Wildland Fire and Smoke… an update for the AAQTF

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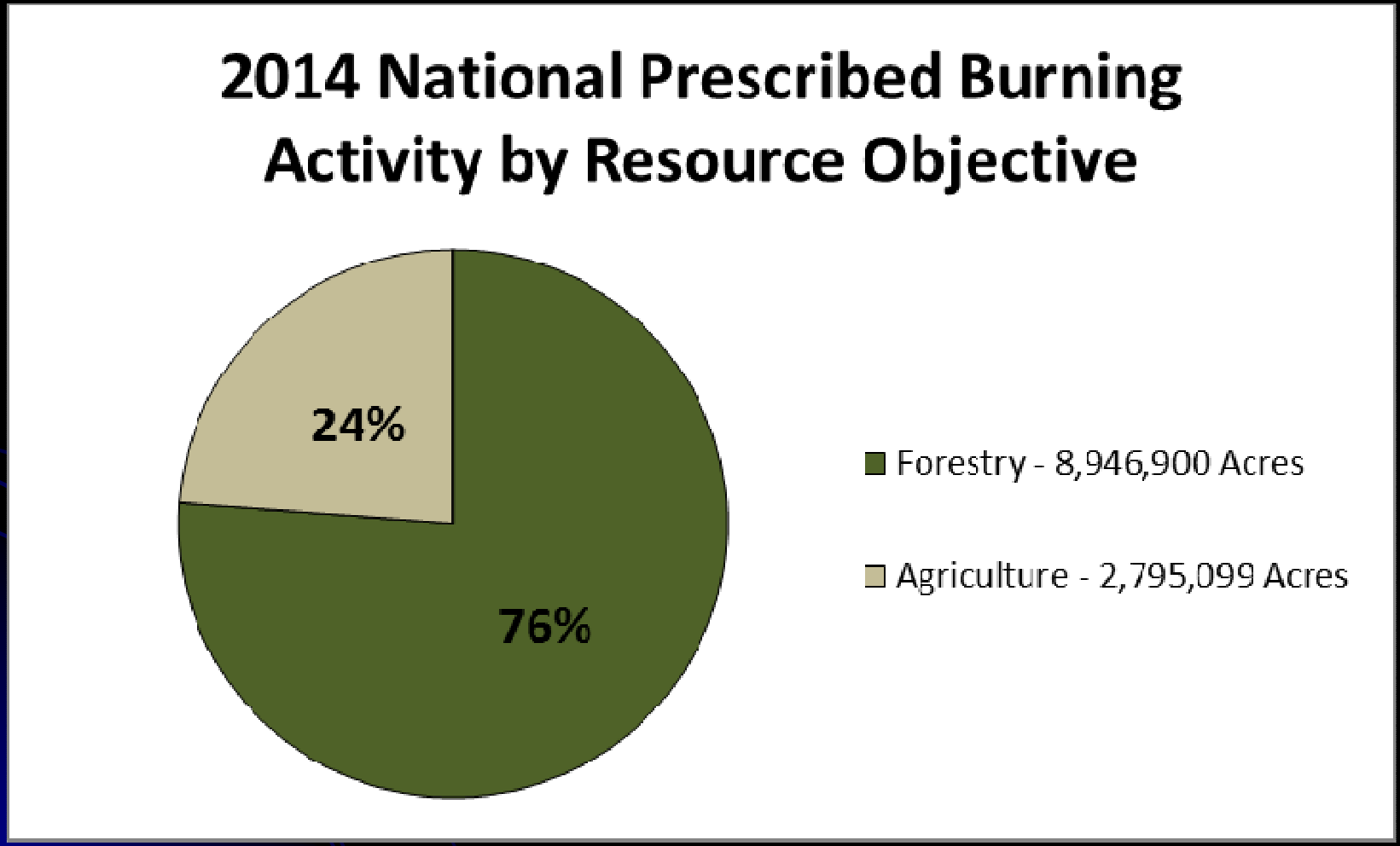
2015 National Prescribed Fire Use Survey: Coalition of Prescribed Fire Councils & National Association of State Foresters



Slightly up from 2011 Survey…

Trends in USFS Prescribed Fire Program – 1996 to 2014

Year Range	1996 to 2001	2003 to 2007	2008 to 2014
Prescribed Fires	24,133	19,468	33,677
Annual Average	4,022	3,980	4,811
Acres Treated	6,406,217	7,079,427	9,812,690
Annual Average	1,067,703	1,415,885	1,401,813
Escapes	235	50	45
Annual Average	39	10	6
Reliability Rate	99.03%	99.75%	99.87%

Note: data for 2002 was omitted as unreliable

EPA National Ambient Air Quality Standards

Criteria pollutants evaluated by EPA every five years

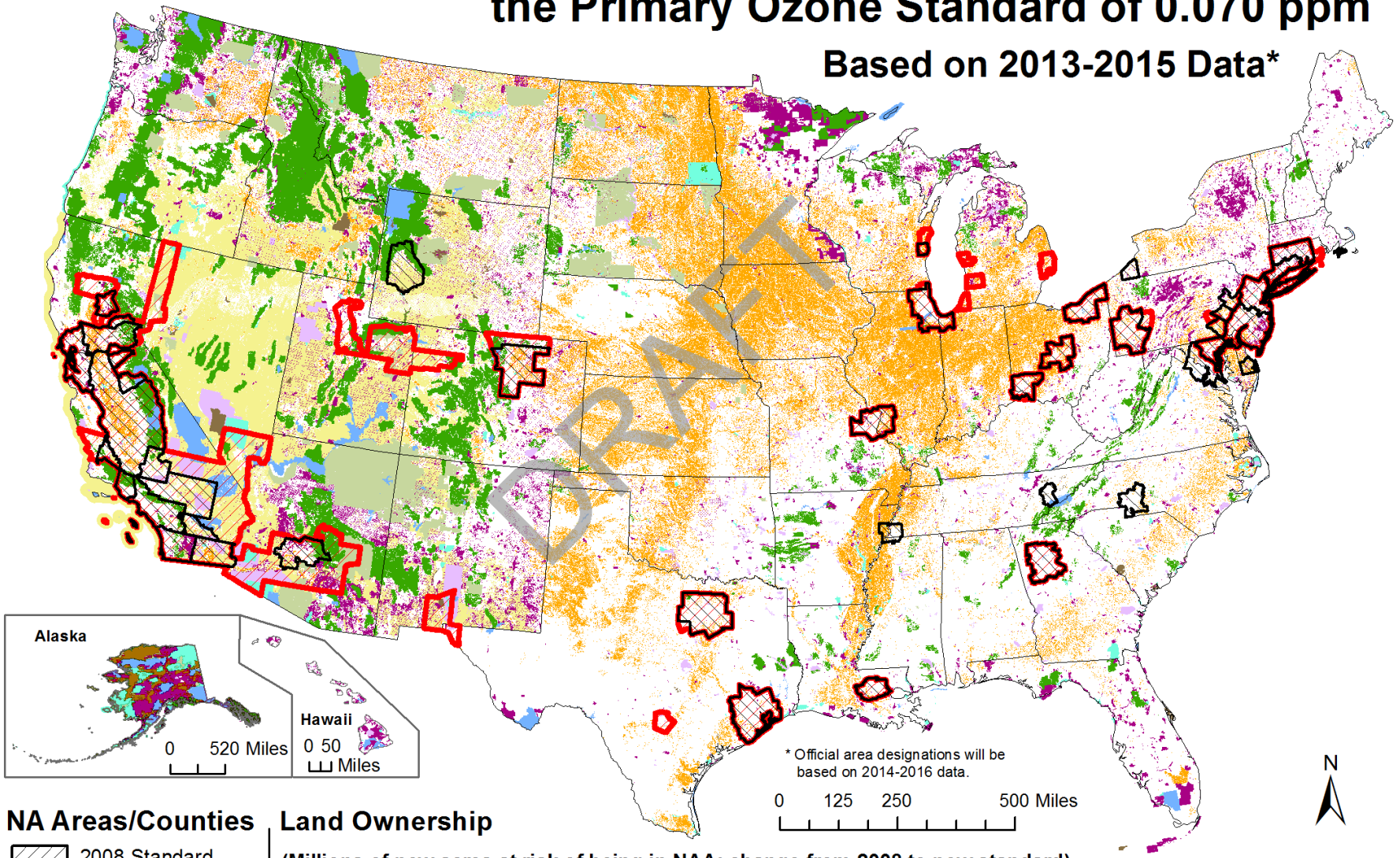
- **Ozone, Particulate Matter,**
- **Carbon Monoxide, Nitrogen Oxides, Sulfur Dioxide, Lead**
  - **-adequacy to protect public health (Primary)**
  - **-adequacy to protect public welfare (Secondary)**

Ozone

1) **New Standard of 70 ppb/8hr out October 1, 2015**
2) **Designations in two years (2017) based on 2014-2016 data**
3) **State Implementation Plans 1-2 years later (severity)**
4) **Exceptional Events Demonstrations possible but costly and challenging under proposed guidance**
5) **Implementation Rule about to be released…**

Areas at Risk of Becoming Non-attainment Under the Primary Ozone Standard of 0.070 ppm

Based on 2013-2015 Data*



NA Areas/Counties

- 2008 Standard (0.075 ppm)
- New Standard (0.070 ppm)

Map compiled by the USDA Forest Service, Fire Modeling Institute. August 12, 2016.

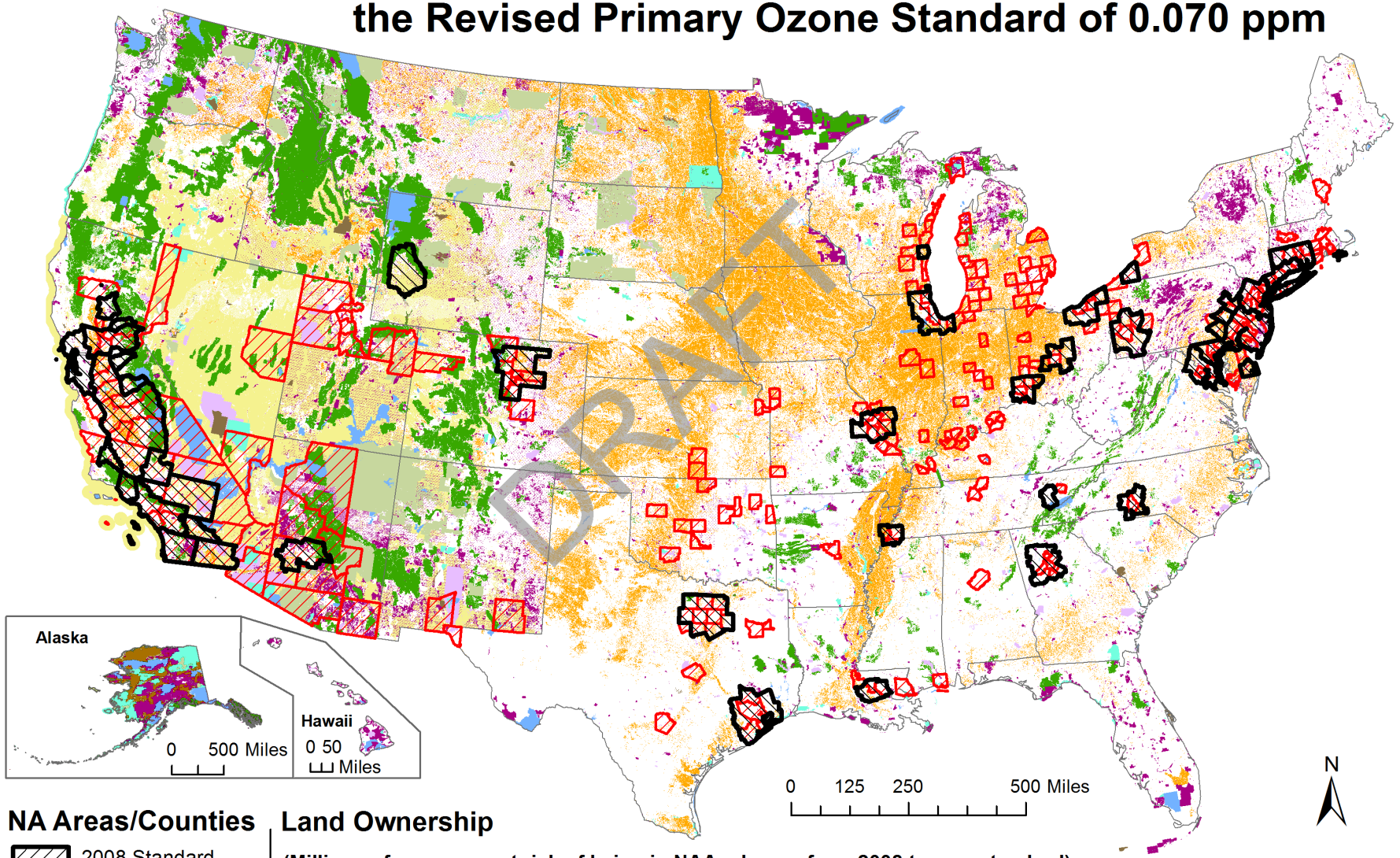
Land Ownership

(Millions of new acres at risk of being in NAA; change from 2008 to new standard)

- BIA (3.4)
- BLM (15.3)
- DOD (4.4)
- FS (4.4)
- FWS (2.0)
- NPS (2.6)
- Other Federal (0.1)
- State Lands (2.7)
- Other (6.9)
- Agriculture (0.5)

New potential non-attainment areas were identified as MSAs and counties that exceeded the 0.070 ppm threshold using the three-year (2013-2015) average of the 4th highest 8-hour average for each monitoring site. Ozone data were provided by EPA staff. Non-attainment areas under the 2008 standard are from EPA (www3.epa.gov/airquality/greenbook). Ownership data are from the USGS Protected Areas Database v1.3 and the USDA Forest Service Enterprise Data Warehouse. Land cover data (agriculture) from LANDFIRE 2012.

Areas at Risk of Becoming Non-attainment Under the Revised Primary Ozone Standard of 0.070 ppm



NA Areas/Counties

- 2008 Standard (0.075 ppm)
- New Standard (0.070 ppm)

Map compiled by the USDA Forest Service, Fire Modeling Institute. October 13, 2015.

Land Ownership

(Millions of new acres at risk of being in NAA; change from 2008 to new standard)

- BIA (10.7)
- BLM (29.6)
- DOD (7.6)
- FS (12.5)
- FWS (2.9)
- NPS (6.8)
- Other Federal (0.2)
- State Lands (8.9)
- Other (34.7)
- Agriculture (8.3)

New potential non-attainment areas were identified as counties that exceeded the 0.070 ppm threshold using the three-year (2012-2014) average of the 4th highest 8-hour average for each monitoring site. Ozone data were retrieved from EPA's AQS and CASTNET. Non-attainment areas under the 2008 standard are from EPA (www3.epa.gov/airquality/greenbook). Ownership data are from the USGS Protected Areas Database v1.3 and the USDA Forest Service Enterprise Data Warehouse. Land cover data (agriculture) from LANDFIRE 2012.

Areas at Risk of Becoming Non-attainment Under the Primary Ozone Standard of 0.070 ppm

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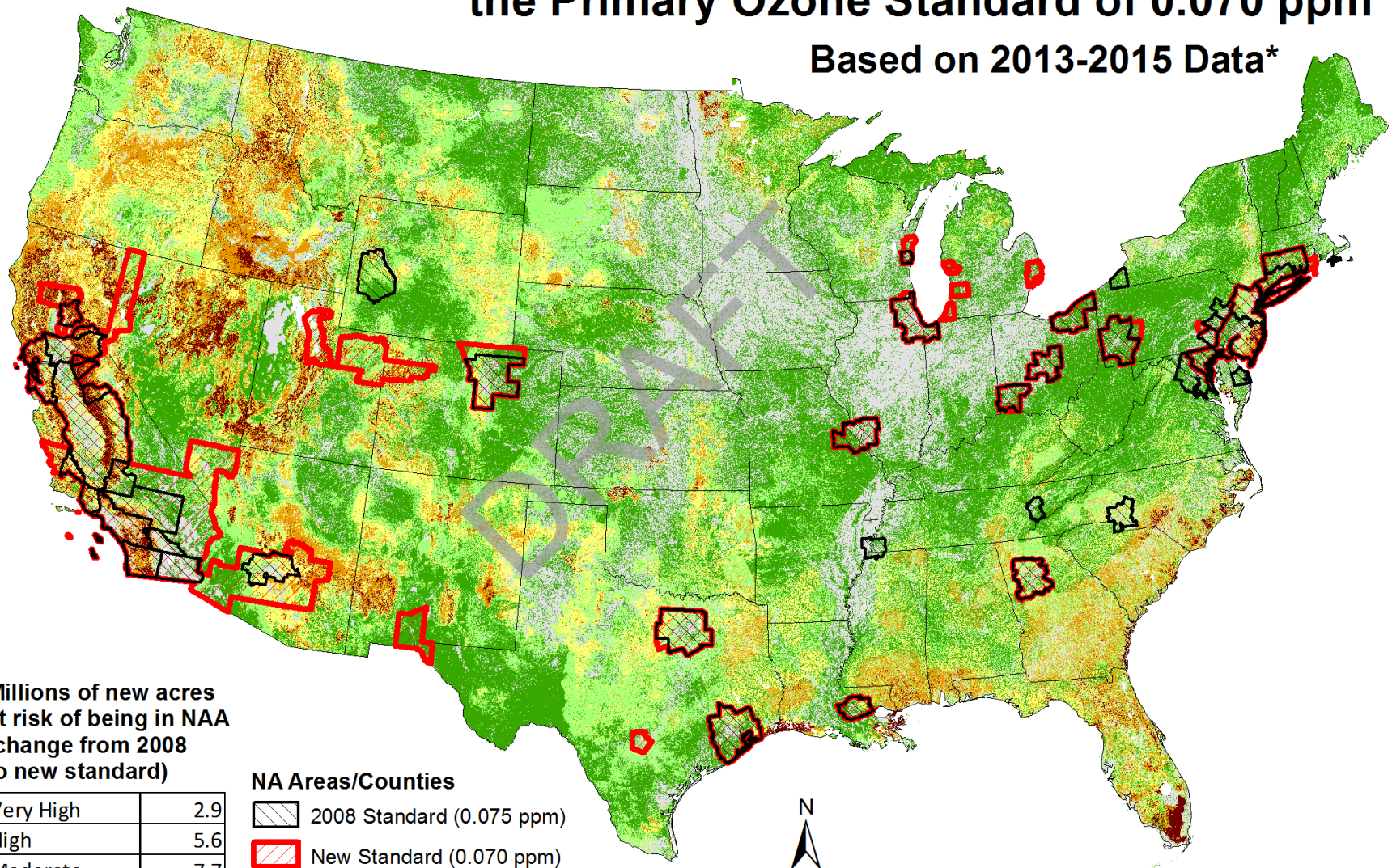


Millions of new acres at risk of being in NAA (change from 2008 to new standard)

Very High	2.9
High	5.6
Moderate	7.7
Low	7.6
Very Low	10.8
Non-burnable	7.3
Total	41.9

NA Areas/Counties

- 2008 Standard (0.075 ppm)
- New Standard (0.070 ppm)

Wildfire Hazard Potential

- Very High
- High
- Moderate
- Low
- Very Low
- Non-burnable

N

0 125 250 500 Miles

* Official area designations will be based on 2014-2016 data.

Map compiled by the USDA Forest Service, Fire Modeling Institute. August 12, 2016.

New potential non-attainment areas were identified as MSAs and counties that exceeded the 0.070 ppm threshold using the three-year (2013-2015) average of the 4th highest 8-hour average for each monitoring site. Ozone data were provided by EPA staff. Non-attainment areas under the 2008 standard are from EPA (www3.epa.gov/airquality/greenbook). Wildfire Hazard Potential data are from the USDA Forest Service, Fire Modeling Institute (www.firelab.org/project/wildfire-hazard-potential).

EPA National Ambient Air Quality Standards

Current Ozone Nonattainment = 111 million acres

Possible nonattainment based 2012-2014 data
225 million acres

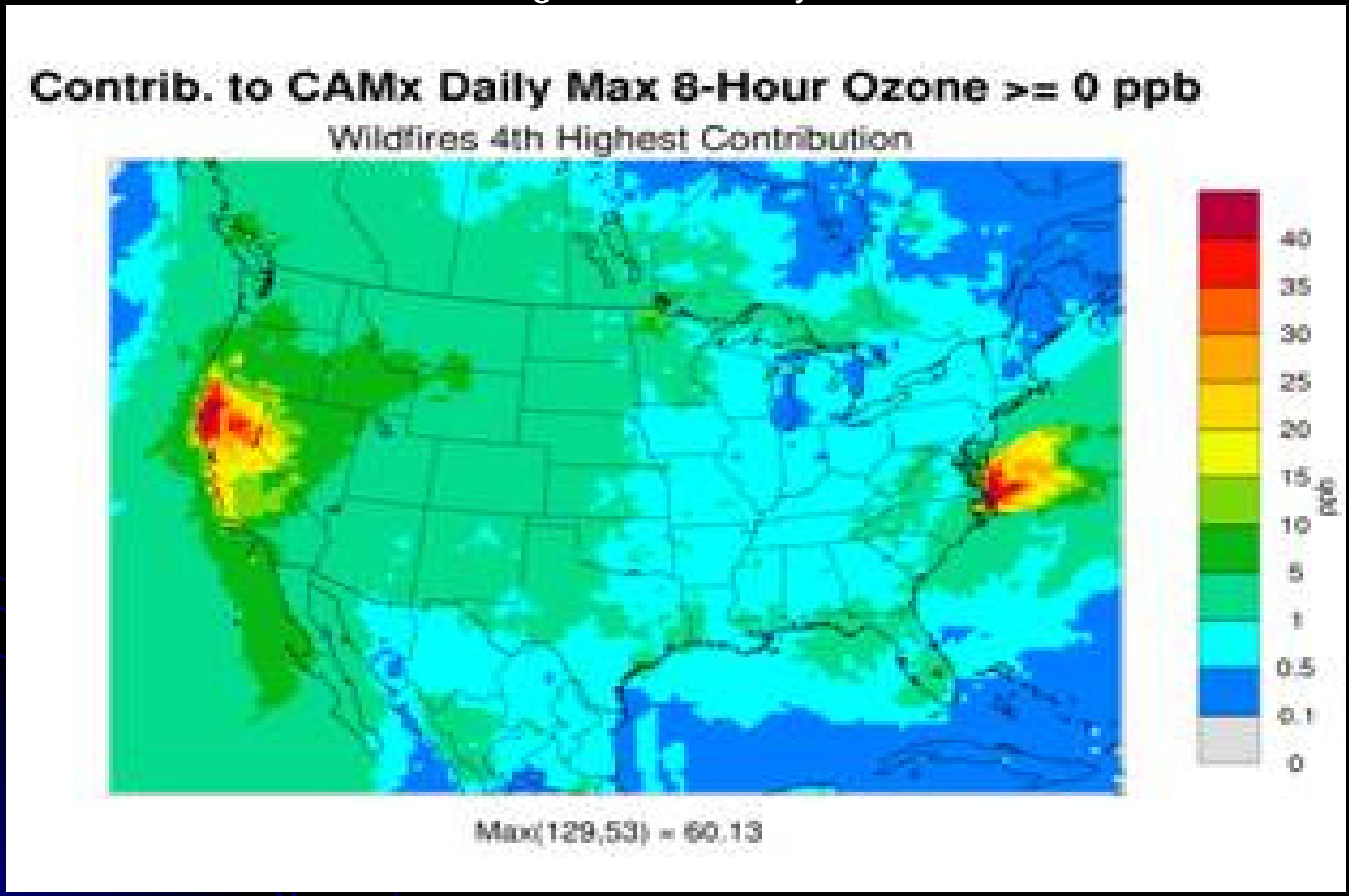
Change with 2013-2015 Data: 153 million acres

2016 looking like 2015 or less ozone readings

High/Very High Wildfire Hazard Potential lands within possible nonattainment areas: 27 million acres

See NWCG Smoke Committee Page on Ozone:
https://www.frames.gov/partner-sites/emissions-and-smoke/smoke-mgt-resources/ozone/

Wildfire contribution to the 4th highest ozone days across the United States for 2008.



Moore, Charles T. et al., Deterministic and Empirical Assessment of Smoke's Contribution to Ozone (DEASCO3) Final Report, 2014. https://wraptools.org/pdf/11-1-6-6_final_report_DEASCO3_project.pdf

EPA National Ambient Air Quality Standards

Ozone Continued…

Recognizes Basic Smoke Management Practices

More Information, Tech Note and Webinar:

https://www.frames.gov/partner-sites/emissions-and-smoke/smoc_air_and_fire/d/

2015 Ozone NAAQS: Anticipated Timeline for Designations Process

Milestone	Date
The EPA promulgates 2015 Ozone NAAQS rule	October 1, 2015
The EPA issues designations guidance	February 25, 2016
States and tribes submit recommendations for ozone designations to EPA	No later than October 1, 2016
The EPA notifies states and tribes concerning any intended modifications to their recommendations (120-day letters)	No later than June 2, 2017 (120 days prior to final ozone area designations)
The EPA publishes public notice of state and tribal recommendations and the EPA's intended modifications, if any, and initiates 30-day public comment period	On or about June 9, 2017
End of 30-day public comment period	On or about July 10, 2017
States and tribes submit additional information, if any, to respond to the EPA's modification of a recommended designation	No later than August 7, 2017
The EPA promulgates final ozone area designations	No later than October 1, 2017

EPA National Ambient Air Quality Standards

Particulate Matter

- **Integrated Science Assessment being reviewed now**

2012 Annual Standard PM2.5 set at 12^{u}g/m^{3}

- **Implementation Guidance out fall 2016**
- **Federal Agencies face General Conformity**
- **Emission inventory needs**
- **Emission factors for prescribed and wildfire:**
  - **Direct PM2.5, VOC, NH3**
  - **SOA development or not**
- **Planning tools to assess possible impacts**
  - **Operational and in-advance**
  - **Emission reduction techniques and factors**
  - **Project NEPA**

>>>>>>>All of this is pertinent to ozone and its precursors…

Proposed Exceptional Events Rule NPRM

- New fire-related rule language and preamble text
  - Clarify that all wildfires on wildland are natural events
  - Clarify that prescribed fire is a human-caused event eligible for treatment as an exceptional event and propose a streamlined path to show how air agencies can satisfy rule criteria
    - Rely on land/resource management plans (for frequency of recurrence and for "not reasonably preventable")
    - Identify recommended components of Smoke Management Programs and expectations…
    - Role of Basic Smoke Management Practices
  - Define fire-related terms in regulatory language
  - Federal capability to submit EER Demonstration

Exceptional Events: Comments on the NPRM

- Environmental community not supportive of majority of proposed revisions
- States/industry generally supportive of streamlining efforts and asked for additional measures to improve efficiency
  - Restructuring 6 criteria in 2007 Rule to 3 (includes removing “but for”)
  - Presumption that event-related emissions originating outside of jurisdiction are not reasonably controllable or preventable
  - Relying on EPA-approved attainment/maintenance SIPs to satisfy not reasonably controllable or preventable
  - Removing flagging and demonstration submittal deadlines
  - Clarification regarding components of a demonstration package
- States/Industry generally do not support:
  - Allowing Federal Land Managers to submit demonstrations
  - Not relying on infrastructure SIPs to satisfy not reasonably controllable or preventable
  - Using Air Quality Control Region boundaries to define the bounds for an area subject to event recurrence
  - General timelines for EPA response (prefer promulgated timelines)
  - Lack of a formal dispute resolution process

Rhetorical Questions

A) Would a state use the EER for a prescribed fire that causes an exceedance or multiple exceedances? What would the process be and what are their expectations?

B) Do LMP's and other planning documents cover fire frequency or use of fire in all areas where prescribed fire is used?

C) Would a state and/or EPA allow an area to go into nonattainment which has contribution from prescribed fire?

D) States seem to be concerned that land managers potentially declare wildfires from escaped or out of prescription prescribed fires as a means to circumvent air quality impacts…

Regional Haze

Chris Werner and Phil Lorang

Proposed RHR Revisions

- Expansion of §51.308(f) to make it stand alone.
- Clarifications to Reflect EPA's Long-Standing Interpretation of the Relationship Between Long-Term Strategies (LTSs) and Reasonable Progress Goals (RPGs)
  - Organize the requirements in the regulatory text to better reflect the actual sequence of steps in the regional haze planning process, as follows:
    1. Calculate current visibility conditions, the Uniform Rate of Progress (URP), & the URP line.
    2. Develop the LTS, by (among other things) evaluating sources that impact visibility at Class I area(s) for potential control measures by considering the four statutory factors.
    3. Calculate RPGs, which comprise projected visibility conditions at the end of the applicable implementation period, and compare the RPG for the 20% most impaired days to the URP line.
  - Require that all states, not just those with Class I areas, must consider the four statutory factors when developing their LTSs.
  - Require that, in developing the LTS, a state must document:
    - The criteria used to determine which sources or groups of sources were evaluated.
    - How these four factors were taken into consideration in selecting the measures for inclusion in its LTS.
    - The technical basis on which the state is relying to determine the emission reductions from anthropogenic sources in the state that are necessary for achieving reasonable progress towards natural visibility conditions in each mandatory Class I Federal area it affects.
  - Require a state to consider the URP and the measures that contributing states are including in their LTSs when determining whether the state's own LTS is sufficient to ensure reasonable progress.
  - Clarify the respective obligations of "contributing states" and "states affected by contributing states" during interstate consultation.

Proposed RHR Revisions

- Impacts on Visibility from Wildland Fires Within the U.S.
  - Fires on wildlands can significantly impact visibility in some Class I areas on some days and have lesser impacts on a greater number of days.
  - The proposal discusses whether measures to reduce emissions from wildland wildfire and wildland prescribed fires may be needed for reasonable progress towards natural visibility conditions.
  - The proposal also discusses whether smoke from fires might cause the projected RPG to be above the URP line, thus triggering the additional analytical requirement to show that there are no additional measures that are necessary for reasonable progress.
    - We expect that the revised approach to selecting the 20% “worst days” will prevent wildfires from causing the RPG to be above the URP line.
    - We are proposing rule language to allow the Administrator to approve a state’s proposal to adjust the URP to avoid subjecting a state to the (previously mentioned) additional analytical requirement due only to the impacts of specific types of wildland prescribed fire.

Efforts to address the conflicts of air regulations and use of wildland fire

USDA-DOI-EPA Leadership Engagement

- **Ozone NPRM - Fall 2014**
  - **-Conflict during the OMB Interagency Review Process**
  - **-OMB concerned at conflict as was leadership**
  - **-Created high level team**
  - **EPA-OAQPS, FS-FAM & Air/NRCS, OWF and others**

WFLC Engagement

1) **Recognizes Effort USDA-EPA-DOI**
2) **Effort aimed at taking to the next level: EPA Regions**
3) **Engage state regulatory and forestry, tribes, others**
4) **Smoke Coordination Models: EPA R4, R10, Assist 9, 8, 6**
5) **Create awareness of EPA Rules that affect fire and Promote engagement and comments**

Wildland Fire and Air Quality

This summary document is intended for resource managers

About Wildland Fire

A wildland fire is any non-structure fire that occurs in forests, scrublands, grasslands, and marshlands. There can be two types of wildland fires: wildfires (unplanned), and prescribed fires (intentionally ignited for management purposes). At the right times and in the right places, wildland fires play an important ecological role across the globe, enhancing public and firefighter safety, benefitting those plant and animal species that depend on wildland fires for habitat restoration, reducing understory vegetation or encroachment, and meeting other ecological requirements.

Wildfires are increasing in both numbers and intensity as a result of past fire suppression

Smoke Management & Air Quality Research Gap Forum

Paul Steblein, DOI-OWF
Pete Lahm, USDA-FS
Mike Zupko, WFLC

TALL TIMBERS
Research Station & Land Conservancy

Wildland Fire Leadership Council

Research Needs

- 33 topics identified, grouped and prioritized
- Top Research Needs
  1. Public Health, Social Behavior, and Communication
     1. Health effects of wildland fire smoke: short-term , high concentration *vs* long-term, lower concentration
  2. Smoke Dispersion and Forecasting Models
  3. Emissions Inventory
     1. Current inventories – incomplete & inaccurate fire accounting, different calculations used, outdated fuels info
     2. National database to capture all wild & prescribed fire from federal, state, tribal, and private landowners

Research Needs

4. Relative Impacts of Prescribed versus Wildfire

- Prescribed fire is offered as key to mitigating risk of wildfire, but need better quantitative data to describe tradeoffs between prescribed & wild fire:
  - Smoke effect on air quality and human health/safety
  - Collateral impacts on social, economic, and ecosystem services
  - Explore use of monitoring data from 2015 fire season to compare with prescribed fire data to evaluate public exposure & duration
  - Review and summarize current science literature and science gaps; convey results to stakeholders

Research Needs

5. Smoke Management & Basic Smoke Management Practices

- Recent EPA rules/guidance requires use of BSMP to minimize smoke impacts from prescribed fires, not all burners may be aware, understand, or track BSMP use in a way that meets EPA requirements

Actions Needed

- Develop online training materials on BSMP
- Assess site and situational applicability of BSMPs
- Evaluate public notification messaging and methods to develop delivery system to effectively desired audiences

National Wildfire Coordinating Group Smoke Committee – Recent Work

- See https://www.frames.gov/partner-sites/emissions-and-smoke/smoke-portal-home/
- Revised Smoke Management Guide for Prescribed Fire
  - 388 pages under internal review for planned release late 2016 (at ISS2)
  - New sections on communication, public perception of smoke, practical meteorology and smoke management
- Smoke Management and Air Quality for Land Managers – updated
  - Includes Basic Smoke Management Practices and Smoke Hazards for Fire Personnel
  - https://www.frames.gov/partner-sites/emissions-and-smoke/educational-resources/tutorial/
- Wildland Fire Personnel Smoke Exposure Guidebook - Version 2
  - https://www.frames.gov/documents/smoke/Smoke-Exposure-Guidebook_NWCG-SmoC-UI_20160301-draft.pdf

News…

- International Association of Wildland Fire and National Wildfire Coordinating Group's Smoke Committee hosting the

International Smoke Symposium 2

- November 14-19, 2016
- Virtual capable as in 2013
- Long Beach, CA
- Funding, Partners, Steering Committee, Program Committee
- Call for presentations and workshops open

Wildland Fire Air Quality Response Program

- Operationally addressing smoke from wildfires
  - Public health and safety
  - Public and fire personnel transportation safety
  - Fire personnel smoke exposure
- Monitoring, Modeling, Messaging, Coordination
  - 25 emergency deployable PM2.5 monitors
  - Cadre of 20+ Air Resource Advisors - technical specialists from an interagency community (Fed/State/Tribal/Local)
    - Dispatched to incidents as part of the incident management team or for Forest or area needs
  - Use of custom designed operational tools for smoke forecasting: USFS Pacific Northwest Research Station–AirFire Team 1) BlueSky PM2.5, 2) Monitoring analysis tools 3) Complexity Tools, 4) Product Partnerships – NOAA 1km