

# National Park Service Visibility Monitoring Network

IMPROVE Meeting November 3, 2015  
Grand Canyon National Park

Mark Tigges – Nephelometer  
Scott Cismoski – Web Camera  
Air Resource Specialists



## Twelve Sites in the Network



10/20/2003 07:47




## Recent Operational Changes

### 1. 2014 – 2015 Five Sites Self-Service

- Acadia National Park
- Great Smoky Mountains NP
- Shenandoah National Park
- National Capital Parks
- Mount Rainier National Park





## Recent Operational Changes (Continued)

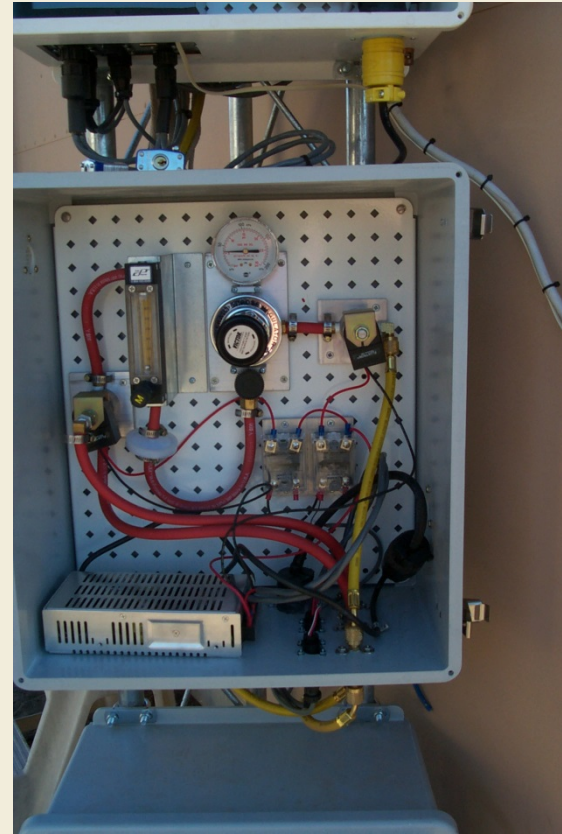
2. 2014 – 2015 All Service Visit Travel Combined with the NPS Gaseous Monitoring Contract Work
3. 2015 – 2016 All Site Servicing Intervals Increased from One to Two Years

# New Hope for Aging Equipment



A Decline in the use of Nephelometers and Support Systems in Arizona (ADEQ) Could Benefit the NPS Program

# New Hope for Aging Equipment



# National Park Service Air Quality Webcam Network

20 Cameras in 19 parks



Bryce Canyon camera  
installed September 2013  
and added to web site  
October 2015



<http://www.nature.nps.gov/air/WebCams/index.cfm>



# National Park Service Webcam Site Visits for FY2015

[www.nature.nps.gov](http://www.nature.nps.gov)

10,517,039 unique visitors

[www.nature.nps.gov/webcams](http://www.nature.nps.gov/webcams)

8,013,213 (74% of all visitors)

## Top 5 locations:

- Great Smoky Mtns - Purchase Knob 1,257,716
- Great Smoky Mtns - Look Rock 1,193,191
- Grand Canyon 757,528
- Denali
- National Mall and Memorial Parks

Approximately 40% of visits to NPS sites are from mobile devices.

This is expected to increase in FY2016 and beyond.

<http://www.nature.nps.gov/air/WebCams/index.cfm>



# New National Park Service Web Site Launched October 30, 2015

<http://www.nature.nps.gov/air/WebCams/index.cfm>

Modern look and feel within NPS framework requirements....

The desktop screenshot shows a full-width header with the National Park Service logo and navigation tabs: Find a Park, Discover History, Explore Nature, Working with Communities, Get Involved, Teachers, Kids, and About Us. The main content area is titled "Grand Teton National Park" and features a "Webcam" section with a live video feed of a mountain range. To the right of the video is a "Current Air Quality" widget showing "Ozone (O<sub>3</sub>)" at 19 ppb (Good) and "Current Weather" with a temperature of 25 °F. A sidebar on the left contains "AIR RESOURCES" and social media links. The footer includes the nps.gov logo and "EXPERIENCE YOUR AMERICA™" slogan.

... using “Responsive Design” for smartphone, tablet and other mobile users.

The mobile screenshot shows a responsive design with a dark header containing the National Park Service logo and "Explore Nature" navigation. Below is a search bar for "Web Cameras" and a "Grand Teton National Park" section with a "More Webcams" button. The main content area features a "Webcam" section with a live video feed of a mountain range. Below the video are buttons for "Camera", "Clear/Hazy", "Landmarks", and "Map It". At the bottom, a "Current Air Quality" widget shows "Ozone (O<sub>3</sub>)" at 19 ppb (Good) and "Visibility".

# New Map Page

National Park Service  
U.S. Department of the Interior

Find a Park Discover History **Explore Nature** Working with Communities Get Involved Teachers Kids About Us

**AIR RESOURCES** NPS » Explore Nature » Air Resources

## NPS Air Quality Web Cameras

**Locations** | **Gallery**  
Map | Images from All Camera Sites

### Webcam Network

Current digital images and air quality information from 18 national parks are part of the NPS air quality web camera network. Images are updated every 15 minutes. Air quality data—including ozone, particulate matter, visual range, and weather conditions—are updated hourly. Learn more about air quality and the national parks by exploring the webcam pages.

### Locations

### About Air Pollution

- Pollutants of Concern
- Sources of Pollution
- Effects of Air Pollution
- Monitoring
- Studies
- Interactive Educational Tool

### In Depth

- Air Quality Trends in Parks
- Climate Friendly Parks
- EPA AirNow

### Feature

**On the Air**

Explore Nature Home  
About Natural Resources  
Contact Natural Resources  
Search  
RSS

Facebook  
Twitter  
YouTube  
Flickr  
Instagram

**PARK**  
SHARE YOUR STORY  
Last Updated: October 30, 2015

nps.gov EXPERIENCE YOUR AMERICA™

National Park Service  
U.S. Department of the Interior

Find a Park Discover History **Explore Nature** Working with Communities Get Involved Teachers Kids About Us

**AIR RESOURCES** NPS » Explore Nature » Air Resources

## NPS Air Quality Web Cameras

See park images and air quality at the locations below.

**Explore by Map** | **Explore by Image**

### About the Network

Current digital images and air quality information from 19 national parks are part of the NPS air quality web camera network. Images are updated every 15 minutes. Air quality data—including ozone, particulate matter, visual range, & weather conditions—are updated hourly.

### About Air Quality

- Air Quality in Parks
- Air Quality Basics
- NPS Air Data Products

Back to Top

nps.gov EXPERIENCE YOUR AMERICA™

U.S. Department of the Interior FOIA Privacy Policy Disclaimer and Ownership USA.Gov NPS Home Accessibility

<http://www.nature.nps.gov/air/WebCams/index.cfm>

# New Image Browser Page

National Park Service National Park Service U.S. Department of the Interior

Find a Park Discover History Explore Nature Working with Communities Get Involved Teachers Kids About Us

AIR RESOURCES NPS » Explore Nature » Air Resources

Air Quality in Parks Basics Data Products Laws & Policy Monitoring & Data Permit Applications Photos & Multimedia Planning Publications Studies Students & Teachers Web Cameras Who We Are

## NPS Air Quality Web Cameras

Locations Map Gallery Images from All Camera Sites

**Grand Teton National Park**  
10/30/2015 09:30 MDT

**Great Smoky Mountains National Park, Look Rock**  
10/30/2015 11:30 EDT

**Great Smoky Mountains National Park, Purchase Knob**  
10/30/2015 11:45 EDT

**Hawai'i Volcanoes National Park**  
10/30/2015 05:15 HST

**About Air Pollution »**  
Pollutants of Concern  
Sources of Pollution  
Effects of Air Pollution  
Monitoring  
Studies  
Interactive Educational Tool

**In Depth »**  
Air Quality Trends in Parks  
Climate Friendly Parks  
EPA AirNow

**Feature »**  
On the Air

Explore Nature Home  
About Natural Resources  
Contact Natural Resources  
Search  
RSS  
Facebook  
Twitter  
YouTube  
Flickr  
Instagram

**PARK**  
SHARE YOUR STORY  
Last Updated: October 30, 2015



National Park Service National Park Service U.S. Department of the Interior

Find a Park Discover History Explore Nature Working with Communities Get Involved Teachers Kids About Us

AIR RESOURCES NPS » Explore Nature » Air Resources

Air Quality in Parks Basics Data Products Laws & Policy Monitoring & Data Permit Applications Photos & Multimedia Planning Publications Studies Students & Teachers Web Cameras Who We Are

Explore Nature Home  
About Natural Resources  
Contact Natural Resources  
Search  
RSS

## NPS Air Quality Web Cameras

See park images and air quality at the locations below.

Explore by Map Explore by Image

**Acadia National Park**  
Maine | Currently Unavailable

**Big Bend National Park**  
Texas | 10/30/2015 08:15 CDT

**Bryce Canyon National Park**  
Utah | Currently Unavailable

**Denali National Park**  
Alaska | Currently Unavailable

**Grand Canyon National Park**  
Arizona | 10/30/2015 06:15 MST

**Grand Teton National Park**  
Wyoming | 10/30/2015 07:15 MDT

**Great Smoky Mountains National Park, Look Rock**  
Tennessee | 10/30/2015 09:15 EDT

**Great Smoky Mountains National Park, Purchase Knob**  
Tennessee | 10/30/2015 09:30 EDT

**Hawaii Volcanoes National Park**  
Hawaii | 10/30/2015 05:15 HST

**Joshua Tree National Park**  
California | 10/30/2015 06:15 PDT

**Mammoth Cave National Park**  
Kentucky | 10/30/2015 08:15 CDT

**Mount Rainier National Park**  
Washington | 10/30/2015 09:15 PDT

<http://www.nature.nps.gov/air/WebCams/index.cfm>



# New Data Page

**National Park Service**  
National Park Service  
U.S. Department of the Interior

Find a Park Discover History **Explore Nature** Working with Communities Get Involved Teachers Kids About Us

**AIR RESOURCES**

Grand Teton National Park

View From Teton Science Center Looking West Air Data & Weather NPS Air Webcams

### Ozone - O<sub>3</sub>

updated 10/30/2015 09:00 AM MDT

Understanding Ozone » O<sub>3</sub> 10-day charts »

| O <sub>3</sub> concentration | Current | Today's Maximum | Yesterday's Maximum |
|------------------------------|---------|-----------------|---------------------|
| 8-hour average               | 19 ppb  | 23 ppb          | 27 ppb              |
| 1-hour average               | 19 ppb  | 21 ppb          | 29 ppb              |

Levels of Public Health Concern for 8-hr avg O<sub>3</sub> »

| 0 ppb | 60       | 76                             | 96        | 116            |
|-------|----------|--------------------------------|-----------|----------------|
| Good  | Moderate | Unhealthy for Sensitive Groups | Unhealthy | Very Unhealthy |

\*Ozone (O<sub>3</sub>) is measured in parts per billion (ppb)

### Current Air Quality »

Ozone - O<sub>3</sub> updated 10/30/2015 09:00 AM MDT

0 ppb 60 76 96 116

Good Moderate Unhealthy for Sensitive Groups Unhealthy Very Unhealthy

### Current Weather »

updated 10/30/2015 09:00 AM MDT

Temperature 24 F  
Humidity 91 %  
Wind E-7 mph  
Precipitation - 1 hr 0 in.

### Weather

updated 10/30/2015 09:00 AM MDT

Weather 10-day charts »

|                                       |          |
|---------------------------------------|----------|
| Current temperature                   | 24 F     |
| Yesterday's minimum temperature       | 27 F     |
| Yesterday's maximum temperature       | 37 F     |
| Current relative humidity             | 91 %     |
| Yesterday's minimum relative humidity | 80 %     |
| Yesterday's maximum relative humidity | 96 %     |
| Current wind speed                    | 7 mph    |
| Current wind direction                | E        |
| Precipitation in last hour            | 0.00 in. |
| Precipitation since midnight          | 0.00 in. |
| Yesterday's precipitation             | 0.07 in. |

### Visibility

updated 10/30/2015 09:25 AM MDT

Understanding Visibility Data » Visibility 10-day charts »

| Approximate Visual Range | Current     | Yesterday's Maximum | Yesterday's Minimum |
|--------------------------|-------------|---------------------|---------------------|
|                          | unavailable | 243 miles           | 156 miles           |

Explore Nature Home  
About Natural Resources  
Contact Natural Resources  
Search  
RSS  
Facebook  
Twitter  
YouTube  
Flickr  
Instagram

**PARK**  
SHARE YOUR STORY



**National Park Service**  
National Park Service  
U.S. Department of the Interior

Find a Park Discover History **Explore Nature** Working with Communities Get Involved Teachers Kids About Us

**AIR RESOURCES**

Grand Teton National Park

Viewcam Air Data & Weather

### Ozone (O<sub>3</sub>)

CURRENT 1-Hour Average 20 ppb

CURRENT 8-Hour Average 19 ppb

0 ppb 60 76 96 116

Good Moderate Unhealthy for Sensitive Groups Unhealthy Very Unhealthy

### Current Air Quality

Ozone (O<sub>3</sub>) updated 10/30/2015 07:00 AM MDT

20 ppb

Good

Visibility 243 miles

Distance 243 miles

Temperature 25 F

Humidity 93 %

Precipitation, 1-Hr 0.00 in.

Wind ESE 4 mph

### Weather

updated 10/30/2015 07:00 AM MDT

Temperature 25 F  
Humidity 93 %  
Precipitation 0.00 in.

### Visibility & Weather

Visibility 243 miles

Wind ESE 4 mph

Yesterday's: 243 miles MAX, 166 miles MIN

Temperature 25 F  
Yesterday: 37 F MAX, 27 F MIN

Humidity 93 %  
Yesterday: 96 % MAX, 80 % MIN

Precipitation 0.00 in., Today  
0.07 in., Yesterday

Weather Update: 10/30/2015 07:00 AM MDT  
Weather Update: 10/30/2015 08:38 AM MDT  
Data collected at Teton Science Center

Understanding Visibility | Visibility 10-Day History | Data Disclaimer

Weather 10-Day History | Data Disclaimer

**Park Specific Links**  
Grand Teton National Park  
Grand Teton National Park - Environmental Factors  
Air Quality in Parks, Grand Teton NP  
More Grand Teton NP Webcams

**About Air Quality**  
Air Quality in Parks  
Air Quality Basics  
NPS Air Data Products

Back to Top

<http://www.nature.nps.gov/air/WebCams/index.cfm>



# New Mobile Pages

**National Park Service**  
National Park Service  
U.S. Department of the Interior

☰ Explore Nature

**AIR RESOURCES**

Web Cameras ▾

## NPS Air Quality Web Cameras

See park images and air quality at the locations below.

Sort by Park Name ▾

- Acadia National Park**  
Maine | Currently Unavailable
- Big Bend National Park**  
Texas | 10/30/2015 08:15 CDT
- Bryce Canyon National Park**  
Utah | Currently Unavailable
- Denali National Park**  
Alaska | Currently Unavailable
- Grand Canyon National Park**  
Arizona | 10/30/2015 06:15 MST
- Grand Teton National Park**  
Wyoming | 10/30/2015 07:15 MDT

**National Park Service**  
National Park Service  
U.S. Department of the Interior

☰ Explore Nature

**AIR RESOURCES**


Web Cameras ▾

## Grand Teton National Park

**More Webcams**

**Webcam** | **Air Data & Weather**

**View from Teton Science Center | Looking West**  
Updated 10/30/2015 07:15 AM MDT



**Camera** | **Clear/Hazy** | **Landmarks** | **Map It** | **Archives** »

**Current Air Quality**

**Ozone (O<sub>3</sub>)** ?

**Good** | **19 ppb**

Updated 10/30/2015 07:00 AM MDT

**Visibility**

**National Park Service**  
National Park Service  
U.S. Department of the Interior

☰ Explore Nature

**AIR RESOURCES**

Web Cameras ▾

## Grand Teton National Park

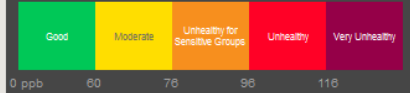
**More Webcams**

**Webcam** | **Air Data & Weather**

**Ozone (O<sub>3</sub>)** ?

**CURRENT 1-Hour Average** **20 ppb**

**CURRENT 8-Hour Average** **19 ppb**



**View Scale Definitions** »

**Today's Maximum O<sub>3</sub>**

|              |               |
|--------------|---------------|
| 1-HR Average | <b>21 ppb</b> |
| 8-HR Average | <b>23 ppb</b> |

**Yesterday's Maximum O<sub>3</sub>**

|              |               |
|--------------|---------------|
| 1-HR Average | <b>29 ppb</b> |
| 8-HR Average | <b>27 ppb</b> |

Ozone is measured in parts per billion (ppb).  
Updated 10/30/2015 07:00 AM MDT  
Data collected at Teton Science Center

[Ozone Health Effects](#) | [10-Day History](#) | [Data Disclaimer](#)

<http://www.nature.nps.gov/air/WebCams/index.cfm>



## Planned Webcam Site Enhancements

- New Image Archive Browser Page
  - all images and associated meteorology and air quality data
  - Air Resources Division implementing image database
  - mobile friendly
- New Timeline Plot Page
  - selectable time periods, scales, parameters
  - mobile friendly