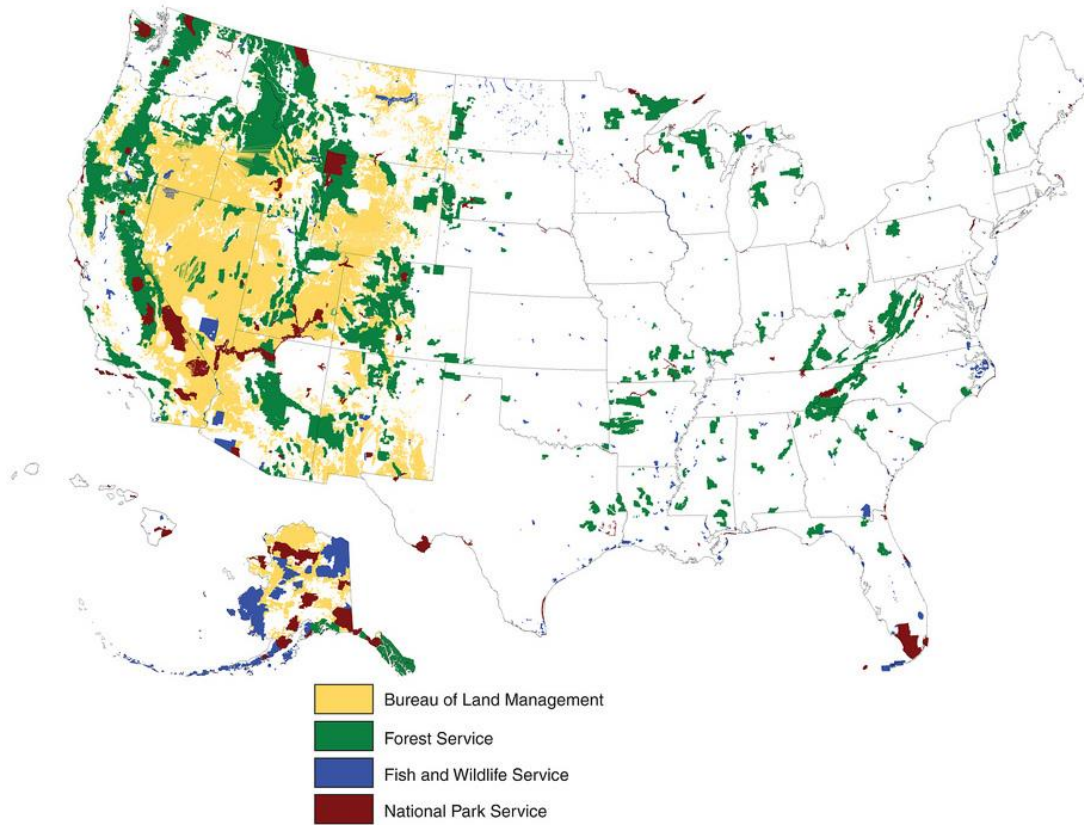




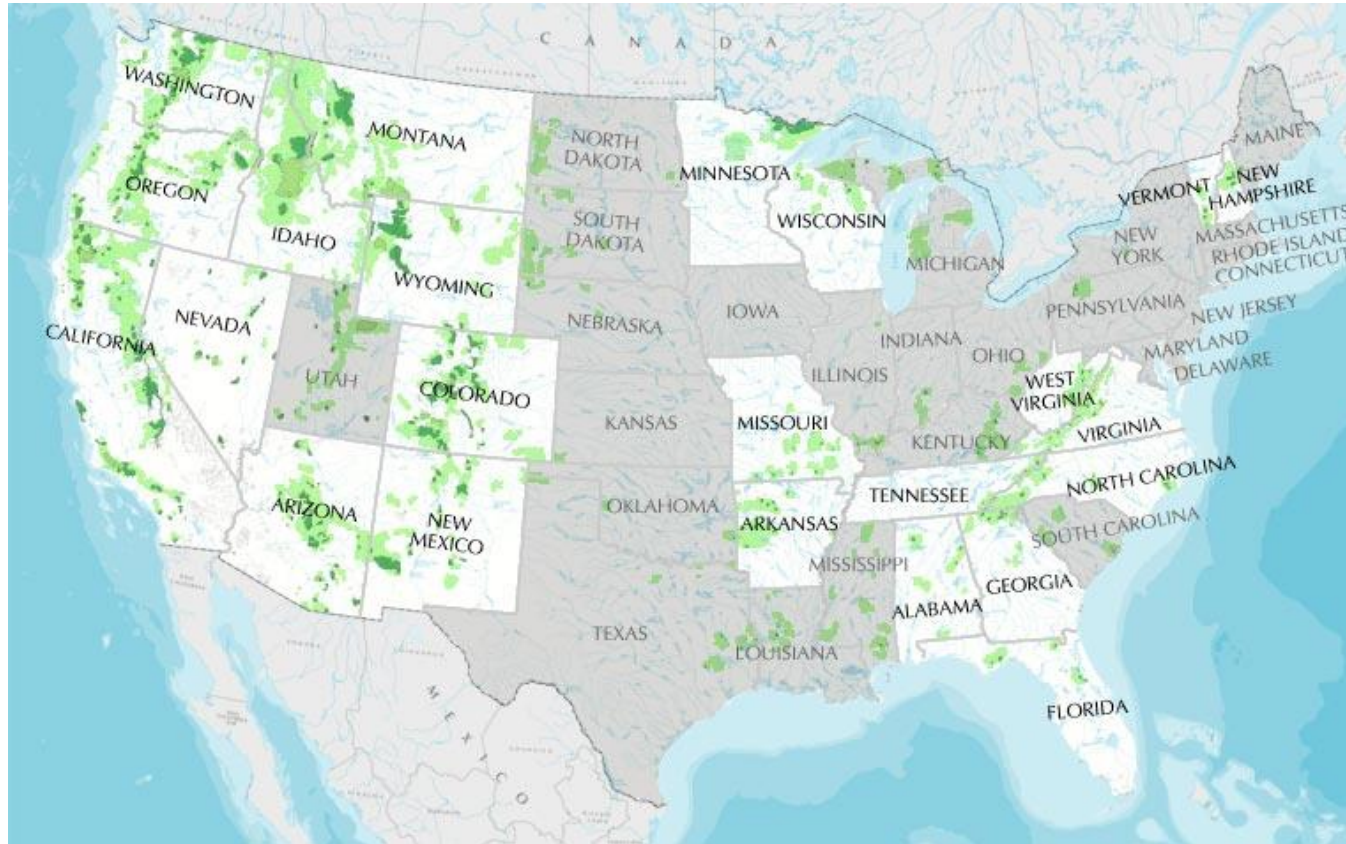
# USFS AIR RESOURCE MANAGEMENT: AN INTRODUCTION

National Association of Clean  
Air Agencies, Oct 22 2019  
Washington, DC

# FEDERAL LANDS OF THE UNITED STATES



# HOW THE USFS AIR PROGRAM BEGAN: THE 1970 CLEAN AIR ACT



**National Forest System** (light green)  
**USFS Class I Areas** (dark green) (88)  
Other Class I Areas not shown  
National Park Service (48)  
US Fish & Wildlife Service (21)

# OTHER APPLICABLE FEDERAL LAWS

**Other laws inform protection of air quality on all federal lands** and habitats in order to sustain health, productivity, and biodiversity on federally managed lands:

- ❖ 1964 Wilderness Act
- ❖ 1970 National Environmental Policy Act
- ❖ 1973 Endangered Species Act
- ❖ 1976 National Forest Management Act (USFS)
- ❖ 1916 Organic Act (established National Park Service)
- ❖ 1976 Federal Land Policy and Management Act (BLM, NPS, FWS)



**And underlay agency mission:** *'To sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations'*

# ARM RESPONSIBILITIES SUMMARY

## Monitor and assess status and trends in

- ambient air, precipitation chemistry, surface water quality, soil chemistry, terrestrial and aquatic biota
- Establish Air Quality Related Values for sensitive natural and cultural resources

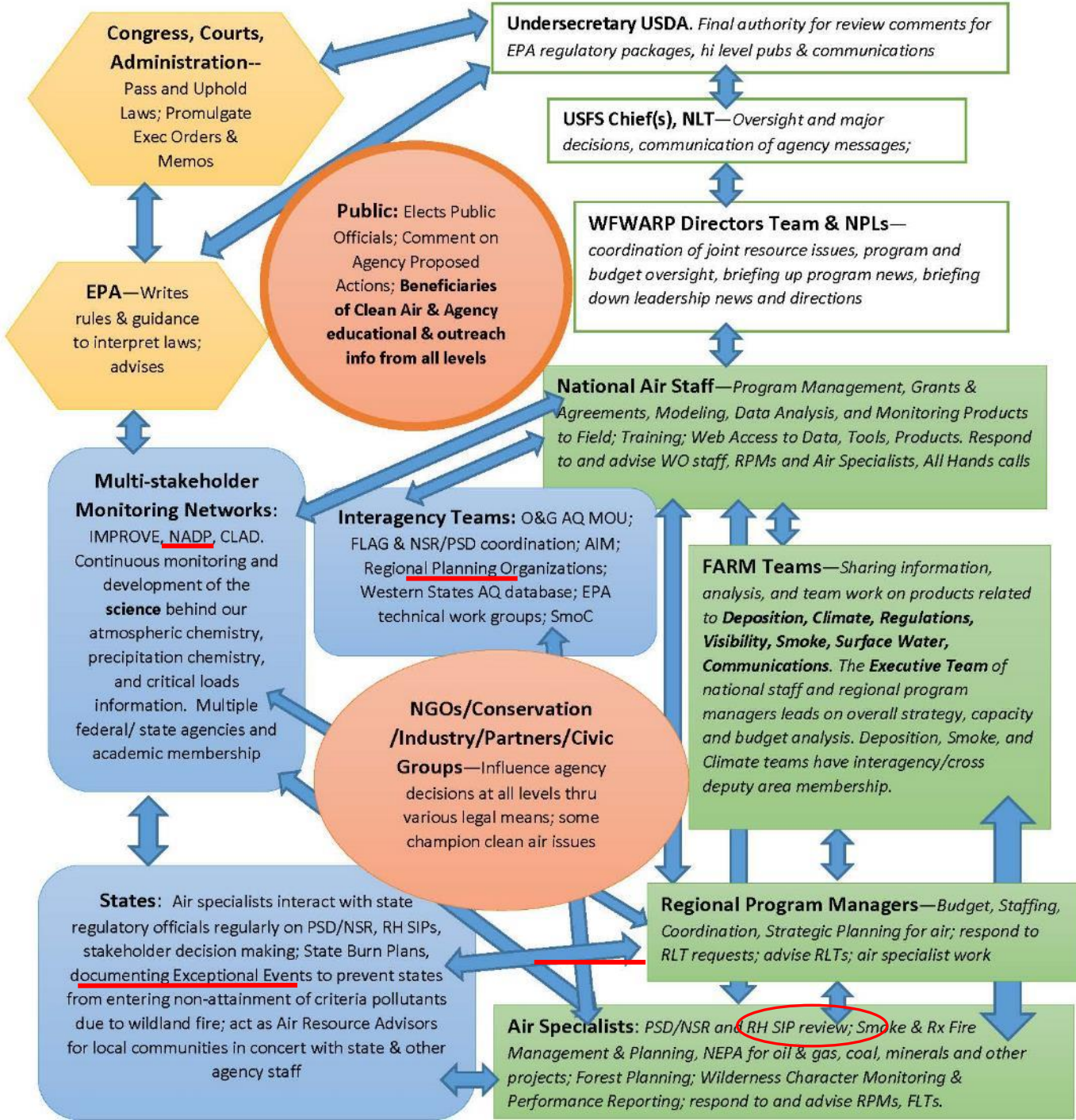
## Provide technical reviews and recommendations

- **Prevention of Significant Deterioration** permits for Class I Areas
- **State Implementation Plans** for the Regional Haze Rule (Class I Areas) and for the NAAQS
- **Proposed federal regulations** and agency directives and policies

## Ensure that management activities comply with federal and state air quality laws

- **Forest Planning** – assess AQ status, trends, exceedance of critical loads, management implications
- **NEPA**—conduct air quality analyses for energy and mining project to comply with the NEPA
- **Manage Smoke**
  - Exceptional Events demonstrations
  - Monitoring PM during wildland and prescribed fires
  - Public health and firefighter health advisories
  - Determining appropriate prescribed burn windows for prescribed fire

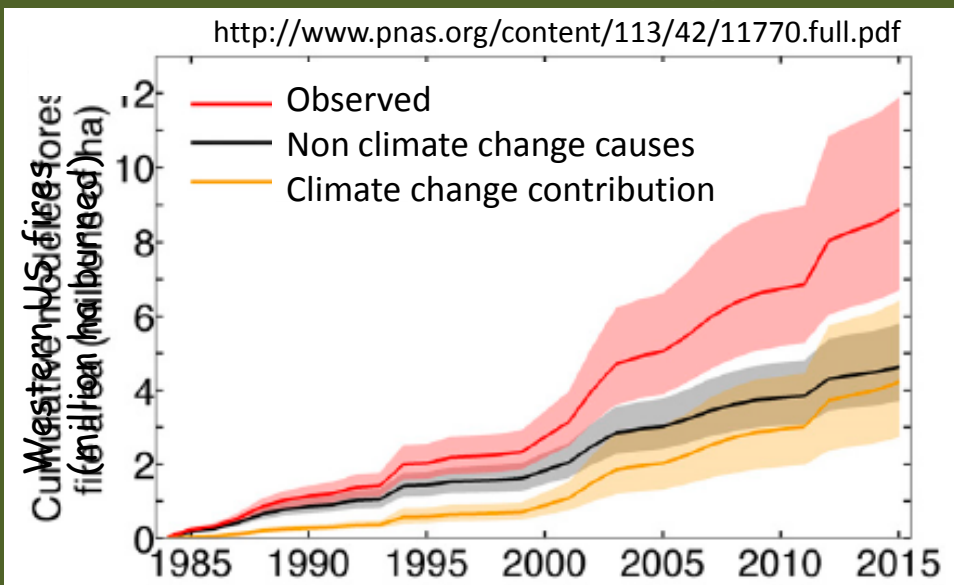
# ROLES OF THE US FOREST SERVICE IN AIR QUALITY PROTECTION IN THE US





# MONITORING NETWORKS

# Smoke Monitoring

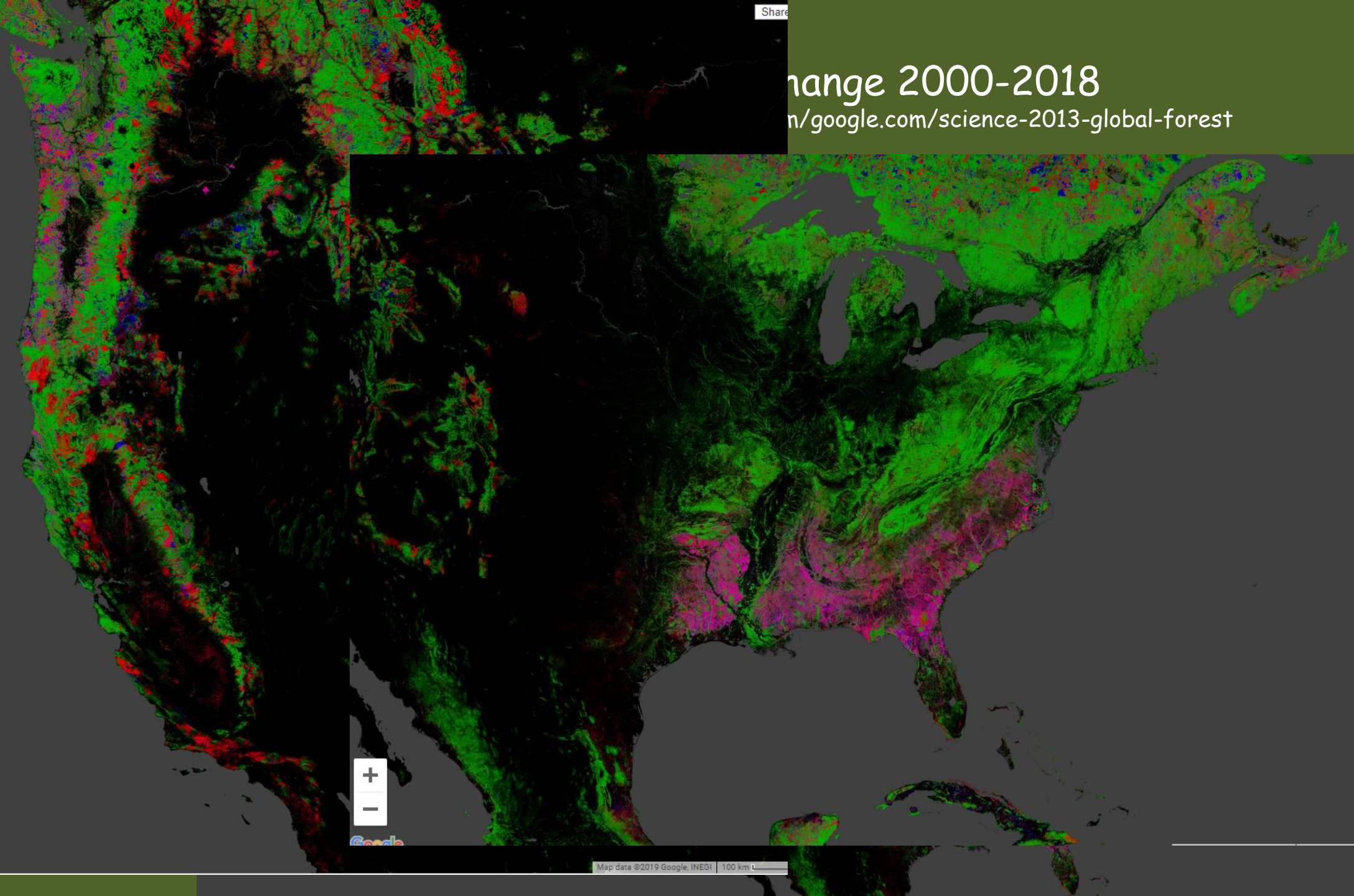




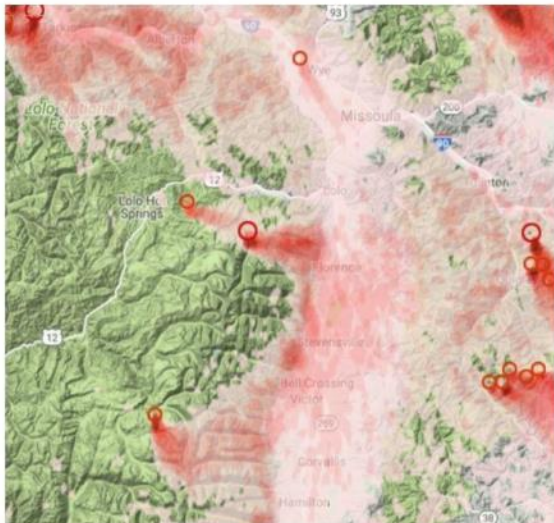
Share

# Change 2000-2018

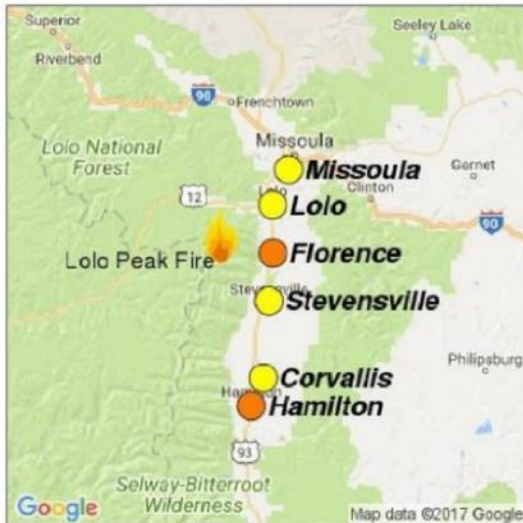
<https://www.google.com/science-2013-global-forest>



**Air Quality and Smoke Outlook for Bitterroot Valley**



Predicted smoke impacts for 7/31/17 6:00pm



Predicted air quality 7/31/17 6AM-9PM



Community	Forecast	Mon 7/31	Tues 8/1
Missoula	Hazy conditions Mon. AM, clearing by Noon. Light to moderate smoke returns 8pm thru early Tues. AM. Hot dry weather, shifting winds and fire growth could cause higher smoke levels Tues.	Yellow	Orange
Lolo	Moderate smoke early Mon. AM, Clear from Noon thru early evening. Moderate smoke late evening to early Tues. AM.	Yellow	Yellow
Florence	Moderate smoke early Mon. AM, Clear from Noon thru early evening. Moderate smoke late evening to early Tues. AM. Hot dry weather, shifting winds, impacts from multiple fires to the north and east, and fire growth could cause higher smoke levels Tues.	Yellow	Orange
Stevensville	Light smoke early Mon. AM. Clear throughout the day. Haze returns early evening. Smokier conditions on Tues.	Yellow	Yellow
Corvallis	Light smoke early Mon. AM. Clear throughout the day. Haze returns early evening. Smokier conditions on Tues.	Yellow	Yellow
Hamilton	Clear with light smoke through early evening. Moderate smoke late evening to early Tues. AM. Hot dry weather, shifting winds, impacts from fires to the north and east, and fire growth could cause higher smoke levels Tues.	Yellow	Orange

**Smoke:** Heavy smoke settled in the Bitterroot Valley overnight in some areas last night into early this morning. Most areas will see clearing and slight haze through late afternoon. Smoke from Lolo Peak and other fires to the north and west may settle into drainages and the valley late evening through early morning. Missoula, Lolo, and Hamilton may see more smoke than other communities this evening.

**Fire:** The fire has consumed 4,792 acres to date and is expected to grow. Upcoming hot, dry weather and shifting wind directions may encourage fire growth on the north and west perimeters

**Other:** Expect increased smoke levels throughout the day Tues. thru the rest of the week as general winds shift to the NE and ENE with some higher gusts, hot temperatures and low humidity.

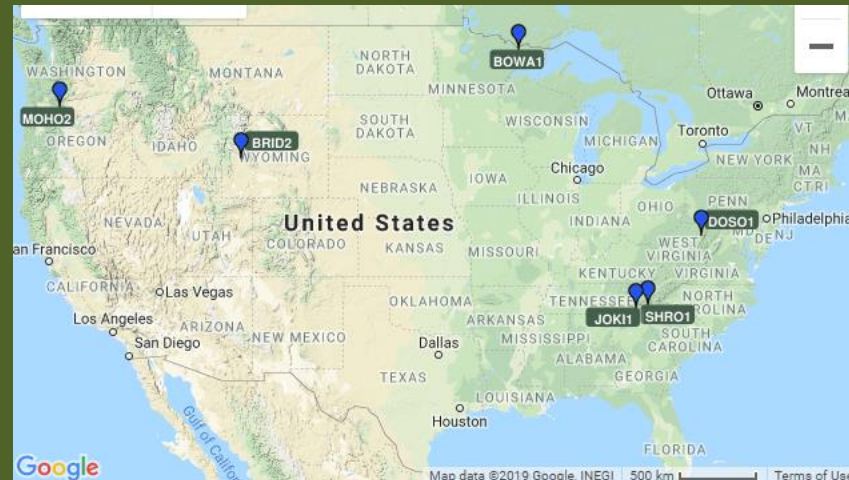
Air Quality Category
GOOD
MODERATE
UNHEALTHY for SENSITIVE IND.
UNHEALTHY for ALL
VERY UNHEALTHY



# Visibility (IMPROVE) and Scene Monitoring

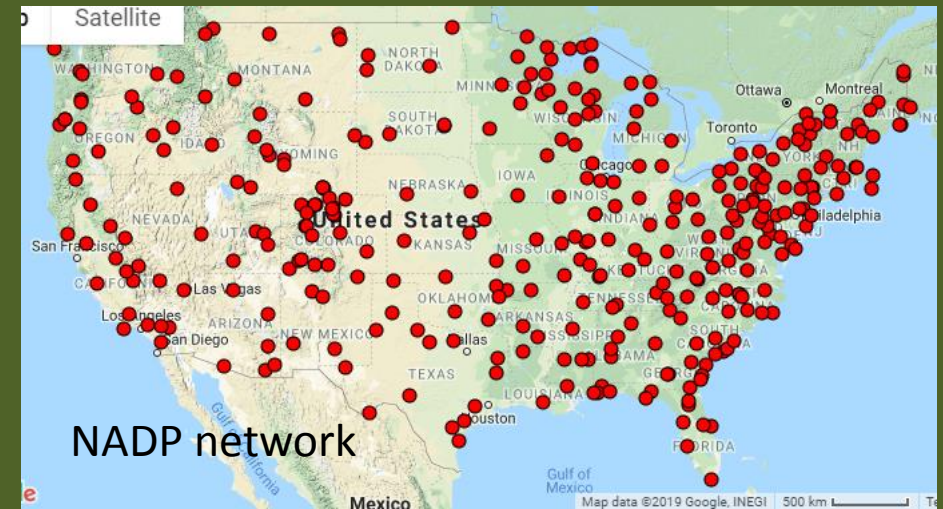


The IMPROVE network

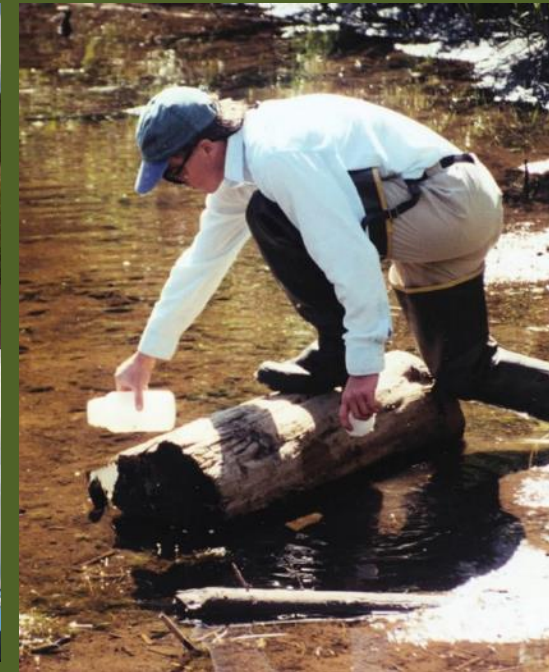


Camera network

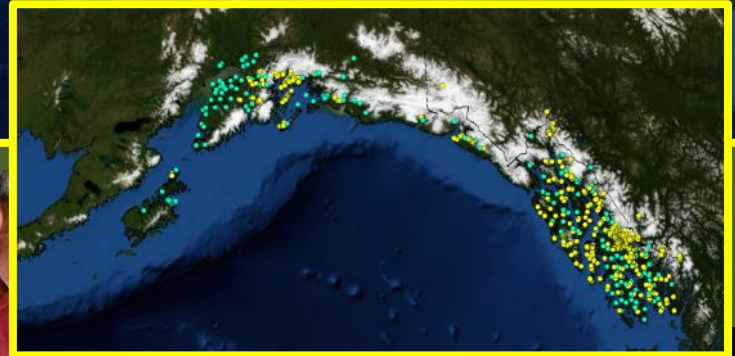
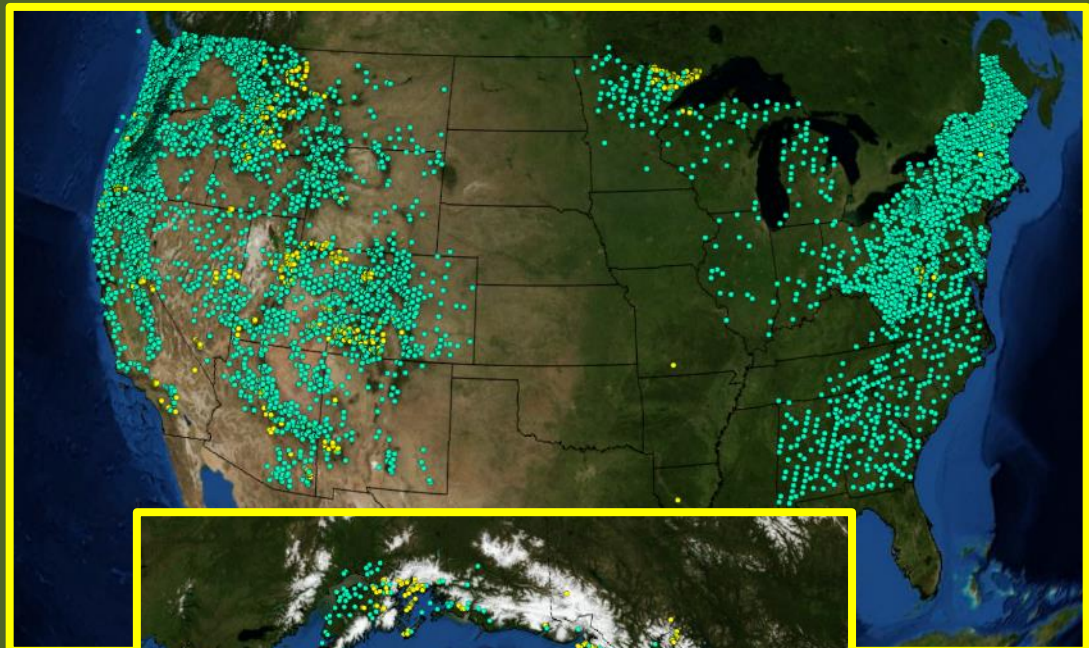
# Air, Precipitation, and Snow Sampling



# Monitoring Aquatic Systems



# Vegetation Monitoring



# CRITICAL LOAD

*A quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge.*

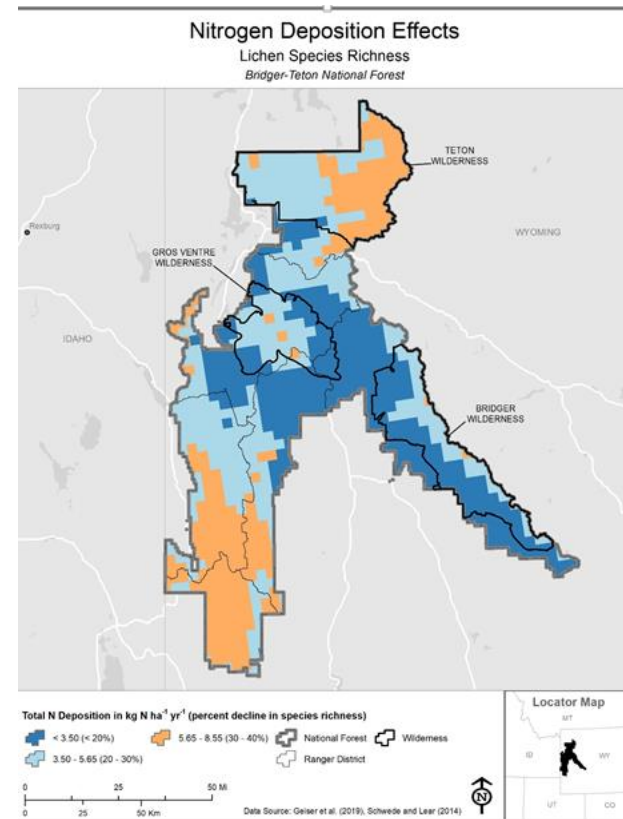
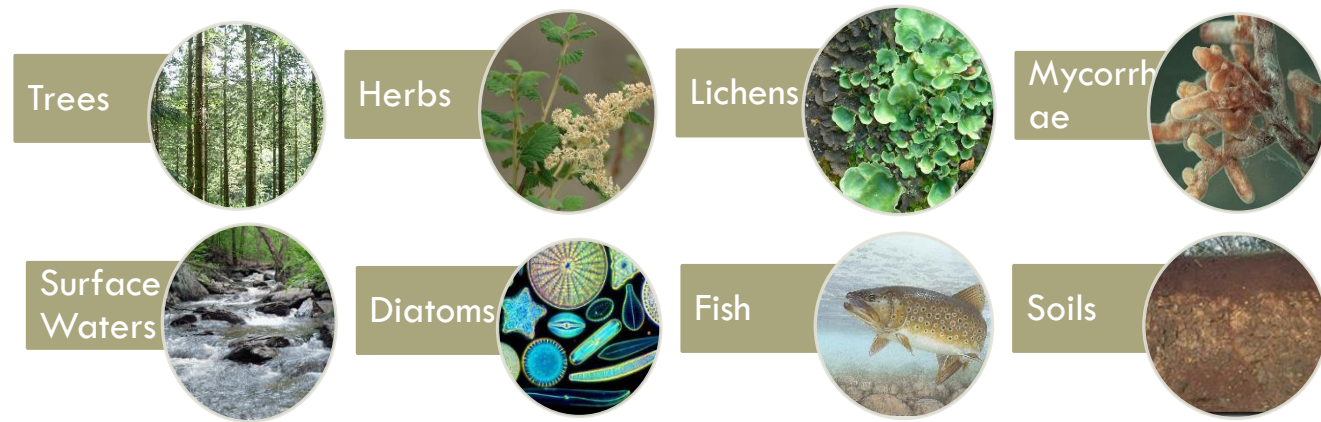
**Can be used to in planning and air quality assessments to:**

- Assess ecosystem health
- Inform the public about natural resources at risk
- Evaluate the effectiveness of emission reduction strategies
- Guide a wide range of management decisions.

Critical Loads of Atmospheric Deposition Committee of the National Atmospheric Deposition Program

<http://nadp.slh.wisc.edu/committees/clad/>

Critical Loads Mapper Tool <https://clmapper.epa.gov/>



# ACCESSING USFS AND OTHER FEDERAL LAND MANAGER AIR QUALITY DATA


FS Air quality website <https://www.fs.fed.us/air/>

Federal Land Manager Database  
<http://views.cira.colostate.edu/fed/>

- IMPROVE <http://vista.cira.colostate.edu/Improve/>
- Surface water quality <http://views.cira.colostate.edu/fed/FSWQ/>
- Lichens <http://gis.nacse.org/lichenair/>
- Camera digital images <https://www.fsvisimages.com/>
- Smoke management <https://www.fs.fed.us/air/smoke.htm>
- NADP <http://nadp.slh.wisc.edu/>


**AIR RESOURCE MANAGEMENT**

**Program Spotlight**




See what's 'hot-off the press' from the Air Resources Program.

**Wilderness Air Quality**




Learn about how we protect wilderness air quality.

**Who We Are**




Learn about our mission statement and the people who accomplish it.

**Our Partners**




Air is everyone's resource. See who we are working with to protect National Forest air.

**Monitoring and Data**




Monitoring and data drive our decisions. Learn more about our work.

**Air Pollution**



Learn about air pollution and its impacts to forests and grasslands.

**Laws and Policy**



Learn about the law and policies which guide our efforts.

**USDA Forest Service**  
1400 Independence Avenue  
SW  
Washington, D.C.  
20250-0003  
(202) 205-8333

**E-GOV**  
**USA.gov**  
Government of the United States



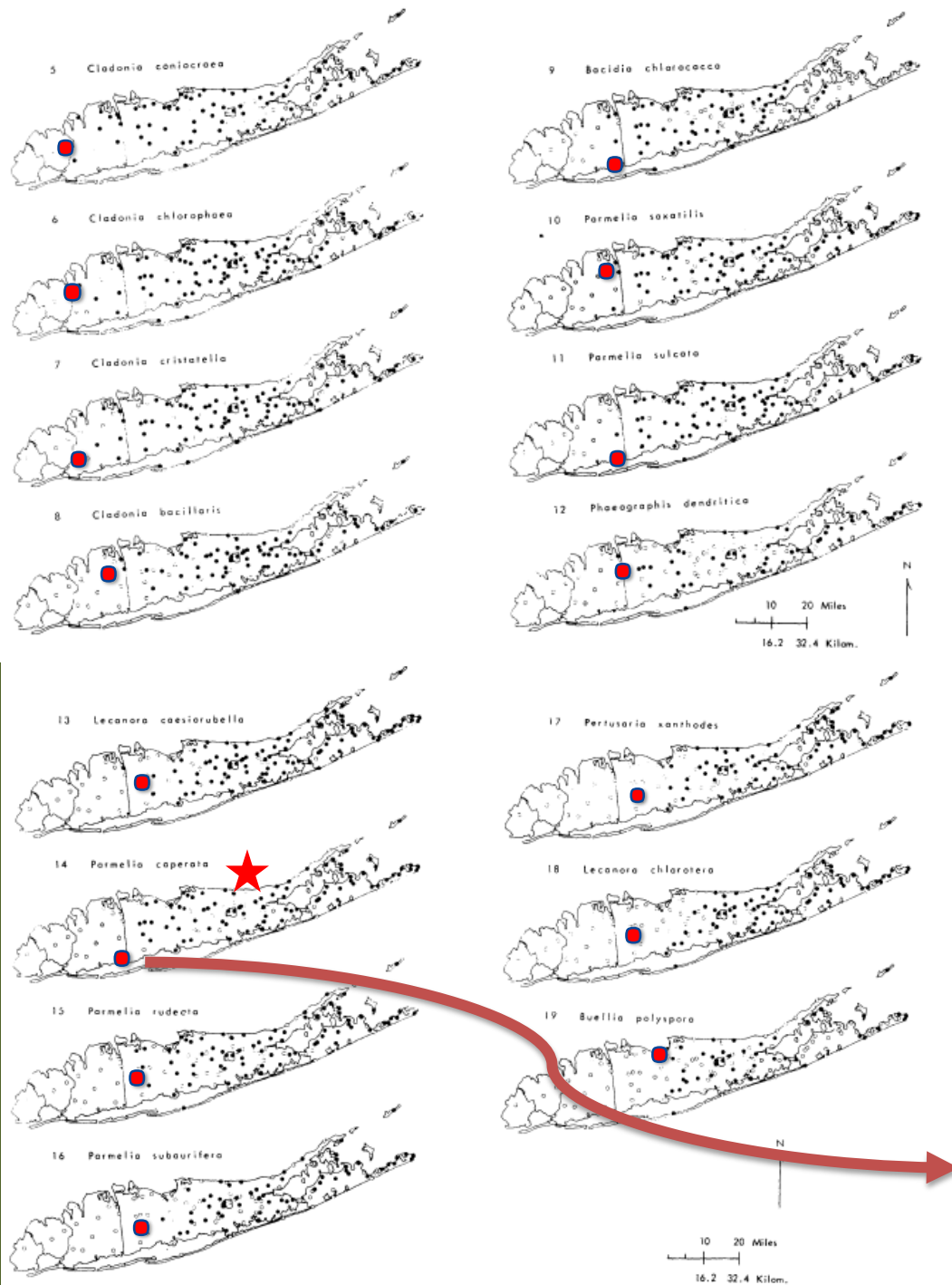


Air pollution in New York City 1966-1970

# 1966 NYC Lichen desert



Dr. Irwin Brodo



*Parmelia caperata*



2014  
Central  
Park