



# Spatial analysis of ecological and social variables in stakeholder-based collaborative projects in North Carolina, USA



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## ABSTRACT

Recent ecosystem management literature suggests collaboration involving diverse stakeholders at multiple scales will move us toward inter-jurisdictional governance of natural resources, which may result in positive environmental and social outcomes. However, little is understood about to what degree collaboration is occurring and how ecological and social variables correlate with collaborative projects. This study evaluates a ten-year dataset of projects initiated by participants in the North Carolina Natural Resources Leadership Institute (NRLI), which represents a sample of collaborative projects in the state. Consistent with other studies is that at the tail end of the distribution, where there is the greatest project overlap (11 projects), project density is highly correlated with high population and high income. However, unlike other studies, findings also show that ecological factors are also positively correlated with a relatively high number of projects (5 to 7 projects). By presenting this information in a spatial context, gaps in collaboration are easily identified, both informing future project selection and adding to the ongoing dialogue on how the integration of social and biological sciences can inform the stakeholder process.

## RESEARCH QUESTIONS

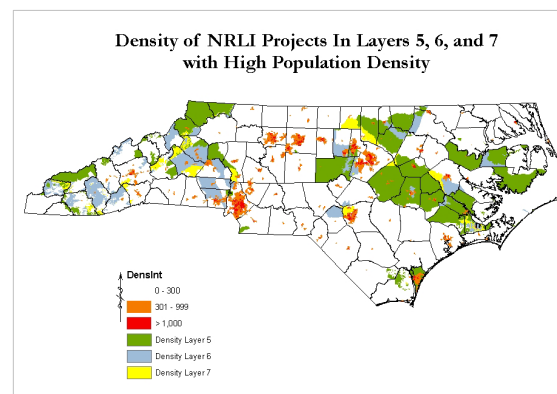
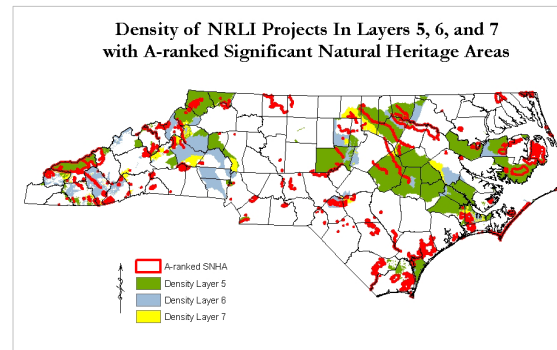
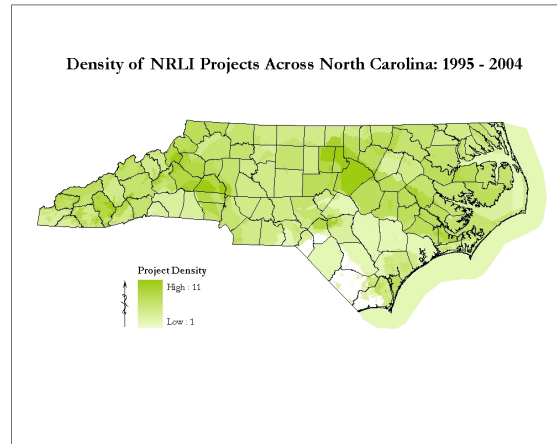
- ❖ Does collaboration actually move us toward inter-jurisdictional governance, as suggested by ecosystem management?
- ❖ What ecological and demographic factors are associated with collaborative projects?
- ❖ Are collaborative projects driven by environmental problems or by people (job-convenience)?

### Expectation for collaborative projects:

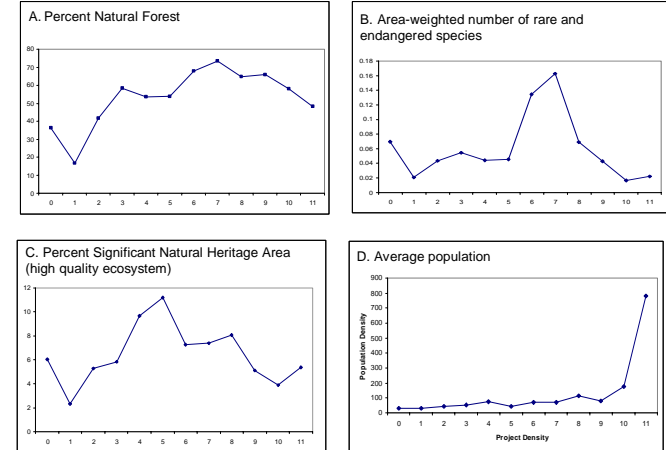
	Population Density HIGH	Population Density LOW
Ecosystem Quality HIGH	HIGH	MEDIUM
Ecosystem Quality LOW	MEDIUM	LOW

## METHODS

- Mapped project density of 123 NRLI collaborative projects and 21 biodiversity-specific projects according to high population density and high quality ecosystems ("Significant Natural Heritage Areas") (Figures 1-4)
- Analyzed relationship between project density layers the following variables:
  - *Project variables*  
Participant workplace location, environmental issue, presence/absence of stakeholder type
  - *Ecological variables*  
Landcover, rare and endangered species, percent "Significant Natural Heritage Area", percent publicly owned
  - *Social variables*  
Population density, average median household income



## FINDINGS: Selected variables by project density



- ❖ 43% of projects occur across political jurisdictions
- ❖ Projects bring together a diverse set of stakeholders (86 unique combinations of stakeholder type)
- ❖ While 25% of participants are from Wake County, 53/100 counties have no participants

	Population Density HIGH	Population Density LOW
Ecosystem Quality HIGH	HIGH	MEDIUM
Ecosystem Quality LOW	MEDIUM	LOW

## CONCLUSIONS

- There is some bias in where projects are located and in the type of projects that are being implemented.
- NRLI can help implement the theories of ecosystem management by leveraging resources in places with high biodiversity and encouraging multi-jurisdictional governance in areas with high population.
- Biodiversity is not the primary mission of NRLI, however 60% of projects relate to biodiversity.

## RECOMMENDATIONS

- Baseline data about the natural resources that are affected by NRLI projects should be collected so that future research can evaluate the impacts of these stakeholder-based projects on the environment.
- This type of analysis should be conducted across land management agencies to determine the extent to which ecosystem management is being applied at the local, state, and national scale and to identify places of synergy or redundancy.