



OVERVIEW OF REGIONAL HAZE PLANNING

Regional Haze Planning Work Group consensus – May 7, 2019

INTRODUCTION

This page explains what “regional haze planning” is and what kinds of technical data must be gathered to carry it out. The purpose of this explanation is to help both air quality planners and the public understand how data support improvement of visibility at federally managed scenic areas. All data may be found on the Technical Support System or “TSS”.

In 1977, serious degradation of scenic views at national parks and wilderness areas prompted Congress to require the U.S. Environmental Protection Agency (EPA) to take action. Initial work was conducted to identify specific facilities whose emissions clearly caused regional haze in these nationally treasured places, and the eventual result was the 1999 Regional Haze Rule. This rule mandates gradual progress toward restoring “natural” visibility conditions by the year 2064 at designated national parks, wilderness areas, monuments, forests, seashores, and wildlife refuges, collectively referred to as Class I areas. The rule was revised in 2017 to strengthen visibility protection, emphasizing that states must reduce human-caused emissions of air pollutants that impair visibility at these special places held in the public trust.

THE PLANNING PROCESS REQUIRED BY THE REGIONAL HAZE RULE

The Regional Haze Rule establishes a multi-step process to improve visibility. The rule divides the process into ten-year planning periods. During each period, states undertake a series of steps to achieve gradual improvement in visibility. (Tribes may also undertake regional haze planning, depending on their facilities’ emissions and possible effects on Class I areas. Planning may involve developing a tribal implementation plan (TIP), coordinating with a regional EPA office to develop a federal implementation plan (FIP), or other actions to address regional haze planning needs.) The current planning period is an exception to the ten-year rule. It begins in 2021 and ends in 2028. EPA anticipates that later planning periods will resume the normal ten-year interval. By the time the final planning period ends, in 2064, Congress’ goal is for visibility to be restored to what state and federal planners agree is natural for each Class I area. This requires estimating emissions from natural sources (such as sea salt, dust, and wildfire smoke), emissions from anthropogenic (human-related) sources, and amounts of pollution which are beyond the control of states (such as international emissions, and some transportation-related emissions).

Before each ten-year planning period begins, every state must complete a series of steps:

1. States review the data in the Interagency Monitoring of Protected Visual Environment (IMPROVE) monitoring network (<http://vista.cira.colostate.edu/Improve/>), which measures the visibility-impairing pollutant concentrations at a given Class I area;
2. States calculate the amount of air pollutants known to contribute to poor visibility that is emitted within their boundaries from a variety of different sources;
3. States analyze this data on visibility and pollutants to identify pollution sources likely contributing to visibility problems at particular areas, both inside their own borders and in other states;
4. Each state identifies “reasonable” pollution control methods that will reduce emissions from human-caused sources to improve visibility;

5. Regional technical experts use computer modeling to project how much the identified pollution control measures are expected to improve visibility at each Class I area over ten years;
6. Throughout plan development, states consult informally with the Federal Land Managers of the Class I areas to communicate intended benefits of regulatory actions, and then ask the Federal Land Managers for a formal review of the plan before it is released to the public for final review. States are also encouraged to consult informally with tribes, local authorities and other states that may be impacted by the states' emissions and potential control strategies.
7. Ideally, States, local agencies and Tribes consult with their EPA regional offices throughout the SIP planning process. This may help identify and resolve potential technical, policy, and legal issues before plan finalization and adoption by the state. This also improves the likelihood that the State will submit an approvable SIP to EPA. EPA recommends submission of a draft plan for review and feedback in advance of formal plan submission to EPA.
8. After public review, states adopt plans to implement the identified pollution control methods, make them legally binding, and thus strive to achieve the projected ten-year visibility improvement at each area; and
9. States' plans report what the visibility trends have been and the improvements to visibility that are expected due to the adopted pollution control techniques.

Final EPA approval of the plan is required following the state adoption process.

HOW TSS DATA SUPPORTS THE REGIONAL HAZE PLANNING PROCESS

The TSS provides data that states use in carrying out the above steps. The types of data found on the TSS and how that data help meet planning requirements are described below.

Air monitor data: What are the visibility conditions?

The TSS provides measurements of visibility, and of visibility-impairing air pollutants, obtained from air quality monitors placed in or near national parks and wilderness areas around the United States. The air monitors that gather these measurements are part of the IMPROVE network, maintained by a steering committee of federal, regional, state, and tribal air quality and land management agencies. IMPROVE monitors measure pollutants in the air that contribute to visibility impairment including ammonium sulfate, ammonium nitrate, organic carbon mass, elemental carbon, fine soil, coarse soil, and sea salt, although some of these haze-causing particles are natural. Measurements are expressed in units of concentration (micrograms pollutant per cubic meter of air). Using formulas, these concentrations are converted to a unit of light extinction, which is a measure of how much light gets blocked out per unit of distance. (The greater the light extinction, the greater the haze, which worsens the visibility.) Light extinction is then converted to a unit of measurement called a deciview, which measures how the human eye perceives changes in visibility. The higher the deciview values, the worse the visibility. Planners and members of the public who want to know what past visibility conditions were at a particular national park or wilderness area, which visibility-impairing pollutants were present, and visibility trends may consult the monitor data available on the TSS.

Emissions data: How much and what kind of pollution is being produced?

The TSS provides data based on estimates of the amount and type of visibility-impairing pollutants that different types of sources put into the air in a given year – an “emissions inventory.” The TSS provides emissions inventory data for such pollutants as nitrogen oxides, sulfur dioxides, particulate matter, and volatile organic compounds. This emissions inventory tells a user how much of each of these pollutants

comes from different types of sources, including stationary sources (such as factories and power plants) and mobile sources (such as cars, trucks, aircraft, and trains) Planners and members of the public who want to know the amount and types of these pollutants coming from a specific category or source may consult the emissions inventory data available on the TSS. The emissions inventory data also list estimates of pollutants from some natural sources, such as wildfires.

Modeling and analysis data: How do we analyze and make projections based on monitor and emissions data?

The TSS data provide the results of quantitative computer simulations, and related types of data and calculations, that provide useful information for planners:

- “Weighted Emissions Potential Calculations” quantitatively describe how pollutants from a particular source could be transported to a specific park or wilderness;
- “Source Apportionment Modeling” helps users understand which types of pollutant sources may be causing visibility issues at the various parks and wilderness areas.
- “Photochemical modeling” simulates how air pollutants are emitted, react with each other, interact with atmospheric processes and sunlight, and travel from the emissions sources to Class I area monitors and are detected as haze-causing pollutants.

Data and technical information for each of these topics can be found on the modeling and analysis portions of the TSS.

The above types of data on the TSS help planners understand what kinds of pollution control methods can improve visibility at each park or wilderness area. For example, after identifying which types of pollutants and sources are likely affecting visibility in particular locations, planners identify sources that likely contribute *significant* pollution to those areas, then identify pollution control methods that can improve visibility. “Four-factor analyses” assess reasonable control methods, based on cost of controls, implementation time needed, impact on energy and the environment, and the remaining life of the emitting source.

The information on potential emissions–reducing controls from the four-factor analyses are then modeled and results are shown on the TSS. This modeling projects how much future visibility improvement is likely to result from implementing the identified pollution control methods. These projections, referred to as “Reasonable Progress Goals” (RPGs), are expressed as a deciview level. These goals represent the new level of visibility, specific to each Class I area that can be achieved by 2028, or the end of the second planning period.

In each subsequent planning period, States, Tribes, local air agencies, and Federal Land Managers work together to ensure that reasonable progress at each protected area is made toward achieving natural conditions.