

WRAP TSS: Frequently Asked Questions

General Regional Haze Questions

What is “regional haze?”

Regional haze is a term that EPA uses to refer to visibility impairment at designated national parks and wilderness areas caused by air pollution from numerous sources dispersed over a wide geographic area. The Clean Air Act has a goal to prevent visibility impairment at designated national parks and wilderness areas. EPA distinguishes this kind of visibility impairment from the kind caused by a single source that impairs visibility at a single park or wilderness area.

What are the designated parks and wilderness areas where visibility is impaired by regional haze?

EPA refers to these designated parks and wilderness areas as “Mandatory Federal Class 1 Areas,” which we’ll refer to as Class 1 Areas. There are 156 of these, listed in federal regulations. You can see the list at <https://www.epa.gov/visibility/list-areas-protected-regional-haze-program>.

What causes regional haze?

Regional haze is caused by air pollution made up of particles that scatter sunlight, thus obscuring visibility over distances visible to the human eye. The particles that cause this effect form from both particles and gasses emitted by human activity and natural events. On the human activity side, industrial facilities like power plants and vehicles like cars and trucks emit particles and gasses that can be carried long distances and can interact with other substances to form visibility-obscuring particles. Natural events, such as wildfires, volcanic activity, and high winds can put particles into the atmosphere that also obscure visibility.

What does the federal government do to try to alleviate regional haze?

The federal Clean Air Act mandates that EPA issue regulations to improve visibility in Class 1 Areas, and in 1999, EPA issued the Regional Haze Rule. These regulations require states to submit plans periodically to EPA, which must do three things:

- The plans must show which Class 1 Areas have visibility that’s affected by the air pollutant emissions from that state, whether those Areas are in the state or beyond its borders.

- The plans must show reasonable pollution control measures the state will put in place to reduce the state’s emissions from human activity that affects visibility at Class 1 Areas. The plans do not address emissions from natural events beyond human control.
- The plans must show how much visibility improvement is expected to result from the pollution control measures. The federal regulations on Regional Haze require that states evaluate progress in improving visibility conditions in Class 1 Areas relative to the rate of progress needed to achieve “natural conditions” by the 2064 benchmark established in the Rule.

How do we know how much visibility impairment exists at a Class 1 Area?

Air quality monitors are positioned in or near each Class 1 Area. These monitors measure the amount of visibility impairing particles in the air – that is, how much pollution is in the air that keeps people from seeing natural vistas clearly. This nationwide network of monitors is called the IMPROVE (Interagency **M**onitoring of **PRO**Tected **V**isual Environments) network. IMPROVE is managed and operated by a committee of federal agencies, including EPA and the various land management agencies, as well as organizations that represent state regulatory agencies. More information on IMPROVE is available at <http://vista.cira.colostate.edu/Improve/>.

How do we know where the visibility impairing pollutants in an area come from?

Federal and state air quality planners, working with federal land managers, perform highly technical analyses to answer that question. In part, they do this by identifying air pollutant emission sources in the region around a Class 1 Area. For each source, planners and land managers measure the amount of air pollutants emitted that are known to contribute to visibility impairment. They use state of the art computer models to identify where these pollutants are traveling, taking into account things like:

- the type of emission source (for example, a power plant versus a wildfire);
- the kind of pollutant;
- wind and temperature conditions;
- how different pollutants interact with each other in the atmosphere;
- how pollution travels across state boundaries; and
- how pollution is transported into the United States from outside U.S. borders.

How do we know how much visibility impairing pollution is coming from particular sources?

EPA regulations require states to keep track of air pollutant emissions, from both natural and human sources. Every year, states must report the amount of these pollutants from their biggest sources (called “major sources”). Every three years, states must also report their emissions of regulated pollutants from all their sources, not just the largest ones. In addition to reporting emissions data, states can do additional modeling that estimates visibility impacts.

What is the “WRAP”?

The “WRAP” is the Western Regional Air Partnership, a voluntary partnership of states, tribes, federal land managers, local air agencies and the United States EPA, whose purpose is to understand current and evolving regional air quality issues in the West. The WRAP assists state air agencies in preparing plans to meet requirements in federal regional haze regulations. The WRAP region encompasses the 15-state area of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming.

What is the WRAP Technical Support System (TSS)

WRAP partners help operate and manage a Technical Support System (TSS). The TSS provides air quality data related to regional haze to agency planners, land managers, and the public. The TSS is currently in development, but when complete, it will offer interactive displays showing technical data and measurements, such as:

- the location of Class 1 Areas and IMPROVE monitor sites;
- visibility conditions at Class 1 Areas over time;
- the amount of visibility-impairing particles in the air at Class 1 Areas;
- the amount of emissions (by sources in each state) of pollutants that contribute to visibility impairment;
- results of computer modeling showing how emissions travel long distances from a human or natural source, how they help to form visibility impairing particles, and how much visibility impairment happens as a result;
- results of computer modeling showing how air pollution control measures might affect visibility conditions at Class 1 Areas.

Data-Related Questions

Which sites/locations do these data apply to?

The TSS houses monitoring data from all IMPROVE sites across the country. However, the analysis for various metrics, including the Most Impaired Days (MID) metric, follows EPA’s tracking metric approach from their 2018 Guidance Document (<https://www.epa.gov/visibility/technical-guidance-tracking-visibility-progress-second-implementation-period-regional><https://www.epa.gov/visibility/technical-guidance-tracking-visibility-progress-second-implementation-period-regional>), a calculation methodology recommended by the WRAP Regional Haze Planning Work Group. While the WRAP recommends this methodology, some states may diverge from this methodology for site-specific or state-specific reasons. The methodology for analyzing monitoring data may also vary from region to region.

Where does the IMPROVE data originate and what years are included?

The Regional Haze IMPROVE dataset was originally taken from the Federal Land Managers Environmental Database. The data has been augmented to substitute for those sites which are missing data. This augmentation was performed by Air Resource Specialists and finalized in December, 2018. The dataset currently includes data up to and including the year 2017. This final data download will provide States with a static dataset that they can use for state implementation planning purposes.

What are “most impaired days?”

“Most Impaired Days” is a term used by EPA to describe the 20% of monitored days that have the most haze due to anthropogenic (human caused) haze.

The recommended method to determine “Most Impaired Days” first estimates the natural and anthropogenic contributions to fine particulates measured at IMPROVE monitors, and then anthropogenic visibility impairment is calculated as the total light extinction relative to natural light extinction. Estimates of natural haze include both extreme events such as wild fires and dust storms and routine natural sources of particulates such as vegetation and sea salt in the atmosphere.

How can I learn more about tracking visibility progress at IMPROVE sites?

For more information on tracking visibility progress for the second round of Regional Haze planning please see the following resources:

- [*Technical Guidance on Tracking Visibility Progress for the Second Implementation Period of the Regional Haze Program*](#). U.S. EPA. December 20, 2018.
- [*Guidance on Regional Haze State Implementation Plans for the Second Implementation Period*](#). U.S. EPA. August 20, 2019.
- [*Protection of Visibility: Amendments to Requirements for State Plans*](#). U.S. EPA. January 10, 2017.
- [*Interagency Monitoring of Protected Visual Environments \(IMPROVE\) website*](#).
- [*Federal Land Manager Environmental Database website*](#).
- Gantt, B., Timin, B. Tracking visibility progress for the Regional Haze Program: Current status and recent updates. Journal of Air & Waste Management, 2019, PENDING PUBLICATION.

[TSS Website-Related Questions](#)

Do I need to login?

Not always. There are resources and pages on the website that do not require a login to access, but many others that do. Most of the data-intensive tools and resources will require you to login because these pages need to be protected from hackers, spammers, and bots. Leaving the site "wide open" to the general public could significantly affect the performance of the site for regular users, so many of these pages are protected with a login requirement. If you click on a link or visit a page that requires a login, you will simply be redirected to the [Login page](#).

I'm new to regional haze planning, where do I start?

Where to start on the TSS depends on what you are trying to accomplish. First, you can check out the [Overview of Regional Haze Planning](#) to get a general overview of how regional haze planning works. Once you are ready to start looking at data for your Class I areas, there are numerous tools on the TSS website to help you.

A good place to start is the [Visibility Summaries](#) page. From here you can click on any Class I area on the map at the top and get a quick view of the visibility trends at that site. The first tab "Dv Trends" shows how the haziest and clearest days have changed over time compared to the baseline natural conditions. The "Haze Budgets, Clear Days" tab shows the annual average of individual species contribution on the clearest days through time. The "Haze Budgets, Hazy Days" tab shows the annual average of the individual species contribution on the haziest days through time. Finally, the "Haze Budgets, Most Impaired Days" tab shows the annual average of the individual species contribution on the most impaired days through time.

To dig deeper into the visibility data, you can go to the [Haze Analysis Tools](#) page. This page allows you to dig deeper into the visibility data by seeing individual days selected for the clearest, haziest, and most impaired days. The "Daily, All Days" tab shows the individual light extinction by species for each day of the selected year. These graphics are sorted by calendar day, total haze, or impairment. The "Daily, Group Days" tab shows the individual days selected for clearest, haziest, and most impaired days only. The "Monthly", "Seasonal", and "Annual" tabs show the average light extinction by month, season, or year for the period selected. The "Glide Path" tab shows the glide path information for the clearest, haziest, and most impaired metrics.

There is also the ability to download raw data and conduct further analysis. The raw data can be accessed via the [Query Wizard](#) page.