Trees & Wildfire in Urban-Suburban Areas:

Management Recommendations for Communities

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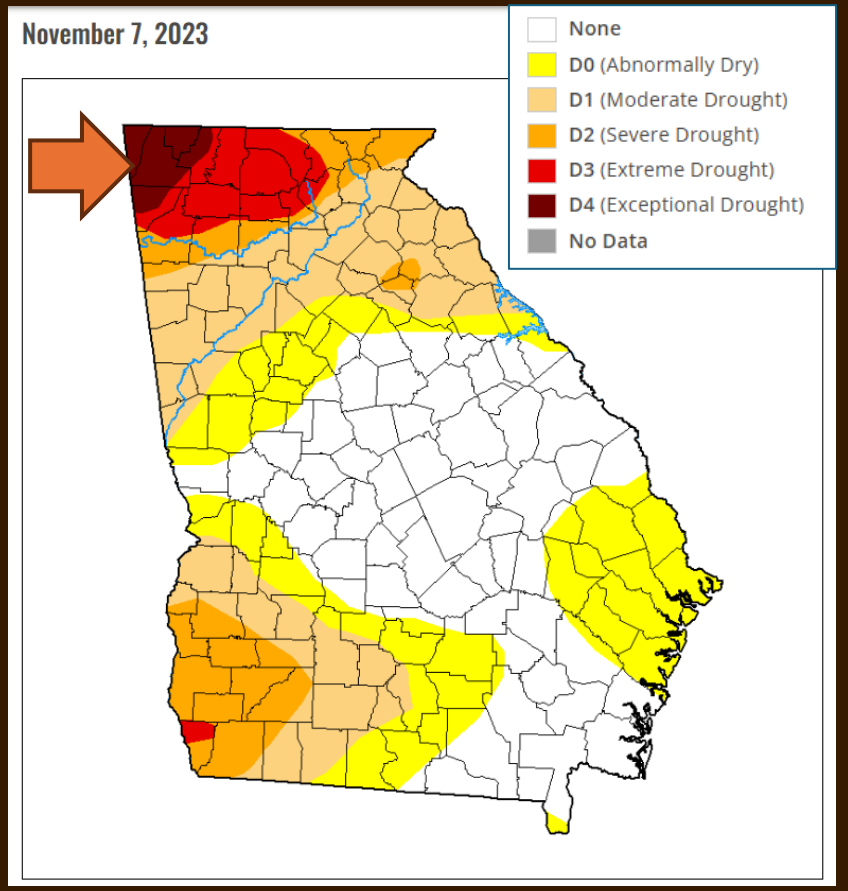
GTC Annual Georgia Tree Conference
Jekyll Island, GA

Florida panhandle, 2022. Credit: Mike Fender

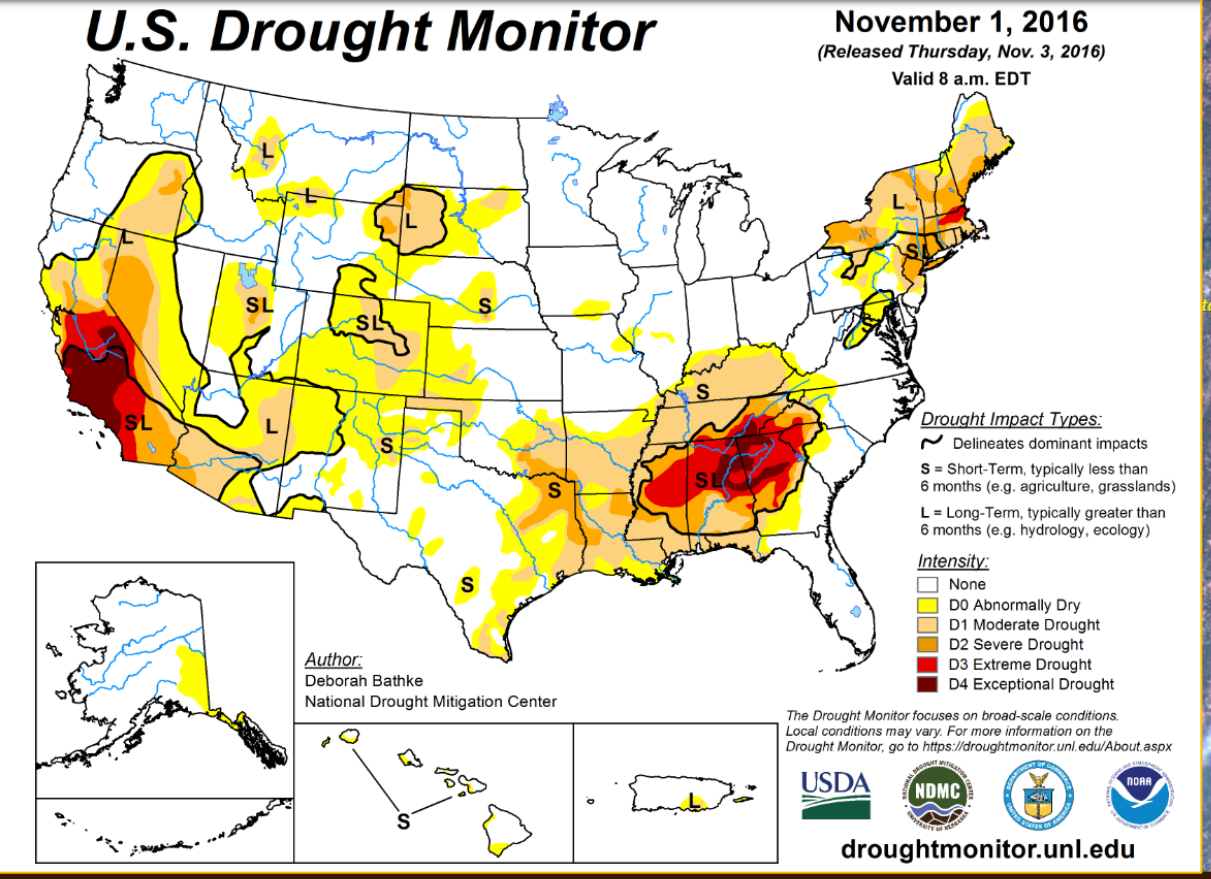
West Mims Fire, Okefenokee NWR, 2017. Credit: NWS

Hold up. Wildfires in GA? That's just a problem out West, right?

700+ acre Walker County wildfire (started by arsonist), Nov 2023. Credit: Walker County, GA



Credit: U.S. Drought Monitor

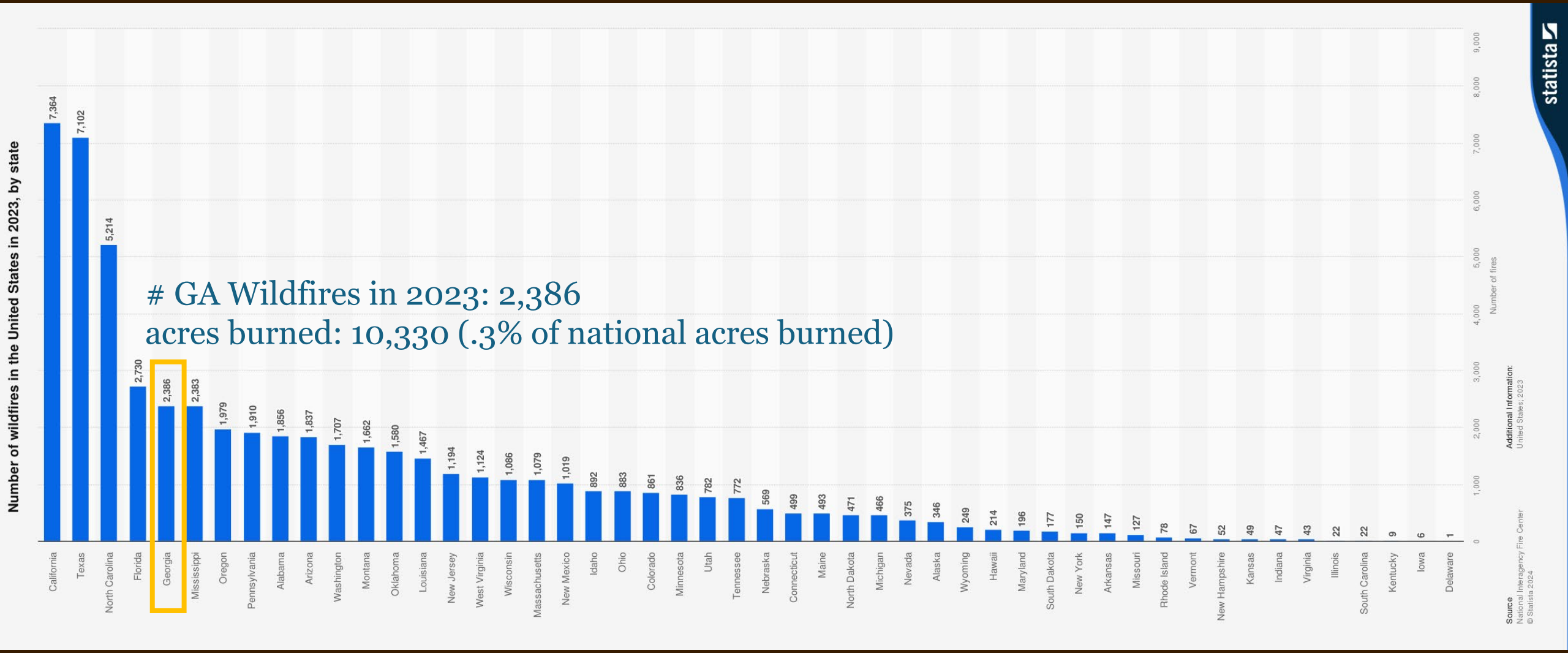


Fall of 2016: Drought led to numerous wildfires in SE, including in GA.

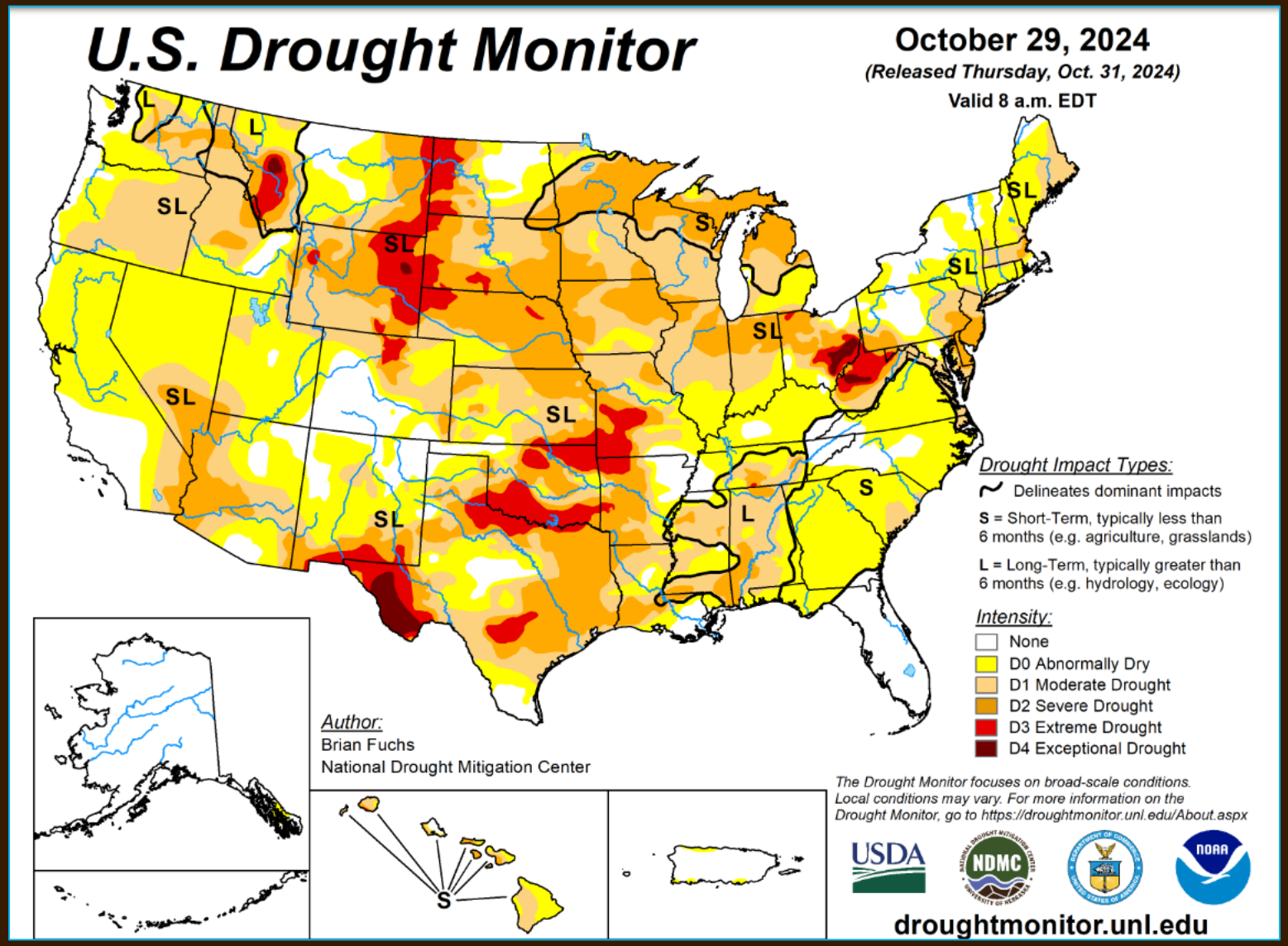
These fires caused loss of life (Gatlinburg), property damage, hazardous air quality, dangerous driving conditions, damaged landscapes, livestock and wildfire injury, and…

…greater awareness that wildfire risk indeed occurs in the SE and GA.

Number Wildfires by State: 2023



Data: National Interagency Fire Center. Figure: Statista



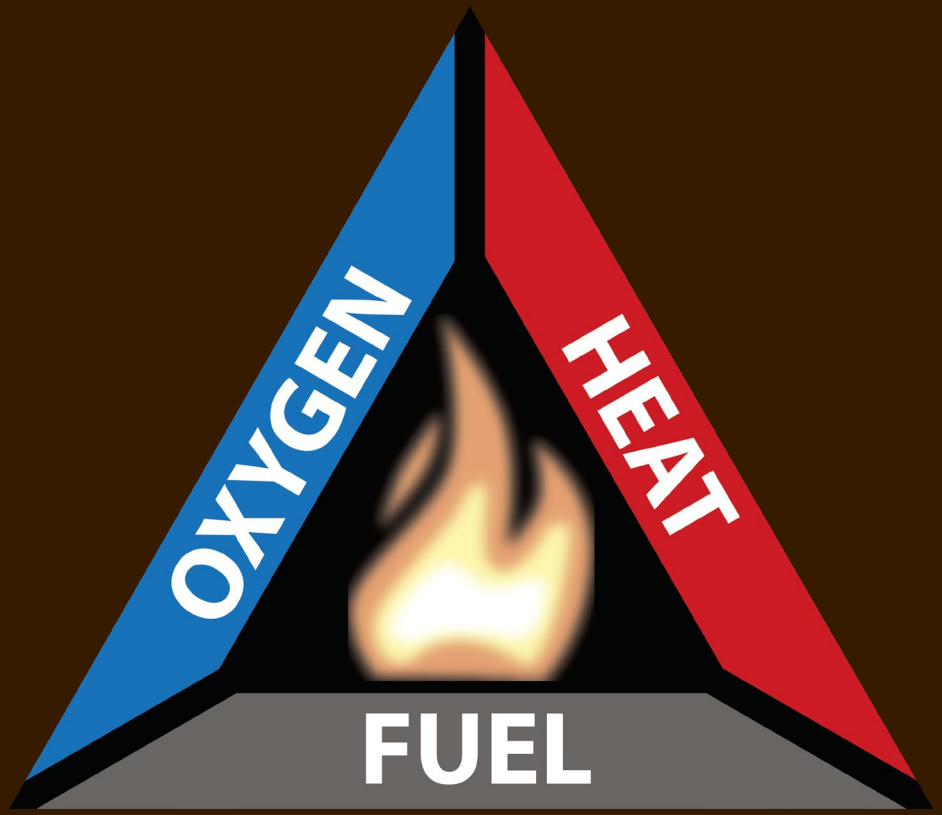
"**Unconstrained exurban and suburban sprawl will further expose human development to weather- and climate-related risks such as wildfire**, hurricanes, floods, intensifying thunderstorms, and tornadoes."

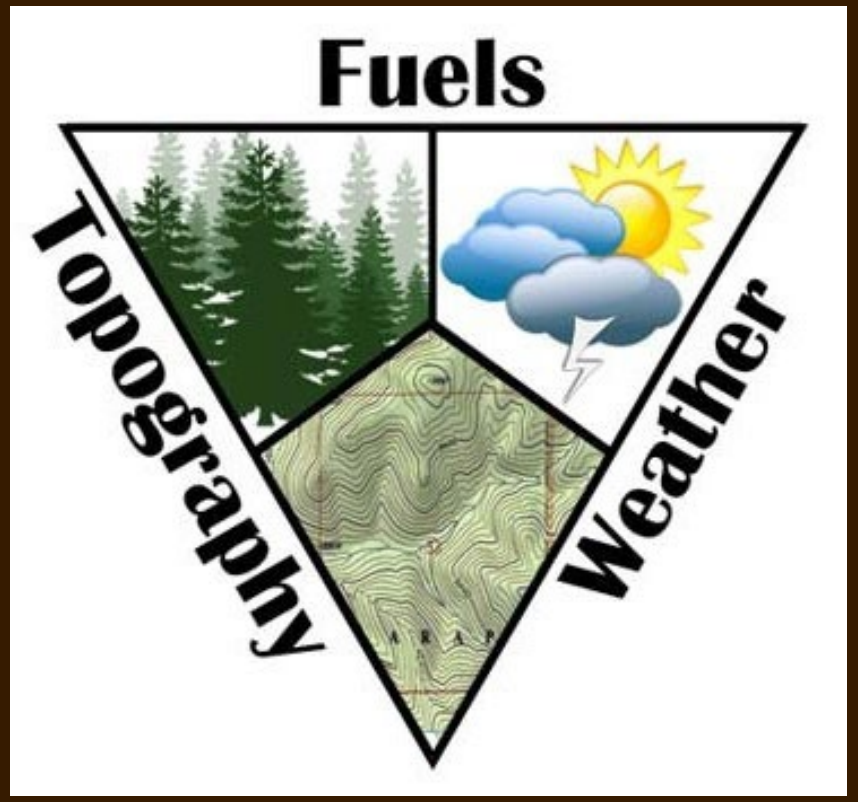
USGCRP, 2023: *Fifth National Climate Assessment*. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. https://doi.org/10.7930/NCA5.2023

Presentation Overview:

- Fire basics
- The WUI
- Southeastern US wildfire risk
- Tree management considering wildfire
- Wildfire Risk Reduction Qualification (WRRQ)

Fire Defined



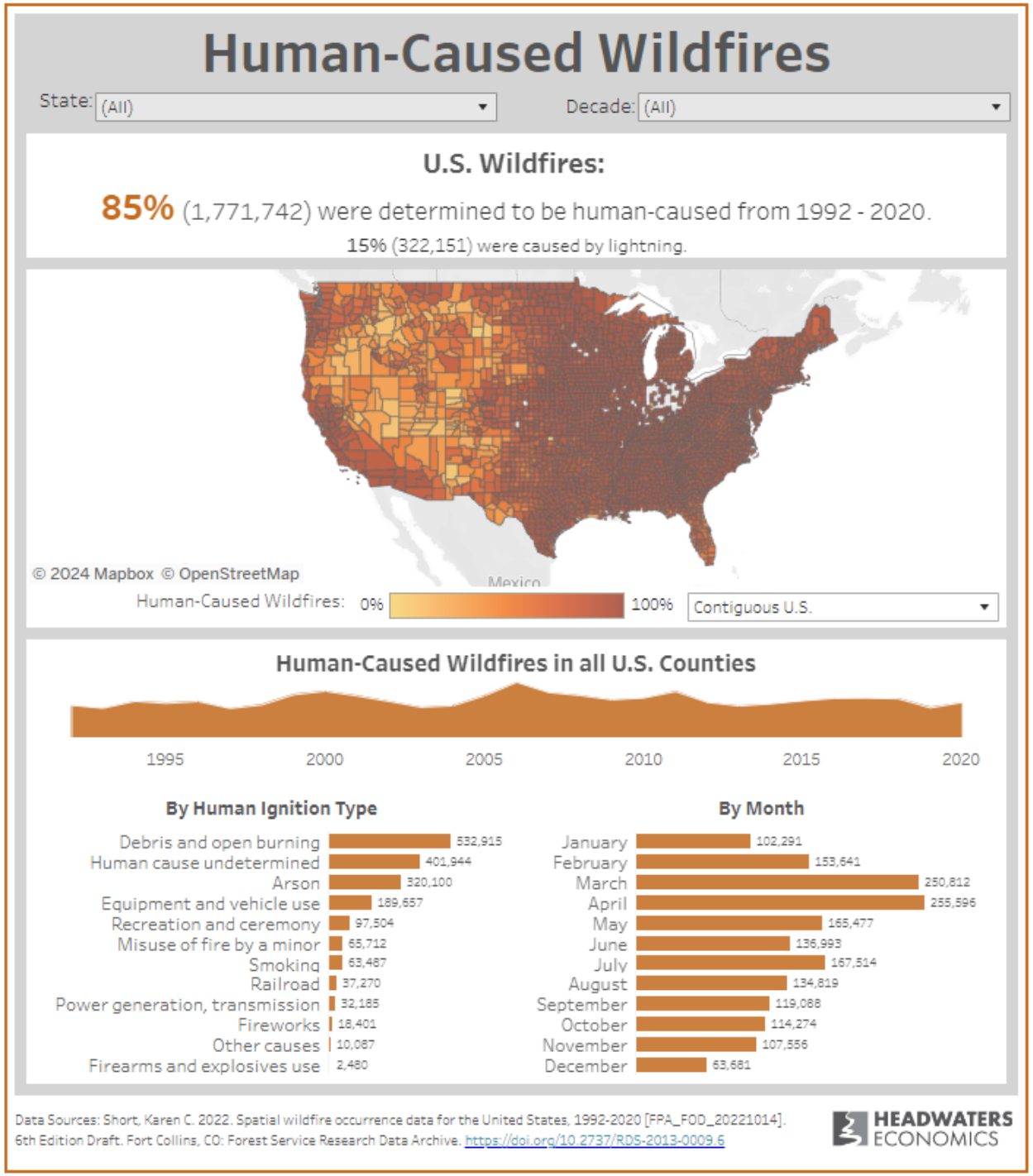


Fire: Combustion or burning, in which substances combine chemically with oxygen from the air and typically give out bright light, heat, and smoke.
Fuel: Anything that will burn

- **Wildfire:** An unplanned, unwanted fire burning in a natural area, such as a forest, grassland, or prairie.

Credit: National Wildfire Coordinating Group, 2023

Approximately 85% of wildfires are caused by humans



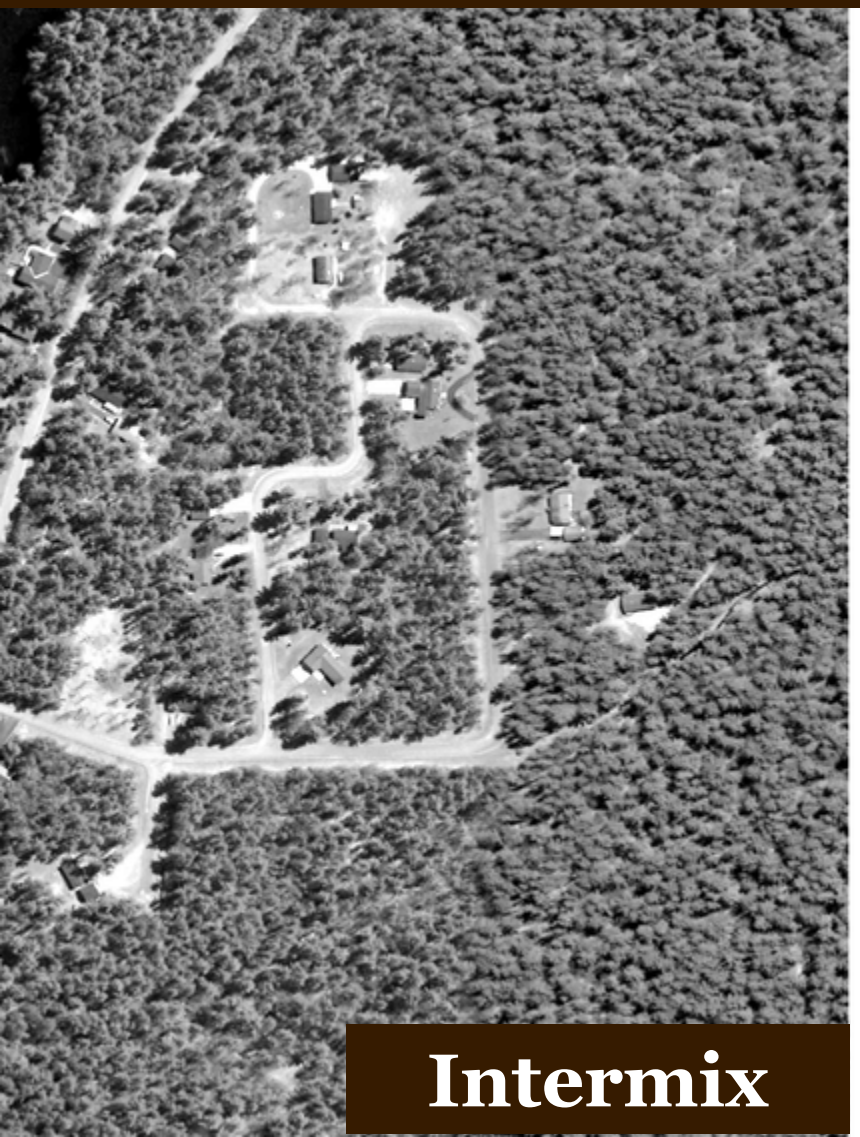
WUI: Wildland-Urban Interface/Intermix

WUI: A zone of transition between unoccupied land and human development. Human-developed landscapes considered to be most at risk to wildfire.

- Interface: structures less than 1.5 miles from land with >75% vegetative cover (that could be susceptible to wildfire) or ≥ 3 structures/acre near this area
- Intermix: area where lower-density housing is mingled with undeveloped wildland with > 50% vegetation cover or ≥ 1 structure/40 acres near this area
- Occluded: structures that are within large parks or forests

- 1/3 of U.S. population lives in WUI
- SE contains states with some of the most houses built in WUI

WUI: Wildland-Urban Interface



Intermix

Interface

Occluded

Why are these areas more at risk?

Credit: Bar-Massada et al., 2014

Visualizing Wildfire Risk in GA

Georgia
1990

Wildland-Urban Interface (WUI)
- Interface
- Intermix

Non-WUI Vegetated
- No housing
- Very low housing density

Non-Vegetated or Agriculture
- Low and very low housing density
- Medium and high housing density
- Water

Contacts

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Data Sources

2020 block geography (US Census Bureau)
2019 National Land Cover Dataset (MRLC)

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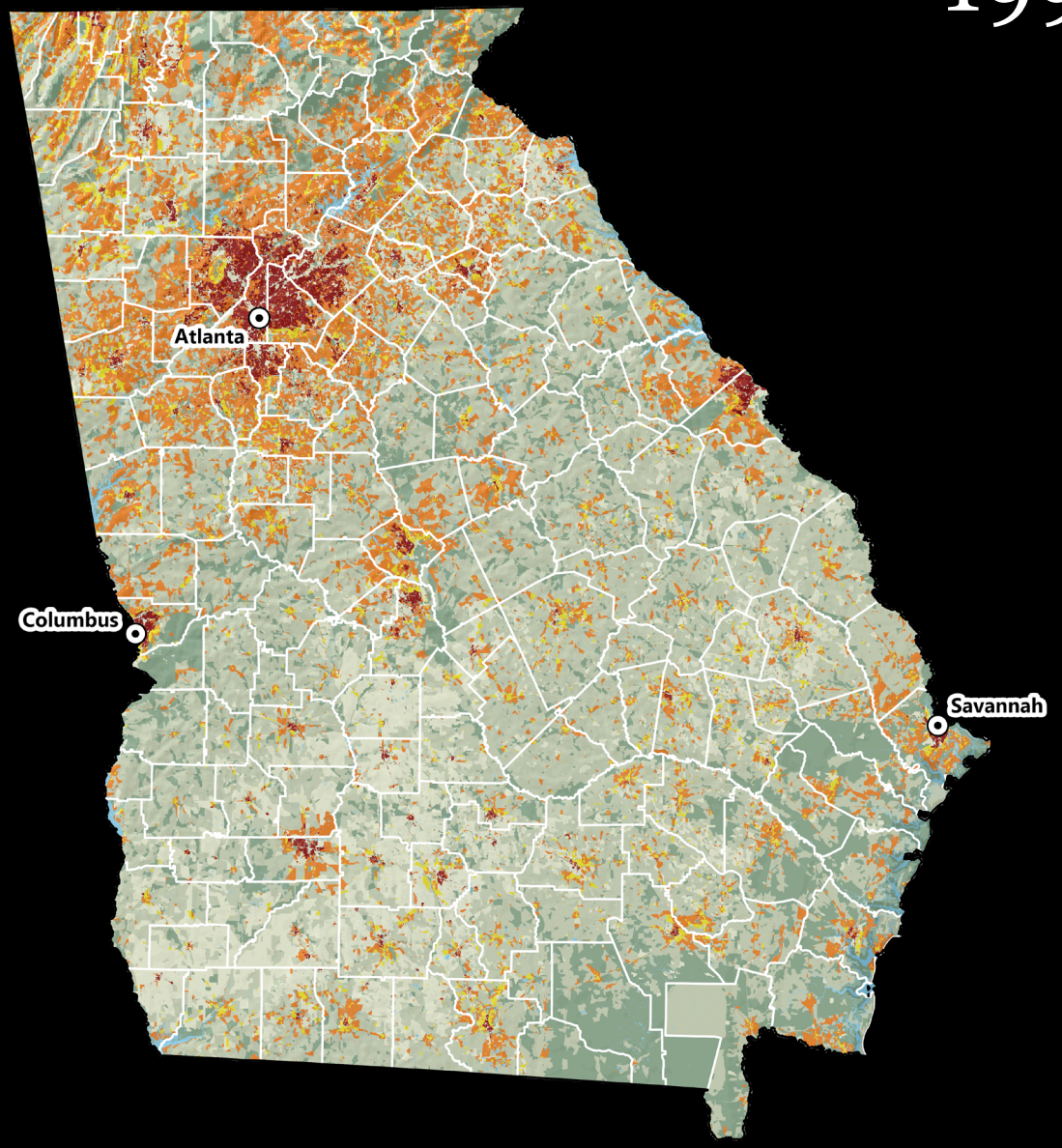

0 50 100 200 km
0 25 50 100 miles

Version 4
SILVIS Lab

Visualizing Wildfire Risk in GA

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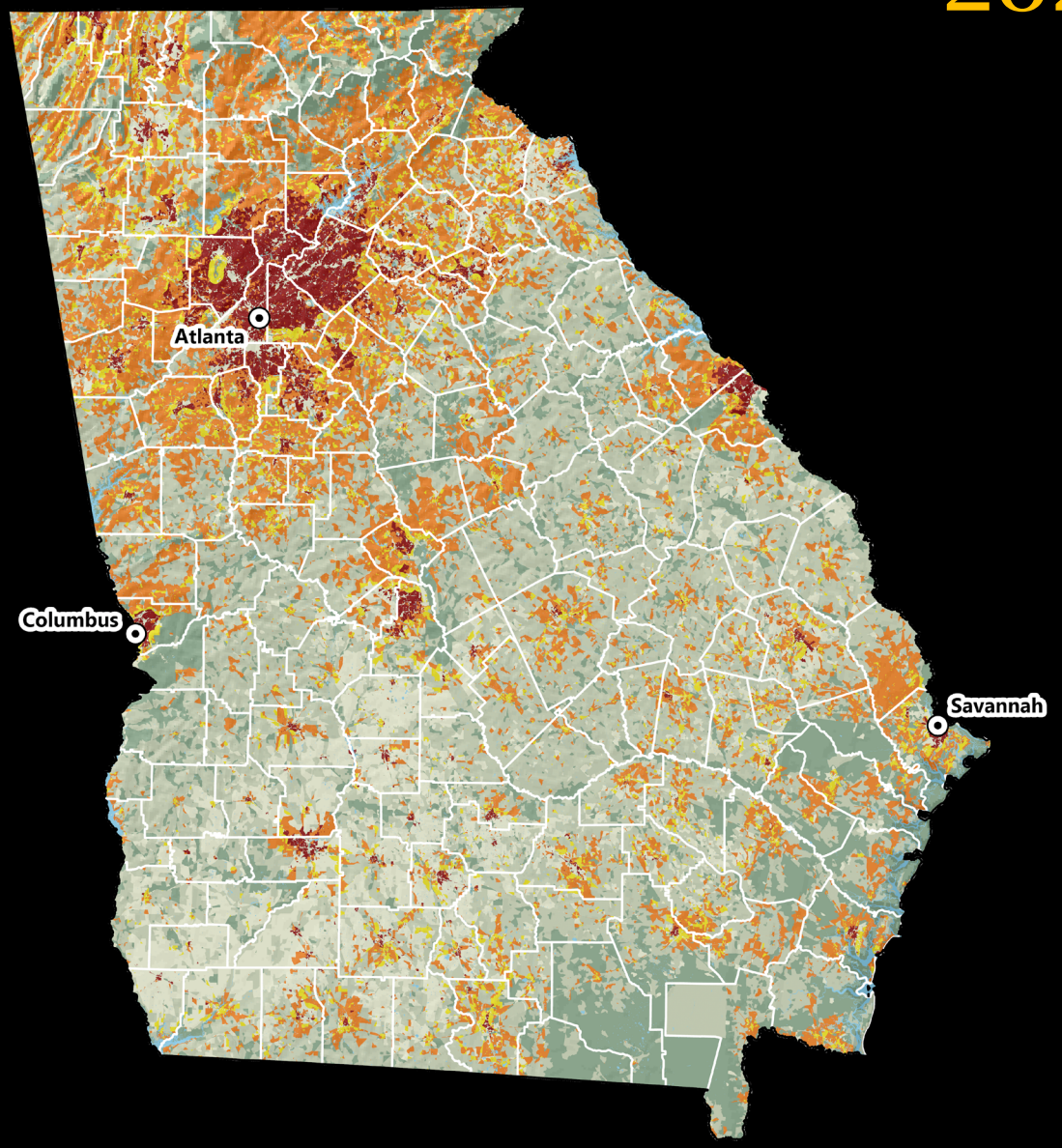

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Wildland Fire in Georgia

Has long been a natural process here


Credit: Frederic Remington

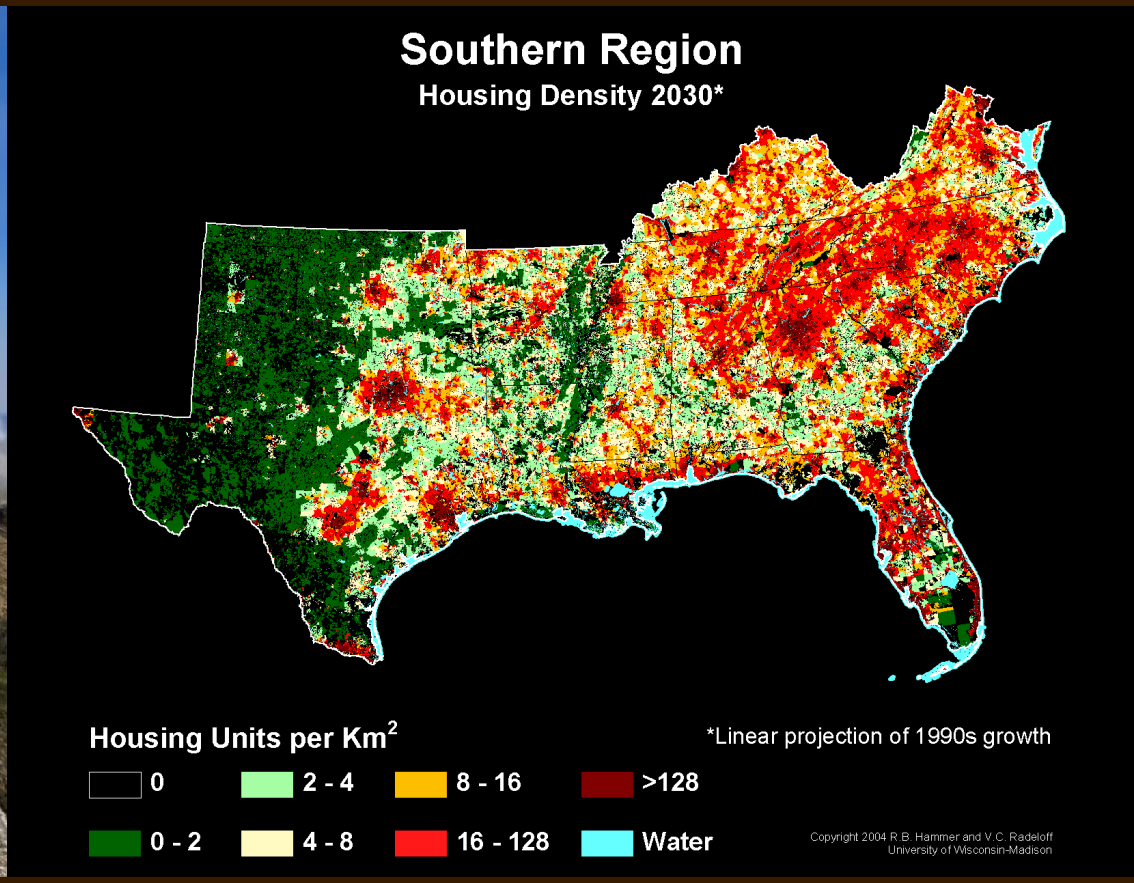

Credit: Holly Campbell


Credit: KDRV.com


Credit: US Forest Service

Wildland fire burning across this landscape leads to a different outcome than…

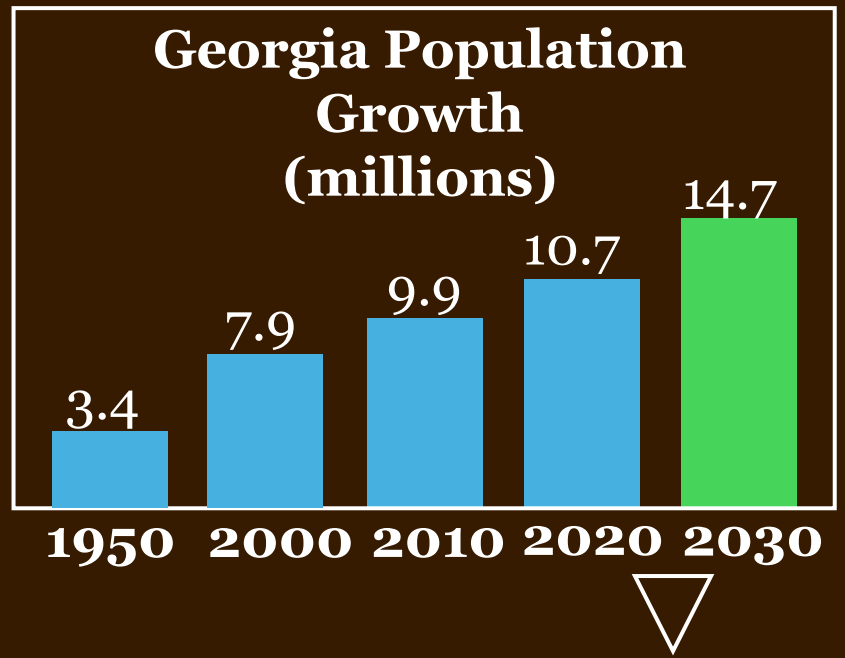
...this landscape, where permanent structures and communities conflict with and limit the spread of wildland fire



Changing SE US & GA Landscapes

Southeastern US forecasted to:

- Develop 30-43 million acres for urban uses by 2060



2023: 11 million
8th most populated state

Sources: Wear and Greis, 2012; 2020 U.S. Census

Wildfire Impacts

- **Wildfires are expensive to manage**
  USFS and DOI budgets increased significantly over decades:
  - $239 million in 1985 to…
  - $3.17 billion spent in 2023
- **Economic impact is high**
  - 1998 Florida fires - $800 million ($1.2 billion in 2018 dollars)
  - Gatlinburg Chimney Tops II Fire (approx. $1 billion in damages)
- **Cost of lives, and more…**

Risk Reductions Actions

Evacuation & Communication Strategies

Other Fuels Reduction in Communities

Herbicide

Mowing & Mulching

Prescribed Fire

Grazing

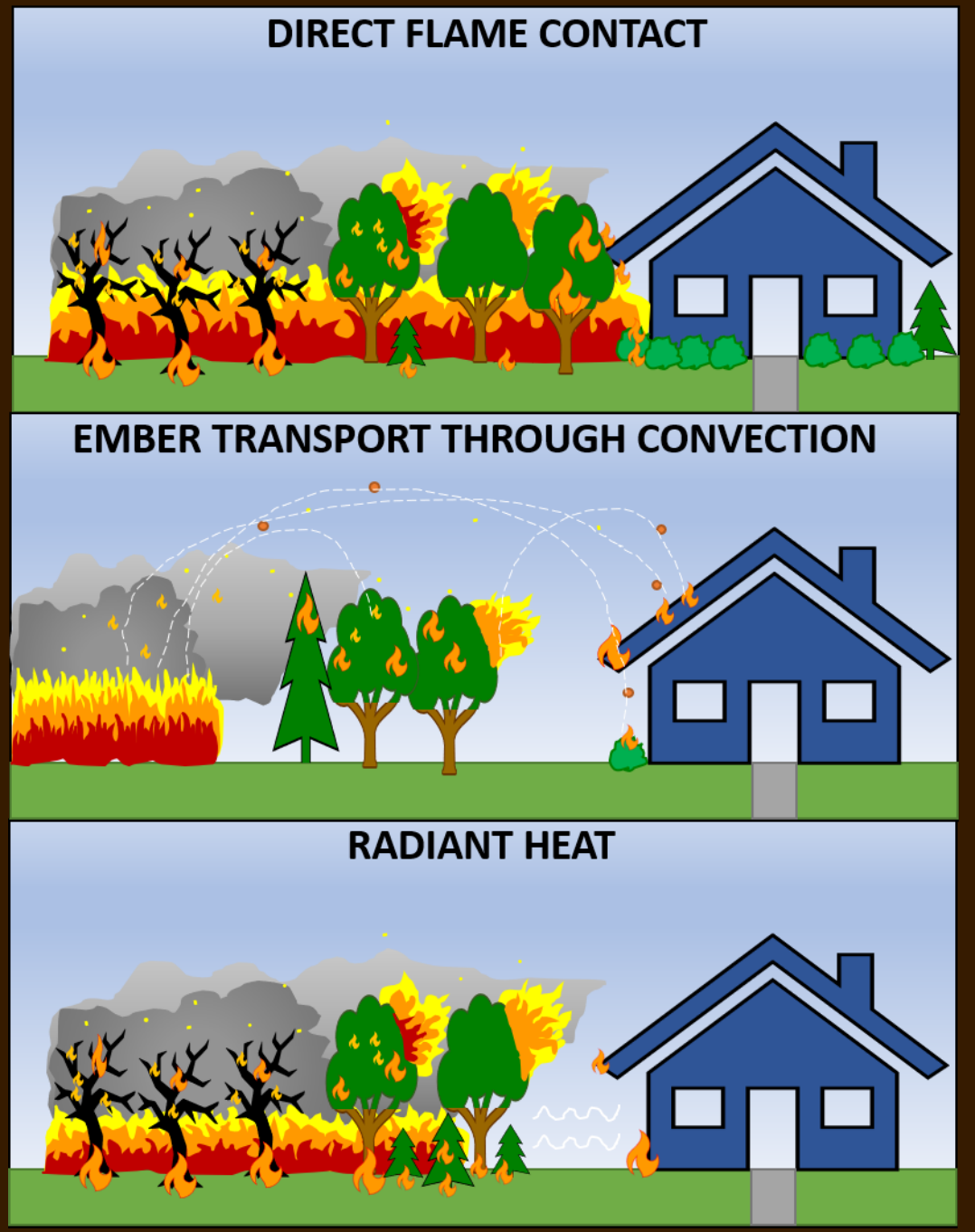
Forest Management

Create & Maintain fire-resilient space 100 ft around structures

Adopt This in a Community/ Neighborhood

Structural Ignition from Wildfires

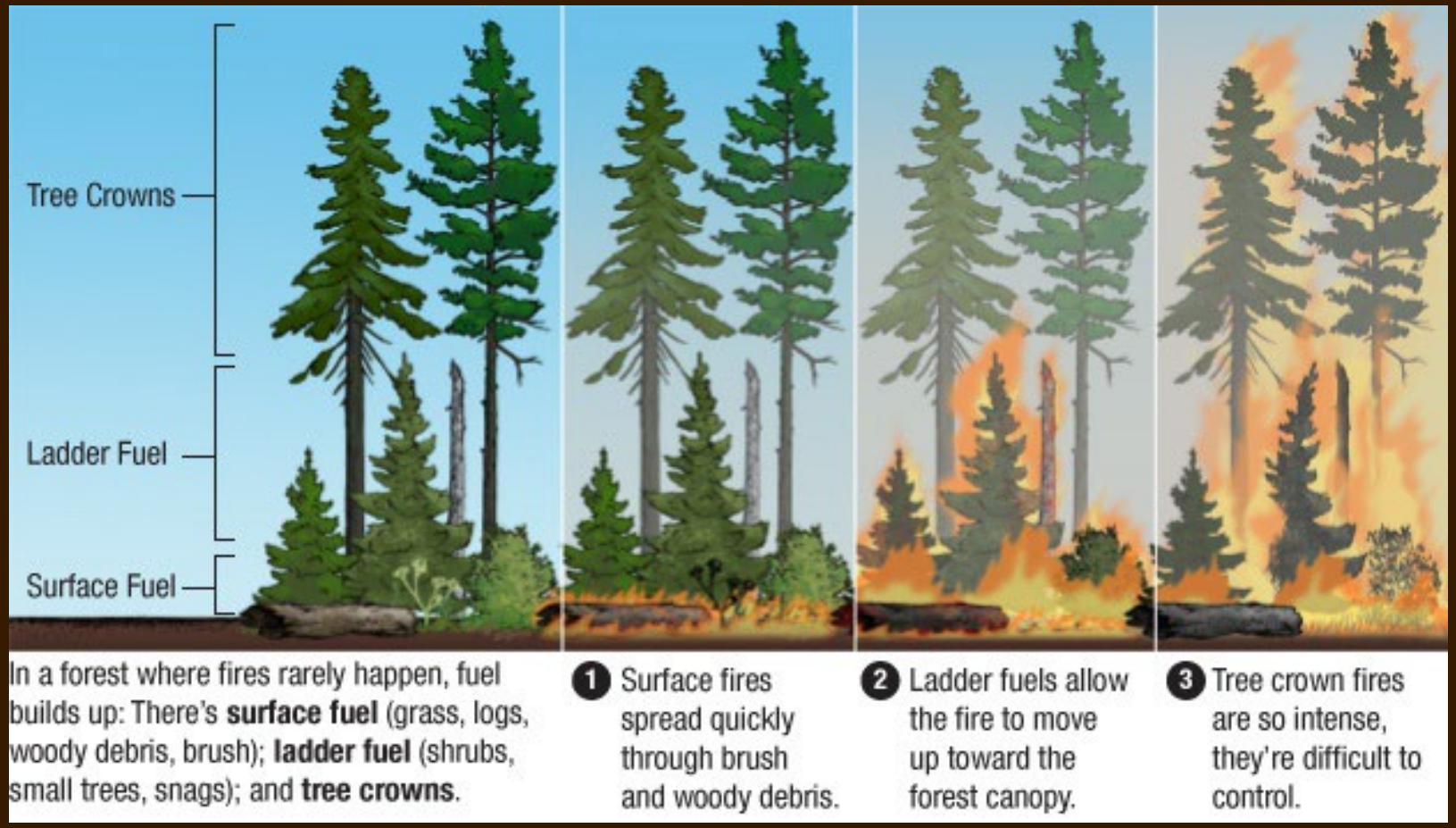
Embers are the #1 way a structure ignites from wildfire



Home Hardening: remove fuels from roofs, gutters, decks, attic/ crawl space vents, etc.

Fire Behavior

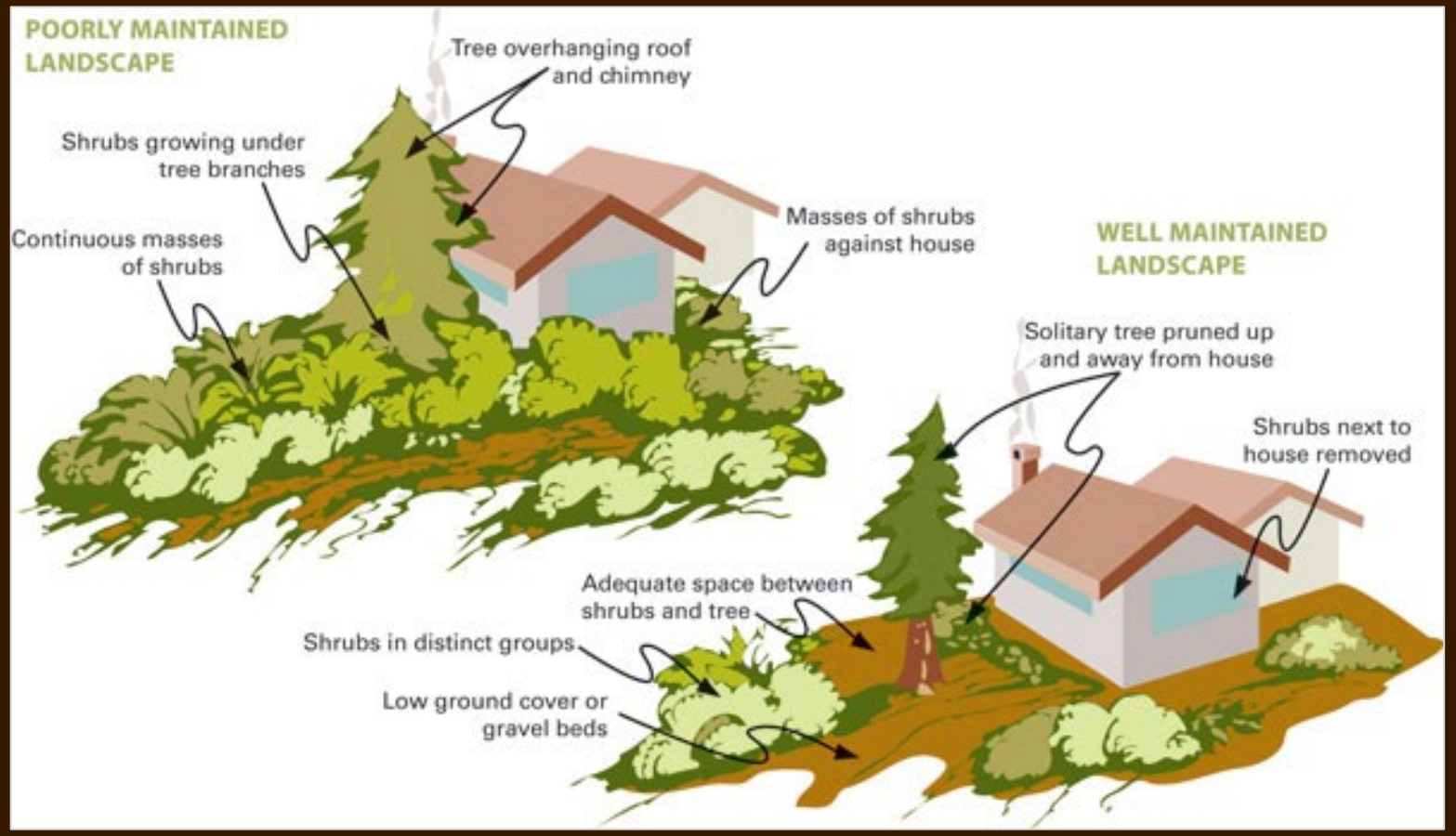
Ladder/Vertical Fuels: can support fire climbing from ground to tree canopy



Better to keep fire "low and slow" (on the ground) and out of trees.

Fire Behavior

Horizontal Fuels: can allow a fire to burn up to a structure



Credit: Utah State University

Fuel break: an area on a landscape that contains non-flammable or low-flammability fuels and can help slow the movement of fire, allowing it to be more readily and safely controlled.

Firescaping

A type of landscape design and maintenance that helps reduce the risk of structural ignition from wildfires by:

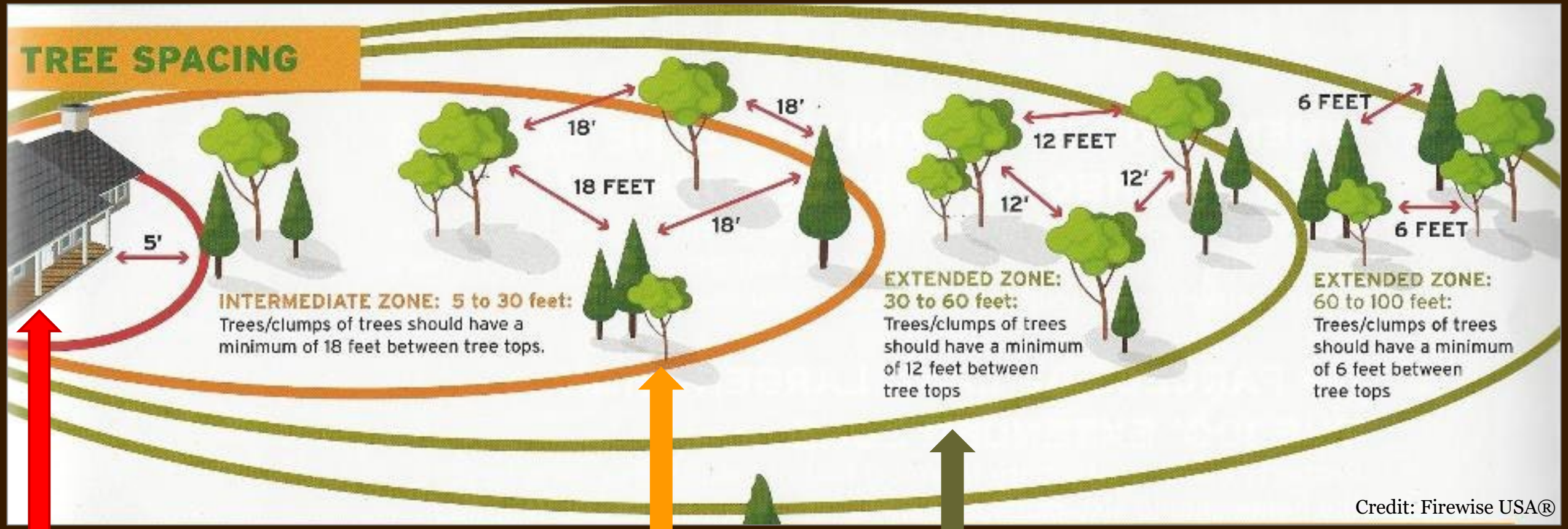
- Modifying existing vegetation surrounding the structure (arranging, spacing, pruning, thinning);
- Prioritizing low-flammability plants and landscape materials;
- Creating fuel breaks; and
- Carrying out seasonal maintenance activities

Synonyms: fire-resilient landscaping, Firewise USA landscaping

Credit: National Fire Protection Association


Credit: Washington State University

Firescaping Design



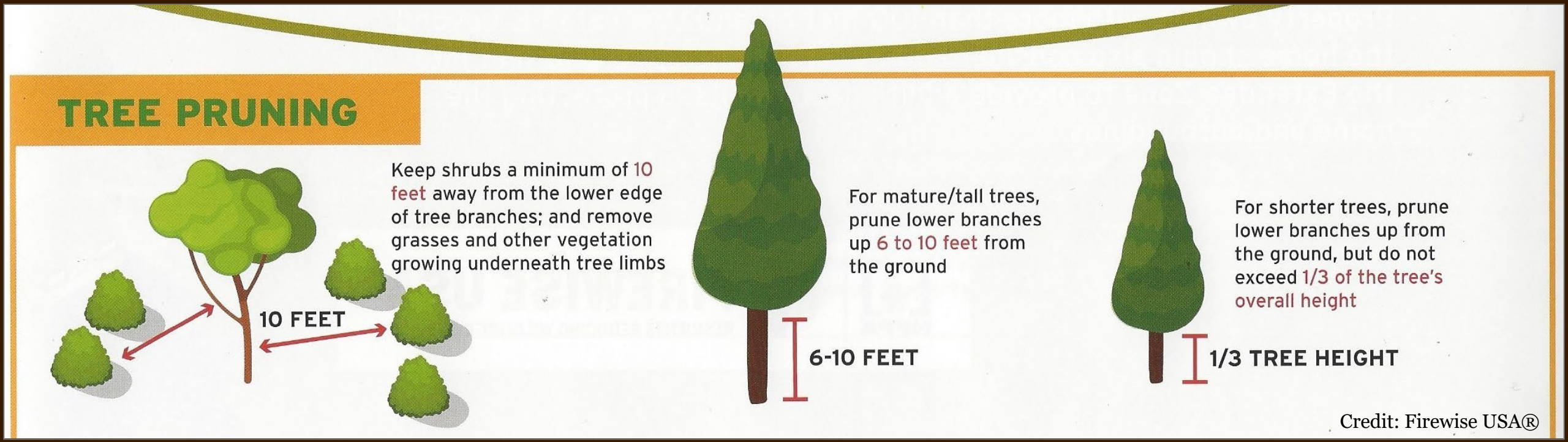
Immediate Zone (0-5 ft):
Trees not recommended

Intermediate Zone (5-30 ft):
18 foot tree spacing

Extended Zone (30-100 ft):
6-12 foot spacing

Tree & Shrub Spacing

- Shrubs ≥ 10 feet from lower limbs of tree
- Prune lower limbs 6-10 feet for tall trees, 1/3 height for smaller trees
  - Maintain 2/3 (approximately 60%) of the total tree height as canopy
- Low flammability species

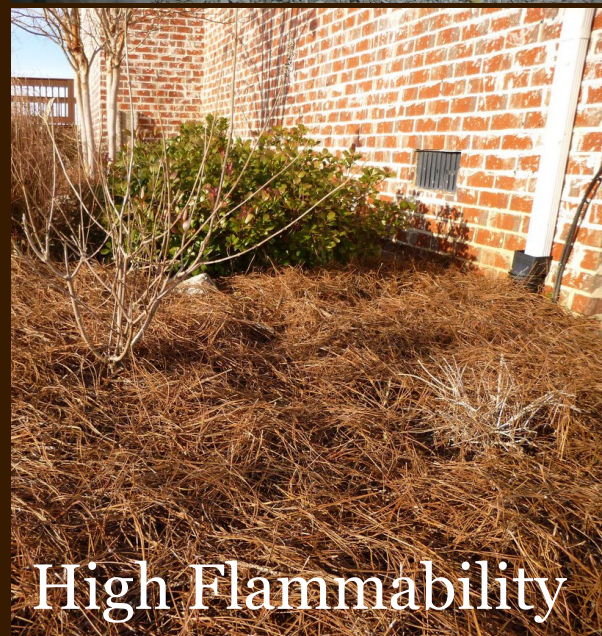


Credit: Firewise USA®

Mulch Can Burn, Too!

MULCH TYPE	RECOMMENDED ZONE
NON-FLAMMABLE	
gravel river rock lava rock decomposed granite pavers	0-5 feet from structure/Immediate Zone
FLAMMABLE/ ORGANIC	
Low flammability	
garden compost composted wood chips shredded bark*	5-30 feet from structure/Intermediate Zone
Moderate flammability	
pine bark nuggets wood chips	> 30 feet from structure/ Extended Zone
High flammability	
pine straw wheat straw shredded evergreen mulch rubber mulch	Not recommended or as far from structure as possible/ far edge of Extended Zone

Source: Zipperer et al., 2007; Quarles & Smith, 2011; Rogstad, 2014



Emergency Access

- Recommended driveway width and slope:
  - (≥ 12 feet wide)
  - slope (≤ 12%)
- Clear driveway:
  - canopy raised to ≥ 13.5 foot clearance above driveway
  - trees pruned 10 feet on both sides of driveway
- Driveway width and design to accommodate emergency vehicles
- Clearly marked house number, street signs, neighborhood sign

Sources: Firewise USA® &
University of Nevada Cooperative Extension *Living with Fire*

Communities, Arborists, & Urban Foresters Can Play an Important Role in Decreasing Wildfire Risk

New Georgia Training

- **Wildfire Risk Reduction Qualification (WRRQ)** training (offered through GAA)
- January 2024: “Train the Trainer" course (Marietta, GA)- GFC employees, GAA board members, and others
- June 2024: 23 arborists (Gainesville, GA) The next class will be January 8-9 in Rome, Georgia. (more details to follow
- Next Training: January 8-9, 2025 (Rome, Georgia)

Credit: Jessie McClellan

Resources

Firewise USA:

https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA

Living with Fire:

https://www.livingwithfire.com/

Insurance Institute for Business and Home Safety- Wildfire Resources:

https://ibhs.org/risk-research/wildfire/

Knowing your wildfire risk:

https://wildfirerisk.org/explore and https://www.southernwildfirerisk.com/

Community Tree Care in Wildfire-Prone Landscapes (Campbell & Gordon, 2022):
https://resources.ipmcenters.org/resource.cfm?rid=36456

Preparing for Wildfires with Firescaping (online training developed by Holly Campbell):
https://nick.ugaurbanag.com/course/view.php?id=9

Wildfire Risk Reduction Qualification (WRRQ) in Georgia: https://www.georgiaarborist.org/wrrq

Thank You!

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