Assessing Local Economic Impacts and Opportunities for Land Protection in New England

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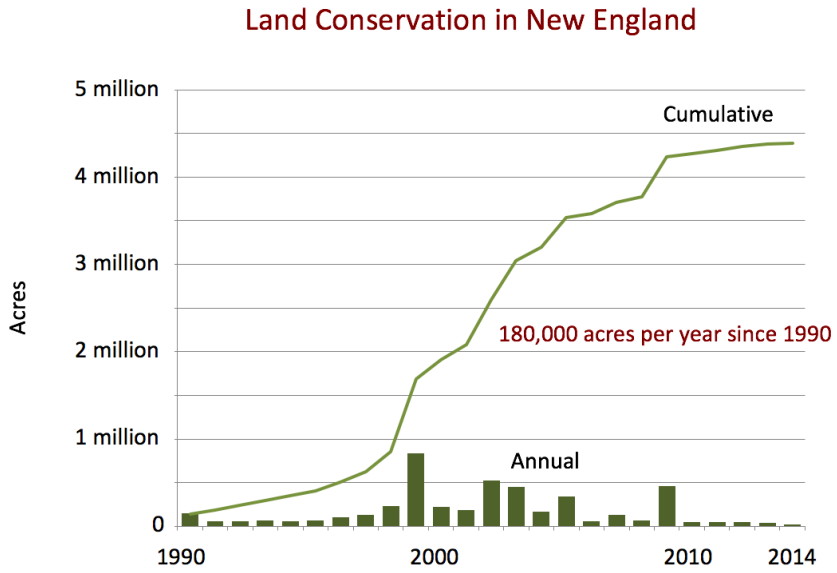
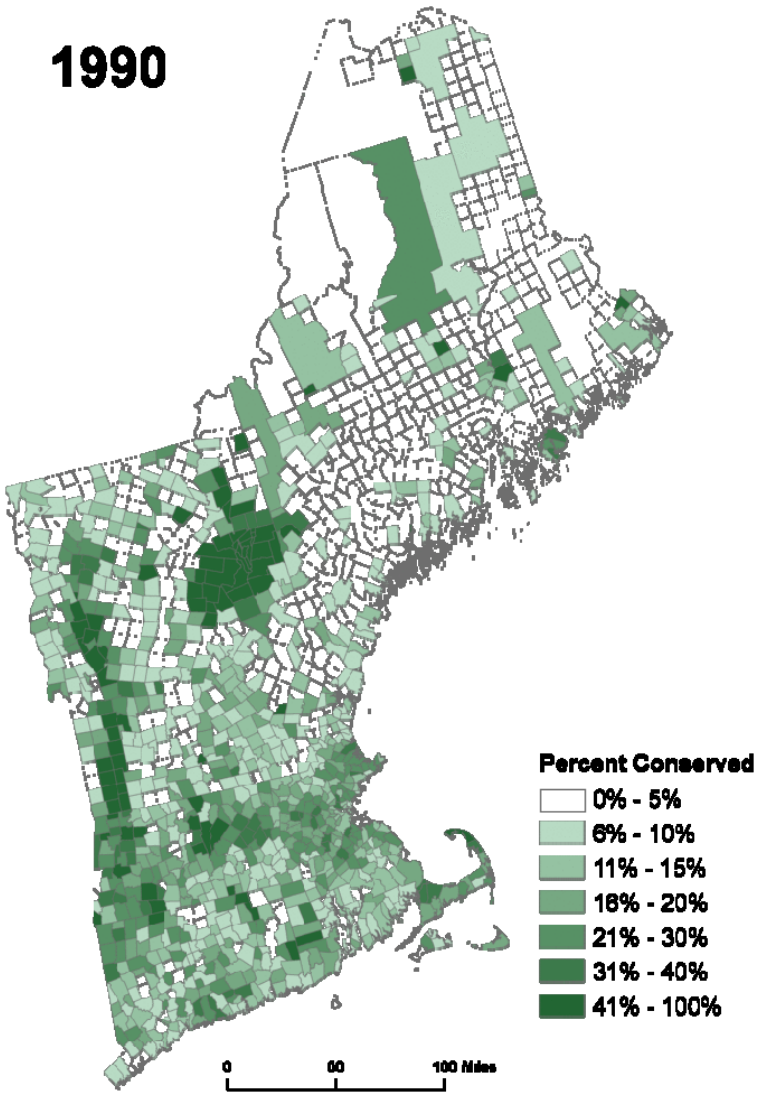
ALPINE Seminar, Fall 2020

> 4.5 million acres protected 1990-2015



- Substantial land protection in last two decades (Foster et al. 2017)



What does this mean for local economies?

- Clear benefits of land protection, but also costs
- Benefits to many, costs often local

→ Question: what are the **net local impacts** of protection on **key economic indicators**

→ Case: New England 1990-2015

New England an important case

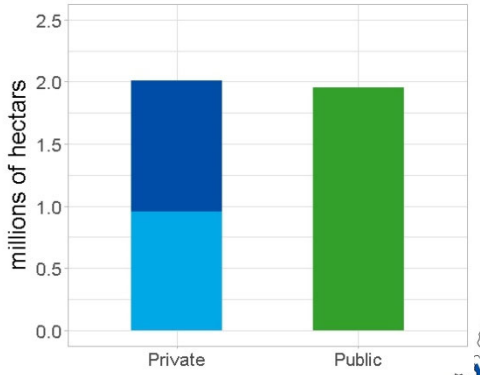
- Prior research: public lands
  - U.S.: e.g. Lewis, Hunt and Plantinga 2002, 2003, Eichman et al. 2010, Rasker et al. 2013, Chen et al. 2016, Walls et al. 2020
  - International: e.g. Sims 2010, Andam et al. 2010, Canavire-Bacarreza and Hanauer 2013, Ferraro and Hanauer 2014, Gurney et al. 2014, Robalino and Villalobos 2015, Sims and Alix-Garcia 2017, Oldekop et al. 2018
- Future: like New England
  - > 80% privately owned (Butler et al. 2016)
  - More densely populated
  - New protection: 20% public; 29% private; 51% Large protected timber lands (LPTs)

Methods: Multiple regression, panel data

- Estimation goal: causal impacts
- Changes in employment due to changes in land protection?
- Strategy:
  - Panel data: compare changes across time within towns/cities
  - Timing: assess changes in economic indicators after protection
  - Controls for other factors: town-level fixed factors, regional growth trends, common time factors, protection in neighboring towns

Land protection data: 1990-2015

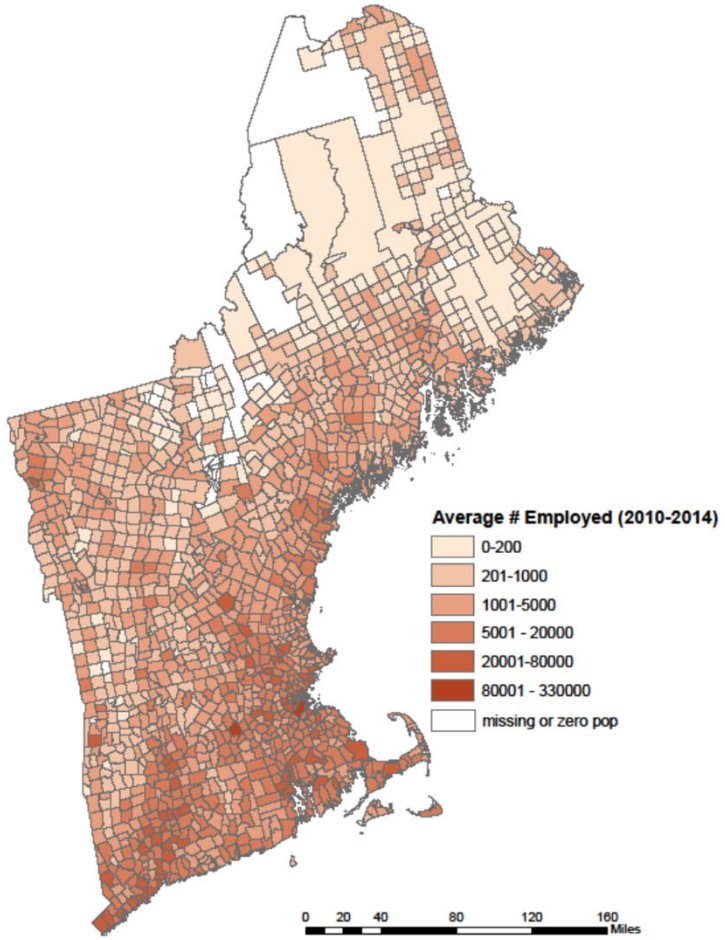
- Highstead/Harvard Forest: aggregation of multiple databases
- Includes ownership class and date of establishment



Public protection
Private protection
Large protected timber lands

Local economic indicators: 1990-2015

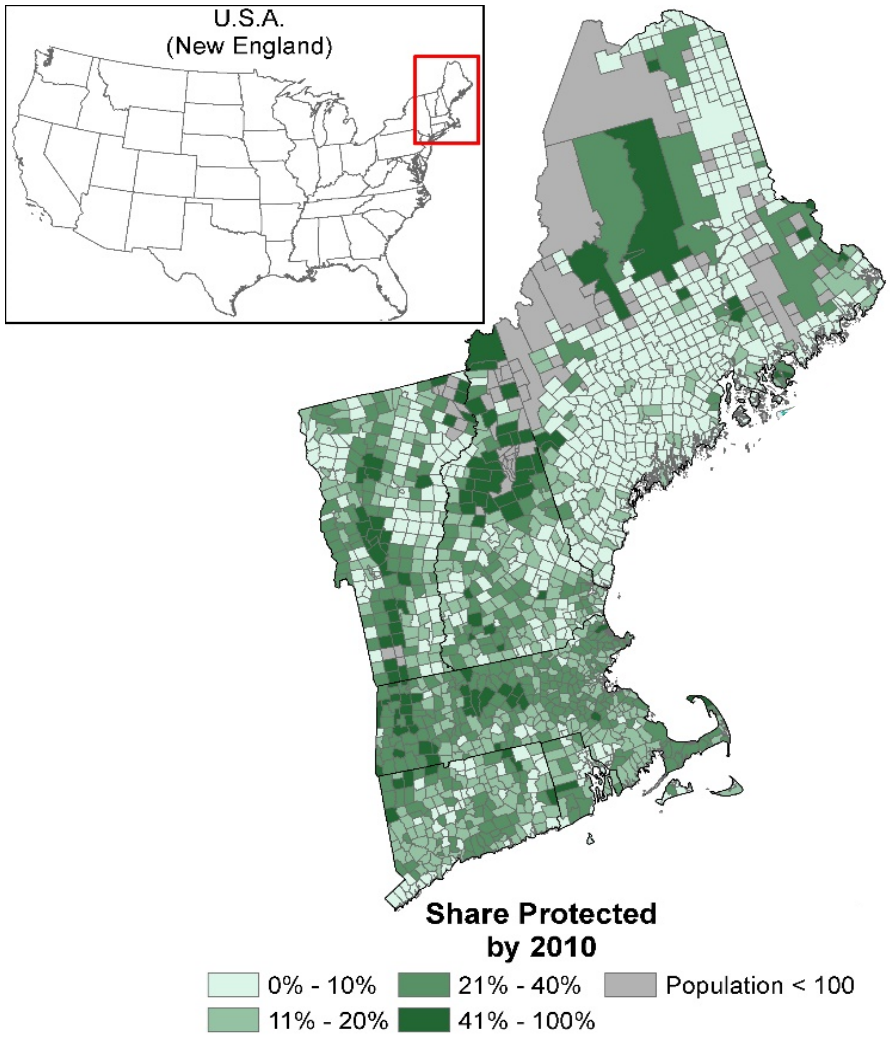
- **Unit of analysis: towns/cities**
- **# people employed, # people in labor force, unemployment rate** (BLS Local Area Unemployment Stats)
- **# new residential building permits** (Census Building Permit Series)
- **median household income, population, employment by major sector** (Census and ACS)



Average # employed, 2010-2014 (LAUS)

Note: study coverage

- Study covers all county sub-divisions with population > 100 in 1990 and no major boundary changes
- > 99% of population



Panel regression model

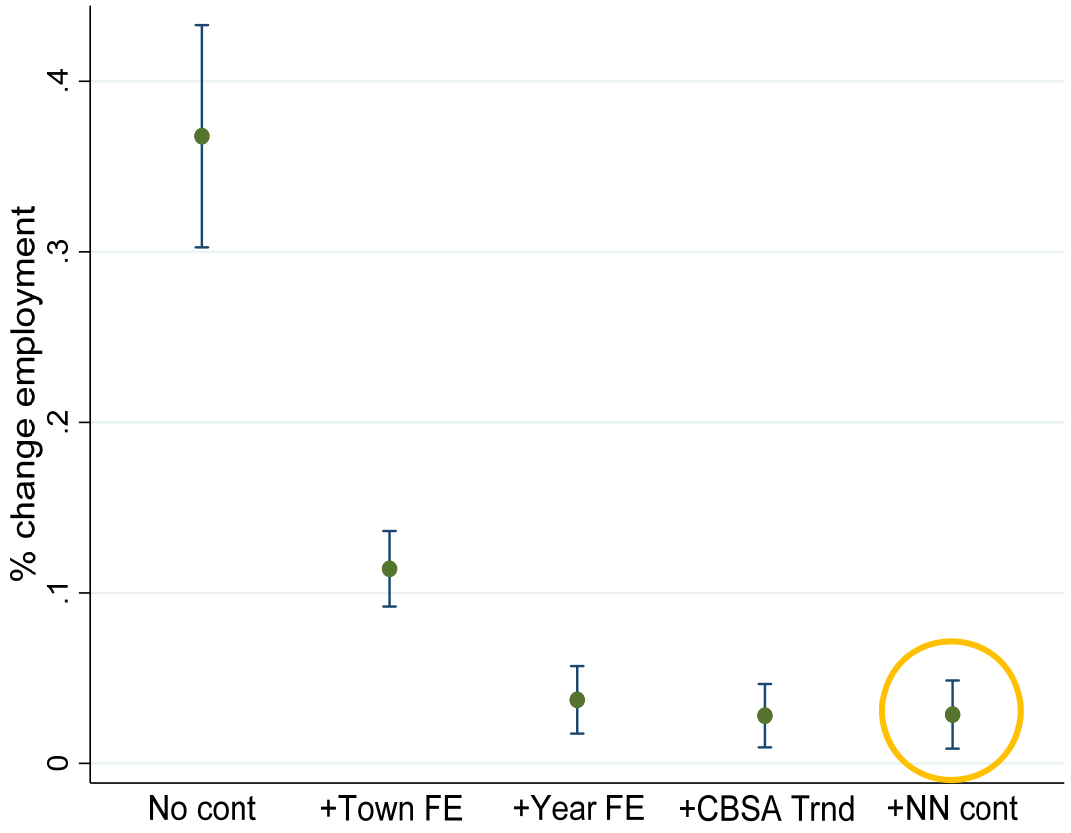
Model:

$$\ln(Y_{ic,t}) = \beta_0 + \beta_1 \ln(PROT_{ic,t-1}) + \beta_2 \ln(NN10PROT_{ic,t-1}) + \alpha_i + \delta_t + \Omega'(t * \lambda_c) + \varepsilon_{ic,t}$$

- Outcomes for 5 five-year periods (90-94, 95-99, 00-04, 05-09, 10-14)
- Economic indicators a function of protection in prior period
- Controls for town-level fixed factors
- Controls for regional growth trends, time periods, protection in neighboring towns
- Standard errors clustered by town or city

Estimated impacts on employment

- Additional 1% of land protection → 0.03% additional employment in next period

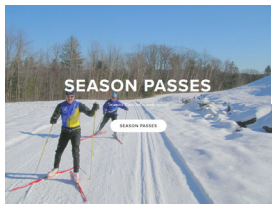


Points: coefficients; bars: 95% Confidence Intervals

Greater employment

- Impacts on emp.: + but small-moderate
  - E.g.: 20,000 employed people, share protected 10-15% (50% change) → + 1.5% in # employed (or +300 people)

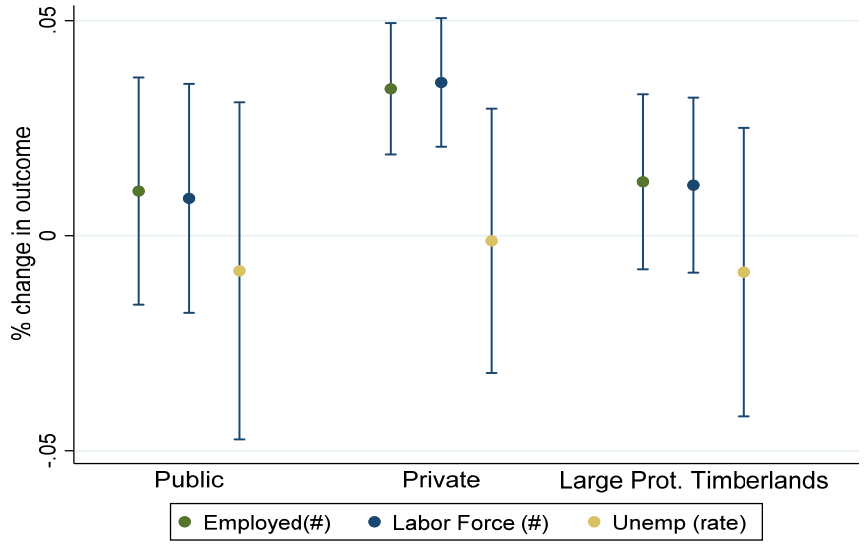
- Why/how?
  - Recreation and tourism: spending on lodging, equipment, guides, etc.
  - Amenity value: draws people and business
  - Resource use: e.g. wood products, maple syrup

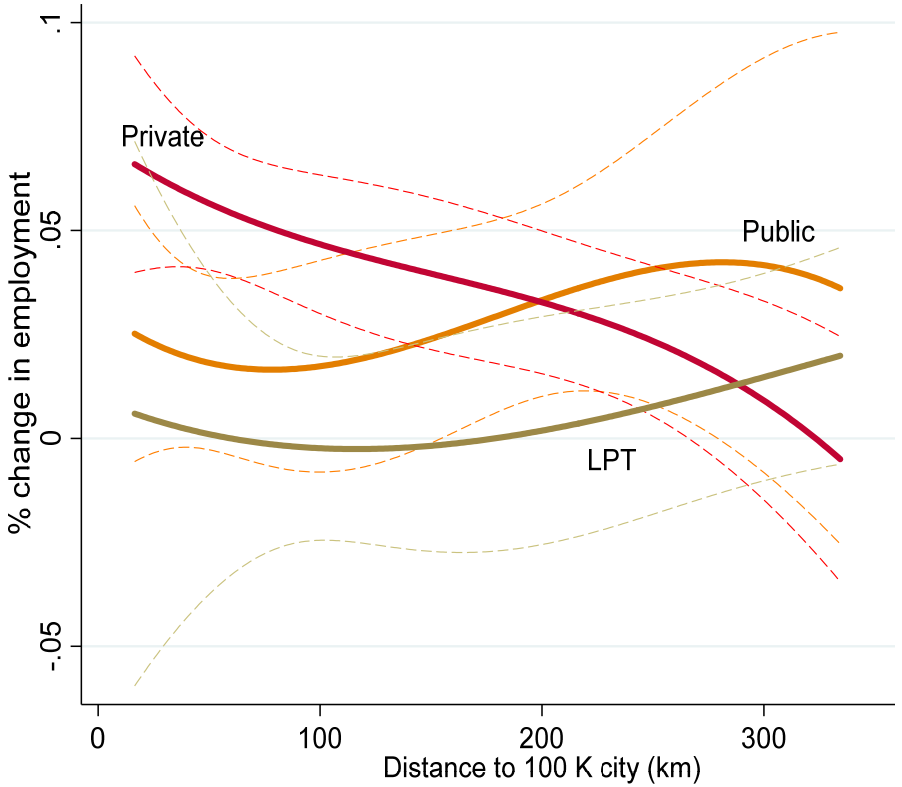


Other indicators

- Labor force: **+**
- Unemployment: -
- New housing permits: +
- Median income, population: +
- Sectoral employment: - for resource-related industries, + for recreation/arts/entertainment

Public, Private, LPTs all net positives



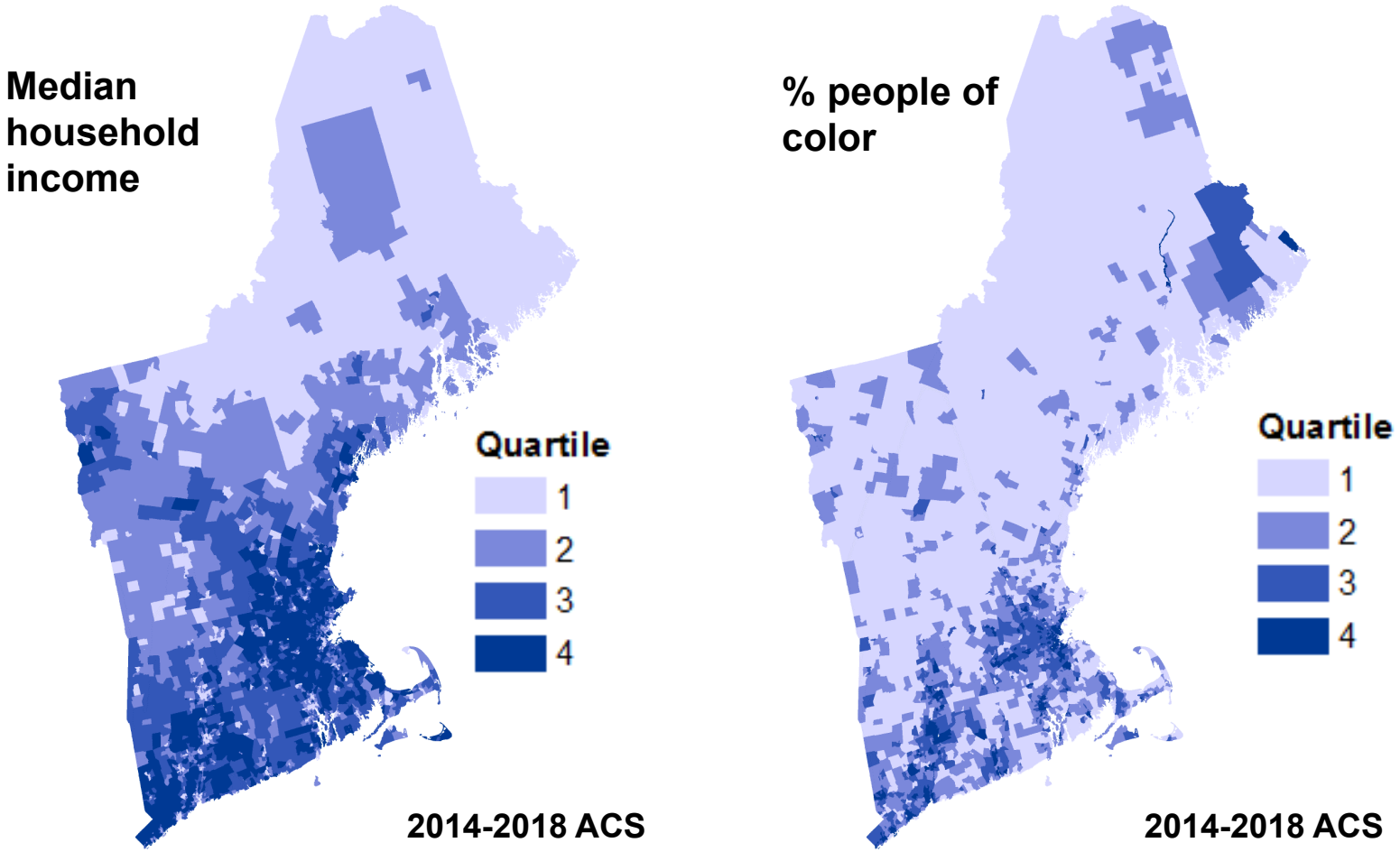


- Both public and private protection needed to achieve positive impacts across a range of geographies

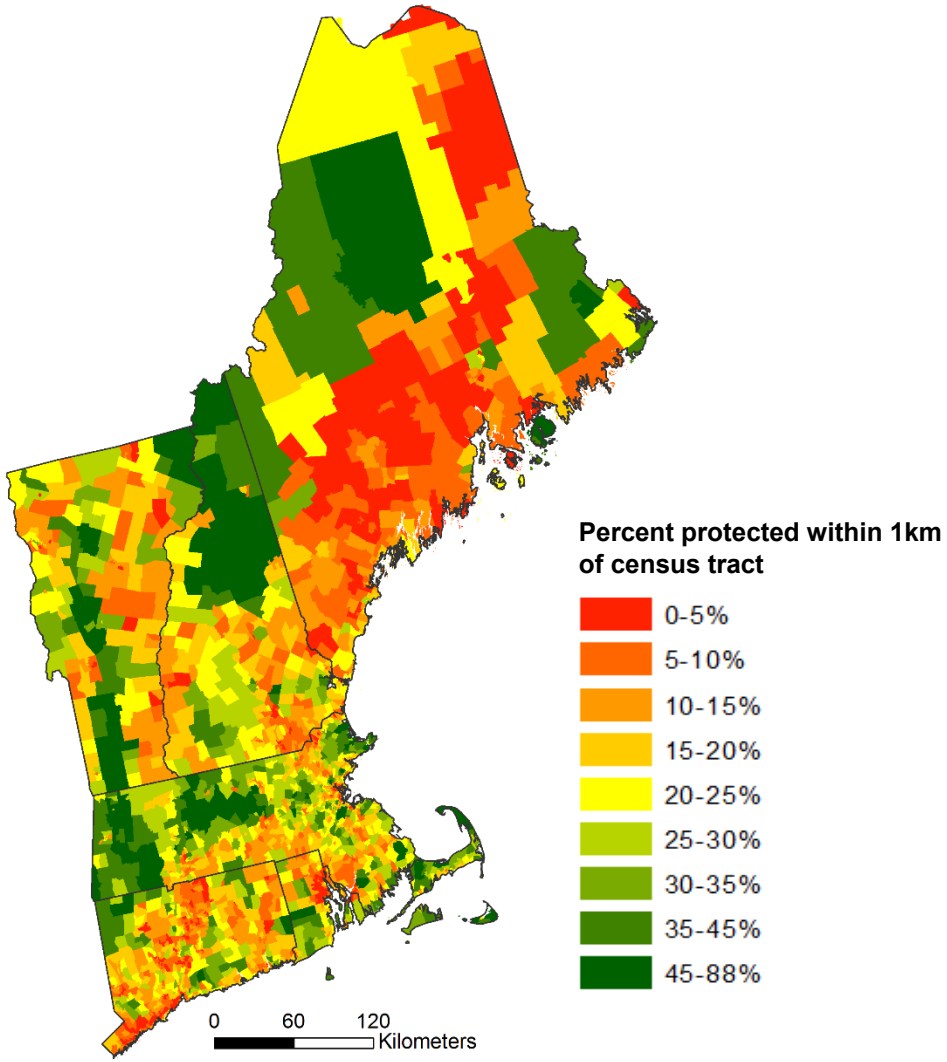
Moving forward

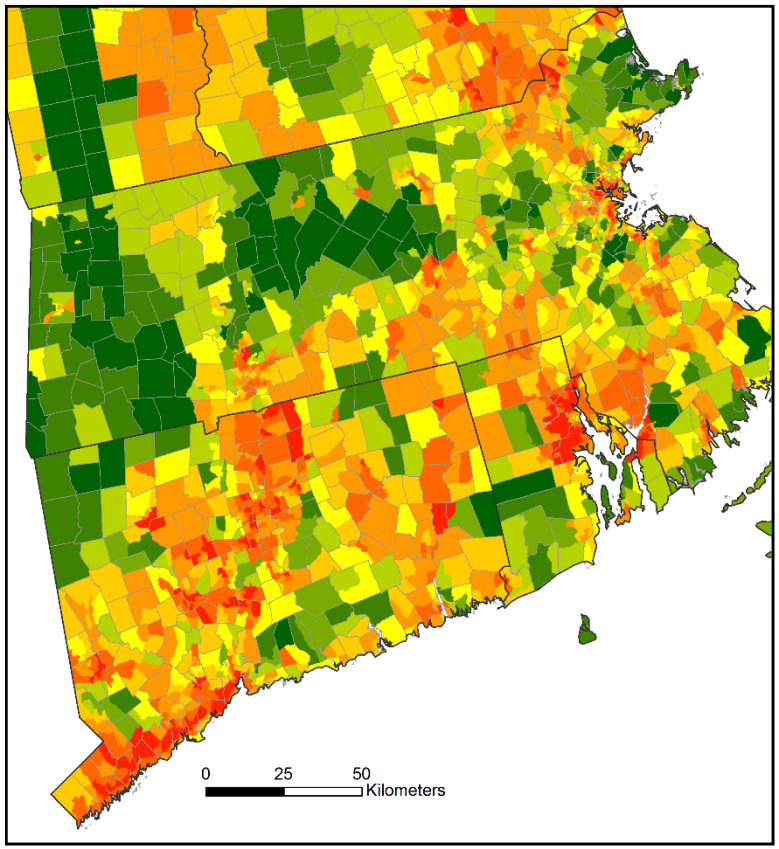
- Substantial new protection → generally positive impacts on local economic indicators
- Key questions remain:
  - What other factors must be in place for success?
    - Highstead: "Community Conservation Perspectives" series
  - Equity implications of land protection
    - Impacts on local tax rates / local public goods?
    - Do socially marginalized communities have access to protected open space? How would an EJ focus shift priorities for future protection?

Are there disparities in access to PAs?



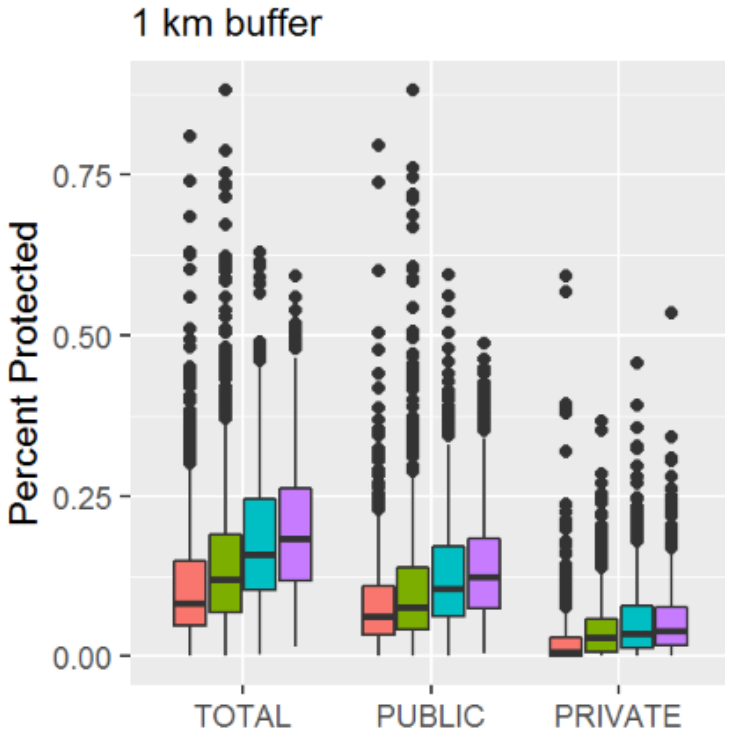
Availability of nearby protected land



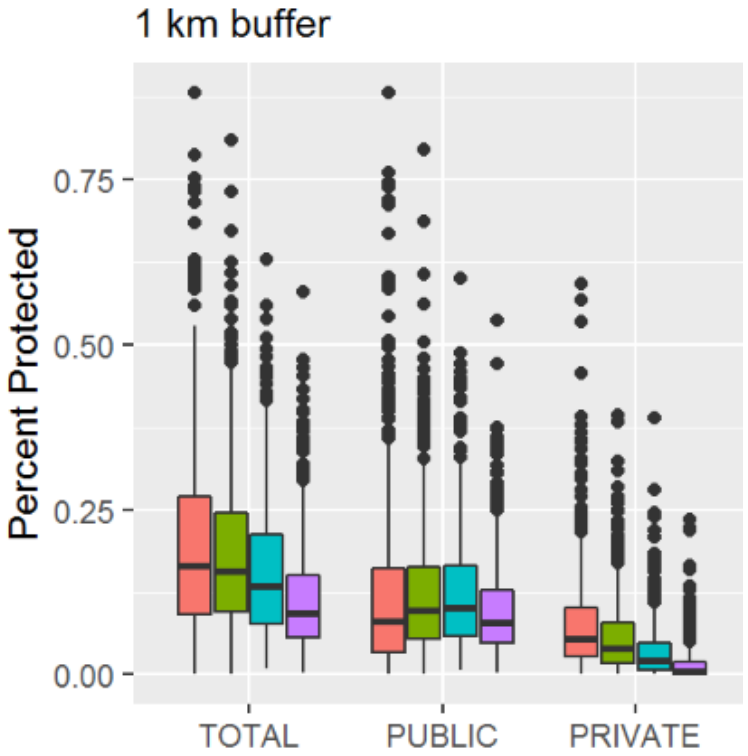


Patterns of disparity in access

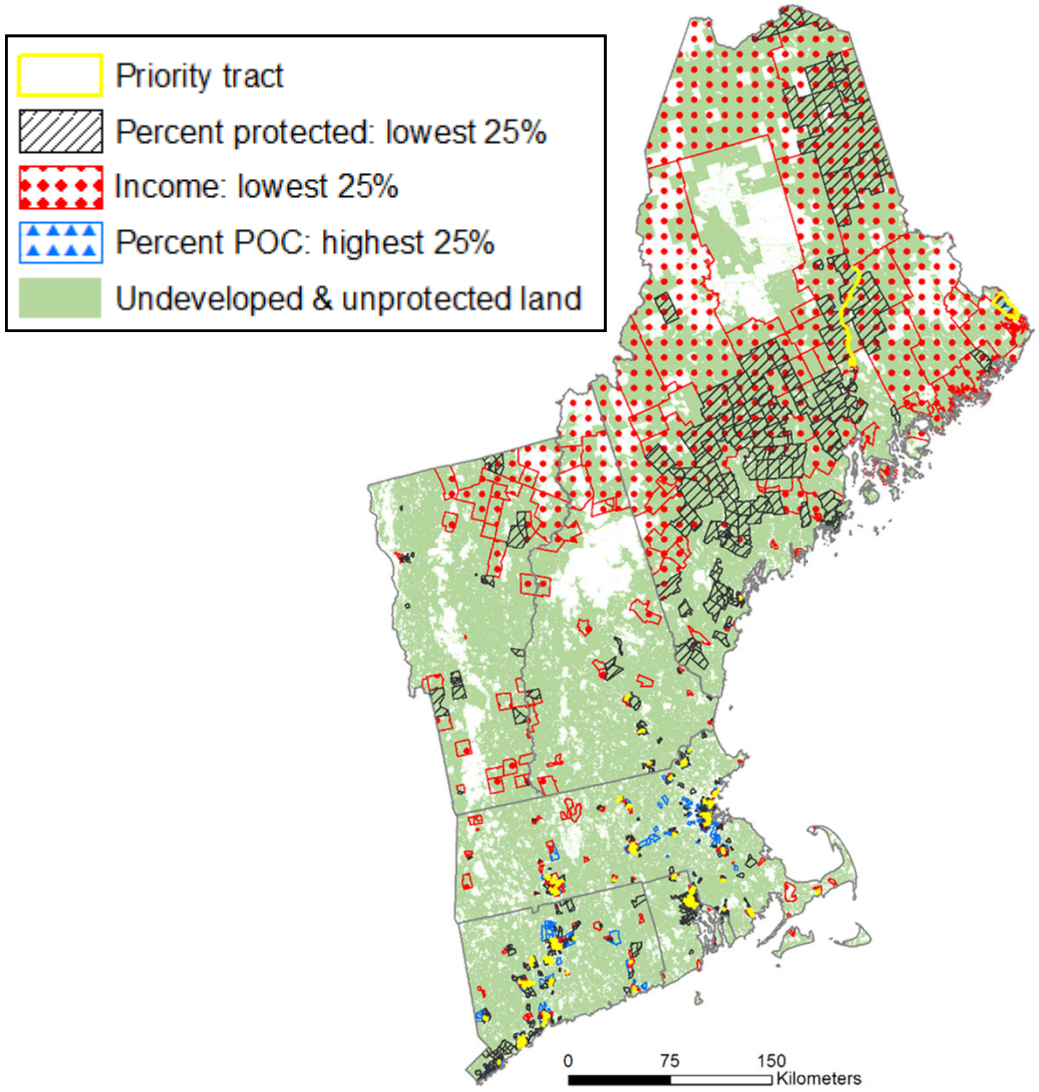
Protected lands by income

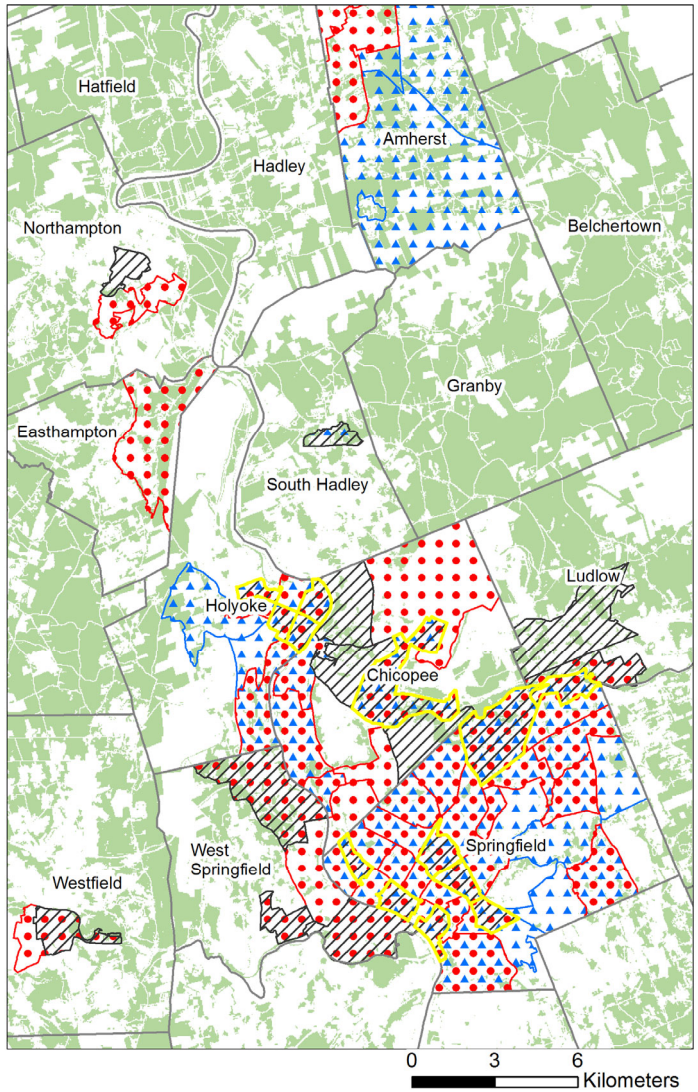


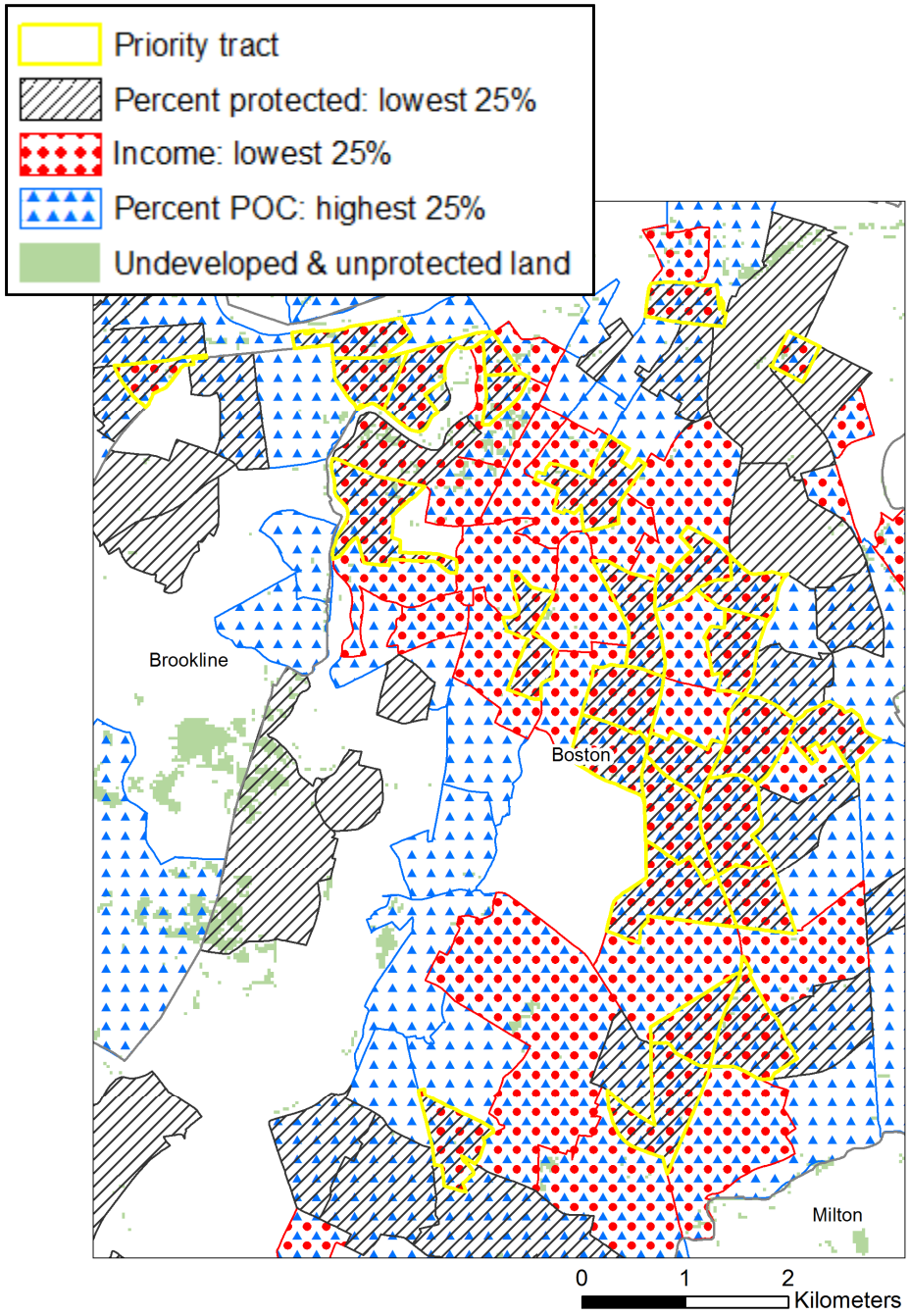
Protected lands by % people of color

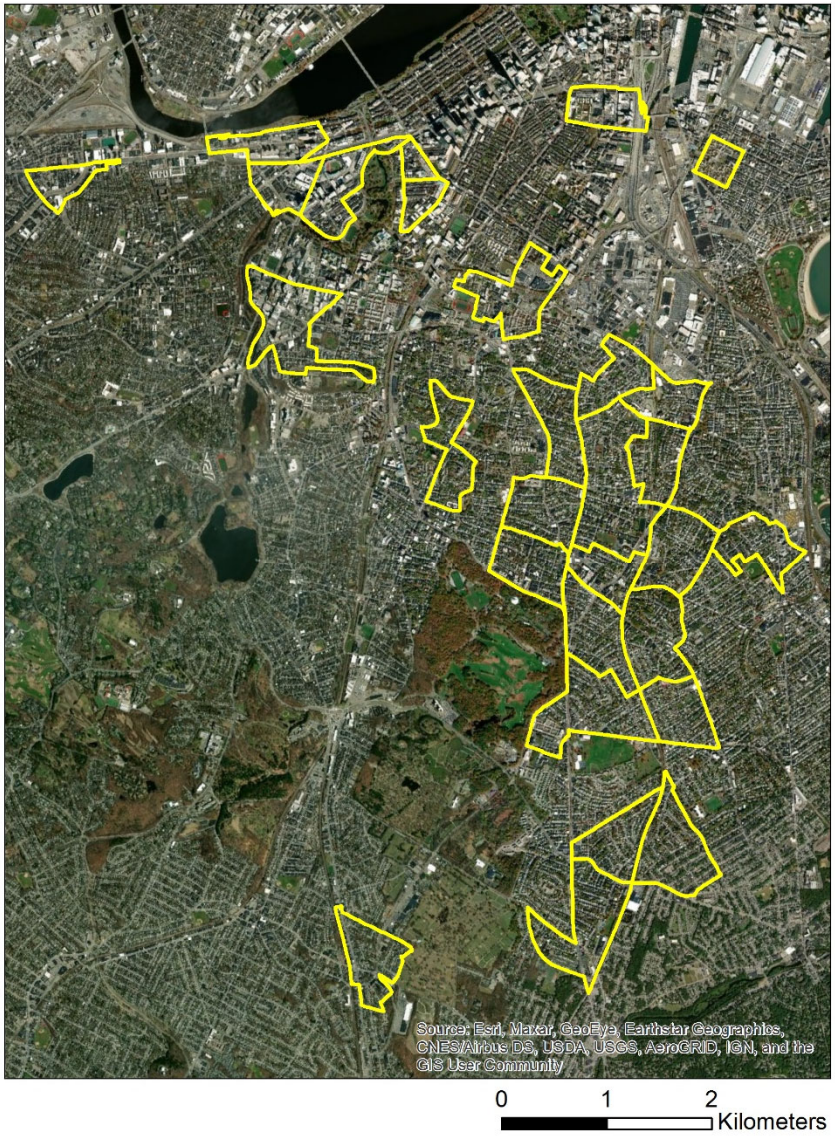


Opportunities to reduce disparities



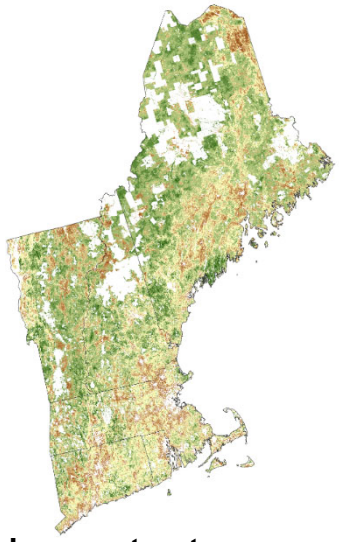



Priority tract
Percent protected: lowest 25%
Income: lowest 25%
Percent POC: highest 25%
Undeveloped & unprotected land
Brookline
Boston
Milton
0
1
2
Kilometers

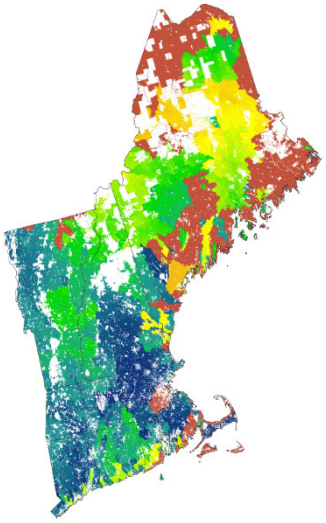

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
0
1
2
Kilometers

How do EJ priorities compare to existing conservation priorities?

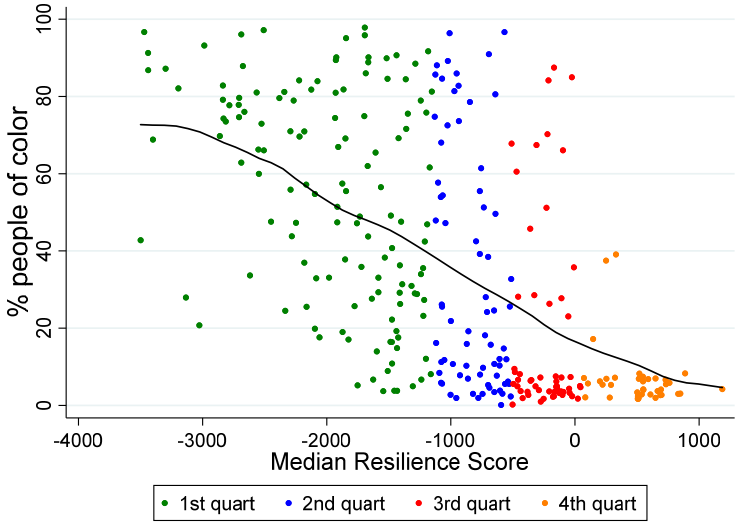
Long term resilience (Anderson et al. 2016)



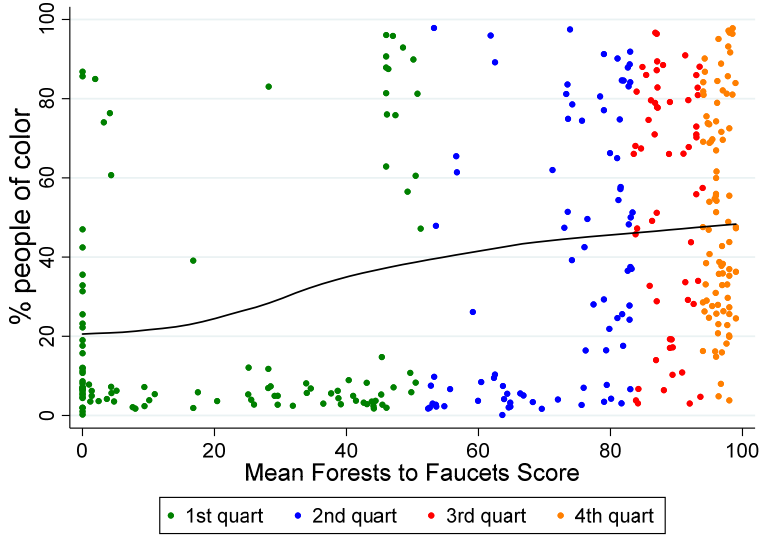
Drinking water importance (USDA Forests to Faucets)



Low protection, low income tracts:



Low protection, low income tracts:



Conclusions

- Substantial new land protection in NE presents a unique opportunity for learning
- **Welcome your questions and reflections**

- **Links: "Assessing the Local Economic Impacts of Land Protection" *Conservation Biology* 2019:** https://doi.org/10.1111/cobi.13318
- Case studies on economic value of conserved land: https://www.wildlandsandwoodlands.org/news/three-new-case-studies-show-economic-value-conserved-land