Regional Air Quality and the Regional Haze Rule:

Information and Resources for Tribal Professionals

Clean, clear air is a resource that has long been valued by people and cultures from around the world, not only for its health benefits and for the joy we feel when viewing an expansive landscape, but as an important component of the sacred places in many cultural traditions. The American West, in particular, has been cherished for the sweeping views of mountains, plains, mesas, and coastlines found across the region. Polluted air is not only unhealthy to breathe, but can also produce subtle to sometimes dramatic visibility impairments from regional haze, making it difficult to engage in traditional cultural practices or enjoy those sweeping views. This was considered important enough that the federal Clean Air Act included as a National Visibility Goal "*the **prevention of any future**, and the **remedying of any existing**, **impairment of visibility** in mandatory class I Federal areas which impairment **results from manmade air pollution.**"*[1] This fact sheet introduces the topic of regional haze and discusses what causes it, how it's managed in a long-term improvement program by the Regional Haze Rule, and what you as a Tribal Nation can do to improve visibility and overall air quality for the benefit of both people and the environment.

Regional haze and why it's important

- Haze is caused by certain types of air pollution that interact with light and reduce the ability of people to see details across large distances.
- Although local emissions sources can impair visibility, much of the pollution that causes haze often comes from far away and disperses across large areas. Therefore, it is considered a regional, rather than a local problem.
- Visibility reduction caused by regional haze can impair cultural practices for Tribal members, and reduce visitors' enjoyment of special places such as National Parks and Wilderness areas.
- Regional haze is a symptom of overall air quality problems that have effects far beyond visibility, as the same pollutants that cause haze (primarily fine particles) are linked to a host of other environmental and human health problems including:
  - acidification of lakes and streams;
  - depletion of soil nutrients;
  - damage to culturally important plants, as well as sensitive forests and farm crops;
  - aggravated asthma;
  - respiratory problems such as irritation of the airways, coughing, or difficulty breathing
  - heart attacks; and
  - premature death in people with heart or lung disease

How haze is formed

- **Fine particles and certain gaseous compounds** in the atmosphere can scatter and/or absorb light traveling from an object along a viewer's sight path, as well as scattering light from other sources (clouds, the ground,

[1] Section 169A of the Clean Air Act

etc.) into the sight path (see figure next page). The result is an overall reduction in the distance that can be seen, as well as a decreased ability to discern colors, forms, and textures of the object being viewed.

- Pollutants causing haze include **naturally occurring particles** such as wind-blown dust and wildfire smoke, as well as **human-caused emissions** including soot from diesel vehicles, fly ash and sulfur dioxides from coal burning, nitrogen oxides from power plants and automobiles, and ammonia from farms and feedlots.
- Some of these pollutants also interact with each other or with natural components of the atmosphere to produce **secondary pollutants** such as sulfates, nitrates, and ozone, which also contribute to regional haze.
- The pollutants that contribute to haze are small and light, and **can travel hundreds or even thousands of miles from their original sources** on wind currents, and be dispersed across large areas. Thus haze in a particular area can be the result of pollution originating nearby, or in a different state or country.

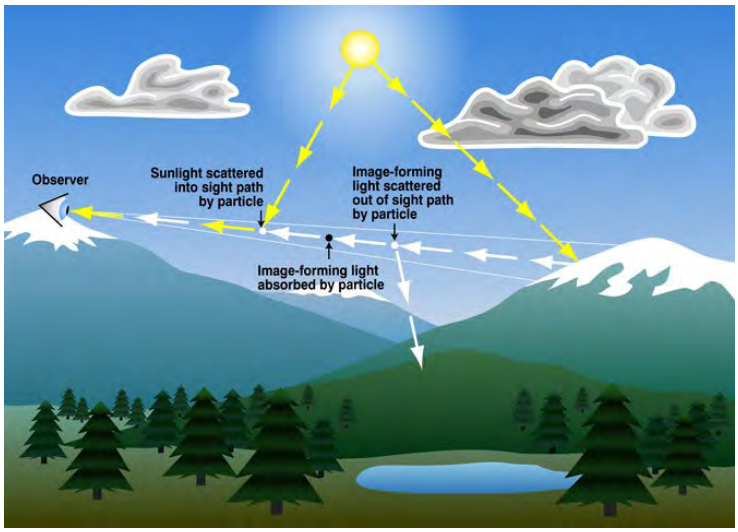


Figure courtesy of the National Park Service

How regional haze is regulated by the federal government

- The **Clean Air Act** (CAA) amendments of 1977 set a national goal for remedying existing and preventing future impairment of visibility resulting from human actions in many National Parks and Wilderness Areas, and in 1980 the EPA issued regulations to address visibility problems that could be "reasonably attributable" to a single source or small group of sources. At that time the technology was not considered mature enough to act on regional haze issues.

Figure courtesy of the USEPA

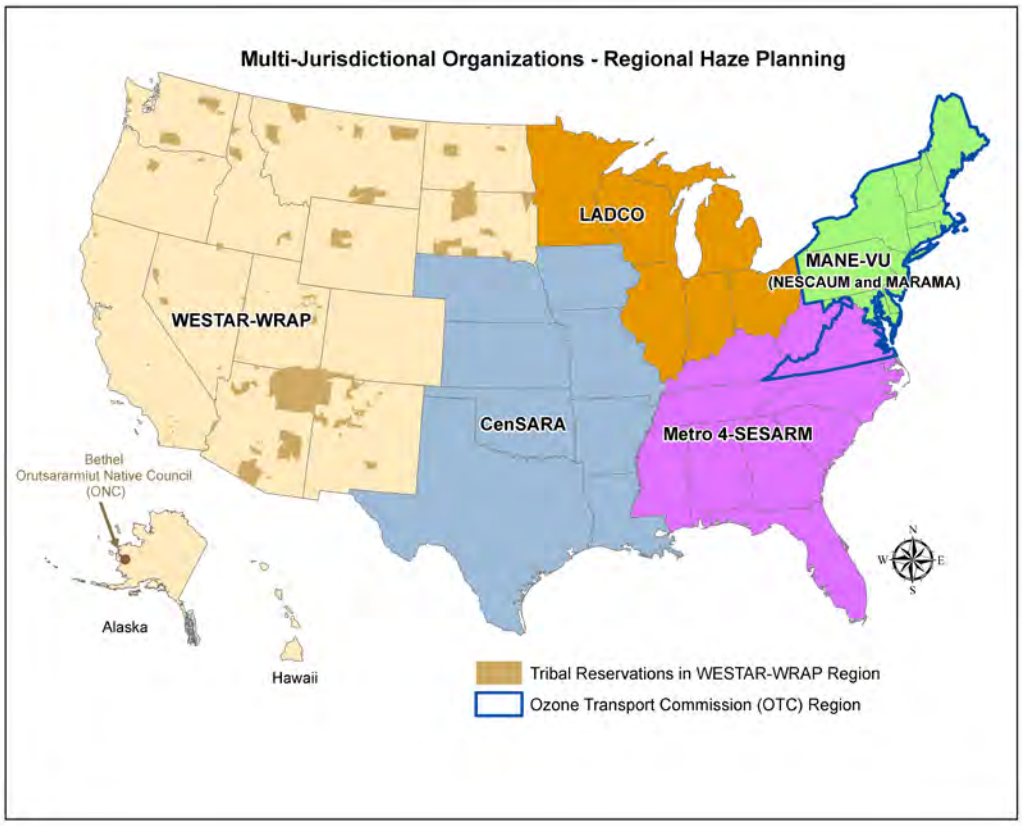
- Federal **Class I areas** designated by the CAA for visibility protection include larger National Parks and Wilderness Areas. There are 156 federal Class I areas across the country, mostly located in the western states (see figure above) and often in areas where Tribes have treaty rights or sacred sites.
- Tribes can also, at their discretion, petition the EPA to designate their lands as Class I areas. There are currently six designated **Tribal Class I areas** including the Northern Cheyenne Reservation, the Flathead Reservation, the Fort Peck Reservation, the Spokane Reservation, the Forest County Potawatomi Reservation, and most recently the Kalispel Indian Reservation.

- While these Class I areas are given protections under other portions of the CAA, the visibility provisions of the Act as described in the Regional Haze Rule requirements only apply to federal Class I areas.

- 1990 amendments to the CAA required the EPA to form a commission to study visibility in Grand Canyon National Park, and 15 other federal Class I areas on the Colorado Plateau, and issue recommendations on how to improve visibility. Following the release of the commission's report, the EPA issued the **Regional Haze Rule** in 1999.
  - Under the Rule, states are required to produce **State Implementation Plans** (SIPs) to demonstrate how they will control emissions that contribute to regional haze.
  - Tribes can also submit **Tribal Implementation Plans** (TIPs) if they choose, and can tailor them to address specific portions of the rule to meet the needs of the Tribe. TIPs are optional, however, and to date no Tribes have approved regional haze TIPs in place.
  - The first Regional Haze SIPs were submitted over several years near the end of the 2000-10 decade for emissions reductions to be implemented by 2018. The next round (Round 2) of Regional Haze SIPs are due from all 50 states no later than July 31, 2021.
  - SIPs must include two **reasonable progress goals** (RPGs) for each Class I area within the state—one for the most impaired days, and one for the least impaired days—for each planning period to show improvement in visibility on the most impaired days and no degradation of visibility on the least impaired days. RPGs are expressed in deciviews, a measurement based on perceptible change to the human eye.
  - A network of monitoring stations (called the Interagency Monitoring of Protected Visual Environments or **IMPROVE**) was established to gather data on baseline visibility in representative federal Class I areas and track progress towards improving visibility as the Regional Haze Rule was implemented. There are currently 110 IMPROVE sites in federal Class I areas around the country, EPA provides the funding for these sites.
  - Additionally, 48 IMPROVE protocol sites (following the IMPROVE data collection methods) are currently operating in other areas to complement the data collected at the IMPROVE sites.
  - Eight IMPROVE protocol sites are located on western Tribal lands, including the Flathead, Fort Peck, Makah, Northern Cheyenne, and Yurok Reservations; and the Knik, Ninilchik, and Sand Point Alaska Native Villages.
- EPA encouraged states and Tribes across the U.S. to address visibility impairment from a regional perspective and Congress provided substantial dedicated funding until 2010 to regional organizations.
  - After 2010, the various Multi-Jurisdictional Organizations (MJOs) across the U.S. are now providing regional analysis and planning support across the U.S. through which such regional planning occurs (see figure to right)[2].
  - Participation in MJOs can help Tribes understand how the Regional Haze Rule is being implemented, and how compliance efforts may impact them.
- To address regional haze and other regional air quality issues in a coordinated manner, the commission formed under the 1990 CAA amendments to study visibility at Grand Canyon National Park and Colorado Plateau Class I areas was tasked with providing recommendations to improve it. To implement their

[2] The organizations include the Western States Air Resources Council-Western Regional Air Partnership, Central States Air Resource Agencies, Lake Michigan Air Directors Consortium, Metro 4-Southeastern States Air Resource Managers, Mid-Atlantic/Northeast Visibility Union, Northeast States for Coordinated Air Use Management, and Mid-Atlantic Regional Air Management Association.

recommendations, the commission advocated for the formation and foundation by EPA of was the **Western Regional Air Partnership**, or WRAP. The WRAP formed in 1997.



- The WRAP is a voluntary partnership of states, tribes, local air agencies, federal land managers and EPA whose purposes is to understand current and evolving regional air quality issues in the West.
- Currently the WRAP partnership is working on the second round of Regional Haze planning, providing training, modeling and analysis, and a standardized database storage system for emissions sources and model results to be incorporated into the SIPS.

Results of the Regional Haze Rule thus far, and challenges for future visibility improvement

- Considerable visibility improvements have been made in affected areas on the haziest days
  - Eastern Class I areas have seen dramatic visibility improvements thanks to emissions reductions from implementation of the Regional Haze Rule, along with the Acid Rain Program and the Cross-state Air Pollution Rule (see the figure below, with darker blue triangles indicating more significant improvements in visibility) .
  - Western Class I areas have seen visibility improvements as well, but not as dramatically as in eastern states, due to natural causes such as wildfires and dust storms, which can mask improvements due to human-caused emissions reductions.

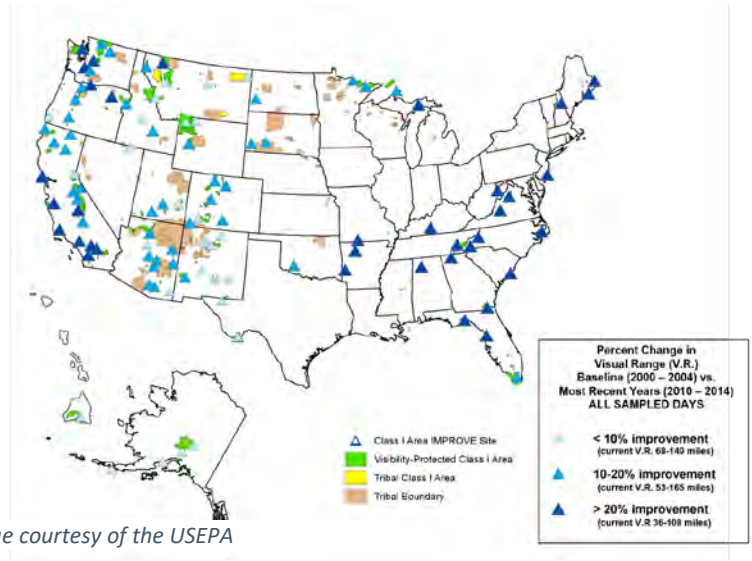


Image courtesy of the USEPA

- The National Park Service estimates that emissions controls established under the first planning period led to approximately 500,000 tons/year of sulfur dioxide (SO_2) and 300,000 tons/year of oxides of nitrogen (NO_x) reductions.
- At this point the "easy" sources to target for emissions reductions (large stationary sources such as power plants) have mostly been addressed, and further progress toward reducing regional haze will require emissions controls on a more diverse set of small or diffuse sources including motor vehicles, oil and gas development, agriculture, etc.
- Emissions from natural causes such as wildfires and dust storms (likely to increase due to climate change) provide challenges to discerning improvement in visibility due to reductions in human-caused emissions.
- Additionally, visibility in Class I areas can be affected by pollutants from emissions sources located outside of the country, and not under U.S. regulatory control.
- Recent rapid increases in oil and gas extraction in various parts of the country may be resulting in negative impacts to visibility in Class I areas (for example a recent study[3] showed impacts of oil and gas production activities in the Bakken region of North Dakota on nearby Class I areas).

The current state of the Regional Haze Rule moving into the second planning period

- In January 2017 the EPA issued amendments to the Regional Haze Rule to address the second planning period (SIPs with 2028 reasonable progress goals). Revisions included:
  - Extending the SIP submittal deadline to July 31, 2021 to give states more time to ensure the SIPs align with steps taken to address other CAA actions;
  - Strengthening the federal land manager consultation requirements to ensure any issues that arise between states or Tribes and nearby federal lands are raised early in the planning process;
  - Reducing the level of effort for the 5-year progress reports due under the Regional Haze Rule; and
  - Making the Reasonably Attributable Visibility Impairment (RAVI) provisions of the Rule more explicit.
- In 2018 the EPA declared its intent to revisit certain aspects of the 2017 amendments to streamline the compliance process and give more control to the states. The EPA is expected to release revised planning guidance and analysis results in 2019.
- The WRAP Board adopted the Regional Haze Principles of Engagement in 2018 to encourage transparency and equal participating among WRAP members for regional haze planning.
- The WRAP partnership is well into the modeling and analyses required to generate data for the Round 2 Regional Haze SIPs due in 2021.

[3] Visibility Impacts at Class I Areas Near the Bakken Oil and Gas Development

Ways for Tribes to get involved in reducing regional haze and improving visibility, and the benefits of participation in the WRAP

- Tribes were involved in efforts to reduce regional haze as part of the commission to study visibility at Grand Canyon National Park (Grand Canyon Visibility Transport Commission), and have played key roles in the WRAP's activities and governance ever since.
- Any Tribes in the WRAP region may participate; however, for membership on the WRAP Board, Technical Steering Committee, or Work Groups, or actions requiring a vote (such as a change to the Charter), active membership is required. (Tribes can also participate on the Technical Steering Committee and Work Groups as advisors, without having an active membership.)
- Tribes within the WRAP region are automatically WRAP members. Becoming an active member requires submittal of an official letter that also designates the primary and secondary contacts for the Tribe (the Air Quality or Environmental Program Manager, and an alternate).
- The WRAP provides technical and planning resources including tools for air quality modeling and analysis, a centralized data warehouse, special studies on air quality issues of concern to members, and training opportunities.
- Participation in the WRAP provides opportunities for Tribal staff to interact and form professional networks with state, local, federal land manager and EPA colleagues.
- WRAP participation provides access to partnering state SIP planners and familiarity with SIP components that may affect Tribal lands.
- Participation in WRAP increases awareness among states and federal partners of Tribes as governmental and regulatory agencies, including requirements to consult with them when reviewing projects near Tribal lands.
- For more information about joining the WRAP, contact Tom Moore at tmoore@westar.org.

WRAP
Western Regional Air Partnership

WESTAR
Western States Air Resources Council

For more information about the WRAP, see www.wrapair2.org.

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