

Stream Length Impaired by Metals

This EnviroAtlas national map displays the length of streams, coasts, canals, and other linear hydrographic features from the 303(d) list of impaired waters within each subwatershed ([12-digit HUC](#)) that are impaired by metals, meaning high levels of metals have been found in the water, sediment, or fish.

Why are impaired streams important?

Stream impairments can be due to a wide variety of causes, including chemical pollutants, physical conditions such as siltation, or biological contaminants such as bacteria. This map shows waters that are impaired by metals, such as mercury. These impairments can have serious impacts on ecosystems, human health, and the economy.

Metals enter waterways from factories, mining, and stormwater runoff, but they can also enter water through natural processes, such as through runoff and the erosion of soils and rocks containing metal. At high levels, metals are toxic to humans and animals, and they are expensive to remove from drinking water.

Mercury is a well-known pollutant that can impair streams. In water, mercury can build up in fish tissue, dissolve into the water, or deposit in bottom sediments. Mercury is released by coal-fired power plants and burning hazardous waste; it then makes its way into streams and lakes, where it can build up in fish and shellfish. When the fish are eaten, it can harm the human nervous system, brain, heart, kidneys, lungs, and immune system.

Section 303(d) of the Clean Water Act requires states to identify water bodies that do not support state designated uses, such as fishing, irrigation, industrial uses, or drinking water supply, due to pollution or other impairments. The states must then establish a [Total Maximum Daily Load \(TMDL\)](#), which caps the amount of each pollutant allowed in the water body based on its use.



Photo: Eric Vance/USEPA

How can I use this information?

The map, Stream Length Impaired by Metals, provides information about the length of streams and other waters with impairments in a 12-digit HUC. It can be used to identify watersheds that have impairments caused by metals. Information about the extent and causes of impairments could guide projects for improving water quality, or inform decisions about how best to use water resources.

Users can view this information along with supplemental layers, such as impervious surface and riparian buffers, to identify possible sources of impairments and remediation needs. It could also be combined with layers on recreation or domestic water consumption to show how metal-related impairments relate to water use.

This map can also be viewed in conjunction with the stream length layer to find out what percent of stream length in a watershed is impaired by metals. Because the total length of streams in a watershed can vary, supplementing information on impairments with information on stream length can give a clearer picture of how extensive the impairments are.



Photos: Eric Vance, EPA

How was the data for this map created?

The January 2, 2013 303(d) Listed Impaired Waters NHD Indexed Dataset was obtained from the [EPA's Geospatial Data Downloads web page](#). (NHD stands for National Hydrography Dataset.) This dataset includes a table listing impaired streams, rivers, and other linear features such as canals, pipelines, and coastlines. The impairment causes were then summarized into broad categories. For metals, two causes were included: Mercury and Metals (other than mercury).

Because some streams cross 12-digit HUC boundaries, the features were split where they crossed watershed boundaries. The lengths of all waters impaired by metals were summed for each 12-digit HUC.

For detailed information on the processes through which this data was generated, see the metadata.

What are the limitations of these data?

All national data layers, such as the 303(d) Listed Impaired Waters NHD Indexed Dataset, are by their nature inherently imperfect; they are an estimation of the truth based on the best available science. Calculations based on these data are therefore also estimations. The user needs to be aware that the mapped data are not perfect and should be used to inform further investigation. Periodic updates to EnviroAtlas will reflect improvements to nationally available data.

This layer only represents waters on a state's approved 303(d) list, and not all impaired water bodies. Therefore, some impaired water bodies are not included in this layer. The extent of monitoring and the methods used also vary from state to state. The dataset may include false positives

resulting from data that is incorrect or inadequate for determining the exact location, or false negatives resulting from missing information. Because the total lengths of waters in a 12-digit HUC may vary, this information should be considered in conjunction with data on stream density and total lengths of streams and coastlines to better understand the extent of impairment in a subwatershed.

For more technical details about the limitations of these data, refer to the metadata. Accuracy information for the source data sets can be found on their respective web sites.

How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded. The dataset used to calculate the impairment counts, which provides greater detail on specific water bodies and the causes and sources of impairment, can be found on EPA's [website](#).

Where can I get more information?

There are numerous resources on water quality and impairment; a selection of these resources is below. Information on section 303(d) of the Clean Water Act can be found at the EPA Office of Water [website](#). To ask specific questions about this data layer, please contact the [EnviroAtlas Team](#).

Acknowledgements

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Selected Publications

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Postel, S. L., and B. H. Thompson. 2005. Watershed protection: Capturing the benefits of nature's water supply services. *Natural Resources Forum* 29:98-108.

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