

Assessment of Land Change Around Forest Conservation Areas in Luquillo, Puerto Rico



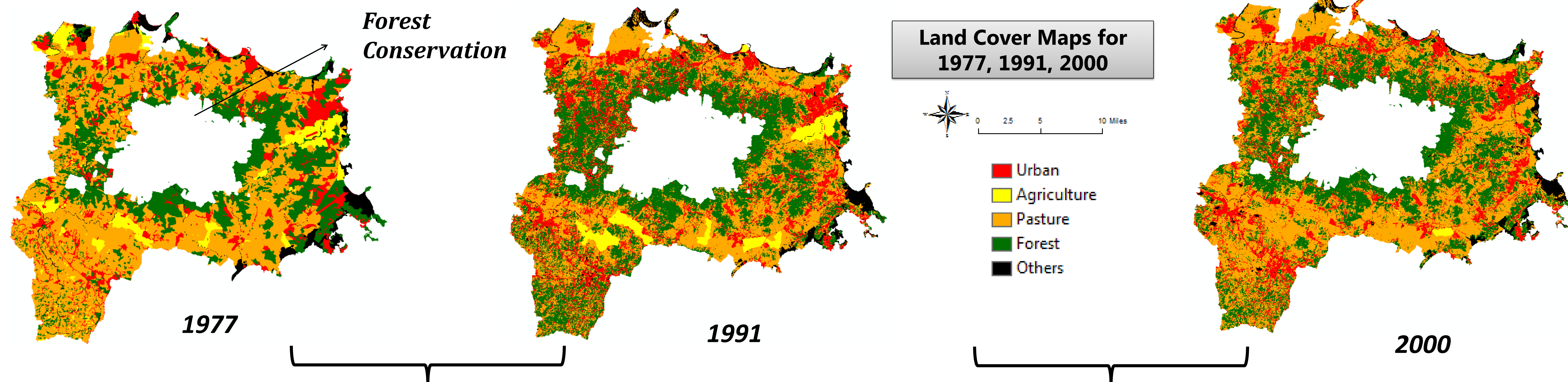
Eva Zhang yuezhang@clarku.edu GISDE Master Program, Clark University
 Advisor: Professor Robert Gilmore Pontius, rpontius@clarku.edu, Geography Department, Clark University



Introduction

The study area is in the eastern part of Puerto Rico including Luquillo and other 5 towns. The maps illustrate the land transitions occurred outside the forest conservation for two time intervals: 1977 to 1991 and 1991 to 2000.

Urban actually targeted Pasture but avoided Forest; Agriculture lost most part and never came back over time; Pasture is the most active category in both gaining and losing.



Transitions Matrices

1977-1991

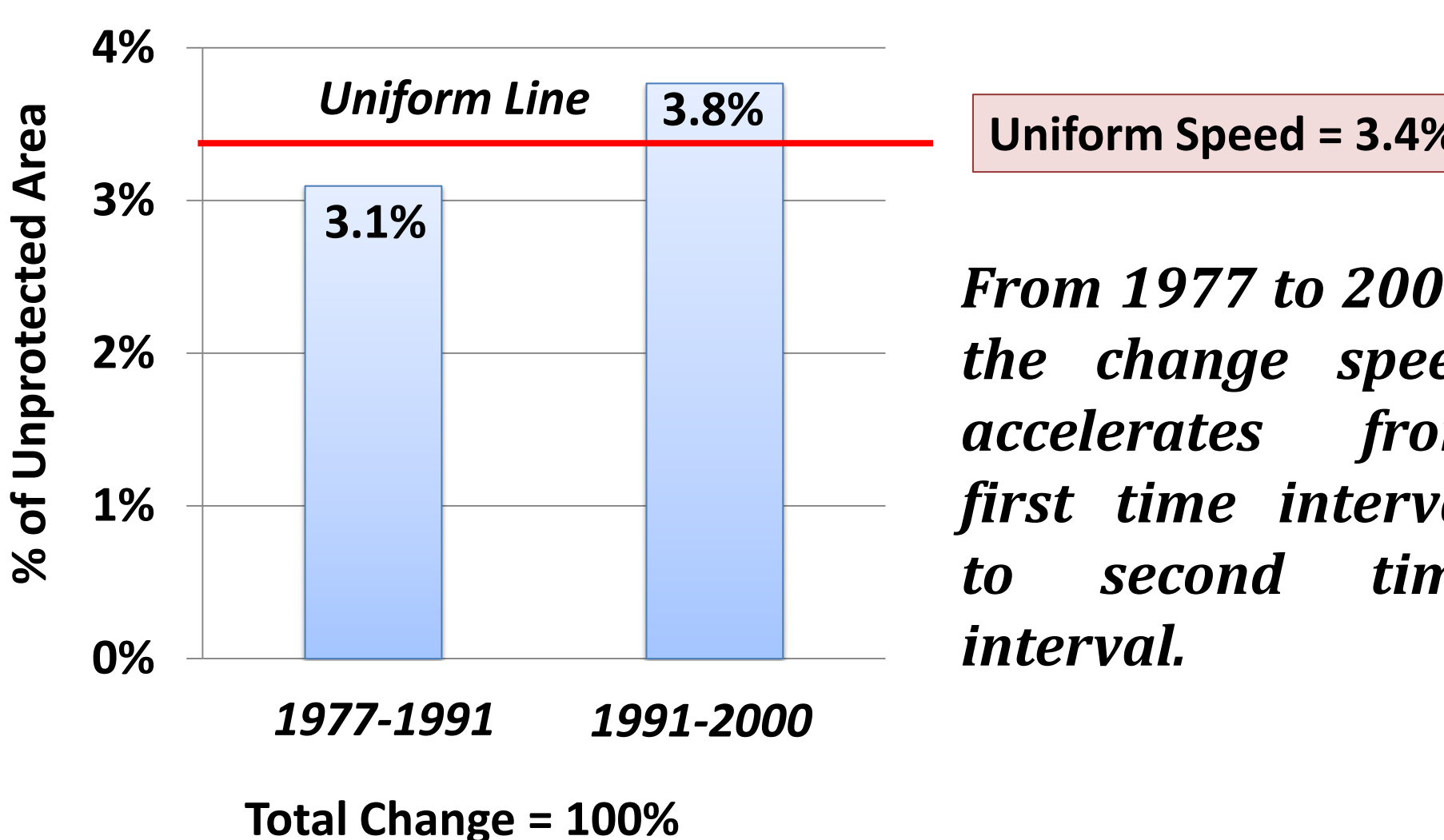
% Study Area	1991					Total 1977	Loss
	Urban	Agriculture	Pasture	Forest	Others		
Urban	8	0	3	2	0	13	4
Agriculture	0	2	3	0	1	5	3
Pasture	8	1	26	14	1	50	24
Forest	2	0	6	12	1	30	10
Others	0	0	1	1	1	3	2
Total 1991	18	4	38	37	2	100	43
Gain	11	2	12	17	2	43	

1991-2000

% Study Area	2000					Total 1977	Loss
	Urban	Agriculture	Pasture	Forest	Others		
Urban	11	0	6	2	0	18	8
Agriculture	0	0	3	0	0	4	4
Pasture	3	0	29	6	1	38	9
Forest	2	0	9	26	0	37	12
Others	0	0	1	0	1	2	1
Total 1991	17	1	47	33	2	100	34
Gain	6	1	19	8	1	34	

Land Change Speed

The bars show annual speed of land change for each time interval.

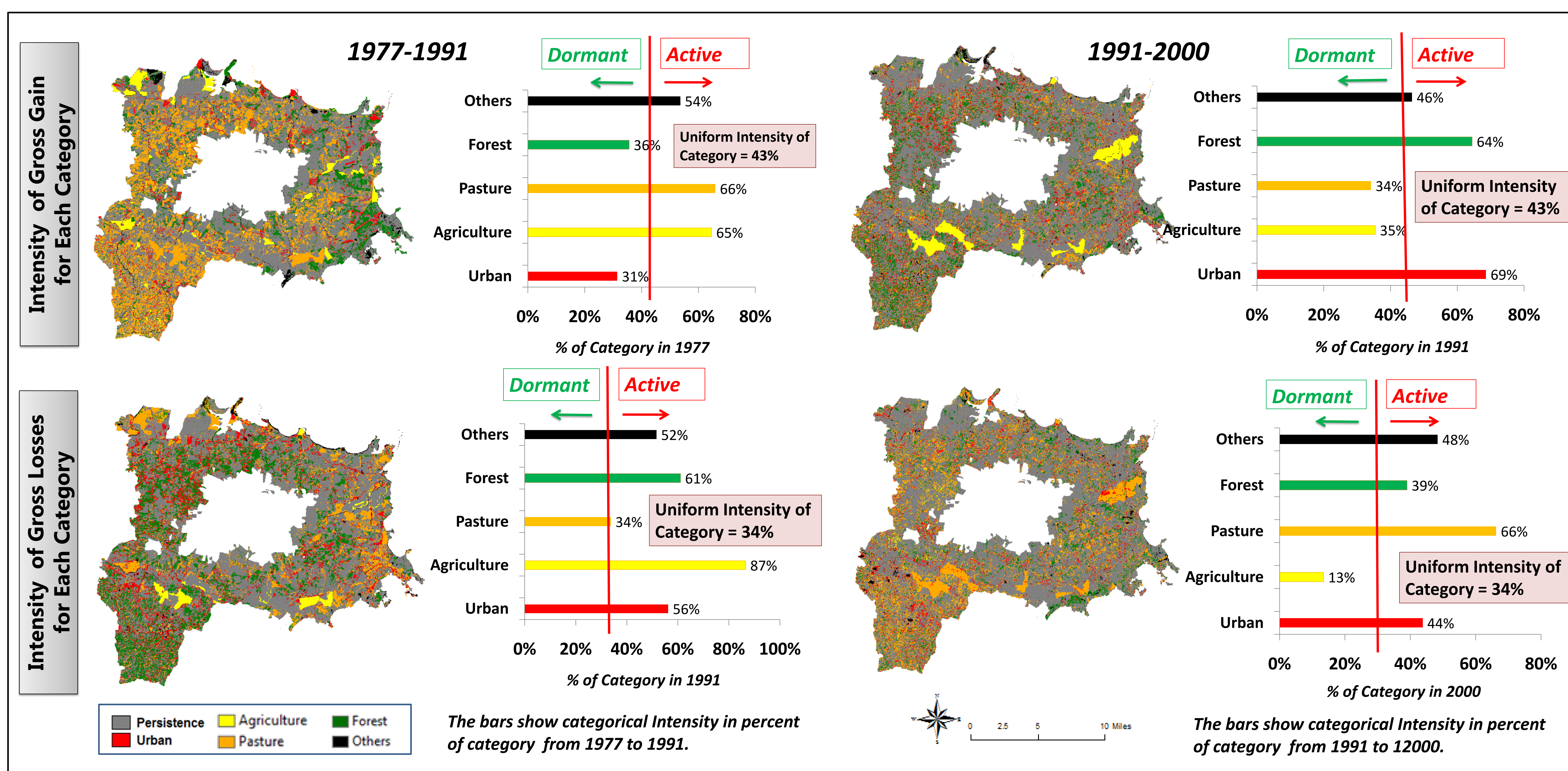


Acknowledgement

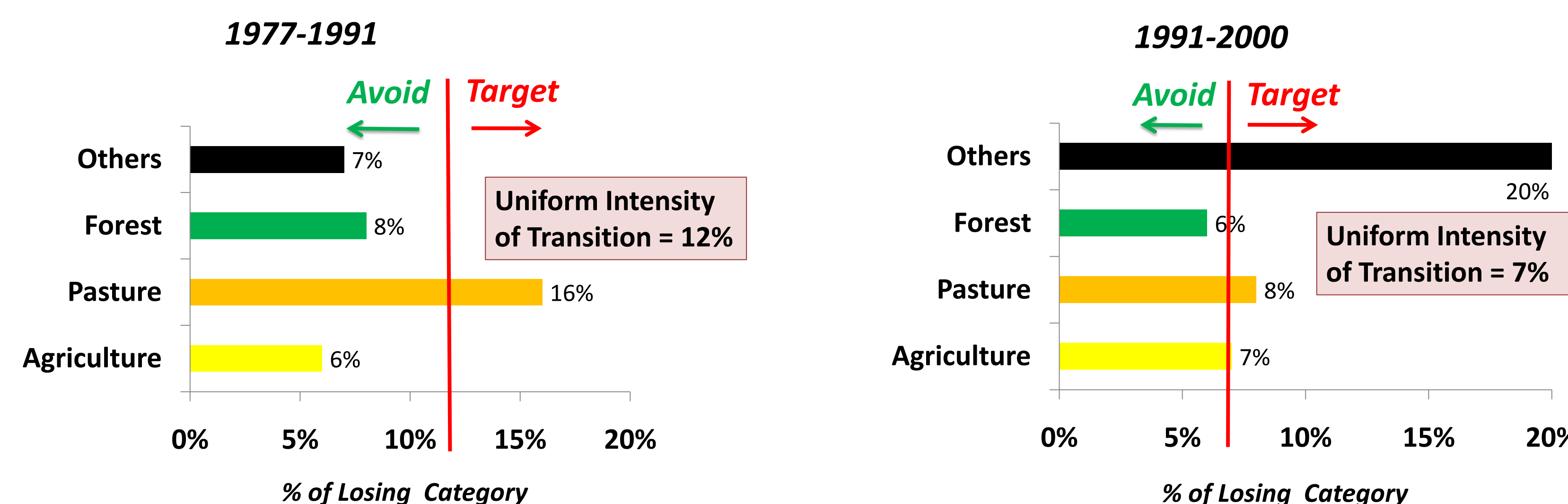
The United States' National Science Foundation supported this research through the Long Term Ecological Research Network via supplement grant DEB-0620579 titled "Maps and Locals (MALS): A Cross-Site LTER Comparative Study of Land-Cover and Land-Use Change with Spatial Analysis and Local Ecological Knowledge".

The method is based on "land change intensity analysis" created by Professor Gil Pontius Jr. Safaa Aldwaik created the computer program to perform the analysis. Nick Cuba and Jonathan Sheets also contributed their ideas in the poster.

Professor Maria Uriarte in Columbia University provided the data in September, 2009.



Transition Intensity Analysis from Other Categories to Urban



Though two time intervals, transitions from other categories to Urban around forest conservation always targeted Pasture and avoided Forest. However, gain of Urban avoided Agriculture in first time interval while gain of Urban targeted Agriculture in the latter time interval.

Conclusion

- The land change speed became faster in second time interval.
- Pasture is the most active category in gross gains and gross losses.
- Forest was active in gaining other categories while Agriculture was always losing over time.
- Transitions from other categories to Urban avoided to obtain Forest but targeted Pasture instead.