

Air Data Exploration



What is happening with the air quality in National Park Service areas?

Understanding air quality is a challenge. This intangible resource crosses park boundaries affecting human health, visibility of park landscapes, and ecosystem health. The National Park Service has a proud history of working with others across the country to monitor air quality conditions. Now, we are improving access to air quality data products for parks. This new website brings together data from multiple monitoring networks and presents specific condition and trend information for over 350 national park units. Take a sneak peak and find out what we know about the air near you!

www.nature.nps.gov/air/data/products/parks/index.cfm

Goals & Design

The NPS Air Resources Division has worked with partners at Colorado State University's Cooperative Institute for Research in the Atmosphere to improve the availability of tailored air quality data products for parks. In doing this we had several goals and design considerations:

- One stop shopping**
Air quality data from 52 separate monitoring data-sets are integrated in one database that supports this project. Statistics are calculated consistently within the application and products are automatically updated as data become available. This innovation will dramatically improve the efficiency of air data analysis and product distribution.
- Park-specific**
This system provides something for everybody (almost)! Air data and resource summaries tailored for over 350 NPS parks are included. In-park or representative monitoring data are used to provide trend information and break down the components of haze and deposition where possible. Additionally, condition statuses for the individual indicators of air quality are identified for all parks in the continental U.S.
- Meaningful data products**
Air resource experts identified criteria for designating representative monitors for parks, selected the statistics presented, and helped design the charts and graphs provided through this tool. As a result the data products presented here can be used in park resource summaries, planning documents, and reports with confidence.
- Easy to use**
The web page presents a clear organization of up to 30 park-specific products. Simply select a park and end year to retrieve all of the data products and begin exploring by indicator and product type. This ease of use makes data accessible to not only park staff but also interested members of the public including researchers, students, and teachers.



Mesa Verde NP - Overall Air Quality

Air Quality Indicator	Specific Measure	Condition Status/Trend*	Rationale
Ozone	Human Health: Annual 8-hr concentration	⚠️	Condition: Human health risk from ground-level ozone remains moderate concern at Mesa Verde NP. This condition is based on BEP Air Resources Division (ARD) and the 2009-2013 estimated annual average (EAA) of 0.12 parts per million (ppm) (8-hr). Trend: For 2004-2013, the trend in ozone concentration at Mesa Verde NP remained relatively unchanged (no statistically significant trend) (NADP Monitor ID: 06030006, CO). Confidence: The degree of confidence at Mesa Verde NP is high because there is an on-site or nearby ozone monitor.
	Vegetation Health: 3-month maximum 12-hr W126	⚠️	Condition: Vegetation health risk from ground-level ozone remains moderate concern at Mesa Verde NP. This condition is based on BEP Air Resources Division (ARD) and the 2009-2013 estimated annual average (EAA) of 1.23 deciviews (dv) above estimated natural condition. Trend: For 2004-2013, the trend in visibility at Mesa Verde NP improved on the 20% haziest days and remained relatively unchanged on the 50% haziest days (IMPROVE Monitor ID: 06030006, CO). The Clean Air Act visibility goal requires visibility improvement on the 20% haziest days, with no degradation on the 50% haziest days. Confidence: The degree of confidence at Mesa Verde NP is high because there is an on-site or nearby visibility monitor.
Visibility	Haze Index†	⚠️	Condition: Visibility warrants moderate concern at Mesa Verde NP. This condition is based on BEP Air Resources Division (ARD) and the 2009-2013 estimated annual average (EAA) of 3.5 deciviews (dv) above estimated natural condition. Trend: For 2004-2013, the trend in visibility at Mesa Verde NP improved on the 20% haziest days and remained relatively unchanged on the 50% haziest days (IMPROVE Monitor ID: 06030006, CO). The Clean Air Act visibility goal requires visibility improvement on the 20% haziest days, with no degradation on the 50% haziest days. Confidence: The degree of confidence at Mesa Verde NP is high because there is an on-site or nearby visibility monitor.
	Wet Deposition	⚠️	Condition: Wet nitrogen deposition warrants moderate concern at Mesa Verde NP. This condition is based on BEP Air Resources Division (ARD) and the 2009-2013 estimated annual average (EAA) of 2.3 kilograms per hectare per year (kg/ha/yr). Ecosystems in the park were rated as having high sensitivity to nutrient-enrichment effects relative to all Inventory & Monitoring parks (Gardner et al. 2012). Trend: For 2004-2013, the trend in total wet nitrogen deposition at Mesa Verde NP degraded (no statistically significant trend) (NADP Monitor ID: 06030006, CO). Confidence: The degree of confidence at Mesa Verde NP is high because there is an on-site or nearby deposition monitor.
Nitrogen	Wet Deposition	⚠️	Condition: Wet sulfur deposition warrants moderate concern at Mesa Verde NP. This condition is based on BEP Air Resources Division (ARD) and the 2009-2013 estimated annual average (EAA) of 4.4 kilograms per hectare per year (kg/ha/yr). Ecosystems in the park were rated as having high sensitivity to nutrient-enrichment effects relative to all Inventory & Monitoring parks (Gardner et al. 2012). Trend: For 2004-2013, the trend in total wet sulfur deposition at Mesa Verde NP degraded (no statistically significant trend) (NADP Monitor ID: 06030006, CO). Confidence: The degree of confidence at Mesa Verde NP is high because there is an on-site or nearby deposition monitor.
	Sulfur	Wet Deposition	⚠️

A state-of-the-parks style table, depicting the condition status and trend for each air quality indicator, provides a park-specific summary of overall air quality.

Air Quality Indicators

This website presents data products related to the 4 primary indicators used to evaluate air quality in national parks:

- Ozone**
Ground-level ozone can harm both humans and plants. Explore the website to learn about trends, exceedances of the human health standard, and the status of ozone in parks.
- Visibility**
Visibility is a measure of how far and how well we can see color and detail in distant views. Park views are sometimes obscured by fine particles and gaseous air pollution which form haze in the atmosphere. Learn how visibility has changed over time and what is in the air on the clearest and haziest days.
- Nitrogen deposition &**
- Sulfur deposition**
The ecological effects of nitrogen & sulfur pollution can include acidification or enrichment of soils and surface waters. Nitrogen and sulfur pollution that enters ecosystems through precipitation is called wet deposition. Visualize how nitrogen and sulfur deposition has changed over time and learn what compounds make up the measured deposition.

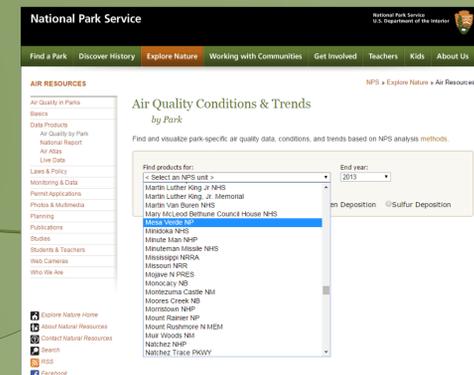
Condition Status	Trend	Confidence In Assessment
Indicator is in Good Condition	Improving	High
Warrants Moderate Concern	Unchanging	Medium
Warrants Significant Concern	Deteriorating	Low

raw air data

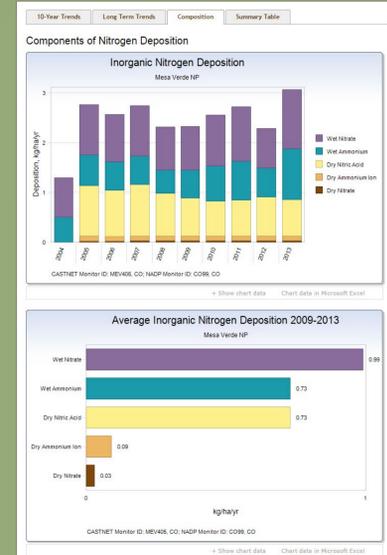


Data Visualization

The screen-shots below illustrate the variety of data products available for Mesa Verde NP.

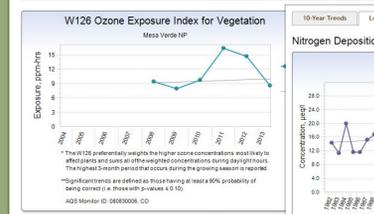
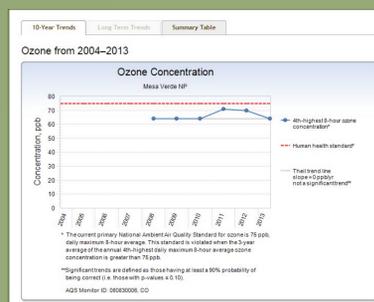


Mesa Verde NP - Nitrogen deposition



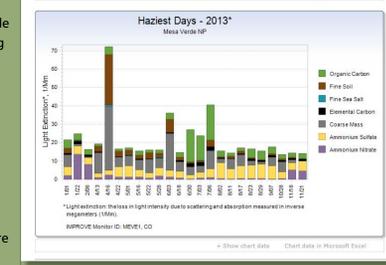
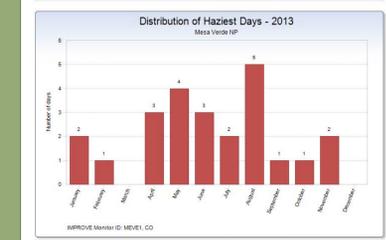
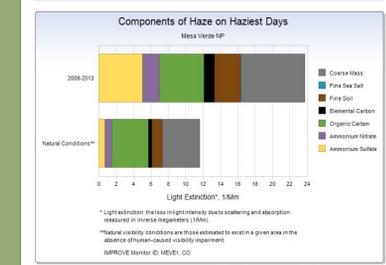
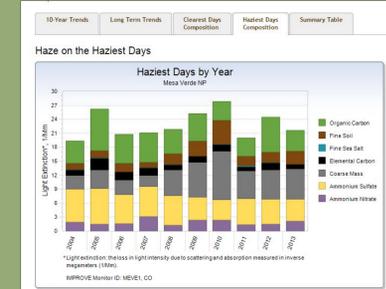
In addition to trend and summary information, charts illustrating the components of nitrogen and sulfur deposition are provided.

Mesa Verde NP - Ozone & Nitrogen Trends



10-year and long-term trends are available for parks with representative monitors. Trend graphs include the significance of a trend and show reference values for comparison with monitored data, for example the human health standard is included on ozone concentration graphs. At Mesa Verde NP ozone monitoring shows levels of significant concern for vegetation health. Also at Mesa Verde NP, ammonium deposition is increasing at a significant rate though overall levels are considered moderate.

Mesa Verde NP - Visibility



For more information

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