



Wildland Fires

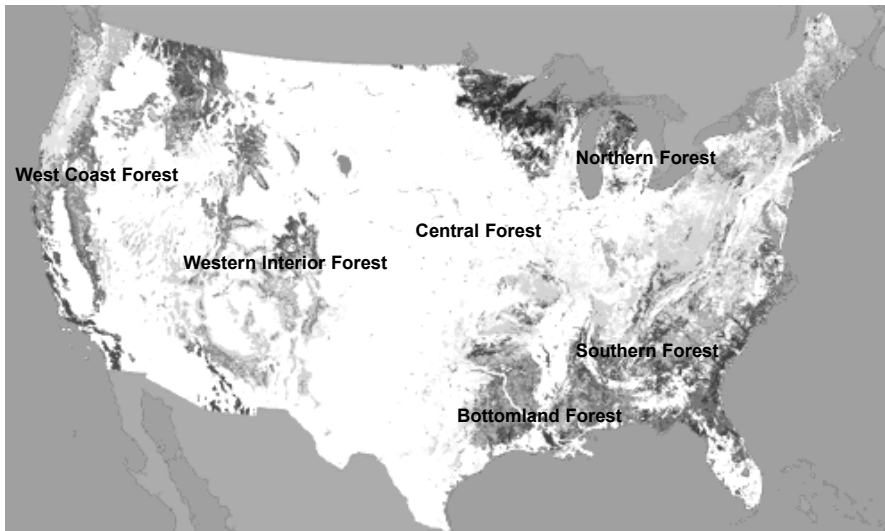
James T. Johnson, PhD, CWB®
University of Georgia

Acknowledgements:
Jason Gordon, UGA
Jennifer Fawcett, NCSU



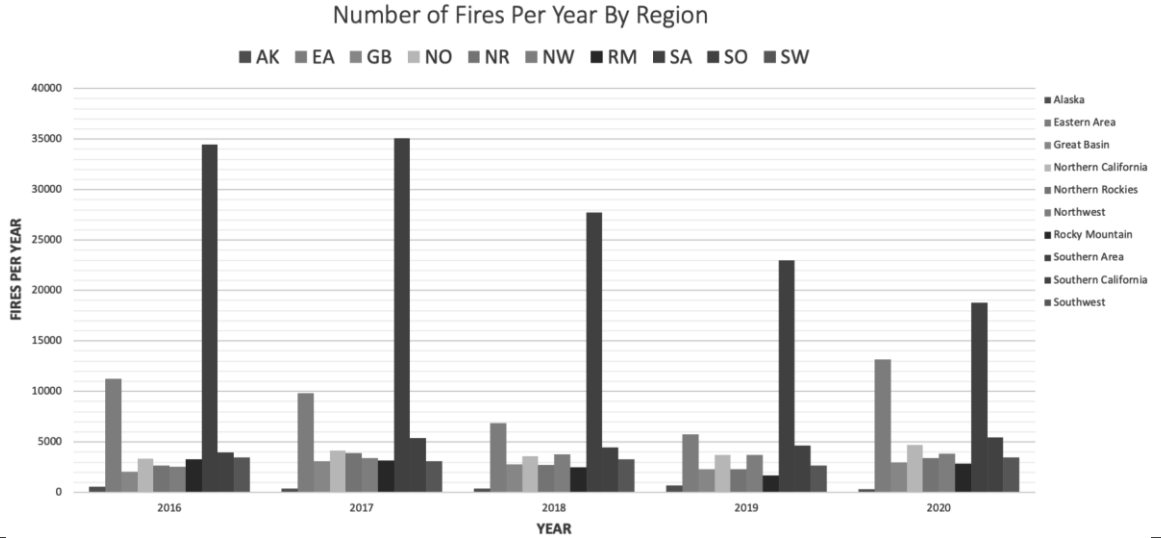
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Six Forest Subtypes



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Wildfires in the US

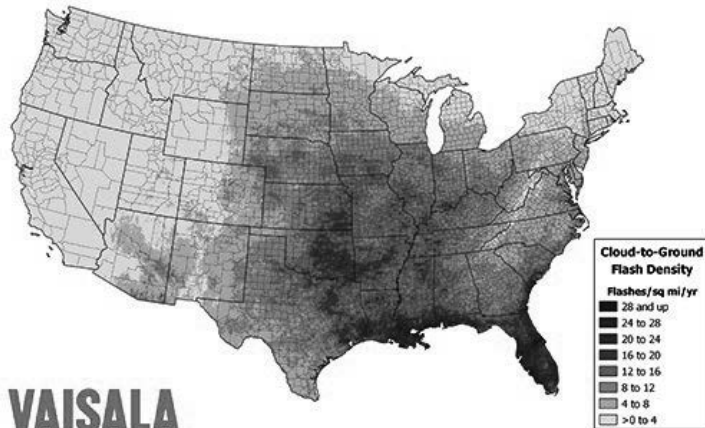


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Lightning Strikes in the US

National Lightning Detection Network
Average Cloud-to-Ground Flash Density, 2010-2019



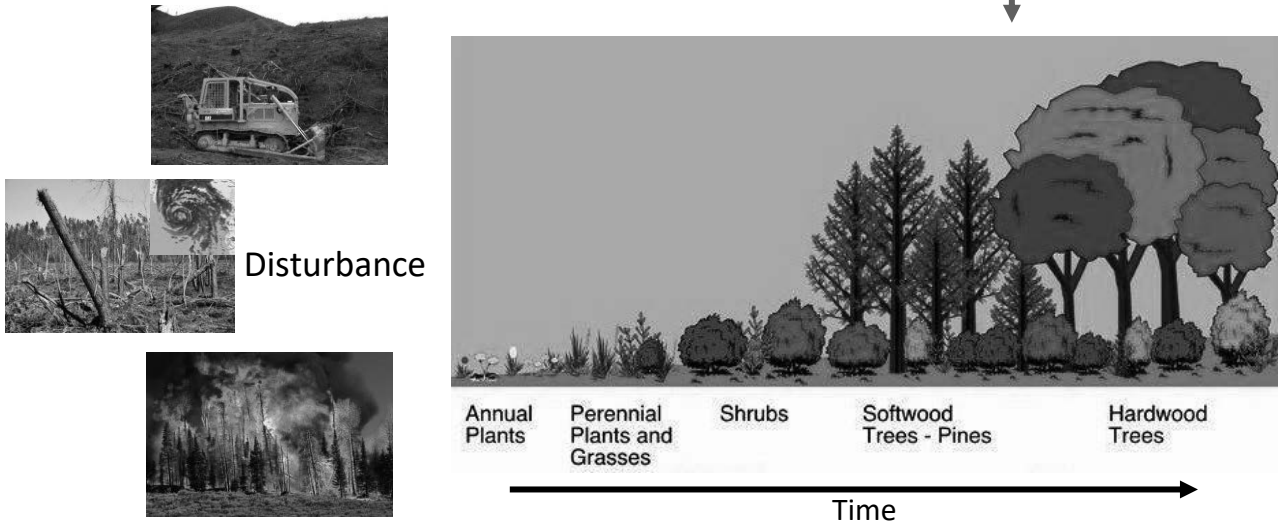
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Forest Succession



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Landscapes Shaped by Fire

Example:
Pine savannas

“If they can promote fire,
they remove the competition
from hardwoods”



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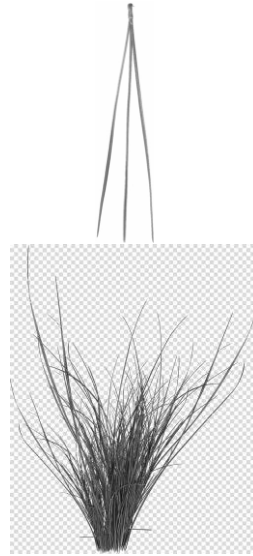
“Wants” to Burn



Longleaf Pine



Wiregrass



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Vegetation Response (1 month)



Time of year is important

Does Not “Want” to burn



Native Americans and Fire

- Clear Campsites (protect from wildfires)
- Hunting
- Parasite reduction



European colonization = fire suppression



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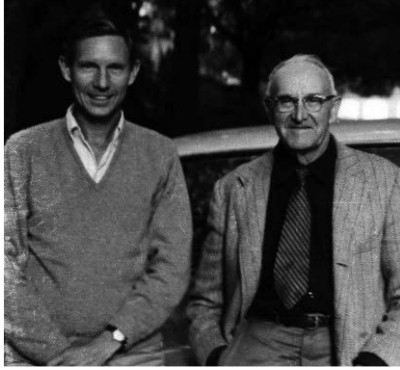


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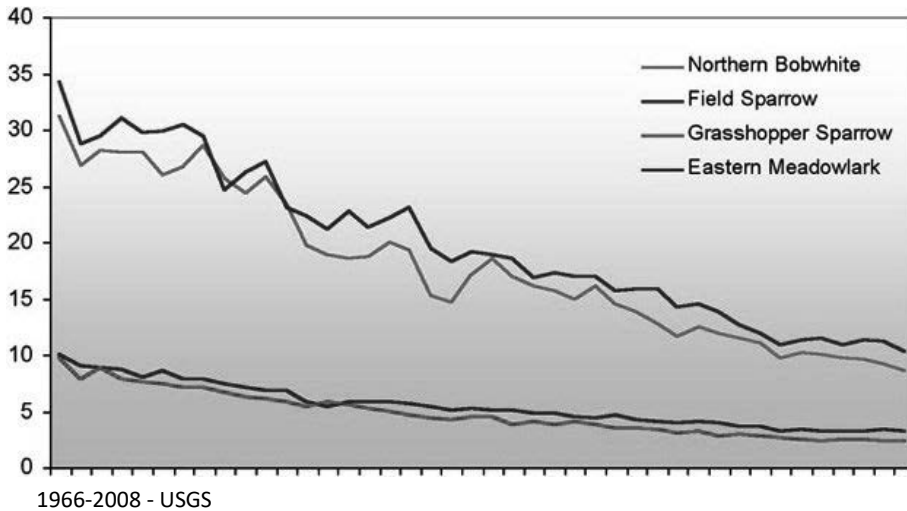
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Tall Timbers Quail Population

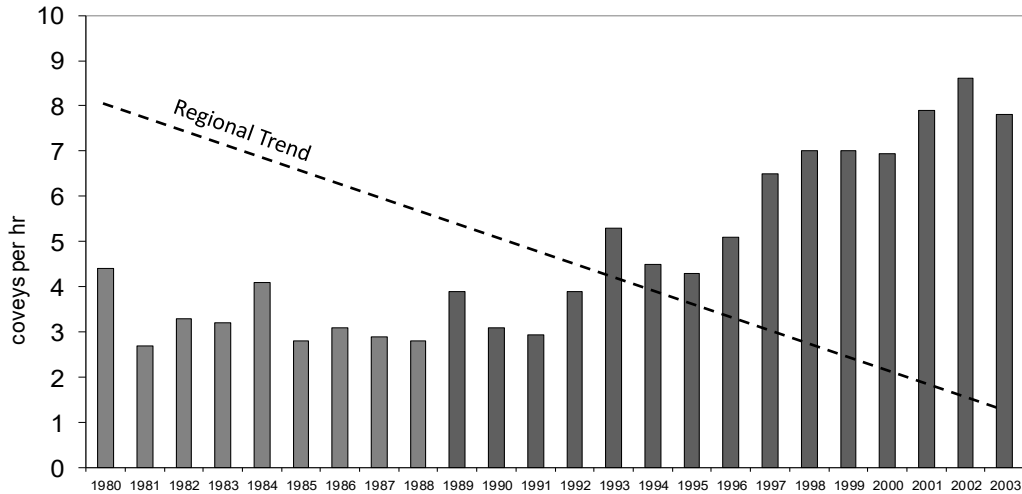
Leon Neel and Herbert Stoddard



Population Decline



Tall Timbers Quail Population



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Wildland fire

Any non-structure fire that occurs in vegetation or natural fuels

Wildfire

A wildland fire originating from an unplanned ignition, such as lightning, volcanos, unauthorized and accidental human caused fires, and prescribed fires that are declared wildfires

Prescribed fire

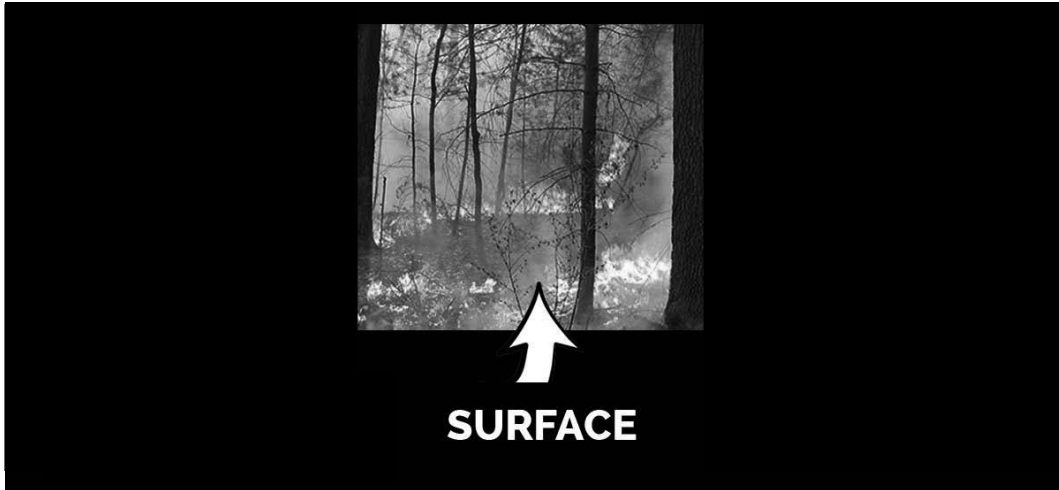
A wildland fire originating from a planned ignition in accordance with applicable laws, policies, and regulations to meet specific objectives



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Types of Wildland Fires



Prescribed Fire

“A modern principal of wise land stewardship is the careful and professional application of prescribed fire.”



Low Intensity



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High Intensity



Reasons and Benefits of Prescribed Fire



Wildfire Risk Reduction

In the South, there is a solid base of science showing that repeated use of prescribed fire decreases the risk of catastrophic wildfires

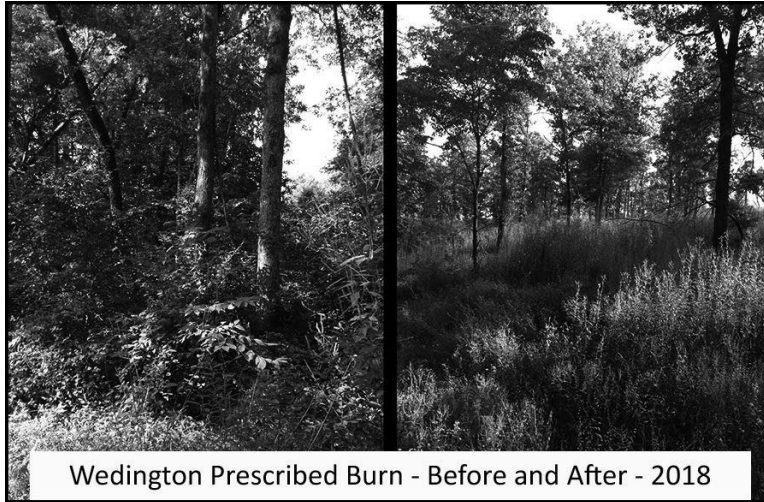
Summary

Collectively, these studies indicate that 50 years of research have found similar results: In flatwoods ecosystems in the South, prescribed burning reduces wildfire risk for several years after the burn until the shrub understory and midstory recover. While Davis and Cooper's 1963 research is still supported, additional research in the last two decades has refined the fire risk reduction time interval to approximately two years following a prescribed fire.

CONCLUSION

Results from this observational research are consistent with several other studies in the Southeastern United States. Addington, et al. concluded that "...our study provides evidence of the cumulative effect of landscape-scale prescribed fire in reducing wildfire activity over time." Furthermore, forests at Fort Benning, like most of the forests in the southeastern United States, are a fire-prone landscape and they will inevitably burn, whether or not it is intentional. Therefore, the authors suggest: "Prescribed fire offers a means of controlling the distribution of fire on the landscape both spatially and temporally, with benefits extending to smoke and emissions management." Prescribed fire will decrease the number of wildfires in those locations, in

Fuels Reduction



Forest Health & Wildlife Habitat

- Helps control insects and disease
- Creates habitat for game and non-game species, including many that are threatened or endangered



Rangeland Management

- Improves grazing vegetation and reduces the need for fertilizers
- Reduces competition from some weeds, and produces palatable forage for livestock



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Site Preparation and Timber Management

- Prepares harvested sites for replanting
- Provides other benefits, like wildlife habitat, while benefiting preferred timber species



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Aesthetics & Recreation



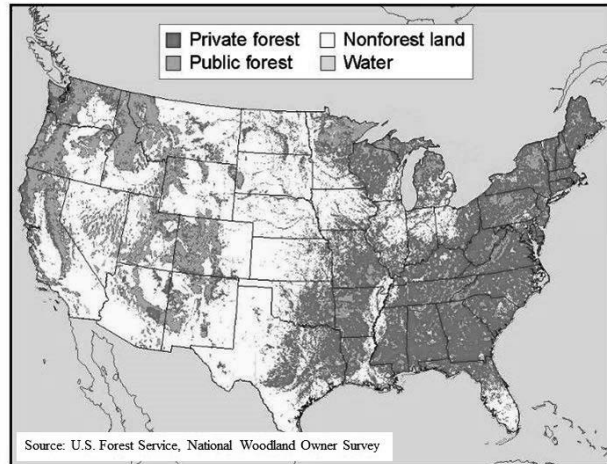
Cultural Connection

For many, particularly indigenous people, using fire is a way to connect to their heritage



Importance of Private Land

- Most land in the South is privately owned
- Accomplishing large-scale land management goals *must* include private landowners

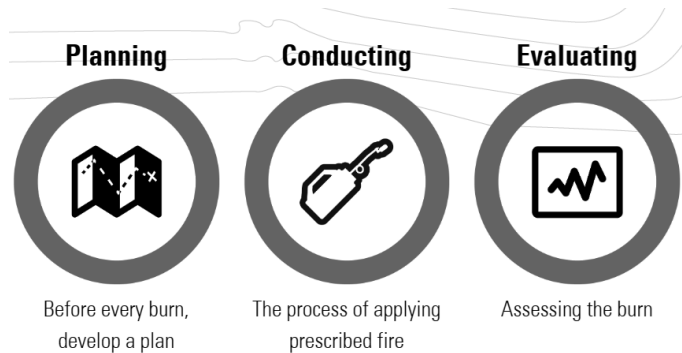


Options for Private Landowners



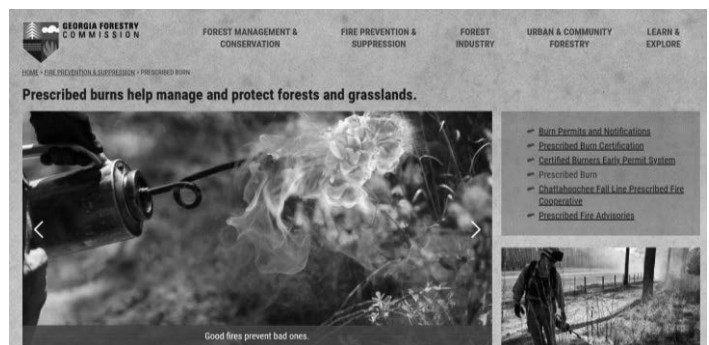
Prescribed Fire in Practice

A well-planned burn is much more likely to be a safe and effective burn



Planning the Burn

- Key questions:
 - What are my objectives?
 - What resources do I need and have available?
 - What do my stand conditions need to be to meet my objectives?
- Using a **burn plan** is not only helpful, but required in some jurisdictions



What is a Burn Prescription Plan?

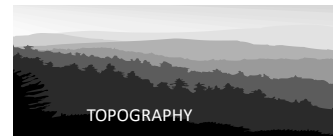
- A written plan that states the how, what, where, when, and why of burning.
 - Should be site specific
 - Include burning technique(s) to be used
 - Take time to “scout” the site and surrounding area
 - Know topography, fuel types, species, smoke sensitive areas, any elderly in the area, hospitals, highways, chicken houses, etc...
- Once notarized, becomes a “legally binding” document.



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Considerations



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Planning the Burn



SMOKE MANAGEMENT

- HOW MUCH SMOKE?
- WHERE CAN IT GO?
- SMOKE SENSITIVE AREAS

CONTROL LINES

- MINIMUM AMOUNT
- STRAIGHT
- NO FINGERS
- AVOID TRYING TO HOLD LINES IN CUTOVERS
- NOT ON PROPERTY LINE
- BLADE LINES WHERE NEEDED
- DOUBLE OR WIDEN IN HIGH HAZARD AREAS

BMP CONSIDERATIONS

- WATER BARS
- STREAM CROSSINGS

SUFFICIENT MANPOWER & EQUIPMENT

- HAND TOOLS
- SLIP ON UNITS
- TRACTORS
- ATV'S
- AVAILABLE WATER SOURCE
- DRINKING WATER
- DOCUMENT BUILDINGS AND CONTENTS PRIOR TO BURN (PHOTOGRAPHS)

WEATHER & SITE CONDITIONS

- WIND DIRECTIONS
- TEMP
- HUMIDITY
- SOIL AND FUEL MOISTURE
- DEPTH OF DUFF LAYER
- TOPOGRAPHY

Conducting the Burn

- Considerations
 - Burn crew and roles
 - Review burn plan and map
 - Equipment
 - Weather
 - Smoke management
 - Control lines
 - Topography & Terrain
 - Fuels



Considerations Vary by Location



Fire Weather

Many weather factors can dictate the risk, intensity, and spread of wildfire



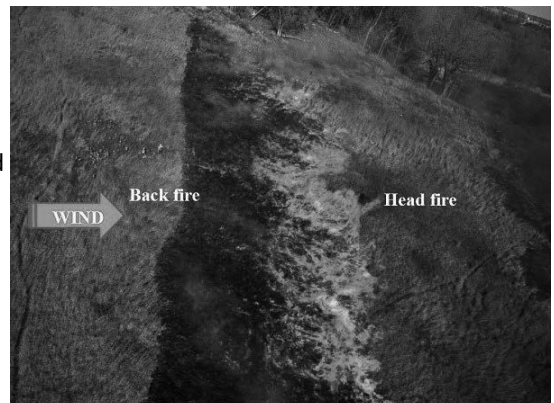
Fire Weather

- Wind
- Precipitation
- Temperature
- Humidity
- Atmospheric Stability



Wind

- Wind speed directs rate of spread and course of fire
- Diurnal
- Effects of canopy
 - Full canopy will reduce winds and rate of fire spread
- Fronts



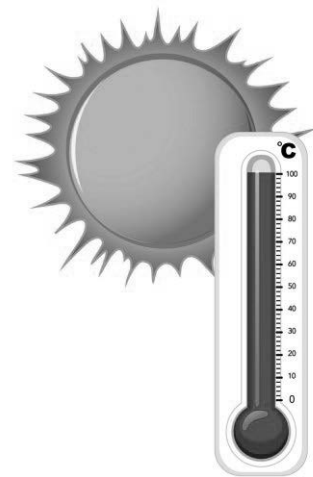
Precipitation

- Length and amount determine fuel moisture conditions
 - Fine Fuels: Reach saturation quickly
 - Large Fuels: Takes longer to reach saturation
- Year to year also important



Temperature

- Temperature effects fuel moisture content
- Warmer = Drier = Hotter fires
- Seasonality



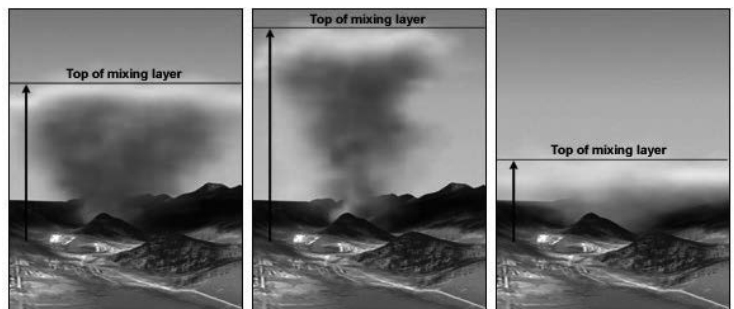
Humidity

- Relative Humidity: Amount of moisture in the air, relative to what the air can hold for a given temperature.
- Rule of Thumb: Every 20 degree increase in temperature reduces relative humidity by 50%,
- Rule of Thumb: Every 20 degree decrease in temperature doubles relative humidity.
- **Extreme burning conditions occur when temperature is high, humidity is low, and high wind speeds.**



Atmospheric Stability

- Ability of air to rise
- Important for smoke management
 - Part of the reason for getting a permit, is to ensure that the atmosphere is sufficiently unstable so as to allow smoke to rise.
- Unstable Atmosphere
 - (Puffy) Cumulus clouds
- Stable Atmosphere
 - (Flat) Cirrus clouds



Possible Landowner Barriers to Burning

- Resources
- Capacity
- Liability concerns
- Lack of:
 - knowledge
 - training opportunities
 - experience



Categories of State Liability Law for Smoke and Fire Escape

- Strict Liability
- Simple Negligence
- Gross Negligence
- Uncertain

- Check local laws!



Reduce Your Liability

- Understand and follow your state's laws. Ex:
 - Providing notice to adjacent landowners
 - a watchperson guarding the fire
 - fully extinguishing the fire
- Have and follow a burn plan
 - Includes having adequate capacity and resources
- Become a Certified Burner (or hire one)
- Obtain prescribed burn insurance
- Increase your knowledge and experience



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Training



**GEORGIA FORESTRY
COMMISSION**

FOREST MANAGEMENT &
CONSERVATION

FIRE PREVENTION &
SUPPRESSION

FOREST
INDUSTRY

HOME > FIRE PREVENTION & SUPPRESSION > PRESCRIBED BURN CERTIFICATION

GFC offers a certification program for those who practice prescribed burning.



Special training is important when preparing to conduct a prescribed burn.



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