

Why GAO Did This Study

Atmospheric deposition, a process that transfers pollutants, including NO_x, SO₂, and mercury, from the air to the earth's surface, can significantly impair the quality of the nation's waters. EPA can potentially address atmospheric deposition through the CWA and the CAA, but concerns have been raised about its ability to do so. GAO was asked to examine EPA's efforts to address atmospheric deposition of pollutants that impair waterbodies. This report examines (1) the extent to which atmospheric deposition of NO_x, SO₂, and mercury contributes to the impairment of the nation's waters and identify the key sources of these pollutants; (2) the regulatory tools that EPA uses under the CWA to address the effects of atmospheric deposition, and the challenges, if any, that it faces in doing so; and (3) the regulatory tools that EPA uses under the CAA to address the effects of atmospheric deposition, and the challenges, if any, that it faces in doing so. To conduct this work, GAO reviewed EPA data, reports, and activities and interviewed agency officials and other experts.

What GAO Recommends

GAO recommends that EPA determine whether EPA can obtain in a timely manner the data it needs to establish secondary NAAQS adequate to protect against the effects of acid rain and, if not, identify alternative strategies to do so. EPA agreed with GAO's recommendation.

WATER QUALITY

EPA Faces Challenges in Addressing Damage Caused by Airborne Pollutants

What GAO Found

Atmospheric deposition of nitrogen oxides (NO_x), sulfur dioxide (SO₂), and mercury contributes to the impairment of the nation's waters, but the full extent is not known. For example, states provide EPA with data on the extent to which their waterbodies do not meet water quality standards, and some states have reported that some of their waterbodies are polluted because of atmospheric deposition. However, the states have not assessed all of their waterbodies and are not required to report on the sources of pollution. Similarly, federal studies show that atmospheric deposition of NO_x, SO₂, and mercury is polluting waterbodies but have data for only some waters. The main sources of NO_x and SO₂ are cars and other forms of transportation and coal-burning power plants. Power plants are also the largest U.S. source of mercury emissions, but international sources also contribute to the mercury deposited in U.S. waters.

EPA has sought to address atmospheric deposition through Clean Water Act (CWA) programs but faces challenges in doing so. Specifically, states typically establish water quality standards—considering EPA recommended criteria—for each waterbody. If a waterbody does not meet standards, CWA generally requires the state to set a Total Maximum Daily Load (TMDL) that identifies the maximum amount of pollutant that can enter the waterbody and still meet standards. States are responsible for taking actions to ensure the TMDL is met. For point sources of pollution, such as a pipe from a sewer treatment plant, CWA requires new or renewed permits to be consistent with the TMDL. However, there is no similar statutory requirement for nonpoint sources of pollution, such as atmospheric deposition. States may take actions, such as providing technical or financial assistance to limit pollution from nonpoint sources, but face a challenge when atmospheric deposition pollution affecting their waters originates in emissions from a different state.

EPA has also sought to address atmospheric deposition through Clean Air Act (CAA) regulations but faces challenges in doing so. EPA issued regulations that reduced emissions of NO_x, SO₂, and mercury and in turn the amount of pollution in waterbodies. Even with reduced emissions, NO_x, SO₂, and mercury continue to pollute the nation's waterbodies. EPA's recent attempt to address atmospheric deposition by establishing secondary National Ambient Air Quality Standards (NAAQS)—standards to protect public welfare—targeting the effects of acid rain caused by NO_x and SO₂ on water bodies was not successful. EPA stated that uncertainty regarding atmospheric modeling and limitations in available data prevented determination of secondary NAAQS adequate to protect against the effects of acid rain, and the agency has not identified alternative strategies. EPA has begun a 5-year pilot program to gather additional scientific data, but it is unclear whether or when the agency will be able to address scientific uncertainties to enable adoption of a protective secondary NAAQS. EPA also did not set secondary NAAQS to address nutrient over-enrichment in aquatic ecosystems caused by NO_x because of the limited available scientific data. Many sources of nitrogen can contribute to nutrient over-enrichment in a waterbody, including sources of nitrogen unrelated to atmospheric deposition. EPA recently announced an effort that is to lead to the development of an integrated nitrogen research strategy that includes approaches to reducing atmospheric deposition of NO_x into waters impaired because of nutrient over-enrichment by nitrogen.