Lancaster Clean Water Partners

Collaborative Watershed Mapping Tool
Data Sources and Descriptions

Tool access and video tutorial:
https://lancastercleanwaterpartners.com/collaborative-watershed-mapping-tool/

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 three different tabs and a references section

- 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.
- Water Quality: This tab includes data layers with information on water quality including the index of biological integrity (IBI) and other 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.
- Reference: Administrative boundaries, watershed boundaries, and water features are available at the bottom of the tabs of the Collaborative Watershed Mapping Tool to provide additional context for the other layers.

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 the restoration projects will result in significant water quality benefits on-the-ground.

Implementation

This tab shows layers at the local scale including existing planning efforts, high resolution hydrology, protected and conserved land, and best management practice 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 provides tool users with the water features in Lancaster County, including national data, county data, and complementary high-resolution data sets.

The mapping unit displayed in the prioritization layers 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.

Layer	Description	Data Source
Planning Efforts		
Partner Inventory	Partner inventory and organization types working in Lancaster County	Penn State University Agriculture and Environment Center; 2021 Updated by Chesapeake Conservancy 2023
Pollution Reduction Plan Best Management Practices	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 2023	PA Department of Conservation and Natural Resources; WeConservePA 2023
Fish and Boat Access Sites	Fishing and boating access areas in public/semi-public areas	PA Fish and Boat Commission; 2022
Rapid Stream Delisting Catchments	Catchments identified by LCWP as high priority for stream delisting based on stream impairment, monitoring data, and partner knowledge	Chesapeake Conservancy; 2023
Hydrology		
NHD Catchments	2012 National Hydrography Dataset Plus V2 catchment boundaries	U.S. Geological Survey; 2012
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,	Lancaster County Planning Commission; 2014

	lakes and other bodies of water wider than 10 feet	
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
BMP Opportunity Areas		
Buffer Restoration Opportunity Areas 35’	35 ft. width buffer restoration opportunity areas	Chesapeake Conservancy; 2023
Transportation		
Transportation Improvement Program Projects 2021 - 2024	Transportation Improvement Program proposed projects for 2021 - 2024	Lancaster Metropolitan Planning Organization; 2020
Protected Land		
Conservation Easements	Properties with conservation easements	WeConservePA; 2023
Farmland Preservation Easements	Properties with farmland preservation easements	WeConservePA; 2023
Land Cover/Use		
High Resolution Land Use	18 classes; 2017/2018 High Resolution Land Cover Dataset for the Chesapeake Bay watershed	Chesapeake Conservancy; 2022
High Resolution Land Cover	13 classes; 2017/2018 High Resolution Land Cover Dataset for the Chesapeake Bay watershed	Chesapeake Conservancy; 2022
Prioritization		
Priority Watersheds	Catchment summaries aggregated to subwatersheds	Chesapeake Conservancy; 2019
Priority HUC12 Watersheds	Catchment summaries aggregated to HUC 12 watersheds	Chesapeake Conservancy; NHD Plus HR, USGS; 2019
Priority Catchments	Catchment summaries of the metrics below. Higher opportunity score indicates higher priority (darker color)	Chesapeake Conservancy; 2019
Stream Length per Parcel	Average stream length per parcel (fewer -> more miles of stream frontage per parcel)	Parcels, Lancaster County GIS; NHD Plus HR, USGS; 2019
Stream Bank Volume Loss	Estimated potential for stream bank volume loss. (Lower → Higher	Water Sciences Institute; 2019

	erosion potential)	
Buffer Restoration Opportunity Area	Acreages of buffer restoration opportunities (Lower → Higher Acreage)	Chesapeake Conservancy; 2019
Growing Greener Watershed Renaissance Initiative	Watershed geographies eligible for the Growing Greener Watershed Renaissance Initiative	PA Department of Environmental Protection; 2023
Disadvantaged Communities within MEBs	Disadvantaged communities will be identified based on demographic metrics from the American Community Survey.	U.S. Environmental Protection Agency; 2022
Agricultural Areas within MEBs	Agricultural areas that are located within watersheds in the Bay geography with excess nitrogen loads.	U.S. Environmental Protection Agency; 2022
Most Effective Basins	Areas in the Chesapeake Bay Watershed that are identified as the most effective for nitrogen reduction per EPA.	U.S. Environmental Protection Agency; 2022
HUC12 Hotspot Map Bank Erosion	Ranked HUC12 watersheds in Lancaster for bank erosion	Water Sciences Institute; 2024
Valley Bottom Heatmap Bank Erosion Wide	Heatmap showing stream corridors with the highest bank erosion rates per length of stream - wide grid size	Water Sciences Institute; 2024
Valley Bottom Heatmap Bank Erosion Narrow	Heatmap showing stream corridors with the highest bank erosion rates per length of stream - narrow grid size	Water Sciences Institute; 2024
Terraces Legacy Sediment	Locations where legacy sediment has deposited	Water Sciences Institute; 2024
Bank Erosion Polygons	Shows stream bank retreat and volume loss as suspended sediments	Water Sciences Institute; 2024
Historic Mill Dams	Location of historic mill dams	Water Sciences Institute; 2024
2018 Prioritization Data		
Nitrogen Loading (CAST)	Modeled edge-of-stream nitrogen loading rates (Lower → Higher loading rates)	HUC12 CAST estimates, Drexel University ANS; 2019
Phosphorus Loading (CAST)	Modeled edge-of-stream phosphorus loading rates (Lower → Higher loading rates)	HUC12 CAST estimates, Drexel University ANS; 2019
Sediment Loading (CAST)	Modeled edge-of-stream sediment loading rates (Lower → Higher loading rates)	HUC12 CAST estimates, Drexel University ANS; 2019

Water Quality

The datasets in the Water Quality tab indicate the water quality in Lancaster County, using a variety of indicators including water chemistry and macroinvertebrate data.

Layer	Description	Data Source
Water Quality		
IBI Scores - PADEP	Index of biological integrity (macroinvertebrate survey data)	PA Department of Environmental Protection; 2023
IBI Scores - SRBC	Index of biological integrity (macroinvertebrate survey data)	Susquehanna River Basin Commission; 2018 - 2021
Water Quality Data Lancaster County Volunteer	Water Quality Monitoring Data	Lancaster County Water Quality Volunteer Coalition; 2017-2020
Water Quality Data SRBC	Water Chemistry Data	Susquehanna River Basin Commission; 2018-2021
Water Quality - CS Datum	Water Quality data and monitoring station points from CS Datum	CS Davidson; 2023
Water Quality - Lititz Run	Monitoring data of Lititz Run stream	Warwick Township; 2020

Policy

The datasets 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.

Layer	Description	Data Source
Policy		

Exceptional Value/High Quality Streams	Streams Chapter 93 Designated Use	PA Department of Environmental Protection; 2023
Impaired Streams for Aquatic Life	Integrated List Non-Attaining for Aquatic Life	PA Department of Environmental Protection; 2023
Trout Streams	Streams that support wild trout fishery	PA Fish and Boat Commission; 2023
Flood Hazard Areas	National Flood Hazard Layer data indicating areas with high flood risk	Federal Emergency Management Agency; 2021
State Gamelands	Boundaries of the Pennsylvania State Game Lands for the management of public resources	PA Game Commission; 2023
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
Disadvantaged tracts from Climate and Economic Justice Screening Tool	Tracts are considered disadvantaged because it meets more than 1 burden threshold AND the associated socioeconomic threshold	PA Department of Environmental Protection; 2023
Urban and Village Growth	Urban and village growth boundaries in Lancaster County	Lancaster County Planning Commission; 2022
Urban Areas	Polygon boundaries of urban areas based on U.S. Census Bureau maps	PA Department of Transportation; 2023
Places 2040 Character Zones	Character zones reflecting different land use patterns in Lancaster County	Lancaster County GIS; 2020
State House Boundaries	State House boundaries within Pennsylvania	PA Department of Transportation; 2023
U.S. Congressional Boundaries	United States Congressional boundaries within Pennsylvania	PA Department of Transportation; 2023

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.

Layer	Description	Data Source
Lancaster County	County boundary and demographic information for the U.S. counties	U.S. Census Bureau; 2022
Municipalities	Boundaries of municipalities and second class townships, boroughs	PA Department of Transportation; 2023

	and cities	
HUC12 Watersheds	NHD Plus High Resolution HUC 12 Watershed Boundaries PA	U.S. Geological Survey; 2021 WeConservePA; 2023
NHD Streams	NHD Plus High Resolution Flowlines	U.S. Geological Survey; 2017 WeConservePA; 2023
MS4 Municipalities	Municipalities under MS4 requirements	PA Department of Environmental Protection; 2012
Parcels	Parcel boundaries for Lancaster County	Lancaster County Assessment Office; 2023