pennsylvania
DEPARTMENT OF TRANSPORTATION

PHASE1

PENNDOT EXTREME WEATHER VULNERABILITY STUDY

APPENDIX C

PROJECT STUDY MAPPING AND DATA FILES

Study Prepared By:

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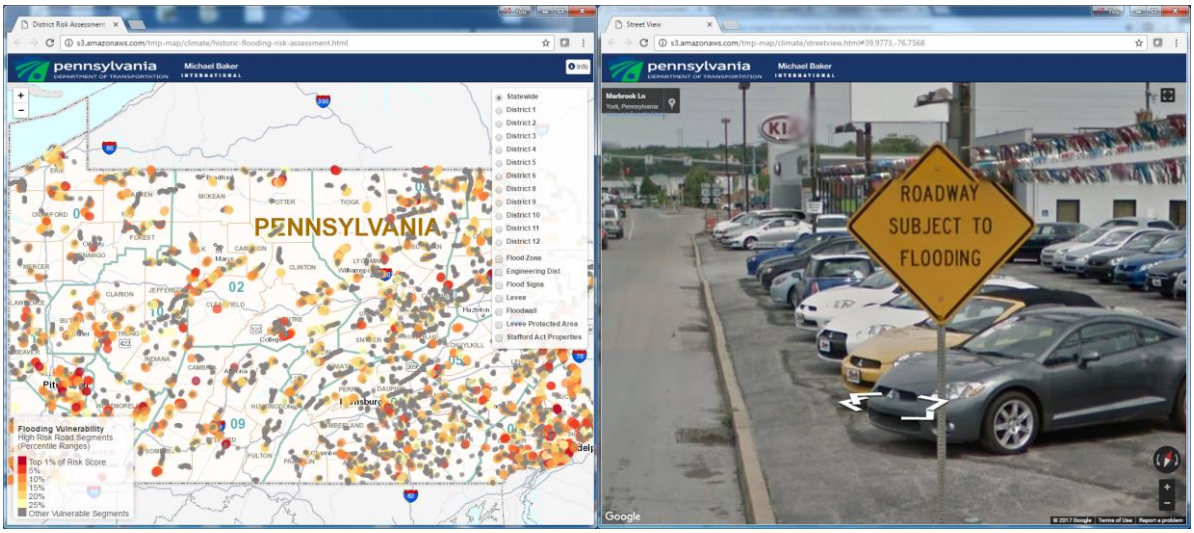
INTERNATIONAL

DRAFT VERSION - JANUARY 2017



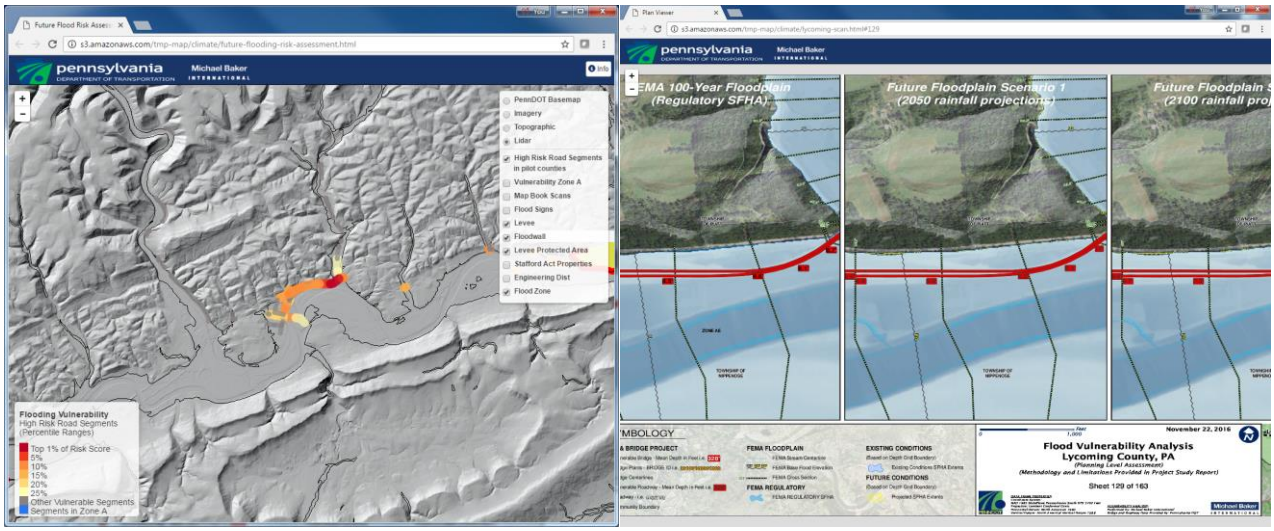
historic-flooding-risk-assessment.html

This map provides an assessment of the existing vulnerabilities identified through PennDOT's Road Conditions Reporting System (RCRS) and other stakeholder outreach comments. The risk scoring is presented Statewide and also recalculated per individual Engineering District. Selecting the District number will zoom to the extent of the District boundary and thematically color the identified segments based upon the risk score calculations. Additional data overlays available include Flood Zones, Engineering District boundaries, "Roadway Subject To Flooding" signs extracted from PennDOT's sign inventory database, Levees, Floodwalls and Stafford Act properties from the US Army Corps of Engineers database.

The risk scoring process is described in further detail in the Risk-Assessment-and-Prioritization-PA-Extreme-Weather-Vulnerability-Study.pdf (1 MB). Additionally, the Vulnerability-Risk-Scoring-Sheet-12-12-16.xlsm (4.8 MB) worksheet is provided that allows for testing of alternative weighting schemes. The existing map is based on the default values provided in this spreadsheet.

A zipped .shp file of the assessment results is available for download.

(2.1 MB) historic-high-risk-segments.zip



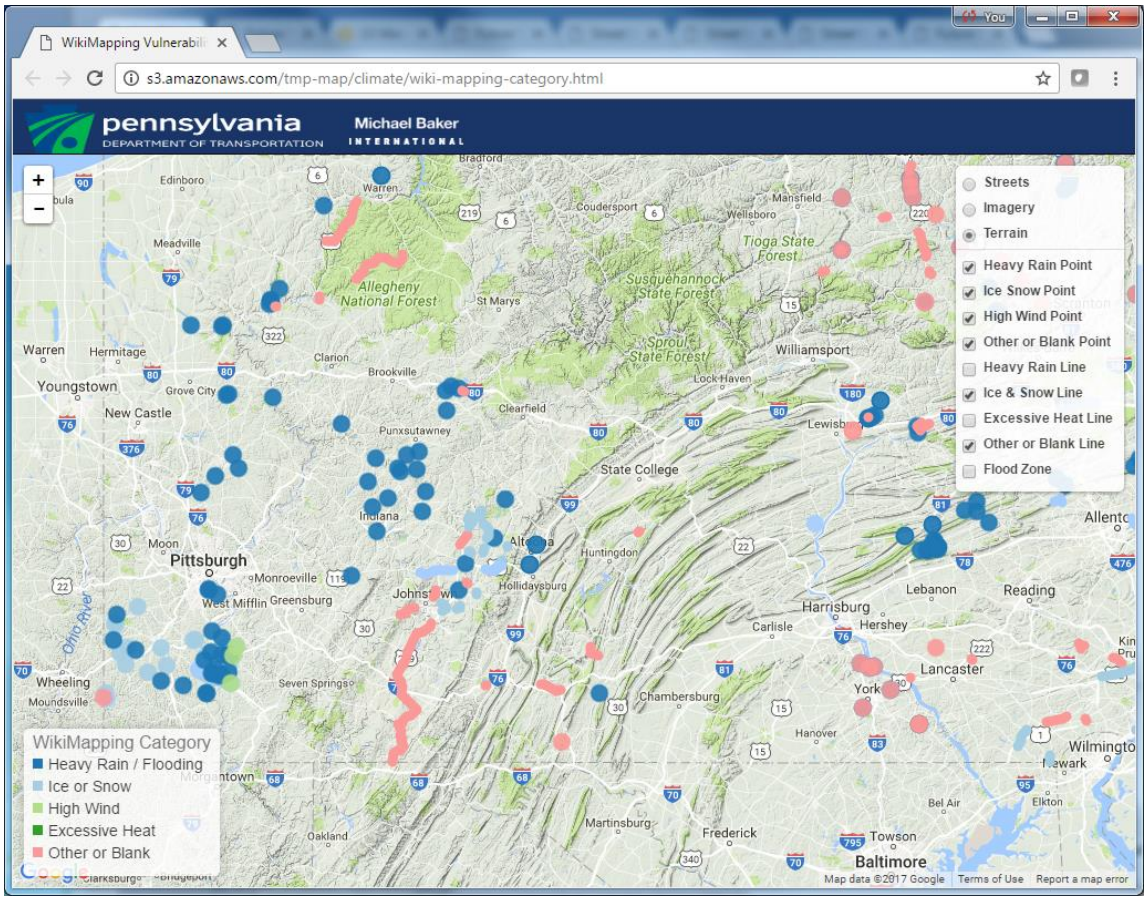
[future-flooding-risk-assessment.html]

The Future Flooding Risk Assessment map predicts future flooding scenarios for three selected pilot counties. The pilot counties include Allegheny, Delaware and Lycoming. A detailed explanation of the future forecasting methodology is available in Appendix D, *Methodology for Forecasting Flooding Vulnerabilities*. For each pilot county a series of Mapbook .pdf's are available, they are included in appendix E of this report. Additionally, the Mapbook results are available as an overlay in the web mapping. The layer "Map Book Scans" contains the bounding box polygon of each individual sheet, clicking on the polygon will display a link to the individual Mapbook page.

A zipped .shp file of the future flooding results and Zone A segments are available for download.

(372 KB) future-high-risk-segments.zip

(54 KB) zone-a-road-segments.zip



wiki-mapping-category.html

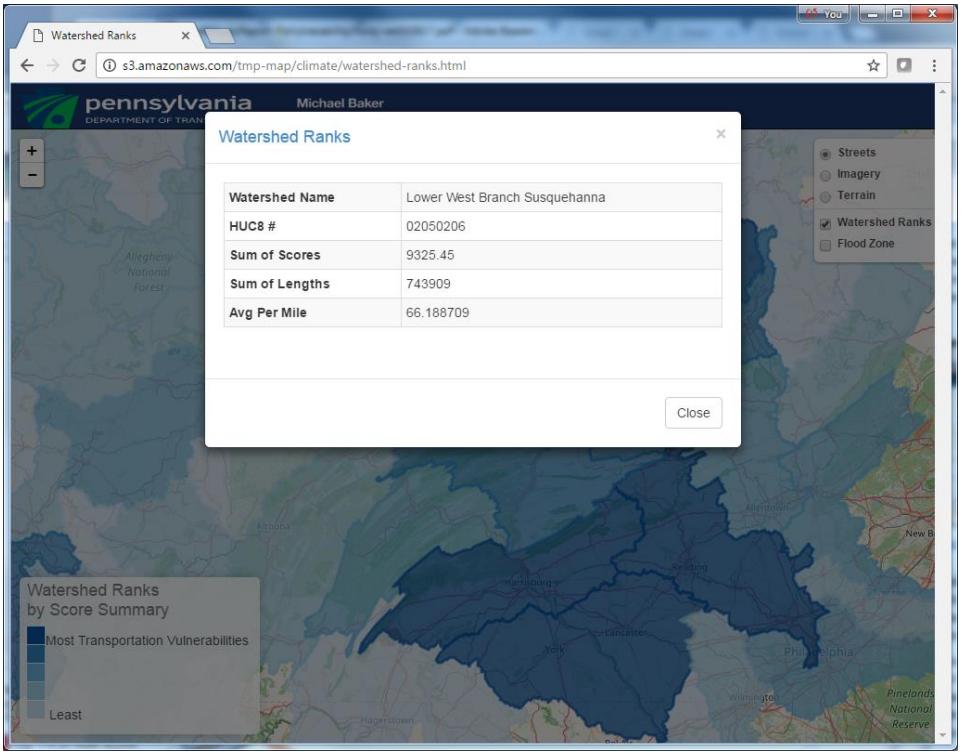
The Wiki Mapping web map is from data collected during the District Outreach meetings. A web based survey tool was created to assist in collection of vulnerable transportation assets. More information about the District outreach process is available in Appendix A.

http://wikimapping.com/wikimap/PennDOT-Extreme-Weather-Vulnerability-Tool.html

More information about the Wiki Mapping can also be found in Section 3 Exhibit 10 of the report.

A zipped .shp file of the data collected from the district outreach process is available for download.

(74 KB) wiki-mapping-data.zip



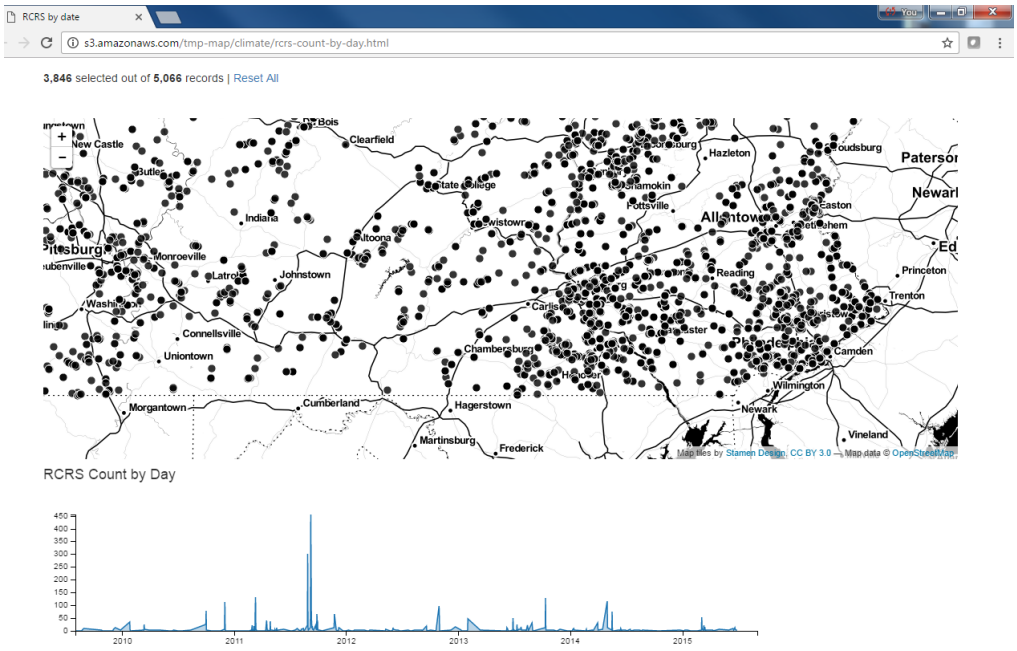
watershed-ranks.html

The water shed ranks map provides a summary of state roadway mileage that are vulnerable to flooding aggregated to the USGS Hydrological Unit Code (HUC) 8 level. Clicking on the individual watershed displays the watershed name, HUC code, sum of roadway mileage, and average risk score per mile. The flood zone boundary is also included as an overlay to provide additional visual context.

More information about the water shed ranks can be found in Section 4 Exhibit 13 of the report.

A zipped .shp file of the water shed ranks data is available for download.

(738 KB) water-shed-ranks.zip



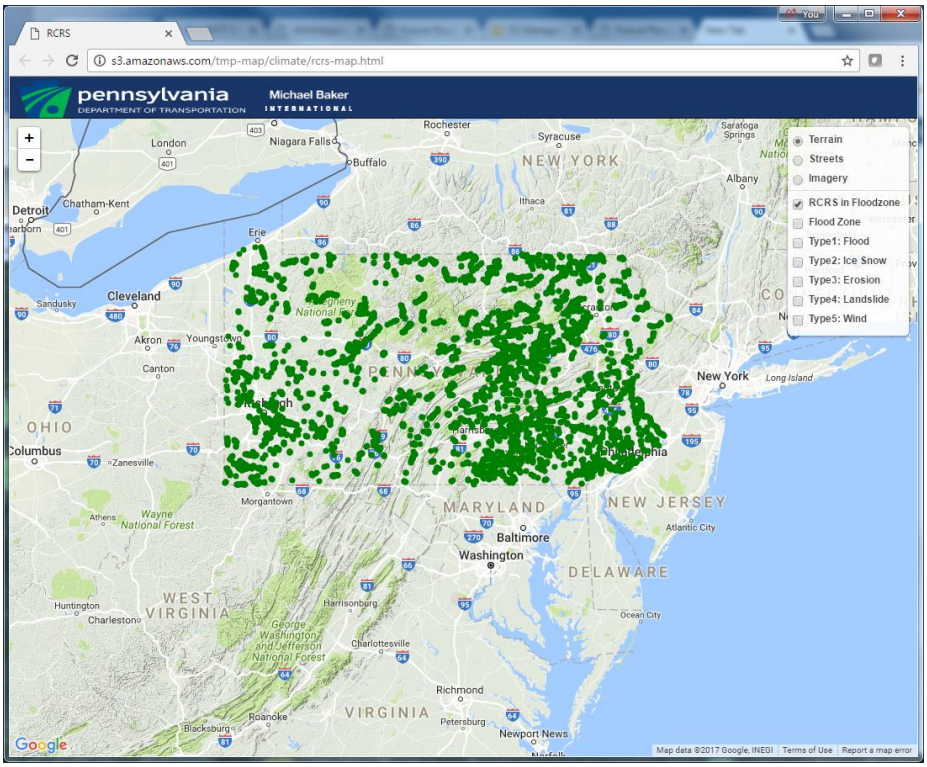
rcrs-count-by-day.html

The RCRS data filtered by date provides a way to categorize the data based upon the date recorded in the RCRS database. A graph along the bottom is associated to the map view. Zooming and panning the map window will update the chart to correspond to the counts in the map window. Also, selecting a date range (Ctrl + left mouse click) in the chart section will update the map view based upon the date range selected. In the popup window of the selected RCRS point is a link to Google street view to provide extra visual context of the area.

More information about the RCRS data filtered by date can be found in Section 4 *Mapping of Vulnerable Locations* of the report.

An Excel spreadsheet of the RCRS extract is available for download.

(5.7 MB) RCRS_Floods.xls



rcrs-map.html

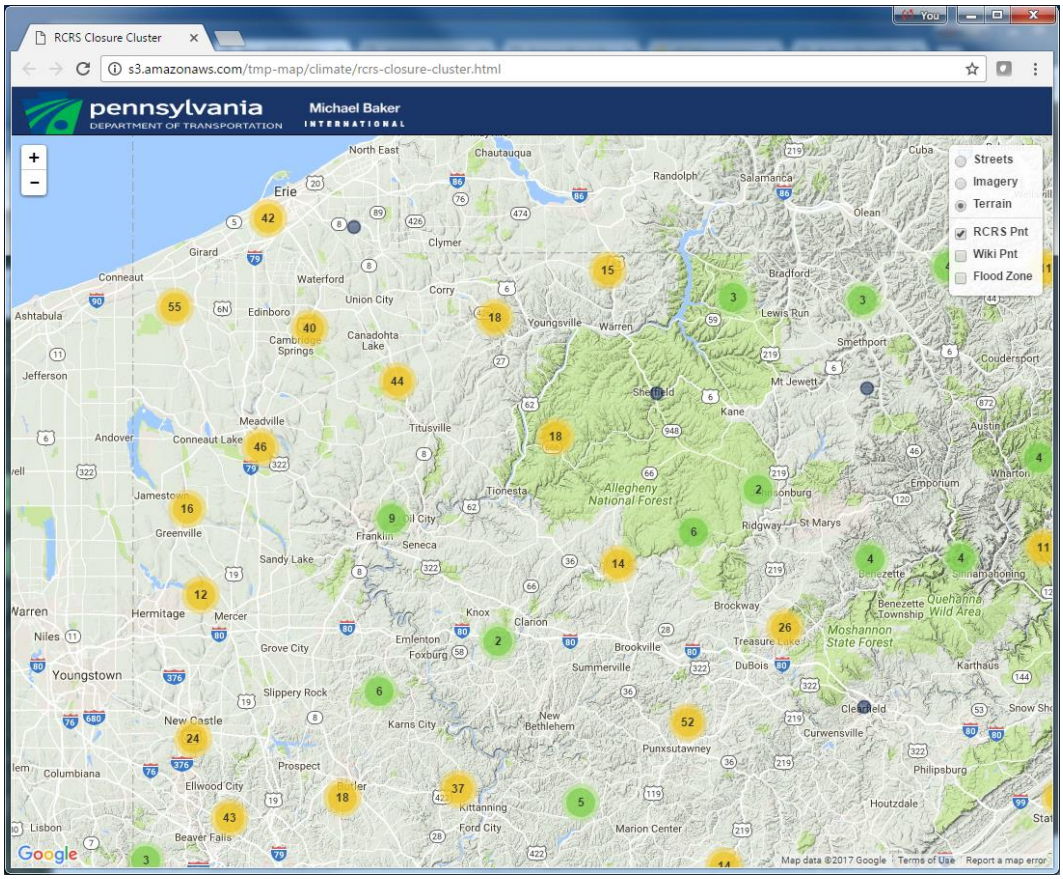
The RCRS map attempts to further classify the data by information contained in the comments section. The comments section was analyzed to find keywords such as Flood, Ice & Snow, Erosion, Landslide and Wind and then the data was separated into distinct overlays that can be toggled on and off to visually identify locations of vulnerability.

The first layer RCRS in Flood Zone is the entirety of the RCRS database clipped to the Flood Zone polygon layer. The subsequent 5 layers are classified based upon comments entered into the RCRS database.

More information about the RCRS Classification Map can be found in Section 4 *Mapping of Vulnerable Locations* of the report.

An Excel spreadsheet of the RCRS extract is available for download.

(5.7 MB) RCRS_Floods.xls



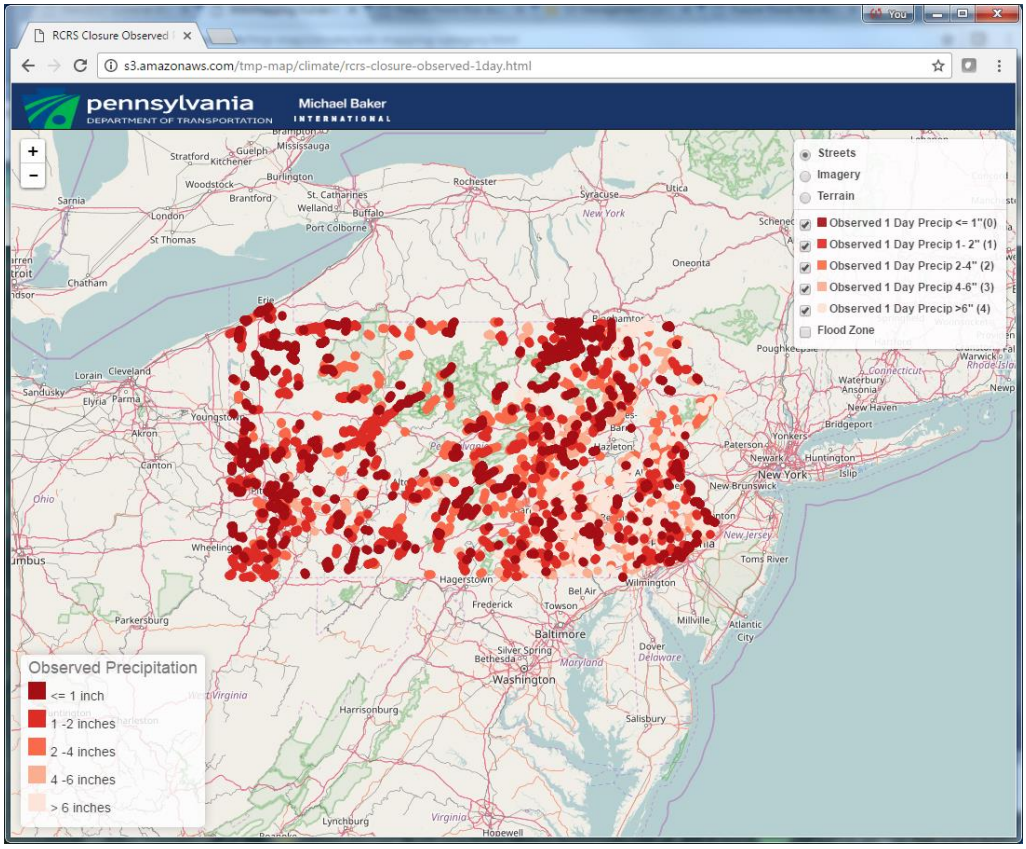
[rcrs-closure-cluster.html]

The RCRS Closure Cluster Map presents a picture of closure data clustered by frequency. The center point of the mapped segments are clustered by proximity and a count of the RCRS closures is presented inside the circle. The cluster counts change based upon the zoom level of the map. Zooming all the way in and clicking on the cluster circle reveals the individual RCRS location along with a popup window that contains a link to street view to provide further context about the location.

More information about the RCRS Closure Cluster Map can be found in Section 4 *Mapping of Vulnerable Locations* of the report.

An Excel spreadsheet of the RCRS extract is available for download.

(5.7 MB) RCRS_Floods.xls



rcrs-closure-observed-1day.html

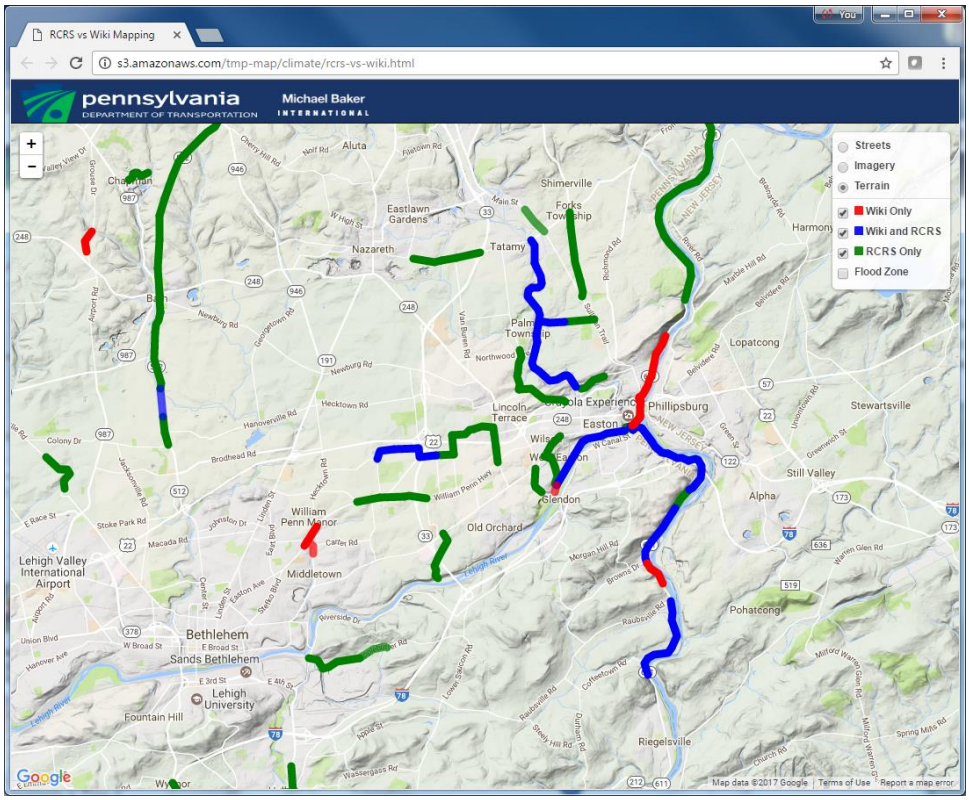
rcrs-closure-observed-4day.html

This map compares the RCRS data on the date of closure to the historical NOAA precipitation data averaged by the watershed (HUC 8) in which the RCRS event occurred. The 1 day observation looks at the precipitation on the day of the RCRS event and the 4 day looks at the day of the RCRS event and the prior 3 day totals.

The RCRS/NOAA observed data is discussed in the report at Section 4 *Mapping of Vulnerable Locations.*

A zipped .shp file of the RCRS/NOAA 1 day and 4 day classification is available for download. Fields include the RCRS ID, Closure Comments, Date of Closure and 1 & 4 day classifications.

rcrs-noaa-data.zip



rcrs-vs-wiki.html

This map compares the RCRS data and the data collected during the District Outreach meetings. Map overlays include Wiki Only – vulnerable locations identified during the Outreach meetings, but a subsequent match was not found in the RCRS database. Wiki and RCRS – locations that were identified at the Outreach meetings and have a matching record in the RCRS database. And then RCRS Only overlay, includes vulnerable segments that are listed in the RCRS but do not have a corresponding record from the District Outreach meetings.

Data used in the comparison mapping is from the RCRS .xls and the Wiki Mapping database.

(5.7 MB) RCRS_Floods.xls

(74 KB) wiki-mapping-data.zip