Massachusetts Land Trust Coalition

Quarterly Meeting

Brigham Hill Community Farm, North Grafton, MA Dec 13, 2018



Private land protection in Massachusetts: measuring impacts, modeling costs





(preliminary findings; for MLTC members only)

Christoph Nolte Assistant Professor **Boston University**





Impacts and Cost-Effectiveness of Conservation Interventions



Nolte et al. (2013) PNAS

South America's Deforestation Frontiers



Chaco



Nolte et al. (2017) Glob Env Change

Nolte et al. (2017) Ecol Econ



			— R	RESEA	RCH THEMES -	
PLACES	Co	ost		A	llocation	Impact
Conservation Evidence System	Scalable a appraisals owners,	Scalable automated appraisals for trusts, owners, regulators		Explaining selection, predicting outcomes of future efforts		Quantifying impacts of past and future conservation policy
		licen publi	sed & c data		18M parcels >2.5ac	30 years of land cover change
	e e e e e e e e e e e e e e e e e e e	Cou	nties		221M sales	topography
	Sa Pa	ales + arcels 1676	54%			water
	Sa	ales 1041	34%		\$40B direct public funding	species
	Pa	arcels 137	4%			roads
	No	one 254	8%		146K easements	demographics

Massachusetts

220,187 parcels > 1ha (2.5ac)

6,676 protected >80% 1985-2006

What difference did it make?

- For protected parcels
- For neighboring parcels

Main Collaborators: Massachusetts / New England







Jonathan Thompson Senior Ecologist Harvard Forest Spencer Meyer Senior Conservationist Highstead Foundation Kate Sims Assistant Professor Amherst College





% Developed within 200m, 1988

Land Cover Change vs. Protection

1986-2006



Impact Estimation: Matching

- Unit of Analysis: Properties
- Variables for Matching:
 - Physical: slope, wetland coverage, proximity to coastal waters, river / lake frontage, forest cover at protection
 - Infrastructure: travel time
 - Demographics: median income, population density
 - Parcel size
 - Adjacent protection (w/in 200m)
- Outcome: Average annual % forest loss / development (t_{prot}+3 to 2012)









Did protection reduce land cover change?



Pressure is main determinant of impact

Development Impacts by Median Income



Development Impacts by Travel Time



All key actors made a difference



Did protection *increase* land cover change on adjacent parcels (spillovers)?



Cost Estimation: Automating Appraisals



Fair market value without restriction

Fair market value with restriction

1. Appraisal Cost

2. Vulnerable to Potential Bias



The Billion-Dollar Loophole

The most generous charitable deduction in the federal tax code is being manipulated to make big profits — and there's no sign that Congress has any intention of fixing the problem.

by Peter Elkind, Dec. 20, 2017, 6:30 a.m. EST

New conservation easement lawsuit, legislation in works to address Colorado conservation easement scandal



Robert Keller, in his office, points to an overhead view of a conservation easement project (Melissa Golden for Fortune)

- 1000s of property sales
- Dozens of variables for each
- Modeled after actual appraisal practice
 - >100 appraisals in Colorado
 - >100 appraisals in Massachusetts
- Advanced statistical methods & machine-learning
- Prediction benchmark: sales prices of properties encumbered with easements

One-click estimates of the value of a conservation restriction for any parcel

- Distribution of plausible values
- List of most comparable sales
- For land owners, land trusts, regulators, and appraisers.

Future

- Can be combined with tax incentive calculator.
- Develop a web portal to connect landowners to land trusts?

AcreValue	Map / Plans / Pro /	FAQ / Granular / Log In / Sign Up
FIELDS LAND SALI	ES	
Iowa City, IA, USA Showing all Parcels.		Commercial applications already exist for agricultural farmland. How good can we get?
Image: Creek	Zoom or search to view fields PARCEL ACREVALUE \$9,029 ACRES 16.7 CSR2 84	Iowa farmland values and GIS map AVG ACREVALUE \$7,521/ac AVG CSR2 69 FIELDS 1,161,570 COUNTIES
Find Me + Hybrid Map	OWNER (05/15/17) Log in to view	Adair County AVG ACREVALUE \$7,313/ac AVG CSR2 64

	RESEARCH THEMES					
Η	ow can th	nis be				
	icoful to	>2.5ac				

Thank you!

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