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

- Congress, Courts, Administration—Pass and Uphold laws; Promulgate Exec Orders & Memos
- EPA—Write rules & guidance to interpret laws; advises
- Multi-stakeholder Monitoring Networks: IMPROVE, NADP, CLAD. Continuous monitoring and development of the science behind our atmospheric chemistry, precipitation chemistry, and critical loads Information. Multiple federal/state agencies and academic membership
- States: Air specialists interact with state regulatory officials regularly on PSD/NSR, RH SIPs, stakeholder decision making; State Burn Plans, documenting Exceptional Events to prevent states from entering non-attainment of criteria pollutants due to wildland fire; act as Air Resource Advisors for local communities in concert with state & other agency staff
- Interagency Teams: O&G AQ MOU; FLAG & NSR/PSD coordination; AIM; Regional Planning Organizations; Western States AQ database; EPA technical work groups; SmoC
- NGOs/Conservation/Industry/Partners/Civic Groups—Influence agency decisions at all levels thru various legal means; some champion clean air issues
- Public: Elects Public Officials; Comment on Agency Proposed Actions; Beneficiaries of Clean Air & Agency educational & outreach info from all levels
- Undersecretary USDA—Final authority for review comments for EPA regulatory packages, hi level pubs & communications
- USFS Chief(s), NLT—Oversight and major decisions, communication of agency messages
- WF-WARP Directors Team & NPIs—Coordination of joint resource issues, program and budget oversight, briefing up program news, briefing down leadership news and directions
- National Air Staff—Program Management, Grants & Agreements, Modeling, Data Analysis, and Monitoring. Products to Field: Training; Web Access to Data, Tools, Products. Respond to and advise WO staff, RPMs and Air Specialists, All Hands calls
- FARM Teams—Sharing information, analysis, and team work on products related to Deposition, Climate, Regulations, Visibility, Smoke, Surface Water, Communications. The Executive Team of national staff and regional program managers leads on overall strategy, capacity and budget analysis. Deposition, Smoke, and Climate teams have interagency/cross deputy area membership.
- Regional Program Managers—Budget, Staffing, Coordination, Strategic Planning for air; respond to RLT requests; advise RPMs; air specialist work
- Air Specialists: PSD/NSR and RH SIP review; Smoke & Rx Fire Management & Planning, NEPA for oil & gas, coal, minerals and other projects; Forest Planning; Wilderness Character Monitoring & Performance Reporting; respond to and advise RPMs, RLTs.
MONITORING NETWORKS
Smoke Monitoring

http://www.pnas.org/content/113/42/11770.full.pdf

Western US fires


- Observed
- Non climate change causes
- Climate change contribution

(million ha burned)
Smoke Forecast issued 7/31/2017 9:45 AM MDT

Air Quality and Smoke Outlook for Bitterroot Valley

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

<table>
<thead>
<tr>
<th>Community</th>
<th>Forecast</th>
<th>Mon 7/31</th>
<th>Tues 8/1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missoula</td>
<td>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.</td>
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<tr>
<td>Lolo</td>
<td>Moderate smoke early Mon. AM, Clear from Noon thru early evening. Moderate smoke late evening to early Tues. AM.</td>
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<tr>
<td>Florence</td>
<td>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.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stevensville</td>
<td>Light smoke early Mon. AM. Clear throughout the day. Haze returns early evening. Smoker conditions on Tues.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corvallis</td>
<td>Light smoke early Mon. AM. Clear throughout the day. Haze returns early evening. Smoker conditions on Tues.</td>
<td></td>
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</tr>
<tr>
<td>Hamilton</td>
<td>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.</td>
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<td></td>
</tr>
</tbody>
</table>

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.
Visibility (IMPROVE) and Scene Monitoring

The IMPROVE network

Camera network
Air, Precipitation, and Snow Sampling

NADP network

NADP monitor
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/
1966 NYC Lichen desert

Dr. Irwin Brodo

Parmelia caperata