



Stream Length with Impaired Biota

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 12-digit hydrological unit (HUC) with impaired [biota](#), meaning that the waterbodies show negative changes in the types and numbers 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 EnviroAtlas map shows waters contain impaired 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 aquatic 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 harsher 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 clean water 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 Loads](#) (TMDL), which cap the amount of each pollutant allowed in the water body based on its use. The TMDL sets a target for the total load that the water body is expected to assimilate and then divides the load into allowable contributions from [point](#) and [nonpoint](#) sources.

How can I use this information?

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

Users can view this information along with other EnviroAtlas layers, such as impervious surface and riparian buffers, to identify possible sources of impairments and remediation needs. The map can be combined with layers on recreation or domestic water consumption to show how impairments relate to water use. This map can be viewed in conjunction with the stream length layer to find out what



percent of stream length in a HUC contains impaired biota. Because the total length of streams in a HUC can vary, supplementing information on impairments with information on stream length can give a clearer picture of the extent of the impairments.

How were the data for this map created?

The January 2, 2013 [303\(d\) Listed Impaired Waters NHD Indexed Dataset](#) was used to create this map layer. This dataset includes a table listing impaired streams, rivers, and other linear features such as canals, pipelines, and coastlines. The impairment causes were 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 the boundaries. The lengths of all waters with impaired biota were summed for each 12-digit HUC.

What are the limitations of these data?

All national data layers, such as the 303(d) Listed Impaired Waters National Hydrography Dataset (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 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 12-digit HUC. 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 [WATERS Geospatial Data Downloads](#) website.

Where can I get more information?

There are numerous resources on water quality and impairment; a selection of these resources is listed below. The EPA Office of Water provides information on [Section 303\(d\)](#) of the Clean Water Act. For additional information on how the data were created, access the metadata for the data layer from the drop down menu on the interactive map table of contents and click again on metadata at the bottom of the metadata summary page for more details. To ask specific questions about this data layer, please contact the [EnviroAtlas Team](#).

Acknowledgments

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Selected Publications

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