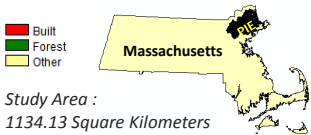
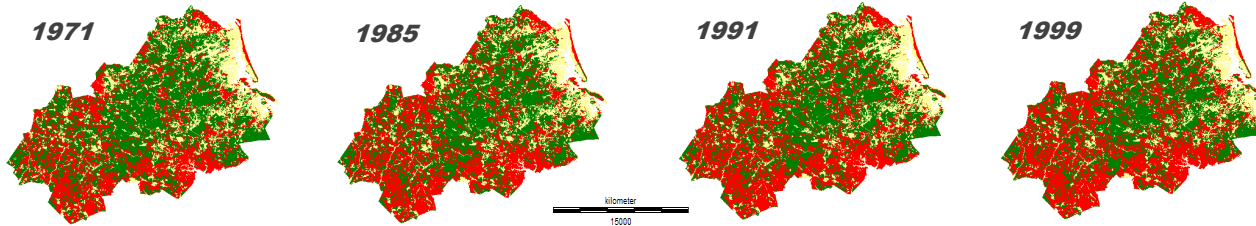


Do Builders Consistently Target Forest from 1971 to 1999?



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Uniform Loss Intensity of Forest

$$= \frac{\text{area of loss of Forest during interval 1971 - 1985}}{\text{area that is not Forest at 1985}}$$

Intensity of Forest Loss to Built

$$= \frac{\text{area of Forest loss to Built during interval 1971 - 1985}}{\text{area of Built at 1985}}$$

Uniform Gain Intensity of Built

$$= \frac{\text{area of gain of Built during interval 1971 - 1985}}{\text{area that is not Built at 1971}}$$

Intensity of Built Gain from Forest

$$= \frac{\text{area of Built gain from Forest during interval 1971 - 1985}}{\text{area of Forest at 1971}}$$

INTRODUCTION

The study area is the Plum Island Ecosystems (PIE) LTER research site in northeastern Massachusetts, where the largest land change in recent decades is the transition from Forest to Built. The maps have three categories: Built, Forest and Other. The Other category includes Agriculture, Range, Water, Wetland and Barren. The four time points are 1971, 1985, 1991 and 1999. Transition matrices summarize each time interval. Both the amount and the intensity of the land use transition are analyzed.

METHOD

Intensity of transition is the area of a transition between two categories, divided by the area available for that transition. The intensity of transition is then compared to the uniform intensity. If the intensity of transition is larger than the uniform intensity, we call it "Target", otherwise, we call it "Avoid". The **uniform intensity** is the area of transition divided by the total area available for that transition. At left are examples of equations from 1971 to 1985.

1971-1985

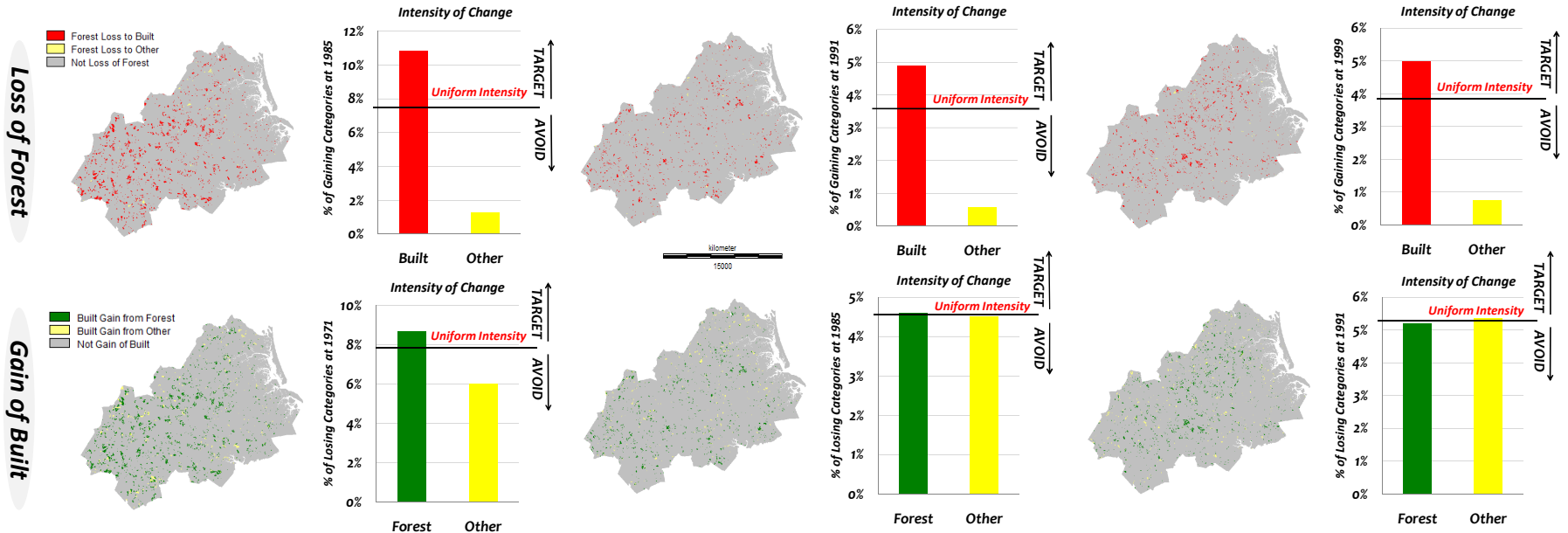
Crosstab Matrix (% of Study Area)		1985			Total1971	Loss
		Built	Forest	Other		
1971	Built	32.9	0.0	0.0	32.9	0.0
	Forest	4.1	43.2	0.2	47.5	4.4
	Other	1.2	0.0	18.4	19.6	1.2
Total1985		38.2	43.2	18.7	100.0	5.6
Gain		5.3	0.0	0.3	5.6	

1985-1991

Crosstab Matrix (% of Study Area)		1991			Total1985	Loss
		Built	Forest	Other		
1985	Built	37.9	0.2	0.1	38.2	0.3
	Forest	2.0	41.1	0.1	43.2	2.1
	Other	0.8	0.1	17.7	18.7	1.0
Total1991		40.7	41.4	17.9	100.0	3.3
Gain		2.8	0.3	0.2	3.3	

1991-1999

Crosstab Matrix (% of Study Area)		1999			Total1991	Loss
		Built	Forest	Other		
1991	Built	40.0	0.7	0.1	40.7	0.7
	Forest	2.2	39.1	0.1	41.4	2.3
	Other	1.0	0.2	16.7	17.9	1.1
Total1999		43.1	40.0	16.9	100.0	4.1
Gain		3.1	0.8	0.2	4.1	



CONCLUSION

- From 1971 to 1999, Forest loses more intensively to Built than to Other.
- Before 1991, Built gains more intensively from Forest than from Other, which indicates that builders targeted Forest before 1991.
- After 1991, Built gains with equal intensity from Forest and Other, which indicates that builders no longer targeted Forest after 1991.

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