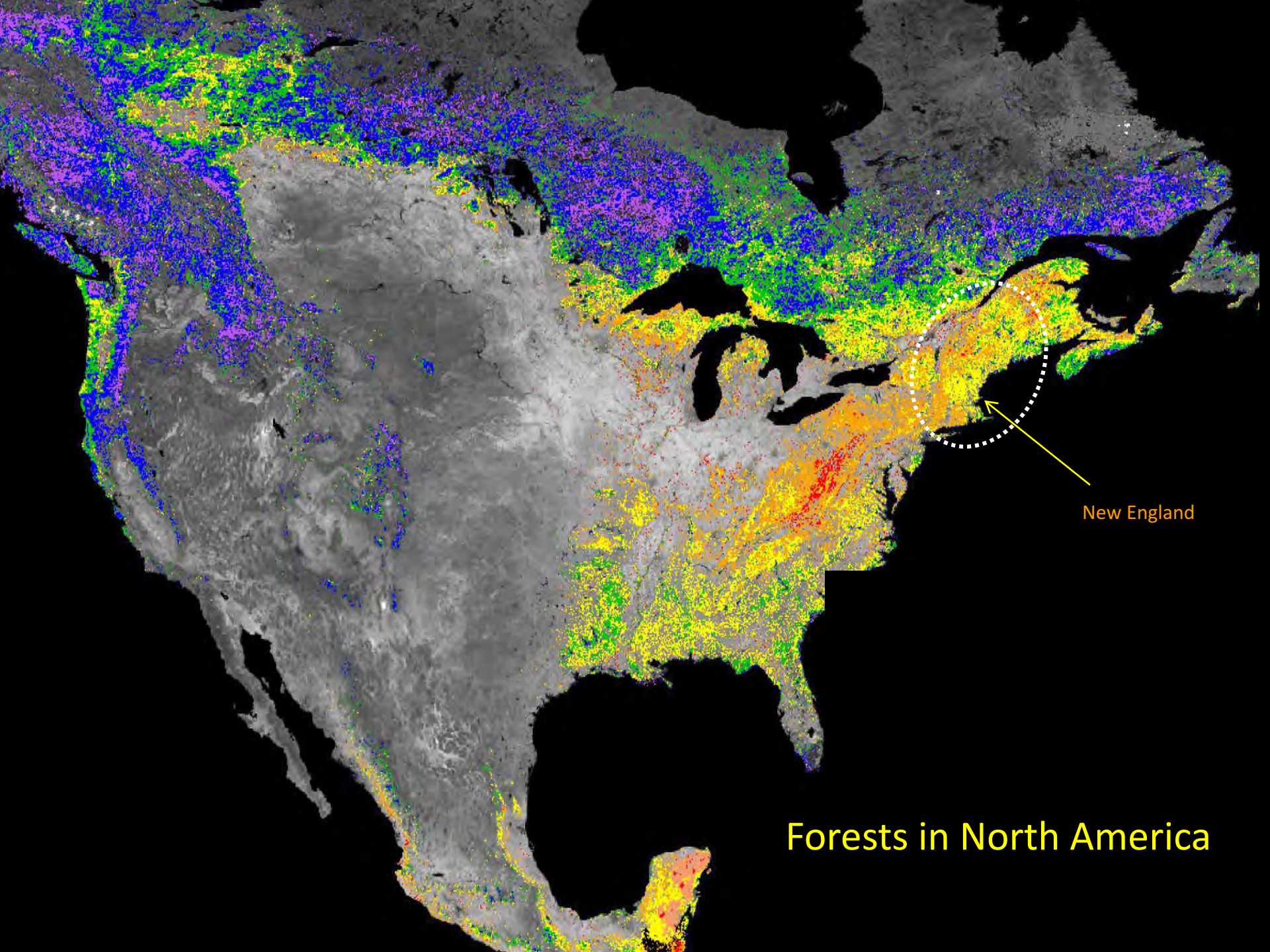


Whither New England?





New England

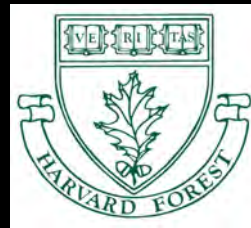
Forests in North America

Harvard Forest

Est. 1907

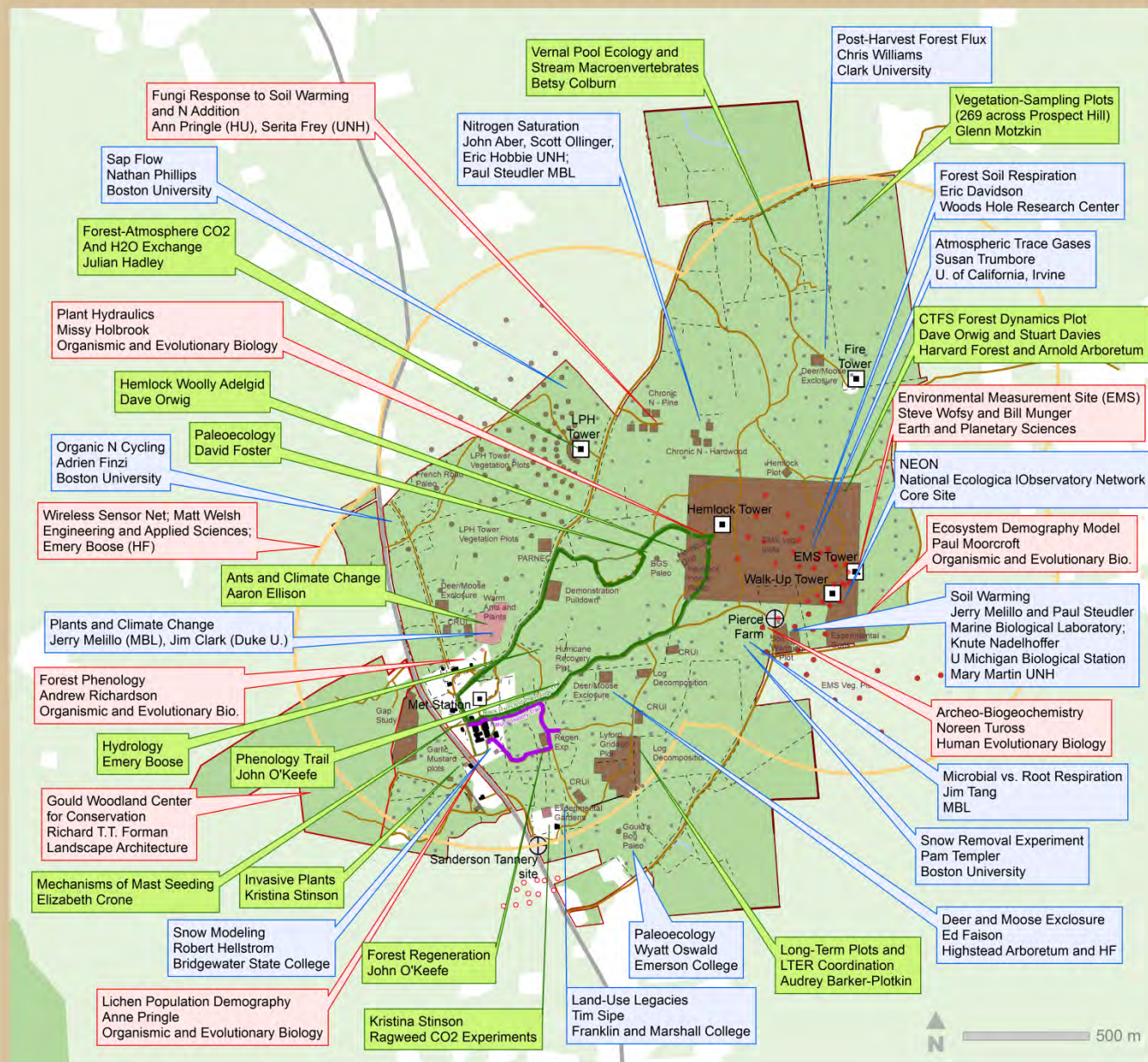
Harvard University's 4000-acre Laboratory and Classroom

NSF – Long Term Ecological Research site since 1988





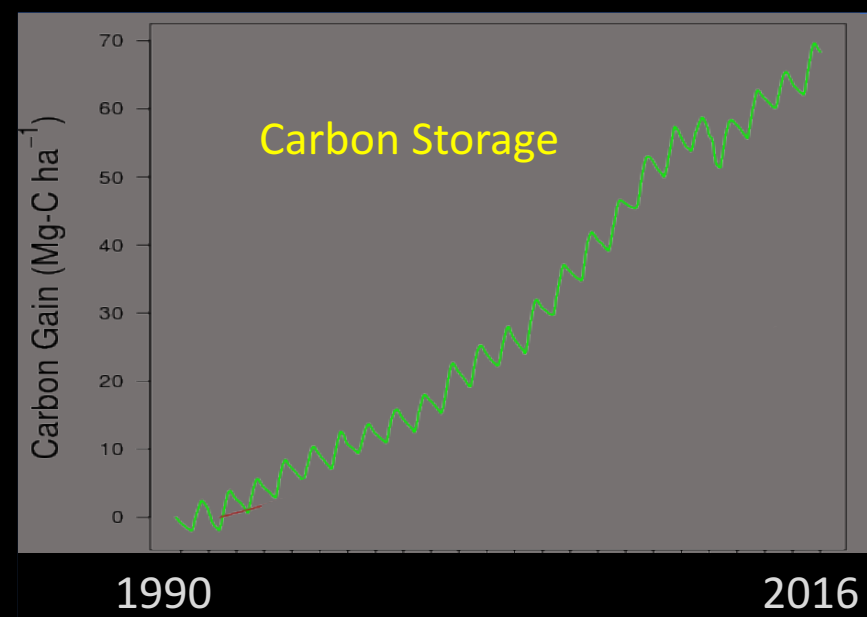
Harvard Forest - Major Research Activities on Prospect Hill



 HU Faculty
 HF Scientists
 Scientists from Other Institutions

Harvard Forest

A globally significant record of forest carbon dynamics



2015



HEMLOCK

A Forest Giant on the Edge

DAVID R. FOSTER, Editor

2017

A Meeting of Land and Sea

Nature and the Future of MARTHA'S VINEYARD

DAVID R. FOSTER

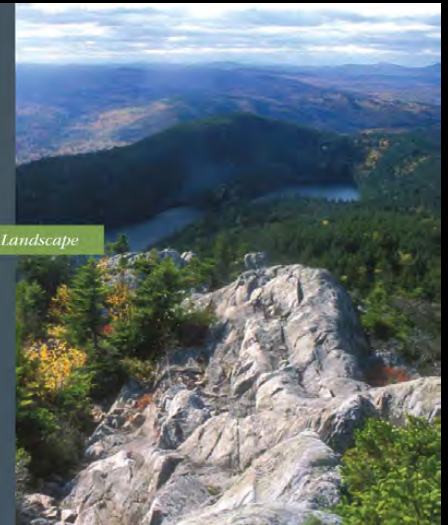


Wildlands and Woodlands

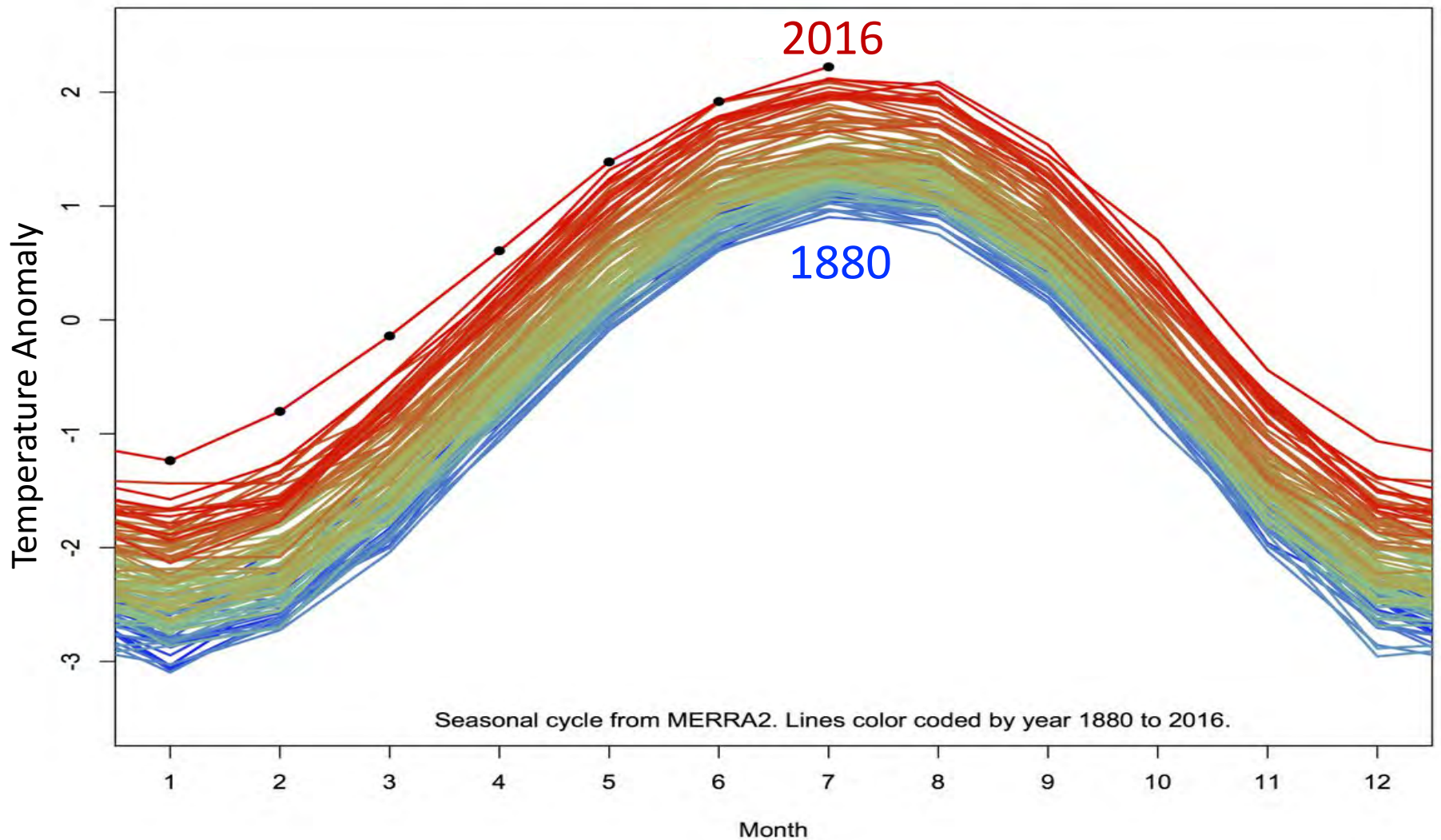
A Vision for the New England Landscape



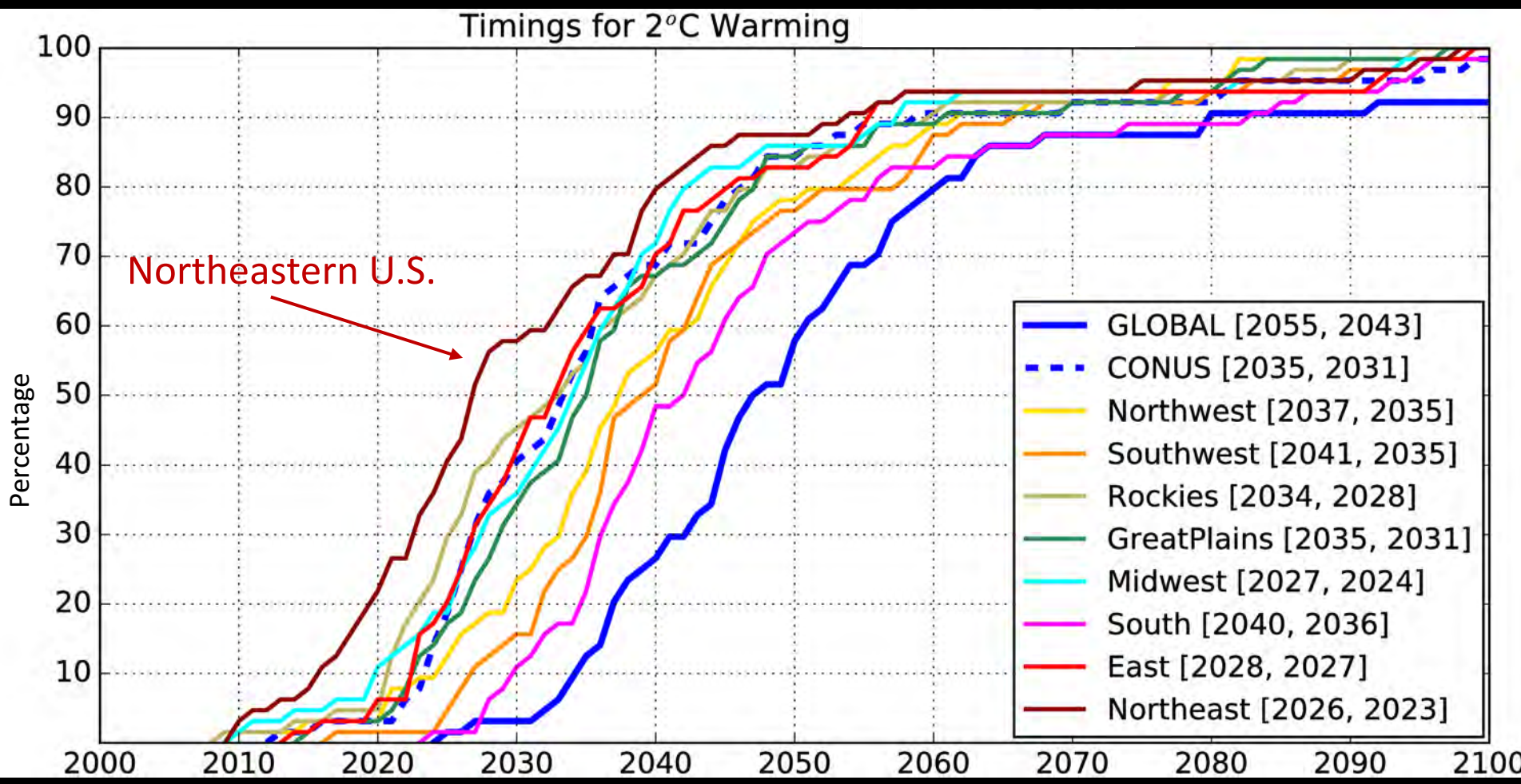
2005 2010 2017



Global Temperature

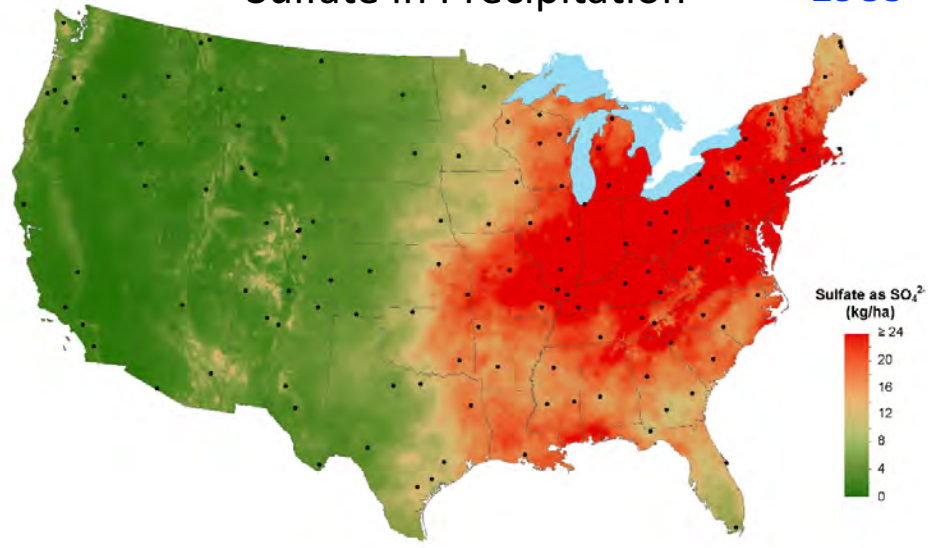


“The fastest warming region in the contiguous US is the Northeast, which is projected to warm by 3°C when global warming reaches 2°C.”

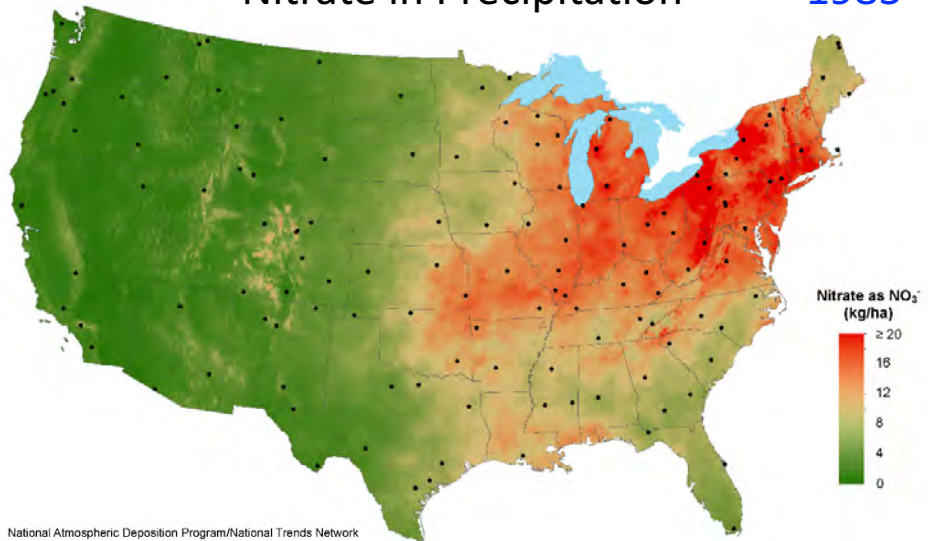


Acid Rain

Sulfate in Precipitation 1985

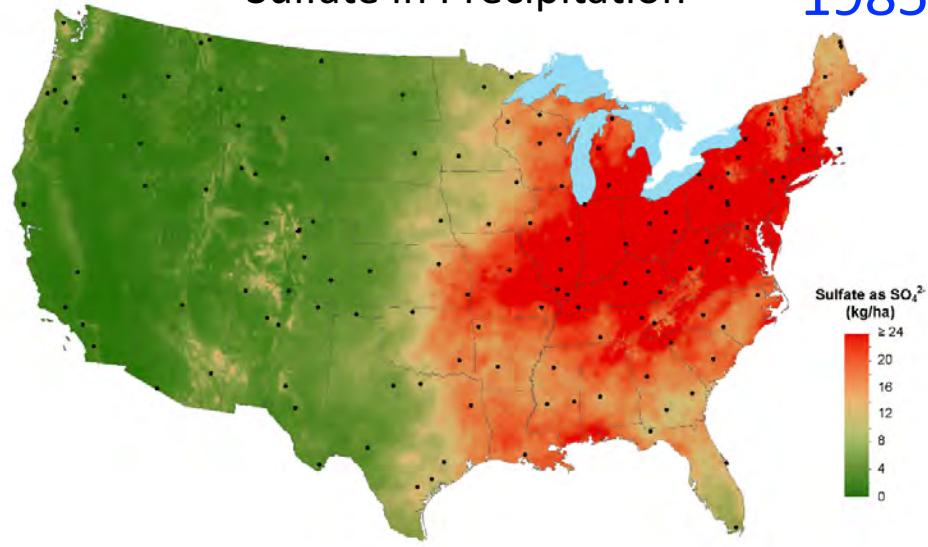


Nitrate in Precipitation 1985



Acid Rain – A Continental Scale Success Story

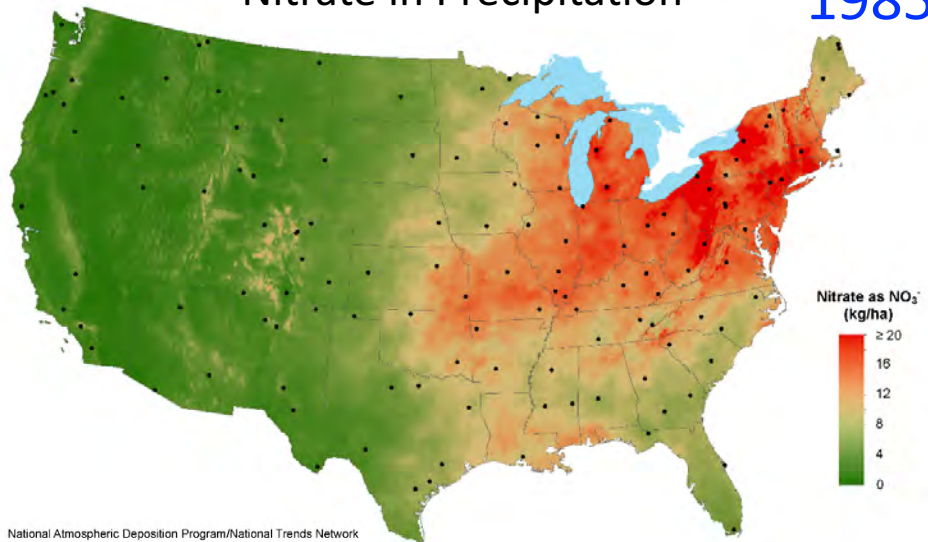
Sulfate in Precipitation 1985



Sulfate in Precipitation 2013

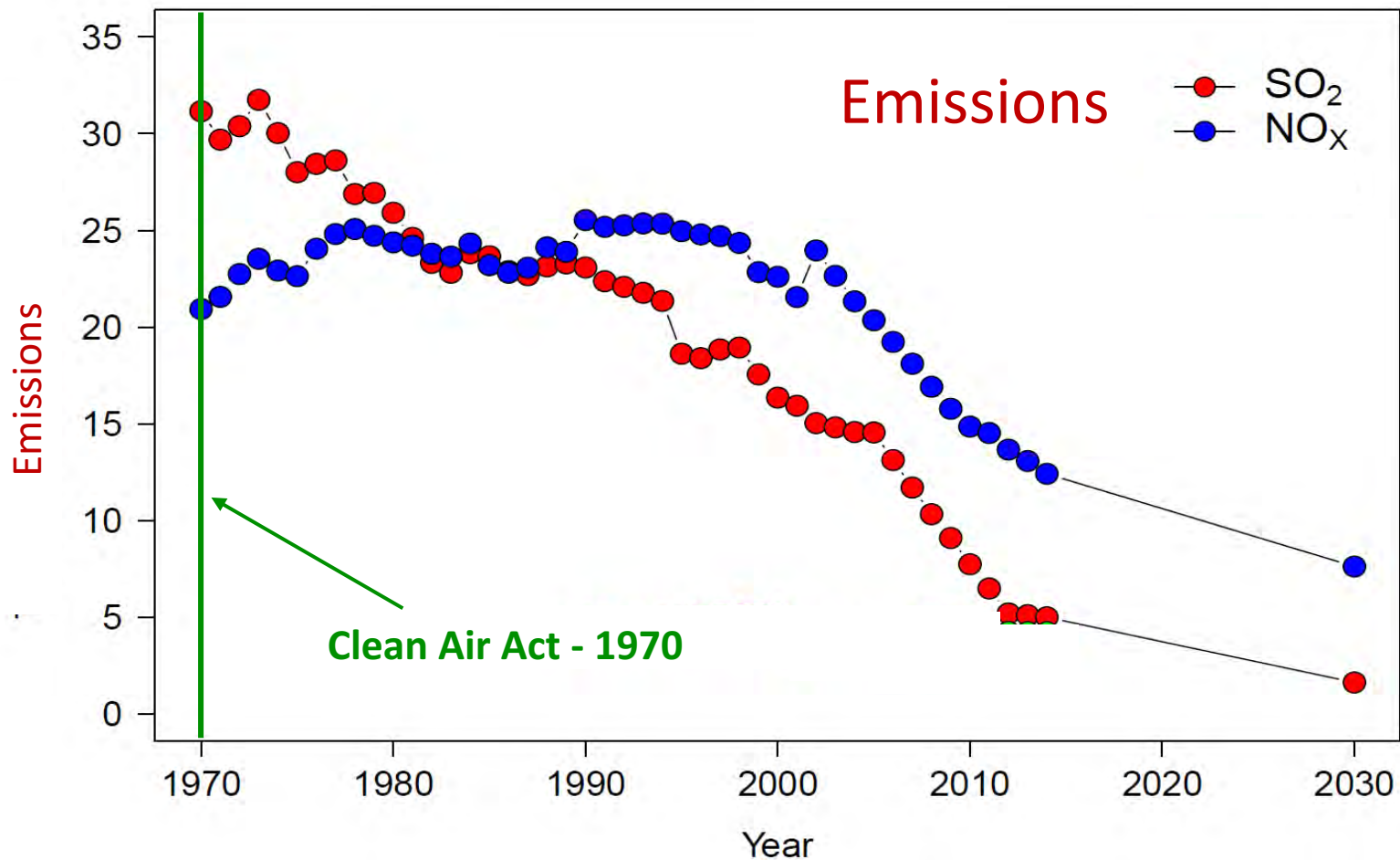


Nitrate in Precipitation 1985



Nitrate in Precipitation 2013





From 1970 to 2015, national emissions of S, N, CO, ozone, lead, dropped an average of 70 percent while gross domestic product grew by 246 percent

With huge health benefits

feb

mar

apr

may

jun

jul

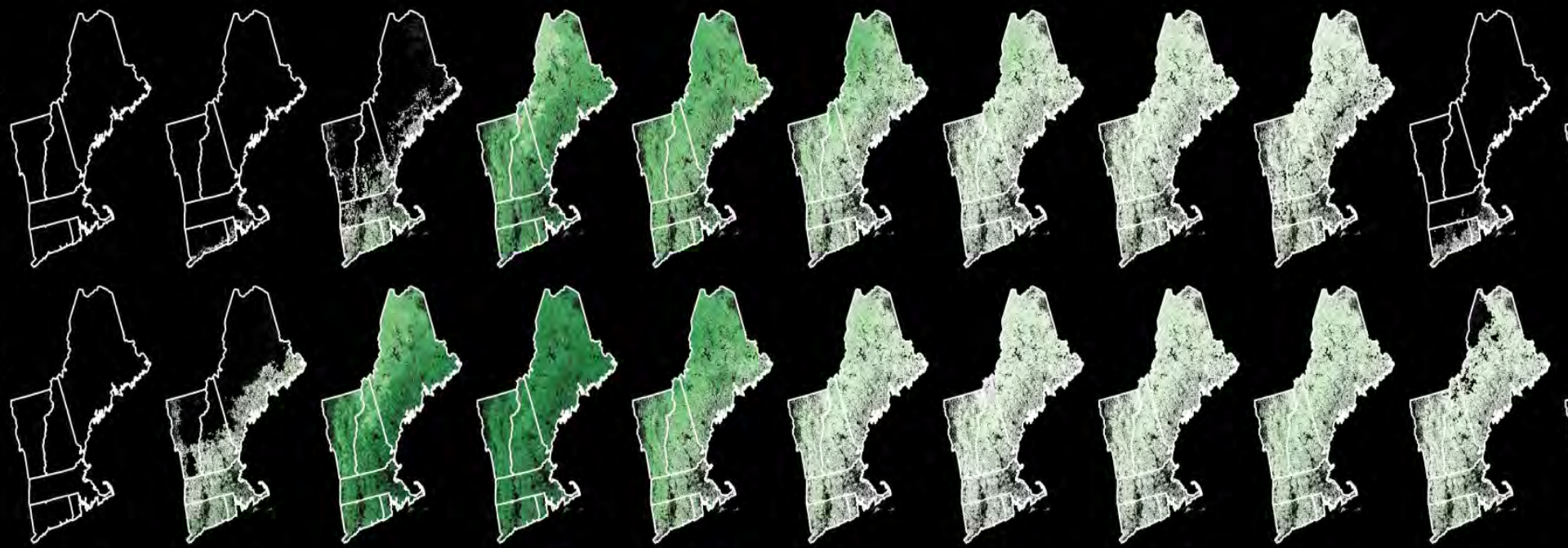
aug

sep

oct

nov

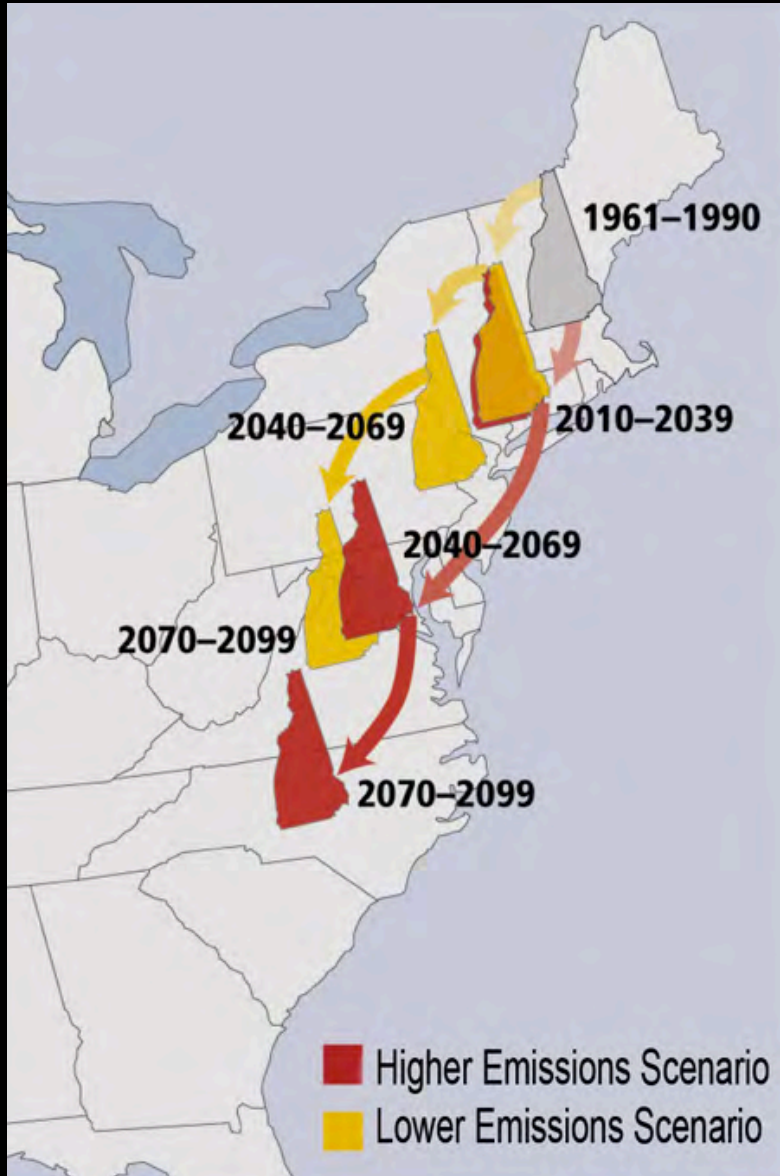
Current (2016)



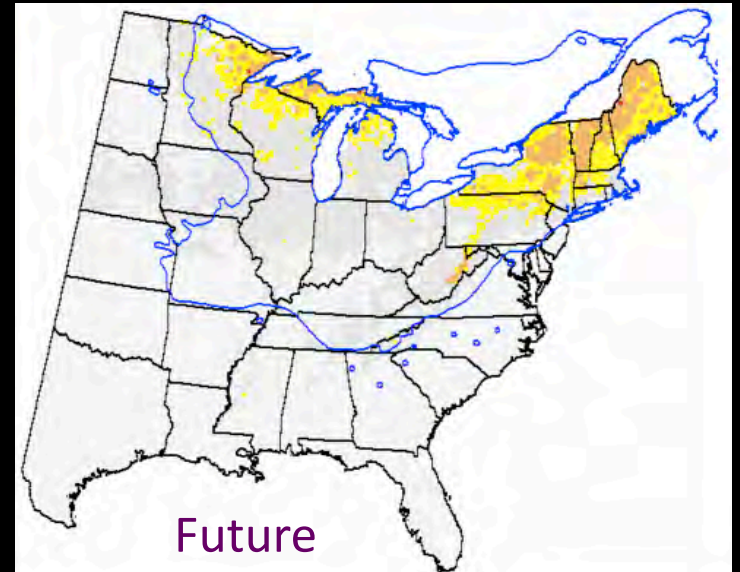
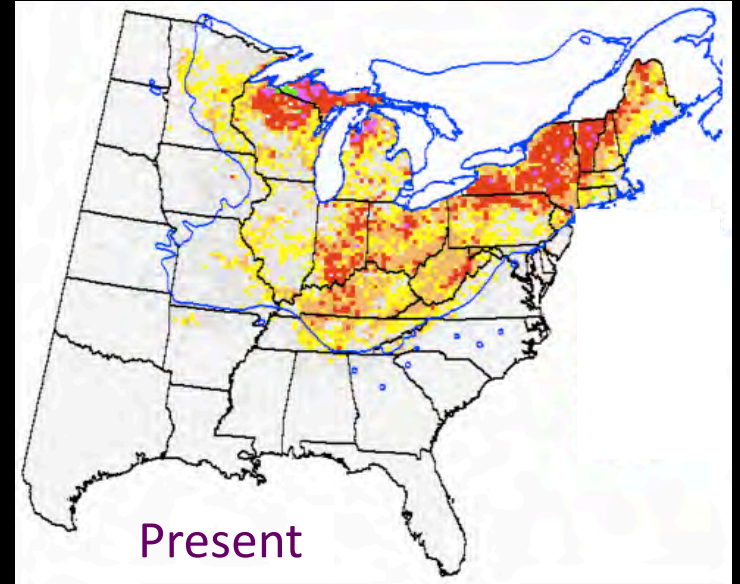
Future (2100)

Caricatures of the Future

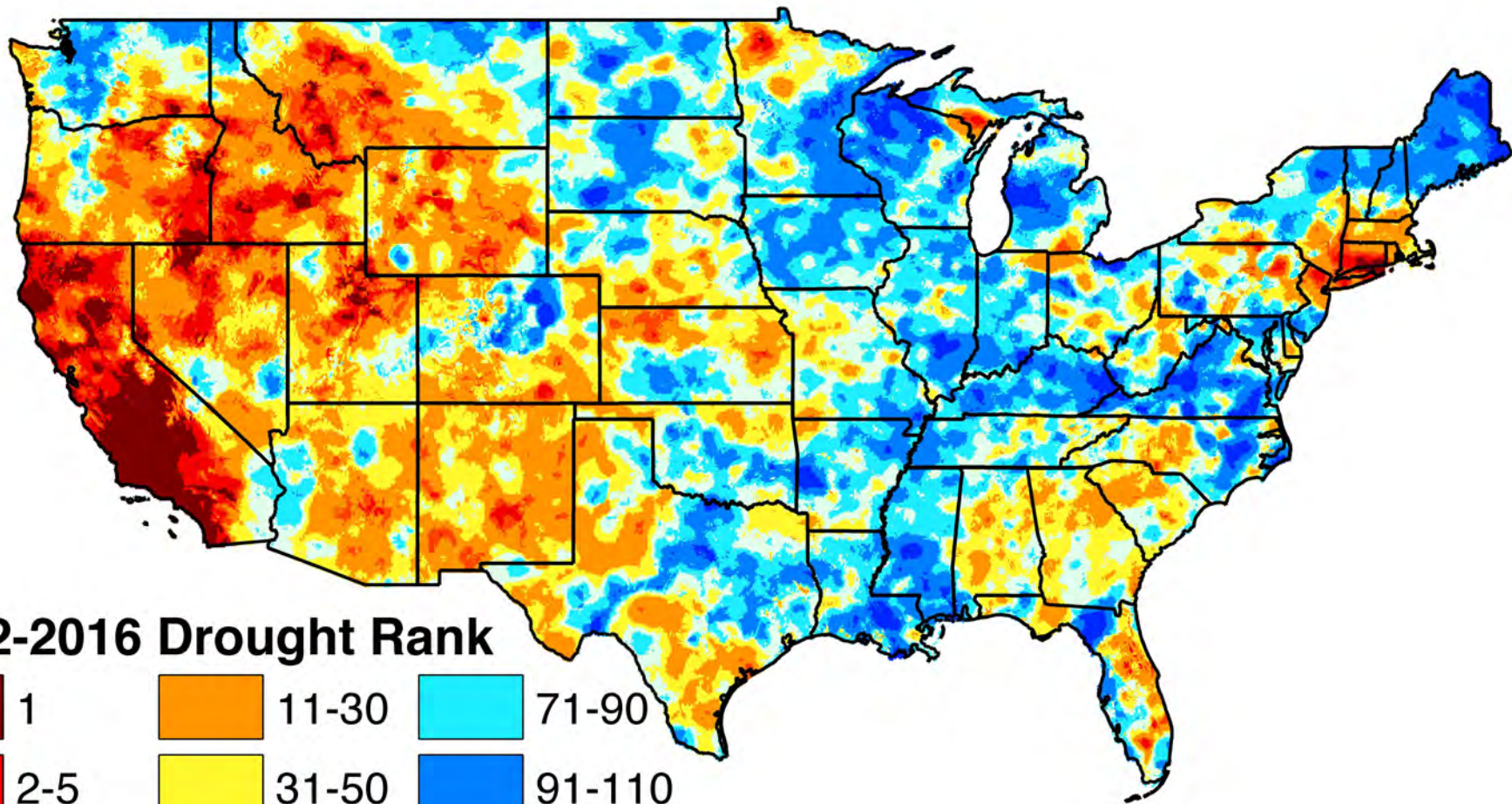
New Hampshire Moving South



Sugar Maple Moving North







2012-2016 Drought Rank

1	11-30	71-90
2-5	31-50	91-110
6-10	51-70	111-118

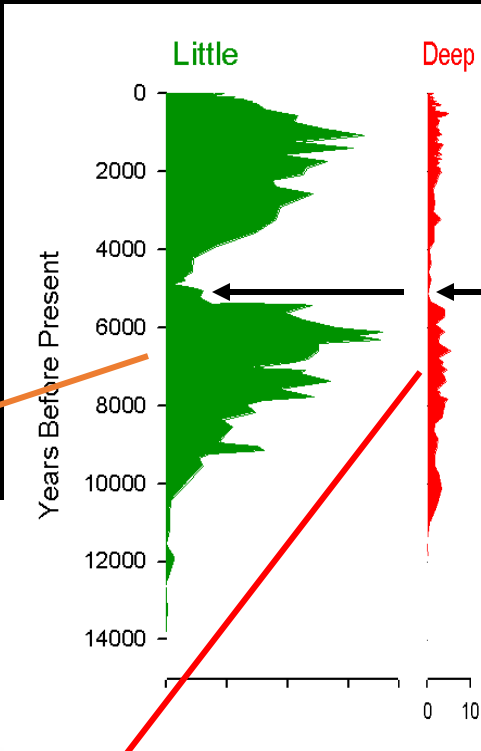


Insects and Drought -- North Road, Martha's Vineyard 2009

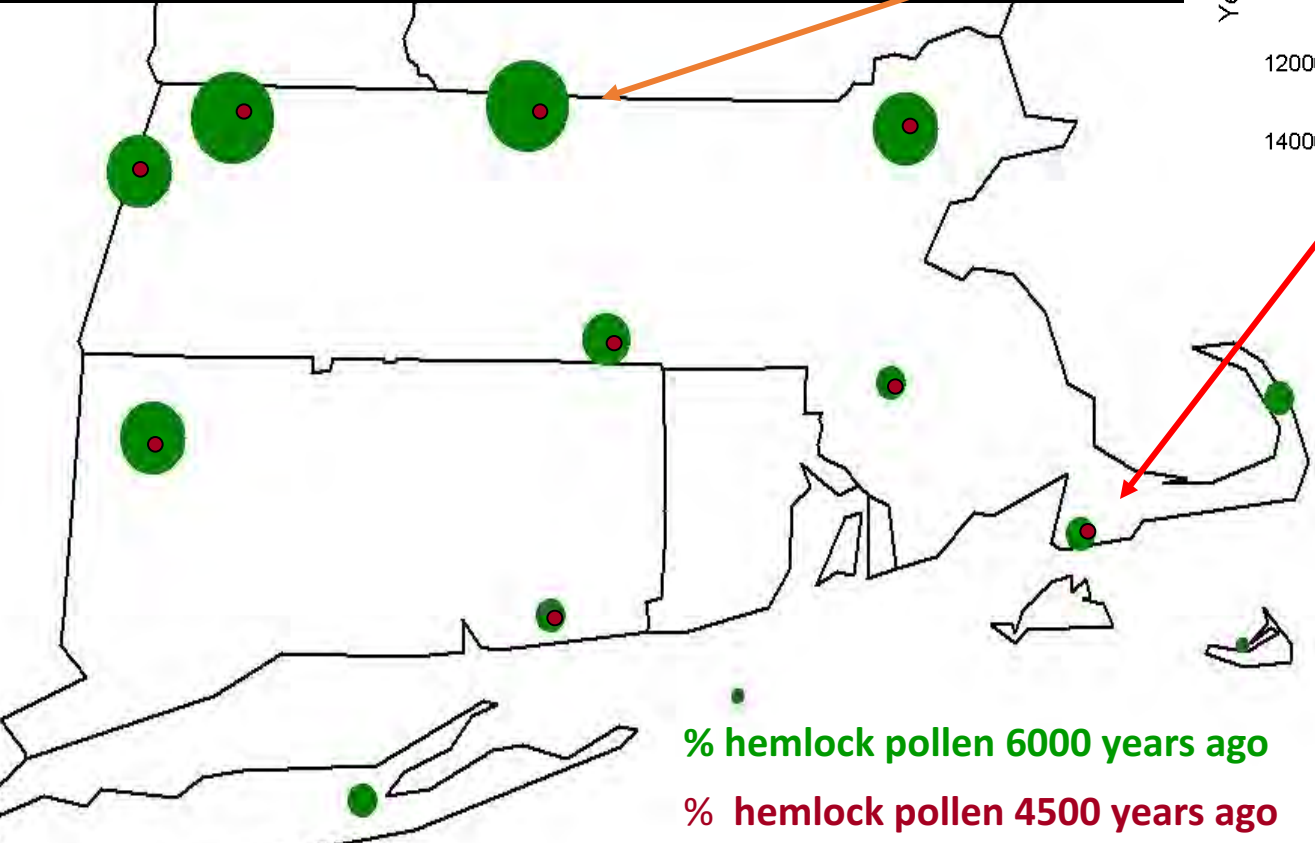


Mid-Holocene Hemlock Decline

5000 Years BP



Hemlock decline

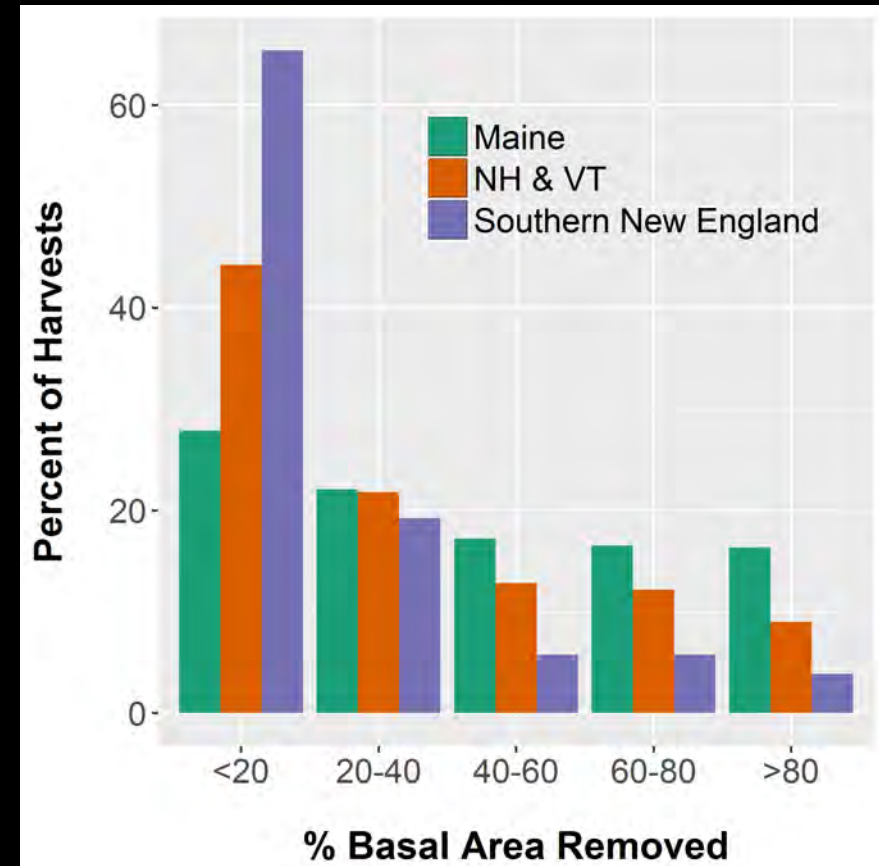
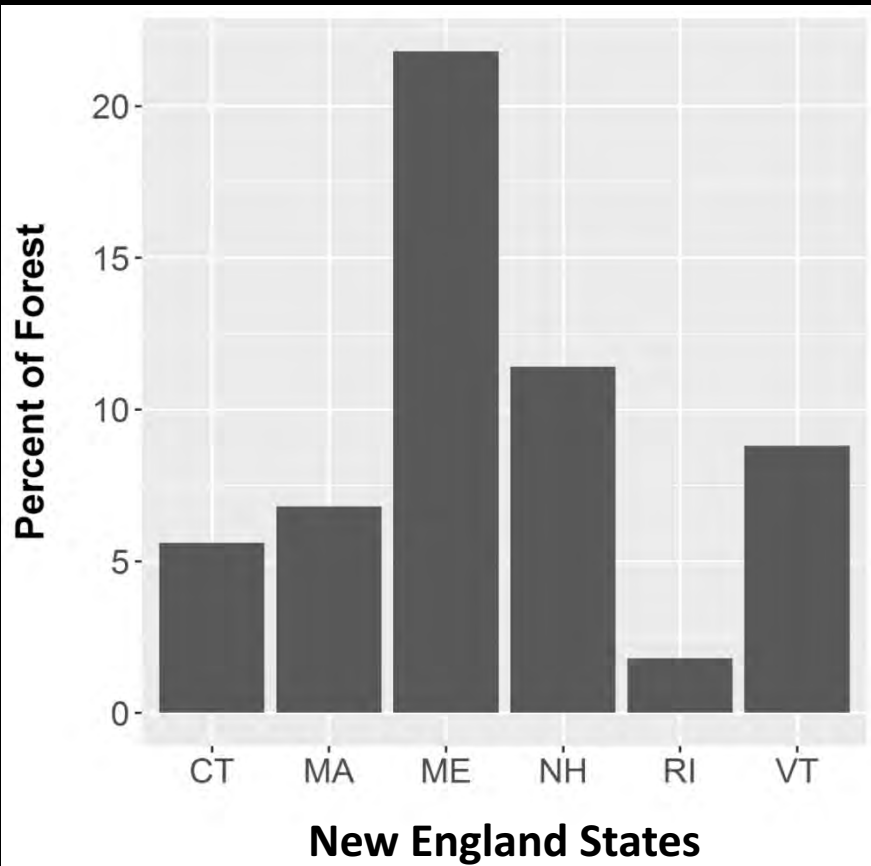


% hemlock pollen 6000 years ago

% hemlock pollen 4500 years ago



HARVEST IS A LARGER CAUSE OF ADULT TREE MORTALITY IN NEW ENGLAND THAN ALL OTHER SOURCES COMBINED



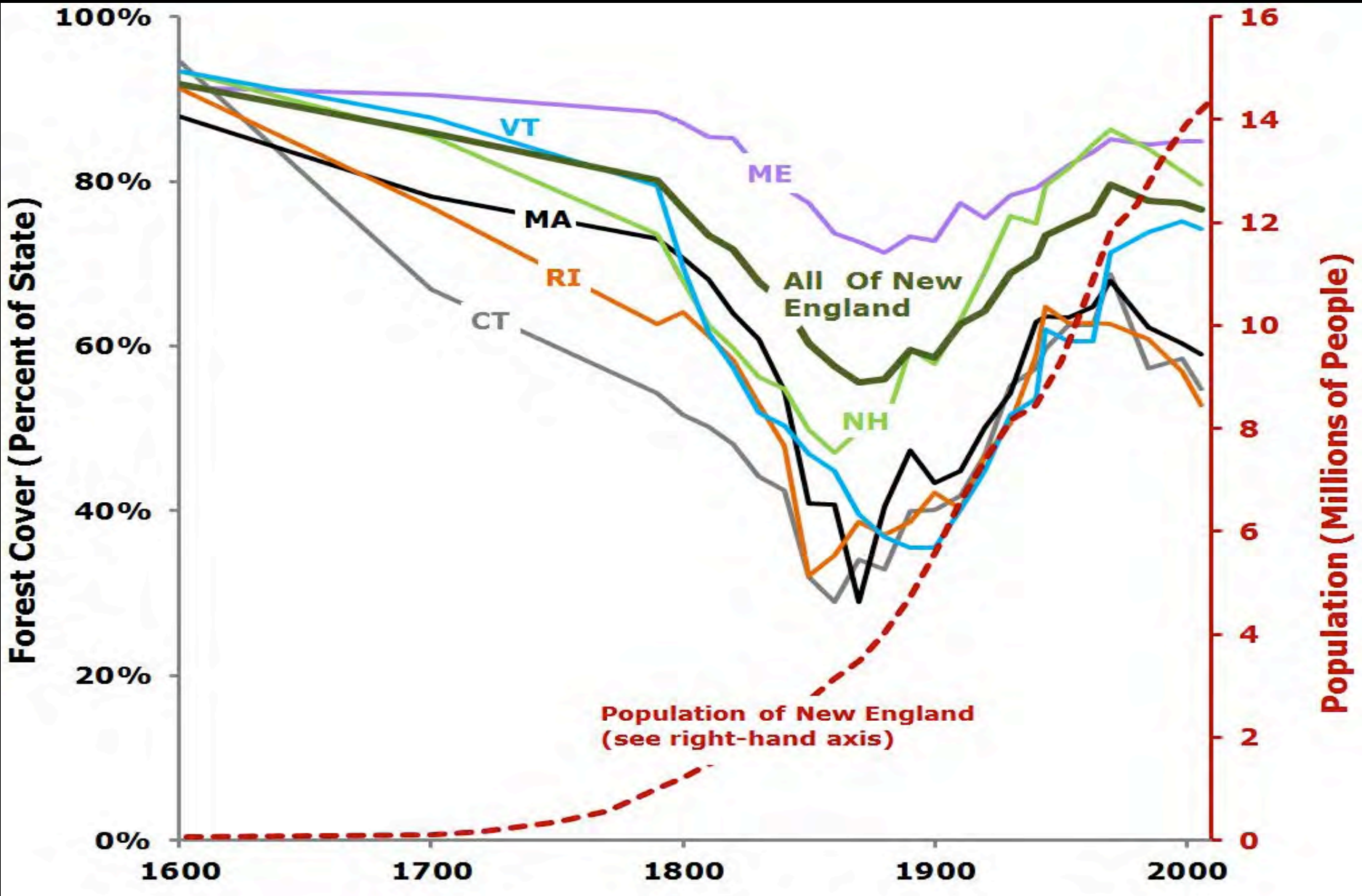
DEVELOP



Hunt Farm, Orange MA



Southern Woodlands, Oak Bluffs



Pre-Colonial Forest

Modern Forest

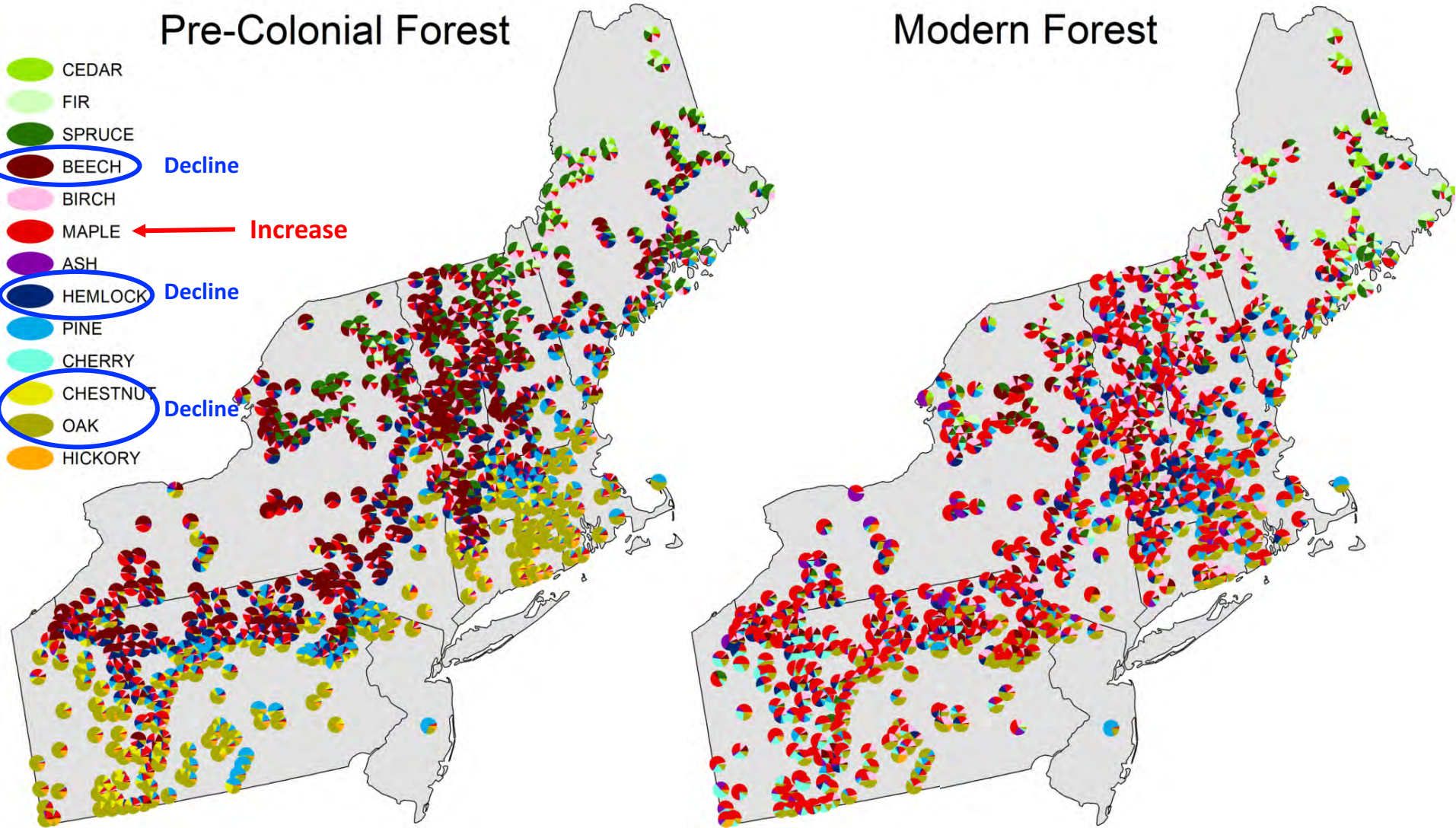
- CEDAR
- FIR
- SPRUCE
- BEECH
- BIRCH
- MAPLE
- ASH
- HEMLOCK
- PINE
- CHERRY
- CHESTNUT
- OAK
- HICKORY

Decline

Increase

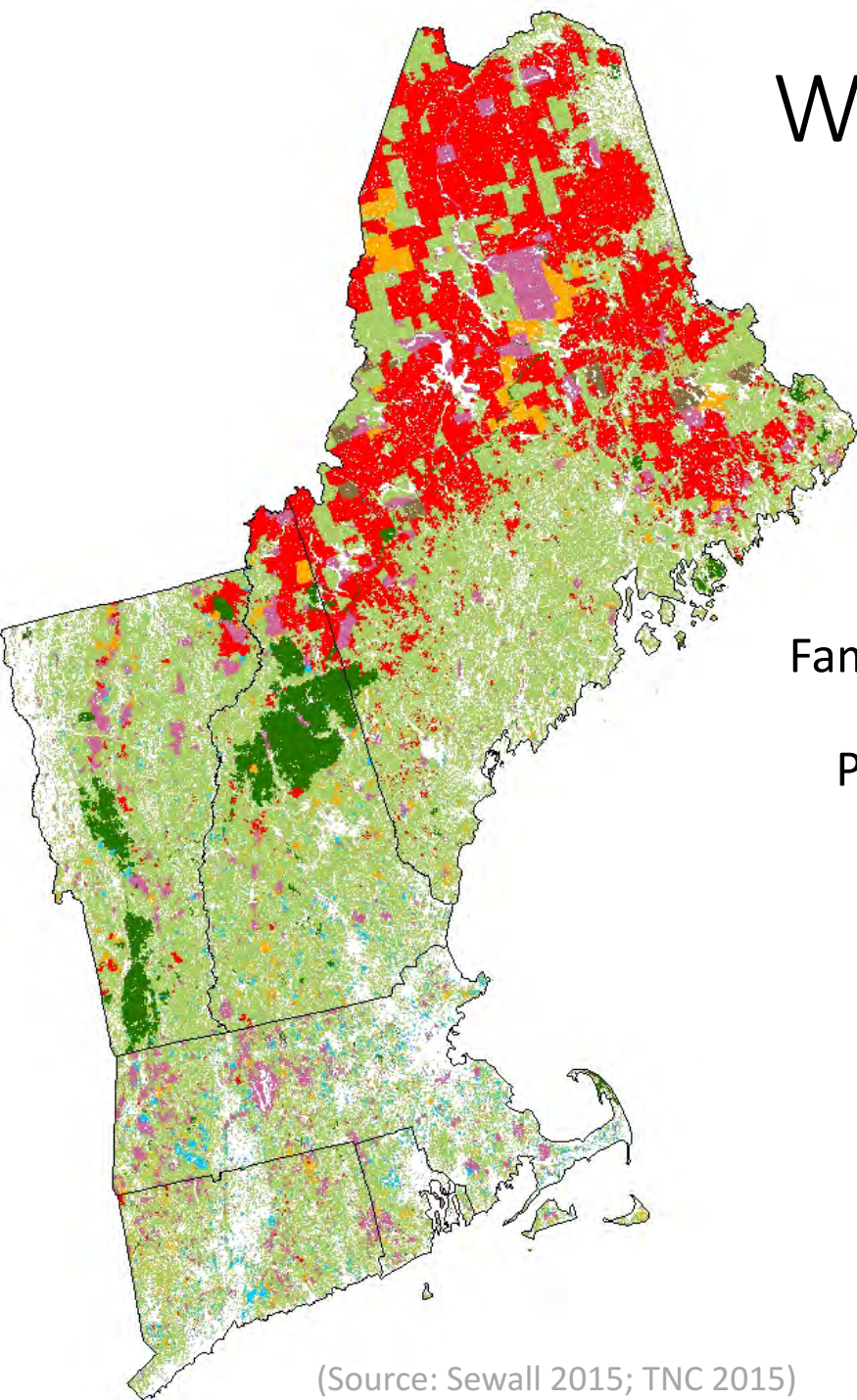
Decline

Decline

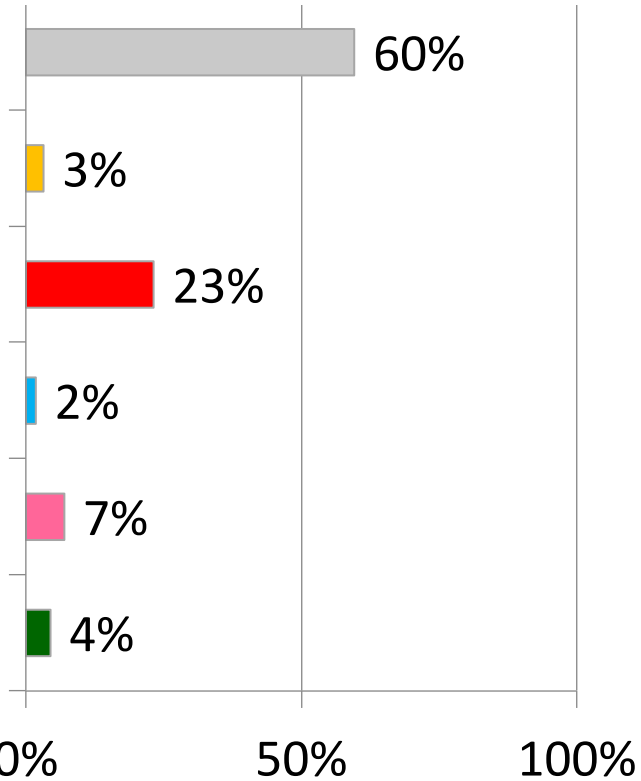


WHO OWNS NEW ENGLAND'S FORESTS?

214,000 Forest Land Owners
With more than 10 acres
Own 12.2 million acres



Family Forest Owner



(Source: Sewall 2015; TNC 2015)

Increasing Forest Resiliency for an Uncertain Future

#1a Keep Forests Forested

#1b Keep Forests Connected



David Kittredge

Wildlands and Woodlands

John D. Aber *University of New Hampshire*

Charles V. Cogbill *Sterling College, Vermont*

Elizabeth A. Colburn *Harvard Forest, Harvard University*

Anthony W. D'Amato *University of Minnesota*

Brian M. Donahue *Brandeis University*

Charles T. Driscoll *Syracuse University*

Aaron M. Ellison *Harvard Forest, Harvard University*

Timothy J. Fahey *Cornell University*

David R. Foster *Harvard Forest, Harvard University*

Brian R. Hall *Harvard Forest, Harvard University*

Clarisse M. Hart *Harvard Forest, Harvard University*

Malcolm L. Hunter *University of Maine, Orono*

Lloyd C. Irland *Yale University*

William S. Keeton *University of Vermont*

David B. Kittredge *University of Massachusetts*

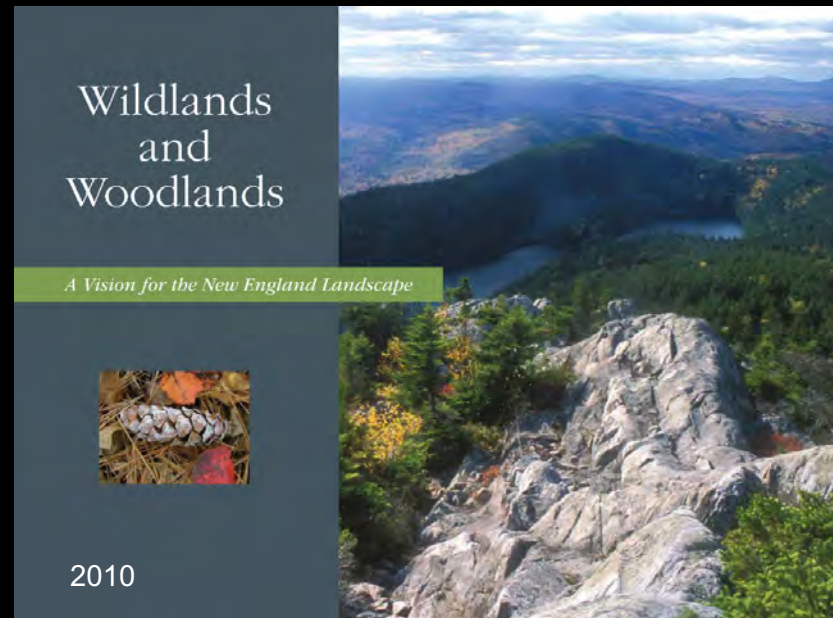
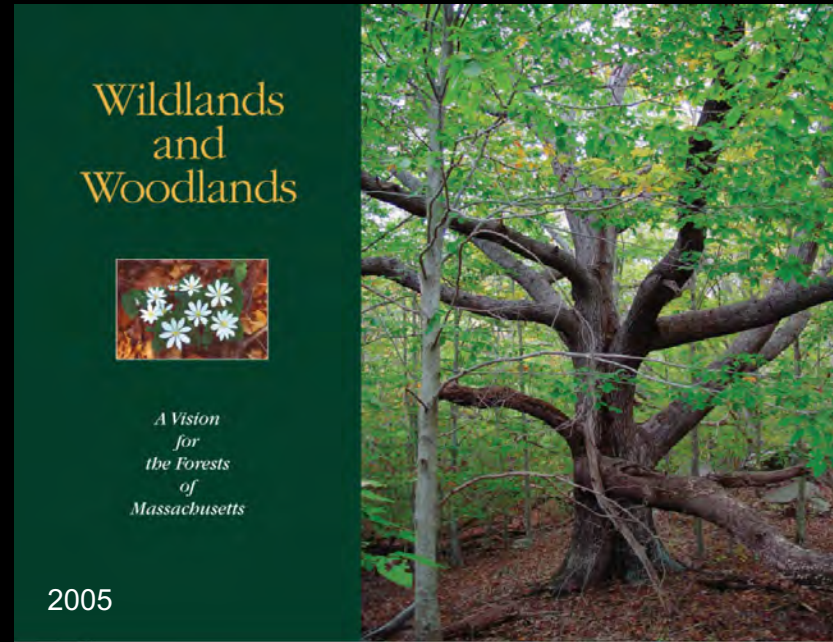
Kathleen F. Lambert *Harvard Forest, Harvard University*

James N. Levitt *Harvard Forest, Harvard University*

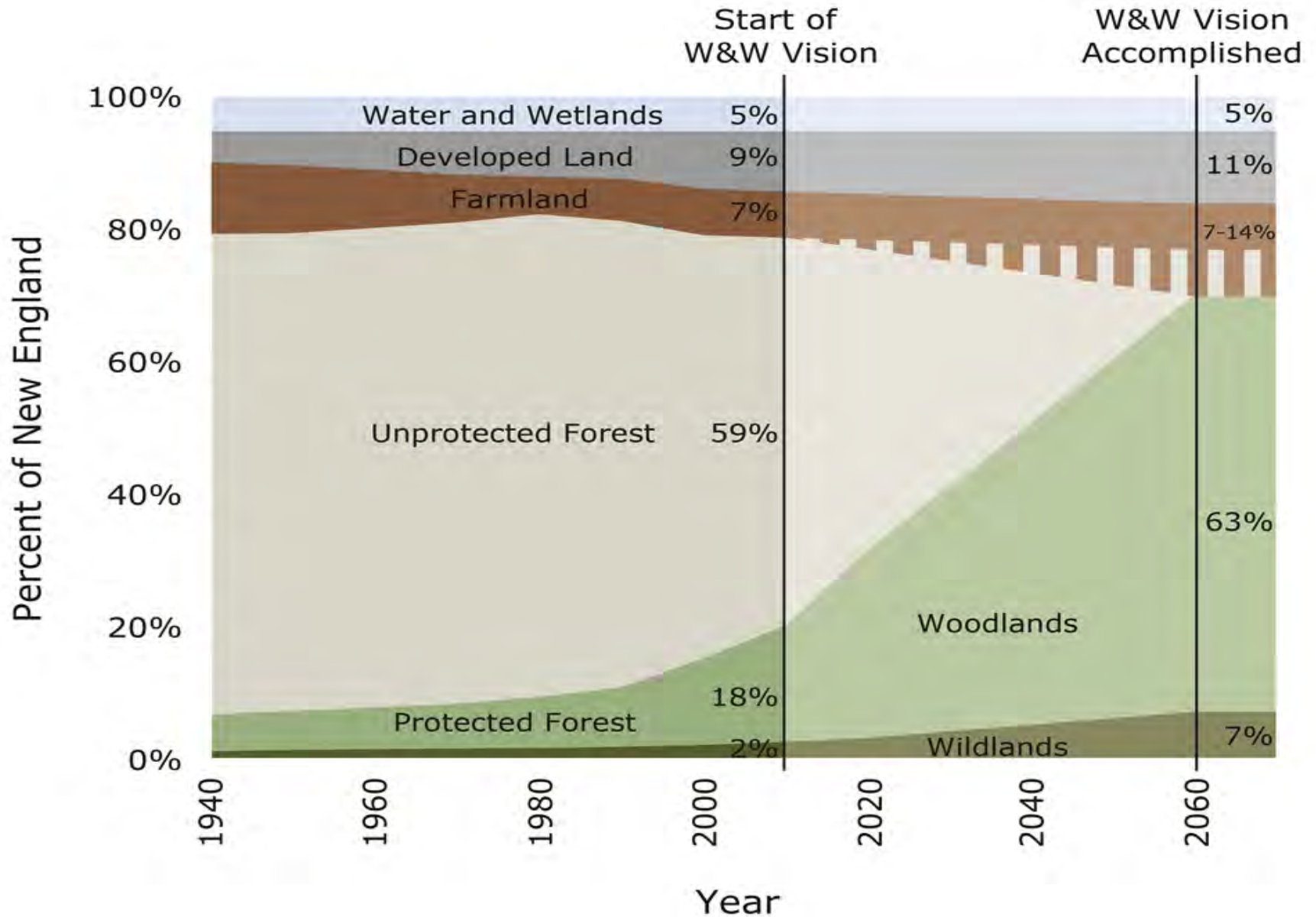
Robert J. Lillieholm *University of Maine*

David A. Orwig *Harvard Forest, Harvard University*

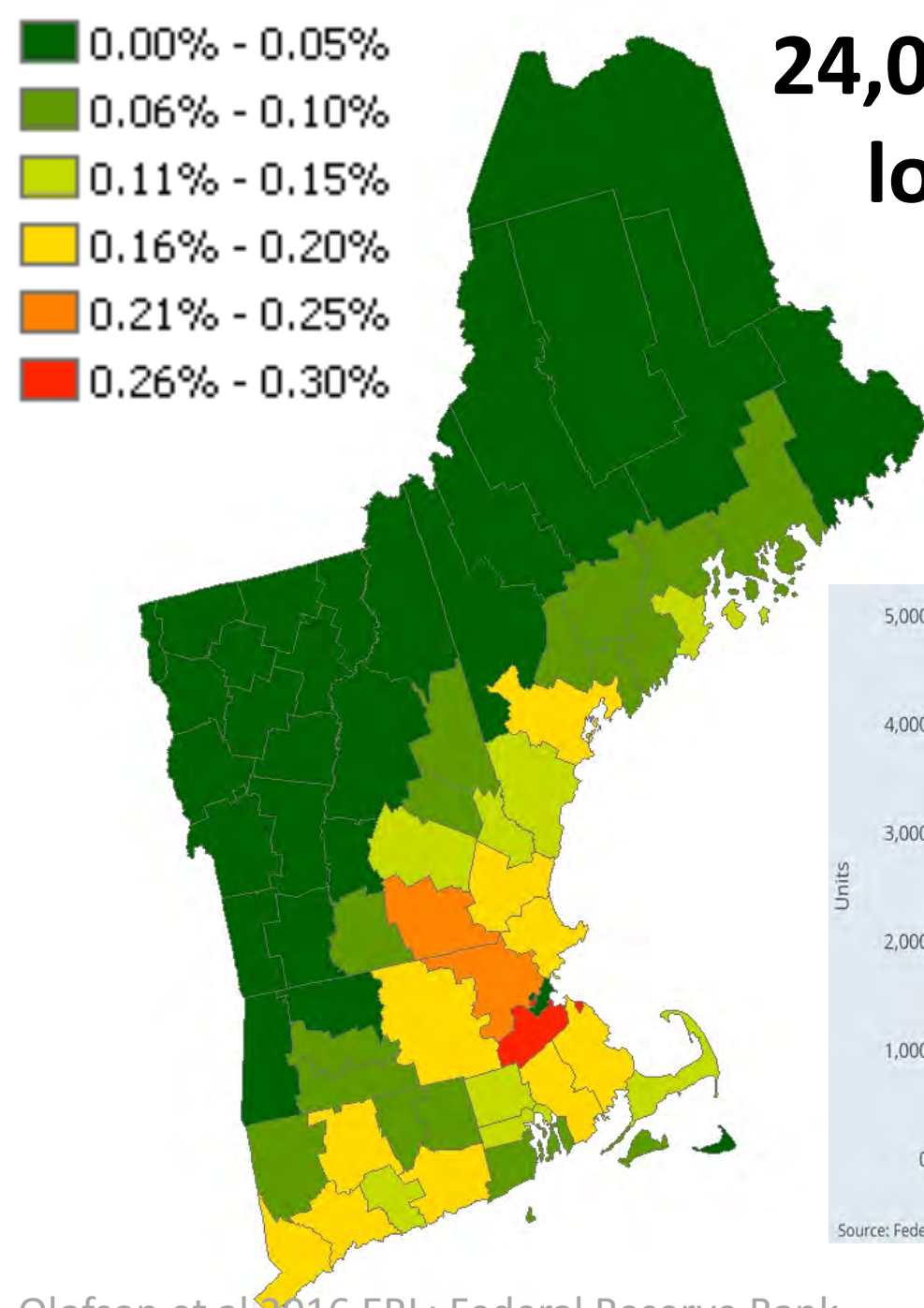
Jonathan R. Thompson *Smithsonian Institution*



Wildlands and Woodlands Vision



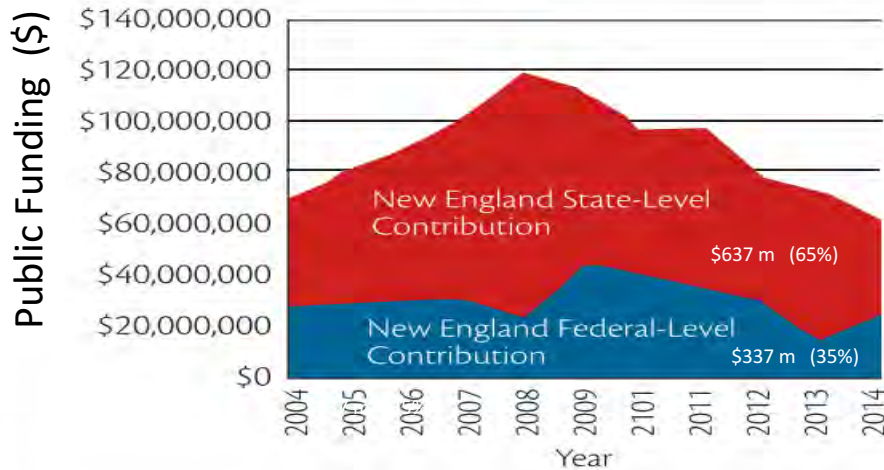
24,000 acres yr⁻¹ of forest lost to development since 1985



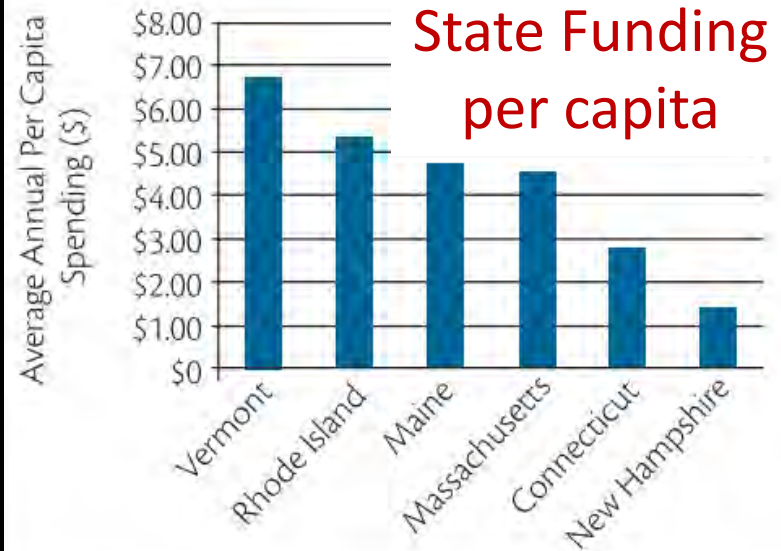
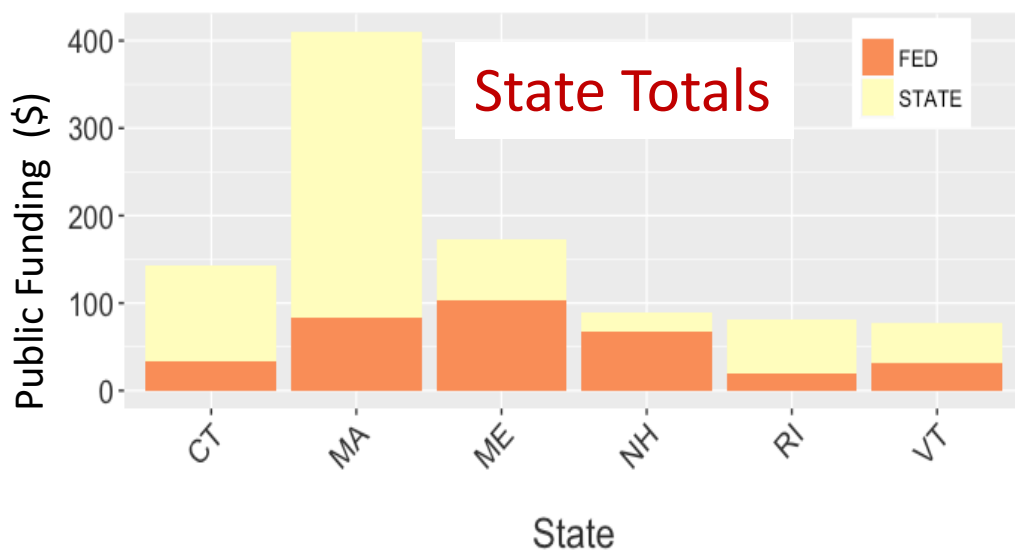
Housing Starts in New England



Combined State and Federal Funding for Land Conservation – New England

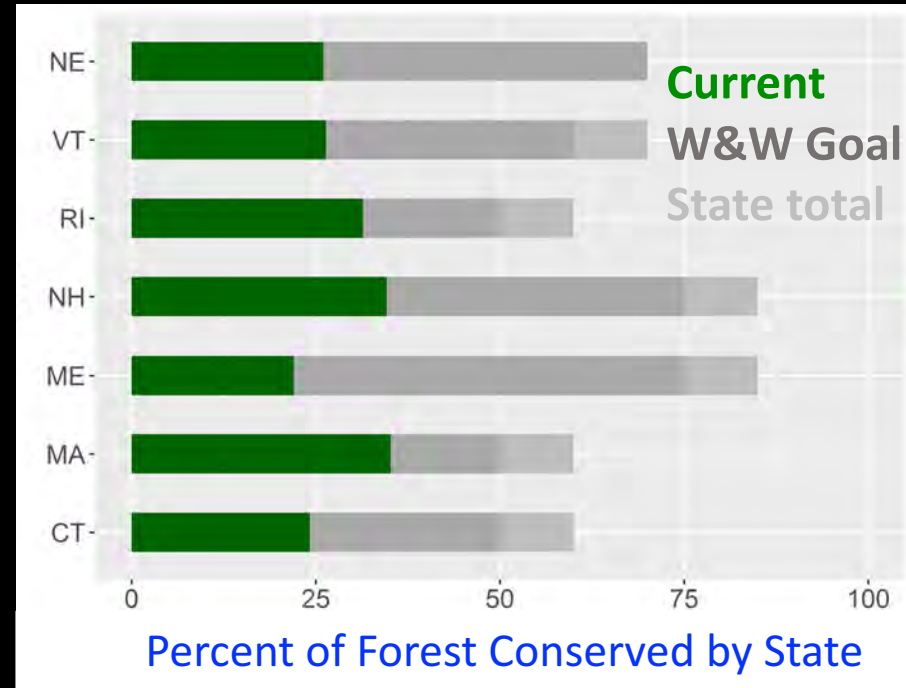
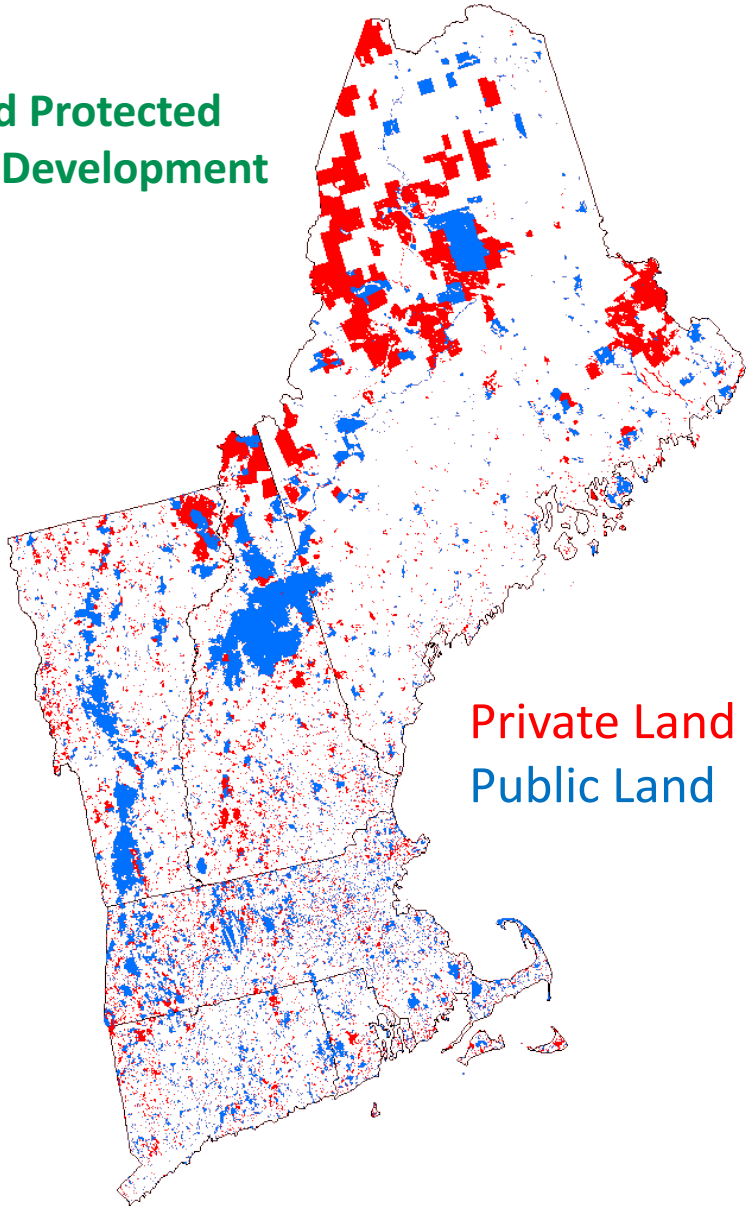


Public Funding for Land Protection is Highly Variable and Declining



9.4m acres are protected from development

Land Protected
From Development

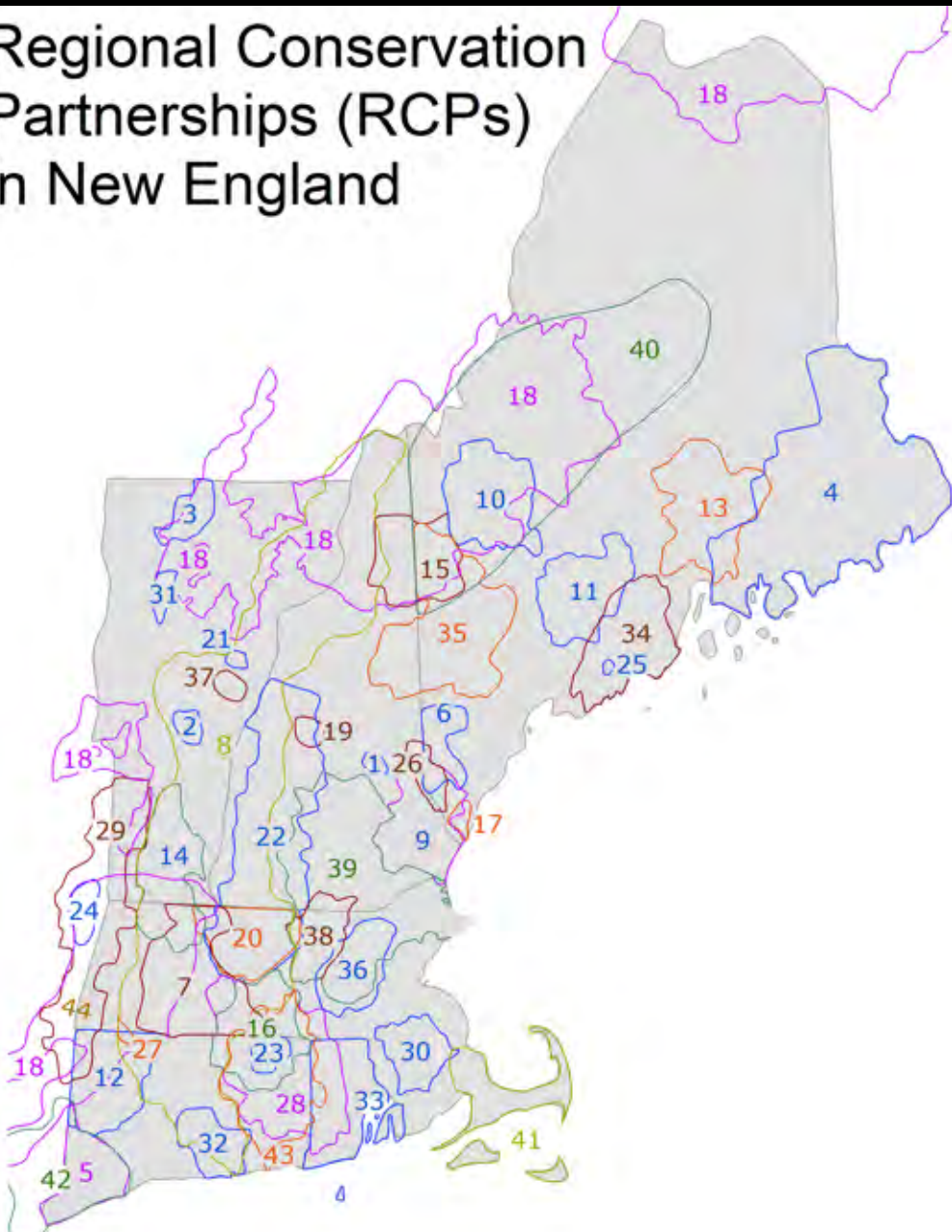


50% Since 1990

73% by easement since 1990

Regional Conservation Partnerships -- Collaboratives Advancing Land Conservation

Regional Conservation Partnerships (RCPs) in New England

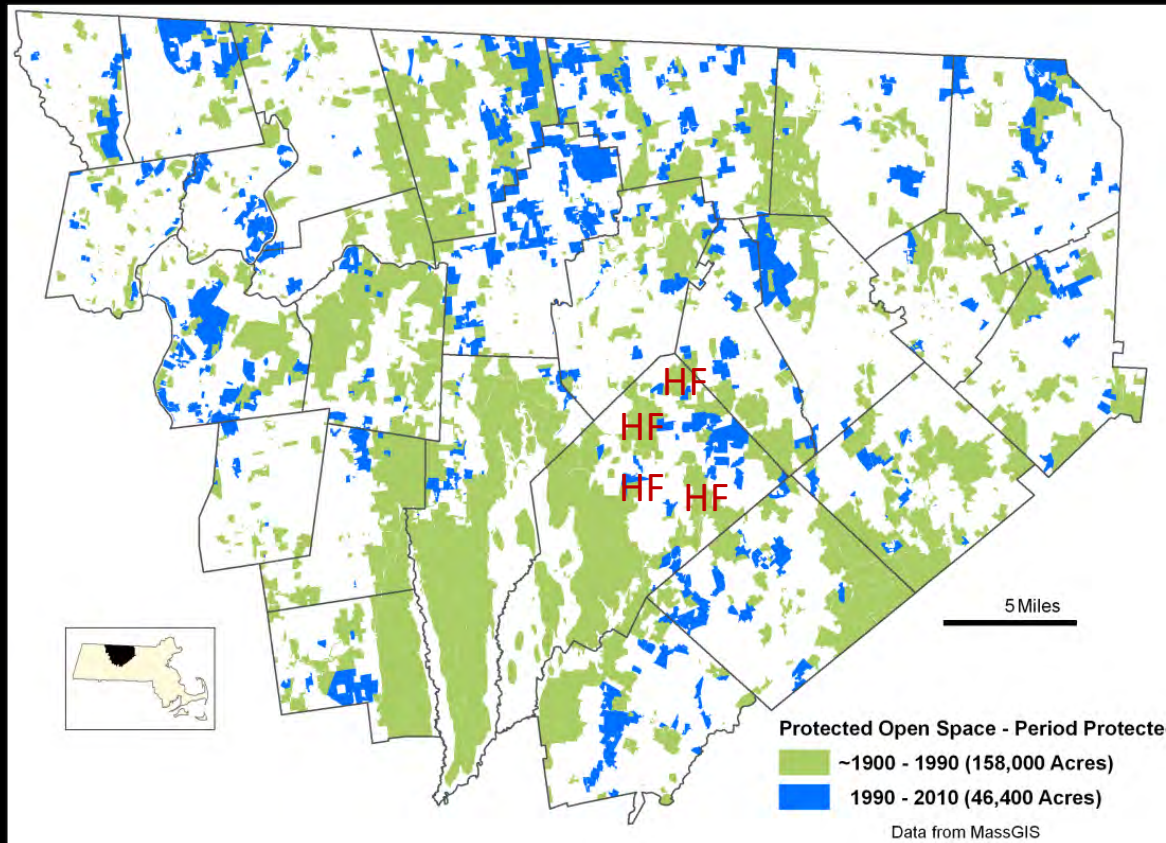


Kestrel Land Trust

North Quabbin Regional Landscape Partnership

MassConn Sustainable Forest Partnership

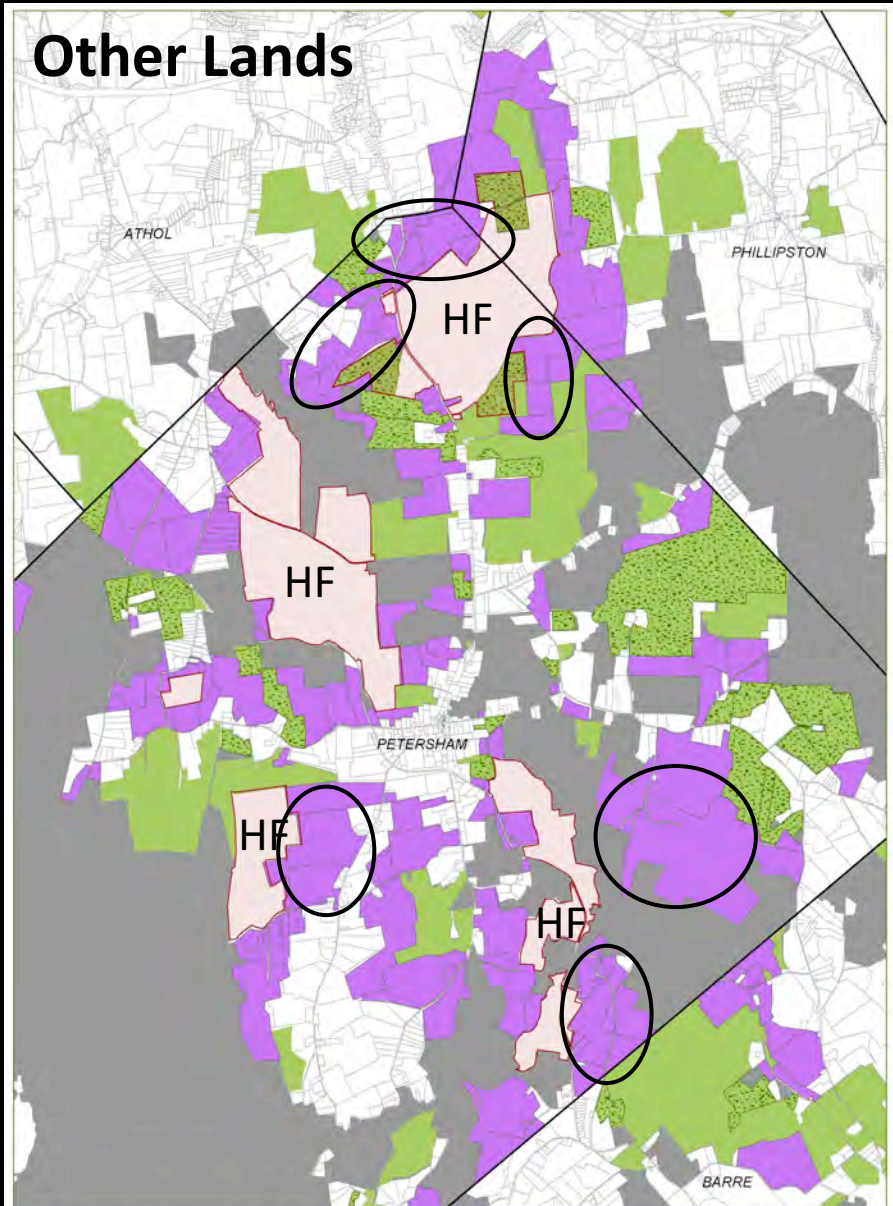
North Quabbin Regional Landscape Partnership



- Founded in 1997 – Led by Mount Grace Land Conservation Trust
- 26 towns
- 22 Active partners
- Land protection through
- Outreach and training to land owners, foresters, towns etc.

Harvard Forest Land Protection Effort Began in 1993

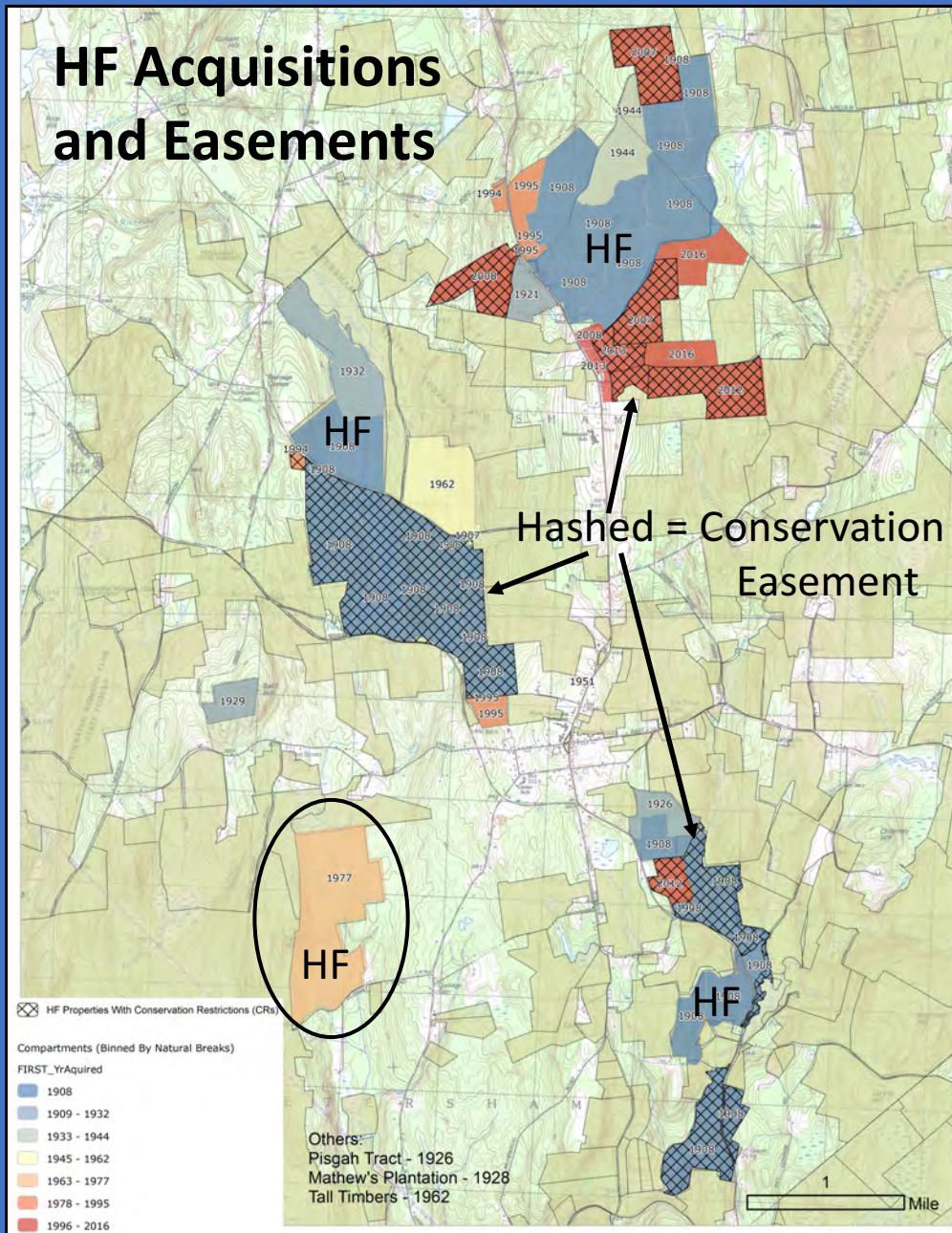
Other Lands



Conserved before 1993
Conserved since 1993

Harvard Forest
Remaining Priority

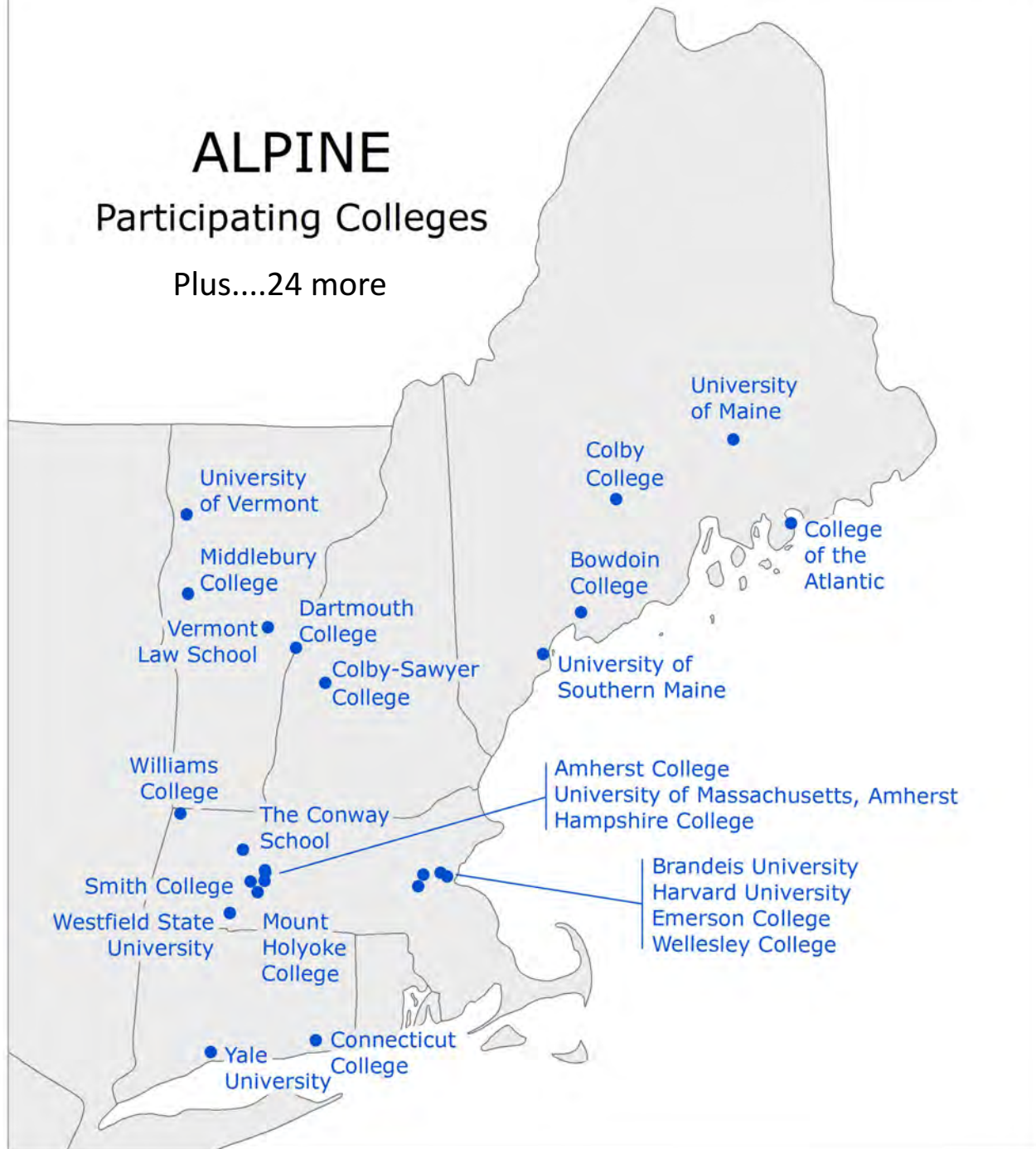
HF Acquisitions and Easements

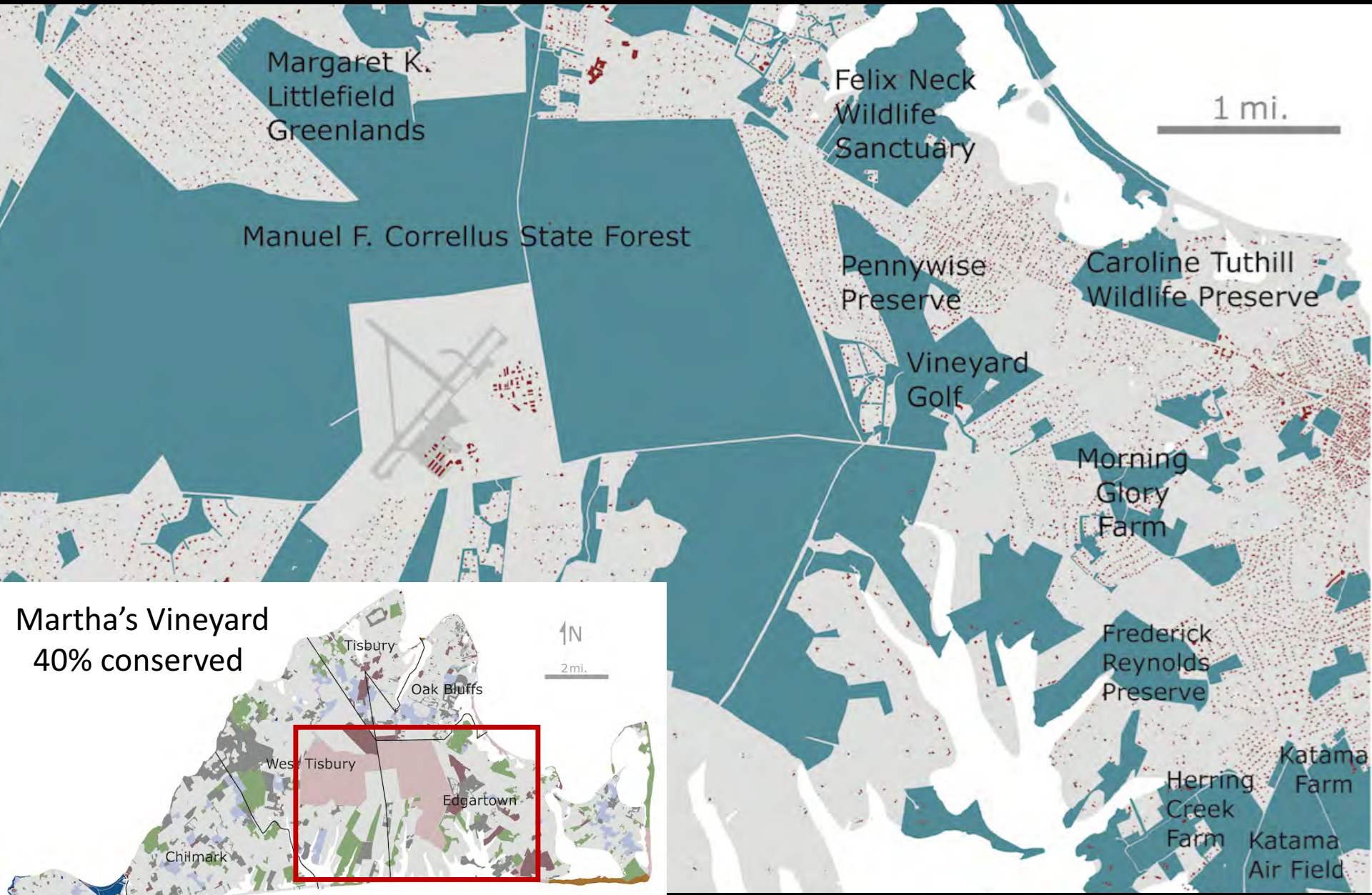


ALPINE

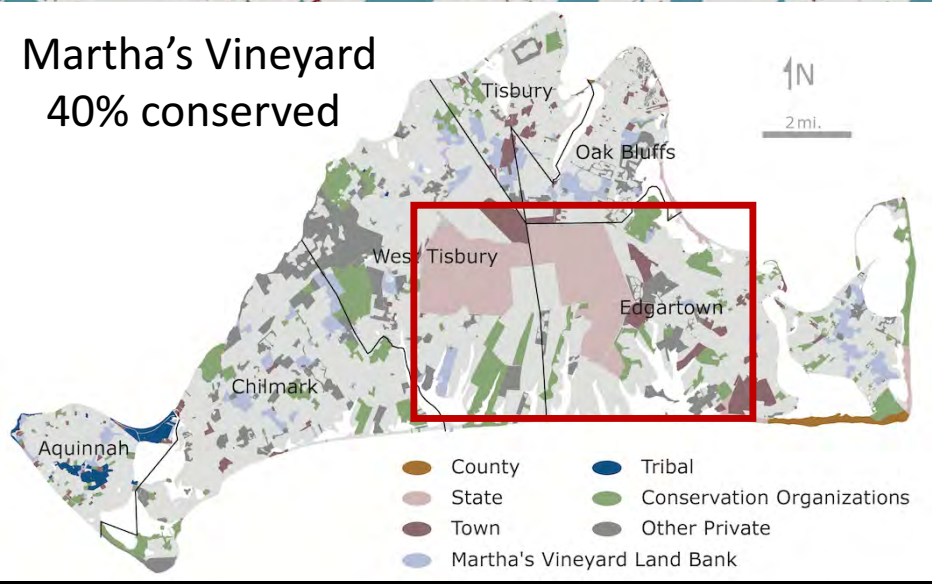
Participating Colleges

Plus....24 more





**Martha's Vineyard
40% conserved**



- County
- State
- Town
- Martha's Vineyard Land Bank
- Tribal
- Conservation Organizations
- Other Private



**KESTREL
LAND TRUST**

CONSERVE THE VALLEY YOU LOVE

You can do
something powerful
today to address the
greatest challenge
our planet faces:



CONSERVE THE FORESTS YOU LOVE!



Buffum Brook Community Forest – 160 ac

West Quabbin Forest Legacy – 2000 ac

Brewer Brook, Westhampton/Williamsburg – 1000 ac

THE FOREVER FARMLAND INITIATIVE

Working together to permanently protect farmland throughout the
Massachusetts Connecticut River Valley.

The Mount Holyoke Range Protection Project

Conserve the Mountains You Love!







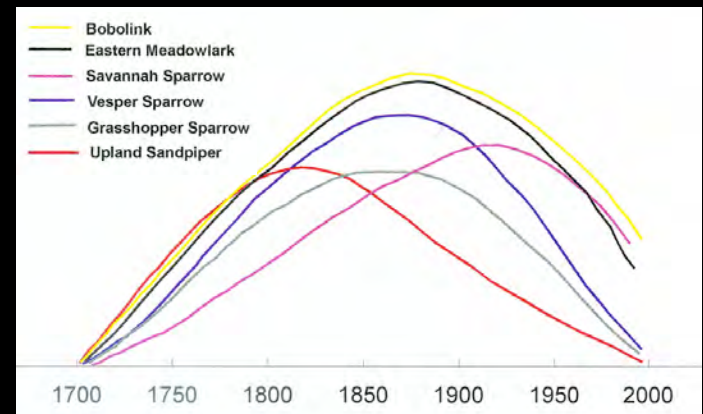
Research on Harvard Farm

Glenn Motzkin Conroy School

Dan Flynn Arnold Arboretum

Martha Hoopes Mount Holyoke

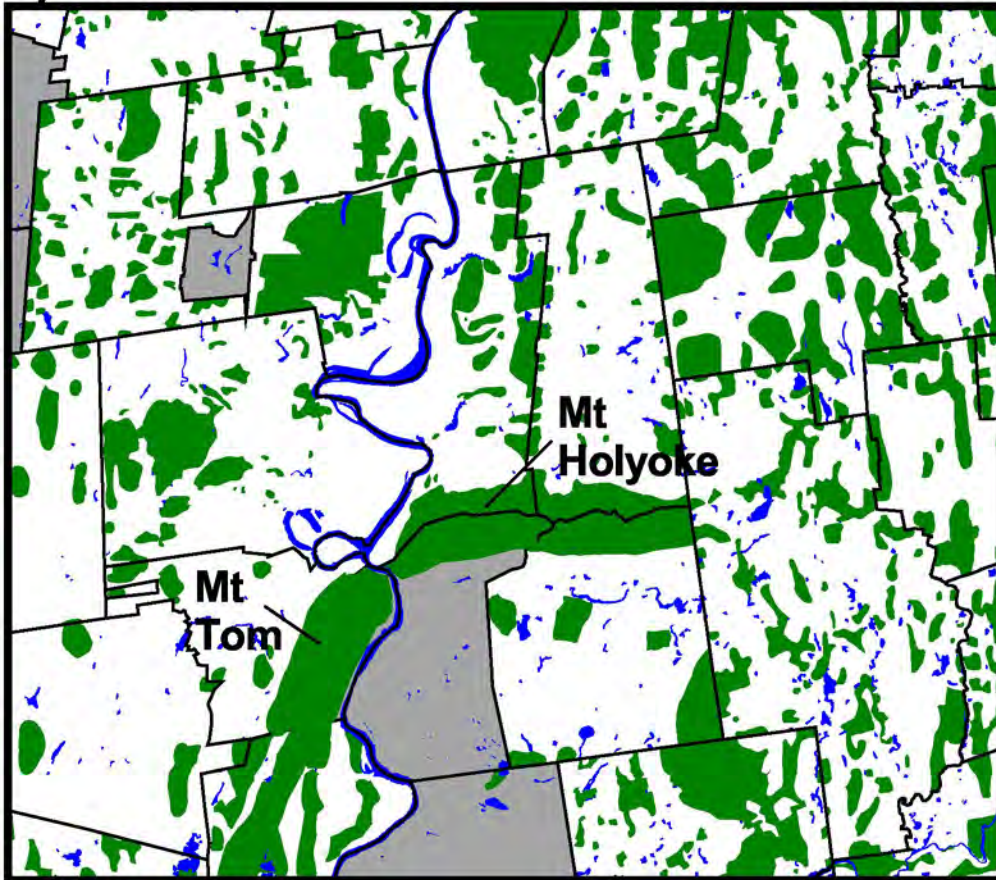
Serita Frey UNH



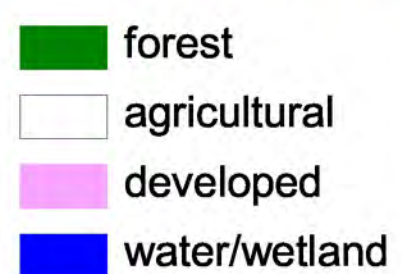
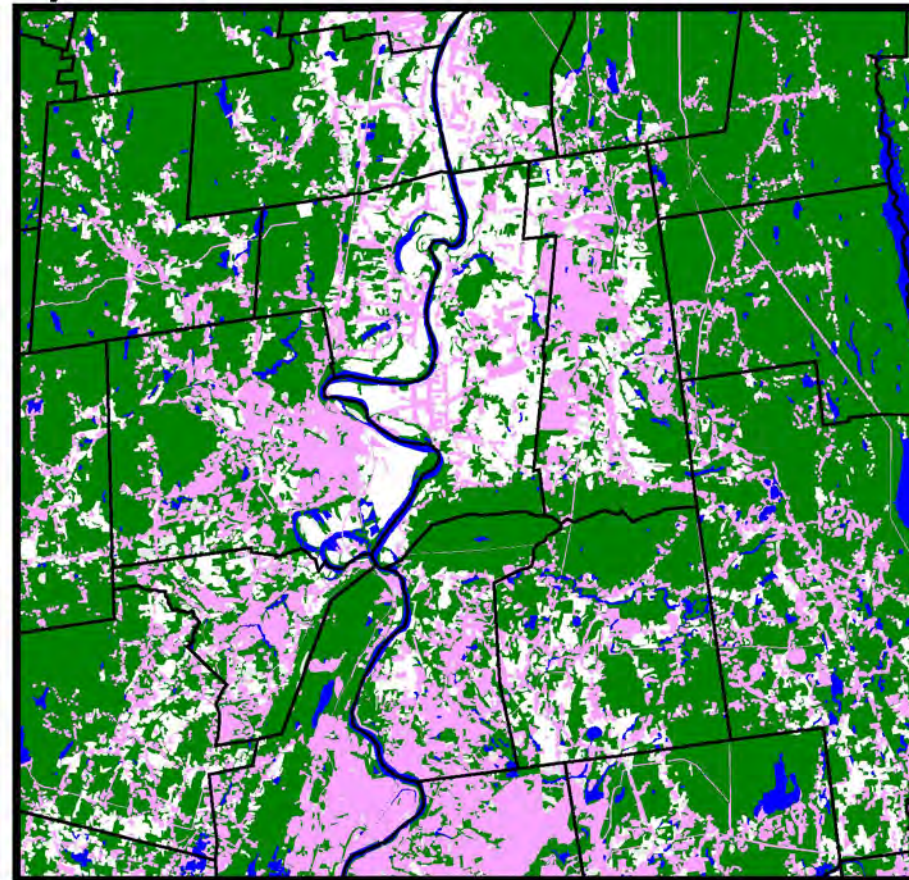
Grassland Bird Species

The Connecticut Valley and Holyoke Range Through Time

a) 1830

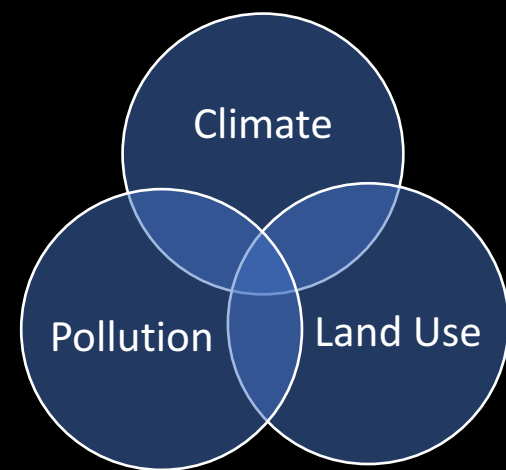


b) 1999



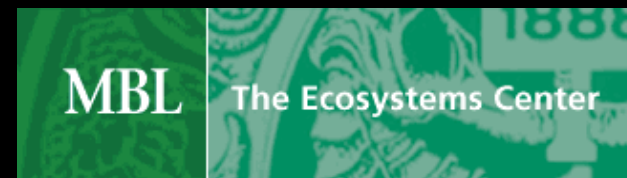
5 mi





Kathy Fallon Lambert, Director; Harvard Forest

Goal: synthesize science regionally to increase its impact on environmental policy & conservation



Whither New England?

