



13th Meeting of the International Pest Risk Research Group
3-6 September 2019, Poznań, Poland

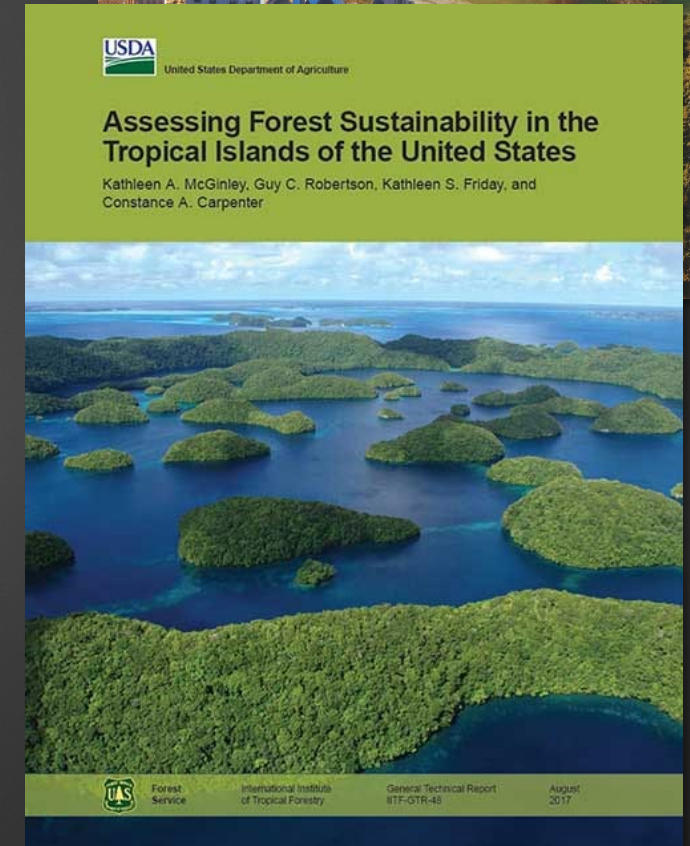
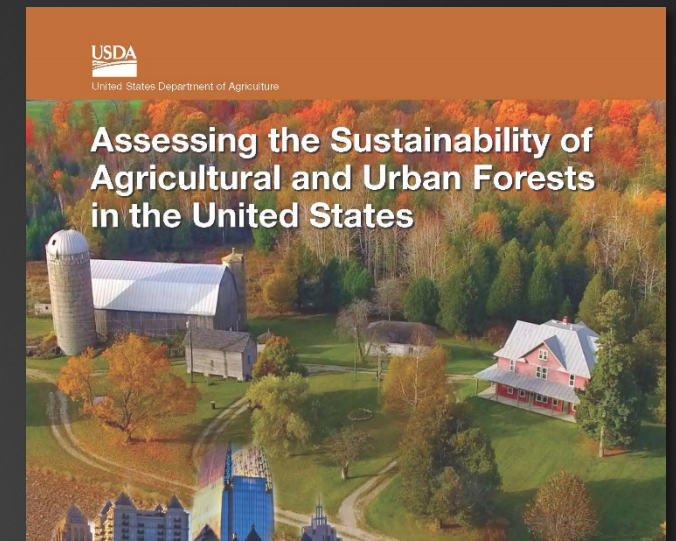
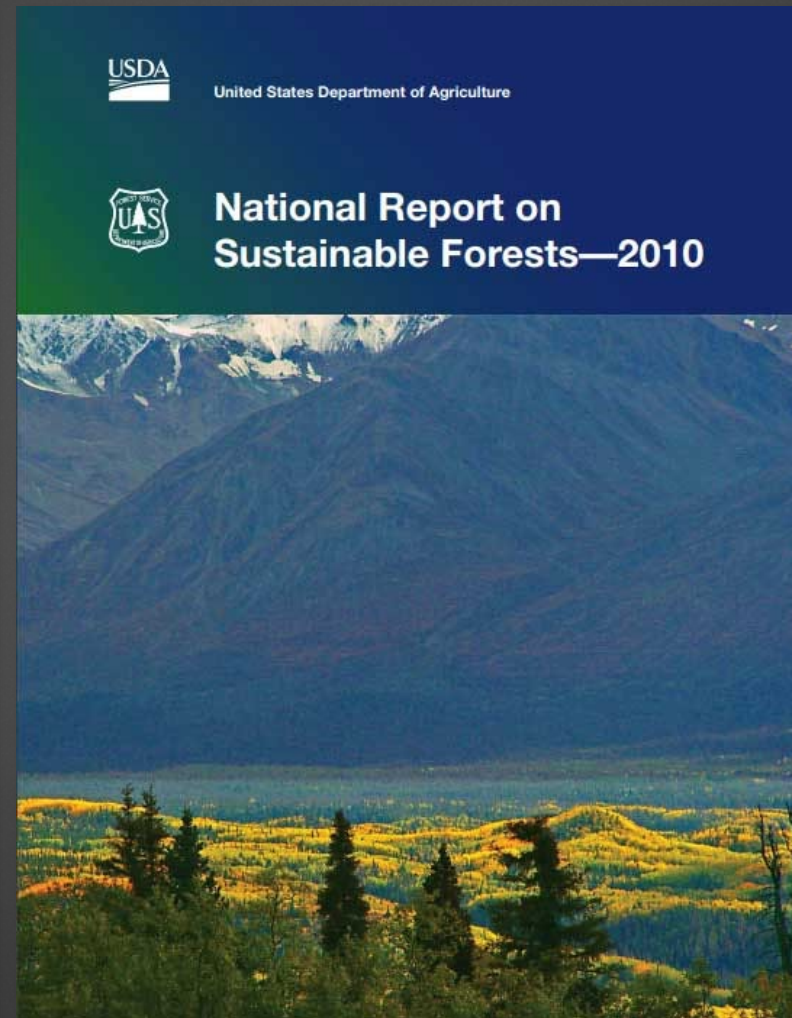
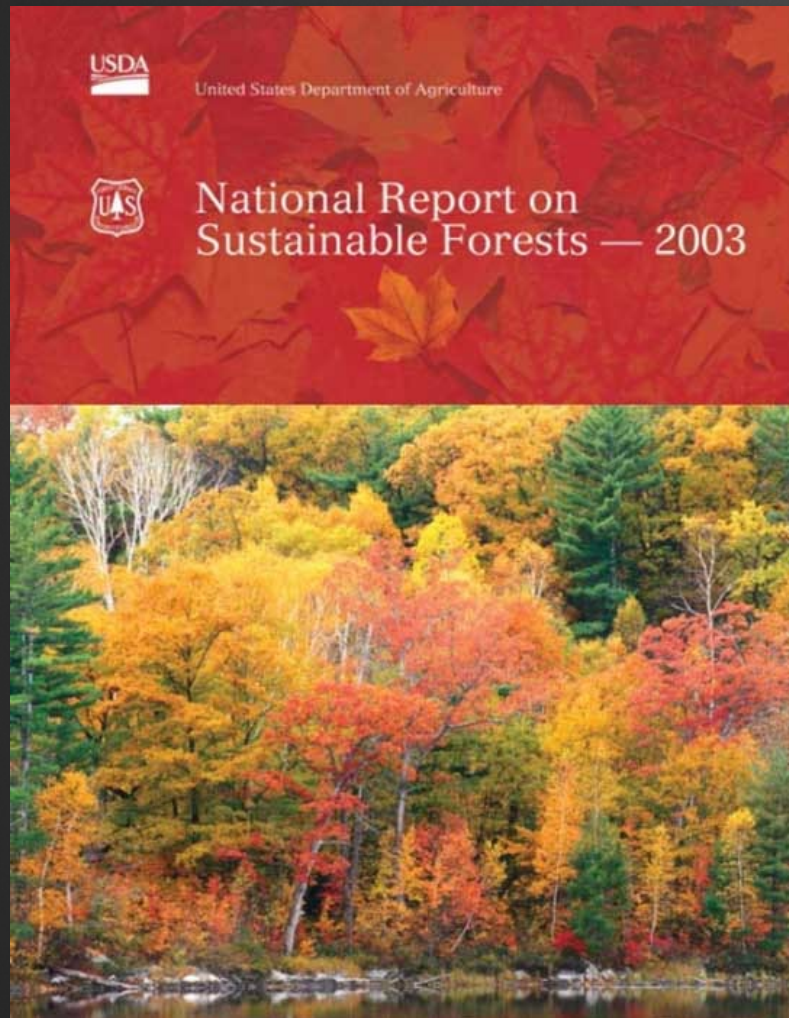
Pest risk analysis and environmental sustainability reporting

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Forest Sustainability Reporting in the United States



Montréal Process Criteria and Indicators (MP C&I)

▶ Seven criteria

1. Conservation of biological diversity
2. Maintenance of productive capacity of forest ecosystems
3. Maintenance of ecosystem health and vitality
4. Conservation and maintenance of soil and water resources
5. Maintenance of forest contribution to global carbon cycles
6. Maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of societies
7. Legal, institutional, and economic framework for forest conservation and sustainable management

▶ 64 indicators distributed among these criteria

Criterion 3: Maintenance of Ecosystem Health and Vitality

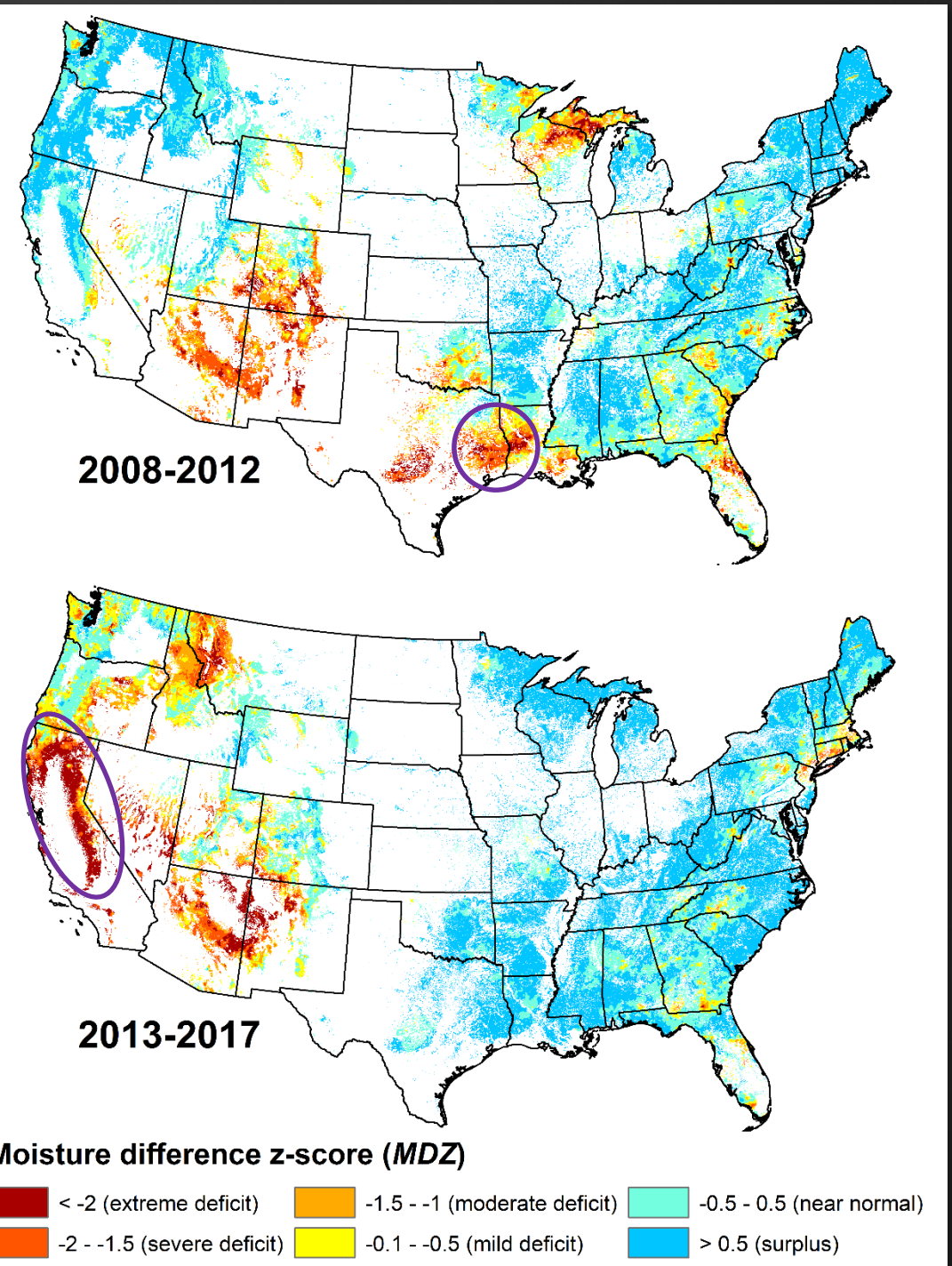
- ▶ Two indicators
 - ▶ 3.15: Area and percent of forest affected by biotic processes
 - ▶ 3.16: Area and percent of forest affected by abiotic processes
- ▶ Last year, I became the USDA Forest Service lead for Criterion 3 and its indicators

What Does This Entail?

- ▶ Actually, involves many data sets I already use
- ▶ Statistical and geospatial
 - ▶ Or at least can be summarized regionally
- ▶ Associations with forest pest risk
 - ▶ Predisposing factors (e.g., drought)
 - ▶ Interacting factors (e.g., fire)
 - ▶ Areas of damage / mortality
- ▶ Recently, emphasis on long-term trends

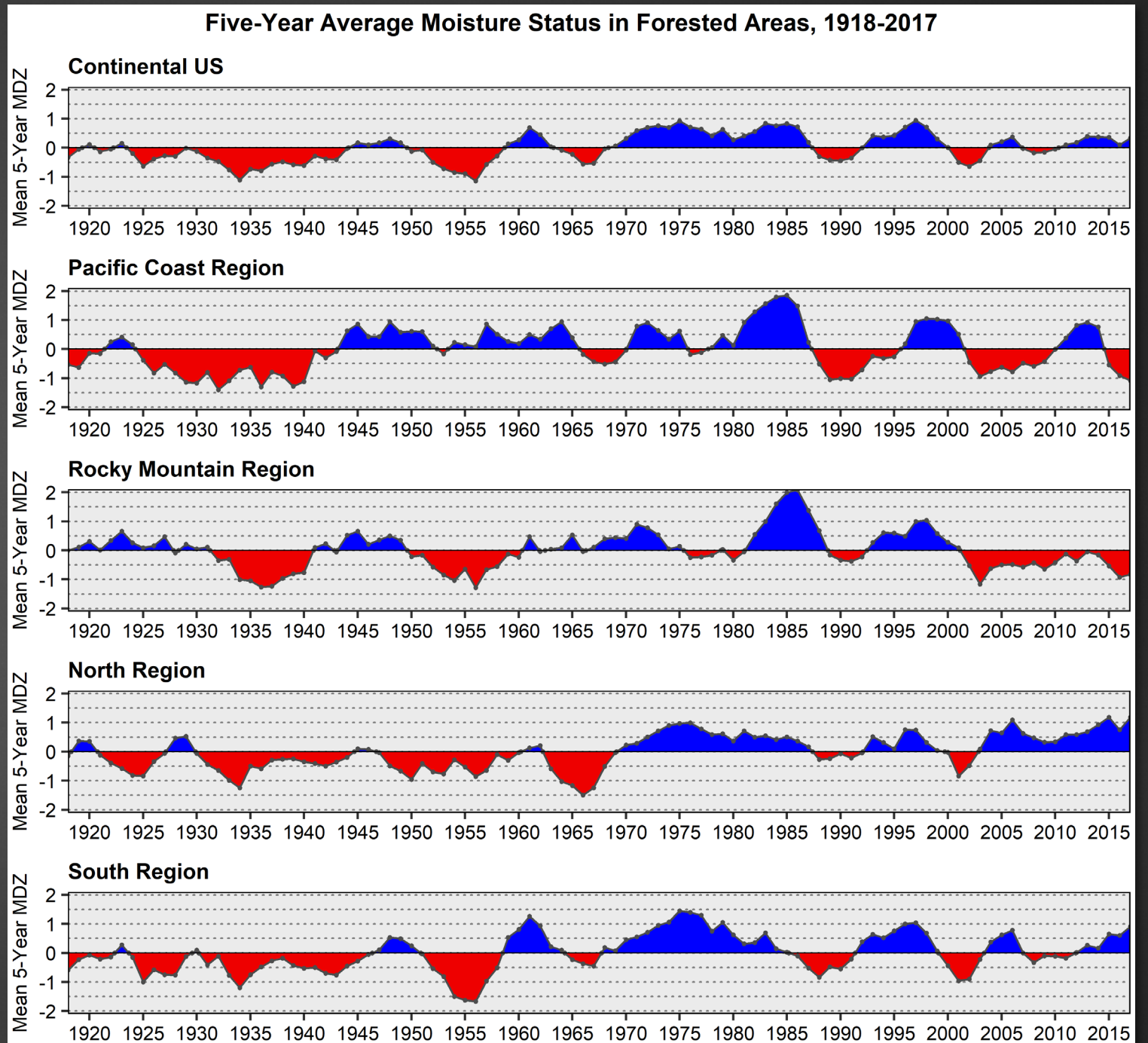
Drought

- ▶ Another responsibility: drought reporting for Forest Health Monitoring (FHM) Program
- ▶ MDZ = moisture difference z-score
 - ▶ Drought index based on long-term moisture history
 - ▶ Useful for different time windows
 - ▶ 3-year or 5-year windows for forest systems

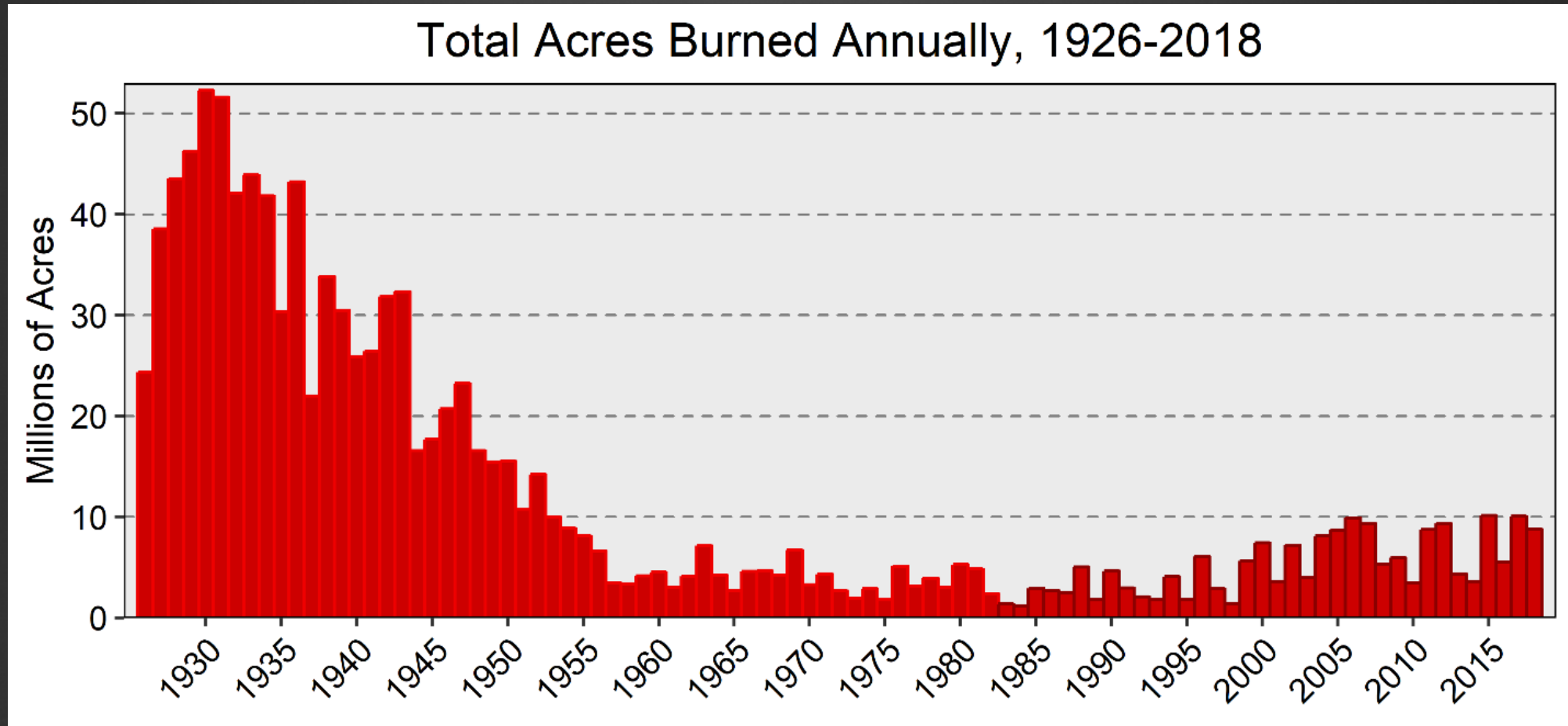


Drought

- ▶ National and regional trends in 5-year MDZ
- ▶ 100 years: 1918-2017



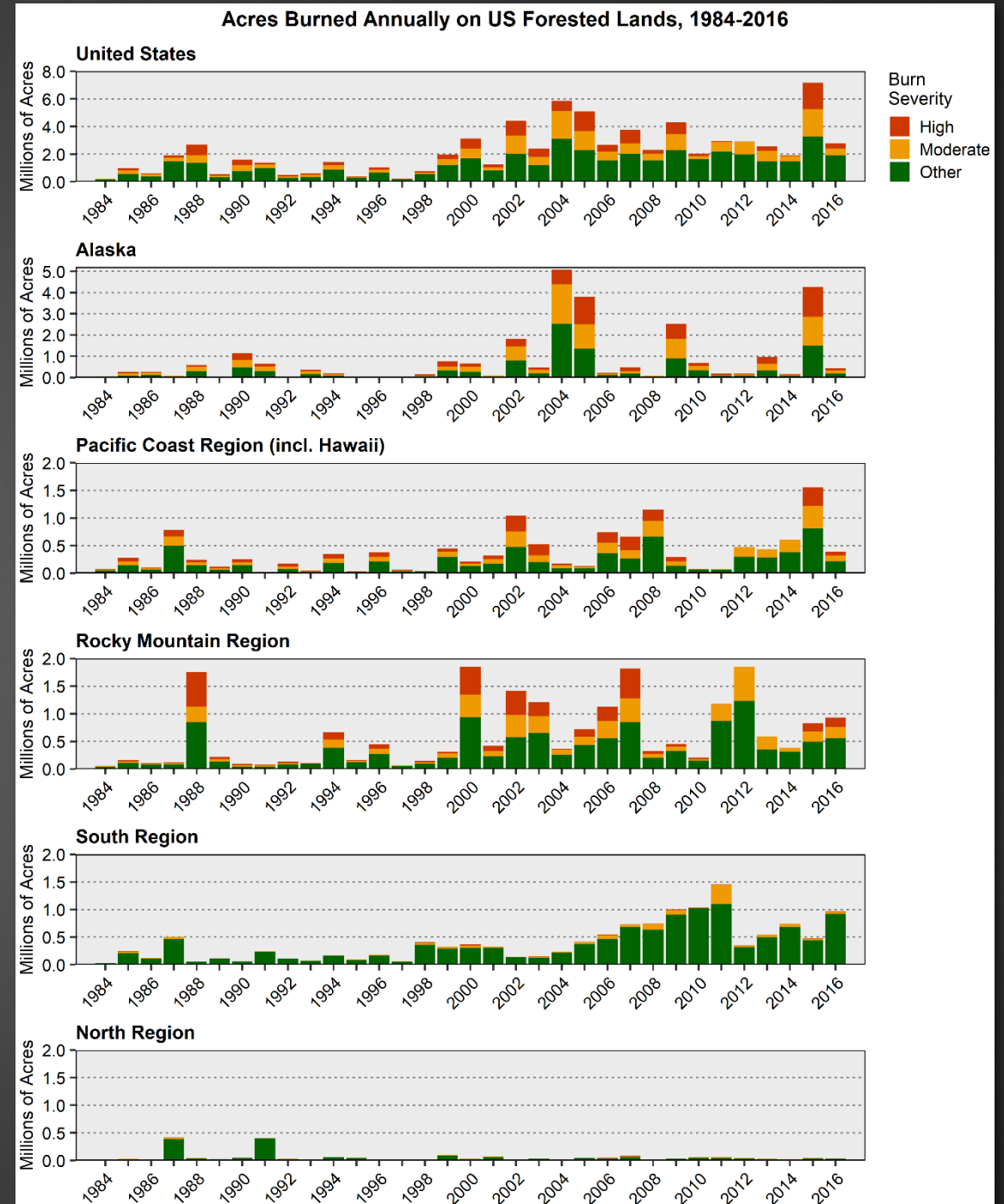
Wildland Fire: Long-Term National Trends



Data from National Interagency Fire Center (NIFC)

Wildland Fire

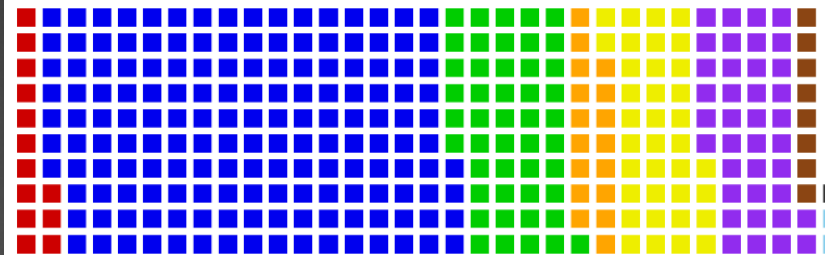
- ▶ National and regional trends, 1984-2016
- ▶ Monitoring Trends in Burn Severity (MTBS) data



Areas of Forest Mortality Due to Abiotic Causes

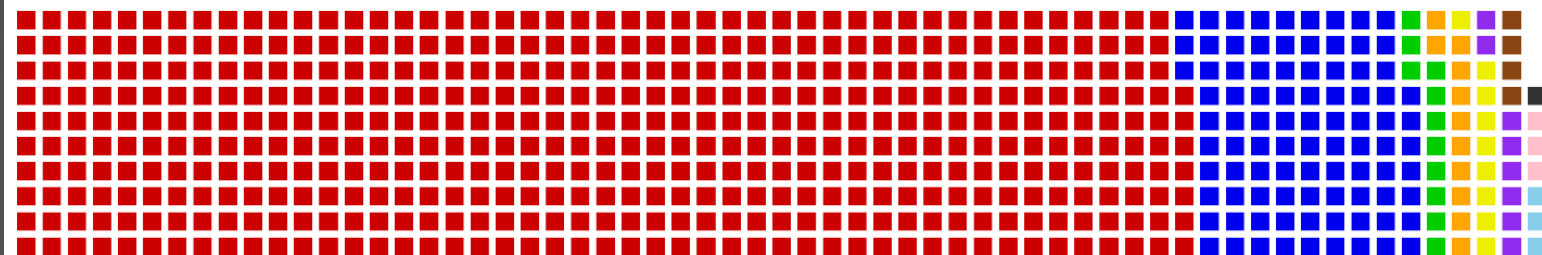
- ▶ Documented in aerial survey data
- ▶ Collected by individual states
- ▶ Compiled by USDA-FS Forest Health Protection

Conterminous United States, 2008-2012: 323,000 ac



1 sq = 1000 ac

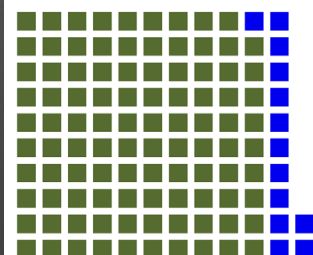
Conterminous United States, 2013-2017: 607,000 ac



1 sq = 1000 ac

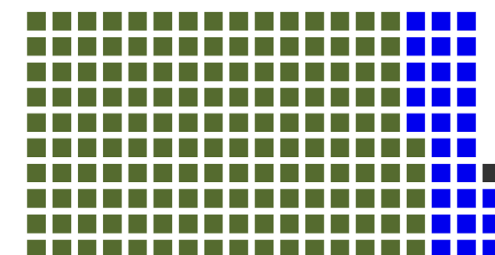


Alaska, 2008-2012: 112,000 ac

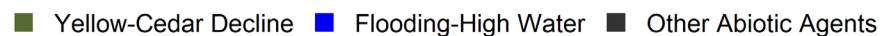


1 sq = 1000 ac

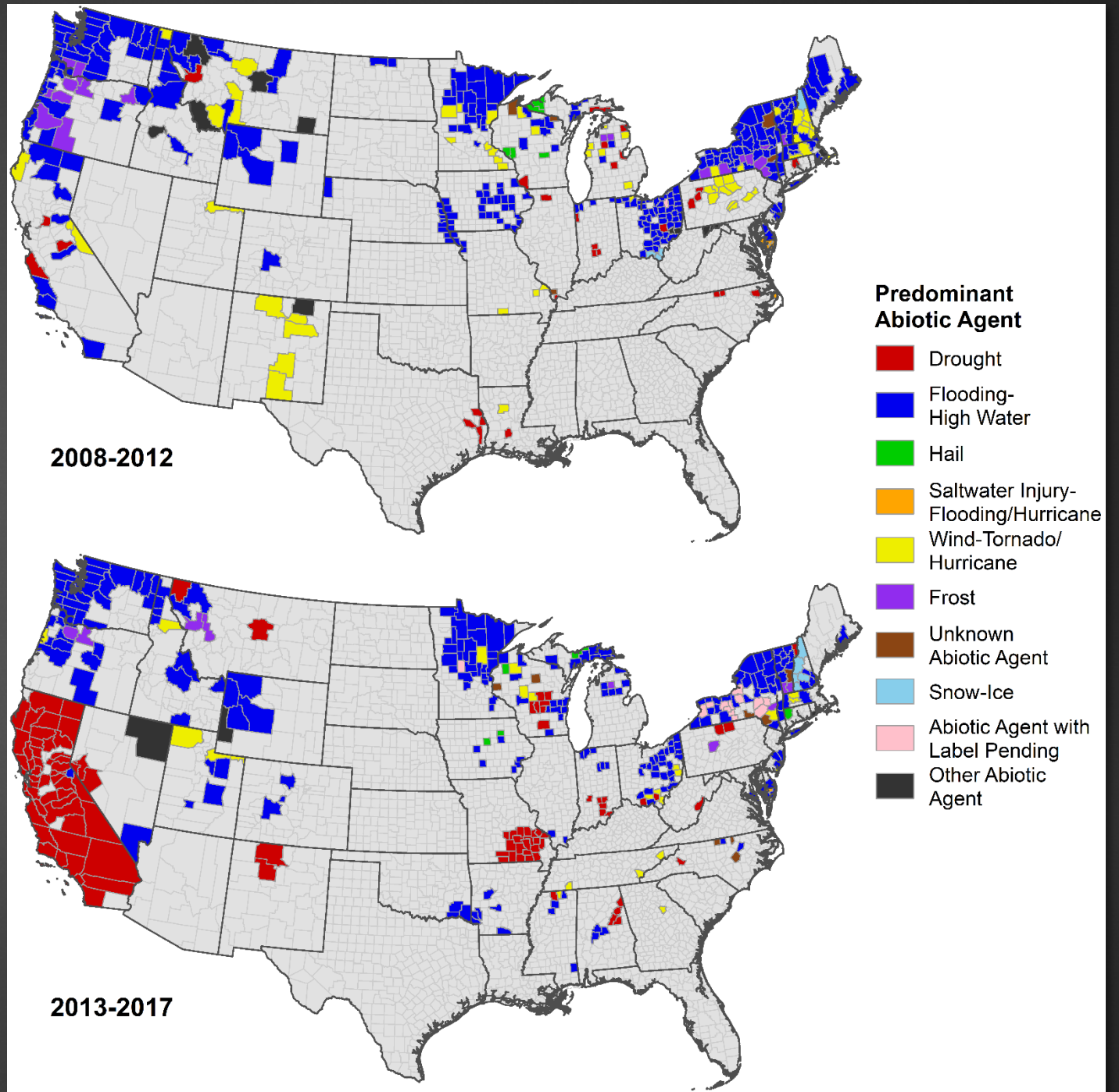
Alaska, 2013-2017: 184,000 ac



1 sq = 1000 ac

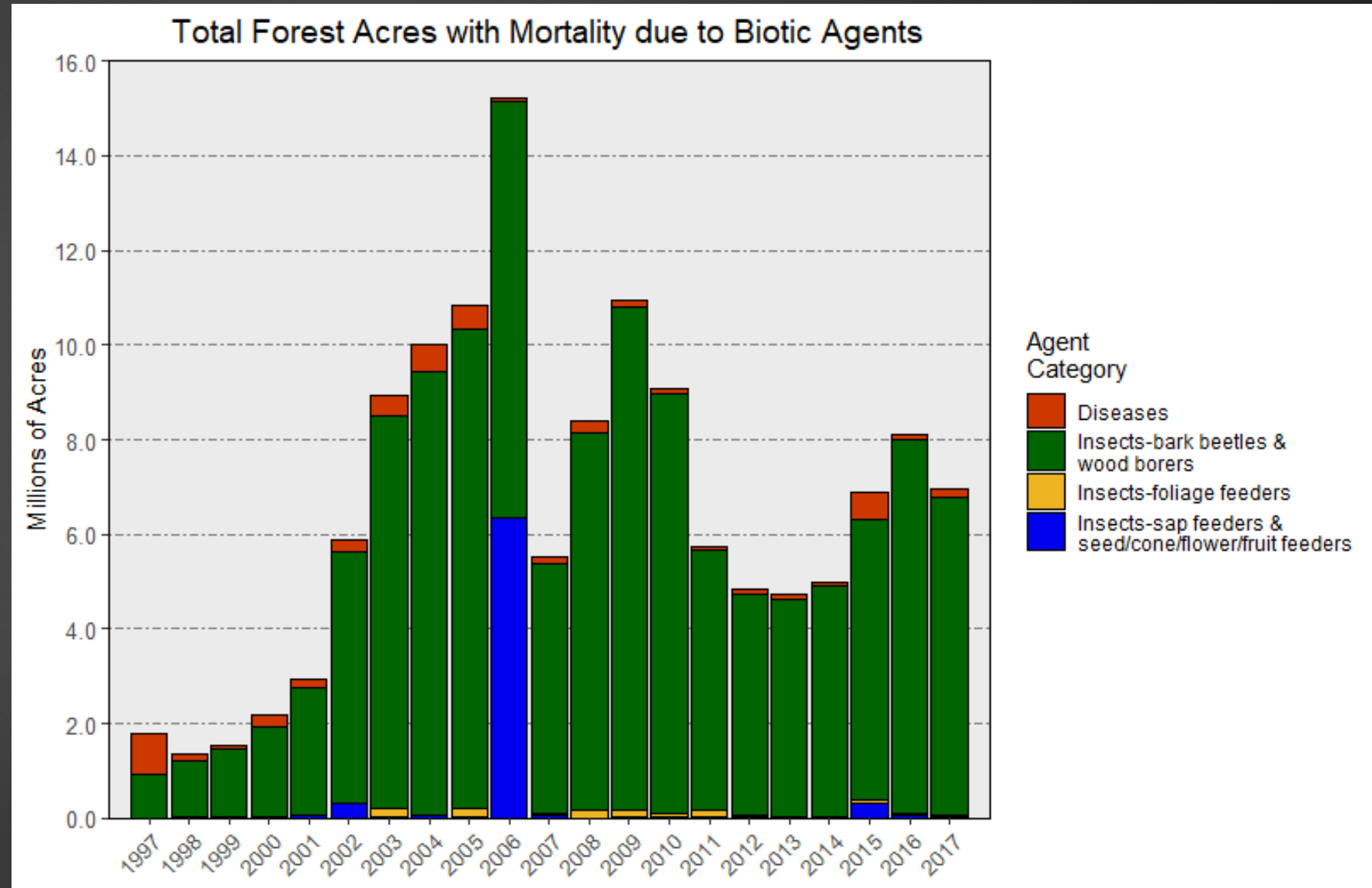


Counties with Forest Mortality Due to Abiotic Causes



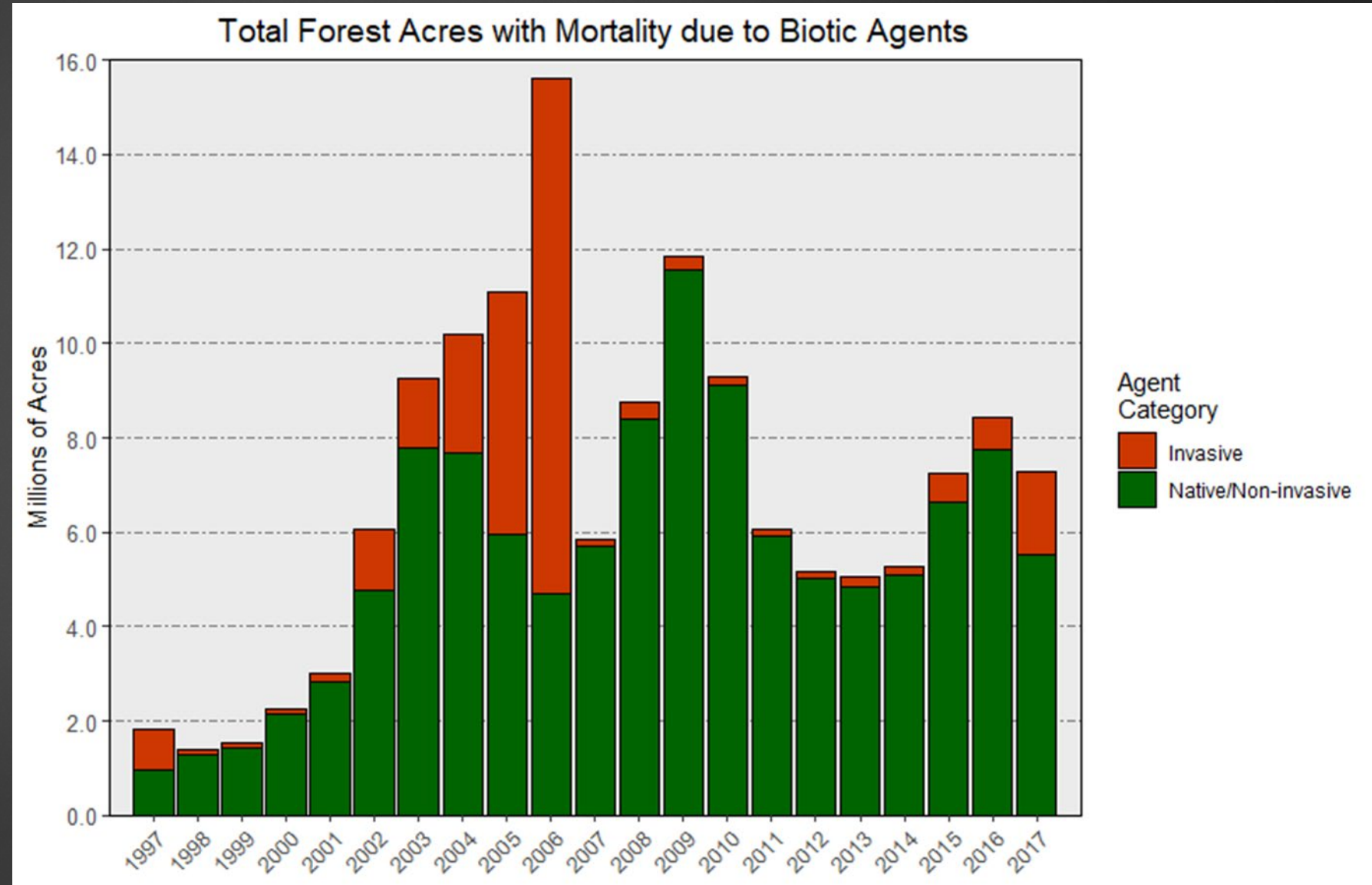
Mortality Due to Biotic Agents

- ▶ As documented in aerial survey data
- ▶ Totals for conterminous USA, 1997-2017



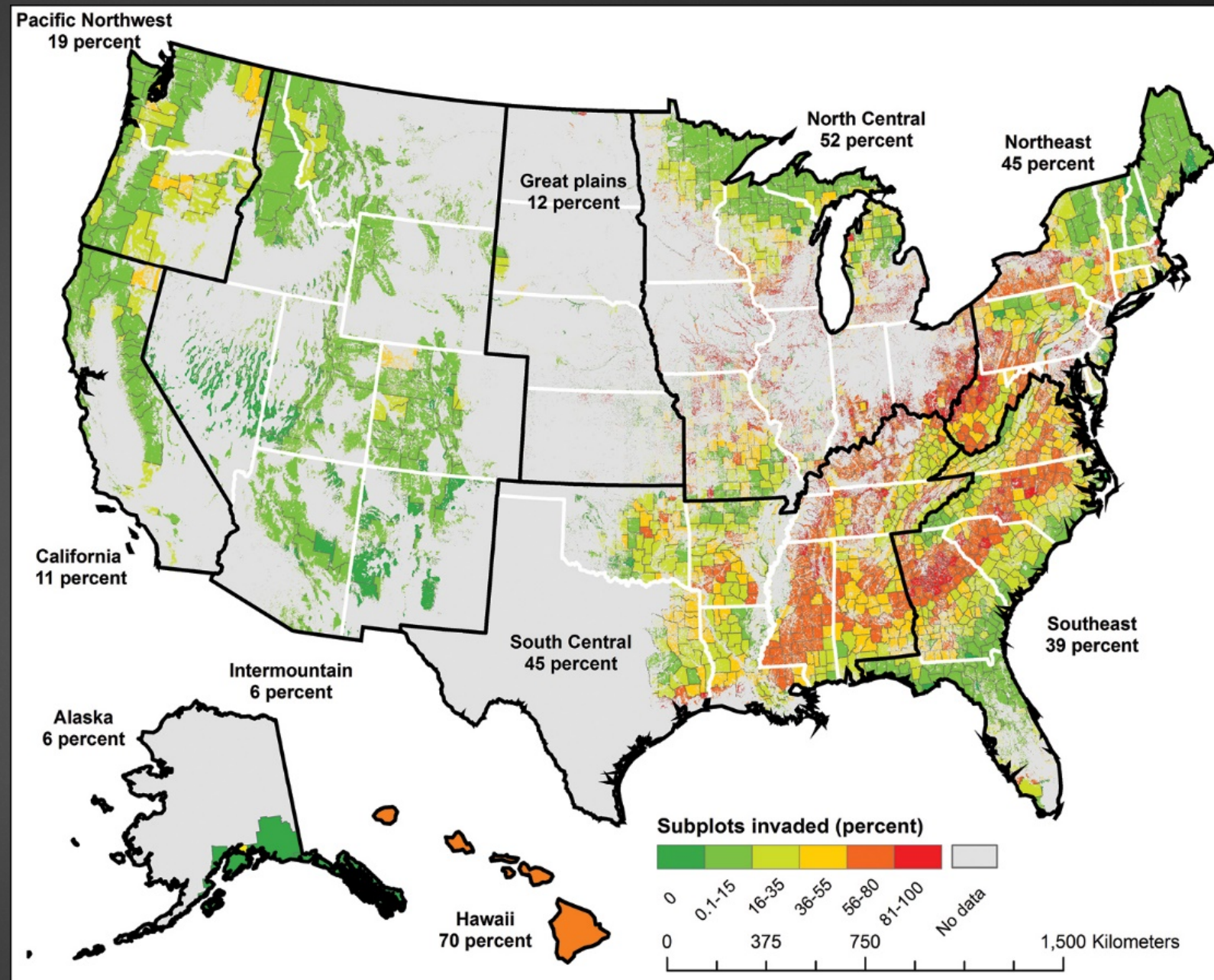
Mortality Due to Biotic Agents

- ▶ As documented in aerial survey data
- ▶ Totals for conterminous USA, 1997-2017



Plant Invasion Intensity

- ▶ Proportion of invaded subplots
- ▶ Forest Inventory and Analysis (FIA) data
 - ▶ National forest inventory for USA



From Oswalt et al. 2015. NeoBiota 24: 49-54

As We Move Into



- ▶ Synergies between sustainability reporting and pest risk analysis/research
- ▶ Although working on forest health aspect of forest sustainability...
- ▶ ...obvious parallels with crop health and sustainability of agricultural systems

Some Questions to Stimulate Discussion

- ▶ Do you work on sustainability reporting?
- ▶ If not, do you know someone at your agency/institution who does?
- ▶ How about someone at a different agency/institution?

Some Questions to Stimulate Discussion

- ▶ Do you use data that are, or could be, used for sustainability reporting?
 - ▶ Pest distribution data?
 - ▶ Host data?
 - ▶ Data on related factors (e.g., drought)?
 - ▶ How do you share your data?

Some Questions to Stimulate Discussion

- ▶ Any ideas for partnerships/collaboration?
 - ▶ Regionally?
 - ▶ Nationally?
 - ▶ Internationally?

Questions?

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