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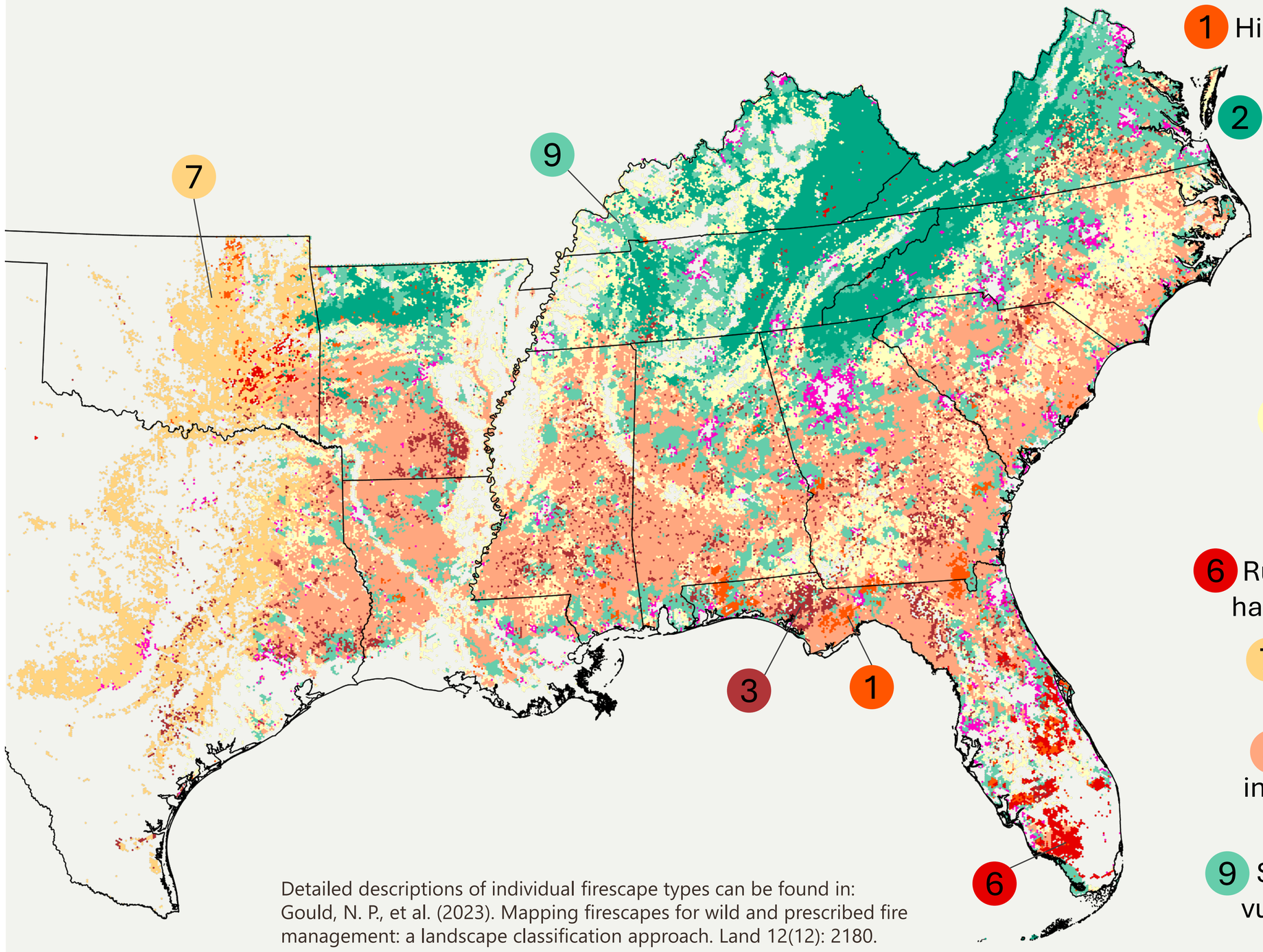
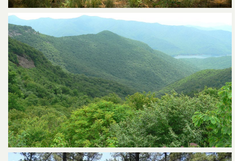
# Firescapes: mapping fire as a social-ecological system

## Firescapes in the Southeastern United States

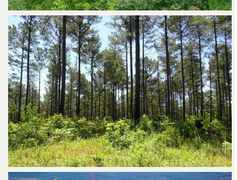



1 History of fire, potential for intense fire

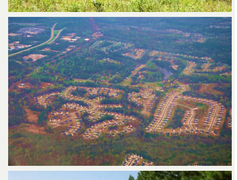
2 Cool & wet broadleaf mountain forests



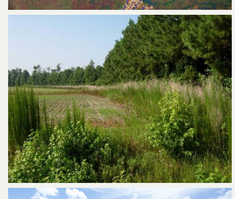
3 Rural pine forest, conversion to agricultural lands



4 Urban periphery landscapes



5 Rural agriculture, vulnerable communities, low wildfire potential



6 Rural mixed forest with hazardous fire potential

7 Warm & dry, mixed woodlands

8 Rural pine forests, intense fire, vulnerable communities

9 Semi-rural, low social vulnerability, moderate climate

Detailed descriptions of individual firescape types can be found in: Gould, N. P., et al. (2023). Mapping firescapes for wild and prescribed fire management: a landscape classification approach. Land 12(12): 2180.

## The Firescapes concept

Firescapes are landscape types, defined in terms of the many social and ecological factors that shape how fire and its associated risks and benefits operate as a human-environment system.

Landscapes in the same firescape have shared properties that help describe how fire, its causes, and its consequences tend to play out in those places.

Mapping firescapes relies on a large set of fire-relevant social and ecological variables.

## A data-driven mapping method

The Southern Region Firescapes analysis began with 73 variables[1] mapped in hexagonal landscape units about 2,500 acres (1,000 ha) in size. Only units with at least 25% forest cover were considered. Factor analysis on these data produced eight factors that explain much of the spatial variation in the complete dataset. The factors have natural interpretations in terms of fire history, expected occurrence & intensity; forest conditions and fuels; climate; conservation values; social and ecological vulnerabilities; population, infrastructure & WUI; and land use change. The factors were then used in a cluster analysis to classify every landscape into one of nine types—i.e., 'firescapes'—each with distinctive factor scores.

Most of the data used in the mapping process measure social, ecological, and biophysical properties that change over time. With updated data, firescapes may show geographic change. For the *Southern Forest Outlook*, firescape changes are projected under future climate and socioeconomic scenarios[2]. Data from other regions could also be used to extend the map—likely identifying novel firescapes in the process.

## A landscape context for managing fire

Firescapes provide a broad-scale context for considering appropriate fire management strategies in different settings.

Increasingly, successful decision-making and living with fire require a broadened and integrated understanding of fire's many dimensions.

Firescapes can help inform locally appropriate outreach, community preparedness investments, use of prescribed fire, and other risk management tools.

1. Gould, N. P., et al. (2023). Mapping firescapes for wild and prescribed fire management: a landscape classification approach. Land 12(12): 2180.
2. Wildfire Risk in a Changing Climate. https://storymaps.arcgis.com/collections/724caafdb3fc41d8ab0ea5a9983cac05