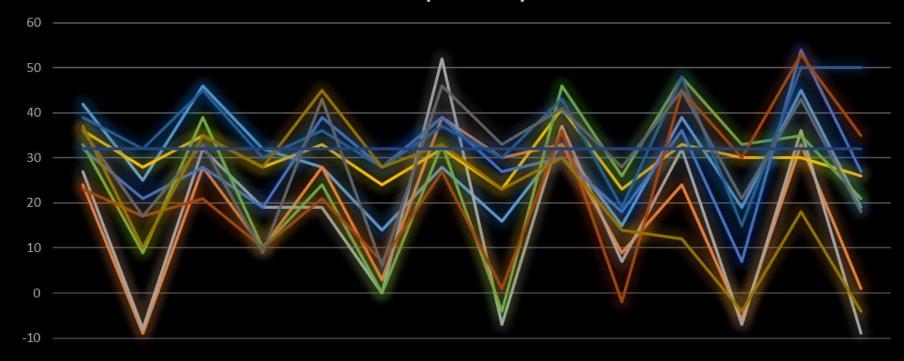
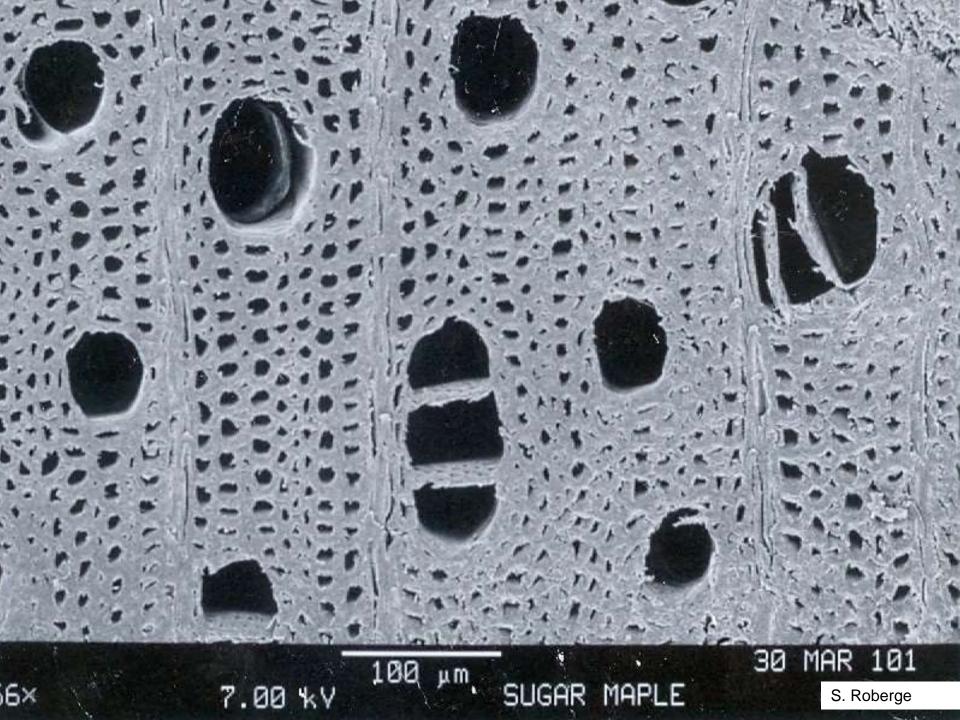


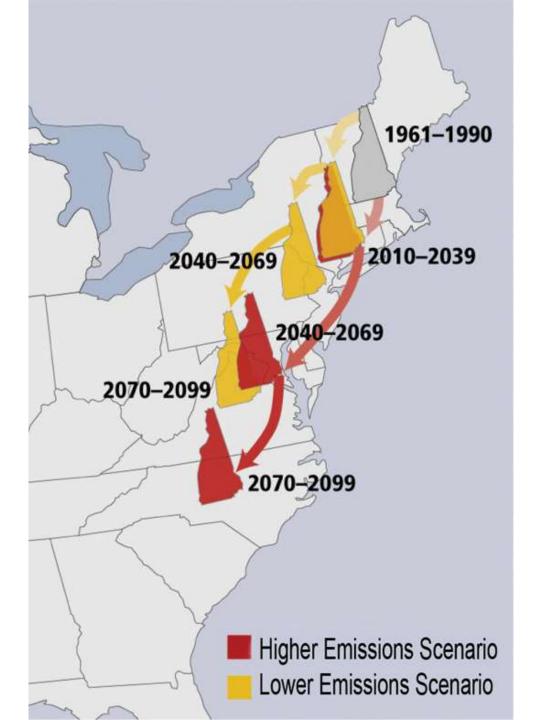
#### High/Low Temperatures (°F) March 1-7, 2007 -2016 Silver Ranch Airport Jaffrey NH

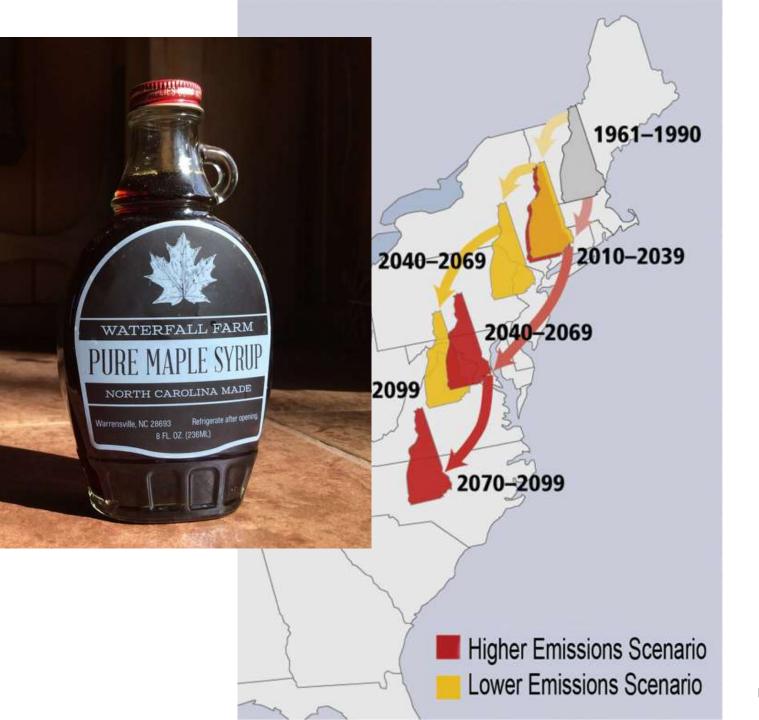


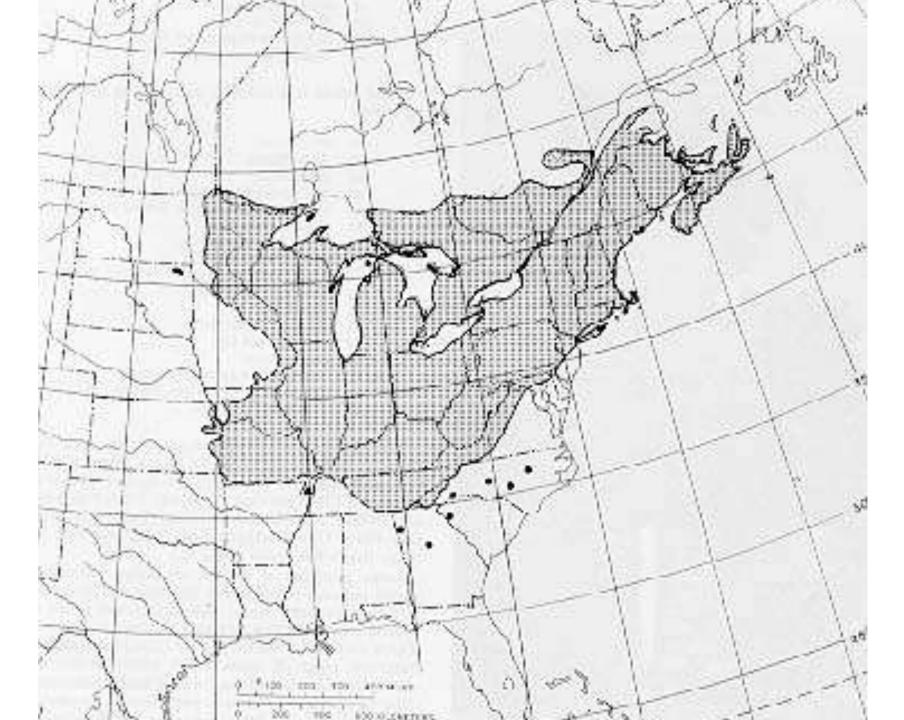
-20	1 High	1 Low	2 High	2 Low	3 High	3 Low	4 High	4 Low	5 High	5 Low	6 High	6 Low	7 High	7 Low
2016	42	25	46	32	28	14	28	16	33	15	39	19	45	19
<b>——</b> 2015	24	-9	28	10	28	3	39	30	33	9	24	-6	33	1
2014	27	-8	32	19	19	0	52	-7	37	7	32	-7	36	-9
<del></del> 2013	36	28	35	28	33	24	32	23	41	23	33	30	30	26
2012	32	21	28	19	39	28	39	27	30	18	36	7	54	27
2011	33	9	39	10	24	0	33	-4	46	26	48	33	35	21
2010	39	32	45	30	36	28	37	30	43	19	48	15	50	50
2009	23	17	21	10	21	7	27	1	36	-2	45	30	53	35
2008	36	17	33	9	43	6	46	33	41	28	45	21	43	18
2007	37	10	35	28	45	28	33	23	30	14	12	-4	18	-4
Freezing	32	32	32	32	32	32	32	32	32	32	32	32	32	32

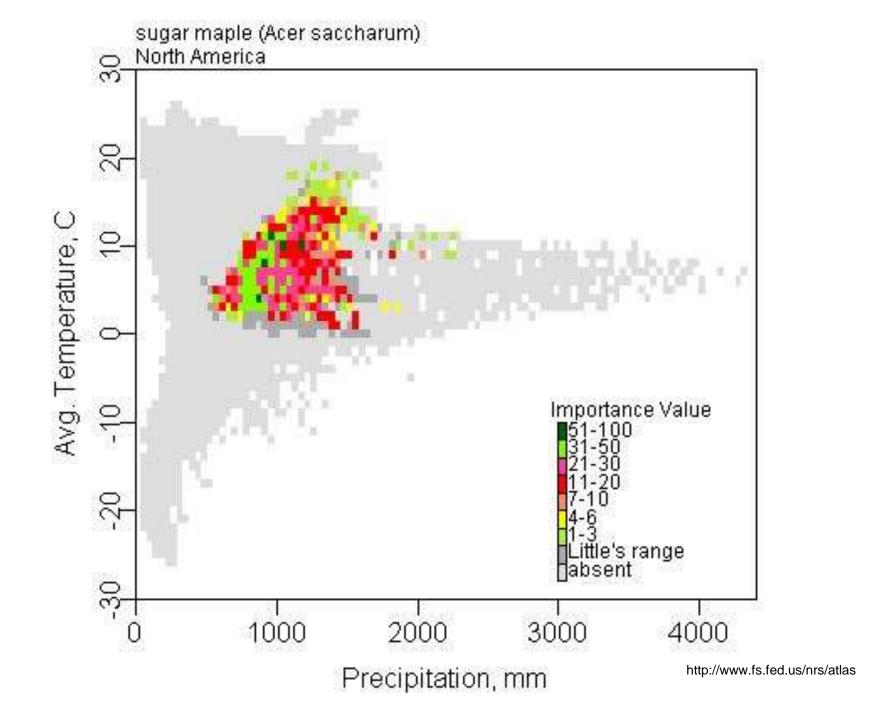


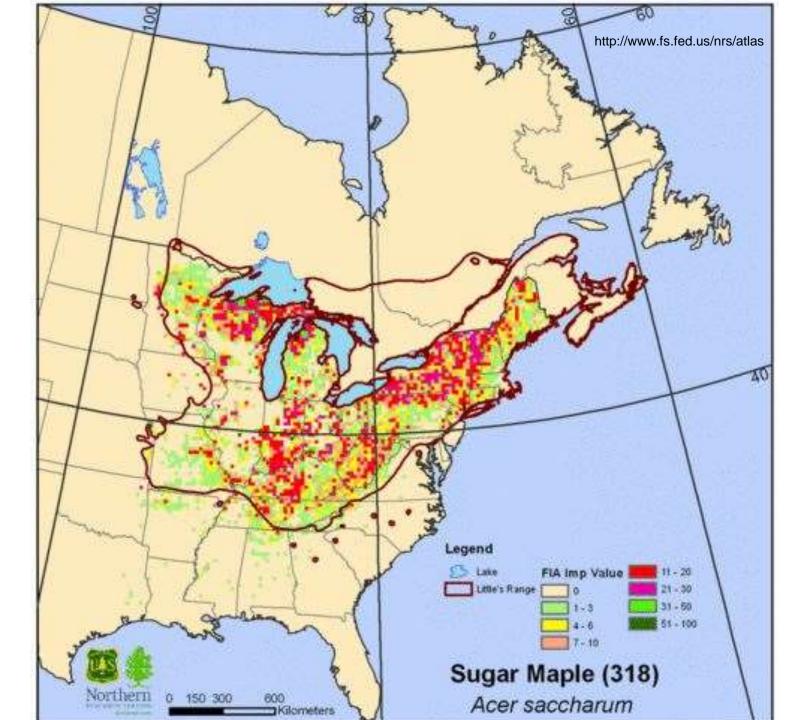










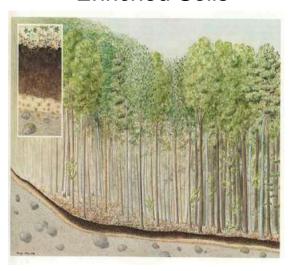


# Why Trees Grow Where They Do In New Hampshire Forests



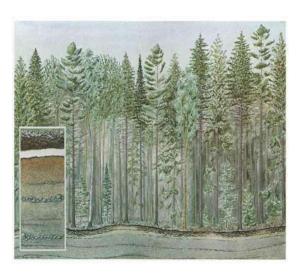
U.S. Department of Agriculture Forest Service Northeastern Forest Experiment Station NF-INF-37-79

#### **Enriched Soils**

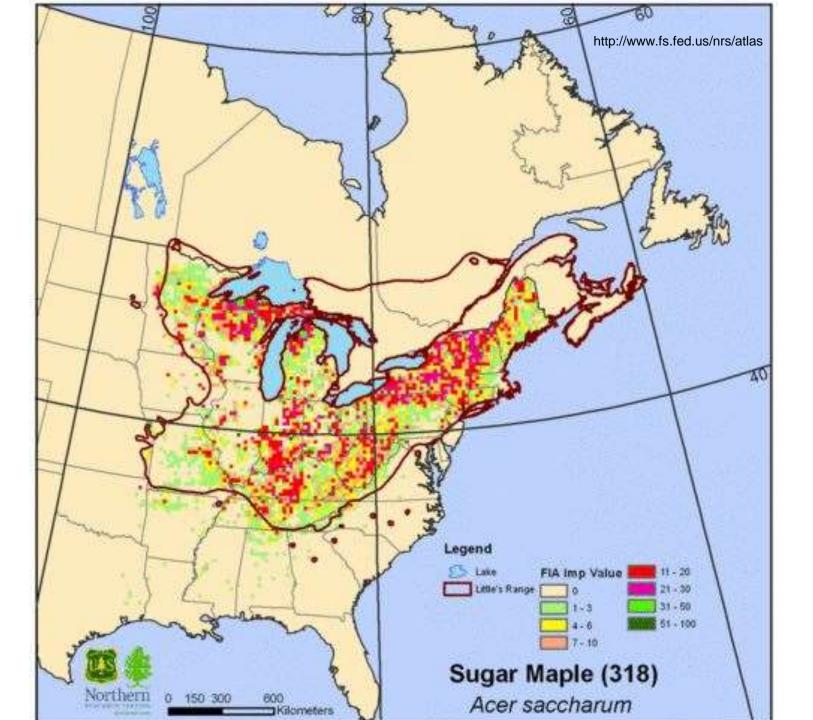


- Lots of organic matter and fine particles.
- Very productive for hardwoods -Sugar Maple, White Ash

#### **Outwash Soils**



- -Mostly sand and gravel, left by glacial meltwater.
- -Very productive for White Pine



# 1961-1990 2010-2039 2040-2069 2040-2069 2070-2099 2070-2099 **Higher Emissions Scenario** Lower Emissions Scenario Frumhoff et al. 2008

### Guesses on Stresses

Root Damage snowpack, frost depth, drought

Nutrient loss snowpack

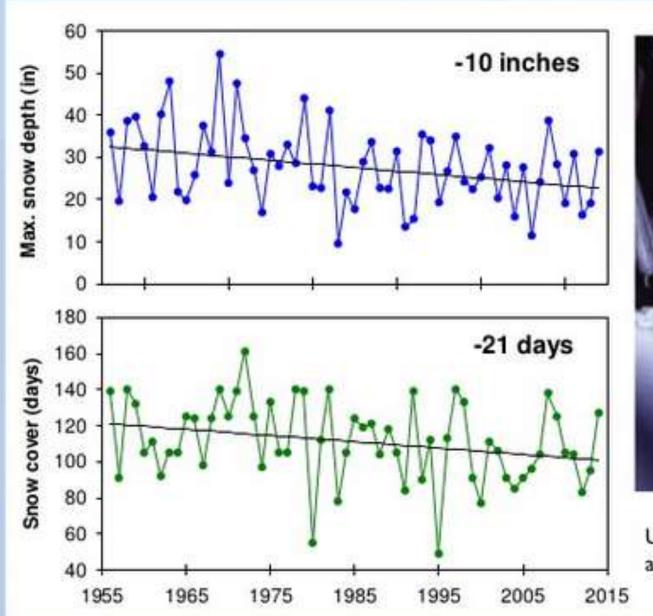
Drought drought

Insects (new & old) drought, temperature

Winter injury snowpack

Burning through starch reserves temperature, snowpack, additional stress

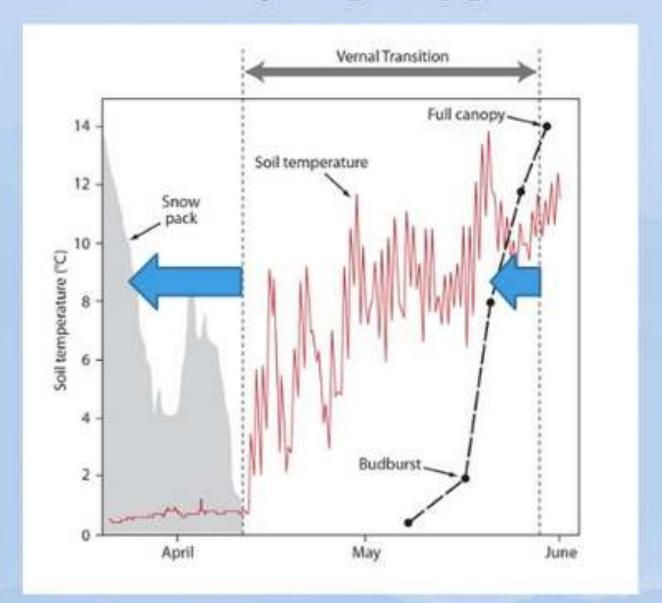
## Snowpack



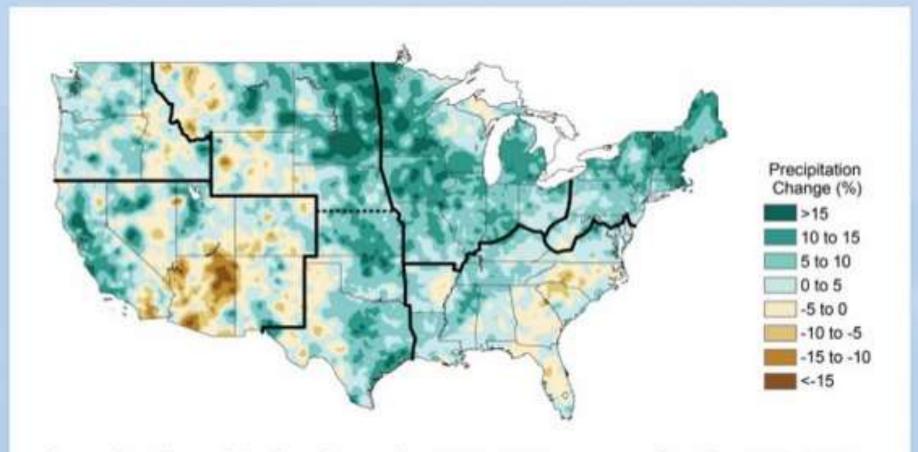


Updated from Campbell et al. 2007 – FS Gen. Tech. Rep.

# The "Spring Trigger"



### Observed US precipitation change

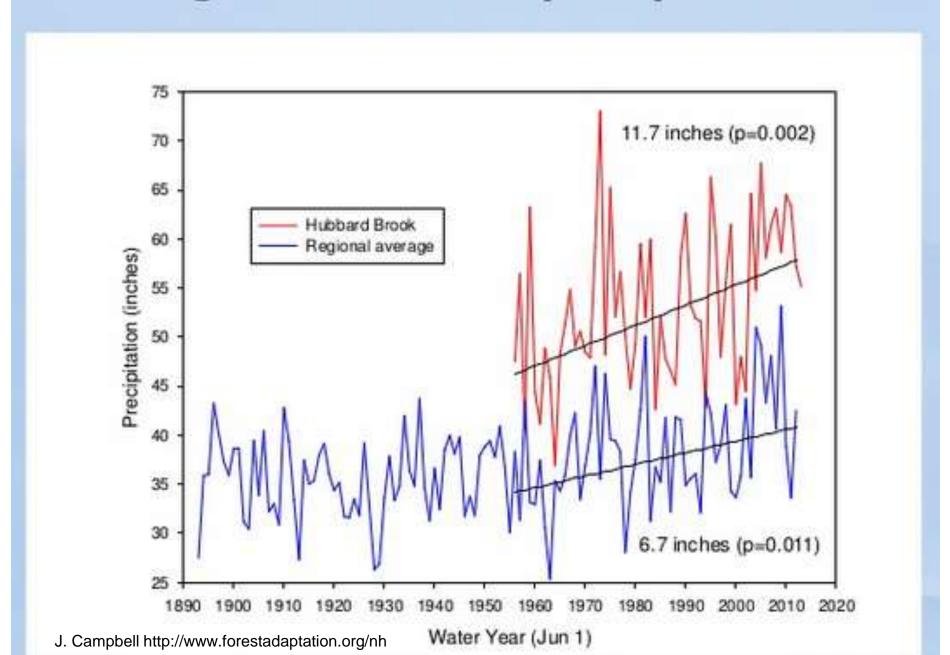


Annual total precipitation change for 1991-2012 compared to the 1901-1960 average.

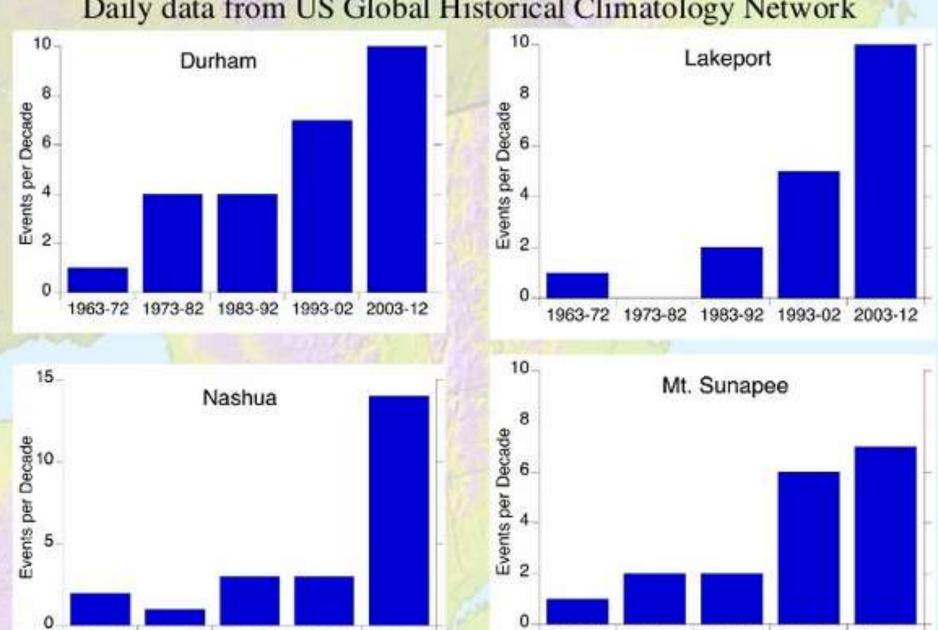
Melillo et al. 2014. National Climate Assessment.

J. Campbell http://www.forestadaptation.org/nh

## Regional trends in precipitation



# Precipitation Events >4" in 48 hrs per Decade Daily data from US Global Historical Climatology Network



1983-92

1993-02

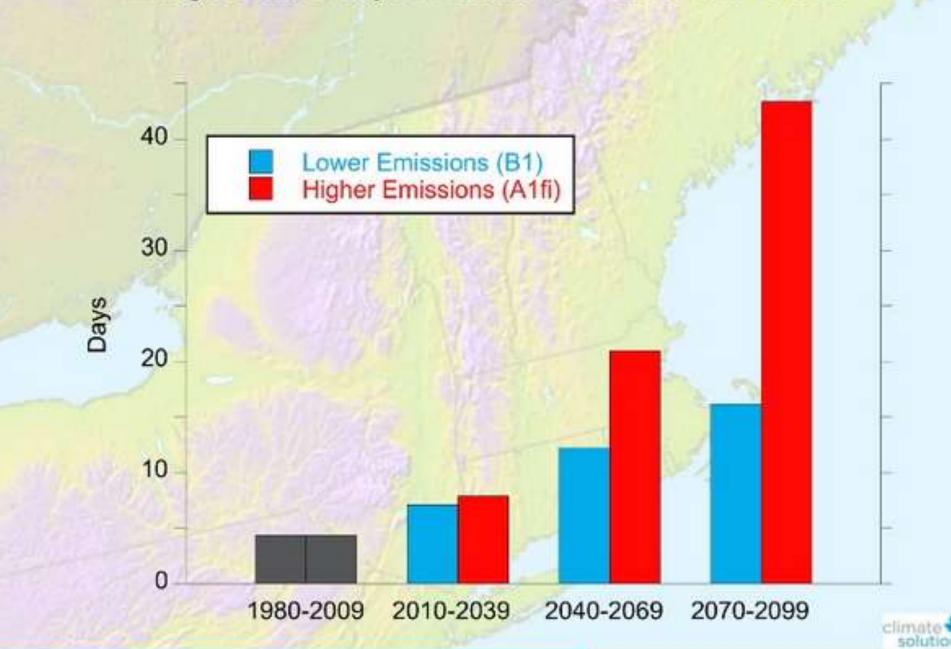
1973-82

1983-92

1993-02

New England: Number of Days Hotter than 90°F (30 year averages)

Average of statistically downscaled simulations from 4 GCMs

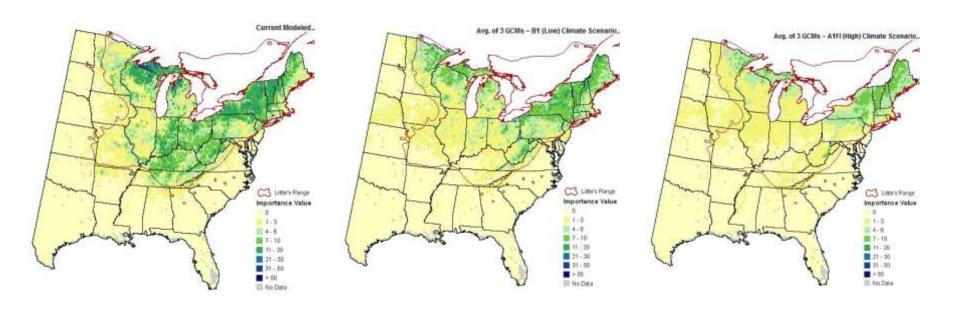


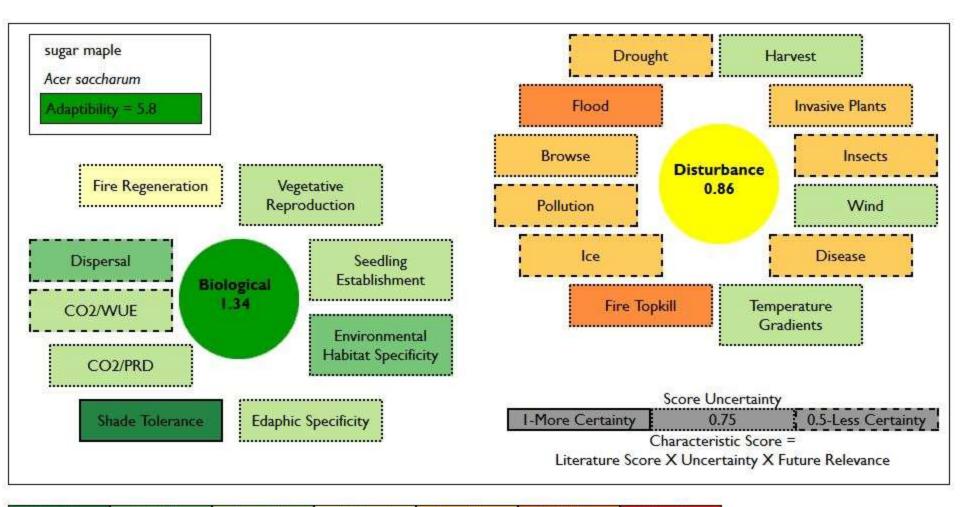




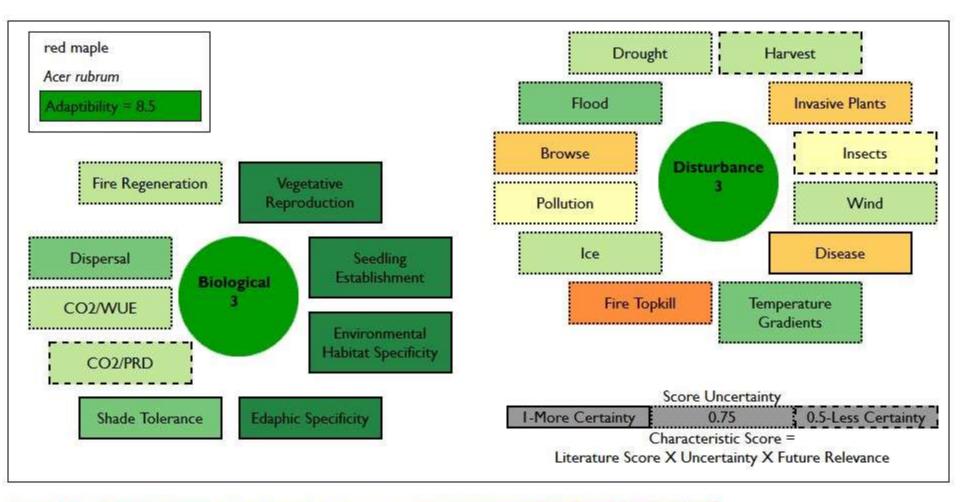
#### Low Emissions

#### **High Emissions**





V Hi Pos	High Pos	Low Pos	Minimal	Low Neg	High Neg	V Lo Neg
+3	+2	+[	0	-1	-2	-3



V Hi Pos	High Pos	Low Pos	Minimal	Low Neg	High Neg	V Lo Neg
+3	+2	+1	0	-1	-2	-3