Stream Length

This EnviroAtlas national map displays the total length in kilometers of streams, coasts, canals, and other linear hydrographic features from the National Hydrography Dataset (NHDPlus) for each 12-digit hydrological unit (HUC).

Why is stream length important?

Streams provide a variety of ecosystem services. They are often the source of water that is used by households, industries, and agriculture. Stream length is an indicator of potential water supply. Eighty percent of the water withdrawn in the U.S. comes from surface water like streams and lakes, and over one third of Americans get some or all of their drinking water from public water systems that depend on streams.[1] This water is consumed for household uses, such as drinking, cooking, and hygiene; industrial uses, including chemical, food, paper, wood, and metal production; agricultural uses; and energy production.

Streams can also contribute to the economy by providing opportunities for tourism and recreational activities such as birding, boating, fishing, hunting, swimming, and sightseeing. Nationally, there are an estimated 46.7 million birdwatchers and waterfowl are the most highly viewed group of birds. In total, wildlife viewing contributed almost $55 billion to the U.S. economy in 2011.[2]

The fishing industry depends on streams to help reduce pollution that would otherwise accumulate in lakes and coastal waters. 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.

Streams serve as a source of food and water, providing habitat for many animals and plants. Streams provide a place

Photo: Bureau of Land Management, Montana

for fish to spawn, and stream riparian areas serve as travel corridors for semiaquatic and terrestrial wildlife.

How can I use this information?

The map, Stream Length, provides information about the total lengths of streams in a 12-digit HUC. Stream length can vary greatly depending on the size of the watershed and factors such as geology, rainfall, and topography (see the *Stream Density* fact sheet for more information).

This map can be used to complement the maps showing stream impairments. By comparing total stream length to impaired length, users can better assess the extent of impairments in local watersheds. For example, this map could be used to determine whether a watershed with a higher than average length of impaired streams is especially polluted.

This map can also be used in conjunction with other EnviroAtlas map layers. By comparing the information in this map to maps about industrial, household, thermoelectric, and agricultural water demand, users can assess the relationship between supply and demand and look for potential imbalances. This map can be viewed in conjunction with land cover maps to find watersheds where there are many streams exposed to urban and agricultural runoff or used with protected area maps to identify opportunities for outdoor recreation or stream restoration.

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How were the data for this map created?

These data were created using the National Hydrography Dataset NHDPlus version 2.1 and the Watershed Boundary Dataset (WBD). The NHDPlus is a dataset produced by the U.S. Geological Survey showing surface waters for the United States. Most of the linear features in this dataset are streams, but it also includes features like coastlines and canals. Since some streams cross 12-digit HUC boundaries, the features were split where they crossed these boundaries. Then, the total length of all streams in meters was calculated for each 12-digit HUC. For detailed information on the processes through which these data were generated, see the metadata.

What are the limitations of these data?

All national data layers, such as the NHDPlus, 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.

Stream length varies along artificial lines in some regions due to differences in how streams were recorded. This can result in rectangular patches with higher or lower stream length than surrounding areas. A stream's perennial status may change during drought cycles or the direction of flow of streams may be recorded in error because of water diversions. The calculated stream length only includes streams recorded in NHDPlus. Because many small streams are not included, stream lengths might be greater than reported in some watersheds. Also, because coastlines are included in the NHDPlus data, stream length may be exaggerated in coastal watersheds. However, as coasts are also included in the maps showing impairments, this stream length layer is still useful for comparison.

How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded. The NHDPlus and Watershed Boundary datasets used to calculate stream lengths can be downloaded from their respective websites.

Where can I get more information?

There are numerous resources on streams; a selection of these resources is listed below. More information on the importance of streams can be found on EPA's Office of Wetlands, Oceans, and Watersheds website. 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.

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Selected Publications

1. Maupin, M.A., J.F. Kenny, S.S. Hutson, J.K. Lovelace, N.L. Barber, and K.S. Linsey. 2014. Estimated use of water in the United States in 2010. United States Geological Survey Circular 1405, U.S. Geological Survey, Reston, Virginia. 56 p.

2. U.S. Department of the Interior, U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2013. 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, FHW/11-NAT (RV), Washington, D.C.

Hjerpe, E.E., and Y.S. Kim. 2007. Regional economic impacts of Grand Canyon river runners. *Journal of Environmental Management* 85:137–149.

Lins, H.F., R.M. Hirsch, and J. Kiang. 2010. Water—the nation's fundamental climate issue: A white paper on the U.S. Geological Survey role and capabilities. Circular 1347. U.S. Geological Survey, Reston, Virginia. 9 p.

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.

United States Environmental Protection Agency. 2016. Healthy watersheds: Protecting aquatic ecosystems through landscape approaches. United States Environmental Protection Agency, Office of Water. Accessed May 2016.