

# Bridging the Gap

*Between new technology and application deployment*

**Dr. Cynthia West, Director – Office of Sustainability  
and Climate  
U.S. Forest Service**

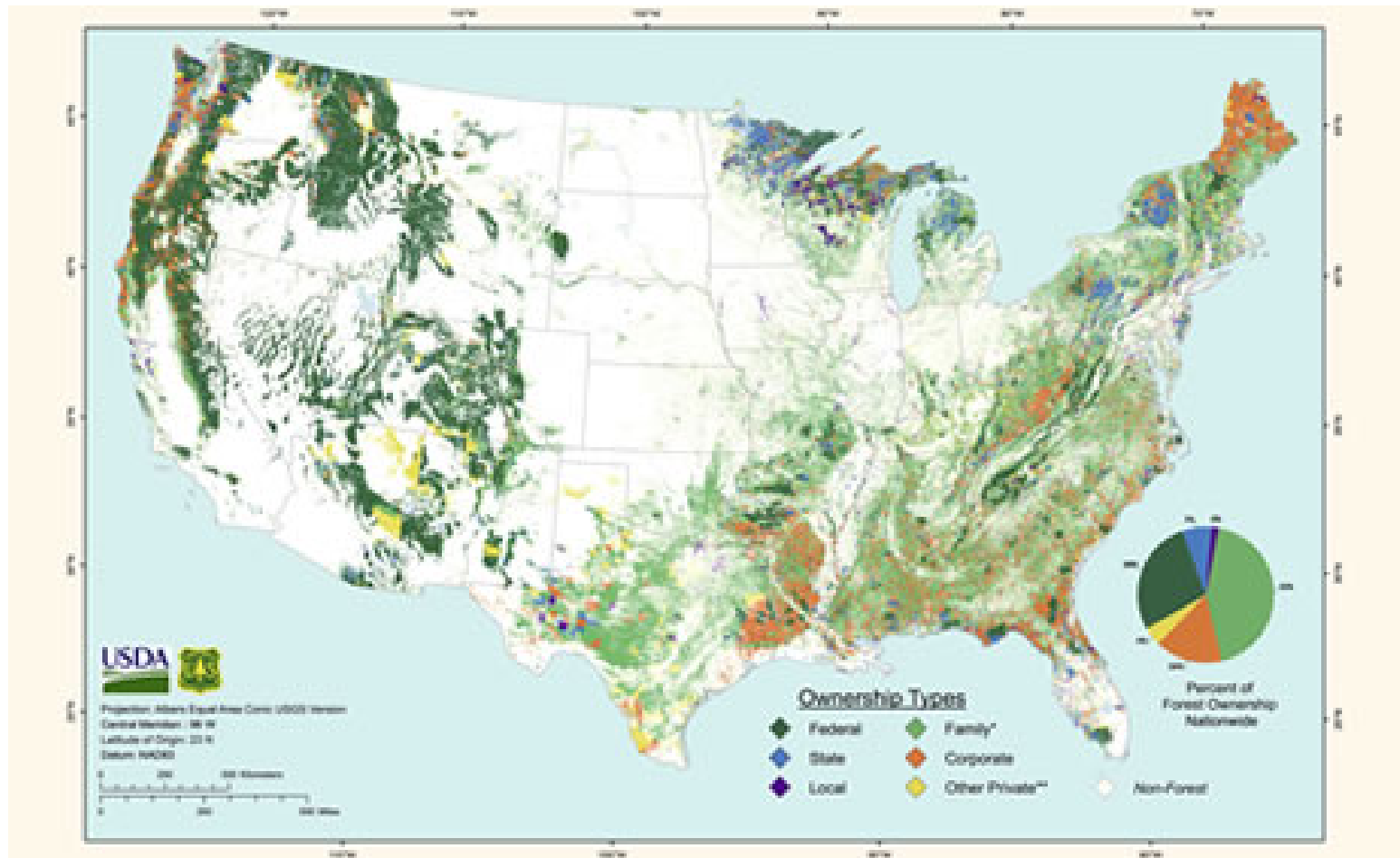


# What we do

- 193 million acres
- 500 million acres
- 57,000 miles of trails
- 4,300 campgrounds
- \$18 billion



# Forestland by Ownership



# The Forest Service Mission

- To sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations.

*“Caring for the land and serving people”*

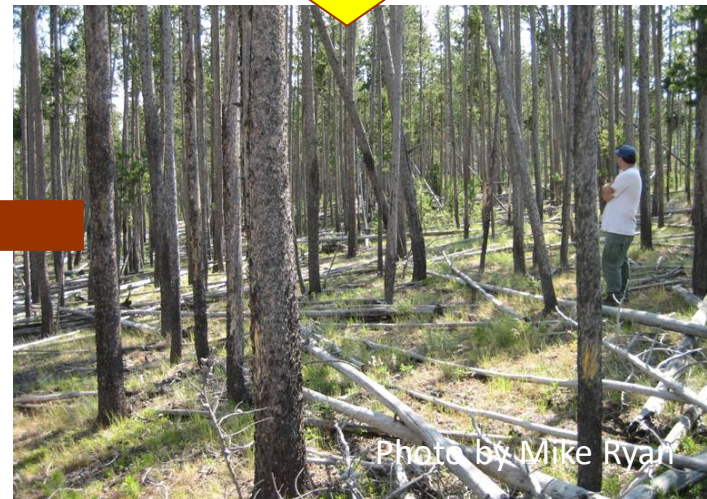
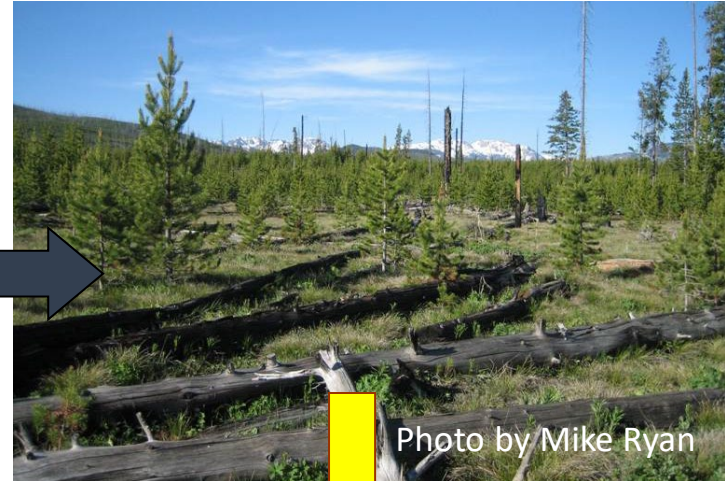


**Nature Provides** *clean air and water and healthy soil from wildlands to urban settings.*



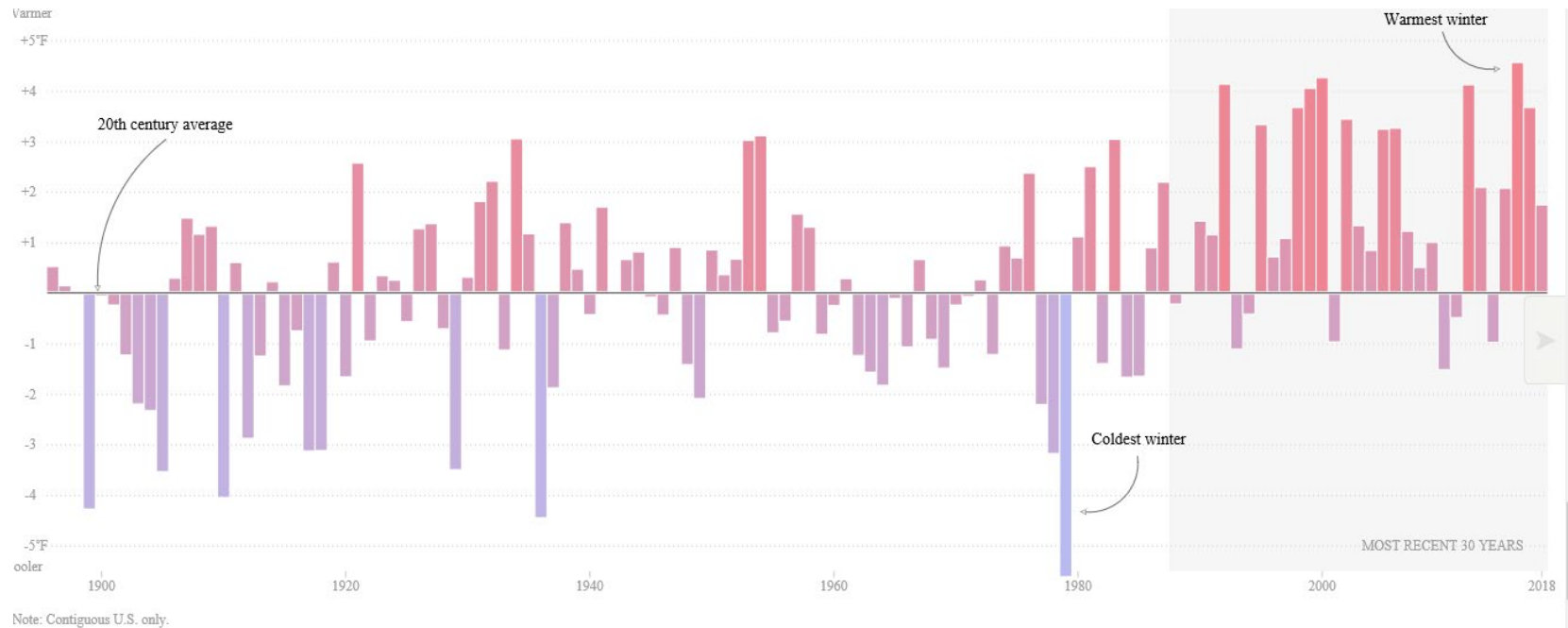


# Natural Process



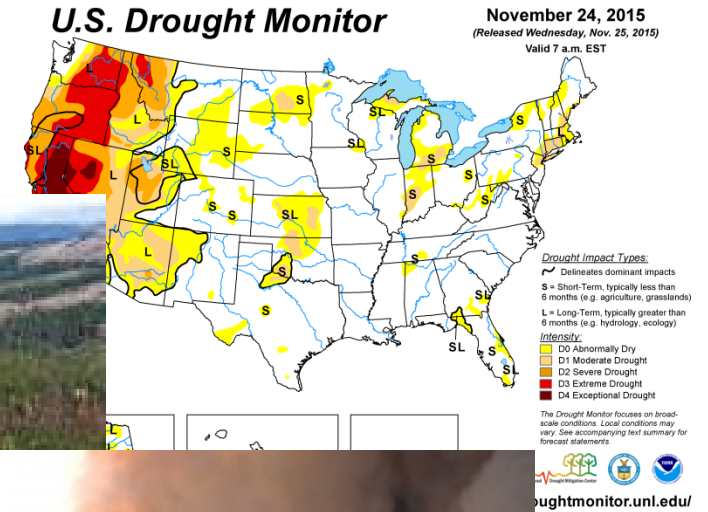
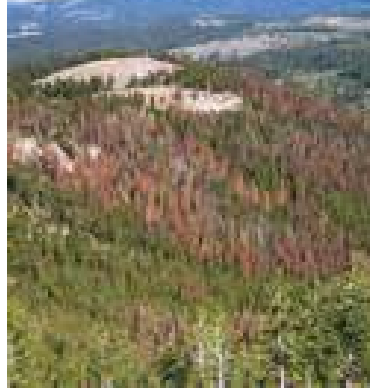


# Our warming world

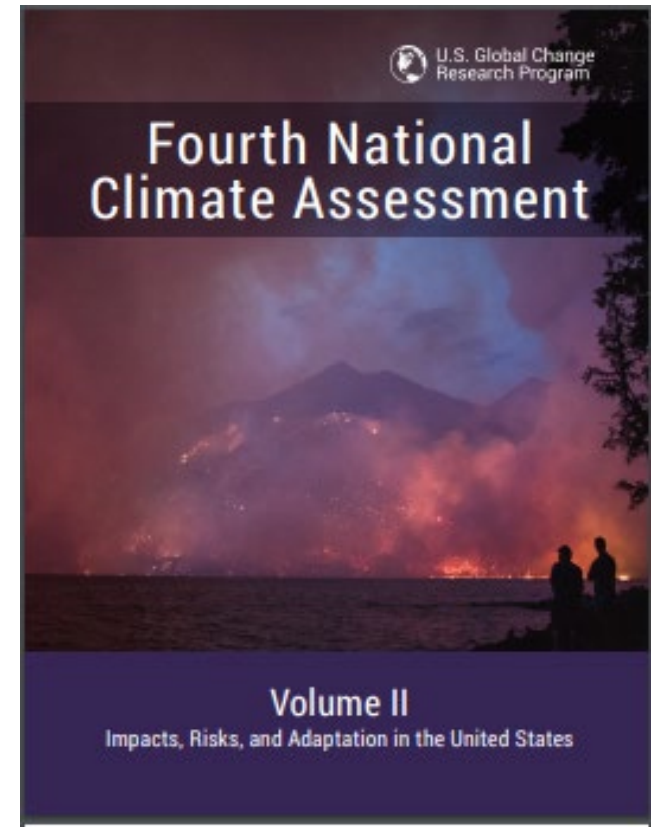
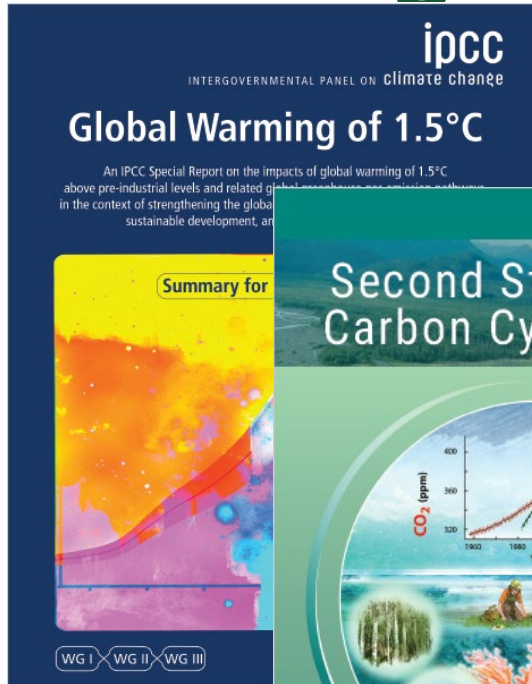




# Disturbance

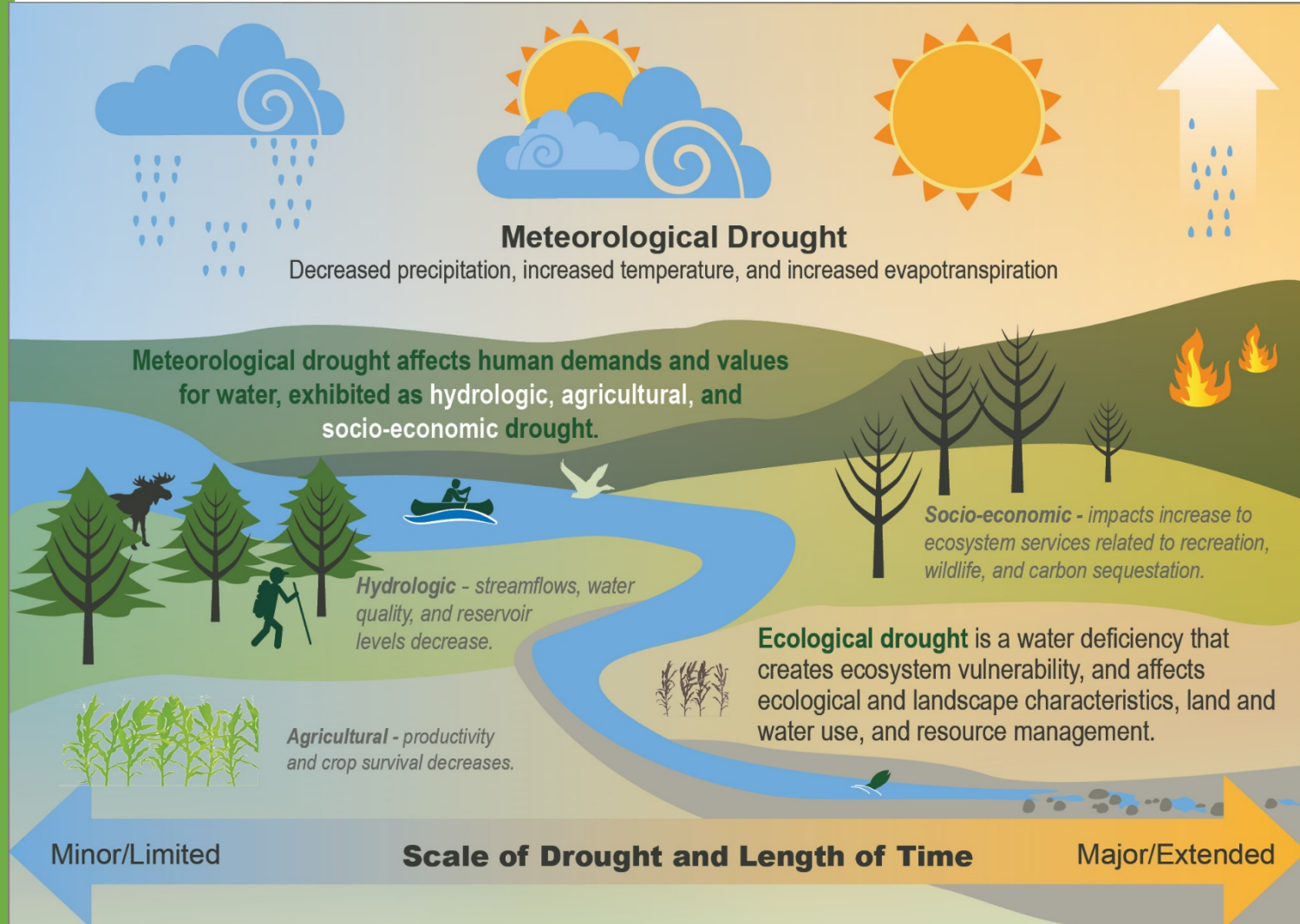
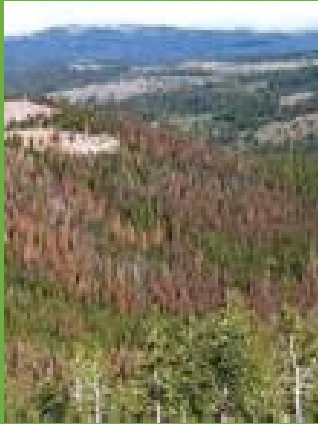


# Change is happening now



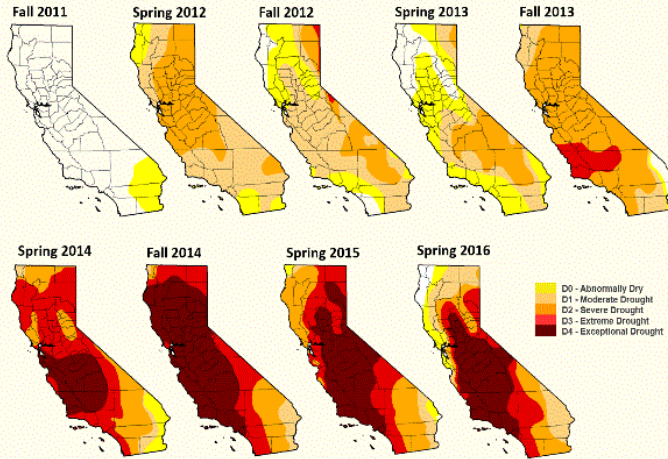


# Drought across a landscape



# California Drought Impacts on Public Forests

## Drought Progression

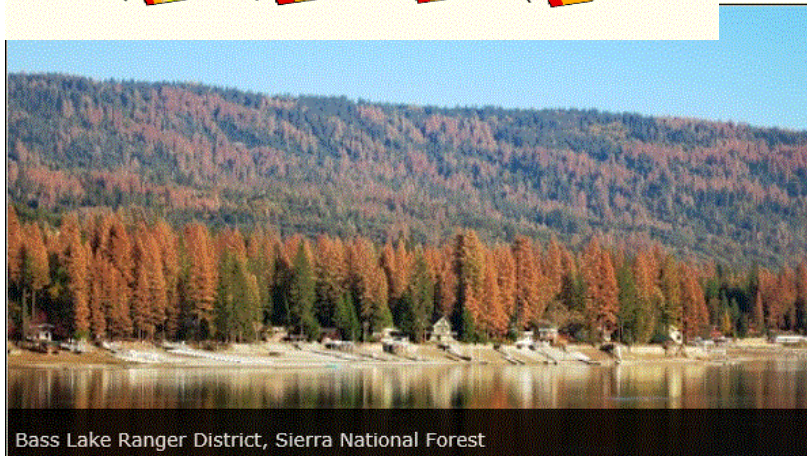


## Water values from public lands:

- Public lands provide 50% of CA water supply
- Estimated water value: \$9.5 bill./yr.
- Supports \$40 bill./yr. of commodity production

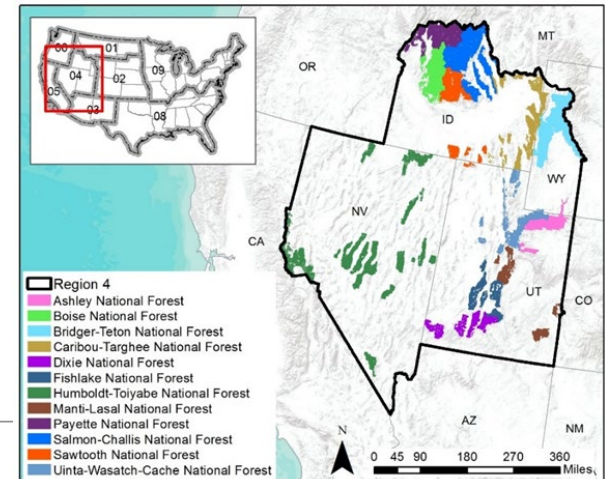
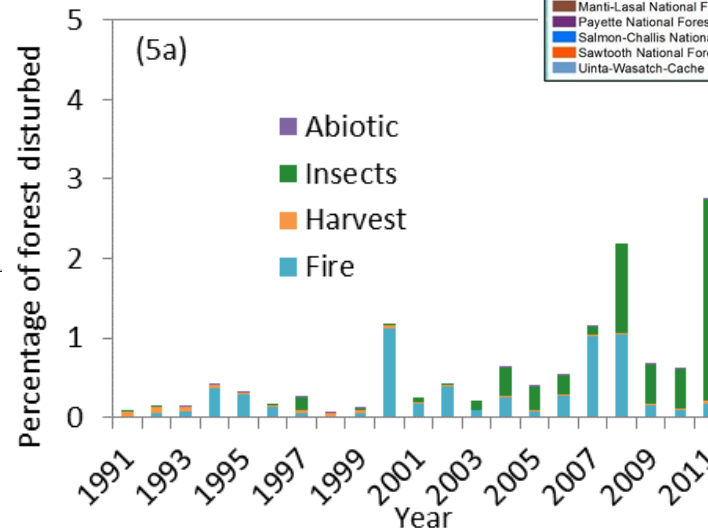
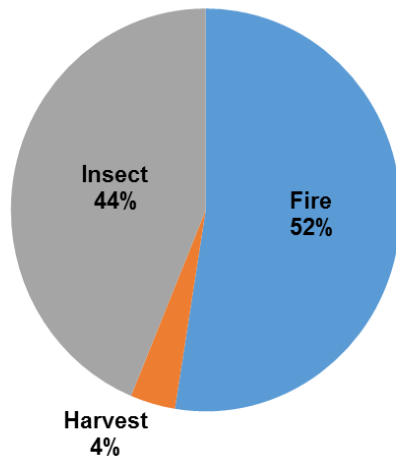
## Risks:

- High mortality forests supply 60% water to central valley for irrigation
- 129+ mill. dead trees are highly flammable
- High risk to water supply from mudslides following fire



# Impacts of climate driven disturbance

Effect of Different Disturbances, 1990-2011, on Carbon Storage in the Intermountain Region





# What do forest managers need?

- Just in time change detection in forest cover to guide changes in policies and practices
- Forest soil moisture detection to guide restoration decisions
- Early warning system for drought stress to prioritize treatments
- Changes in snowpack to guide annual water management and adaptation practices
- Streamflow to guide water management
- Range productivity changes to guide herd and range allotment



# Smart Forests for the 21<sup>st</sup> Century



USFS Smart Forests

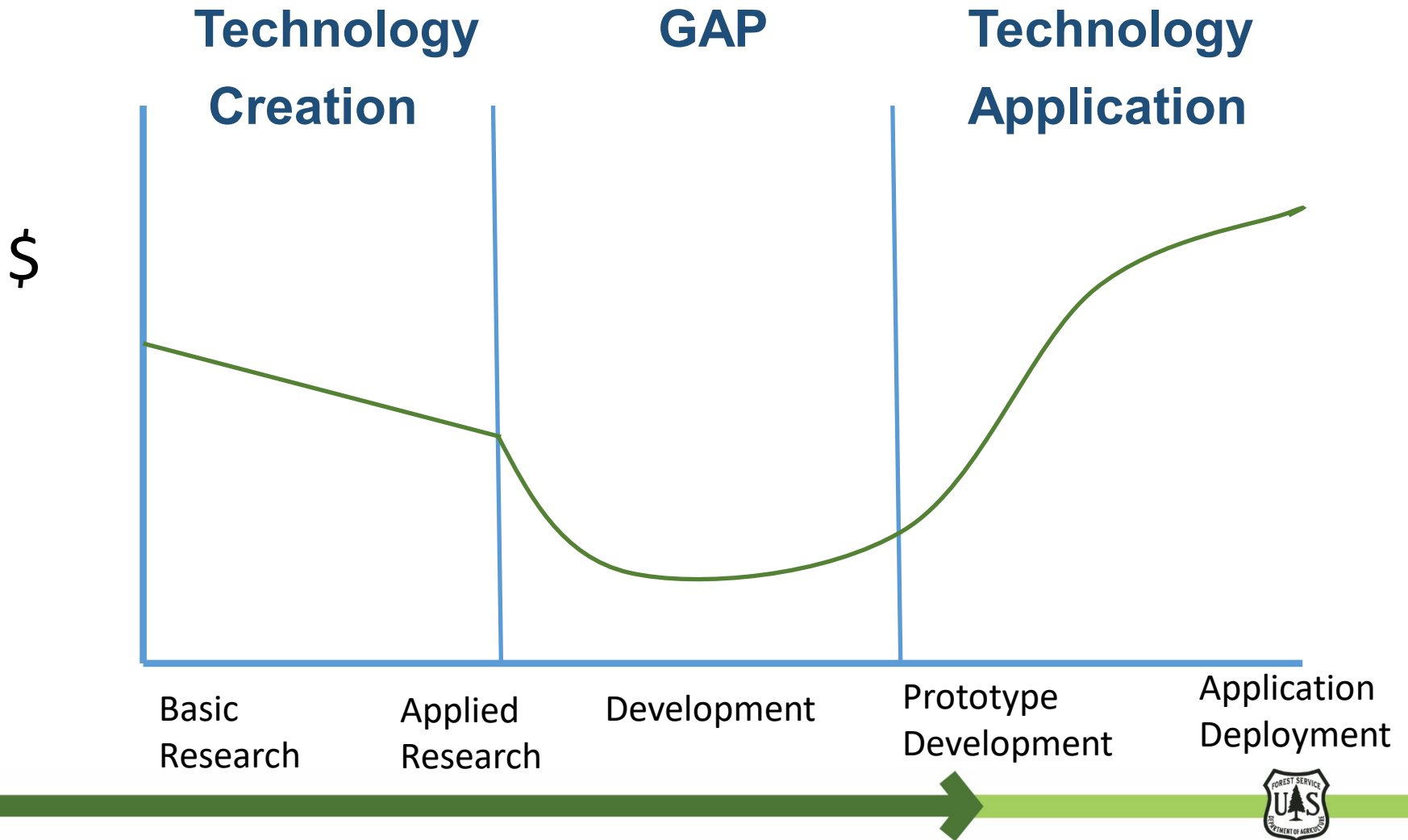


# Experimental Forests

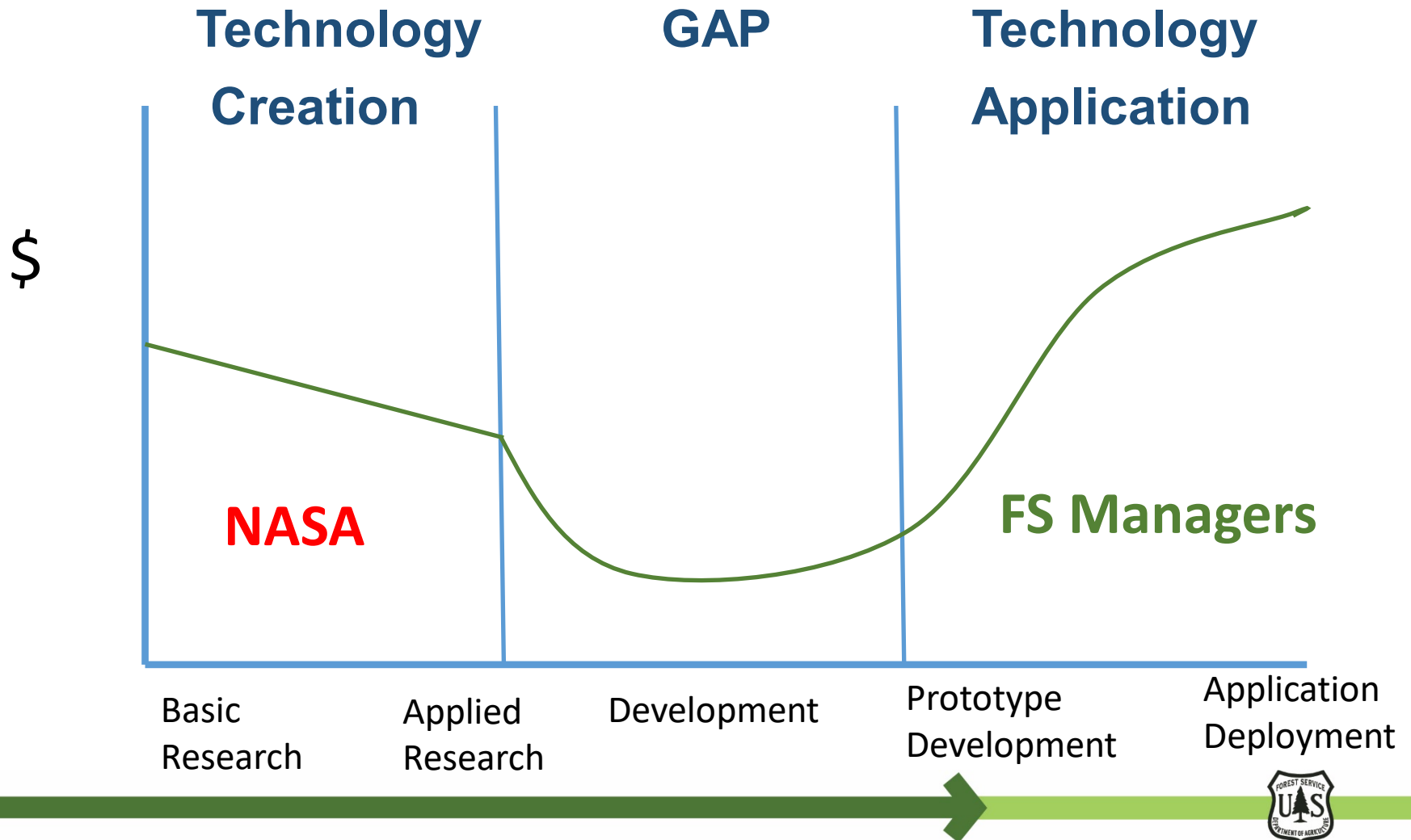
- Supported by Forest Service Research
- Long-term program
- Variable focus and infrastructure, gauged watersheds
- Some on-line soil moisture data available (e.g. Smart Forests, LTERs)



# Bridging the Gap

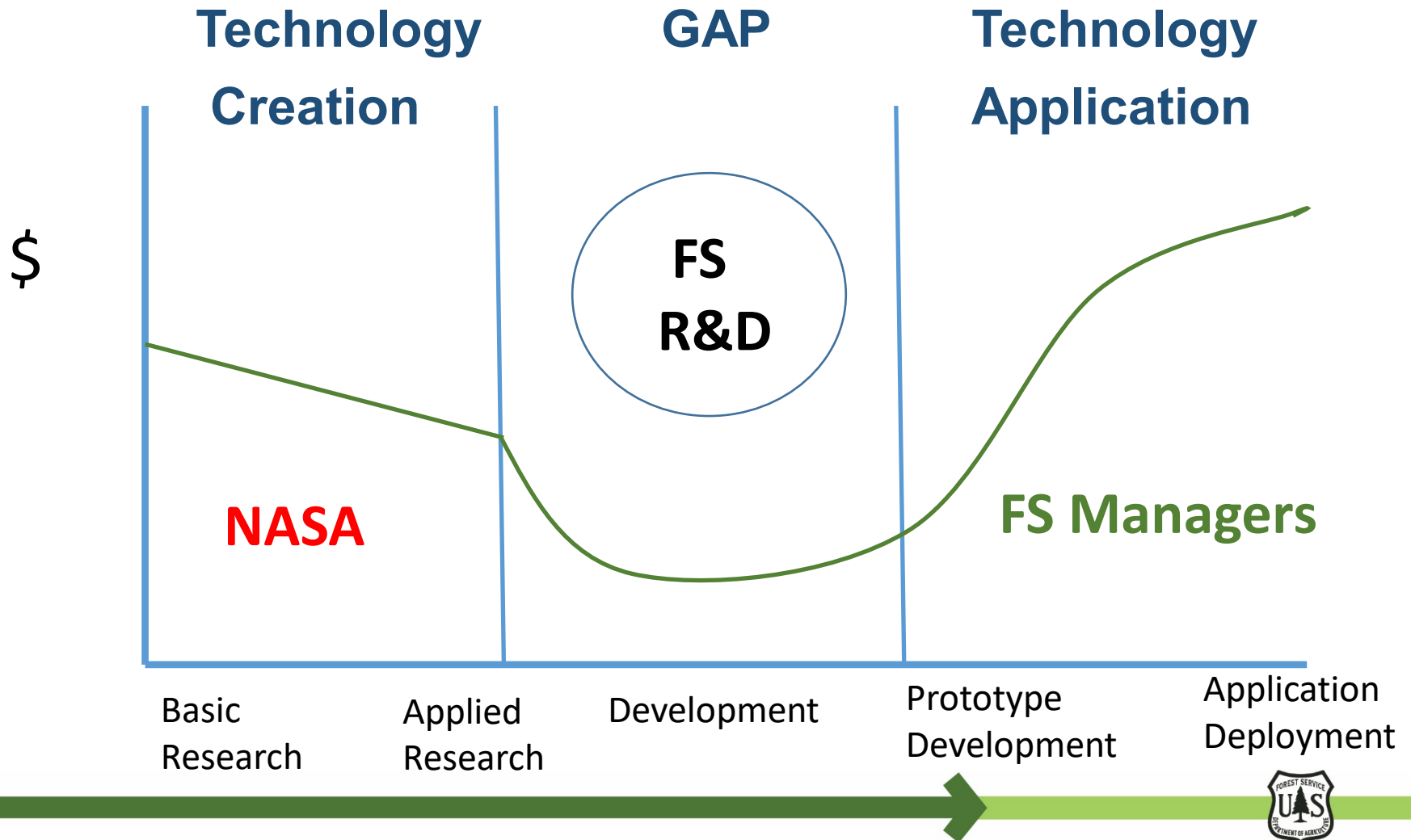


# Bridging the Gap





# Bridging the Gap



# Goal: Resilient forests





