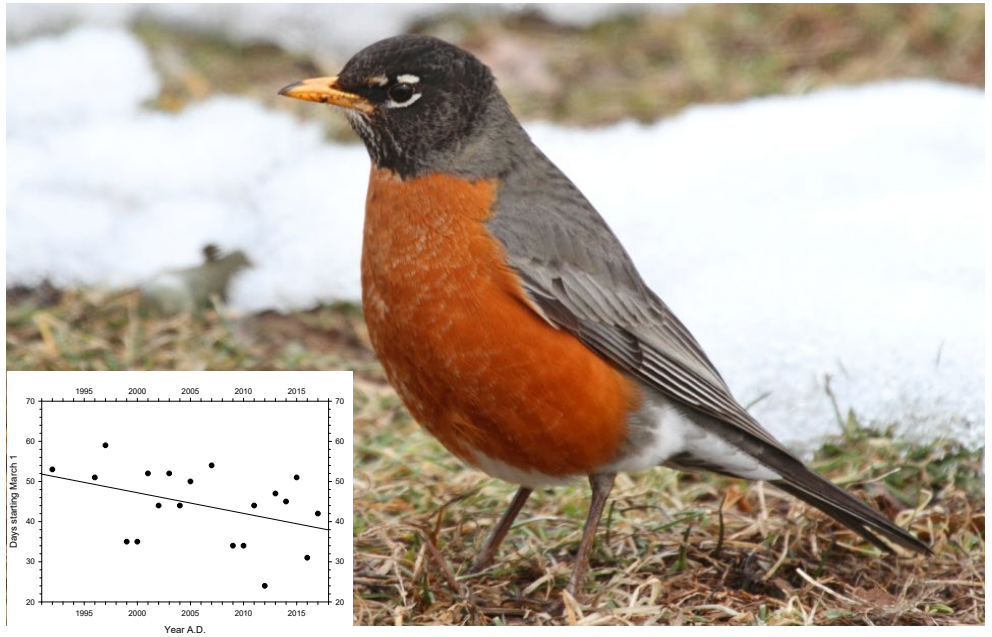
EFFECTS of CHAMPLAIN ICE RETREAT

MIXED RESPONSES:

Robins = YES

Bees = NO

Salamanders = YES



MIXED RESPONSES:

Robins = YES

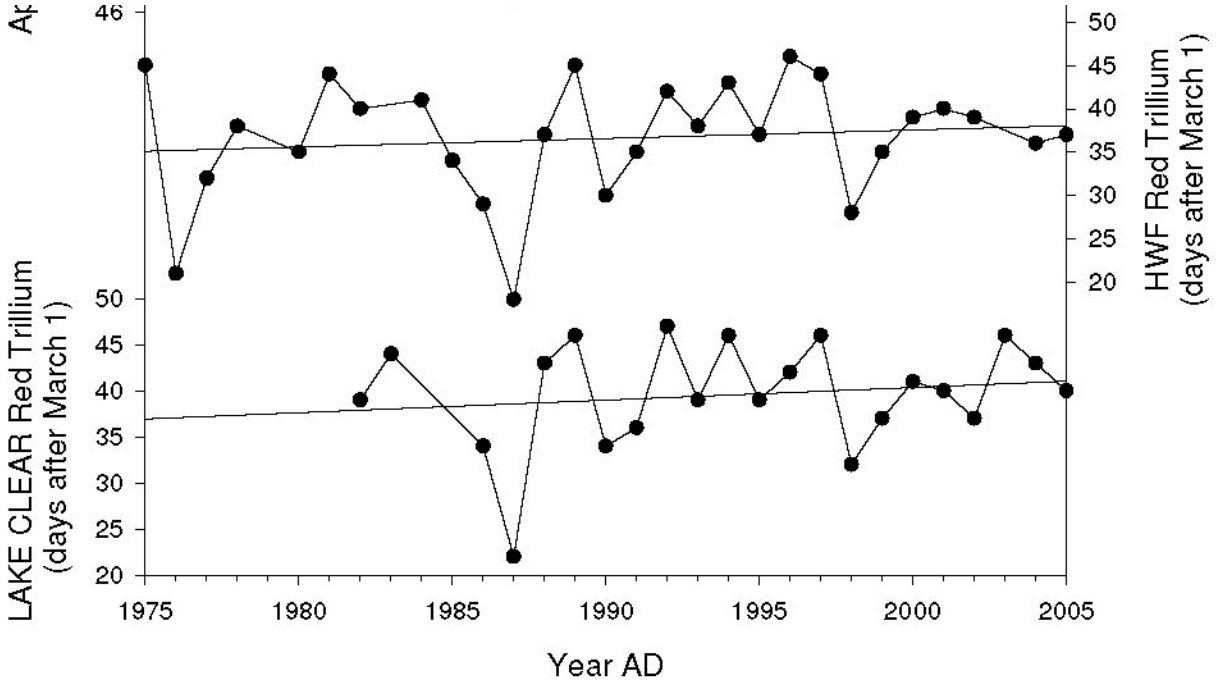
Bees = NO

Salamanders = NO

Little/no warming in SPRING.

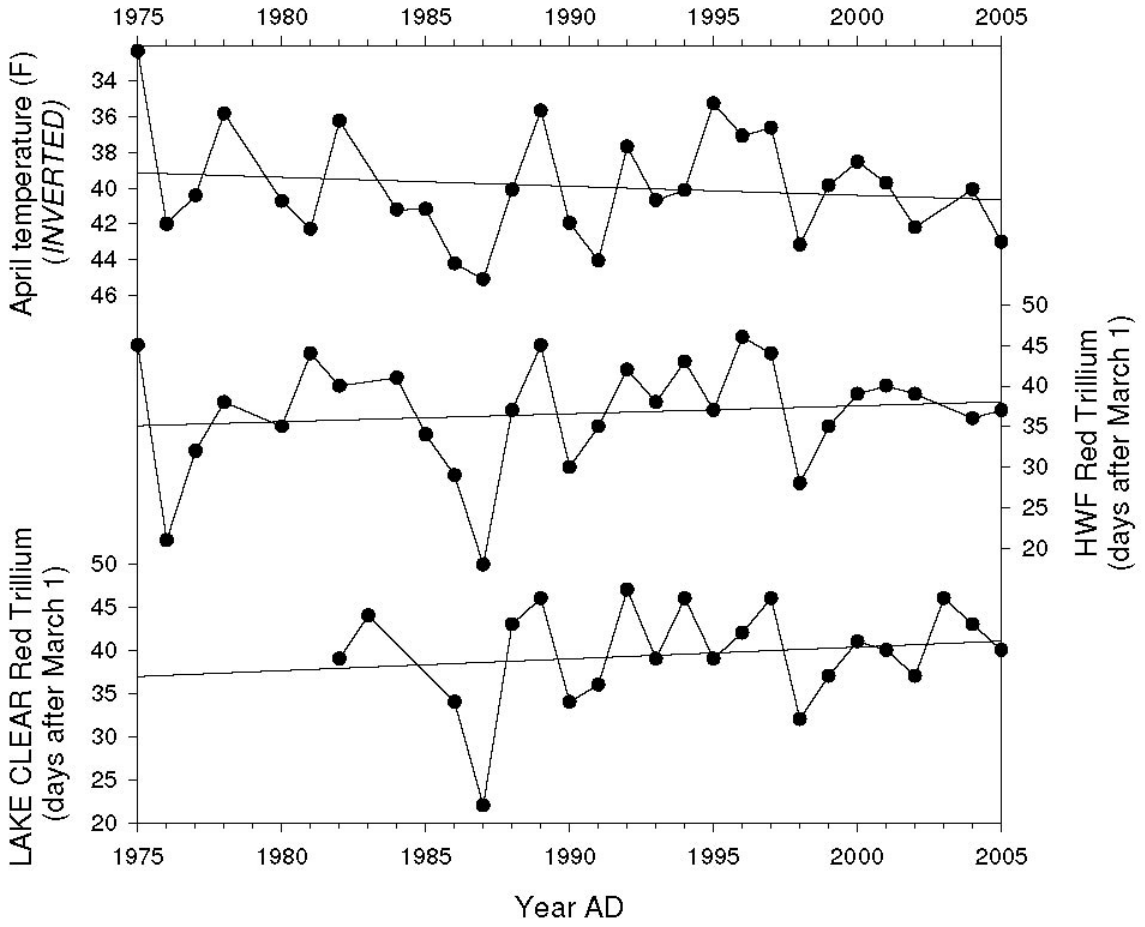
Spring phenology variation is

REGIONALLY COHERENT



Spring phenology covaries with

TEMPERATURE

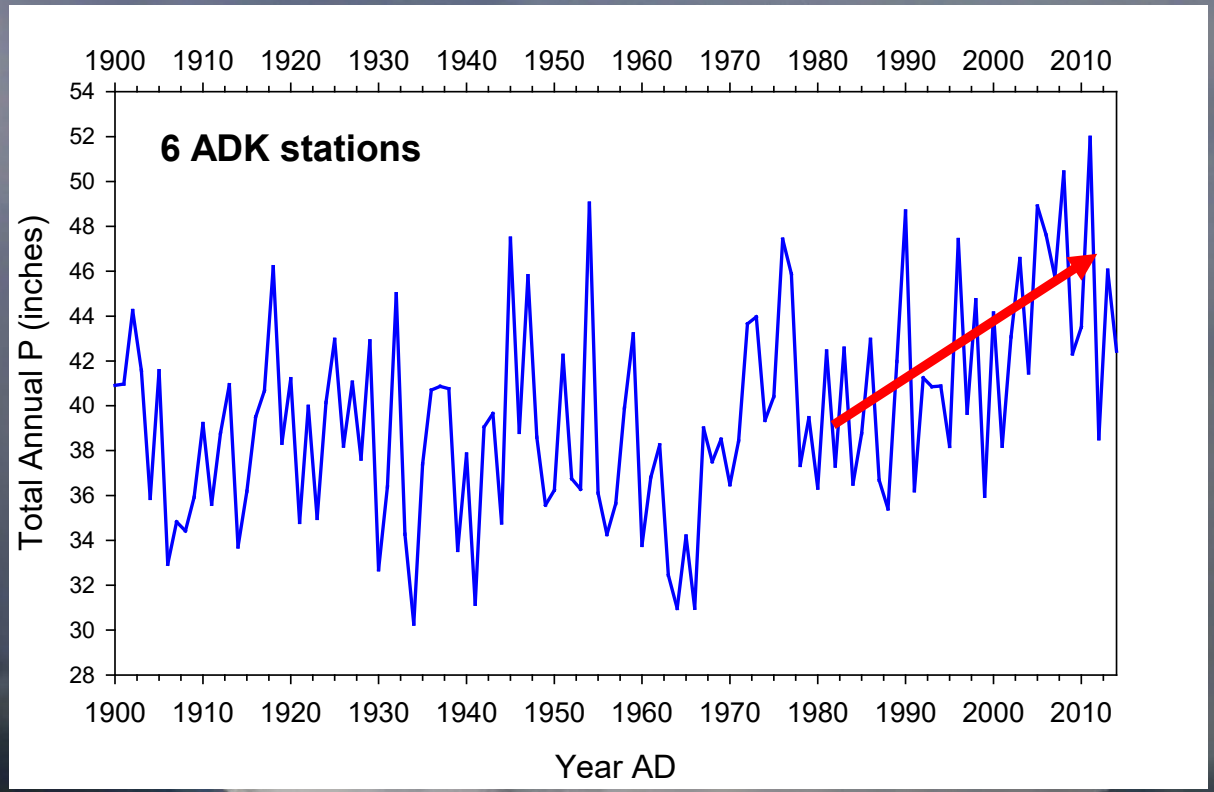


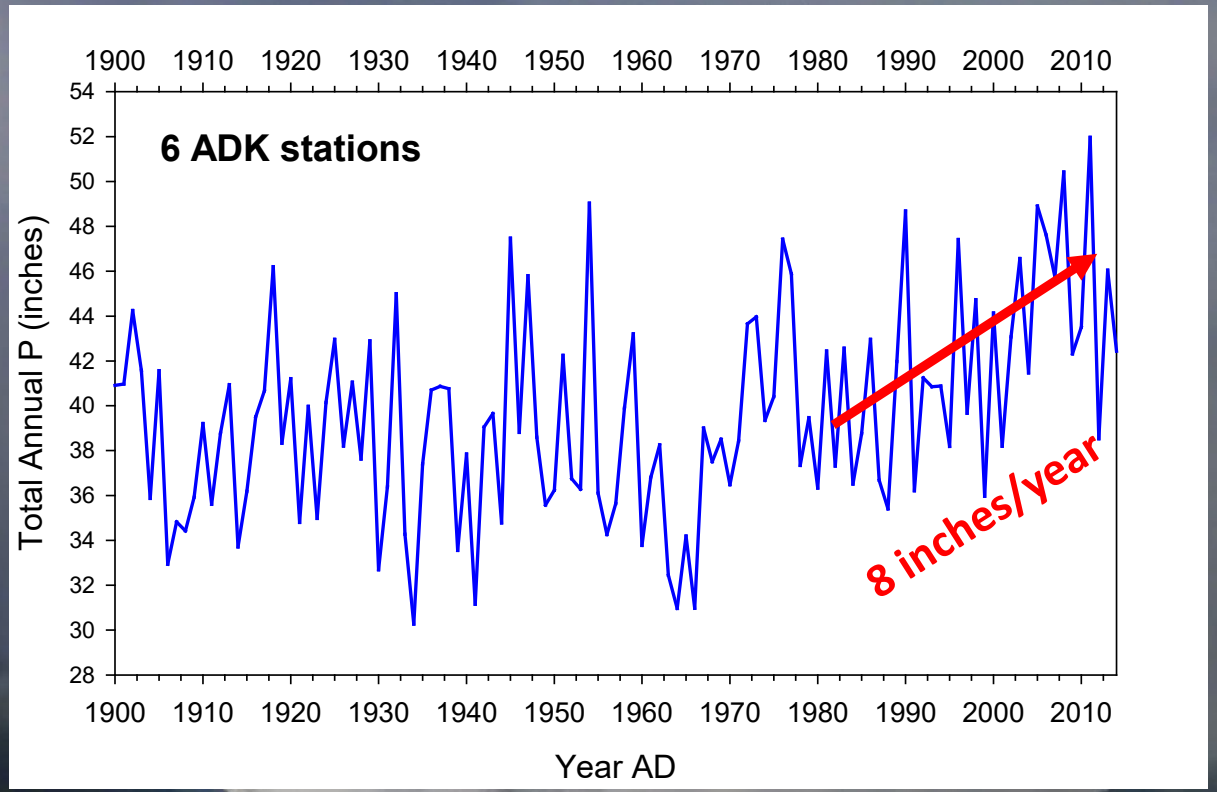
<u>Red maple bud burst</u>:

Strong, negative CORRELATION with March & April temperatures

MARCH: $R^2 = 0.53$, $P < 0.0001$
APRIL: $R^2 = 0.56$, $P < 0.0001$

But
NO SIGNIFICANT
<u>TREND</u> w/o Spring warming


6 ADK stations
Total Annual P (inches)
Year AD
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
28
30
32
34
36
38
40
42
44
46
48
50
52
54


6 ADK stations
Total Annual P (inches)
Year AD
8 inches/year
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
28
30
32
34
36
38
40
42
44
46
48
50
52
54

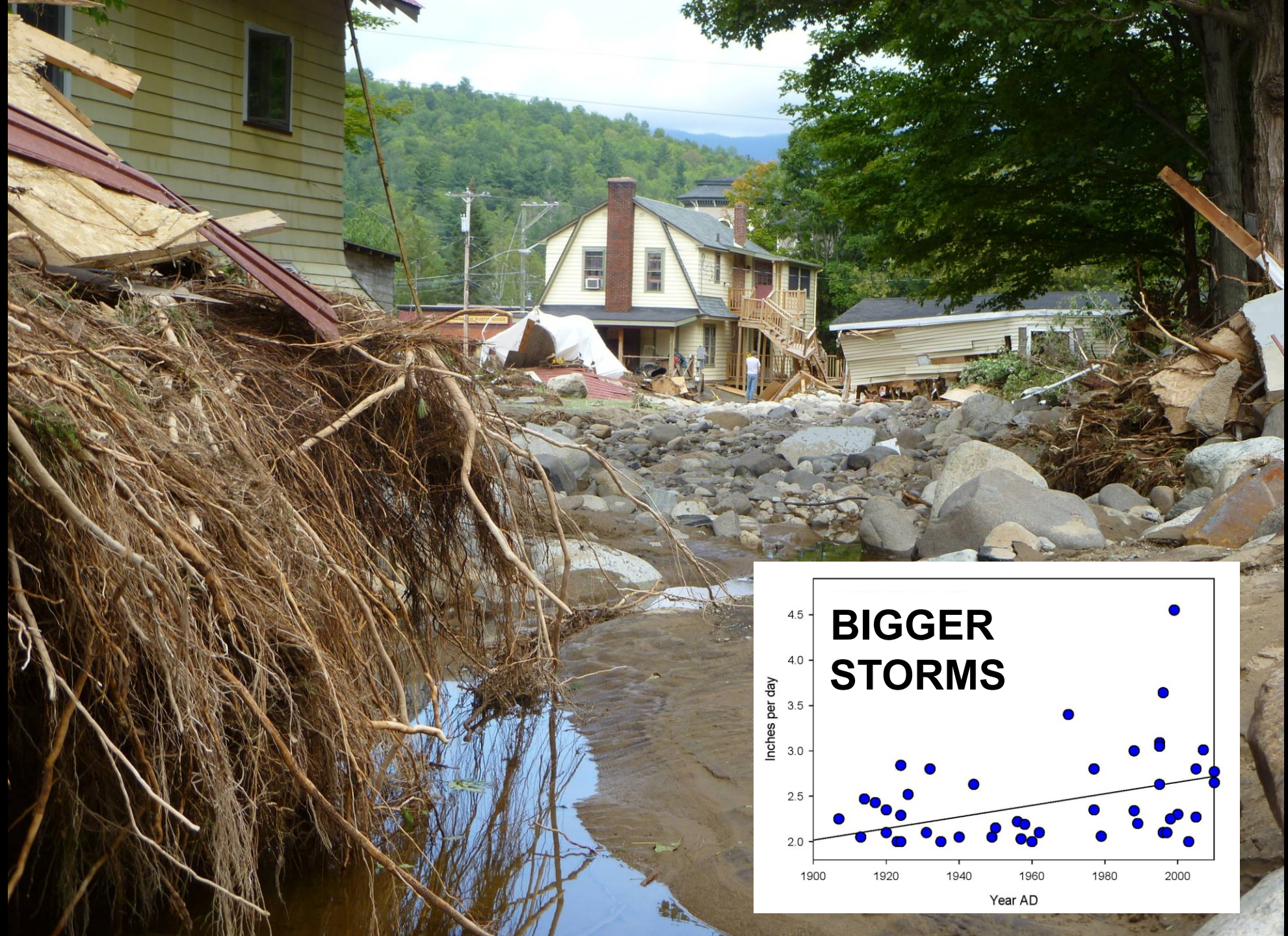

WETTER
since
1970


WETTER
since
1970


WETTER
since
1970

Our local version of ‘SEA LEVEL RISE’

Photo c/o Russell Fox


BIGGER
STORMS
Inches per day
4.5
4.0
3.5
3.0
2.5
2.0
1900
1920
1940
1960
1980
2000
Year AD

CHAMPLAIN- ADK BASIN
TEMPERATURE PROJECTIONS
(2010-2099 AD)

MODERATE B1 SCENARIO:

1-6°F warmer

EXTREME A2 SCENARIO:

6-11°F warmer

(greatest in winter)

PRECIPITATION PROJECTIONS
(2010-2099 AD)

MODERATE B1 SCENARIO:

little or no change

EXTREME A2 SCENARIO:

4-6 inches more per year
(*seasonal changes unreliable)*

Largemouth Bass

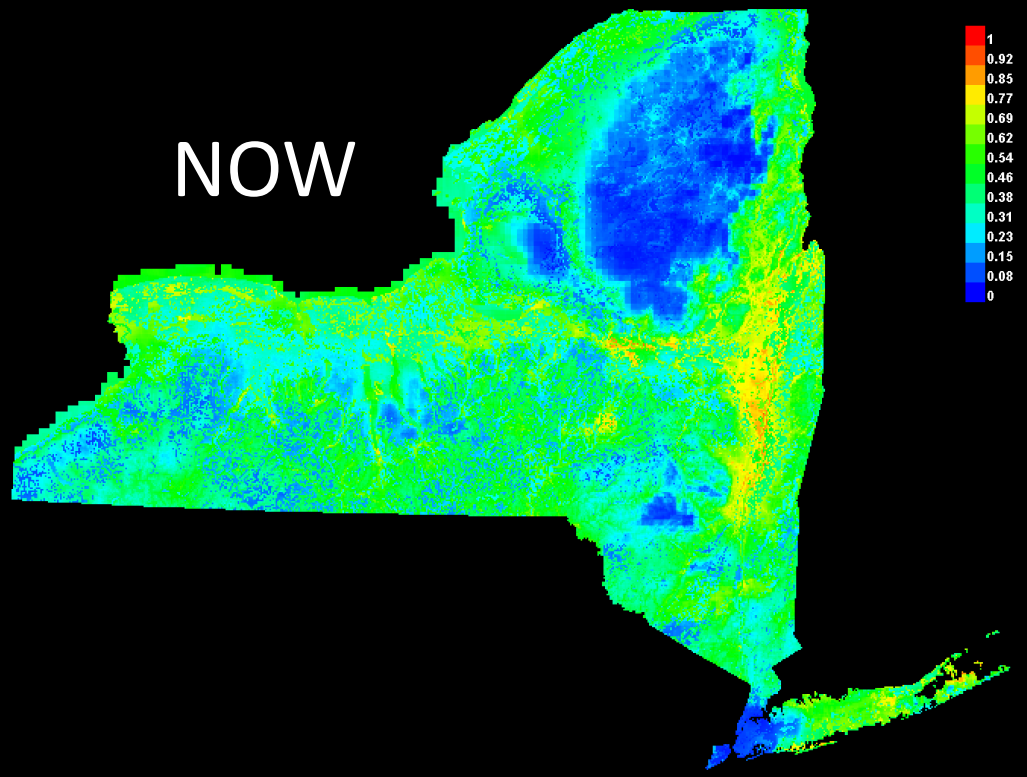
WINNERS?

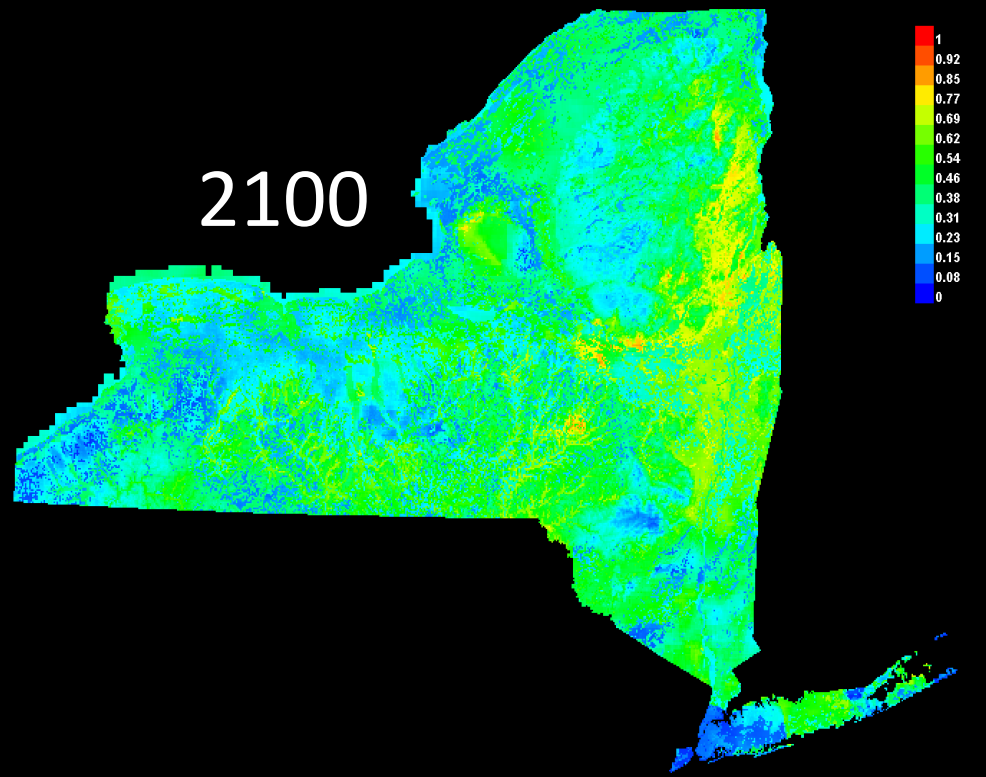
LOSERS?

Milder winters = more deer?

Milder winters = more deer <u>TICKS?</u>

Suitable habitat for DEER TICKS





ADIRONDACK LIFE ARTICLE

ADKS = the Blue Ridge by 2100AD

ADK fall colors will fade to “dull browns and greens”…

COULD
the ADKS come to resemble the Blue Ridge?

Hickory, oak, & black gum pollen in INTERGLACIAL deposits

WHAT IF

the ADKS come to resemble the Blue Ridge?

Mike Farrell

Director
Uihlein Sugar Maple
Research & Extension
Field Station
Lake Placid, NY

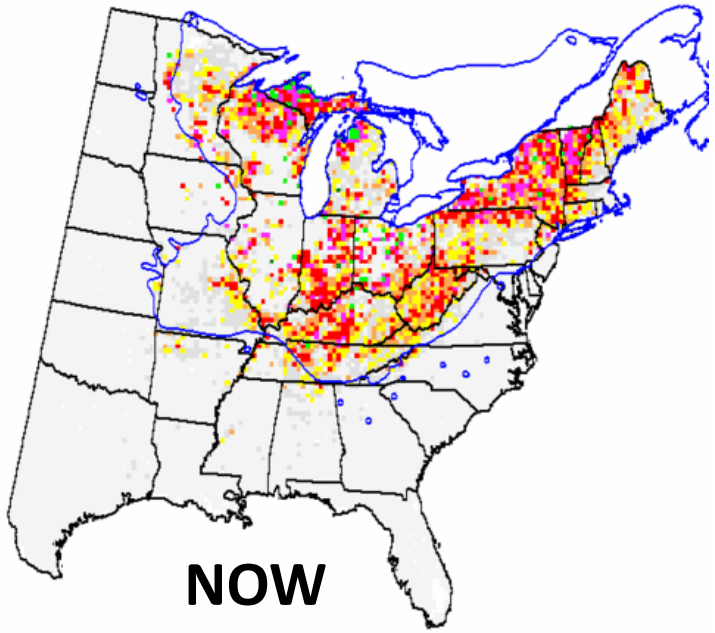
1. **Sugar maples will NOT die off soon from warming**

2. **Maple sugaring works FINE in the Blue Ridge**

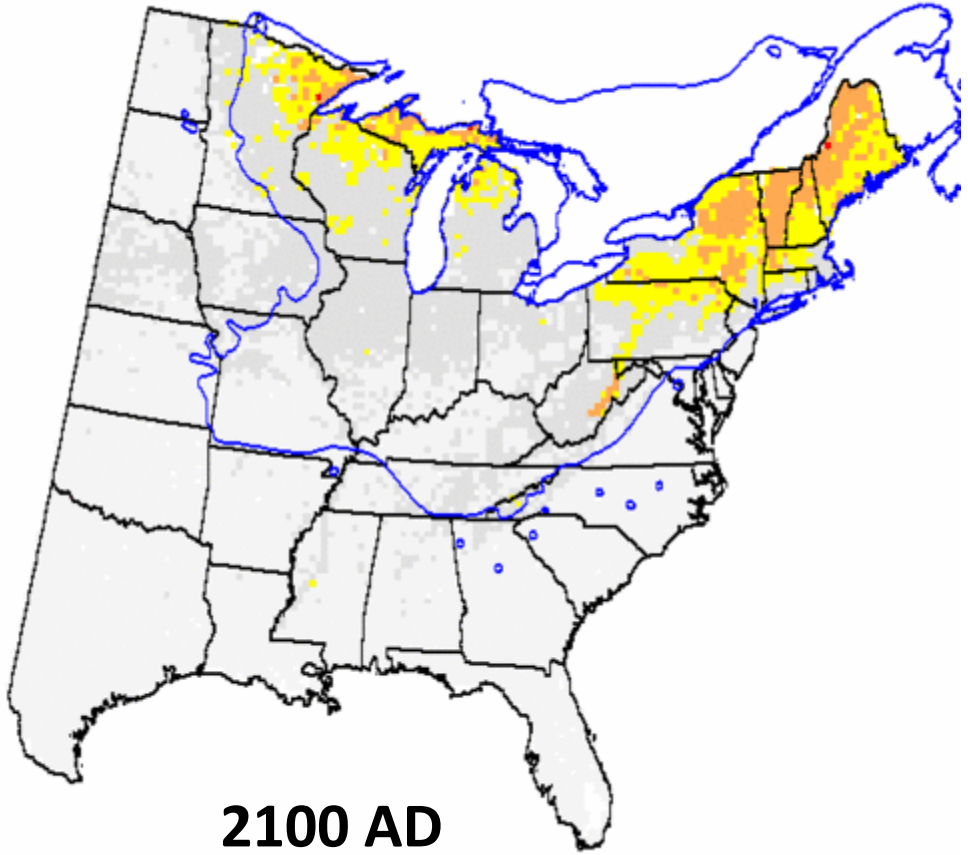
BACK CREEK FARMS, Virginia

little_bnd
us_states
< 1
1 - 3
4 - 6
7 - 10
11 - 20
21 - 30
31 - 50
> 50

USDA United States Department of Agriculture Forest Service | Climate Change Tree Atlas | Northern Research Station



NOW



2100 AD

RECEIVED AUGUST, 2008...

Northern Forest Alliance

32 Park Street • P.O. Box 417 • Stowe, VT 05672 • (802) 253-8227 • www.northernforestalliance.org

Northern Forest Alliance 2008 Climate Change Conference

The Northern Forest Alliance (NFA) is a non-profit organization based in Stowe, Vermont. Our priorities are threefold:

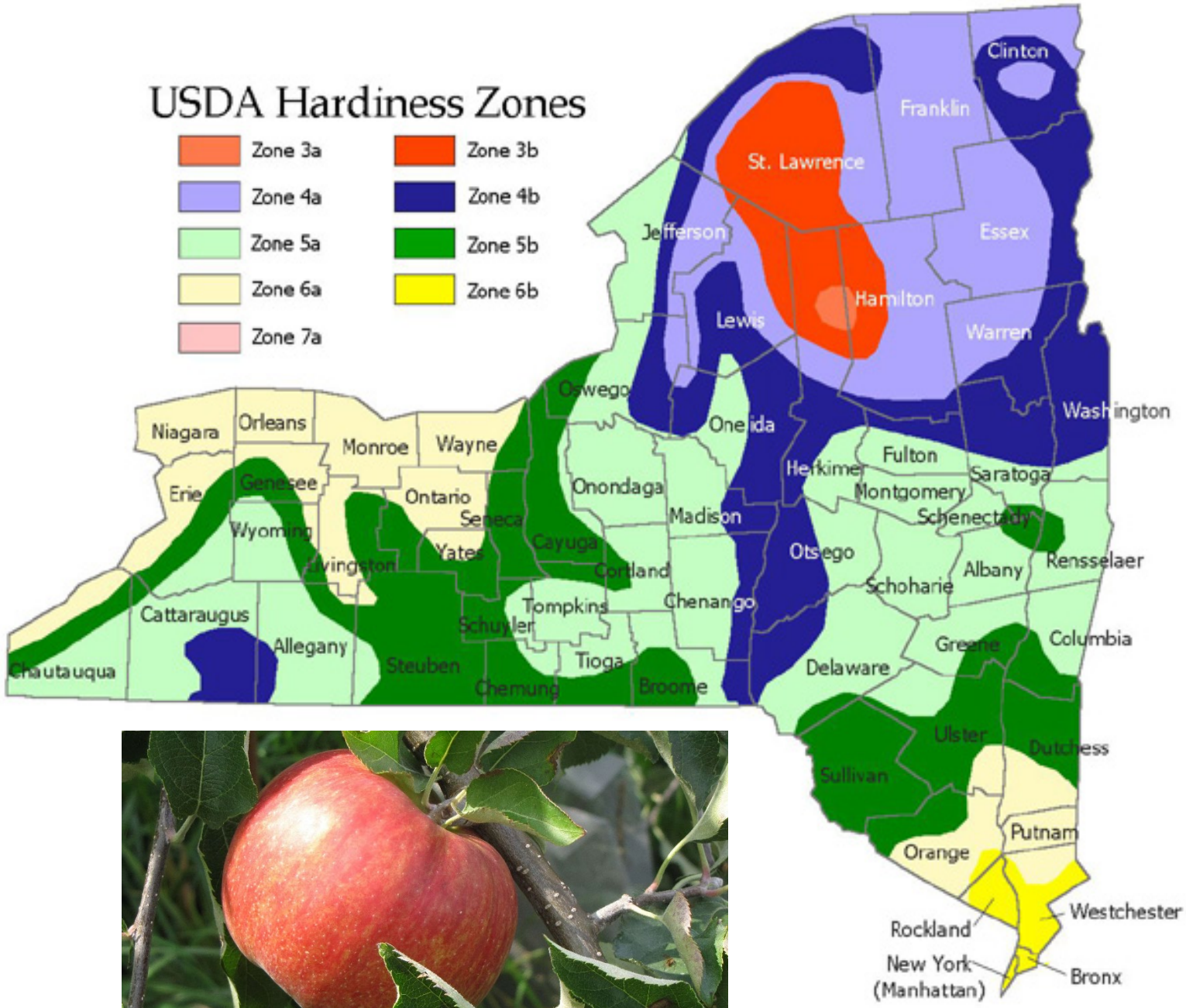
- To conserve Wildlands in the Northern Forest to help protect the forest's ecological integrity, its recreational opportunities and its timber production
- To encourage well managed private forests to support the forest-based economy, including high-value timber products, recreation tourism, and the jobs these industries support
- To build strong, diverse, local economies that support vibrant communities throughout the Northern Forest

We are hosting a conference to address the impact of climate change. Our cherished Northern Forest is at risk. For example, recent scientific studies show that Sugar Maples will go extinct by the end of the century. The time to address these challenges and ensure the health of our natural and human communities is now.

Read the following
before interpreting the maps and tables.

With these models, we are predicting **potential suitable habitat** by year 2100. We are **NOT** predicting where the species will be at that time, as great lag times are involved in tree species migrations.

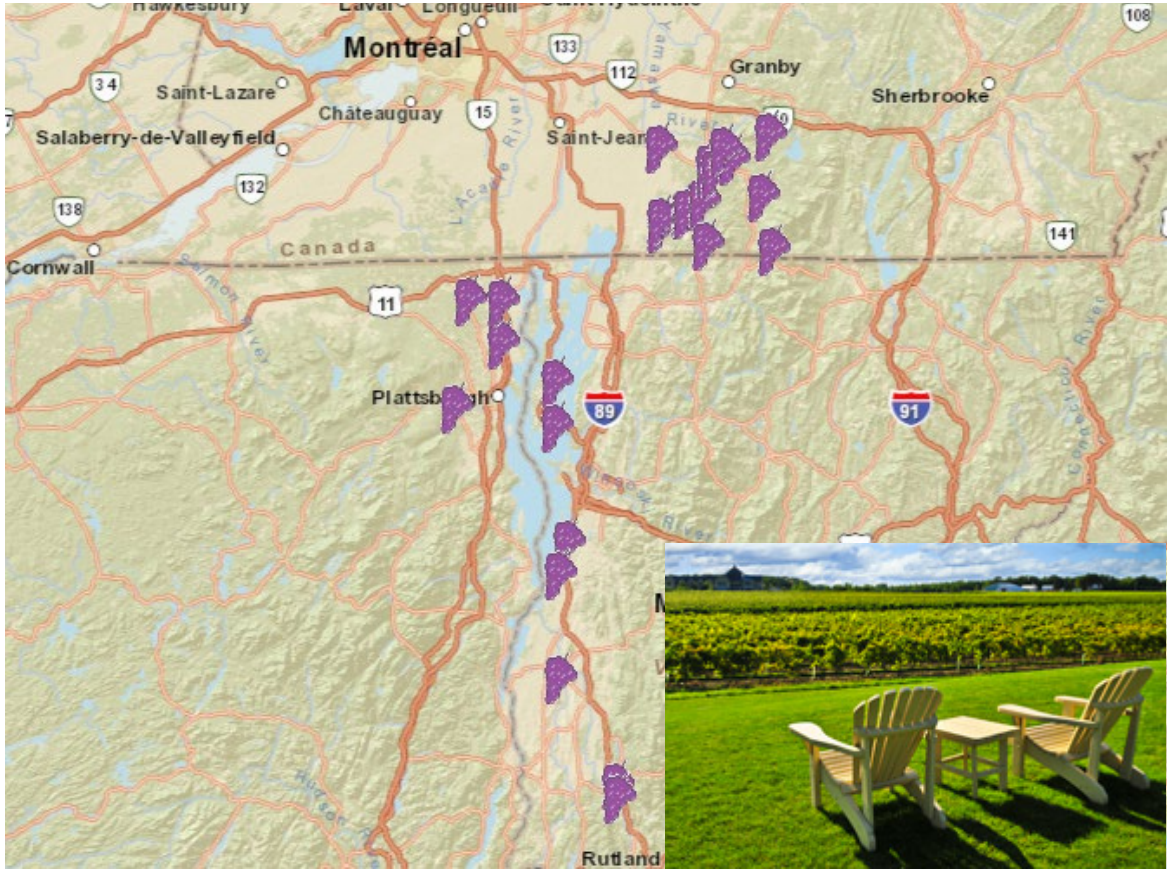
It should also be borne in mind that the model does not account for future biotic interactions (competition, herbivory, mutualism etc.) or other human (land-use change, fire) or natural (ice, wind) disturbances - as these are extremely difficult to quantify accurately for future scenarios. For more details see: Caution



USDA plant hardiness zones in New York State really *ARE* CHANGING

NOT *ALL* BAD?

CHAMPLAIN-RICHELIEU INTERNATIONAL WINE TRAIL



"Drink the Wine, Savor the Scenery"


THANK
YOU

1970-2018, DANNEMORA

JAN, 0.055, SIG (2.6 F)

FEB, MAR, APR, JUNE, JULY = NS

MAY, 0.029, SIG

AUG, 0.025, SIG

SEPT, 0.066, highly SIG (3.2F)

OCT, 0.038, SIG

NOV, 0.03, sig

DEC, 0.056, SIG (2.6 F)

1980-2014 TIME FRAME				
	R-sq	P	slope	change
Annual T	0.23	0.0016	0.068	2.4
Winter T	0.036	0.1397	0.055	x
Spring T	0.033	0.1484	0.042	x
Summer T	0.22	0.0022	0.07	2.5
Fall T	0.31	0.0002	0.096	3.4

Winter P	0.21	0.0031	0.079	2.8
Spring P	0.09	0.0374	0.0802	2.8
Summer P	0.08	0.0474	0.072	2.5
Fall P	0.003	0.4605		x