

WESTAR-WRAP and Satellite Data Applications in the West

Mary Uhl
AOS Applications Seminar Series
September 15, 2022



WESTAR
Western States Air Resources Council



The WESTAR Region

- 15 Western States
- 24% of US population (2020 US Census)
- 50% of US landmass
- 573,284,316 acres of federally-owned lands → 93% of total federal lands in the US

Overview of WESTAR and WRAP

- Purpose
 - Service organizations
 - Assist members in achieving their air quality management goals
- WESTAR
 - Training
 - Provide a forum for discussion
 - Inform policy-related discussions
 - www.westar.org
- WRAP - provides regional technical support
 - Virtual organization, not incorporated
 - 70+ member agencies include 15 state air agencies, NPS, FWS, BLM, USFS, EPA, and interested tribes and local air agencies/districts in the WRAP region
 - Board and technical committees have representatives across states, tribes, federal, and local agencies.
 - www.wrapair2.org



WESTAR/WRAP and EPA

Funding

- States fund WESTAR/WRAP by setting aside EPA grant funding; these funds come to WESTAR/WRAP through an EPA grant
- Some funding directly from states
- Some funding from other federal agencies

Communications

- Sometimes...EPA communicates with states through MJOs
- WESTAR/WRAP communicates with EPA through consensus-based membership letters and at fall and spring meetings

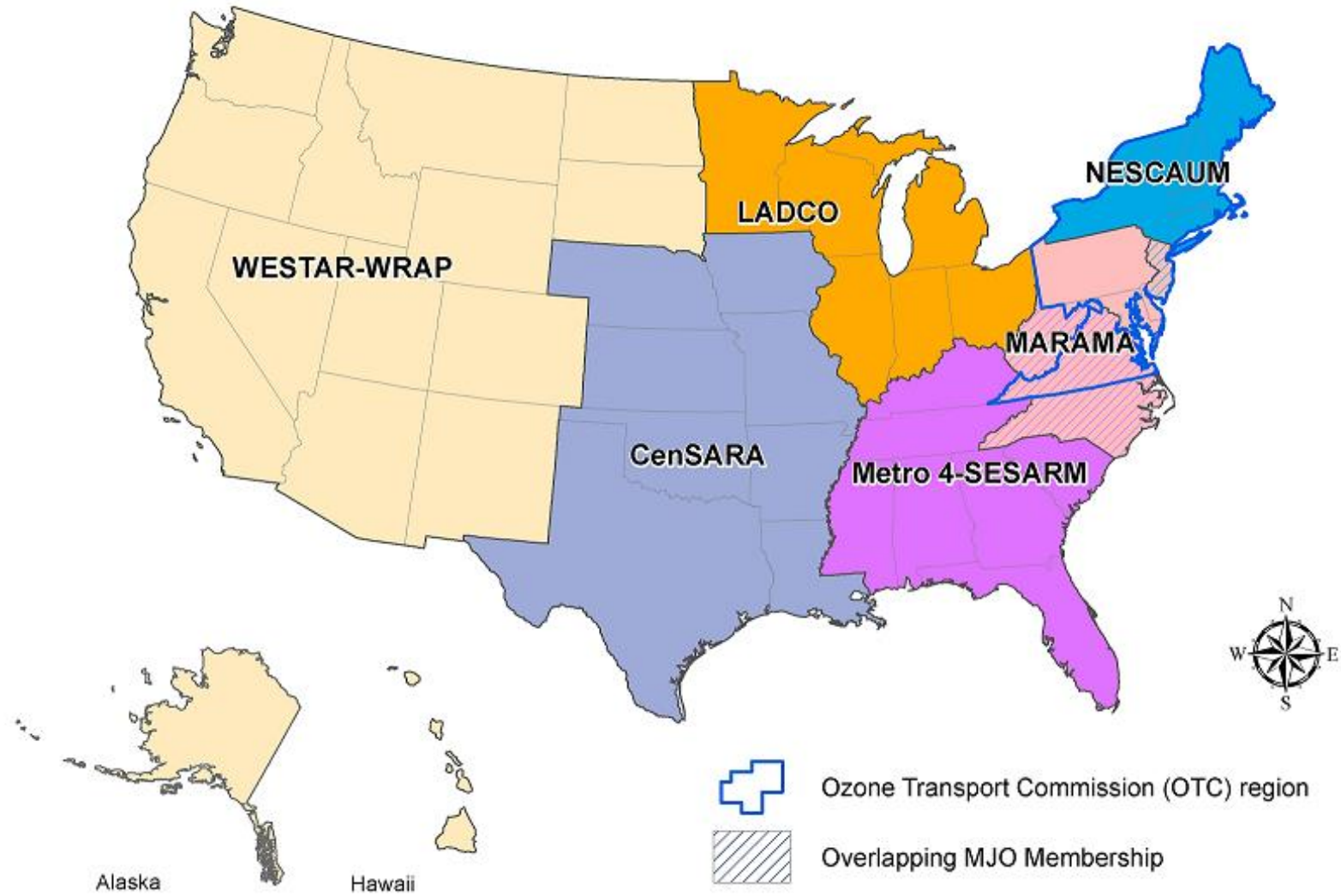
Technical Coordination

- Federal/State Technical Work Collaboration Group

Training

- WESTAR/WRAP provides training courses to states with EPA funding

Multi-Jurisdictional Organizations



WESTAR/WRAP and other MJOs

Coordination of training

Work with EPA to improve technical work

Coordination/consultation on technical work between regions

Sharing of knowledge, leadership efforts and initiatives

Joint workshops

Why the American west's 'wildfire season' is a thing of the past – visualized

America's Skies Have Gotten Clearer,
but Millions Still Breathe Unhealthy Air

Wildfire Increasingly an Urban Health Risk as the West's Wildfires Worsen

Calculating Air Pollution's Death Toll, Across State Lines

Western Air Quality

Smoke From Deadly McBride Wildfire Clouds Sky in Ruidoso, New Mexico

'Dust Bowl' winds hit tornado-devastated western United States

U.S. Forest Service apologizes for Hermits Peak Fire

See How the World's Most Polluted Air Compares With Your City's

Ending Years of Gains, Study Says America's Air Quality Worsens

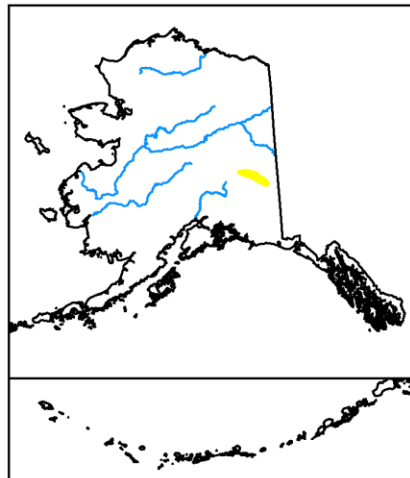
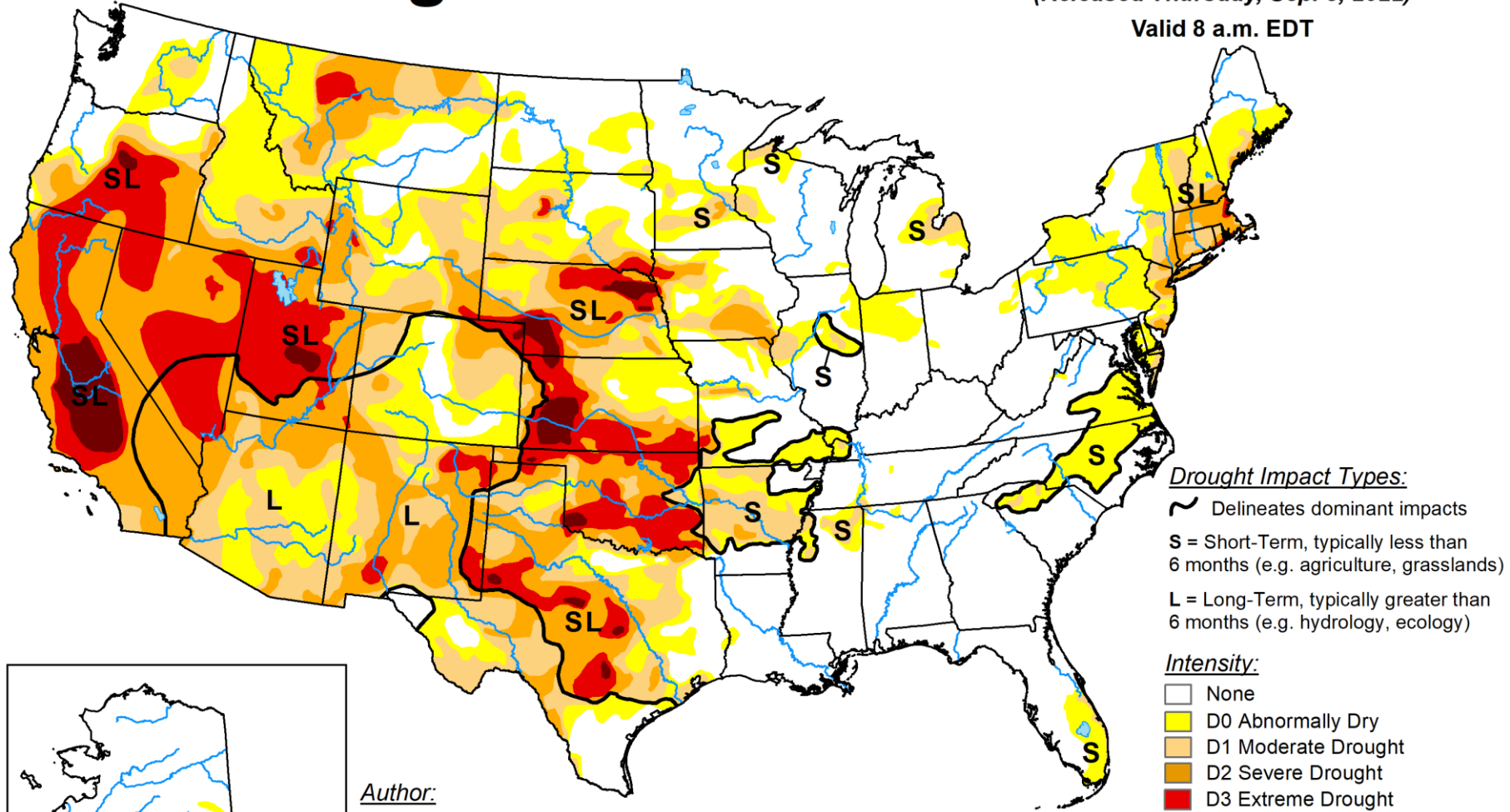
Extreme heat and the ongoing aridification of the West

U.S. Drought Monitor

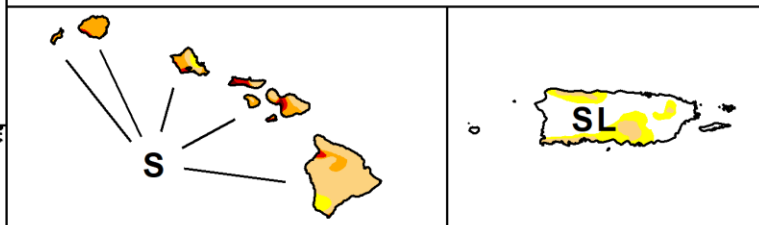
September 6, 2022

(Released Thursday, Sep. 8, 2022)

Valid 8 a.m. EDT



Author:
David Simeral
Western Regional Climate Center



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>



droughtmonitor.unl.edu

The West is different:

- Dominant role of fires
- Basin-specific O&G emissions estimates
- Retirement of western fossil-fueled EGUs
- EPA's national tools historically focus on Eastern U.S., starting with NOx SIP call
- Meteorology (mountain-valley, photochemistry on snow surfaces)
- WESTAR/WRAP Regional Technical Center (system of systems):
 - Technical Support System (TSS) – regionally consistent and complete data analysis / decision support for Regional Haze planning
 - Intermountain West Data Warehouse (IWDW) - easy online access to monitored air quality data, gridded modeling products, emissions data, and an integrated suite of tools to help assess air quality

“the complex terrain, variety of emissions, meteorology and spatial vastness suggests that Western U.S. assessment practice will lead efforts in comprehensive air quality characterization out of necessity”

Obstacles to Improving Air Quality in the West

Wildfire smoke

International Transport of Pollutants

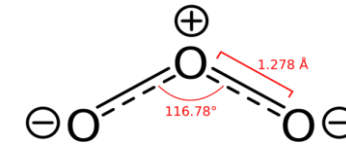
Long-term drought and aridification of the West

Climate Change

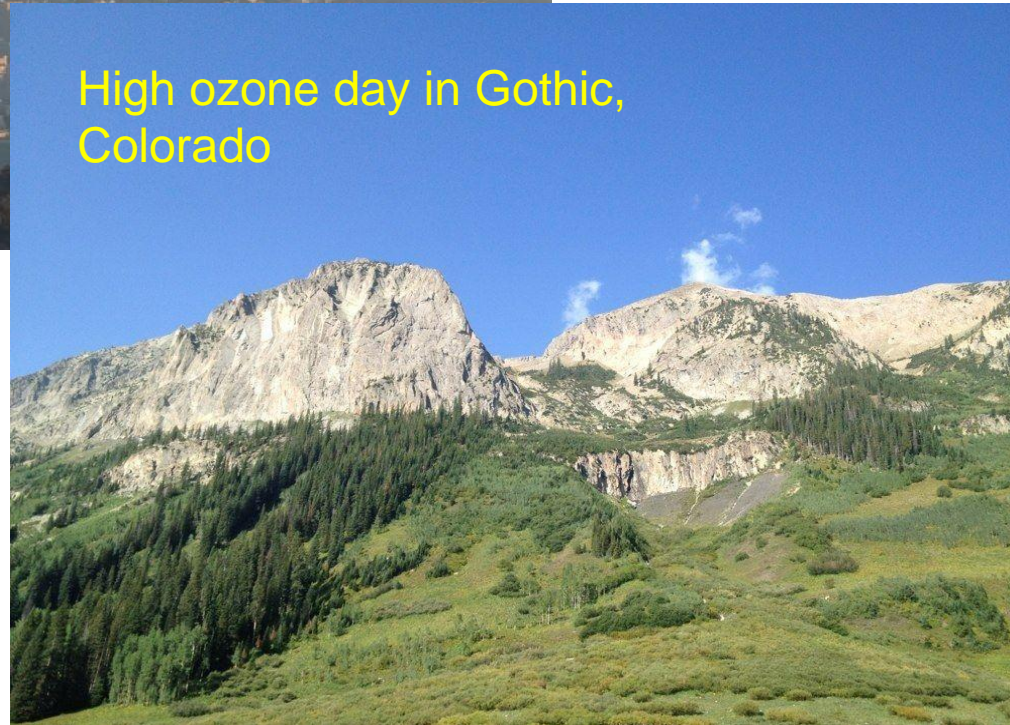
Poor Characterization of Emissions

Exceptional Events

High ozone day in southern California



High ozone day in Gothic, Colorado

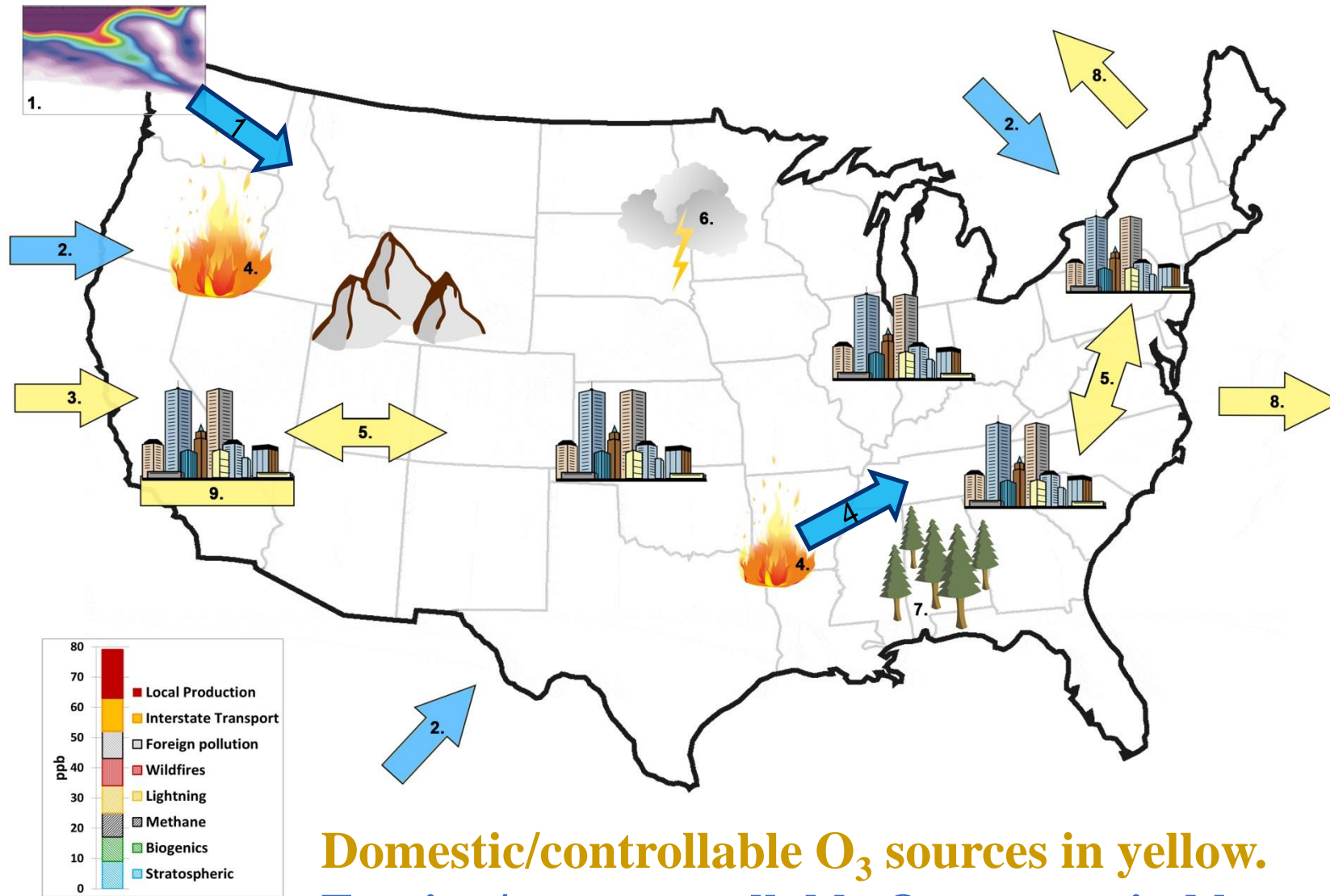


High ozone day in western U.S.

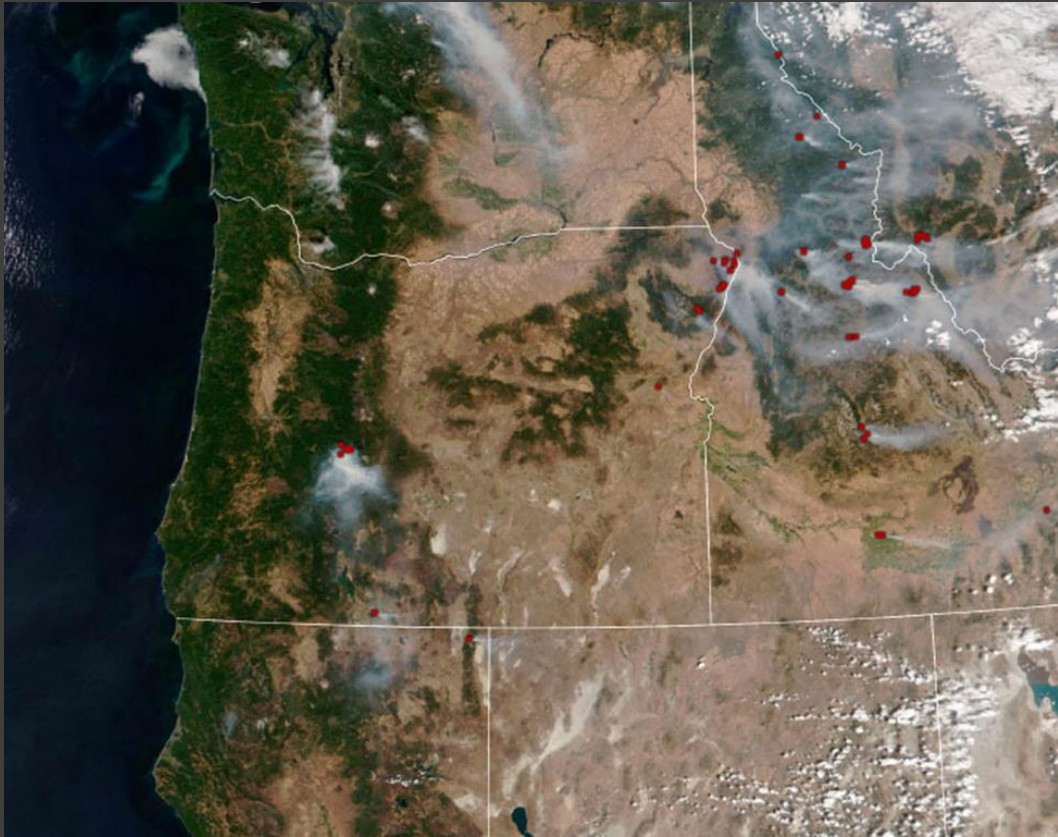


Photo of LA smog from citilesspeak.org

Sources of surface O₃



Domestic/controllable O₃ sources in yellow.
Foreign/non-controllable O₃ sources in blue.



Smoky Fires Rage in the Northwest

- NASA Earth Observatory Image of the Day
- September 8, 2022

Smoke over Northern Utah

September 9, 2022

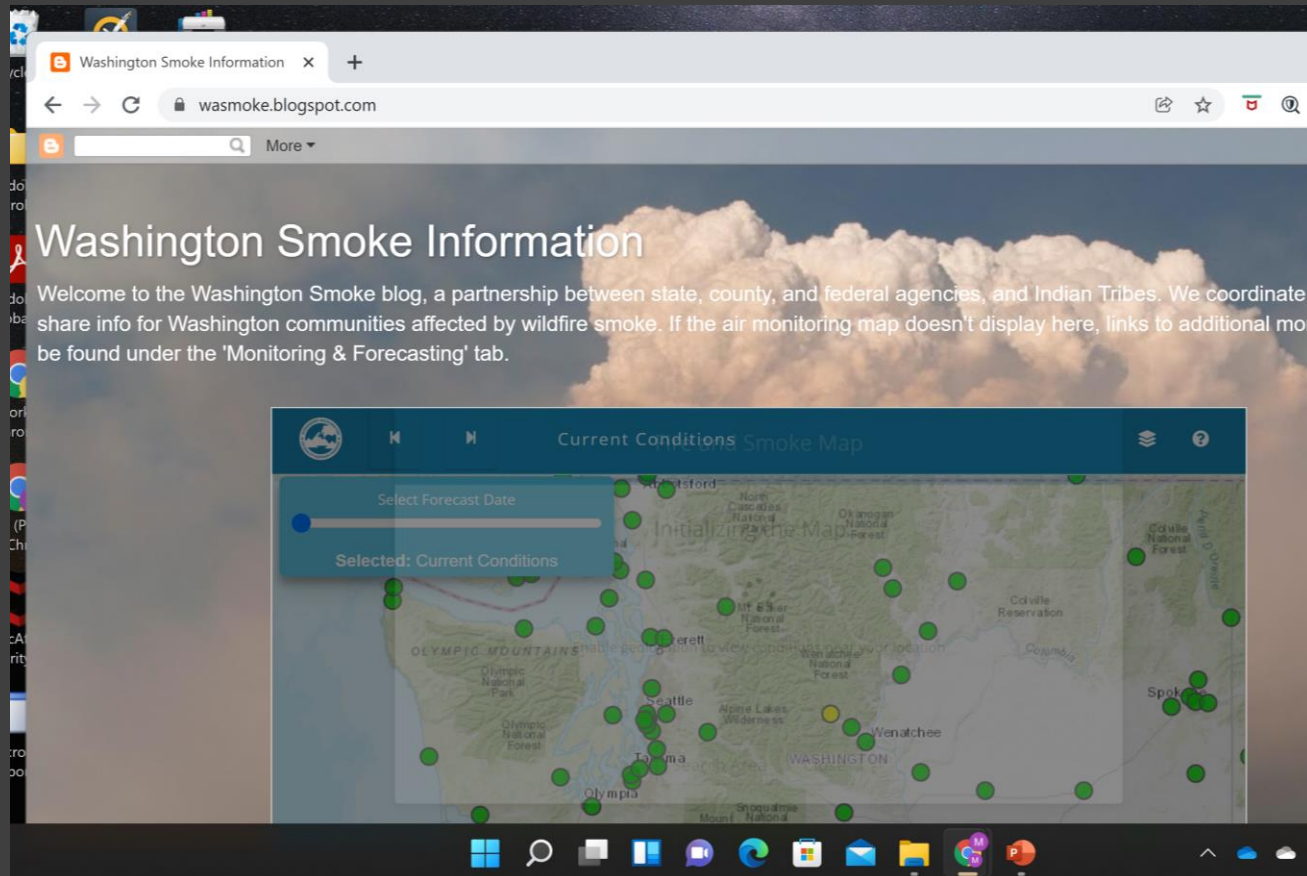




Western Smoke Rides the Wind

- NASA Earth Observatory Image of the Day
- September 12, 2022

Wildfire Smoke State Agency Response-Short-term



- Real-time communication with the public about smoke impacts
- Monitoring data
- Smoke and public health information
- Communities that may be impacted
- Forecasts
- How long smoke will last
- Recommendations for activity curtailment
- Fire Information
- Contact information

State Agency Response-Long- term

Flagging and analysis

Determining regulatory significance (possibly years later)

Consulting with EPA

Development and submittal of Exceptional Events demonstration

EPA action on submittal

Defense of submittal if there is a court challenge

How Satellite Data may Enhance/Inform Western Air Quality Analysis

Conceptual Model Development for NAAQS and other air quality issues

Exceptional Events

- Confirming monitor was affected
- Weight of Evidence data
- Documenting smoke plume
- Changes to burn scars
- Analyzing dust events
- Analyzing stratospheric intrusions

Wildfire smoke analysis and forecasting

Emissions inventory development

- Mobile sources
- Smoke
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- Oil and gas

Evaluating air quality in areas with sparse monitoring network

Evaluating and improving meteorological and photochemical model performance

Informing transport (interstate and international) of pollutants

Air Toxics

WESTAR
Mary Uhl
maryuhl@westar.org

