

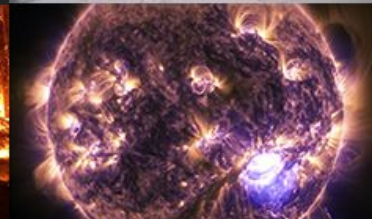
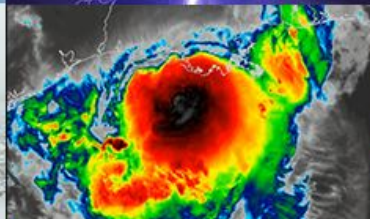


**NATIONAL  
WEATHER  
SERVICE**

# Air Quality Forecasting at NOAA

**JANUARY 25, 2023**

Presenter: Youngsun Jung, NOAA/NWS/OSTI  
with input from NESDIS and OAR





# NOAA's mandates for atmospheric composition research, operations, and products



EXECUTIVE



LEGISLATIVE



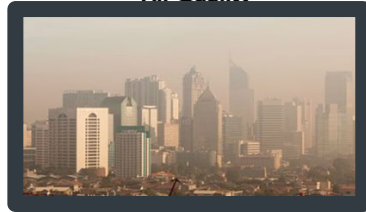
DIPLOMATIC

NOAA has numerous mandates to observe and predict Atmospheric Composition, e.g. [2021 EPA-NOAA MOA on Cooperation in Forecasting Air quality](#)

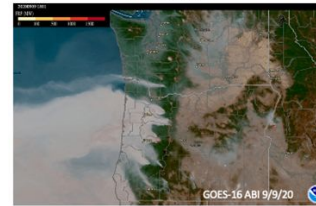
NOAA's research and operational Atmospheric Composition **products** address numerous applications as part of the agency's mission to protect **lives and property**



Air Quality



Wildfires



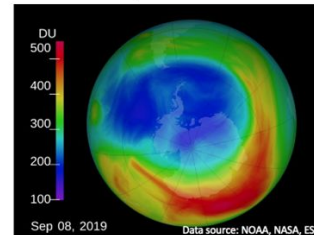
Hazards



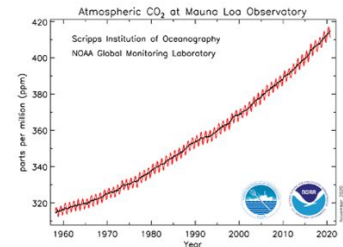
Weather and Climate



Stratospheric Ozone



Greenhouse Gases



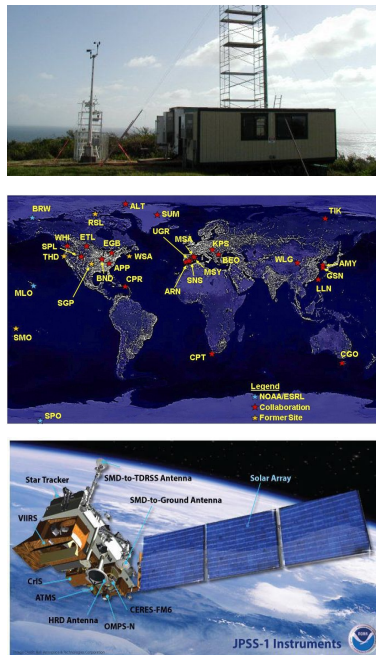


# NOAA air quality capabilities

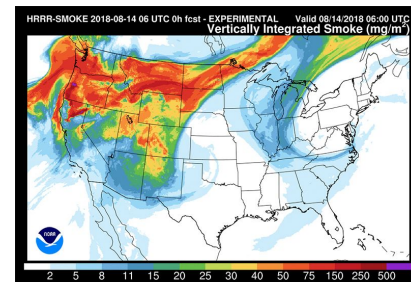
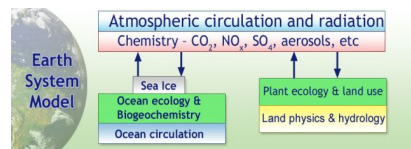
## Measurements



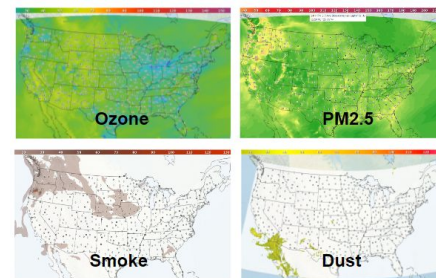
## Monitoring



## Models



## Services



Focus: observe, understand, and predict atmospheric chemical composition and air quality







# Types of research, data, models and services

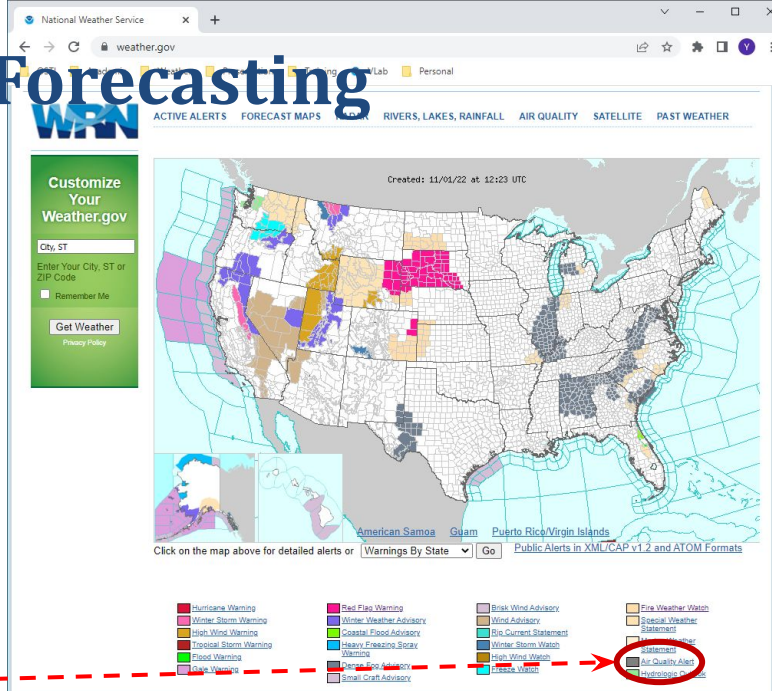
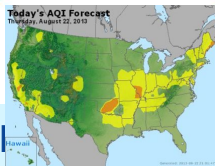
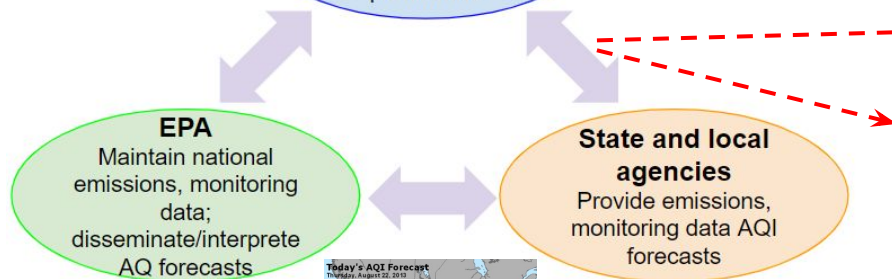
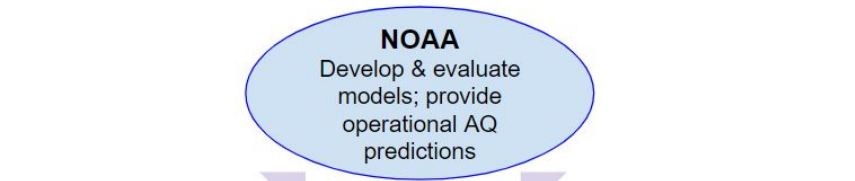


- Monitoring: network of in-situ, remote-sensing, tall tower, sondes, and aircraft sampling for trace gases, aerosols, radiation, boundary layer characterization, surface-atmosphere exchange, meteorology
- Satellite: polar-orbiting and geostationary measurements of trace gas, aerosol, and fire products
- Field campaigns: assessment of impacts of regulatory changes, identification of new air pollution sources, assistance with understanding exceedances, development of process understanding
- Models: developing algorithms and products for emissions, air pollution chemistry, atmospheric physics and dynamics
- Wildfires: advancing smoke forecasts and tracking
- Operational air quality forecast guidance
- Rapid response hazards nowcasting and tracking



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## Operational Air Quality Forecast Guidance



## Air Quality Program hosts the AQ Forecasters' Focus Group Workshop

posted Nov 18, 2022

The NWS/OSTI Air Quality (AQ) Program hosted an Air Quality Forecasters' Focus Group Workshop on 20-21 October 2022. This annual workshop brought together NWS AQ forecast model developers, state and local government AQ forecasters, and representatives from other partner agencies, including EPA and ECCCC, to review NWS AQ forecast performance as well as to discuss research gaps and AQ forecaster needs. The workshop was held in a hybrid format from NCWCP in College Park, MD.

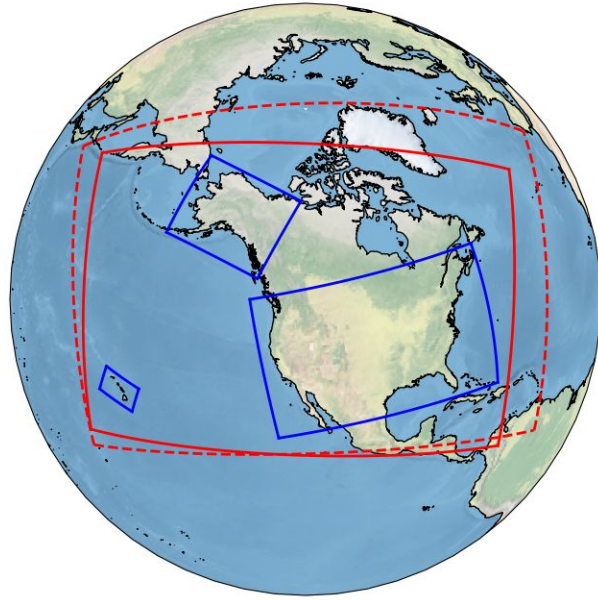


Air quality forecasting relies on the strategic partnership with EPA and state and local air quality agencies.

OSTI Modeling AQ Program Website



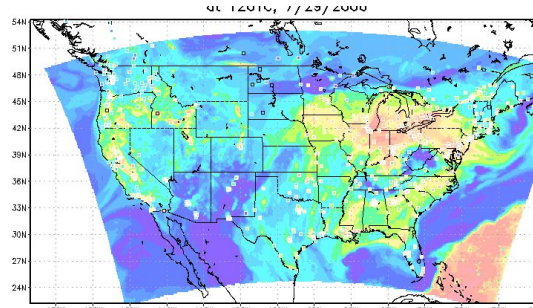
# AQM v7 Implementation



 AQMv6: Operational AQM

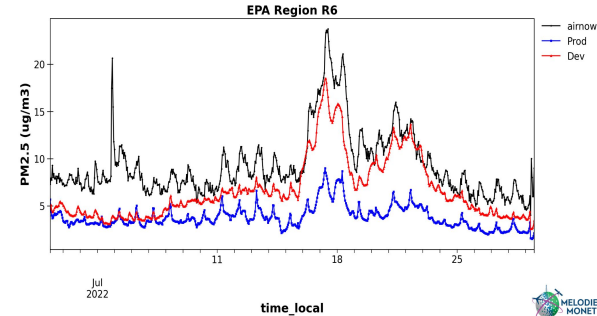
 Future domain at 3 km

 AQMv7 at 13 km



Online CMAQ with plume rise  
(GEFS-Aerosol LBC)

Evaluation of hourly  $PM_{2.5}$ :  
July, 2022



- Atmospheric model
  - GFS to FV3-Limited Area Model
  - Grid spacing: ~13 km
- First online-coupled weather and chemistry model at NOAA
- Improvements to surface  $O_3$  and  $PM_{2.5}$  predictions
- When? July 2023

