AQ and You!

DEQ 101 and Air Quality Monitoring

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Overview

1. DEQ – What do we do?
2. LEAD – Laboratory and Environmental Assessment Division
3. Air Quality Monitoring at LEAD
4. Air Quality Monitoring and Weather
5. Projects and Resources

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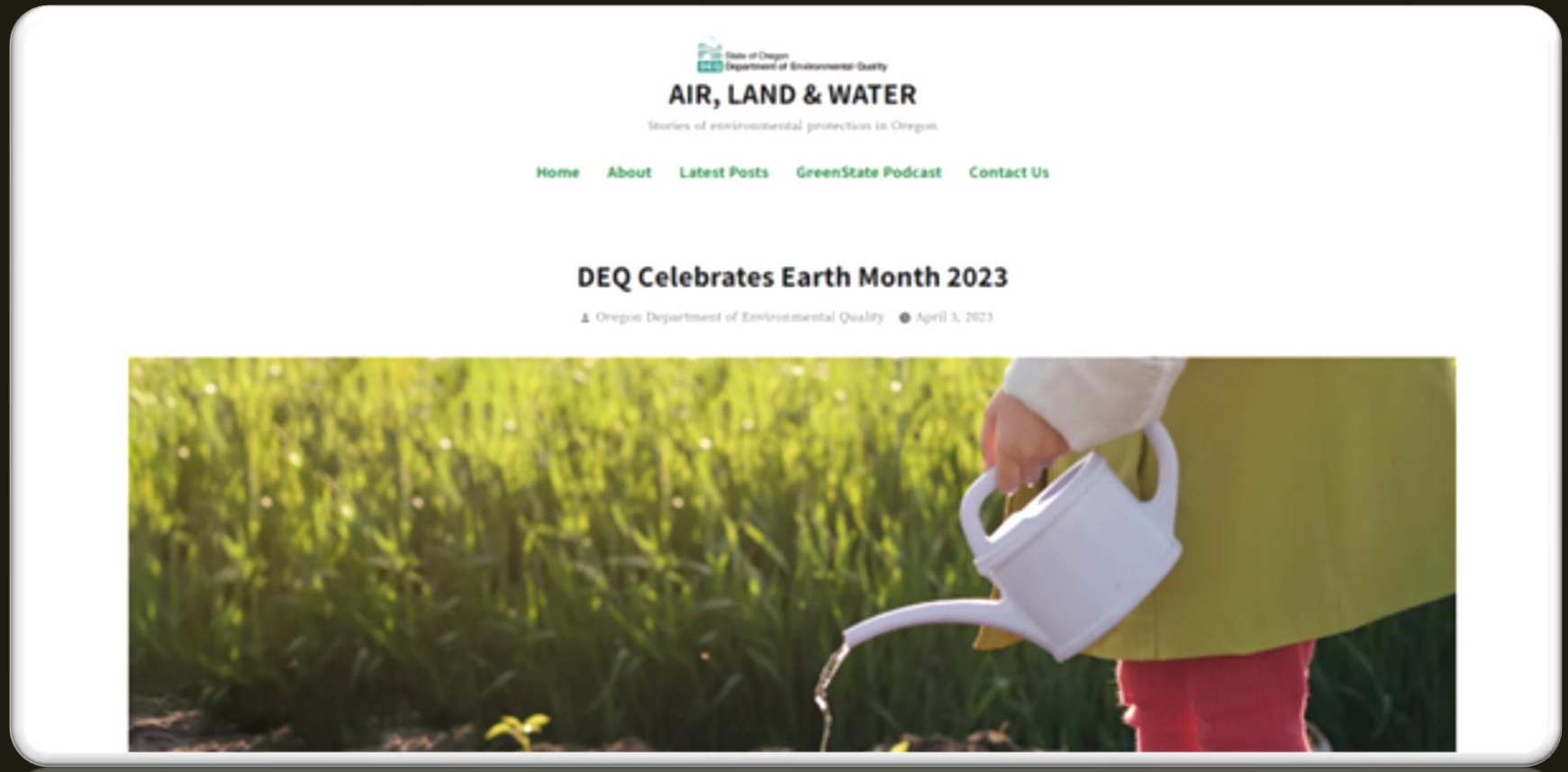
DEQ – What do we do?

- Air
- Land
- Water



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Water Quality at DEQ

- Ballast Water Management
- Biosolids Program
- Clean Water State Revolving Fund
- Drinking Water Protection Program
- Groundwater Protection
- Industrial Pretreatment
- Nonpoint Source Pollution
- Onsite Wastewater Management Program
- Pesticide Stewardship Program
- Section 401 Hydropower Certification

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Land Quality at DEQ

- Brownfields
- Composting
- Conversion Technology Facilities
- Dry Cleaners
- Emergency Response
- Environmental Cleanup
- Food Waste Management
- Hazardous Waste
- Household Hazardous Waste
- Infectious Waste
- Materials Management
- Mattress Stewardship Program
- Oregon E-Cycles
- Oregon's Drug Takeback Program
- Paint Stewardship
- Recycling and Waste Prevention
- Solid Waste Permits
- Tanks Program
- Toxic Reduction and Safer Alternatives
- Waste Prevention and Reuse
- Waste Tire Management

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Air Quality at DEQ

- Action on Climate Change
- Air Quality Monitoring (LEAD)
- Air Quality Permits and Technical Assistance
- Air Toxics Program (LEAD)
- Asbestos Program
- Cleaner Air Oregon
- Climate Protection Program
- Employee Commute Options
- Gasoline Vapor Recovery Program
- Greenhouse Gas Reporting
- Heat Smart
- Nuisance Odor
- Open Burning Regulations
- Oregon Clean Diesel Initiative
- Oregon Clean Vehicle Rebate Program
- Oregon Low Emission Vehicle Regulations
- Regional Haze
- Small Business Assistance Program
- Vehicle Inspection Program
- Wood Stoves

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Laboratory and Environmental Assessment Division

- Air Quality Monitoring
- Water Quality Monitoring
- Analytical Chemistry

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Analytical Chemistry at LEAD

- Inorganic Chemistry
- Organic Chemistry

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Water Quality at LEAD

- Toxics monitoring
- Oregon beach monitoring
- Beach bacteria reports
- Volunteer monitoring
- Water Quality Index
- Harmful Algal Blooms

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Air Quality at LEAD

- Criteria Pollutants
  - Carbon monoxide (CO)
  - Nitrogen dioxide (NO_2)
  - Ozone(O_3)
  - Sulfur dioxide (SO_2)
  - Fine particulate (PM10 & PM2.5)
  - Lead (Pb)
- Air Toxics
  - Hazardous Air Pollutants
  - DEQ monitors 107
- Air Quality Monitoring
  - Instruments
  - What we monitor
  - Where we monitor

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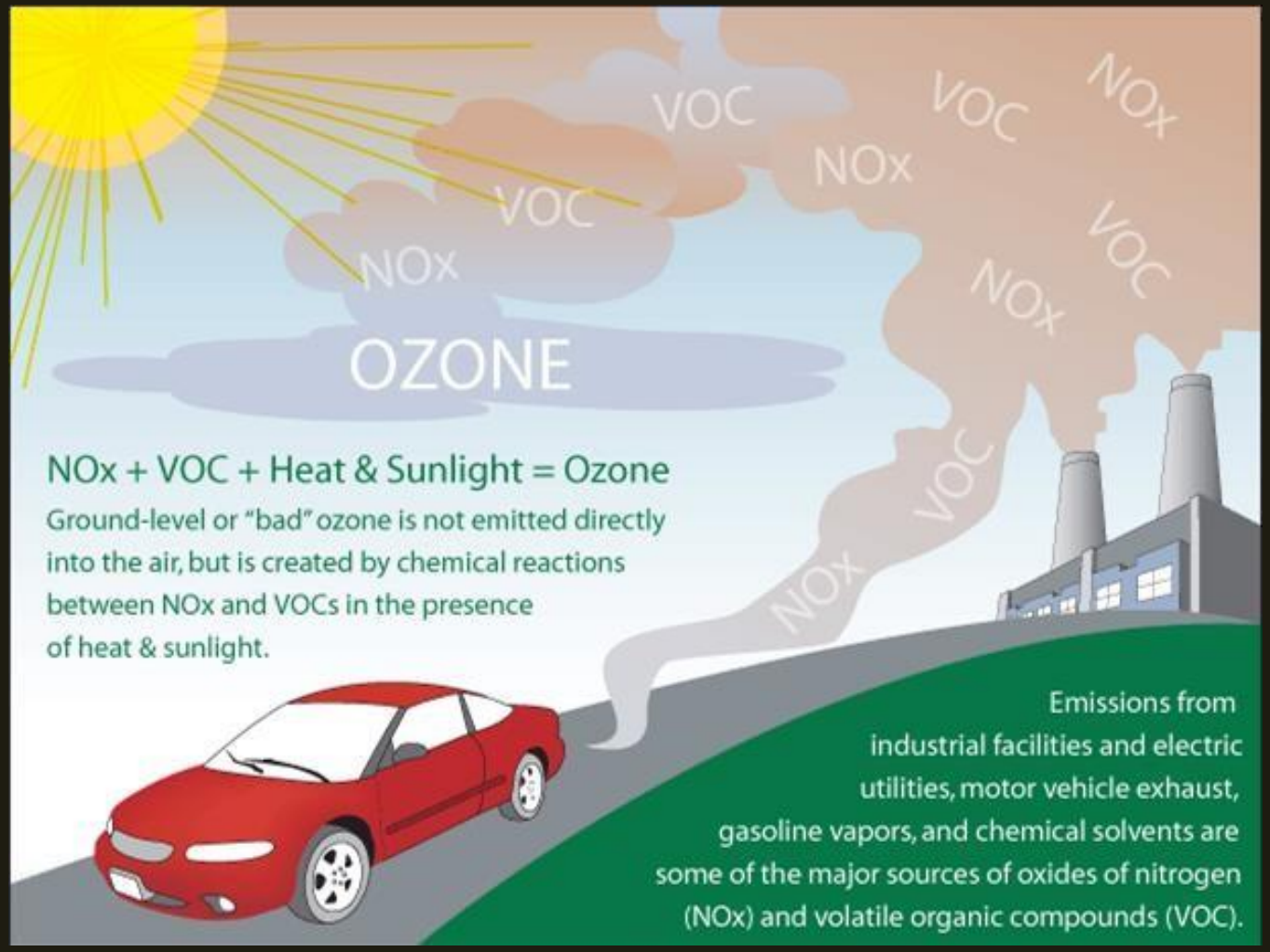
Criteria Pollutants and NAAQS



- CO
- Pb
- NO_2
- O_3
- $PM_{2.5}$
- PM_{10}
- SO_2

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Air Toxics

- HAPs
- NATTS
- CAO

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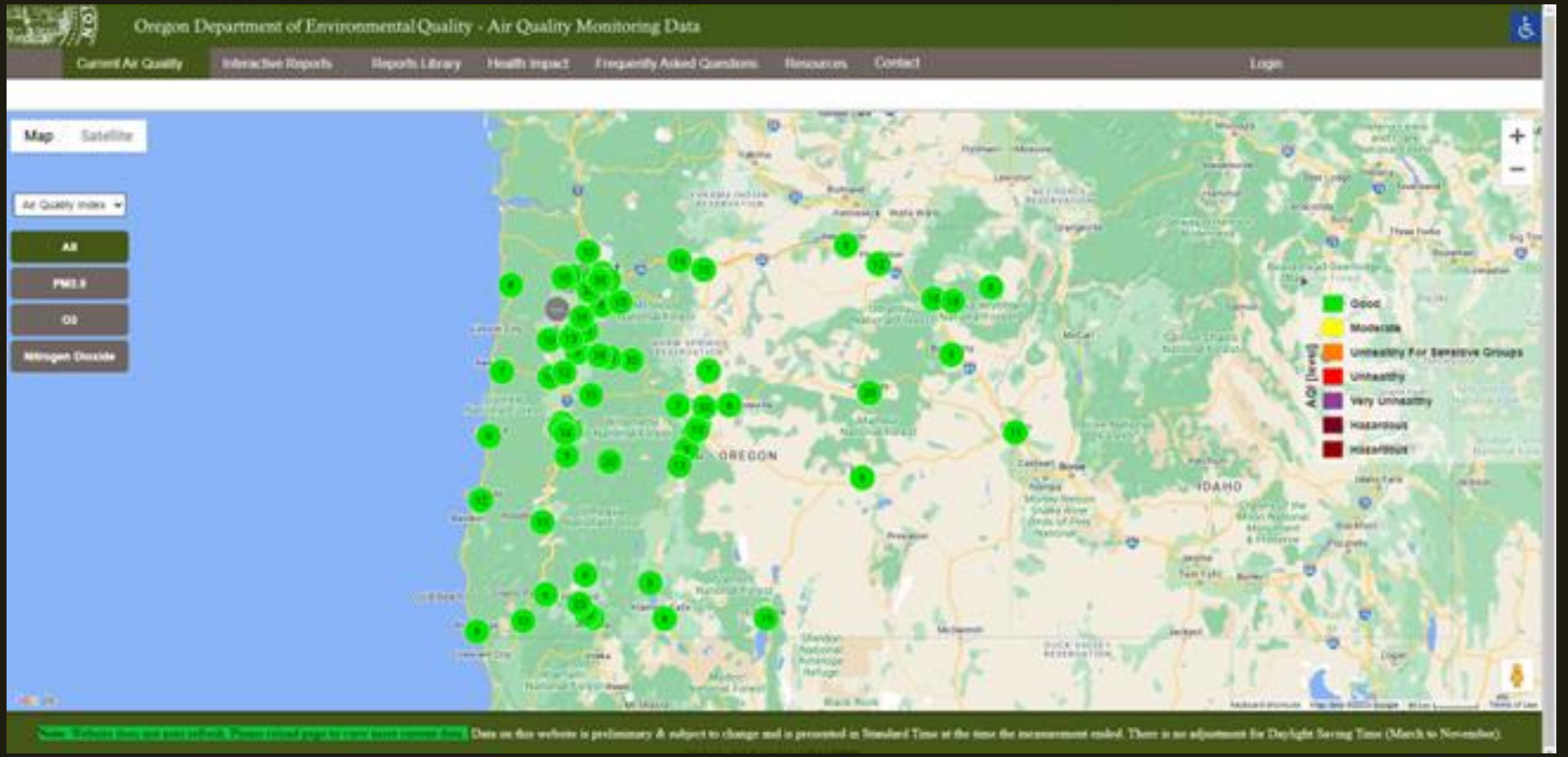
Air Quality Monitoring Instruments

- FRM – PM2.5
- BAM 1020 – PM2.5
- BAM 1022 – PM2.5
- Nephelometer – PM2.5
- SensOR – PM2.5
- PM10 Low Volume (PUF)
- PM10 High Volume
- Gas analyzers (Ozone, NO2, CO)
- Air Toxics Sites – NOx which is both Nitric Oxide (NO) and Nitrogen Dioxide (NO2), SO2, CO, O3
- Met Stations – wind speed/wind direction, solar radiation, temperature, barometric pressure, relative humidity
- Aethalometers – Black Carbon (Diesel Proxy)

Where does DEQ Monitor?



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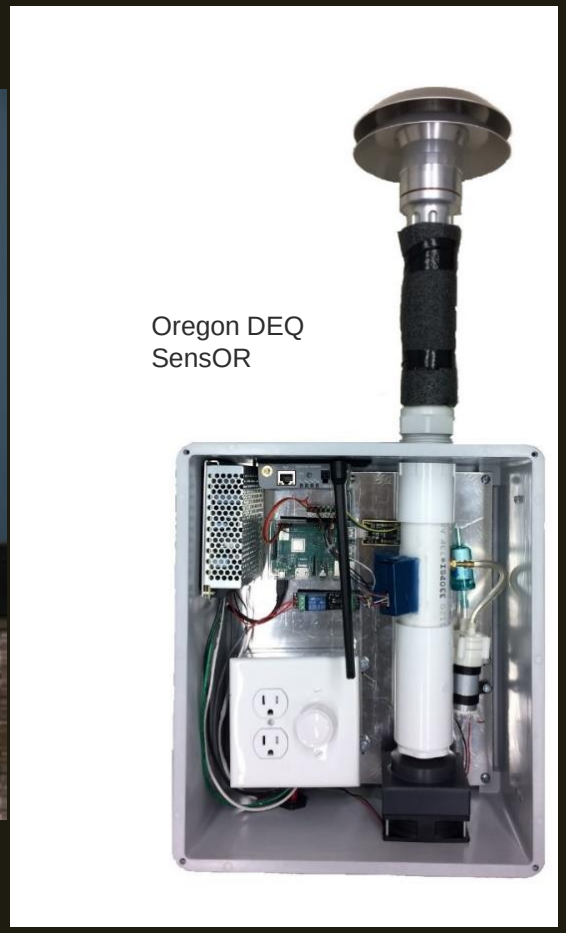
Monitoring Cost and Accuracy

Highly Accurate & Expensive → Lower Accuracy & Cheaper

Federal Equivalent Method


Teledyne T640


Radiance Nephelometer


Oregon DEQ SensOR


Purpleair


Plantower

Sensor evaluation by South Coast AQMD at http://www.aqmd.gov/aq-spec

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Oregon DEQ data quality objectives

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Air Quality Monitoring Performance Targets[1]

Application	Pollutants	Precision & Accuracy[2]	Examples	Supporting Documentation
Regulatory or compliance monitoring, Air toxics monitoring[3]	Ozone, PM2.5, CO, NO2, SO2, Lead, VOCs, HAPs[3]	+/- 10%	Filter-based FRM[4] sampler, Continuous FEM[5] PM monitor, FEM ozone analyzer, EPA laboratory protocols	40 CFR parts 50, 53, and 58, National Air Toxics Trend Station Technical Assistance document
Supplemental monitoring, Special studies, Real-time Air Quality Index	Ozone, PM2.5, H2S, VOCs, Meteorology	+/- 20%	Nephelometer, E-BAM, H2S monitor for odors, Calibrated met station, Sensor-based with quality control and validation	Organization's approved quality assurance plan or sampling analysis plan
Area and source surveys, Screening; Fenceline monitoring, Personal exposure	Ozone, PM2.5, NO2, VOCs, Meteorology	+/- 30%	Calibrated sensors, Home met station	EPA Air Sensor Toolbox
Information, Education, Community monitoring	Ozone, PM2.5, NO2, CO, VOCs and others	+/- 50%	Low-cost sensors, Personal monitors	South Coast AQMD Air Quality Sensor Performance and Evaluation Center

1 This document is for informational use only. DEQ makes no claim, warranty or guarantee of instrument performance when operated by users for their specific applications.

2 These guidelines are likely to evolve as technology and science advance.

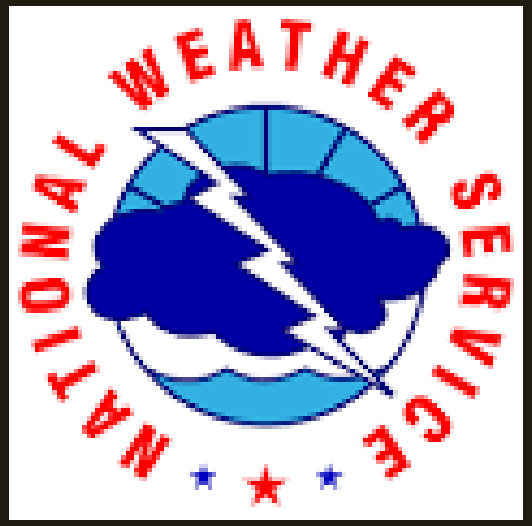
3 Hazardous air pollutants or air toxics

4 Federal Reference Method

5 Federal Equivalent Method

AQ Monitoring and Weather

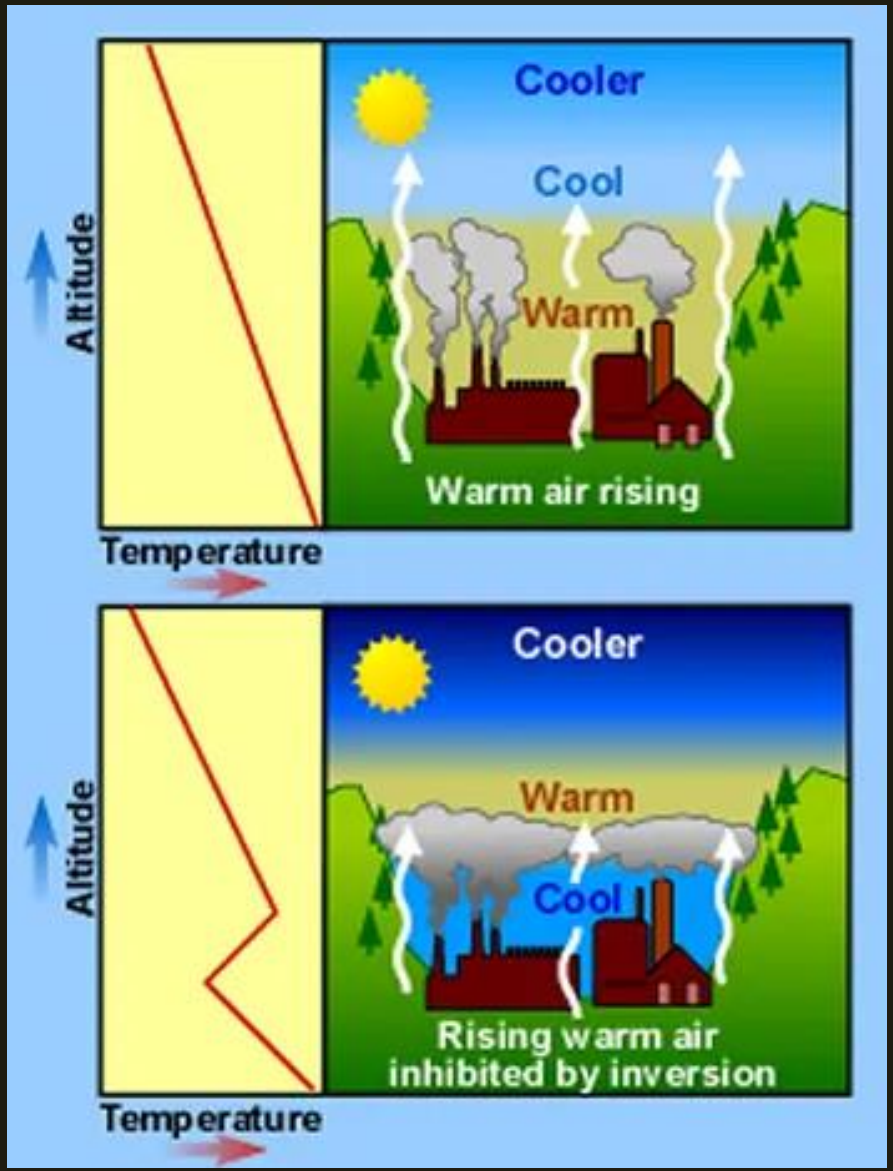
DEQ relies on meteorologist from other agencies to help with forecasting.



…and so many more!

Air Pollution and Weather

- Affected by temperature and precipitation
- Pollution transport
- Acid rain
- Cold weather = inversions
- Hot weather = ozone and stagnant air



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Current Projects

- AQ Curriculum
- SensOR Placement Project
- Thirsty for Knowledge
- … and so much more to come!

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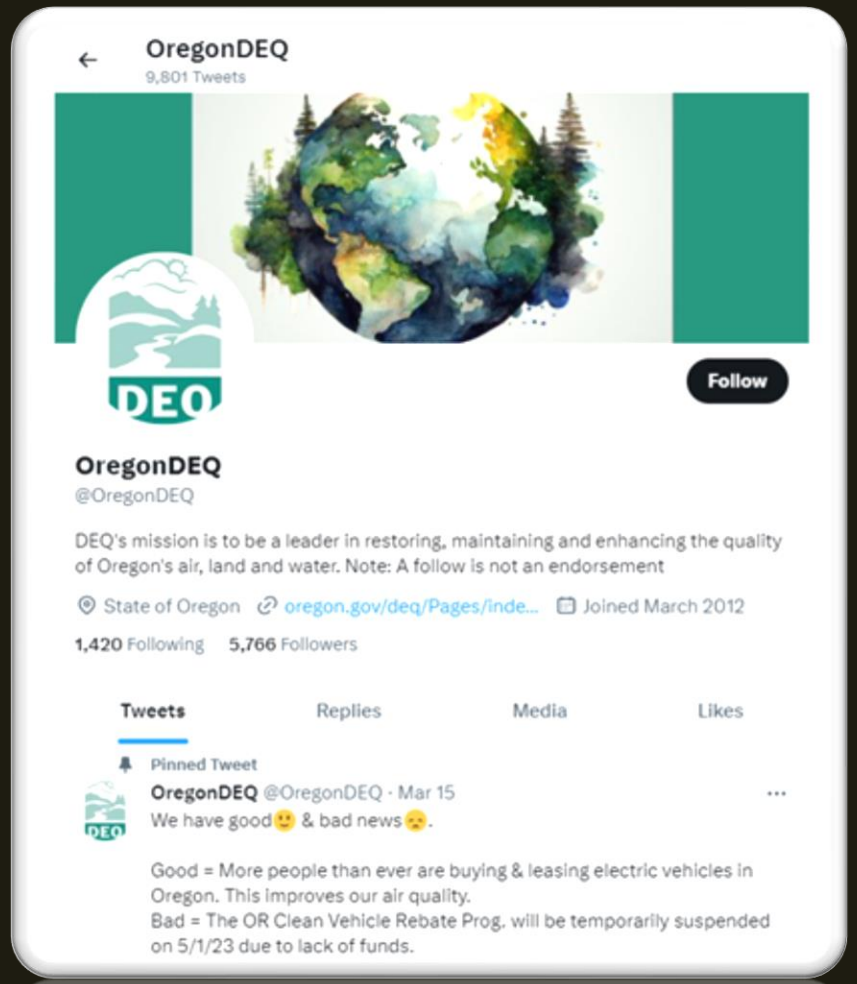
Want to learn more?

- Oregon AQI
- EPA AirNow
- Oregon Smoke Information
- @OregonDEQ Twitter
- Oregon DEQ Facebook
- DEQ Laboratory and Environmental Assessment Division



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Questions?

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