

Investing in our Forests:

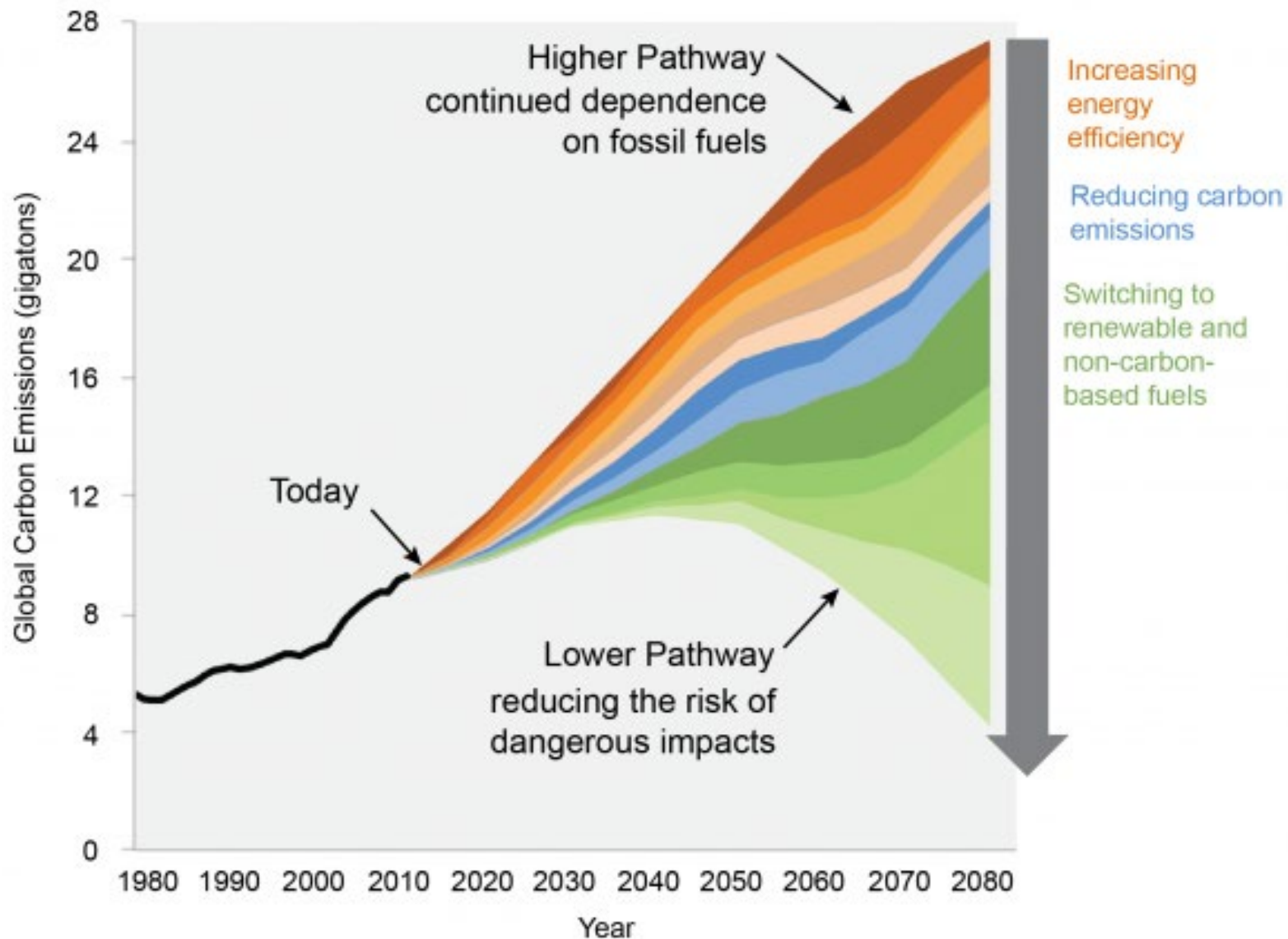
Come for the Climate, Stay for the ...
Health, Water, Air, Tourism, Jobs, Biodiversity

Spencer Meyer
Highstead Foundation
Harvard Forest

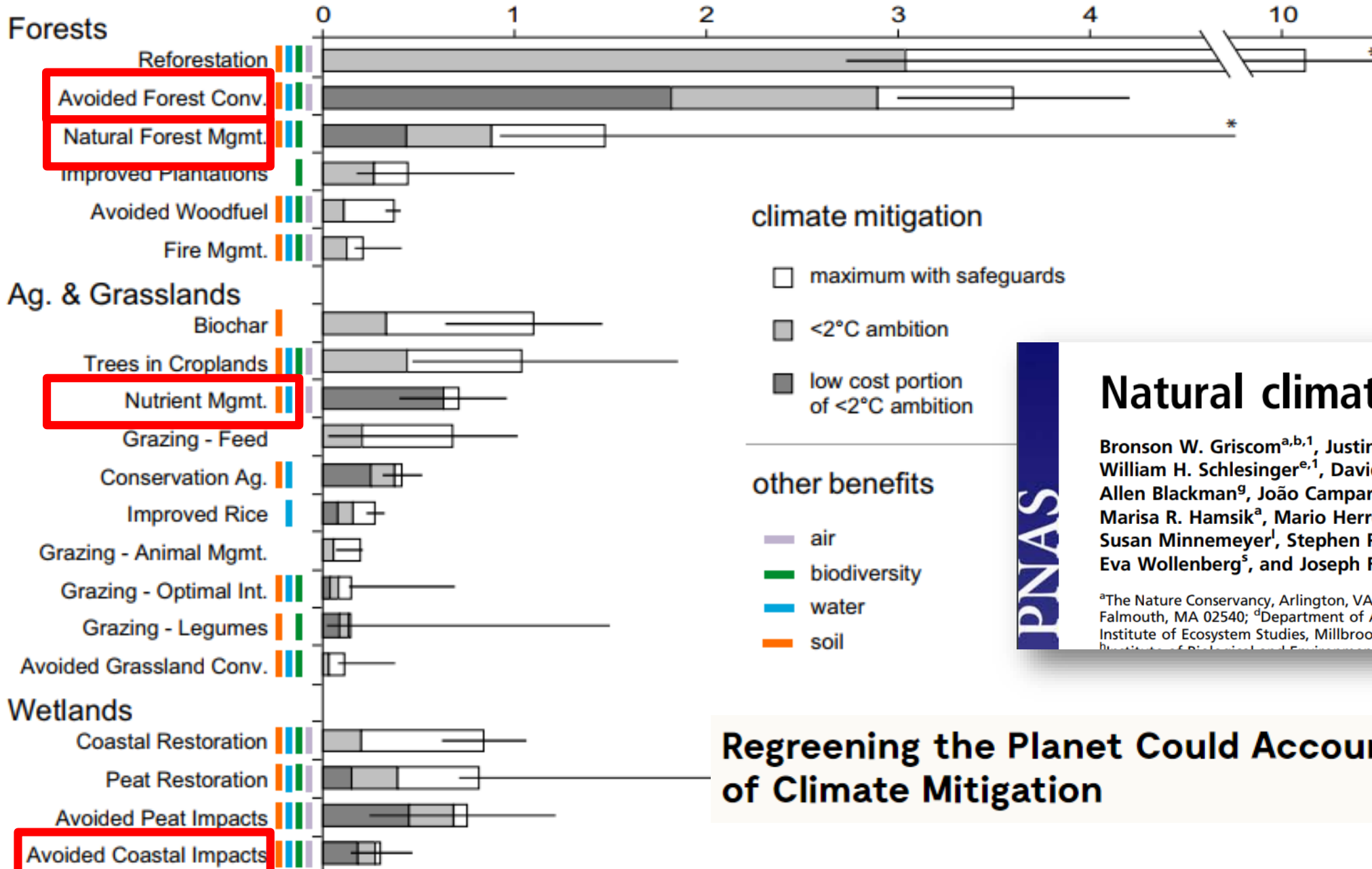


Rick Powell

How to Cut Global Warming Emissions in Half



Climate mitigation potential in 2030 (PgCO₂e yr⁻¹)



climate mitigation

- maximum with safeguards
- <2°C ambition
- low cost portion of <2°C ambition

other benefits

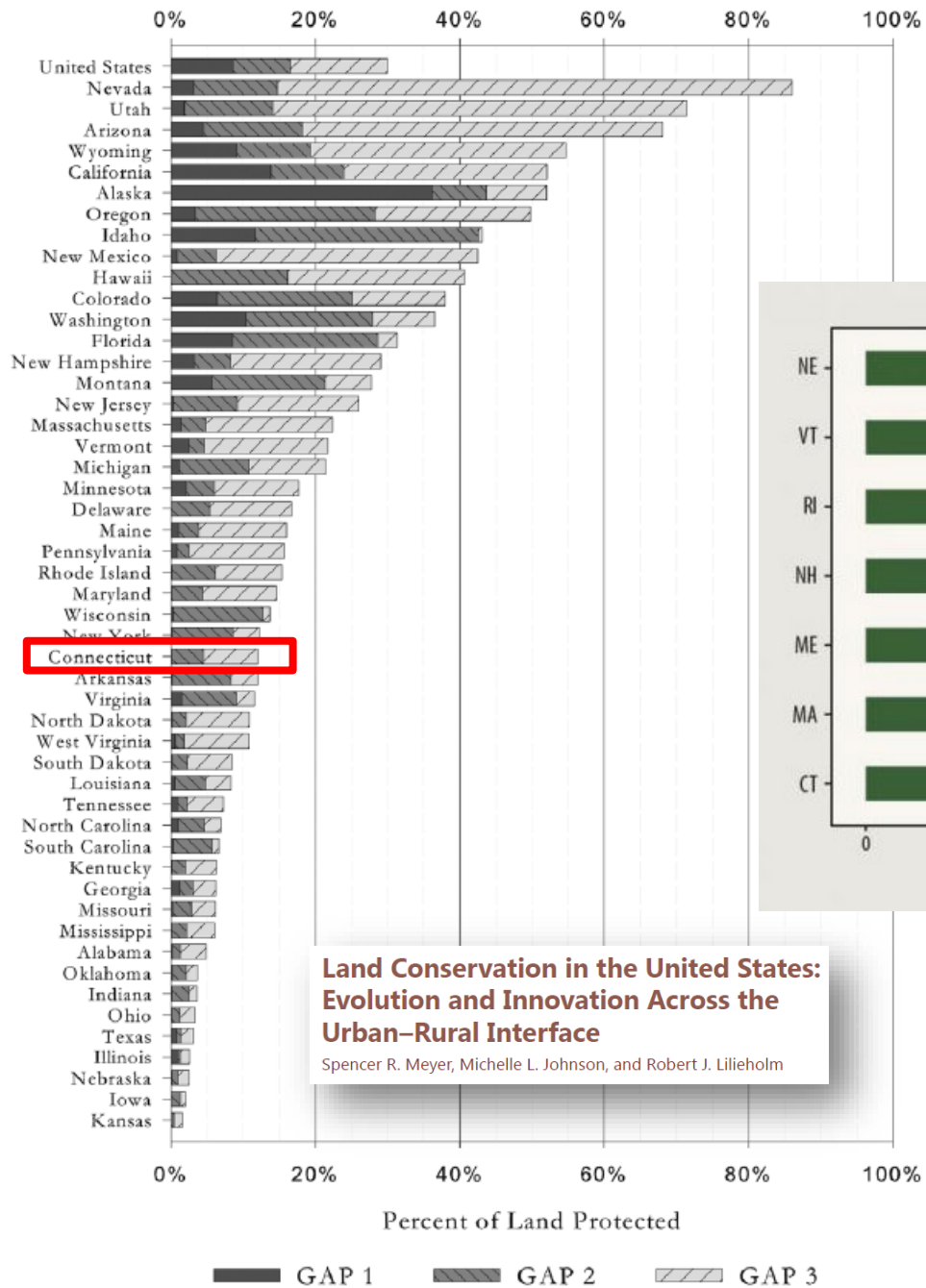
- air
- biodiversity
- water
- soil

Natural climate solutions

Bronson W. Griscom^{a,b,1}, Justin Adams^a, Peter W. Ellis^a, Richard William H. Schlesinger^{e,1}, David Shoch^f, Juha V. Siikamäki^g, Peter Allen Blackman^g, João Campari^j, Richard T. Conant^k, Christophe Marisa R. Hamsik^a, Mario Herrero^m, Joseph Kiesecker^a, Emily La Susan Minnemeyer^l, Stephen Polasky^o, Peter Potapov^p, Francis Eva Wollenberg^s, and Joseph Fargione^a

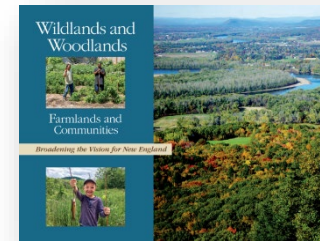
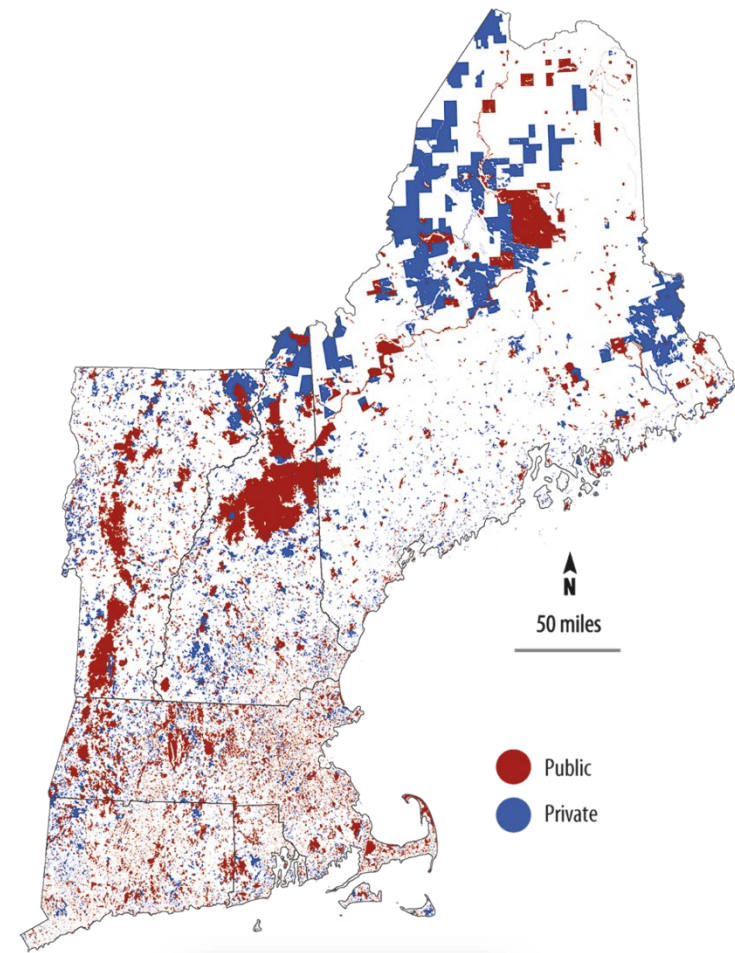
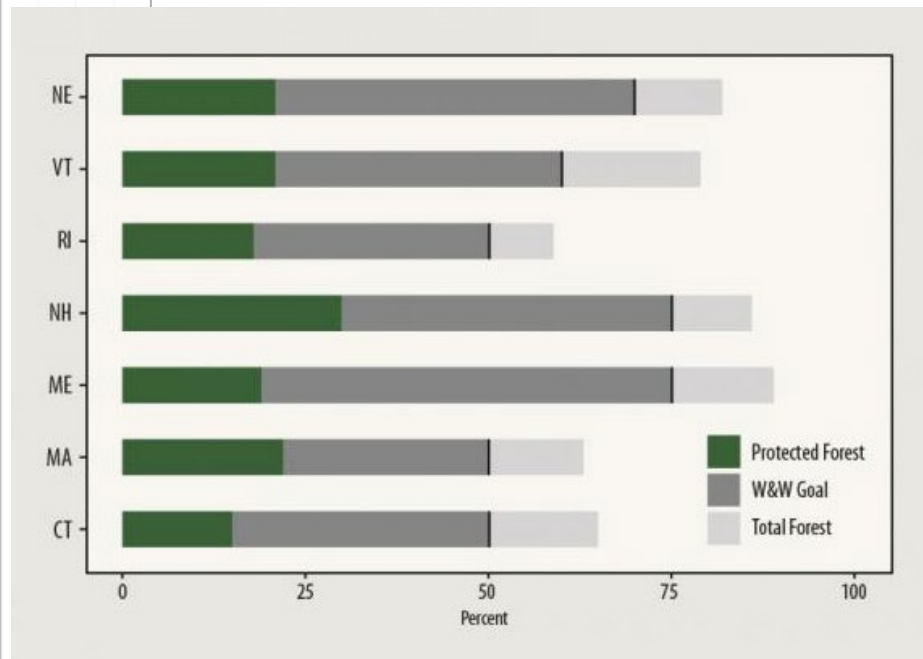
^aThe Nature Conservancy, Arlington, VA 22203; ^bDepartment of Biology, James MacFalmouth, MA 02540; ^dDepartment of Agricultural, Environmental, and Development Institute of Ecosystem Studies, Millbrook, NY 12545; ^fTerraCarbon LLC, Charlottesville, VA 22901; ^gInternational Geosphere-Biosphere Programme, University of Alaska, Fairbanks, AK 99775; ^hDepartment of Biology, University of California, Berkeley, CA 94720; ⁱDepartment of Biology, University of Colorado, Boulder, CO 80502; ^jDepartment of Biology, University of Florida, Gainesville, FL 32611; ^kDepartment of Biology, University of Georgia, Athens, GA 30602; ^lDepartment of Biology, University of Illinois, Urbana, IL 61801; ^mDepartment of Biology, University of Maryland, College Park, MD 20742; ⁿDepartment of Biology, University of Michigan, Ann Arbor, MI 48106; ^oDepartment of Biology, University of Minnesota, St. Paul, MN 55108; ^pDepartment of Biology, University of Nebraska, Lincoln, NE 68583; ^qDepartment of Biology, University of North Carolina, Chapel Hill, NC 27599; ^rDepartment of Biology, University of Oklahoma, Norman, OK 73019; ^sDepartment of Biology, University of Wisconsin, Madison, WI 53706

Regreening the Planet Could Account for One-Third of Climate Mitigation



**Land Conservation in the United States:
Evolution and Innovation Across the
Urban-Rural Interface**

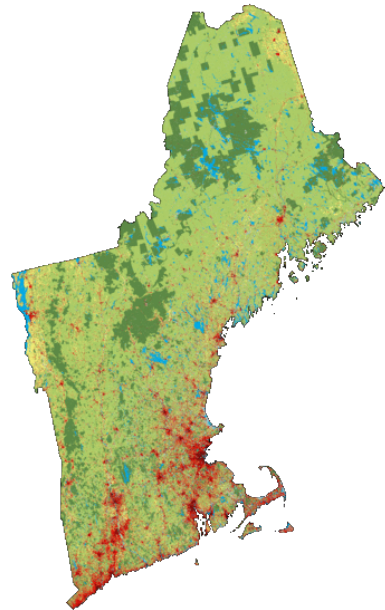
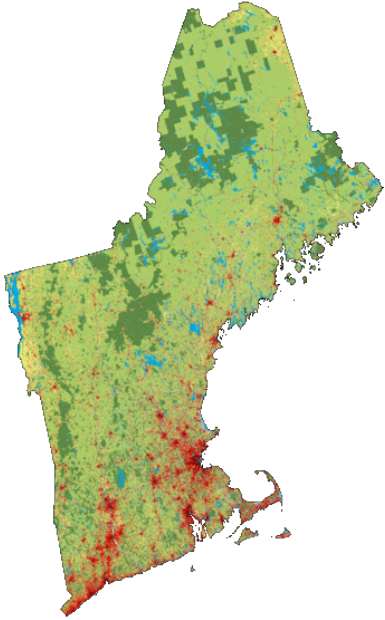
Spencer R. Meyer, Michelle L. Johnson, and Robert J. Lillieholm



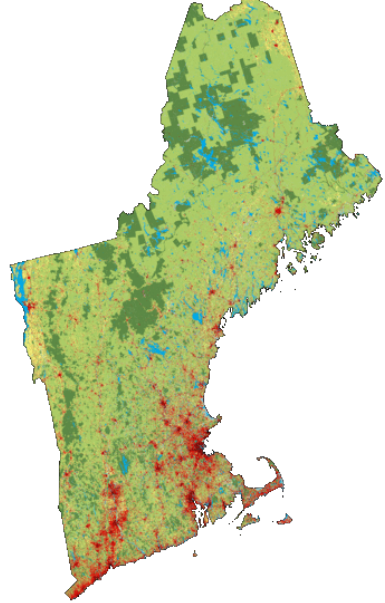
Community Connectedness

2010

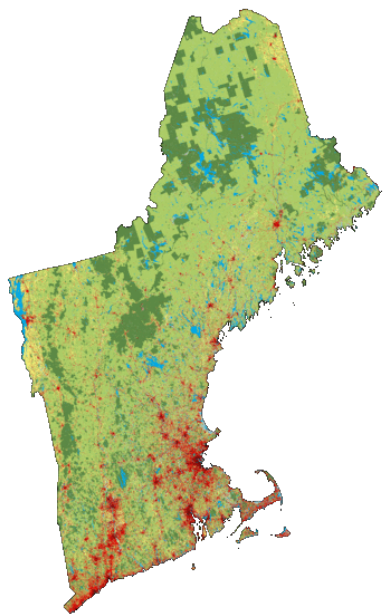
Yankee Cosmopolitan



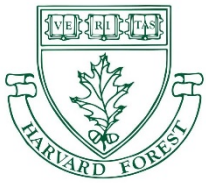
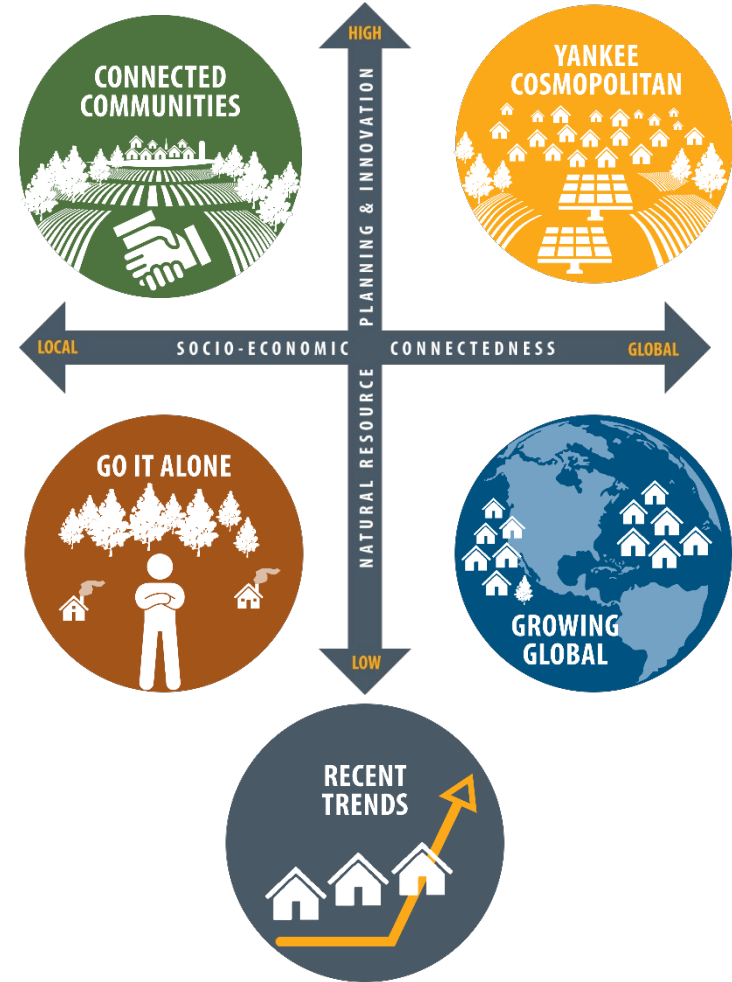
Go it Alone



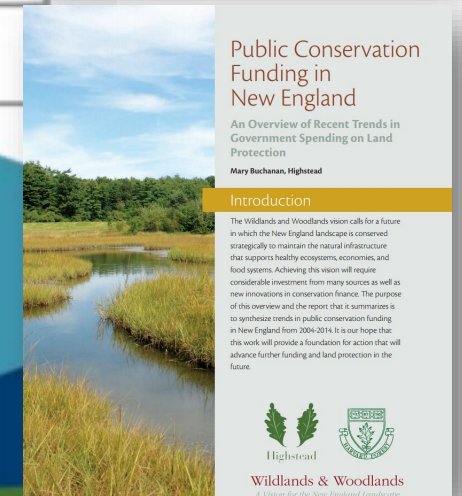
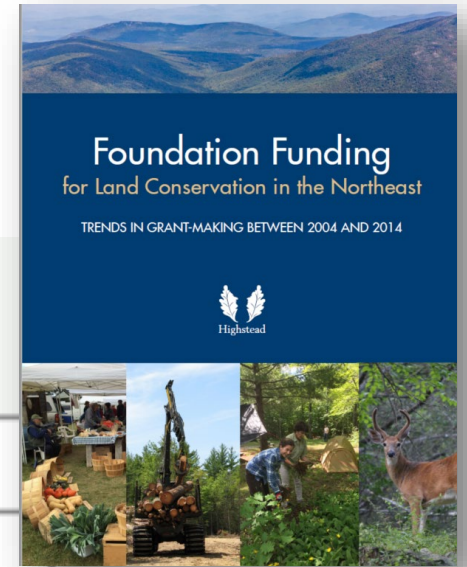
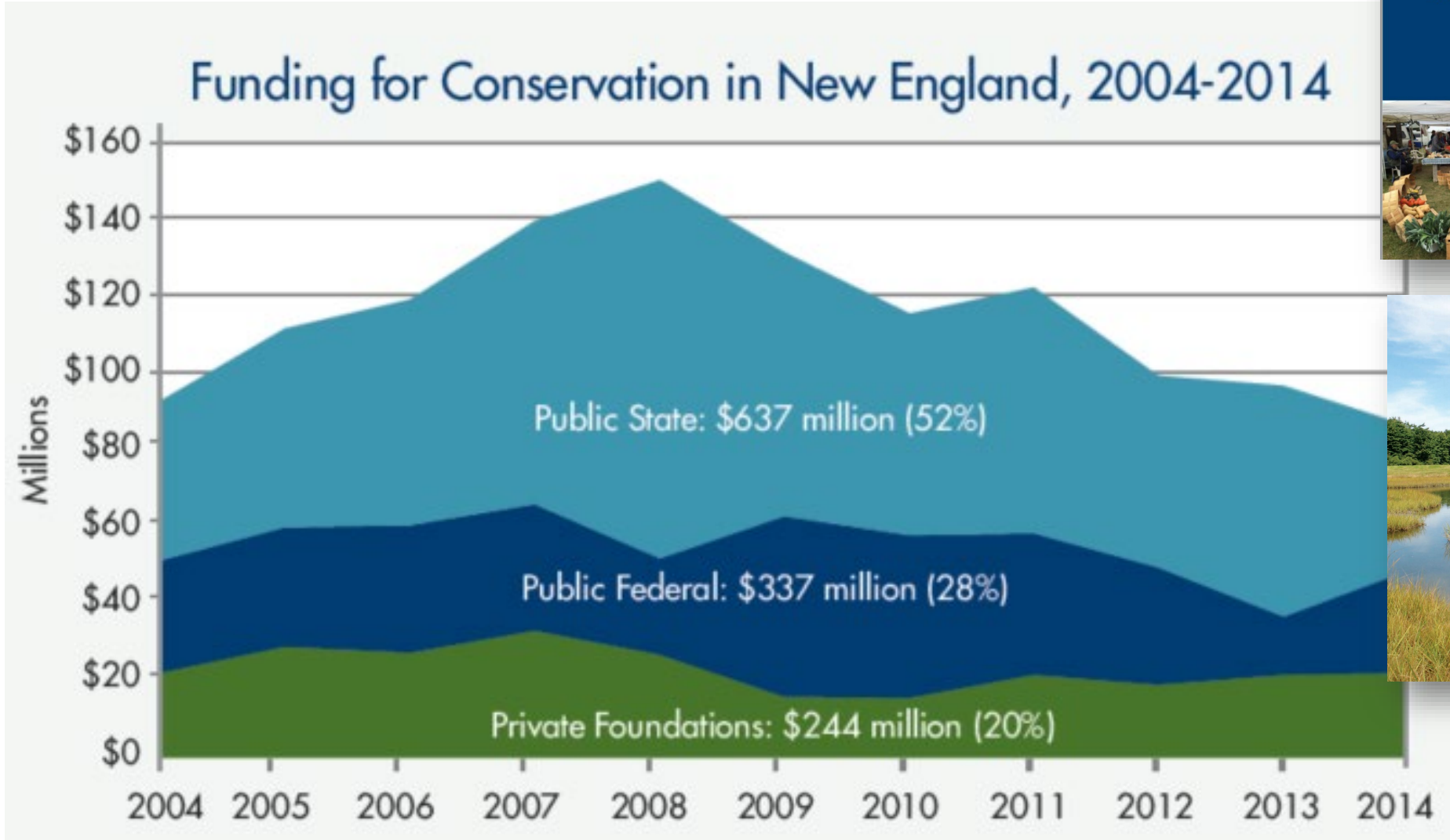
Growing Global



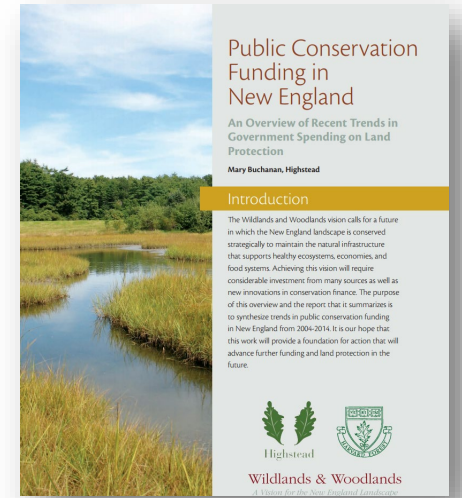
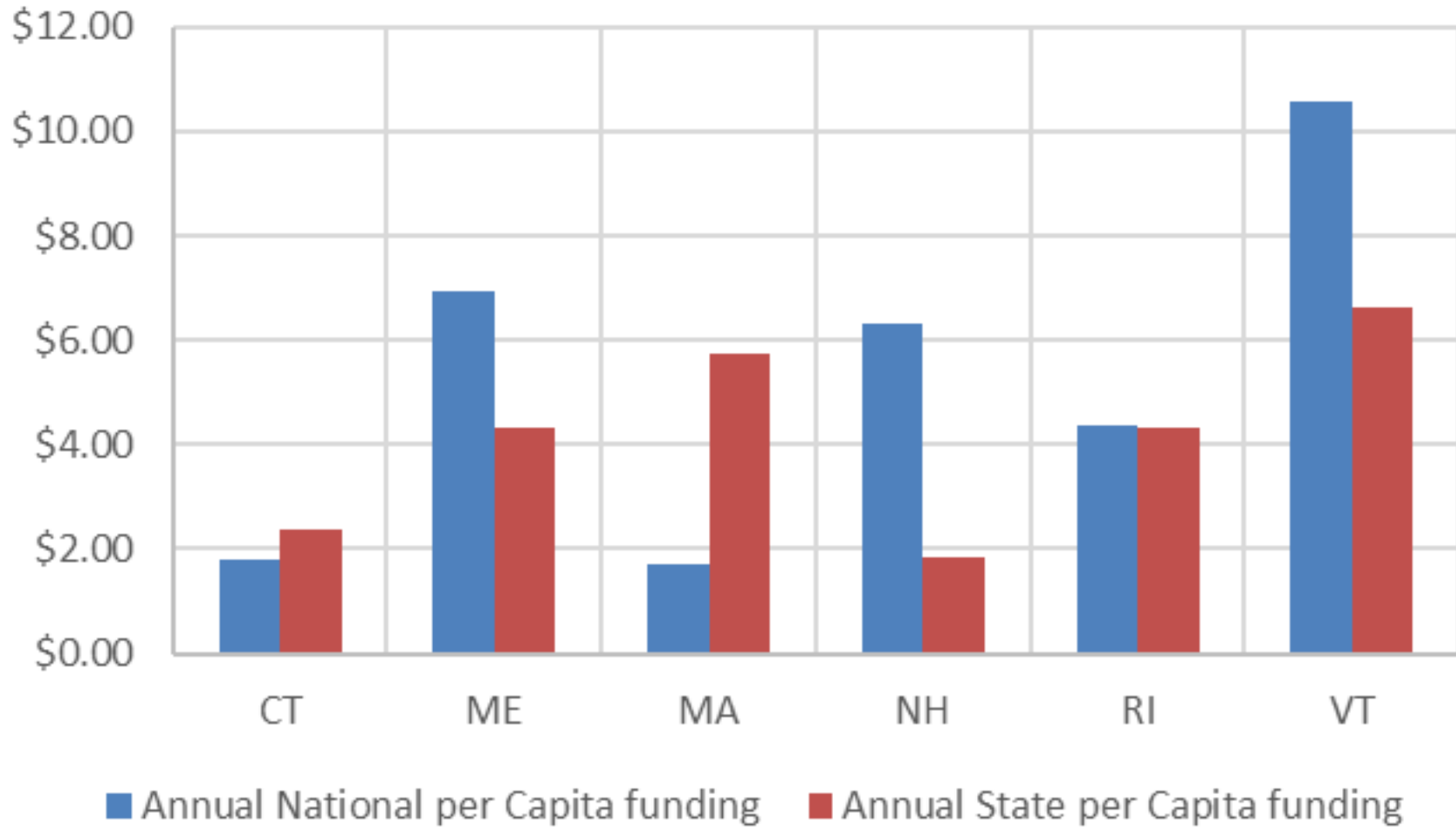
newenglandlandscapes.org



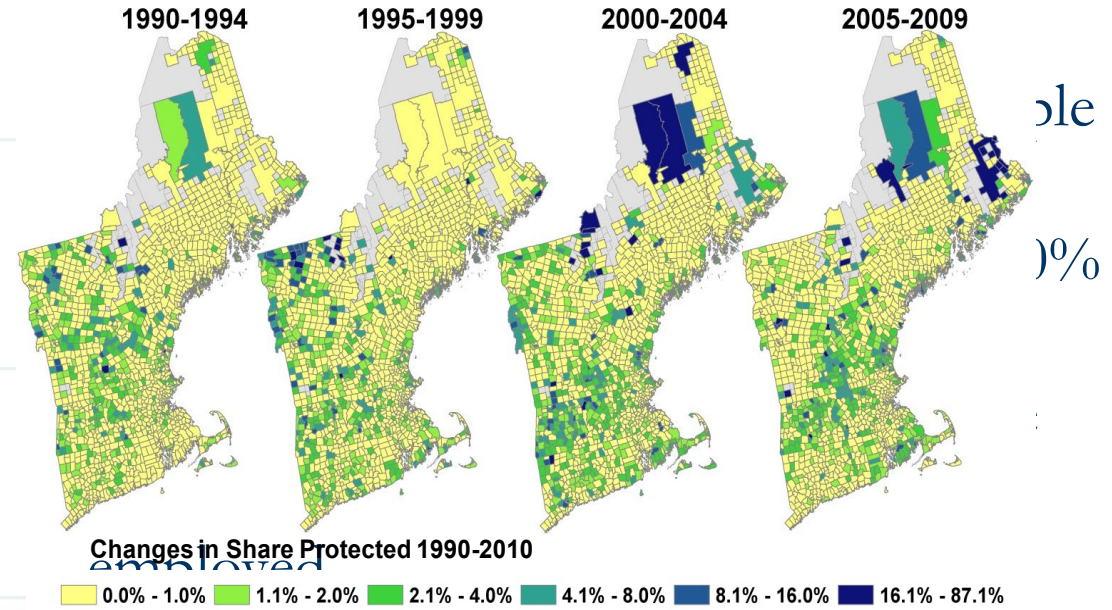
Declining Funding



Per Capita Funding



Conservation = Jobs



Conservation Biology

Contributed Paper

Assessing the local economic impacts of land protection

Katharine R. E. Sims, Jonathan R. Thompson, Spencer R. Meyer, Christoph Nolte, Joshua S. Plisinski

First published:

Article impact:
employment and

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NEW ENGLAND PUBLIC RADIO Listen. Think. Engage.

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Communities Across New England Get Economic Boost From Protected Land

By CARRIE HEALY • MAR 28, 2019

Kate Sims (Amherst), Jonathan Thompson (Harvard Forest), Spencer Meyer (Highstead), Christoph Nolte (Boston University), Joshua Plisinski (Harvard Forest)

Global Heatmap

Heatmap Color

- Hot
- Blue
- Purple
- Gray
- Red

Activity Type

- All
- Bike
- Run
- Swim
- Winter

Heat Opacity

- 0%
- 40%
- 60%
- 80%
- 100%

Layers

- Map
- Labels
- Satellite

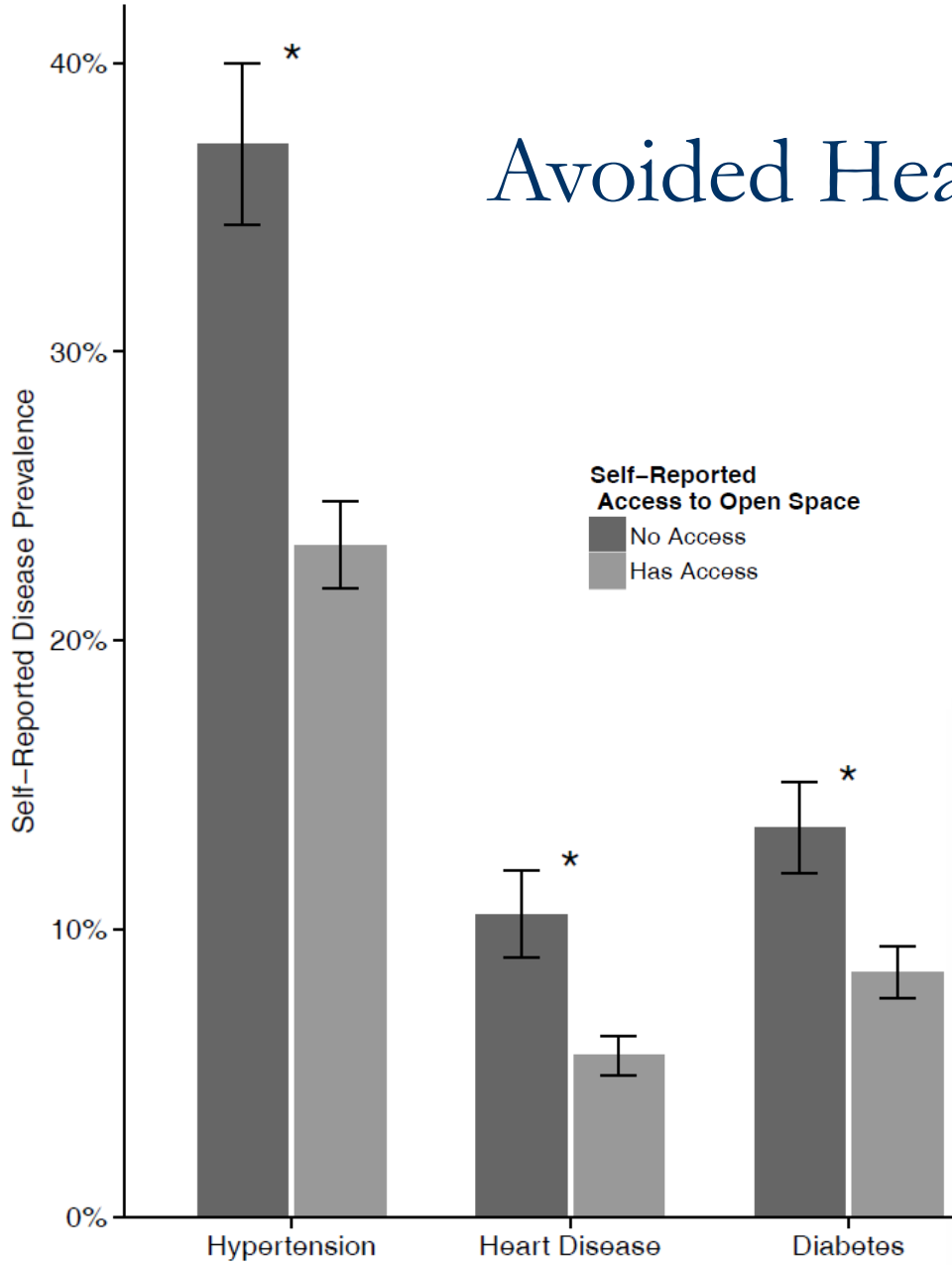
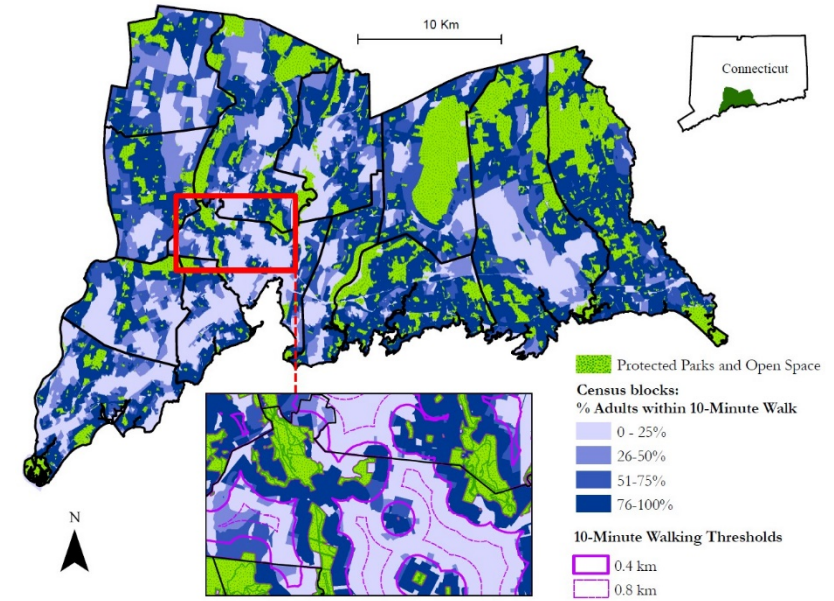
Discover how the heatmap was built. Learn how Strava Metro can help your community.

Learn about heatmap updates.

State	Consumer Spending (\$ billion)	Direct Jobs	State and Local Tax Revenues (\$ million)
Connecticut	\$9.0	69,000	\$743
Maine	\$8.2	76,000	\$548
Massachusetts	\$16.2	120,000	\$911
New Hampshire	\$8.7	79,000	\$528
Rhode Island	\$4.0	37,000	\$293
Vermont	\$5.5	51,000	\$505
New England	\$51.6	432,000	\$3,528



Avoided Healthcare Costs

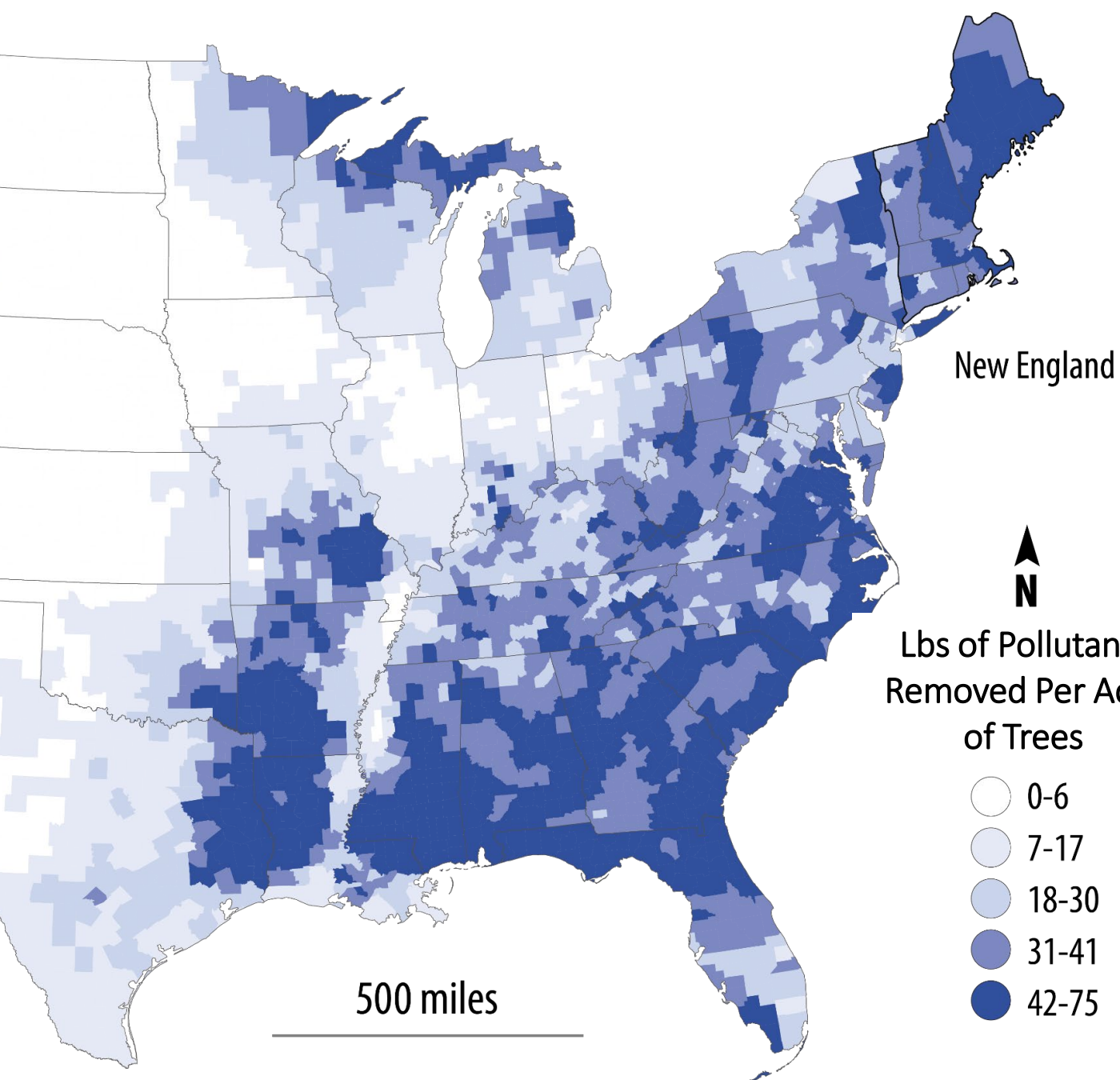


Diseases ^a	Reduction With Access (±SE)	Avoided Cases With Access	Annual Cost/Person	Annual Avoided Cost (±SE)
Hypertension	13.9% (±1.3)	8,443	\$2,669	\$22,531,504 (± \$2.1M)
Heart Disease	4.9% (±0.8)	721	\$8,312	\$5,992,305 (± \$1.0M)
Diabetes	5.0% (±0.7)	1,109	\$7,666	\$8,498,433 (± \$1.2M)
Total				\$37,022,242 (± \$4.3M)

(Meyer et al., in review)

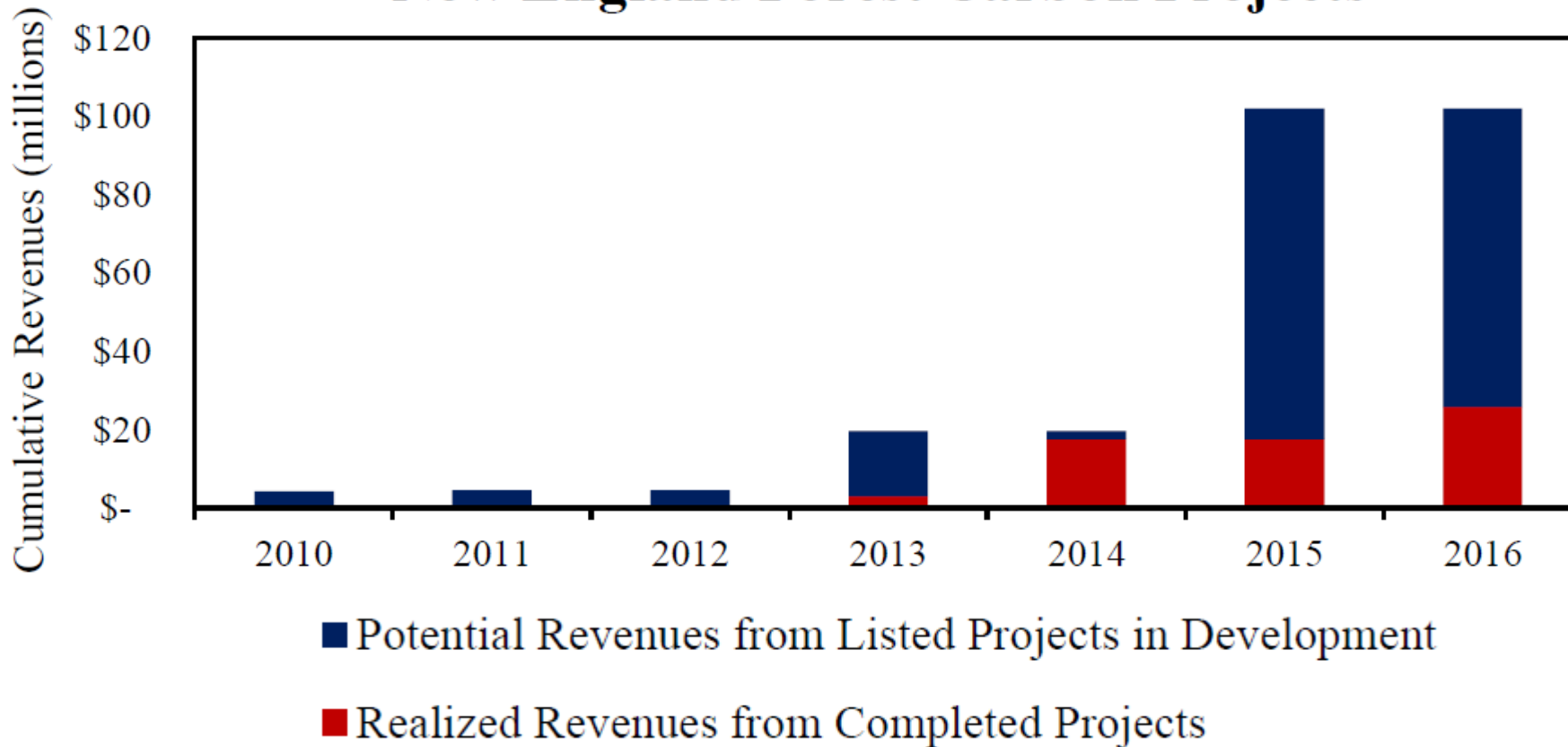
Forests Improve Regional Air Quality

Removes 760,000 tons of pollutants
\$550 M/yr value



What about RGGI?

New England Forest Carbon Projects

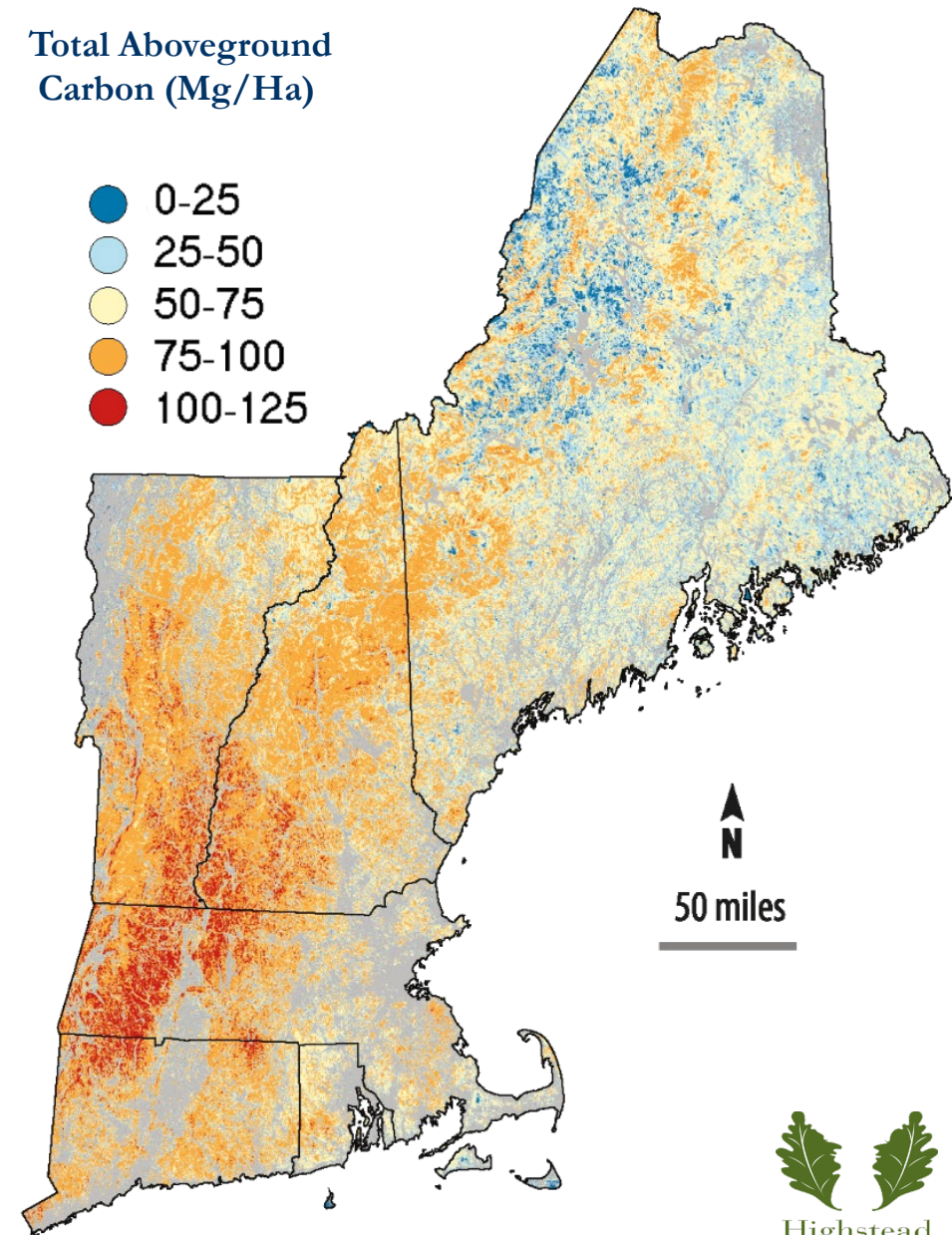


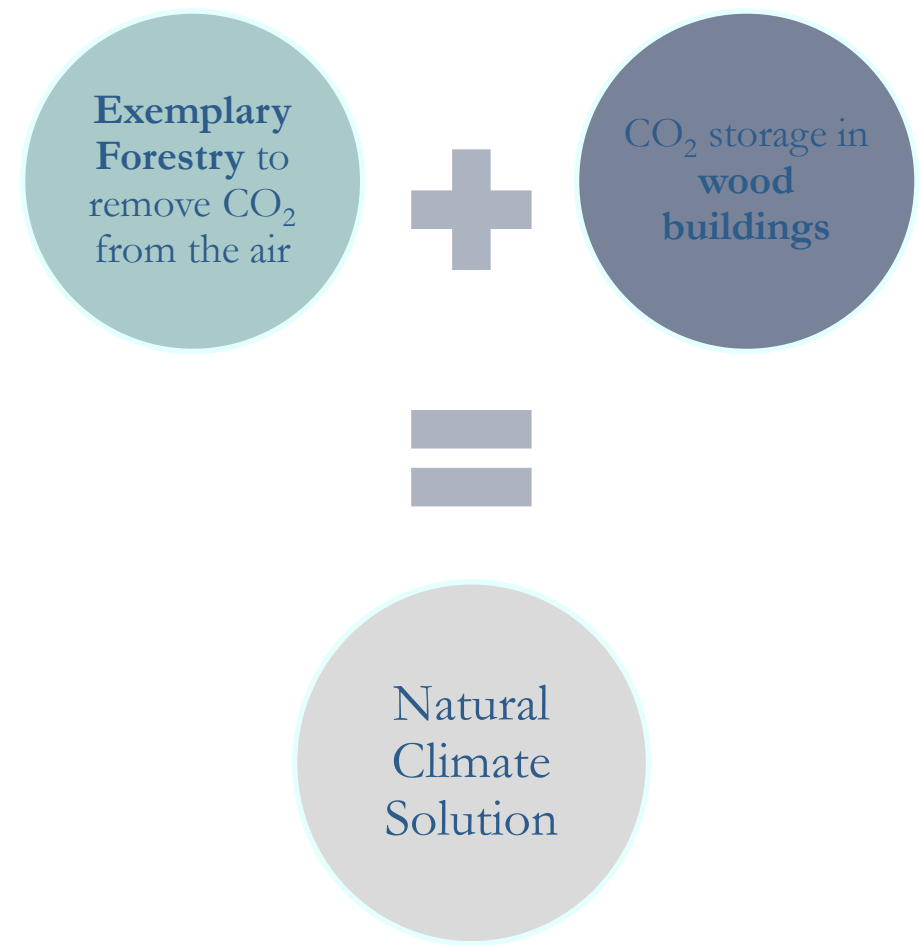
Voluntary Carbon Offsets Growing Rapidly

TABLE 1
Transacted Voluntary Carbon Offset Volume, Value, and Weighted Average Price by Project Category, 2017 and 2018

	2017			2018		
	VOLUME MtCO ₂ e	AVERAGE PRICE	VALUE	VOLUME MtCO ₂ e	AVERAGE PRICE	VALUE
FORESTRY AND LAND USE	16.6	\$3.4	\$63.4M	50.7	\$3.2	\$171.9M
RENEWABLE ENERGY	16.8	\$1.9	\$31.5M	23.8	\$1.7	\$40.9M
WASTE DISPOSAL	3.7	\$2.0	\$7.4M	4.5	\$2.2	\$10.0M
HOUSEHOLD DEVICES	2.3	\$5.0	\$11.8M	6.1	\$4.8	\$29.5M
CHEMICAL PROCESSES/ INDUSTRIAL MANUFACTURING	2.6	\$1.9	\$4.9M	2.5	\$3.1	\$7.9M
ENERGY EFFICIENCY/ FUEL SWITCHING	1.1	\$2.1	\$3.3M	2.8	\$2.8	\$7.8M
TRANSPORTATION	0.1	\$2.9	\$0.2M	0.3	\$1.7	\$0.5M







Notes: 2017 figures are based on 1,041 transactions for a total volume of 43.2 MtCO₂e. 2018 figures are based on 1,568 transactions for a total of 90.7 MtCO₂e. These figures do not include responses that didn't provide price data.





Sebago Clean Waters: Tapping our Forests for Drinking Water

Conservation = Big Benefits for Businesses & Communities

-  Provides 22M gallons of water daily from Sebago Lake
-  Supplies pure drinking water for one in six Mainers
-  Delivers high-grade water for industries and health care
-  Supports tourism and outdoor recreation
-  Reduces risk of flooding and manages stormwater runoff
-  Ensures clean air and water quality to support good health



Water Rates Could Increase 84%

Table 15. Estimated Water Costs for Top 10 Water Users in PWD (medium filtration plant cost option).

Customer Name	Customer Location	2017 Water Consumption (HCF)	2018 Estimated Water Cost	2019 Estimated Water Cost	2020 Estimated Water Cost
Calpine	Westbrook	447,139	\$81,514	\$75,441	\$156,955
Sappi Fine Paper	Westbrook	306,252	\$129,521	\$119,872	\$249,393
Texas Instruments	S. Portland	176,645	\$62,329	\$57,685	\$120,014
ON Semiconductors	S. Portland	139,671			
Yarmouth Water District	Yarmouth	137,074			
Ecomaine	Portland	120,922			
Maine Medical Center	Portland	108,177			
B&G Foods	Portland	75,885			
Portland Housing Authority	Portland	57,738			
Oakhurst Dairy	Portland	44,192			
Top 10 Total		1,613,695	\$1,999,127	\$1,850,192	\$3,849,319
Top 50 Meters Total		2,055,295	\$2,546,203	\$2,356,512	\$4,902,715
PWD Total		8,487,249	\$23,186,245	\$15,009,664	\$38,195,909

* assuming that customers do not adjust their water consumption as a result of increased rates.



Finance Green Infrastructure with State Revolving Funds

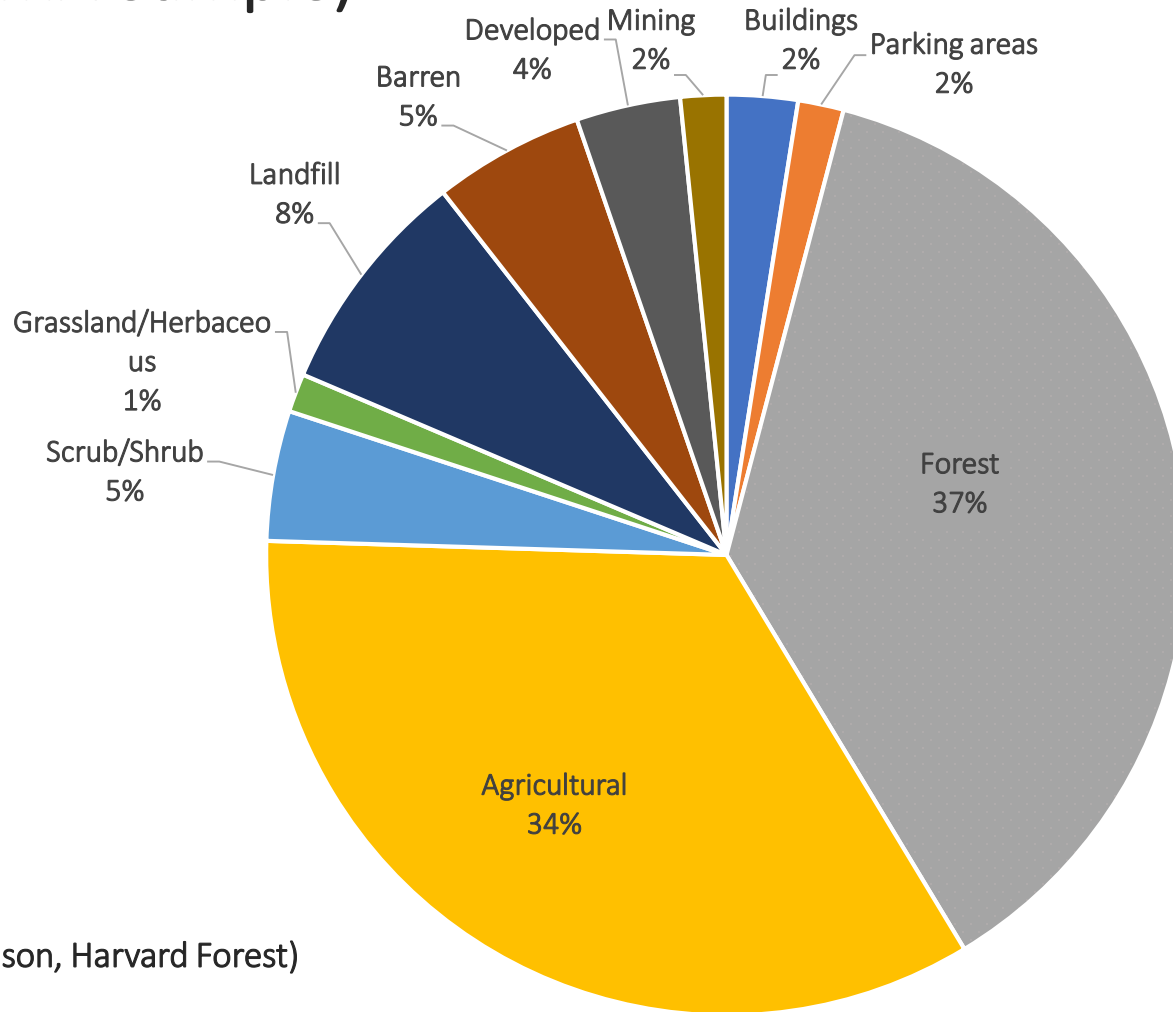


Iowa SRF Sponsorship Program

STATE	CLEAN WATER SRF	DRINKING WATER SRF
MAINE	\$15,000,000	\$19,646,660
NEW HAMPSHIRE	\$175,959,128	\$25,686,828
VERMONT	\$78,405,830	48,531,940
MASSACHUSETTS	\$450,000,000	\$125,000,000
RHODE ISLAND	\$314,046,636	\$164,075,650
CONNECTICUT	\$740,800,997	\$250,900,000

Don't Cut Off the Nose to Spite the Face

Solar Array Conversions (MA Sample)



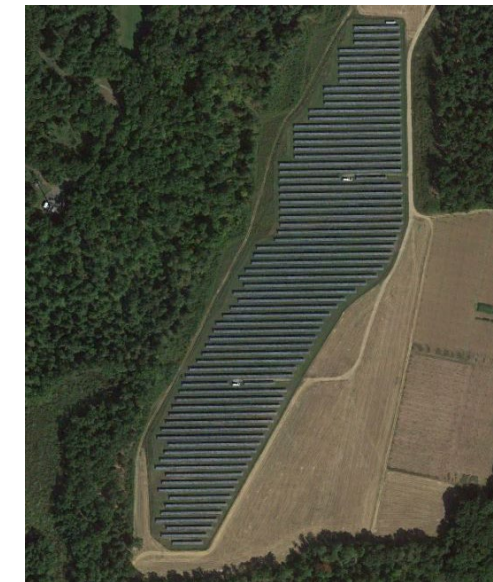
(Emily Johnson, Harvard Forest)



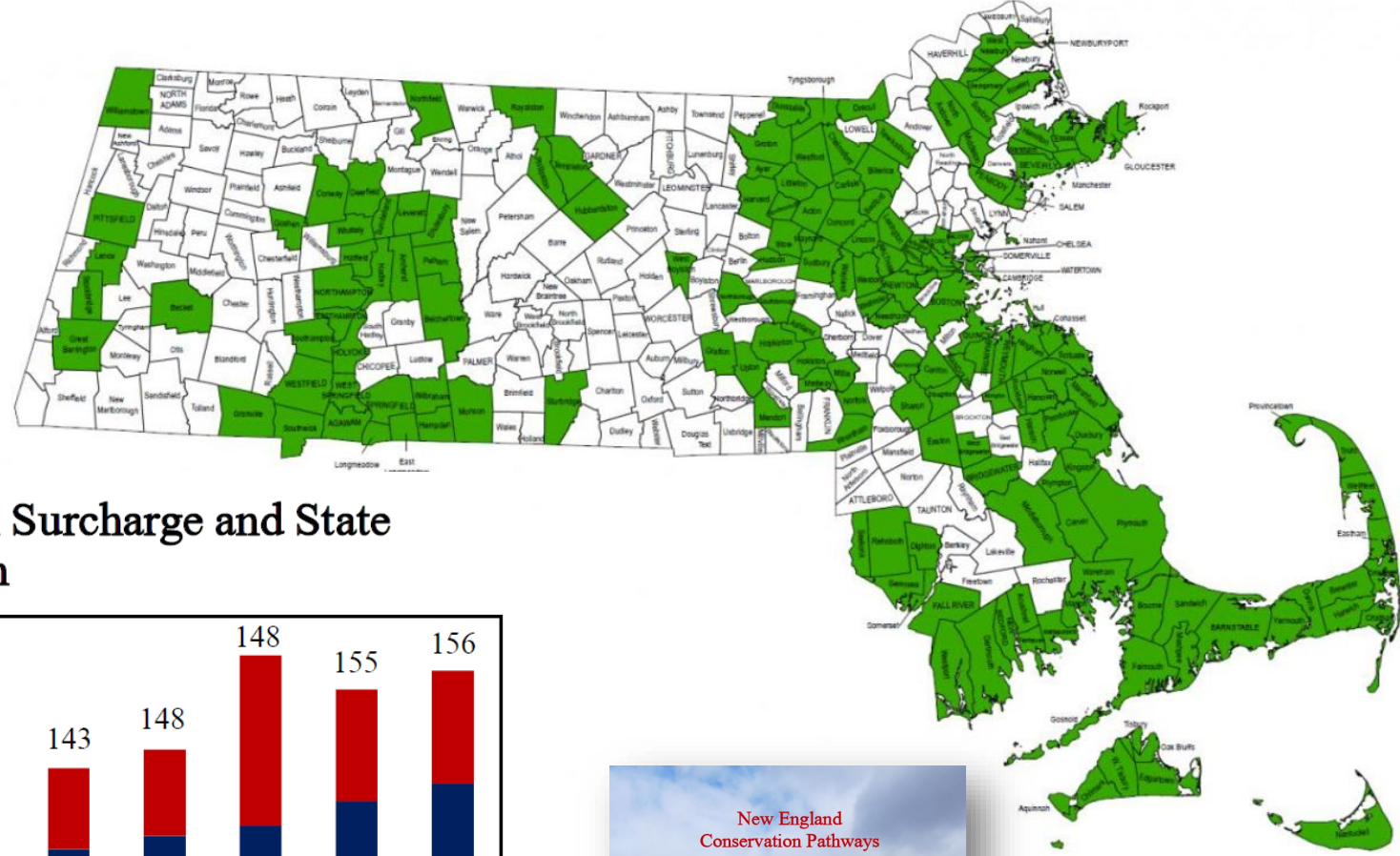
Agricultural Land to Solar
(24.5 acres, Southwick)
(All NRCS Soil of
Statewide Importance)



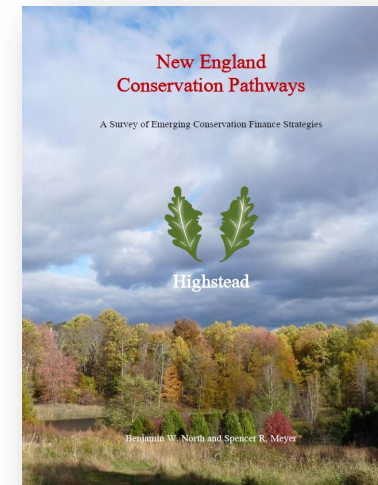
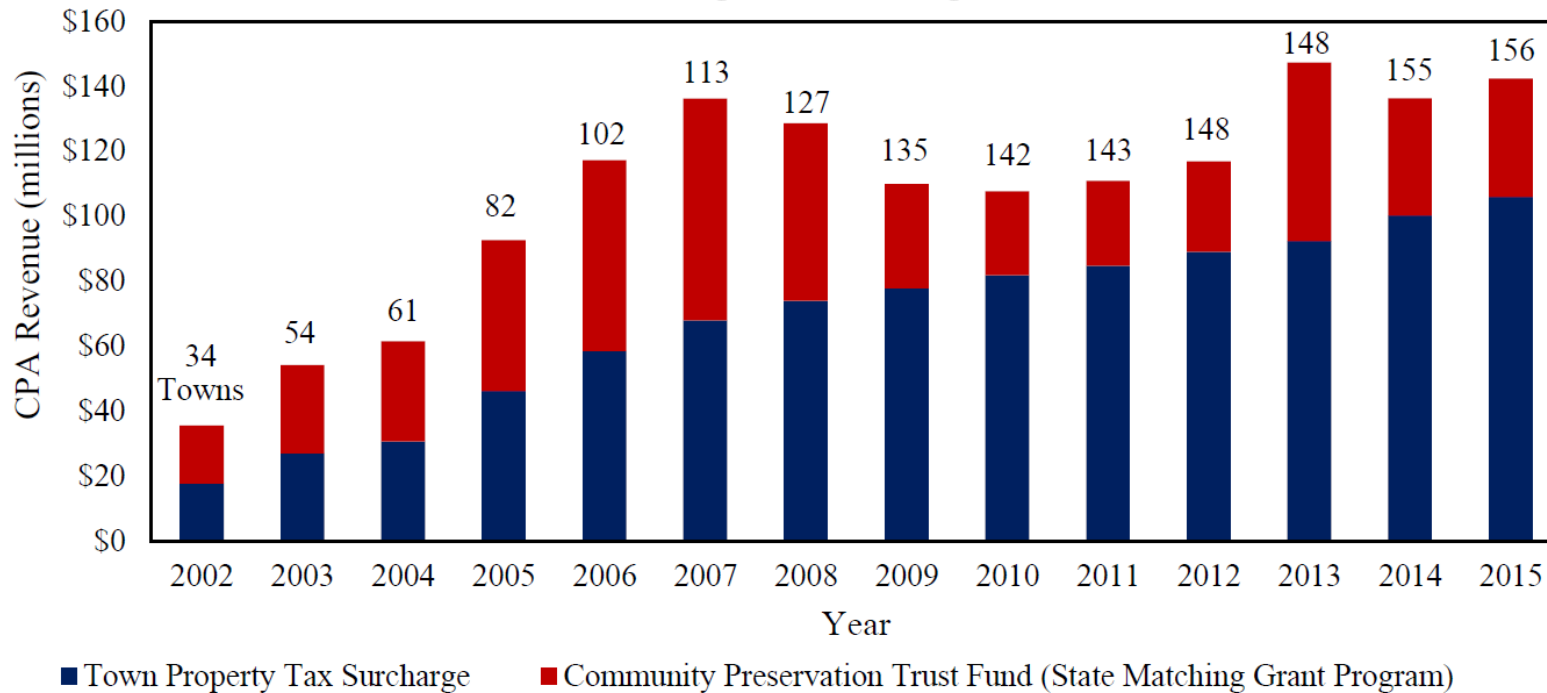
Forest Land to Solar
(34 acres, Shutesbury)
(All state-recognized critical
natural landscape)



MA Community Preservation Act



CPA Revenues Generated from Property Tax Surcharge and State Matching Grant Program



CPA in Other States?

State	Total estimated annual CPA revenues	Estimated annual revenues for open space protection
Connecticut	\$62 million	\$18 million
Maine	\$15 million	\$4 million
Massachusetts	\$142 million	\$41 million
New Hampshire	\$20 million	\$6 million
Rhode Island	\$16 million	\$5 million
Vermont	\$9 million	\$2 million
Total	\$264 million	\$77 million

Minnesota Legacy-Like Sales Tax

State	Current State Sales Tax Rate	Assumed New State Sales Tax Rate	% Increase in Sales Tax Rate	2014 Annual Revenues from existing General Sales and Gross Receipts Taxes	Estimated Additional Annual Sales Tax Revenue for Land Conservation (0.125 % Sales Tax Rate Increase)
CT	6.35%	6.475%	2.0%	\$3.98 billion	\$78.4 million
ME	5.50%	5.625%	2.3%	\$1.19 billion	\$27.1 million
MA	6.25%	6.375%	2.0%	\$5.52 billion	\$110.4 million
RI	7.00%	7.125%	1.8%	\$0.92 billion	\$16.3 million
VT	6.00%	6.125%	2.1%	\$0.35 billion	\$7.4 million
Total	6.25%	6.375%	2.0%	\$11.96 billion	\$239.6 million

\$47/year/household



Highstead

Solutions to Consider

1. “No-Net Loss” forest program would drive demand for investment in avoidance, mitigation, and ultimately protection.
2. Expand corporate tax benefit to private landowners (e.g., refundable inc. tax credit)
3. Incentivize communities to make investments: CPA or conveyance fee options.
4. Expand state’s own reserve system as a public carbon asset.
5. Prohibit forest loss when seeking renewable energy production.
6. Expand Green Bank success to NCS:
 1. Low-cost loans for low-carbon buildings (especially with affordable housing) and low-impact developments
 2. Utilize drinking and clean water state revolving funds for green infrastructure

Closing Thoughts

1. Need direct public investments AND policies to drive demand for private investments in forests.
2. Credit co-benefits of forest protection when evaluating cost-benefit of NCS:
 1. Public health savings from access to open space and recreation (“climate equity”)
 2. Water treatment savings (i.e., the business case)
3. Publicly assert forests are part of our economic engine, whether explicitly priced or not.
4. Private investments/markets for forests require strong public investments.
5. Don’t go it alone: share NCS with neighbors, where most effective.





Spencer Meyer @SpencerRMeyer · Sep 9, 2019

Thanks for coming out to Westwoods and sharing your commitment to our communities' woods and waters (L-R):@CTConservation , @ChristinePalm36, @RobinComey, @SenatorCohenCT, and @SeanScanlonCT. @GuilfordLCT



WildlandsandWoodlands.org

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Cost of Community Services

