Assessing the Utility of LANDFIRE Data for Local and Landscape Analysis in Eastern North Carolina

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THE NATURE CONSERVANCY

Introduction

The LANDFIRE project has produced a suite of continuous GIS data layers describing vegetation, fuels, and fire regimes across the United States. The data were created for use primarily in regional- and national-level analysis. Thus, the data may not be suitable for use at smaller extents. The LANDFIRE team acknowledges that further investigation is necessary to determine applicability to local projects. Therefore, it is important to assess whether and how it should be used across smaller extents, such as landscapes or single management units.

Our goal was to inform land managers and researchers about how to use LANDFIRE data at smaller extents, particularly for vegetation and fuels in the Eastern US.

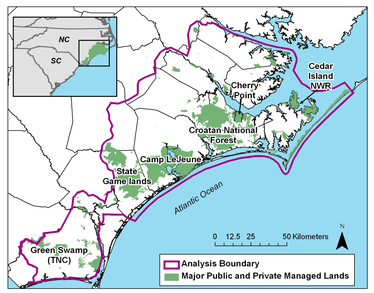
Questions and Approach

We assessed four LANDFIRE data products. For each, we asked:

1. How does LANDFIRE data compare with locally-produced data on a landscape-wide basis?
2. Does LANDFIRE data match what land managers know about the landscape at finer scales?

Each LANDFIRE data layer was crosswalked to the same classification as a locally-produced data source. Pixel-to-pixel comparisons were then made between LANDFIRE and local data. We also solicited feedback from partners representing public and private agencies in the landscape to assess how LANDFIRE matched their views of fuels and vegetation.

Study Area: The Onslow Bight



1.23 million ha

40,000 ha prescribed burning annually

Major landowners include:

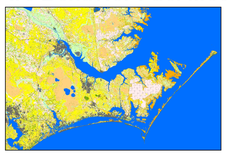
- North Carolina Wildlife Resources
- US Marine Corps Camp LeJeune
- US Marine Corps Cherry Point
- Croatan National Forest
- Cedar Island National Wildlife Refuge
- The Nature Conservancy

Results

LANDFIRE Data Products

Locally-Produced Data

13 Fire Behavior Fuel Models



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Southern Wildfire Risk Assessment Fuels

Based on 2001 land cover

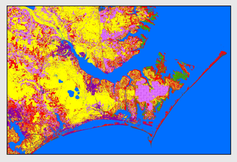
Pixel-to-Pixel Comparison: Landscape

Differences in Landscape Composition

Partner Feedback: Local Management Units

Recommendations for Local and Landscape Use

Fire Regime Condition Class (FRCC)



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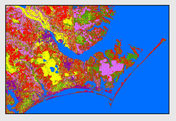
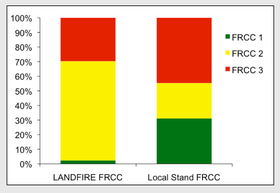
Local Stand FRCC

Summarized for the landscape



Overall agreement: 46%

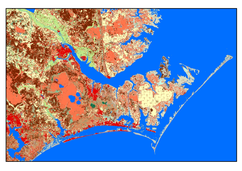
- Much of LANDFIRE FRCC 2 is mapped as FRCC 1 or 3 in local data



- Differences in FRCC between frequently-burned and non-burned areas are not apparent in LANDFIRE data
- LANDFIRE FRCC has too much Class 2
- Local stand FRCC shows patterns better

- Scale-dependence and failure to incorporate fire history means LANDFIRE FRCC has limited utility for local and landscape analysis
- Summarizing locally moderately improves the data

Existing Vegetation Type (EVT)



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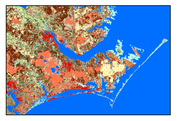
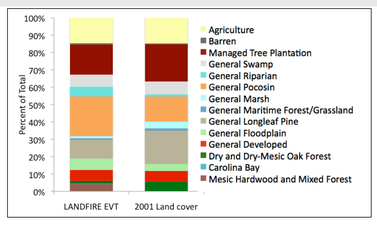
GAP 2001 Land cover

Locally-produced (McKerrow 2006)



Overall agreement: 49%

- Most of Tidal Marsh in EVT are mapped as Swamp in GAP data



- Many marshes are mis-mapped as swamps in LANDFIRE EVT
- EVT captures longleaf pine communities better than GAP land cover

- With the exception of Tidal Marsh systems, LANDFIRE EVT is as good or better than other data for local and landscape analysis

Biophysical Setting (BpS)

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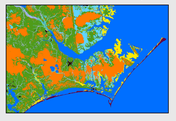
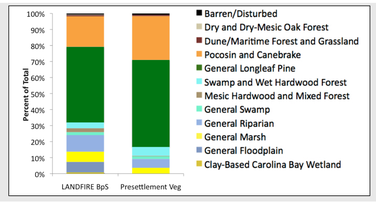
Presettlement Vegetation

Based on county soils (Frost 2006)



Overall agreement: 53%

- Similar composition; BPS shows more Marsh, Riparian, and Floodplain



- In local areas, BpS shows different patterns than partners expect
- Some areas mapped as pocosin should be longleaf
- Small stream riparian systems are overmapped

- Good for landscape-wide analysis
- Local data sources generally preferred over LANDFIRE BpS for smaller extents

Summary

Overall, LANDFIRE data products are useful for landscape-wide analysis, but not as useful for single management units. LANDFIRE FRCC has minimal utility for landscape or local analysis.

Data	Local	Landscape
13 Fuel Models	X	✔
FRCC	X	X
EVT	✔	✔
BpS	X	✔

Implications

LANDFIRE data can be used across landscapes of similar size (~1 million hectares). As with other national data sets, at smaller extents, land managers working on the ground likely have more detailed knowledge than it is possible to obtain from most of the LANDFIRE data.

Interestingly, this analysis implies that LANDFIRE vegetation data products may be more useful than fire-related data when working at local extents.

References

Frost, C.C. 2006. Presettlement Vegetation of the Onslow Bight, NC. Digital file (unpublished).

McKerrow, A. 2006. Mapping and Monitoring Plant Communities in the Coastal Plain of North Carolina: A Basis for Conservation Planning. PhD Dissertation, NC State University.

Acknowledgments

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