Delaware Flood Planning Tool

Users' Guide

Department of Natural Resources
and Environmental Control
89 Kings Hwy
Dover, DE 19901
dnrec.delaware.gov

Table of Contents

Overview

The Delaware Department of Natural Resources and Environmental Control (DNREC) Flood Planning Tool is an interactive web map application. This tool is designed to aid you in researching your flood risk in the State of Delaware. It is intended to provide floodplain managers, insurance agents, developers, real estate agents, engineers, surveyors, local planners and citizens with an effective means by which to make informed decisions about the degree of flood risk for a specific area or property. Map features are connected to geospatial databases that may be queried by users in order to obtain pertinent information that may otherwise be difficult to obtain or relate to specific geographic locations, such as the Advisory Flood Height (AFH) for flood Zone A and downloadable HEC-RAS models.

The online tool is for use in administering the National Flood Insurance Program (NFIP). It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. To obtain more detailed information in areas where Base Flood Elevations have been determined, users are encouraged to consult the latest flood profile data contained in the official FEMA Flood Insurance Study (FIS). These studies are available online at www.msc.fema.gov.

What can I do with the Tool?

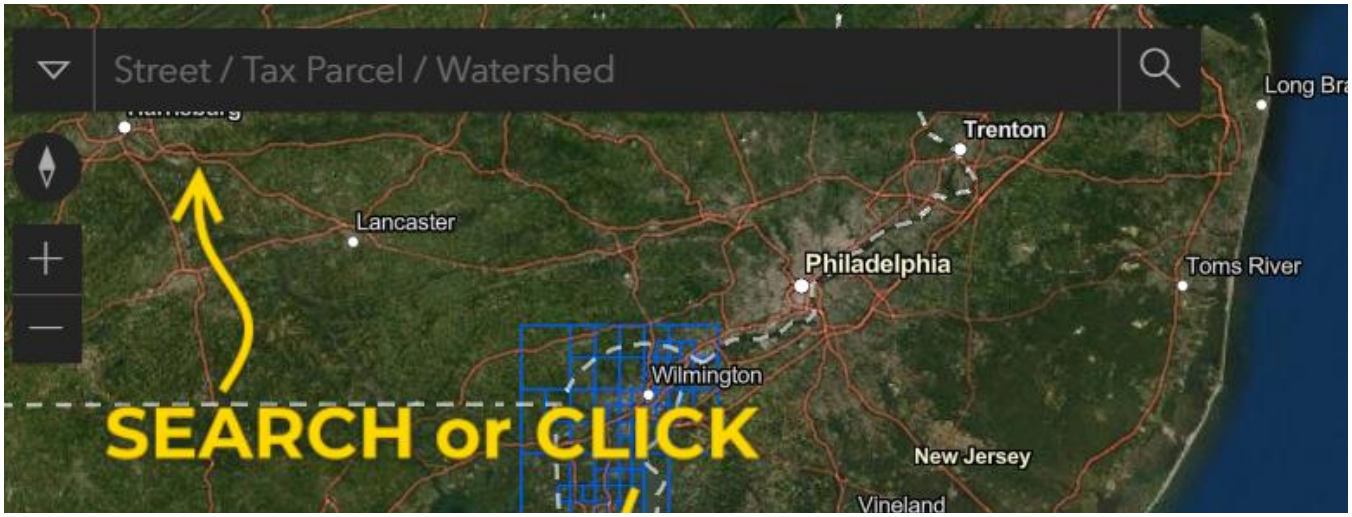
- View FEMA floodplain mapping
- View topographic contours
- Click to obtain info about a location
- Obtain Advisory Flood Height
- Download hydraulic models
- View preliminary floodplain mapping where available
- Make a printable map
- View areas prone to sea level rise

Disclaimer

The Delaware Flood Planning Tool is for reference only within the State of Delaware boundaries. The user of this information understands and acknowledges that the data may be inaccurate or contain errors or omissions and the user assumes full responsibility for any risks or damages resulting from any use of or reliance upon this data. Delaware DNREC does not guarantee the accuracy or reliability of the data generated from this service.

Getting Started

- Locate a property by zooming, panning, and clicking on the location of interest or by entering an address or tax parcel number into the Search box on the top of the screen. A clickable list of matching addresses and tax parcels will appear. Type in a watershed name or HUC10 number to view a watershed. Note that watershed mapping is provided only at the HUC10 level.



- Click a location on the map to display a results box for that location. Summary results will be displayed in the results box. The message at the top of the results box indicates whether the point location clicked is within the FEMA 100-year floodplain. Additional results can be displayed by clicking the “More Details” link at the bottom of the results box.

- Some layers will not appear until you are zoomed in to a certain scale.
- The Results box also includes a Print button. Clicking this button produces a printable map with floodplain mapping results and a legend.

- The initial layers displayed represent the FEMA Floodplain Map and include the Base Flood Elevation, FIRM panel, and floodplain mapping. Additional layers can be displayed by clicking on the layer icon () on the left panel and clicking on the box next to the layers to be displayed.

- The initial basemap displayed is Imagery Hybrid (aerial imagery). A different basemap can be displayed by clicking on the second icon () on the right side of the screen.
- A distance measurement tool is available by clicking the third icon () on the right side of the screen.
- A legend can be displayed by clicking on the bottommost icon () on the right side of the screen.

Advanced features

- Cross section and transect layers can be viewed by turning the layers on under the FEMA Flood Map heading. These layers display the cross sections and transects that are associated with the engineering models used to generate the floodplain mapping. Information about lettered cross sections and numbered transects is available from the Flood Insurance Study which can be downloaded from FEMA's Map Service Center (https://msc.fema.gov).
- Hydraulic models (HEC-RAS) are available for some streams. Turn on the Hydraulic Model Stream Centerlines layer to display stream segments for which hydraulic models are available. Models can be downloaded by clicking on the stream centerline of interest. This brings up the results box, and a model download link is displayed by clicking More Details.
- The LOMA layer displays LOMA point locations along with the LOMA case number and effective date. LOMA documents can be viewed at the FEMA Map Service Center (https://msc.fema.gov).
- In areas where the FEMA floodplain map has been changed via a LOMR, the area affected is shown by turning on the LOMR layer. Also displayed are the LOMR case number and effective date.

How to use preliminary data

Preliminary floodplain maps can be displayed, when available, by clicking the Preliminary FEMA Flood Maps layer. For FEMA guidance on use of draft or preliminary FIS data use the following link: https://www.fema.gov/view-your-communitys-preliminary-flood-hazard-data

Understanding your flood risk using the Delaware Flood Planning Tool

The Delaware Flood Planning Tool contains several components that provide useful information about flood risk at a property.

FEMA flood mapping.The FEMA flood map layers are from FEMA's Flood Insurance Rate Maps (FIRMs). The 1-percent-annual-chance floodplain (also known as the 100-year

floodplain) is delineated. Properties located within the 1-percent-annual-chance floodplain have a 1% or greater chance of being flooded in any year. This equates to a 26% or greater chance of flooding over the life of a 30-year mortgage. Homes with a federally backed mortgage situated within the 1-percent-annual-chance floodplain are subject to a mandatory flood insurance purchase requirement. The 0.2-percent-annual-chance floodplain (also known as the 500-year floodplain) is also delineated for some floodplains.

For zone AE and VE floodplains, a Base Flood Elevation is displayed. This is the estimated elevation that floodwaters would reach during a 1-percent-annual chance flood. In coastal areas the Limit of Moderate Wave Action (LiMWA) is delineated. This is the inland limit of the area expected to receive 1.5-foot or greater breaking waves during the 1-percent-annual-chance flood event. Property owners should consider incorporating coastal construction standards for homes situated within the LiMWA.

For some Zone A floodplains, an Advisory Flood Height is available by clicking on a map location and reviewing the results pane. Zone A floodplains are mapped using approximate methods and Base Flood Elevations are not available. The Advisory Flood Height serves as an approximation of the 100-year flood elevation for Zone A areas.

Elevation Contours. Elevation contours provide information about the ground surface elevation. Ground elevation can be compared to the Base Flood Elevation or Advisory Flood Height to understand how far above or below the estimated 100-year flood height a property lies.

Sea level rise. Sea level rise mapping provides a piece of information about future flood risk. The sea level rise mapping is provided as Mean Higher High Water (MHHW) and as 1-foot elevation increments above MHHW. Properties mapped within the sea level rise zones are at increasing risk from high tide and coastal flooding. For more information about sea level rise in Delaware, including sea level rise projections, visit DNREC's Adapting to Sea Level Rise webpage at the following link:

https://dnrec.alpha.delaware.gov/coastal-programs/planning-training/adapting-to-sea-level-rise/

Floodplain mapping provides a view of flood risk but is limited in its scope. Floodplain mapping represents flood risk at the time of model development and does not reflect changes in climate or land use that may have occurred after the modeling was complete. A floodplain is not delineated for many small streams and waterbodies. Areas subject to flooding associated with insufficient drainage may also be shown outside of the mapped floodplain. The 100-year and 500-year floodplain boundaries are delineated. Properties situated closer to the flood source within the 100-year floodplain may be subject to more frequent flooding. Additionally, properties situated outside of the 100-year or 500-year floodplain also have some level of flood risk. Flood risk at an individual property is also dependent upon structural characteristics of the home. Factors such as the home's elevation, presence or absence of a basement, and flood vents or floodproofing features impact flood risk.

Contacts

For more information about floodplain mapping or flood risk in Delaware, please contact Gina Tonn at Gina.Tonn@delaware.gov or 302-739-9921.

A list of floodplain management contacts for Delaware communities is available by clicking on the Help icon (). Use these contacts for questions about floodplain management in a specific Delaware community.

Glossary

1-percent-annual-chance flood – The flood event that has a 1% chance of occurring each year. Also called the Base Flood or the 100-year flood.

Advisory Flood Height (AFH) - Advisory Flood Height represents the elevation of the surface of the 1-percent-annual-chance or regulatory flood in Zone A (approximate study) modeled areas. The AFH value for a given location serves as a surrogate base flood elevation (BFE) when the latter is not available. AFH data are subject to limitations such as: no hydraulic structures (bridges/culverts/dams) are considered, no reservoir routing/attenuation of flood discharges are incorporated, and no channel survey data are included. Therefore, AFHs may be inaccurate in proximity to a culvert, bridge or other stream crossing. Also, if the site is close to the confluence with a larger stream check the AFH or BFE on the larger stream to see if the site is within the backwater of the 1-percent-annual-chance flood elevation of that larger stream.

Base Flood Elevation - The elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year.

Effective – Effective floodplain maps are the maps currently recognized by FEMA, the maps that are currently in-effect.

Elevation contours – Topographic contour lines displaying the ground surface elevation. Topographic contour lines in the Flood Tool are from FirstMap (https://firstmap.gis.delaware.gov). Contours are indexed at 5-foot intervals and classified as “Normal” or “Depression”. Contours are projected in Delaware State Plane NAD83 (2011) meters and the vertical datum of the source DEM is NAVD88.

Federal Emergency Management Agency (FEMA) – FEMA is an agency of the U.S. Department of Homeland Security.

Flood Insurance Rate Map (FIRM) – FEMA floodplain map displaying floodplain boundaries developed for flood insurance rating purposes. A FIRM is the official map of a community on which FEMA has delineated the Special Flood Hazard Areas (SFHAs), the Base Flood Elevations (BFEs) and the risk premium zones applicable to the community.

Flood Insurance Study (FIS) - A compilation and presentation of flood risk data for specific watercourses, lakes, and coastal flood hazard areas within a community. When a flood study is completed for the NFIP, the information and maps are assembled into an FIS. The FIS report contains detailed flood elevation data in flood profiles and data tables.

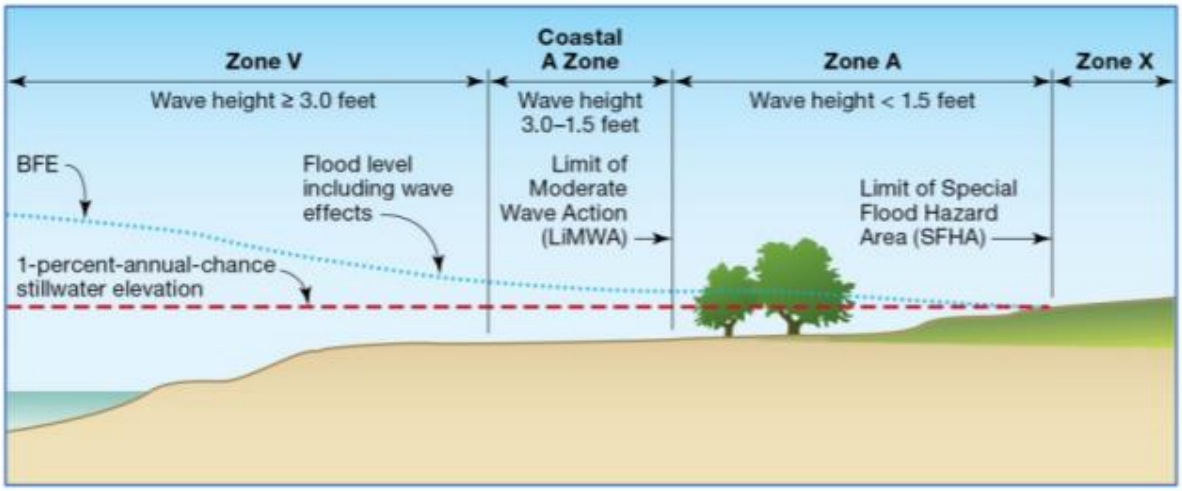
Floodplain – Any area of land subject to inundation by flood waters from any source.

Floodway - A "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations.

Letter of Map Amendment (LOMA) – A LOMA is an official amendment, by letter, to an effective NFIP map. A LOMA establishes a property's location in relation to the Special Flood Hazard Area. LOMAs are usually issued because a property has been inadvertently mapped as being in the floodplain but is actually on natural high ground above the Base Flood Elevation.

Letter of Map Revision (LOMR) - A Letter of Map Revision is FEMA's modification to an effective Flood Insurance Rate Map (FIRM). Letter of Map Revisions are generally based on the implementation of physical measures that affect the hydrologic or hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodway, the effective Base Flood Elevations (BFEs), or the Special Flood Hazard Area (SFHA).

Limit of Moderate Wave Action (LiMWA) the inland limit of the area expected to receive 1.5-foot or greater breaking waves during the 1-percent annual chance flood event



National Flood Insurance Program (NFIP) - The NFIP is a program that makes federally-backed flood insurance available in those states and communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage.

Preliminary – Preliminary floodplain maps are not currently in-effect and are provided for review and guidance purposes. Preliminary maps are not final and are subject to change. Preliminary mapping is provided so that the public can get an early look at the mapping prior to a pending change in the mapping.

Special Flood Hazard Area (SFHA) - An area having special flood, mudflow or flood-related erosion hazards and shown on a Flood Hazard Boundary Map (FHBM) or a Flood Insurance

Rate Map (FIRM) Zone A, AO, A1-A30, AE, A99, AH, AR, AR/A, AR/AE, AR/AH, AR/AO, AR/A1-A30, V1-V30, VE or V. The SFHA is the area where the National Flood Insurance Program's floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies.

Zone A - Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Zone AE - Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

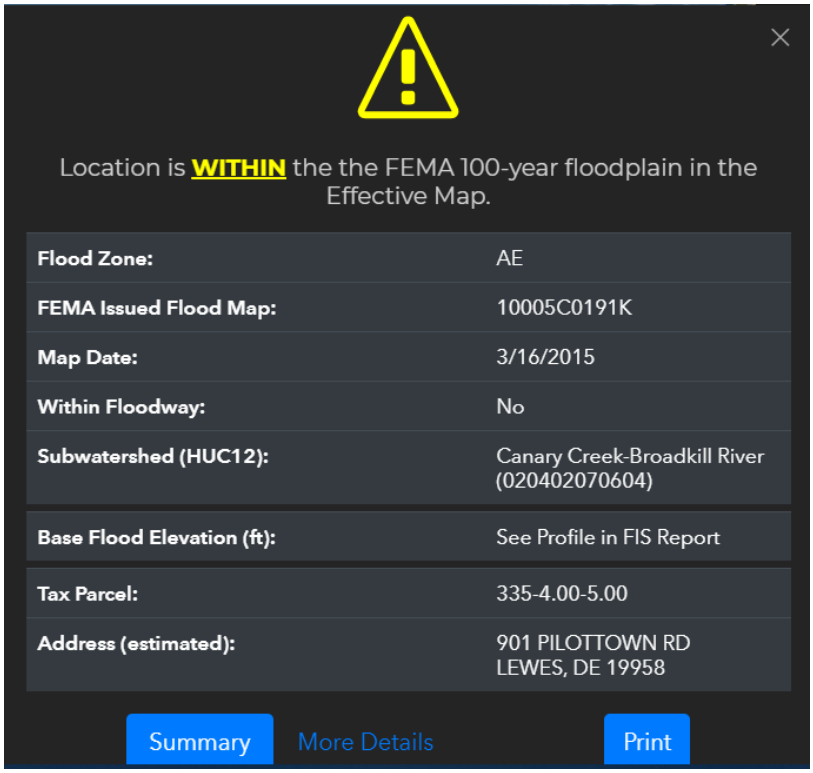
Zone AO - Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply. Some Zone AO have been designated in areas with high flood velocities such as alluvial fans and washes. Communities are encouraged to adopt more restrictive requirements for these areas.

Zone VE - Areas subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

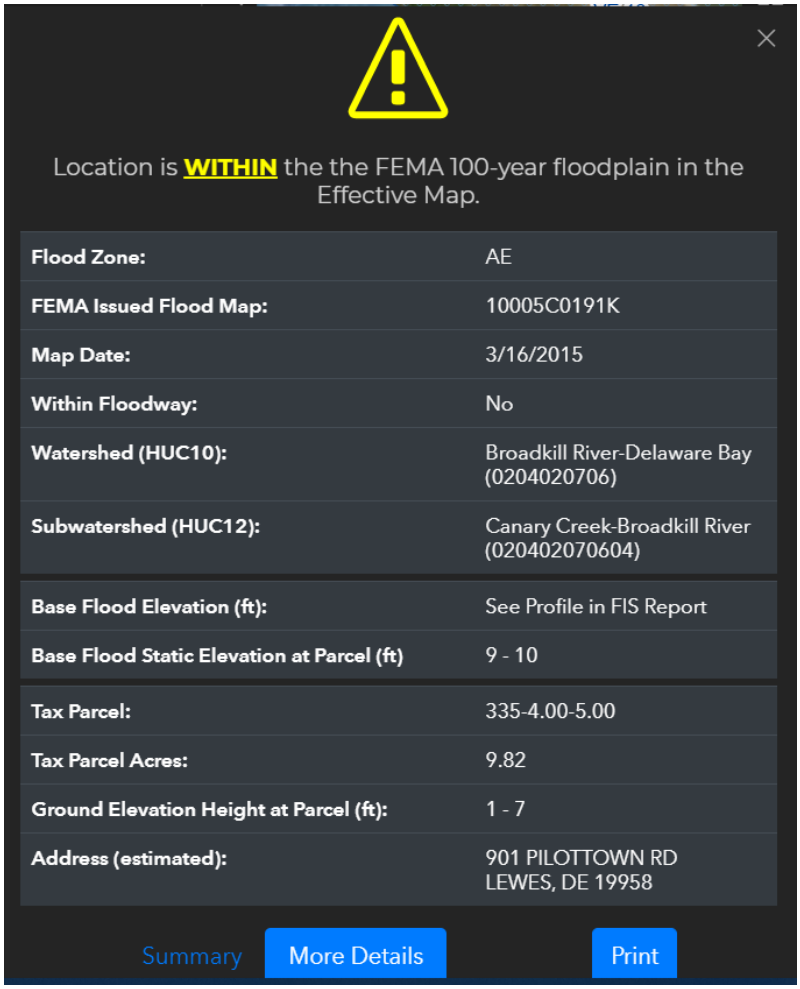
Zone X – An area which falls outside of the Special Flood Hazard Area. Some Zone X areas are shaded and represent the 0.2-percent-annual chance (500-year floodplain).

Results

When a location on the map is clicked, a results box will appear. The message on the top of the results box indicates whether or not the location that was clicked is situated within the 100-year floodplain. Results displayed are for the point location that was clicked. Note that a different point on the same property may have different results, including a different flood zone.



Click on “More Details” to show additional results. In the more detailed results box, the top half displays results specific to the point location clicked. The bottom half of the box displays results for the tax parcel. If available, hydraulic model information is displayed at the bottom of the box.

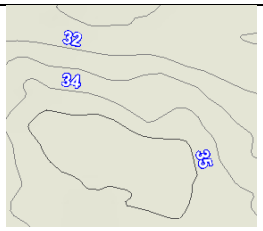
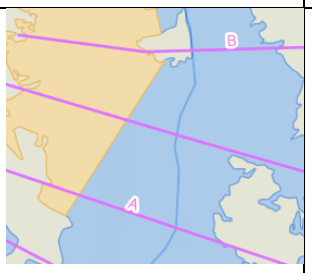

Location is WITHIN the the FEMA 100-year floodplain in the Effective Map.
Flood Zone: AE
FEMA Issued Flood Map: 10005C0191K
Map Date: 3/16/2015
Within Floodway: No
Watershed (HUC10): Broadkill River-Delaware Bay (0204020706)
Subwatershed (HUC12): Canary Creek-Broadkill River (020402070604)
Base Flood Elevation (ft): See Profile in FIS Report
Base Flood Static Elevation at Parcel (ft) 9 - 10
Tax Parcel: 335-4.00-5.00
Tax Parcel Acres: 9.82
Ground Elevation Height at Parcel (ft): 1 - 7
Address (estimated): 901 PILOTTOWN RD LEWES, DE 19958
Summary
More Details
Print

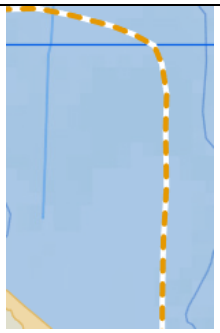
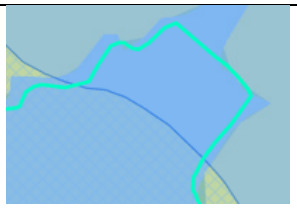
FEMA floodplain mapping flood zone descriptions

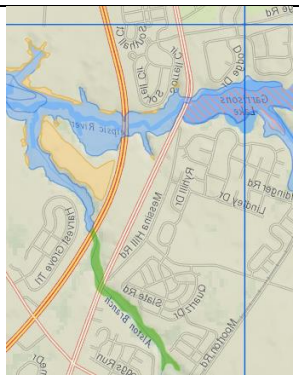
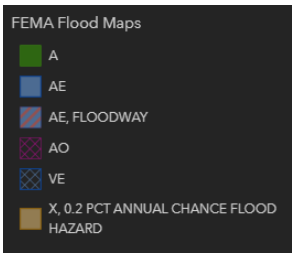
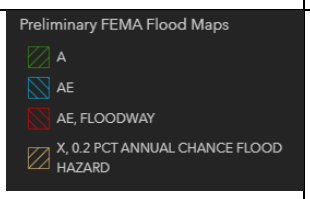
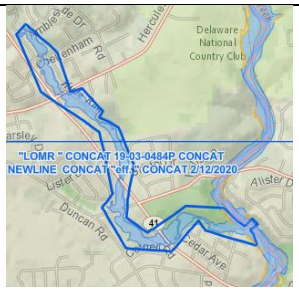
FEMA flood zone	Description
A	Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.
AE	Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.
AE, FLOODWAY	A "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations.
AO	Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply. Some Zone AO have been designated in areas with high flood velocities such as alluvial fans and washes. Communities are encouraged to adopt more restrictive requirements for these areas.
VE	Areas subject to inundation by the 1-percent-annual chance flood event with additional hazards due to storm-induced velocity wave action. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.
X, 0.2 PCT ANNUAL CHANCE FLOOD HAZARD	Some Zone X areas are shaded and represent the 0.2-percent-annual-chance (500-year floodplain).
X	An area which falls outside of the Special Flood Hazard Area.

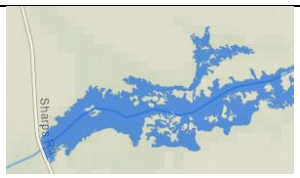
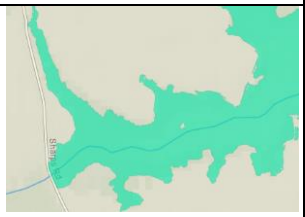
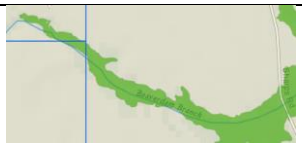
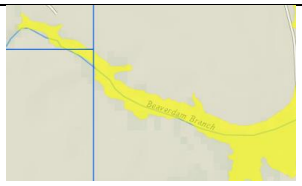
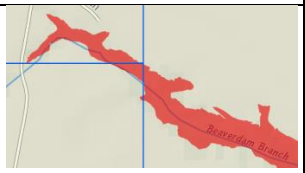
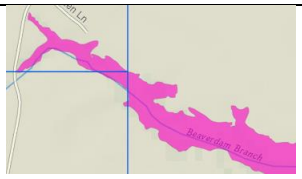
Layers

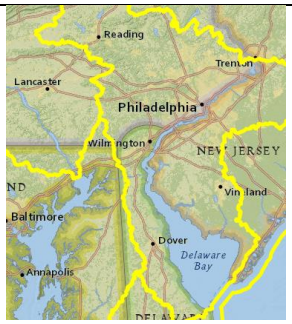
The following layers are available in the Delaware Flood Planning Tool. To change the layers that are displayed, click on the layers button ( ) and click the checkboxes next to the layer names to turn layers on or off. A legend can be displayed by clicking the button on the right side of the screen. The legend lists the layers that are currently displayed along with their symbols.

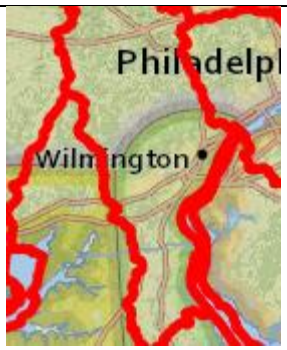
Layer	Description	Symbology	Data Source
Contours	Topographic elevation contours Topographic contours represent the ground elevation. The 1-foot topographic contours are derived from aerial digital elevation modeling. Contours are labeled with the elevation which is provided in the NAVD88 datum.		FirstMap Elevation Contours for Delaware derived from 2014 LIDAR Digital Elevation Model
FEMA Flood Map Layers			
Base Flood Elevation	The Base Flood Elevation (BFE) is the elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in a given year. The BFE is displayed for zones AE, AH, AO, and VE. BFE values are displayed rounded to the nearest foot and the Flood Insurance Study (FIS) should be consulted when a precise BFE value is required.		FEMA DFIRM database NAVD88 datum
Transect	A surveyed cross section taken perpendicular to the shoreline to represent a segment of coast with similar characteristics. Transect data is used when performing overland wave modeling and mapping for a coastal flood study.		FEMA DFIRM database
Cross Sections	Cross sections of riverine flooding sources are taken by surveyors and engineers to gather information about the size and geometry of the stream channel, bridges and culverts along the stream, and the elevation of the ground. This information is used to accurately model the flood hazards for the stream. Cross sections are shown on the FIRM and tabular cross section information is		FEMA DFIRM database

	provided in the Flood Insurance Study (FIS) report.		
LiMWA	The LiMWA depicts the limit of the Area of Moderate Wave Action, the portion of the 1-percent-annual-chance coastal flood hazard area referenced by building codes and standards, where base flood wave heights are between 1.5 and 3 feet, and where wave characteristics are deemed sufficient to damage many National Flood Insurance Program (NFIP)-compliant structures on shallow or solid wall foundations.		FEMA DFIRM database
FIRM Panel	The FIRM panel layer displays the boundary of each FEMA physical map panel. The map panel number and date are provided in the results box.		FEMA DFIRM database
CRBS	The Coastal Barrier Resources Act (CBRA) established the John H. Chafee Coastal Barrier Resources System (CBRS), a defined set of geographic units along the Atlantic, Gulf of Mexico, Great Lakes, U.S. Virgin Islands, and Puerto Rico coasts. Most new Federal expenditures and financial assistance (including flood insurance) are prohibited within the CBRS, with some exceptions. The U.S. Fish and Wildlife Service is responsible for administering CBRA. CBRS boundaries shown on FEMA mapping products are for informational purposes only. For the best available CBRS boundary data, visit: http://www.fws.gov/cbra/Maps/Mapper.html. For additional information on the CBRA and the CBRS, visit: http://www.fws.gov/cbra.		FEMA DFIRM database
Hydraulic Model Centerline Segments	The hydraulic model centerline segments represent the length of stream associated with the hydraulic models that are available for download from the results box.		Extracted from hydraulic models

FEMA Flood Maps	This layer displays the floodplain boundaries for each flood zone.	 	FEMA DFIRM database
Preliminary FEMA Flood Maps	This layer displays preliminary floodplain boundaries and is available only when mapping changes are pending.		DNREC and/or FEMA preliminary data
LOMA	An official amendment, by letter, to an effective FIRM. A LOMA establishes a property's location in relation to the Special Flood Hazard Area. LOMAs are usually issued because a property has been inadvertently mapped as being in the floodplain due to map scale limitations but is actually on natural high ground above the Base Flood Elevation.		National Flood Hazard Layer (NFHL) map server
LOMR	An official revision, by letter, to an effective FIRM and sometimes the accompanying Flood Insurance Study (FIS) report. A LOMR may change flood zones, flood zone boundaries, Base Flood Elevations (BFEs), or other map features. The LOMR is accompanied by an annotated copy of the affected portions of the FIRM and FIS report.		FEMA DFIRM database
Sea Level Rise	An increase in sea level caused by a change in the volume of the world's oceans due to temperature increase, deglaciation (uncovering of glaciated land because of melting of the glacier), and ice melt. https://www.dgs.udel.edu/projects/coastal-inundation-maps-delaware		

MHHW	Mean higher high water (MHHW) – a site-specific datum determined by averaging the highest of the two high tides that occur each day over a 19-year tidal period.		DNREC/DGS coastal inundation mapping
MHHW + 1 ft	MHHW plus one foot of elevation		DNREC/DGS coastal inundation mapping
MHHW + 2 ft	MHHW plus two feet of elevation		DNREC/DGS coastal inundation mapping
MHHW + 3 ft	MHHW plus three feet of elevation		DNREC/DGS coastal inundation mapping
MHHW + 4 ft	MHHW plus four feet of elevation		DNREC/DGS coastal inundation mapping
MHHW + 5 ft	MHHW plus five feet of elevation		DNREC/DGS coastal inundation mapping
MHHW + 6 ft	MHHW plus six feet of elevation		DNREC/DGS coastal inundation mapping
MHHW + 7 ft	MHHW plus seven feet of elevation		DNREC/DGS coastal inundation mapping

Tax Parcels	Property boundaries		FirstMap Delaware State Parcels
Watersheds	Watersheds are delineated by the U.S. Geological Survey (USGS) using a nationwide system based on surface hydrologic features. This system divides the country into 21 regions (2-digit), 222 subregions (4-digit), 370 basins (6-digit), 2,270 subbasins (8-digit), ~20,000 watersheds (10-digit), and ~100,000 subwatersheds (12-digit). A hierarchical hydrologic unit code (HUC) consisting of 2 additional digits for each level in the hydrologic unit system is used to identify any hydrologic area		
HUC 2	Regional level HUC boundary		FirstMap HUC2
HUC 4	Subregional level HUC boundary		FirstMap HUC4
HUC 6	Basin level HUC boundary		FirstMap HUC6

HUC 8	Subbasin level HUC boundary		FirstMap HUC8
HUC 10	Watershed level HUC boundary		FirstMap HUC10
HUC 12	Subwatershed level HUC boundary		FirstMap HUC12