



Collaborative Watershed Mapping Tool

Data Sources and Descriptions

Tool access and video tutorial: <https://lancastercleanwaterpartners.com/collaborative-mapping>

The Collaborative Watershed Mapping Tool is a product of the Lancaster Clean Water Partners' Watershed Action Team and the Chesapeake Conservancy. The mapping layers provide spatial information and landscape context to support planning efforts from restoration and conservation professionals in Lancaster County, Pennsylvania.

Data in the tool has been categorized into four different tabs

- **Prioritization:** This tab shows priority watersheds for restoration at the catchment scale which were then aggregated to the HUC12 watershed scale, and also aggregated to the scale of large watersheds that local groups reference for planning purposes. The factors that went into the priority level are each included as their own data layer listed below the priority data sets.
- **Water Quality:** This tab includes data layers with information on water quality including the index of biological integrity (IBI) and water quality monitoring data.
- **Policy:** This tab includes data layers from federal, state, and local agencies related to water quality, designated uses, flood risk, land use, environmental justice, and urban development.
- **Implementation:** This tab shows data layers relevant to implementation at the local scale including existing planning efforts, high-resolution hydrology, and best management practice (BMP) opportunities.

Disclaimer

Results from this mapping tool should be ground-truthed using local knowledge through stakeholder and landowner participation, as the data is not intended to provide site-specific engineering/project design. Chesapeake Conservancy and Lancaster Clean Water Partners do not guarantee the accuracy of suggested practice locations. Local knowledge and planning expertise is required to apply the data sets in an appropriate manner and to ensure restoration projects will result in significant water quality benefits on-the-ground.

Prioritization

The mapping unit displayed in the Prioritization tab of the Collaborative Watershed Mapping Tool is called a “catchment,” based on the National Hydrography Dataset Plus V2 (2012). **Catchments are small hydrologic units defined as the drainage area associated with stream reaches which have been segmented at confluence points.** An average stream reach is 3,000 feet in length and the average catchment is 600 acres.

How were the catchment metrics prioritized?

The Watershed Action Team identified six broad metrics as important for prioritizing restoration actions across the county. By summarizing and aggregating these metrics (below) by catchments, HUC 12 watersheds, and larger priority watersheds, the Collaborative Watershed Mapping Tool can help identify priority locations for collective work at a variety of scales across Lancaster County.

Prioritization Layers	Description	Data Source
Priority Watersheds	Catchment summaries aggregated to subwatersheds	Chesapeake Conservancy
Priority HUC 12 Watersheds	Catchment summaries aggregated to HUC 12 watersheds	Chesapeake Conservancy; NHD Plus HR, USGS
Priority Catchments	Catchment summaries of the metrics below. Higher opportunity score indicates higher priority	Chesapeake Conservancy
Metrics summarized by catchment		
Nitrogen, Phosphorus, and Sediment loads	Modeled edge-of-stream nutrient and sediment loading rates	HUC12 CAST estimates, Drexel University ANS
Stream Length per Parcel	Average stream length per parcel	Parcels, Lancaster County GIS; NHD Plus HR, USGS
Stream Bank Volume Loss	Estimated potential for stream bank volume loss	Water Sciences Institute
Buffer Restoration Opportunity Area	Acreages of buffer restoration opportunities	Chesapeake Conservancy
Impaired Streams	Percentage of stream miles designated as impaired for aquatic life	Impairment, PA DEP; NHD Plus HR, USGS

Water Quality

The data sets in the Water Quality tab indicate water quality in Lancaster County, using a variety of indicators including water chemistry, macroinvertebrate data, and nutrient and sediment load modeling.

Water Quality Layers	Description	Data Source
IBI Scores- PA DEP	Index of biological integrity (macroinvertebrate survey data)	PA Department of Environmental Protection; 2016
IBI Scores- SRBC	Index of biological integrity (macroinvertebrate survey data)	Susquehanna River Basin Commission; 2011 - 2017
Water Quality Data Lancaster County Volunteer	Water Quality Monitoring Data	Lancaster County Water Quality Volunteer Coalition; 2001-2018
Water Quality Data-SRBC	Water Chemistry Data	Susquehanna River Basin Commission; 1985-2018
Water Quality Data CS Datum	Water Quality data and monitoring station points from CS Datum	CS Davidson, Nov 2020
Total Nitrogen	Estimated total nitrogen loads by catchment	USGS SPARROW; 2012
Total Phosphorus	Estimated total phosphorus loads by catchment	USGS SPARROW; 2012
Suspended Sediment	Estimated suspended sediment loads by catchment	USGS SPARROW; 2012

Policy

The data sets in the Policy tab include data from federal, state, and local agencies related to water quality, designated uses, flood risk, land use, environmental justice, and urban development.

Policy Layers	Description	Data Source
Exceptional Value/High Quality Streams	Streams Chapter 93 Designated Use	PA Department of Environmental Protection; 2019
Impaired streams	Integrated List Non-Attaining for Aquatic Life	PA Department of Environmental Protection; 2020
Class A Trout Streams	Streams that support wild trout fishery	PA Fish and Boat Commission; 2021

Streams Supporting Natural Trout Reproduction	Streams that support naturally reproducing populations of trout	PA Fish and Boat Commission; 2021
Trout Stocked Waters	Approved trout waters open to public fishing and stocked with trout	PA Fish and Boat Commission; 2021
Flood Hazard Boundaries	National Flood Hazard Layer data indicating areas with high flood risk	Federal Emergency Management Agency; 2018
State Gamelands	Boundaries of the Pennsylvania State Gamelands for the management of public resources	PA Game Commission; 2020
Environmental Justice Areas	PA census tracts with a poverty rate of > 20% or a non-white population of > 30%	PA Department of Environmental Protection; 2015
Urban and Village Growth	Urban and village growth boundaries in Lancaster County	Lancaster County Planning Commission; 2020
Urban Areas	Polygon boundaries of urban areas based on U.S. Census Bureau maps	Pennsylvania Department of Transportation ; 2020
Places 2040 Character Zones	Character zones reflecting different land use patterns in Lancaster County	Lancaster County GIS; 2020

Implementation

This tab shows layers relevant to implementation at the local scale including existing planning efforts, high-resolution hydrology, protected land, and best management practice (BMP) opportunities. Data sets in the planning efforts subgroup demonstrate where projects have been proposed or implemented, or priority areas for future implementation. The hydrology data sets orient tool users to the water features in Lancaster County, including national data, county data, and complementary high-resolution data sets.

Implementation Layers	Description	Data Source
Pollution Reduction Plan BMPs	Best Management Practices that Lancaster municipalities have committed to implementing to meet Pollution Reduction Plan requirements	Penn State University Agriculture and Environment Center; 2020
Bureau of Recreation and Conservation Grants Awarded	DCNR grant projects funded through the Bureau of Recreation and Conservation between 1995 and 2019	Department of Conservation and Natural Resources, WeConservePA; 2019
Fish & Boat Access Sites	Fishing and boating access areas in public/semi-public areas	PA Fish and Boat Commission; 2020

Tier 1 and Tier 2 Catchments for Stream Delisting	Catchments identified by LCWP as high priority for stream delisting based on stream impairment and monitoring data and partner knowledge	Chesapeake Conservancy; 2020
Hydrology Layers	Description	Data Source
NHD Catchments	2012 National Hydrography Dataset Plus V2 catchment boundaries	U.S. Geological Survey; 2012
Mill Dams	Locations of mill dams	Water Sciences Institute; 2020
Lancaster County Hydro Arcs	Hydrography centerlines for perennial streams and rivers wider than 10 feet	Lancaster County Planning Commission; 2014
Lancaster County Hydro Polys	Hydrography polygons representing all perennial streams, rivers, ponds, lakes and other bodies of water wider than 10 feet	Lancaster County Planning Commission; 2014
Enhanced Flow Paths	A comprehensive water network data set using Lidar-based terrain data and the Conservancy's high resolution land cover	Chesapeake Conservancy; 2016
Concentrated Flow/ Accumulation	Flow accumulation raster representing how water flows and accumulates across the terrain	Chesapeake Conservancy; 2016
Ground Wetness TWI	Topographic Wetness Index (TWI) calculated with Lidar based terrain data	Susquehanna River Basin Commission; 2018
Transportation		
Transportation Improvement Program Projects	Transportation Improvement Program proposed projects for 2021 - 2024	Lancaster Metropolitan Planning Organization; 2020
BMP Opportunity Areas		
Buffer Restoration Opportunity Areas 35'	35 ft. width buffer restoration opportunity areas	Chesapeake Conservancy; 2016
Protected Land		
Conservation Easements	Properties with conservation easements	WeConservePA; 2021
Farmland Preservation Easements	Properties with farmland preservation easements	WeConservePA; 2021
High-Resolution Land Cover	12 classes; 2016 High Resolution Land Cover Data set for the Chesapeake Bay watershed	Chesapeake Conservancy, University of Vermont; 2016

Reference

The following administrative boundaries, watershed boundaries, and water features are available at the bottom of all four tabs of the Collaborative Watershed Mapping Tool to provide additional context for the other layers.

Reference Layers	Description	Data Source
Lancaster County	County boundary and demographic information for the U.S. counties	U.S. Census Bureau; 2018
Municipalities	Boundaries of municipalities and second class townships, boroughs and cities. MS4 information	Pennsylvania Department of Transportation; 2017
HUC 12 Watersheds	NHD Plus High Resolution HUC 10 and HUC 12 Watershed Boundaries PA	U.S. Geological Survey; 2017
NHD Streams	NHD Plus High Resolution Flowlines	U.S. Geological Survey; 2017