

# **USDA Forest Service National Fire & Air Workshop**

Tucson, Arizona  
January 28-30, 2003



# I. Executive Summary

Smoke from biomass burning poses a significant threat to the accomplishment of fuels reduction on the national forests and rangelands. If not managed properly, smoke can violate air quality standards, impair visibility, pose safety problems on thoroughfares, and create a nuisance that disenfranchises citizens.

When properly managed, smoke can be quite ephemeral thereby reducing impacts. Some smoke can be categorized as natural even though it was emitted from managed fire thereby avoiding regulatory violations. Good communications with neighbors, communities and regulatory agencies about efforts being undertaken to protect human health, public welfare and visibility can instill confidence in the agency fuels reduction program, in fire bosses and in smoke managers.

By hosting the first joint program workshop in Tucson on February 28-30, 2003, the national air and fire programs made the significant commitment at the staff level to work together closely to achieve the objectives of the National Fire Plan (NFP) and the Comprehensive Strategy (CS). For this commitment to yield tangible results, considerable individual leadership will be necessary to change attitudes, develop policies, acquire tools, and implement meaningful and integrated working relationships. For this workshop to mean anything, there must be a true paradigm shift;

away from the belief that air quality is a barrier to fuels reduction and towards an attitude that incorporates effective smoke management into the fabric of the fire culture; away from the belief that smoke is an air program issue and toward the acceptance of smoke management as an agency-wide issue; and away from passive management interest toward smoke management and toward fully committed and supportive involvement.

Responsible smoke management is an agency responsibility beginning at the national level. The Watershed, Fish Air and Rare Plants Staff (WFW) and Fire and Aviation Staff (F&AM) must work together to define best smoke management policies and practices and to lead the way for establishing excellent working relationships with partners and outstanding satisfaction from customers. Smoke management must become an integral working part of the NFP and the CS, not an afterthought. No implied or other conflict should exist between class I area visibility protection, the NFP or the CS. Staffing and budgets for proactive smoke management are not meeting expectations. A programmatic review of air resource management especially one that addresses the relationship with F&AM, Research & Development (R&D) together with the Remote Sensing Applications Center (RSAC), the Weather Program, inter-staff agency specialty-teams, other agencies and interagency groups will help meet this need.

Planning and operational tools are essential for better smoke management. Speciated emissions from all reasonably sized biomass fires should be quantified and tracked. The agency should take the national lead among all federal agencies towards establishing a uniform national web-based fire activity tracking system. Monitoring programs should be improved, supported and expanded to provide high quality, timely and spatially representative knowledge about smoke impacts. Modeling of emissions, meteorology and smoke dispersion provides the manager with added

skill in forecasting smoke impacts. Web sharing of policy and regulatory information that relate smoke to such issues as Regional Haze, and forest and project level planning is a must.

While action at the national level sets the stage for long-lived changes in business methods, Regional and Forest level actions will make the difference in actual improvements in smoke impacts and relationships. This report presents many concrete suggestions for effective changes that are necessary for better smoke management in field units.

## II. Workshop Design and Documentation Overview

### Workshop Design

Prompted by the convergence of the National Fire Plan and increased air quality regulation, a team of Forest Service Air Resource Management and Fire and Aviation Management Program staff organized a workshop to bring regional fire and air personnel together to address related issues. The goal was to gather the fire and air programs that have common and conjoining interests to share knowledge and further develop relationships toward future collaborative endeavors.

The planning team developed the following workshop objectives:

- To improve integration and collaboration of the Forest Service Fire and Aviation Management and Air Resource Management Programs toward the implementation of the National Fire Plan and the protection of air quality.
- To share information and discuss key issues critical to both Air and Fire that affect Agency coordination, decision-making, operations, and forest planning.
- To develop a coordinated strategy to respond to these issues that includes defining roles, identifying communication, information, and technology needs, and developing recommendations to Agency leadership.

Some 65 individuals, mostly representing Forest Service regional office staff in the Fire and Aviation Management and the Air Resource Management programs, attended the workshop. Other participants included members of the Washington Office staff, representatives of Forest Service Research, EPA, FWS, and some contractors.

The workshop was organized into a sequence of plenary and breakout sessions. During the plenary sessions, topical experts presented current policy and research to provide context for the breakout sessions that followed. The regional breakout sessions provided participants a forum to engage one another, to share knowledge and information, and to develop new collaborative strategies.

The breakout discussions focused on three major areas believed to be most critical to current collaborative Air and Fire Program work: Land Management Planning (LMP); State Implementation Plan (SIP) Development and Smoke Management Plans (SMP); and Information and Data Needs. A final breakout session focused on identifying the priority needs of national level Air and Fire Program leadership, and on the development of regional action plans that captured the results of the preceding breakout sessions.

## **Workshop Documentation**

This report does not attempt to document all of the work of all of the breakout groups since a total of 21 breakout sessions produced findings during the course of the workshop. Documented here is 1) a compilation and distillation of all national scope findings from all breakout groups by major topic, 2) national scope findings from each individual breakout group, and 3) regional action plans which are meant to reflect major agreements and findings from the course of the workshop. Detailed results from each of the breakout groups can be found at the workshop web page.

The report concludes with a list of the workshop participants.

Additional information from the workshop is available on the Fire and Air Workshop website at: <http://www.fs.fed.us/eng/rsac/airQ/> including the following:

- Final Report
- Workshop Agenda
- Technical Session Agenda
- Most Power Point Presentations given at the Workshop
- Breakout Group Handout Original
- Original Versions of the Breakout Group Notes
- Glossary of Terms/Acronyms
- References

# III. Workshop Recommendations

Results from the National Fire and Air Workshop are presented below in 3 major categories; 1) a compilation of all the breakout group national recommendations, 2) national recommendations as received from each individual breakout group, and 3) the regional action plans. Complete workshop results can be found at the web site.

## National Needs and Recommendations

The following is a compilation of recommendations from all of the final breakout groups including the National Focus group (WO); Regions 1,2 and 4 (R1/2/4); Region 3 (R3); Region 5 (R5); Region 6 (R6); and Regions 8 and 9 (R8/9). The groups were asked to come up with 3-6 important issues that they felt needed resolution at the national level. Groups that generated specific recommendations are identified in the text. Given the workshop approach, if a region did not identify a particular need in their summary, this should not be viewed as lack of support for an issue. All it means is that the issue didn't appear among the top issues they identified.

This compilation required much distillation and interpretation of individual workgroup reports. The reader is referred to the breakout group reports for further detail.

### Compilation of Priority Recommendations from all National Focus Breakout Groups

#### **Forest Service Fire and Air Program Cooperation**

- Raise awareness within the Agency (especially at higher levels) of common issues, roles, and the importance of the Fire and Air programs working together. Briefing papers would be one approach. (WO)

#### **National Fire Plan and Comprehensive Strategy**

- Successful smoke management is linked to the success of NFP implementation. It seems the agency is not putting an adequate amount of emphasis on promoting successful smoke management compared to other NFP priorities. (R1/2/4, R6)
- The FCAMMS (Fire Consortia for Advanced Modeling of Meteorology and Smoke) should be adequately supported to improve our ability to implement the NFP, especially its smoke management aspects. (WO, R3, R8/9)
- Resolve the apparent conflict between protecting Class I area visibility and the amount of fire use needed to implement the NFP and the Comprehensive Strategy. (R6)

#### **Workforce Size and Skills**

- Does the Agency have the appropriate air quality-related skills and an adequate workforce to support NFP implementation including Regional Planning Organization (RPO) involvement, emission inventory development, SIP development, EPA rule review, etc? (WO)

- Could GACC meteorologists help by providing improved smoke and meteorology predictions in situations where states and/or air pollution control authorities do not? (R1/2/4)
- Could regional specialists or specialty task teams assist other regions as issues arise? (R5)

### **Fire and Emissions Tracking**

- The Agency needs to improve our ability to do emissions tracking and inventory. (WO, R3)
  - NFPORS (National Fire Plan Operations and Reporting System) should be examined as a possible fire tracking system. (WO, R6)
  - Ability to track emissions averted through alternatives to burning or emission reduction techniques is needed. (WO, R6)
  - We need guidance on FASTRACS vs. PFIRS or other approaches for fire emissions tracking. (R5)
- The Forest Service needs to work with other federal and state agencies to standardize definitions and terms applied to fire use and air management, and standardize fire emission tracking methodologies nationally. (R6)
- The National Office should work with other agencies and entities to promote the recognition of all sources of smoke when emission inventories are developed. (R6)
- Finalization of Forest Service Research emission factor work is needed. (R8/9)

### **Partnerships**

- Maintain and strengthen partnerships between NFS, State and Private, Research, and EPA. (WO)
- Important committees for us to be involved with include NFAICG and Wildland Fire Council. (WO, R6)
- Continue to work with the Remote Sensing Application Center (RSAC) to provide smoke tracking by satellite. (R3)

### **National Guidance**

- National guidance on the definition of minimum smoke analysis requirements for forest and project level plans is needed. (R1/2/4)
- Emissions inventory guidance, clarification of responsibilities, and definition of data requirements is needed. Define the implications (possible inaccuracies) if we are not involved when fire and smoke emission inventories are developed by others. (R1/2/4, R5)
- National development of smoke monitoring protocols especially related to regional haze planning. (R5)

### **Technology Transfer**

- Easier access to new and existing information on smoke and air such as a clearinghouse for regulations, technology transfer products, and tools. (R1/2/4)
- Work cooperatively to advocate continued support for the national cache of DataRAM nephelometers with supporting documents including SOP's, protocols, guidance, and joint Air and Fire financial support. (R3)
- Support maintenance and further development of a web page for displaying DataRAM data, either through SATGUARD or GOES. (R3)

## **National Recommendations Individual Breakout Group Results**

The following breakout group notes are presented in close to their original form. Some minor editing for style and clarity was done. Verbatim originals are provided on the workshop results web page.

The National Breakout Group was composed of most of the WO staffs present at the workshop plus selected individuals from regional breakout groups. This final discussion was the only time the National Breakout Group met.

### **National Breakout Group Results - Key Messages**

1. Forest Service Fire and Air Programs are mutually dependent. They must work together effectively if the goals of the National Fire Plan and Comprehensive Strategy are to be fully realized. Specialists and field personnel seem to understand this better than Regional Office and Washington Office personnel. Briefing papers directed at each audience should be prepared to sell the importance of working together, explain issues, and explain roles. Field people feel the need for a more common message from the two programs.
2. We need to do a better job of quantifying outcomes including emissions and impacts. The first step is to develop and maintain an emissions tracking and inventory system. Could NFPORS, with a few modifications, serve this need? The ability to track emissions averted through mechanical treatments or use of emission reduction techniques would be useful.
3. Strong partnerships between NFS, State and Private, Research, and EPA are critical to implementing the NFP and protecting air quality. The FCAMMS will help and should be adequately supported.
4. The Forest Service Fire and Aviation Program is counting on the Air Resource Management Program to accomplish many critical tasks that support NFP implementation including RPO involvement, emission inventory development, SIP development, EPA rule review, etc. We need to address whether we have the appropriate skills and an adequate workforce to deal with the changing workload.

Important committees for us to be involved in:  
Wildland Fire Council and NFAICG (new)

## **Regions 1, 2 and 4 Breakout Group Results – National Recommendations**

1. Smoke management is directly linked to the success of NFP implementation. Without someone to focus on smoke management and collaborate with all parties, implementation could be less than successful. Nationally, we need to emphasize the importance of being successful and where it appropriately fits in with the other priorities. To do so, Air and Fire needs to work together to define the role.
2. Better define the role of the Meteorologists at the GACCs with respect to NOAA, National Weather Service fire weather and smoke dispersion programs, local smoke management unit needs, and FCAMMS. Seems to be a good opportunity to take more advantage of windows of opportunity with improved smoke and meteorology predictions. In addition, units could benefit from better access for analysis and planning of project-level activities.
3. Need some national guidance about minimum requirements for forest and project-level plans. How much detail is appropriate to ensure quality analyses are conducted.
4. Clearinghouse for tech transfer, new information, and tools (i.e., VIEWS as related to Regional Haze). With limited time available and information scattered across the web, it is often difficult and time consuming to find.
5. Emissions inventory guidance is critical. What criteria did the contractor hired by WRAP use? Who is responsible for emissions inventories on the forests (USFS or state)? What are the implications if we aren't involved and they are over- or under- estimated?

## **Region 3 Breakout Group Results – National Recommendations**

1. Cache of DataRAMs – better if some monitors are available out of the region. WO monitors could be used as back up for what the Region has during wildfire, etc.
2. Satellite Guard website – who should control this private site? We want the control to continue to be by the WO, a centralized approach. There could be a separate page for regions, but the site needs to remain managed by one person (WO). We support the design changes to improve the ease for retrieving data.  
  
Should the data delivery system be GOES or SATGUARD, or a combination site? WO needs to research that and present pros and cons.
3. Remote Sensing Application Center (RSAC) to continue to provide services for remote sensing, e.g., smoke tracking by satellite.
4. Support and fund our FCAMM in Colorado (Karl Zeller) so we can meet the expectations of our partners, implement the National Fire Plan, populate our smoke models, etc.

5. Promote an event/activity tracking system that is web-based. RSAC can assist with this, with Brad Quayle as point of contact for hosting the system on their USDA site.

### **Region 5 Breakout Group Results – National Recommendations**

1. National assistance to establish data information needs – i.e., national data/perimeter data: how to tie in?
2. Training.
3. Direction & deadlines necessary for FASTRACS implementation & integration with PFIRS. Establish players in this area.
4. Establish national task teams to help resolve regional issues – to fulfill specialty knowledge gaps – example: Trent Wickman’s regulatory background could really benefit R5 in certain instances.
5. National assistance in developing Pilot FETM.
6. National participation for the development of smoke monitoring protocols related to RH planning - involve research.
7. National methodology for budgeting BFES.

### **Region 6 Breakout Group Results – National Recommendations**

1. Need to standardize definitions and terms applied to fuels and air, and standardize emissions estimates and reporting to fully report and compare information between agencies and across the country for emissions inventory purposes. Utilization in lieu of burning should be reported through NFPORS. Some information may not need to be standardized in order to have comparable data. All affected federal agencies should be involved.
2. National initiatives, such as the National Fire Plan and the 10-Year Comprehensive Strategy, need to include air quality and emissions management as an integral part of the initiatives. The agency needs to resolve the conflict between protecting visibility in Class I areas and the amount of fire use needed to implement the National Fire Plan and the 10-Year Comprehensive Strategy.
3. The National Office should promote the recognition of all sources of smoke emissions, such as agricultural burning and other open burning along with silvicultural burning, for complete emissions inventories, bringing together relevant state and federal agencies.
4. The Forest Service should join the National Fire/Air Issues Coordination Group.

5. We suggest that other regions may want to use the FERA-R6 relationship as a model for setting up a similar coordination between research and users.

### **Regions 8 and 9 Breakout Group Results – National Recommendations**

Note: This group did not submit written national recommendations.

From Flip Charts:

1. Develop web-based fire activity – use Fire Management personnel to do it. (National database important to Region 8/9)
2. LMP: Need Regional direction. WO level too high.

## Regional Action Plans

The second part of the final breakout group was for participants to build a regional action plan of tasks needed at the regional level to improve fire and air cooperation and coordination, and improve our ability to implement the National Fire Plan while protecting air quality.

The following breakout group notes are presented in close to their original form. Some minor editing for style and clarity was done. Verbatim originals are provided on the workshop results web page.

### Regions 1, 2 and 4 Breakout Group Results – Regional Action Plan

Current Program elements:

1. PSD Program:

Review permit application- (R2-Chris, R4-Chris, R1-Ann/Bob??) NV is hit or miss. Not always involved. Some question how ID and ND are being handled.

Monitoring- (i.e. IMPROVE Network) IMPROVE network covered, but local AQRV forest programs seem to be an issue due to funding and other work related priorities.

Modeling- Covered through the existing contract with ARS and collaboration with NPS. Currently the money available seems to be adequate now, but could become a problem in the future if the money was pulled or diverted.

Meetings-Never seems to be enough time to go around.

**Action Item:** Consider addition of 1 FTE to share between R1, R2 and R4 to review PSD applications.

2. Planning:

NEPA Assistance (guidance, analysis and review) - This includes smoke and AQRV's. For fire see Implementation documents, below. Other resource NEPA is covered by Jeff Sorkin and Terry for R2 and R4.

LMP assistance

Project support (internal and external) See implementation documents, below for those assigned.

NRIS -

Implementation documents (burn plans, WFUs, FMPs) R2/R4 fire – Brian, R1 and S Idaho-Ann; Deirdre-Boise NF; Bob Hammer MT/ID, Mark E MT; Gary Jackson Salmon NF.

**Action items:** Workload with NEPA, LMP revisions, implementation documents, and project-level support seems to be increasing faster than the current staff is capable of handling. Expect there to be a real need for smoke expertise to be directly involved with the fire community. Currently only R2 has a Smoke Management person dedicated to the fire community to work through the issues at hand. Preparation of better guidance documents could assist local units in planning and preparation and free up scarce resources to invest their time in other areas. UT and MT struggle to assist the units

among all the other program priorities. Due to shortage of qualified personnel, we might consider out-sourcing NEPA analysis.

3. Collaboration:

SIP Involvement  
Smoke Management Program  
Regional Planning Organizations  
WESTAR  
State and local agencies  
National Fire Plan

**Action items:** Similar to previous topics and covering all this collaboration with the existing staff is tough to accomplish with other program priorities. We seem to be involved when we can be, but there is a lack of consistency in our involvement due to what was described above. Our lack of involvement can send the wrong message to those that would like our involvement.

### **Region 3 Breakout Group Results – Regional Action Plan**

**GOAL:** Implement National Fire Plan and Forest health objectives while protecting and maintaining air quality and managing nuisance smoke.

1. Increase the capability of our regional modeling consortium to provide us tools to implement the National Fire Plan.

Letter from RF to Al Riebau and Jim Saveland closer --- presentation: skills, partners why we need it, products; more funding (wasn't funded as initially planned). Use presentation from Athens. Karl Zeller to help us write the letter. Input from Chuck Maxwell (GACC). We need products we can understand and use on the ground by fuels techs.

2. Foster relationship with Air Quality Bureaus – daily interactions, support them, keep on the good path we're on with the staff relationships.
3. Fill the National Fire Plan position. Jointly develop work plan for the position covering NM and AZ. They can help fill the gap in the RPO workload.
4. \*Technology transfer\* -- we're doing a lot with smoke monitoring, and need to keep going: making Data RAMS available (4), trading in old equipment for Data RAMS next step is more satellite linkages (currently using WO equipment to do that). Two FRM monitors (one not sequential).

Strategic co-placement of Data RAMS with RAWS (Chuck Maxwell has the prototype operating).

5. Interagency Coordination

BLM position in NM will be the smoke data steward (Bye) for all agencies. Therefore we need to continue our database working group in NM with increasing leadership from the state.

Our partners want interagency availability of equipment, training, etc.

6. Continue working on rule making for smoke management with state agencies and other stakeholders.
7. Public Outreach
8. More discussion about how to “work with” Cecilia Abeyta NM Farm Bureau, Paul Seeby of CEED (Center for Energy and Economic Development).

### **Region 5 Breakout Group Results – Regional Action Plan**

1. Continue this process back in Region 5 to Regional Management Team to make a presentation to the Directors of Fire, Air & Ecosystem – this is already requested.
2. Review Air Program - and especially it’s relationship to fuels – Organization : Roles & responsibilities & tools. Goals & objectives. Who should attend these meetings? – identify & create continuity of participants.
3. Briefing paper – adapt some of LMP matrix, work load analysis of fuels & air – what technical expertise necessary to integrate, risks – i.e. conformity analysis.
4. Meet with Barb Bonefeld - FASTRACS vs. PFIRS – explore feasibility of populating FASTRACS first, then develop PIFIRS template and/or means of interface of 2 systems? Or should they be kept separate for respective needs and requirements? Determine economic efficiency of options...careful deliberation of this delicate issue. CANSAC & BlueSky access & utility considered.
5. Severity analysis - from Salt Lake City, Klaus Barber regional analysis modeling – to compare/contrast emissions for Forest Plan revision
6. Formalize the interagency agreement for wildfire monitoring
7. Emissions Inventory - Paramount. Pivotal. Need to garner agency comprehensive support for this difficult and complex issue; creates integrity, credibility, & confidence in information. Internal education necessary to gain support. Optimal for modeling = key for solving many of the other issues.
8. Public Education – funding well worth.
9. Pilot project to look at current technologies and to access current needs & criteria

## **Region 6 Breakout Group Results – Regional Action Plan**

1. Build a more complete emissions inventory for the federal lands.
  - a) Investigate bringing the Northwest Coordination Center into the mix and developing a reporting system for daily reporting of all fire emissions, at least on federal lands. Jim Russell and Janice Peterson would work on developing a more automated process for daily estimation of wildland fire emissions. FASTRACS needs to report to the Northwest Coordination Center automatically so the Intelligence Office can prepare a more complete report to forward to the National Interagency Coordination Center. Will probably take at least one year to investigate what is needed and what is possible.
  - b) Review data requires currently in FASTRACS and work with states to determine what data is really needed and what is not to adequately estimate emissions from prescribed burning. Conduct a marginal analysis on the data used now and any proposed changes to determine the value of the data for regulatory and research needs. Come to agreement on what data is really worth collecting. Roger Ottmar, Janice Peterson, Sue Ferguson, Jim Russell, Tim Rich or John Orbeton. High priority.
  - c) Work to include federal rangeland burning and voluntary compliance currently under MOA in south central Oregon. Jim Russell to lead.
  - d) Identify an appropriate data repository for emissions data and emissions foregone through other treatments.
2. Build a reporting system that includes emission reduction techniques used and the emissions foregone as a result. First priority would be on commercial utilization, in keeping with the 10-Year Comprehensive Strategy. Next priority would be other mechanical methods. Third priority would be biological and chemical methods. One method may be a cross link between NFPORS and FACTS, for example. Tim Rich to take the lead. Janice Peterson will work on better documentation of existing emission management techniques currently available through FASTRACS, such as burning under higher fuel moistures and spring burning.
3. Complete working drafts of guidance documents on information needed in land use plans and conducting air quality analyses. Working drafts should be sent to the field no later than June. Final versions will be completed by the following year in collaboration with the regulatory agencies. Janice Peterson and Louisa Evers.

## **Regions 8 and 9 Breakout Group Results – Regional Action Plan**

### Data Plan

- Web based/geospatial system to track prescribed fire Region-wide.
- FCAMMS – Deliver BlueSky model to the SHRMC/EAMC as soon as possible.

### Land Management Planning

- Develop Regional direction for the NFs for fire/air quality narrative/process.
  - WO is too high a level. Regions and Forests need to be working together. Do it by State, so if there are multiple forests in a state, they need to be working together. May be able to do the planning effort over several states, but ultimately, have to work with individual states.
  - ACTION PLAN – RO air and fire specialists develop a joint R8/9 LMP process. Disseminate to NFs via RF cover letter.
  
- Develop comprehensive emissions **benchmark** – historical, present, future ecological processes, how much you can actually burn, wildfire plus prescribed fire?

#### SIP NAAQS

- Early participation with States (ozone & PM2.5) key, fire and air staff.

#### SIP – Regional Haze/RPO Involvement

- Early participation with RPO/States(ozone & PM2.5) key, fire and air staff.
- Prioritize finalization of southeastern emission factors, and/or publish unpublished data developed by Darold Ward and Dale Wade.
- Embed FS methodology (generation of PM2.5 emissions) in State SIP process.

#### SMP

- Early participation with States (ozone & PM2.5) key, fire and air staff.
- Embed FS methodology (generation of PM2.5 emissions) in State SIP process.

## Members of the Planning Team

Janice Peterson, Chair (Region 6, Air)

Bruce Bayle (Region 8, Air)

Rich Fisher (WO, Air)

Bob Hammer (Region 1, Air)

Patti Hiram (WO, F&AM)

Jim Russell (Region 6, Fire and Air)

Pete Stewart (Region 3, Fire and Air)

Dave Richie (CIRA)

Rebecca Reynolds, Facilitator (Rebecca Reynolds Consulting, Inc.)

## Participant List

Name	Title	Agency/ Organization	Breakout Group/ Workshop Role
<b>Ann Acheson</b> <a href="mailto:aacheson@fs.fed.us">aacheson@fs.fed.us</a>	Regional Air Program Manager	Forest Service	Region 1/2/4/ and Presenter
<b>Suraj Ahuja</b> <a href="mailto:sahuja@fs.fed.us">sahuja@fs.fed.us</a>	North Zone Air Quality Specialist	Forest Service	Region 5
<b>Ron Babbitt</b> <a href="mailto:rbabbitt@fs.fed.us">rbabbitt@fs.fed.us</a>	Electronics Engineer	Forest Service Research	Presenter
<b>Christopher Baisan</b> <a href="mailto:cbaisan@ltr.arizona.edu">cbaisan@ltr.arizona.edu</a>	Sr. Research Specialist	University of Arizona	Presenter
<b>Bruce Bayle</b> <a href="mailto:bbayle@fs.fed.us">bbayle@fs.fed.us</a>	Regional Air Program Manager	Forest Service	Region 8/9
<b>Brian Bischof</b> <a href="mailto:bbischof@fs.fed.us">bbischof@fs.fed.us</a>	R2 Smoke Management Coordinator	Forest Service	Region 1/2/4
<b>John Caffin</b> <a href="mailto:jcaffin@fs.fed.us">jcaffin@fs.fed.us</a>	Fuels/Fire Technology Specialist	Forest Service	Region 8/9*
<b>Erik Christiansen</b> <a href="mailto:echristiansen@fs.fed.us">echristiansen@fs.fed.us</a>	Fuels Management Specialist	BLM/ Forest Service	Region 6
<b>Ricardo Cisneros</b> <a href="mailto:rcisneros@fs.fed.us">rcisneros@fs.fed.us</a>	Air Resource Specialist	Forest Service	Region 5
<b>Scott Copeland</b> <a href="mailto:copeland@cira.colostate.edu">copeland@cira.colostate.edu</a>	Visibility Analyst	CIRA	Presenter
<b>Deirdre Dether</b> <a href="mailto:ddether@fs.fed.us">ddether@fs.fed.us</a>	Fuels Planner	Forest Service	Region 1/2/4*
<b>Louisa Evers</b> <a href="mailto:Louisa_Evers@blm.gov">Louisa_Evers@blm.gov</a>	State/Regional Fire Ecologist	BLM/ Forest Service	Region 6
<b>Sue Ferguson</b> <a href="mailto:sferguson@fs.fed.us">sferguson@fs.fed.us</a>	Research Atmospheric Scientist	Forest Service Research	Presenter
<b>Rich Fisher</b> <a href="mailto:rfisher@lamar.colostate.edu">rfisher@lamar.colostate.edu</a>	Assistant National Air Program Manager	Forest Service	Region 3 and Presenter
<b>Doug Fox</b> <a href="mailto:fox@cira.colostate.edu">fox@cira.colostate.edu</a>	Research Scientist	CIRA	Presenter
<b>Jim Gladen</b> <a href="mailto:jgladen@fs.fed.us">jgladen@fs.fed.us</a>	Staff Director	Forest Service	Presenter

<b>Name</b>	<b>Title</b>	<b>Agency/ Organization</b>	<b>Breakout Group/ Workshop Role</b>
<b>Shane Greer</b> <a href="mailto:sgreer01@fs.fed.us">sgreer01@fs.fed.us</a>	Pike Hotshots Superintendent	Forest Service	Region 1/2/4
<b>Dennis Haddow</b> <a href="mailto:dennis_haddow@partner.nps.gov">dennis_haddow@partner.nps.gov</a>	Environmental Engineer	Fish & Wildlife Service	Presenter
<b>Roy Hall</b> <a href="mailto:rahall@fs.fed.us">rahall@fs.fed.us</a>	Fuels Specialist	Forest Service	Region 3
<b>Bob Hammer</b> <a href="mailto:bhammer@fs.fed.us">bhammer@fs.fed.us</a>	Air Resource Specialist	Forest Service	Region 1/2/4
<b>Ray Hermit</b> <a href="mailto:rhermit@fs.fed.us">rhermit@fs.fed.us</a>	Asst Director Fire & Aviation Mgmt - Fuels	Forest Service	Region 5
<b>Patti Hirami</b> <a href="mailto:phirami@fs.fed.us">phirami@fs.fed.us</a>	Fire Air Quality Specialist	Forest Service	Region 5* and Presenter
<b>Chris Hockett</b> <a href="mailto:chockett@fs.fed.us">chockett@fs.fed.us</a>	R2/4 Regional Air Program Manager	Forest Service	Region 1/2/4
<b>Cindy Huber</b> <a href="mailto:chuber@fs.fed.us">chuber@fs.fed.us</a>	Air Resource Specialist	Forest Service	Region 8/9*
<b>Patricia Koppenol</b> <a href="mailto:pkoppenol@fs.fed.us">pkoppenol@fs.fed.us</a>	Fire Use Specialist	Forest Service	Region 1/2/4
<b>Susan Kozacek</b> <a href="mailto:skozacek@fs.fed.us">skozacek@fs.fed.us</a>	Deputy Forest Supervisor	Forest Service	Presenter
<b>Pete Lahm</b> <a href="mailto:pete_lahm@compuserve.com">pete_lahm@compuserve.com</a>	Arizona Interagency Smoke Management Coordinator	Forest Service	Region 3*
<b>Donna Lamb</b> <a href="mailto:dlamb@fs.fed.us">dlamb@fs.fed.us</a>	National Air Program Manager	Forest Service	Region 8/9*
<b>Bob Lefevre</b> <a href="mailto:rlefevre@fs.fed.us">rlefevre@fs.fed.us</a>	Hydrologist	Forest Service	Region 3
<b>Dave Levinson</b> <a href="mailto:dlevinson@fs.fed.us">dlevinson@fs.fed.us</a>	Meteorologist/Program Coordinator, Montana/ Idaho Airshed Group	BLM	Region 1/2/4 and Presenter
<b>Jerome Macdonald</b> <a href="mailto:jpmacdonald@fs.fed.us">jpmacdonald@fs.fed.us</a>	Regional Wildland Fire Training/Ground Safety Specialist	Forest Service	Region 3
<b>David S. Martinez</b> <a href="mailto:dsmartinez@fs.fed.us">dsmartinez@fs.fed.us</a>	Fire Ecologist	Forest Service	Region 3
<b>Dean McAlister</b> <a href="mailto:dmcalister@fs.fed.us">dmcalister@fs.fed.us</a>	Fire and Aviation	Forest Service	Region 3
<b>Mike McConnell</b> <a href="mailto:msmcconnell@fs.fed.us">msmcconnell@fs.fed.us</a>	Hydrologist	Forest Service	Region 3
<b>Mike McCorison</b> <a href="mailto:mmccorison@fs.fed.us">mmccorison@fs.fed.us</a>	Southern California Province Air Resource Specialist	Forest Service	Region 5
<b>Janet Orona</b> <a href="mailto:jorona@fs.fed.us">jorona@fs.fed.us</a>	Office Manager -Ecosystem Analysis & Planning	Forest Service	Staff
<b>Jon Payne</b> <a href="mailto:jonpayne@fs.fed.us">jonpayne@fs.fed.us</a>	Fuels Specialist	Forest Service	Region 5
<b>Janice Peterson</b> <a href="mailto:jlpeterson@fs.fed.us">jlpeterson@fs.fed.us</a>	Air Resource Specialist	Forest Service	Region 6 and Presenter
<b>Beth Plymale</b> <a href="mailto:tombeth@lightspeed.net">tombeth@lightspeed.net</a>	Air Resource Specialist	Forest Service	Region 5

<b>Name</b>	<b>Title</b>	<b>Agency/ Organization</b>	<b>Breakout Group/ Workshop Role</b>
<b>Deborah Potter</b> <a href="mailto:dapotter@fs.fed.us">dapotter@fs.fed.us</a>	Regional Air Program Manager	Forest Service	Region 3
<b>Trent Procter</b> <a href="mailto:tprocter@fs.fed.us">tprocter@fs.fed.us</a>	Sierra Province Zone Air Program Coordinator	Forest Service	Region 5
<b>Brad Quayle</b> <a href="mailto:bquayle@fs.fed.us">bquayle@fs.fed.us</a>	Remote Sensing Applications Specialist	Forest Service	Presenter
<b>Rebecca Reynolds</b> <a href="mailto:rr@rebeccareynolds.biz">rr@rebeccareynolds.biz</a>	Meeting Design Consultant, Facilitator	Rebecca Reynolds Consulting, Inc.	Facilitator
<b>Tim Rich</b> <a href="mailto:trich@fs.fed.us">trich@fs.fed.us</a>	Fuels Specialist	Forest Service, BLM	Region 6
<b>David Richie</b> <a href="mailto:richie@cira.colostate.edu">richie@cira.colostate.edu</a>	FS Air Program Communications	CIRA	Region 5
<b>Al Riebau</b> <a href="mailto:ariebau@fs.fed.us">ariebau@fs.fed.us</a>	Atmospheric Scientist	Forest Service Research	Presenter*
<b>Jim Russell</b> <a href="mailto:jrussell01@fs.fed.us">jrussell01@fs.fed.us</a>	Regional Air Program Manager	Forest Service and BLM	Region 6 and Presenter
<b>Chuck Sams</b> <a href="mailto:csams@fs.fed.us">csams@fs.fed.us</a>	Regional Air Program Manager	Forest Service	Region 8/9 and Presenter
<b>David (Sam) Sandberg</b> <a href="mailto:dsandberg@fs.fed.us">dsandberg@fs.fed.us</a>	Supervisory Research Physical Scientist	Forest Service Research	Presenter
<b>Kristi Savig</b> <a href="mailto:ksavig@air-resource.com">ksavig@air-resource.com</a>	Visibility Technology Specialist	Air Resource Specialists, Inc.	Presenter
<b>Mark Schaaf</b> <a href="mailto:mschaaf@airsci.com">mschaaf@airsci.com</a>	Associate Atmospheric Scientist, Fire and Smoke Management	Air Sciences Inc.	Presenter
<b>Leslie Sekavic</b> <a href="mailto:lsekavec@fs.fed.us">lsekavec@fs.fed.us</a>	Applied Fire Ecologist	Forest Service	Presenter
<b>Sally Shaver</b> <a href="mailto:shaver.sally@epa.gov">shaver.sally@epa.gov</a>	Director	EPA	Presenter
<b>Alan Smart</b> <a href="mailto:asmart@fs.fed.us">asmart@fs.fed.us</a>	Hydrologist, NRIS	Forest Service	Guest
<b>Charlene Spells</b> <a href="mailto:spells.Charlene@epa.gov">spells.Charlene@epa.gov</a>	Specialist	EPA	Guest*
<b>Andrea Stacy</b> <a href="mailto:astacy@fs.fed.us">astacy@fs.fed.us</a>	Air Resource Specialist	Forest Service	Region 8/9
<b>Pete Stewart</b>	NM Zone Smoke Coordinator - <i>retired</i>	Forest Service	Region 3
<b>Terry Svalberg</b> <a href="mailto:tsvalberg@fs.fed.us">tsvalberg@fs.fed.us</a>	Hydrologist/Air Resource Specialist	Forest Service	Region 1/2/4
<b>Andy Trent</b> <a href="mailto:atrent@fs.fed.us">atrent@fs.fed.us</a>	Project Leader	Forest Service Research	Presenter
<b>Trent Wickman</b> <a href="mailto:twickman@fs.fed.us">twickman@fs.fed.us</a>	Air Resource Specialist	Forest Service	Region 8/9

\* These people participated in the final national focus breakout group rather than with their regional group.