

Stream Length Impaired for Biota

This 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 for [biota](#), meaning they show changes in the type and number of aquatic life.

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 for biota, meaning that aquatic animal populations may be reduced, unhealthy, or absent. These impairments can have serious impacts on ecosystems, human health, and the economy.

There are several factors that can impair aquatic biota. For instance, excessive algal growth as a result of [eutrophication](#), warmer water temperatures, and reduced water flow can reduce the oxygen levels in aquatic environments, clog fish gills, and literally smother the plant and animal life in streams and lakes.¹ Some algal blooms even produce chemicals that are toxic to humans and animals, known as [biotoxins](#) or cyanotoxins. Fish kills, or large numbers of dead fish in a localized area, reduce fishing opportunities and degrade water quality as the fish decompose. These large fish kills also decrease the overall recreational and aesthetic value of an area.

Altering the flow of water through activities such as dam construction and irrigation can interrupt the overall functionality of water systems by slowing water flow, trapping sediments, changing temperature, and promoting the presence of non-native and [invasive species](#). Invasive species are capable of crowding out native species in riparian areas, changing local species composition, and affecting structural integrity as well as the ecosystem's ability to remove pollutants from the environment. Thus, altered water flow may mean increased pollution levels and a more harsh living environment, which may result in the loss of fish species and other aquatic life.¹

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



Photo: Eric Vance/USEPA

in the water body based on its use.

How can I use this information?

The map, Stream Length Impaired for Biota, 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 impaired biota. 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 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 for biota. 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.

How were the data for this map created?

The January 2, 2013 303(d) Listed Impaired Waters National Hydrography Dataset (NHD) Indexed Dataset was obtained from the [EPA's Geospatial Data Downloads web page](#). 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 biota, the causes include: Algal Growth, Biotoxins, Cause Unknown – Fish Kills, Cause Unknown – Impaired Biota, Noxious Aquatic Plants, Nuisance Exotic Species, and Nuisance Native Species

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

For detailed information on the processes through which this data were 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 length of streams 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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Keller, A. A. and L. Cavallaro. 2008. Assessing the US Clean Water Act 303(d) listing process for determining impairment of a waterbody. *Journal of Environmental Management* 86:699-711.

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.

¹ United States Environmental Protection Agency, Office of Water, Watershed Branch. 2012. [Summaries of Water Pollution Reporting Categories](#). Accessed April 2013.