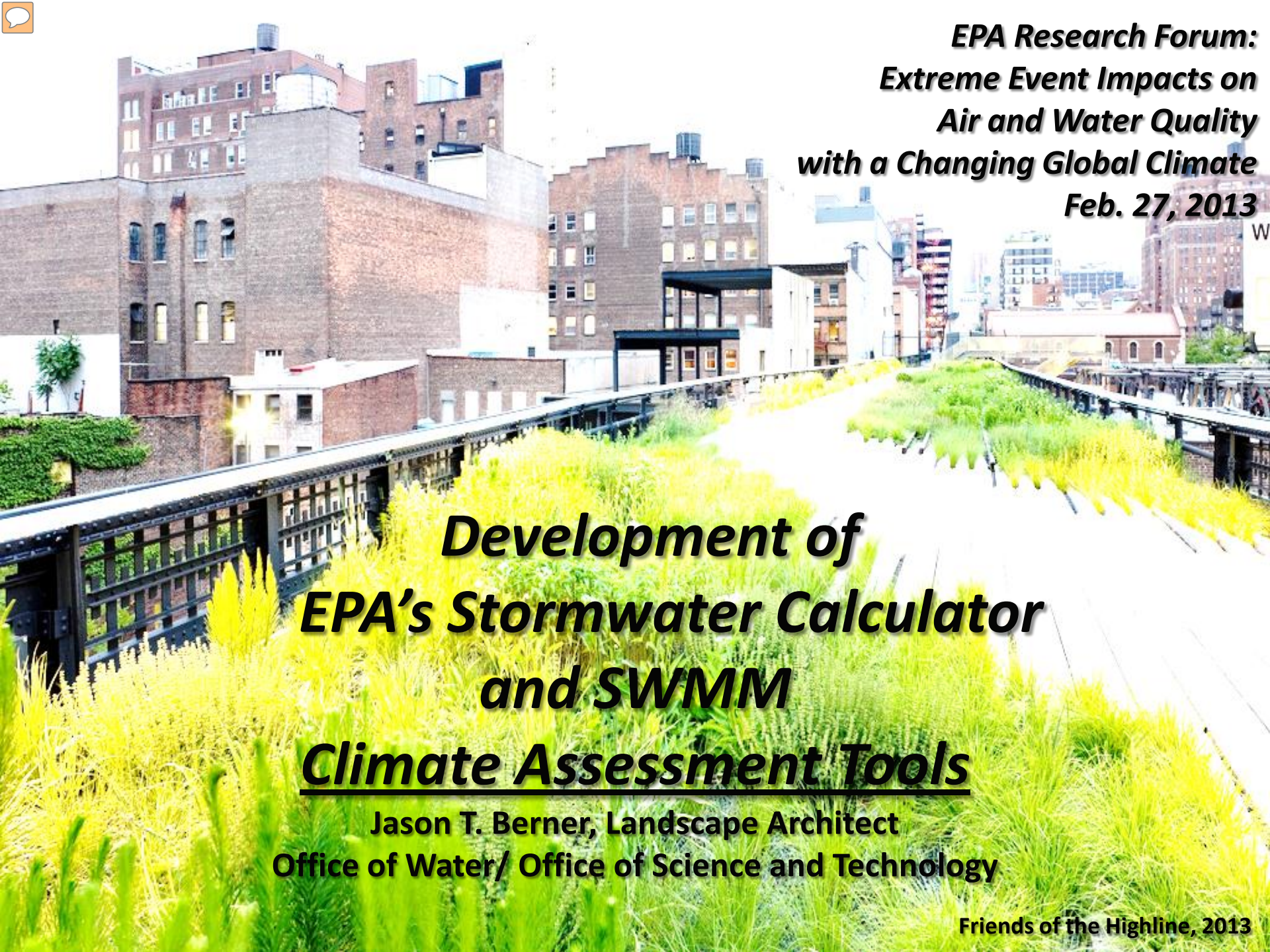


EPA Research Forum:
Extreme Event Impacts on
Air and Water Quality
with a Changing Global Climate
Feb. 27, 2013

Development of EPA's Stormwater Calculator and SWMM Climate Assessment Tools

Jason T. Berner, Landscape Architect
Office of Water/ Office of Science and Technology

Friends of the Highline, 2013

Outline

Stormwater Management Design/Planning Tools:

- **EPA Stormwater Calculator**

- **EPA Climate Assessment Tool (CAT)**
  - **Stormwater Calculator & SWMM (Stormwater Management Model) CAT Enhancements**
  - **Climate Change Projection Scenario Data:**

    Temperature & Precipitation (*EPA CREAT 2.0 (Climate Resilience Evaluation & Awareness Tool*))

What are we doing and Why?

- **Stormwater Management (Green Infrastructure) Design and Planning Tool Needs:**
  - **Model pre and post construction stormwater runoff discharges**
  - **Screening level analysis of various green infrastructure practices throughout USA**
  - **Allow non-modelers to conduct screening level stormwater runoff analyses: urban & municipal planners, and land developers**

❖ **Enhancing SWMM and Stormwater Calculator with Climate Change Assessment Functionalities**

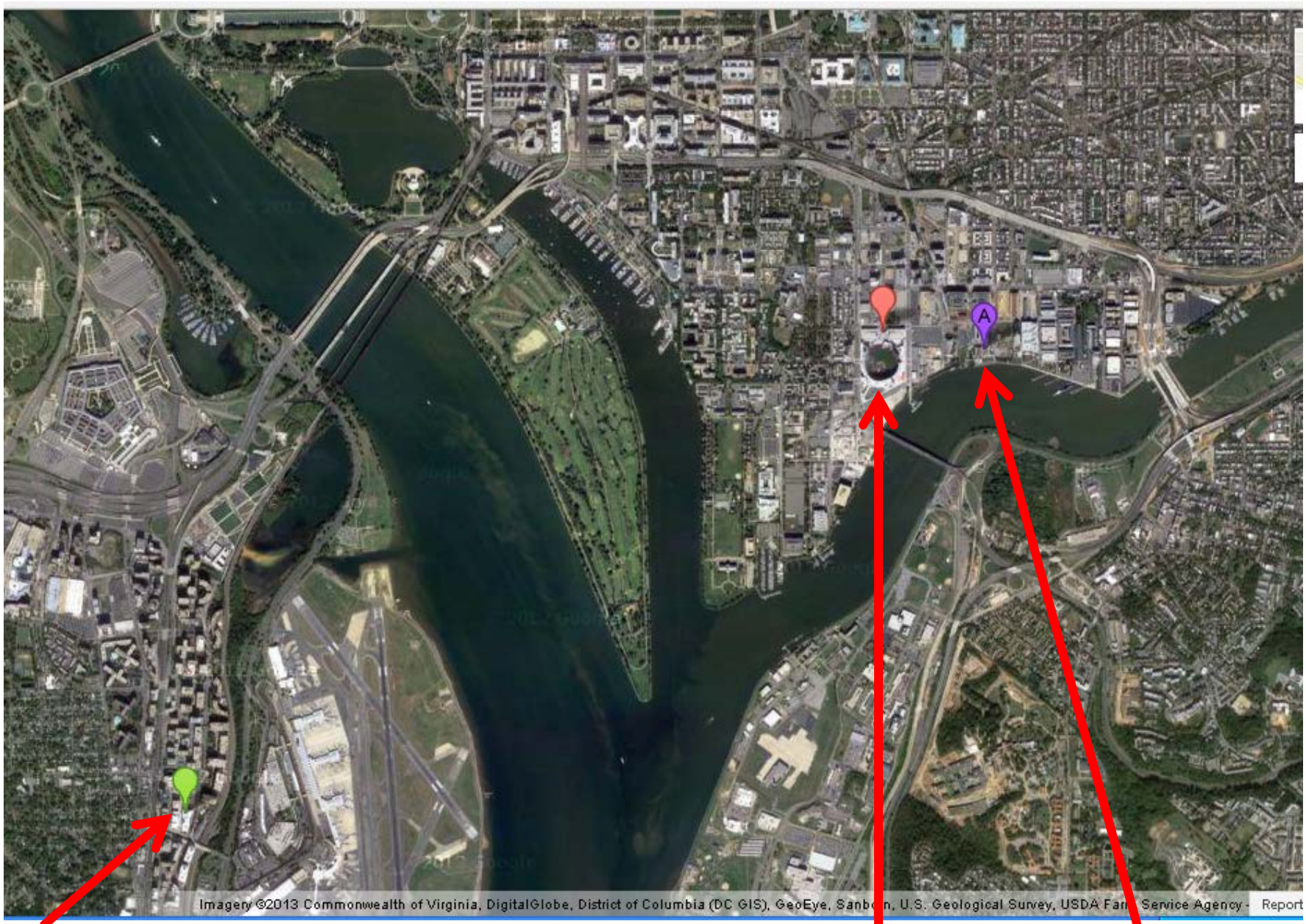
❖ **Adaptation Strategies Guide: Sustainability and Green Infrastructure Information for Water and Wastewater Utilities**

(OWGDW, Climate Ready Water Utilities initiative)

EPA Stormwater Calculator

Washington, DC Redevelopment Project: Yards Park

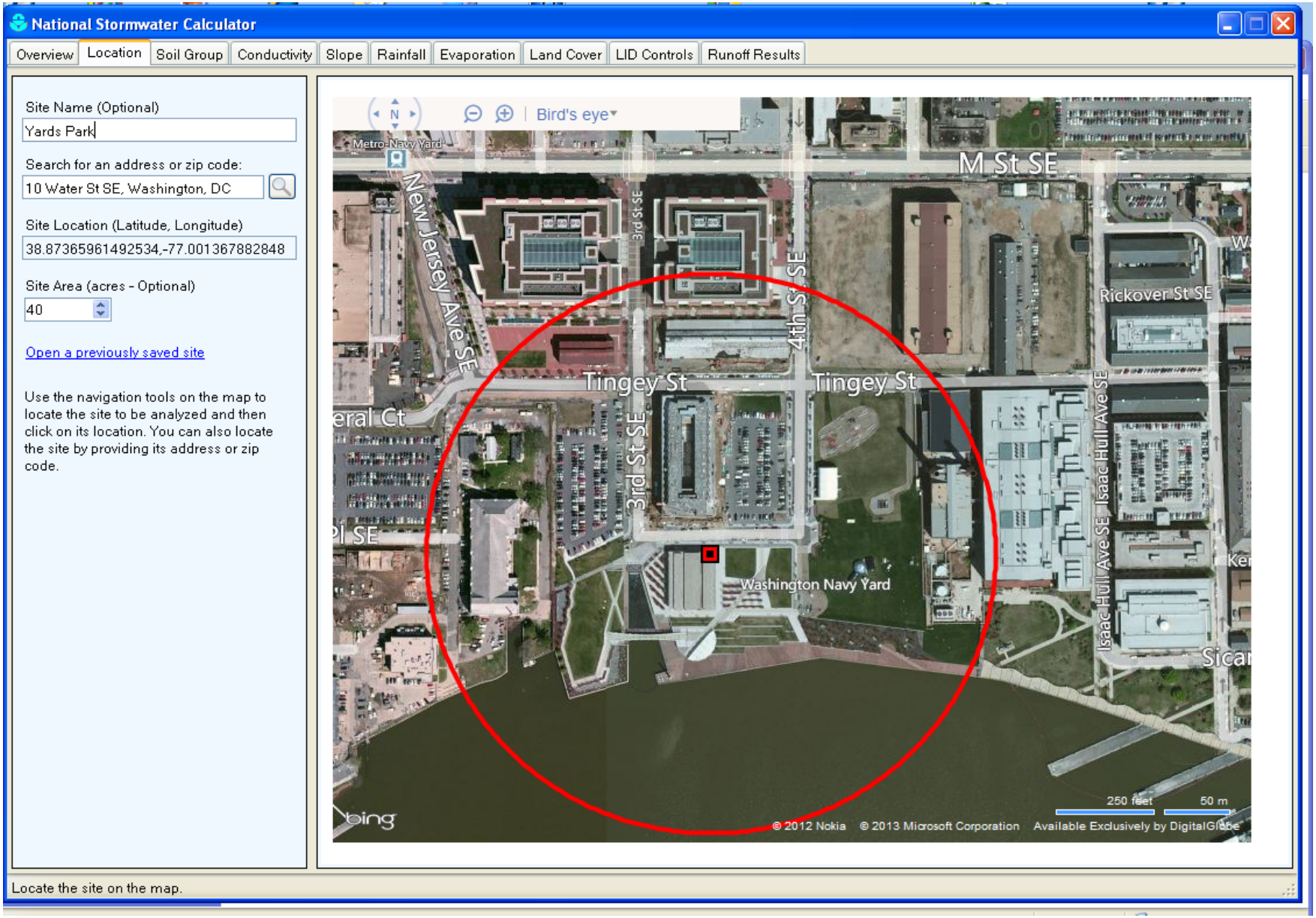
The Yards Park, 2012


A
Imagery ©2013 Commonwealth of Virginia, DigitalGlobe, District of Columbia (DC GIS), GeoEye, Sanb n, U.S. Geological Survey, USDA Far Service Agency
Report
Crystal City, VA
Nationals
Baseball Stadium
Yards Park

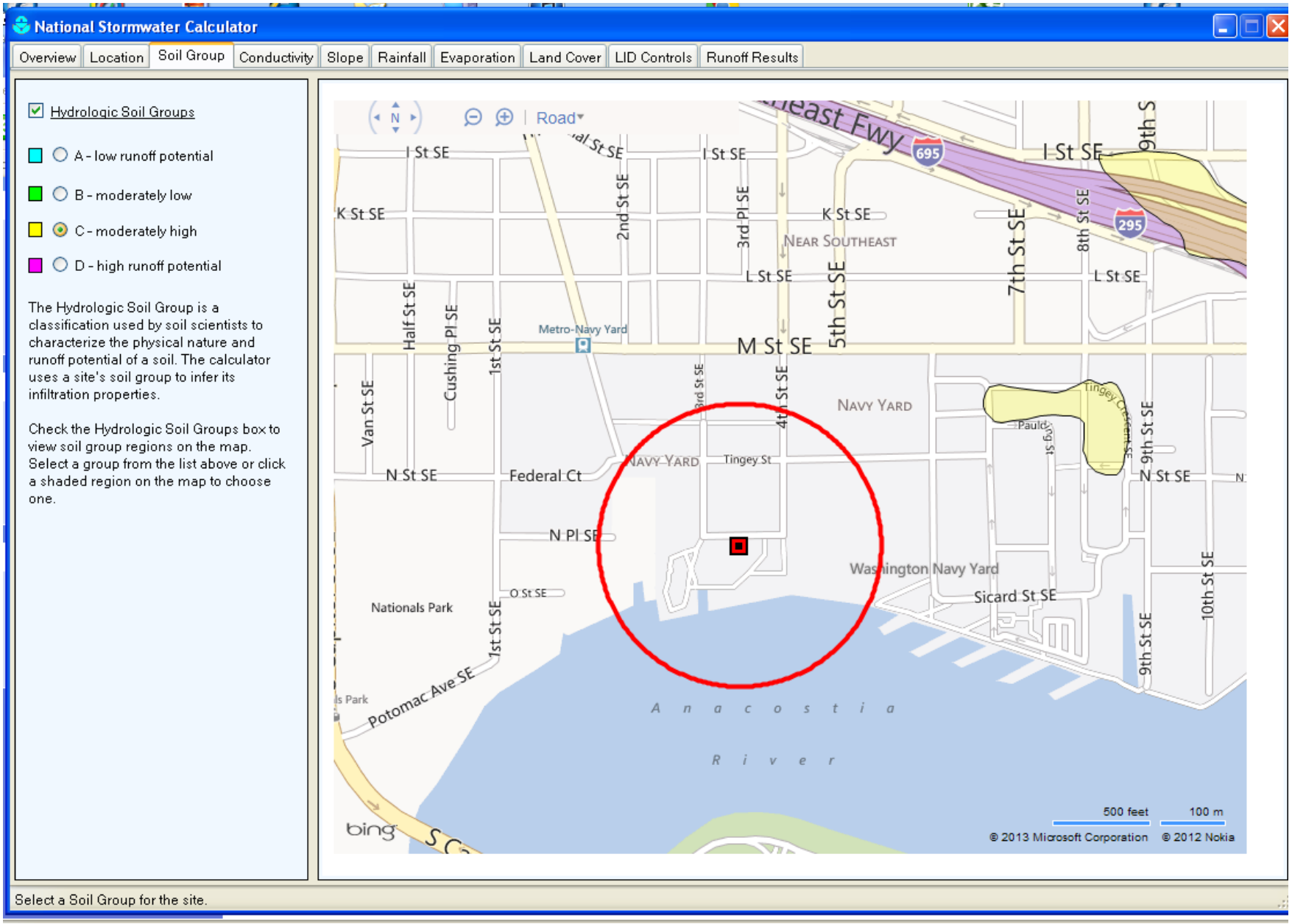
Yards Park, Pre-construction

Post Construction

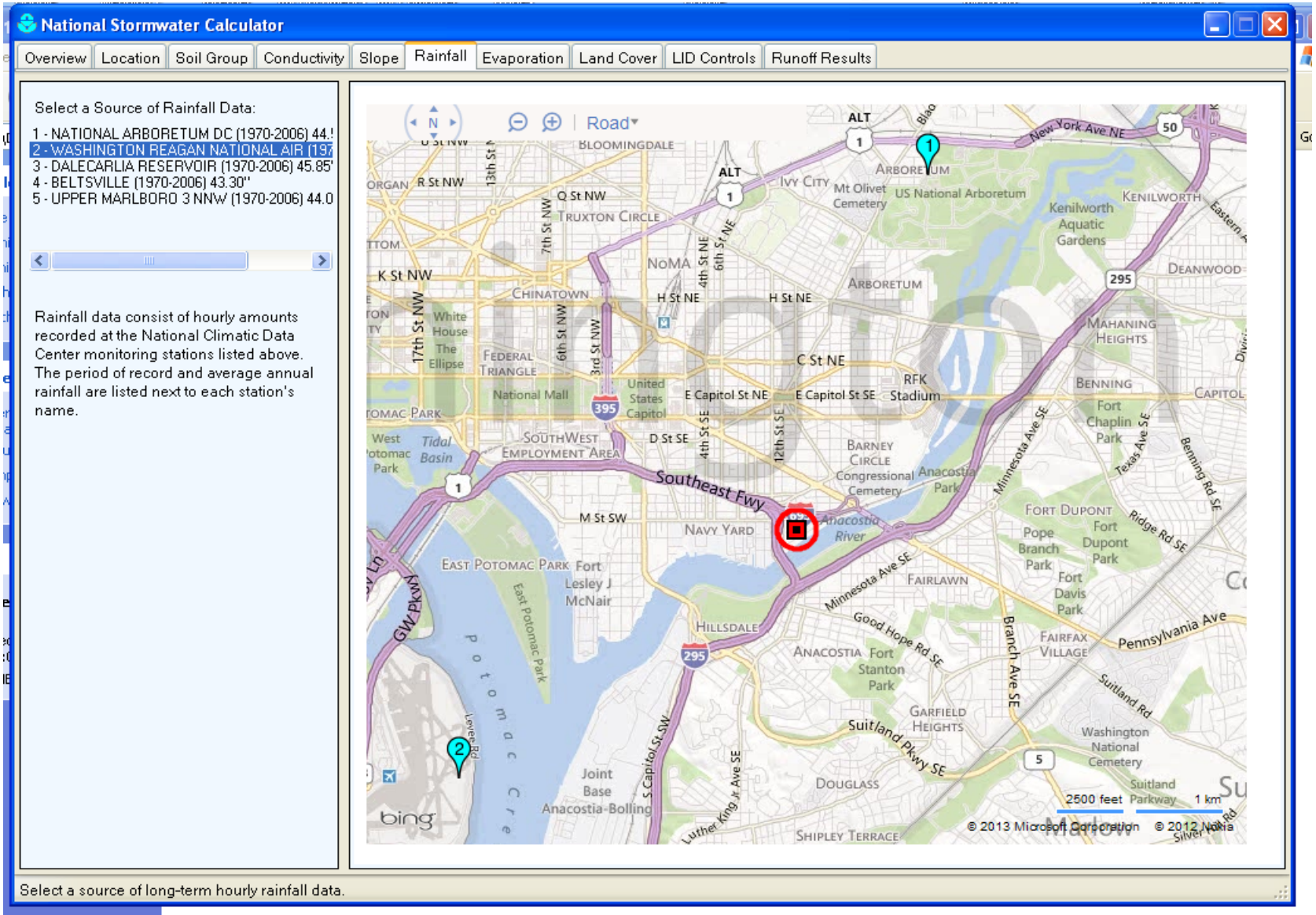
EPA Stormwater Calculator Site Analysis



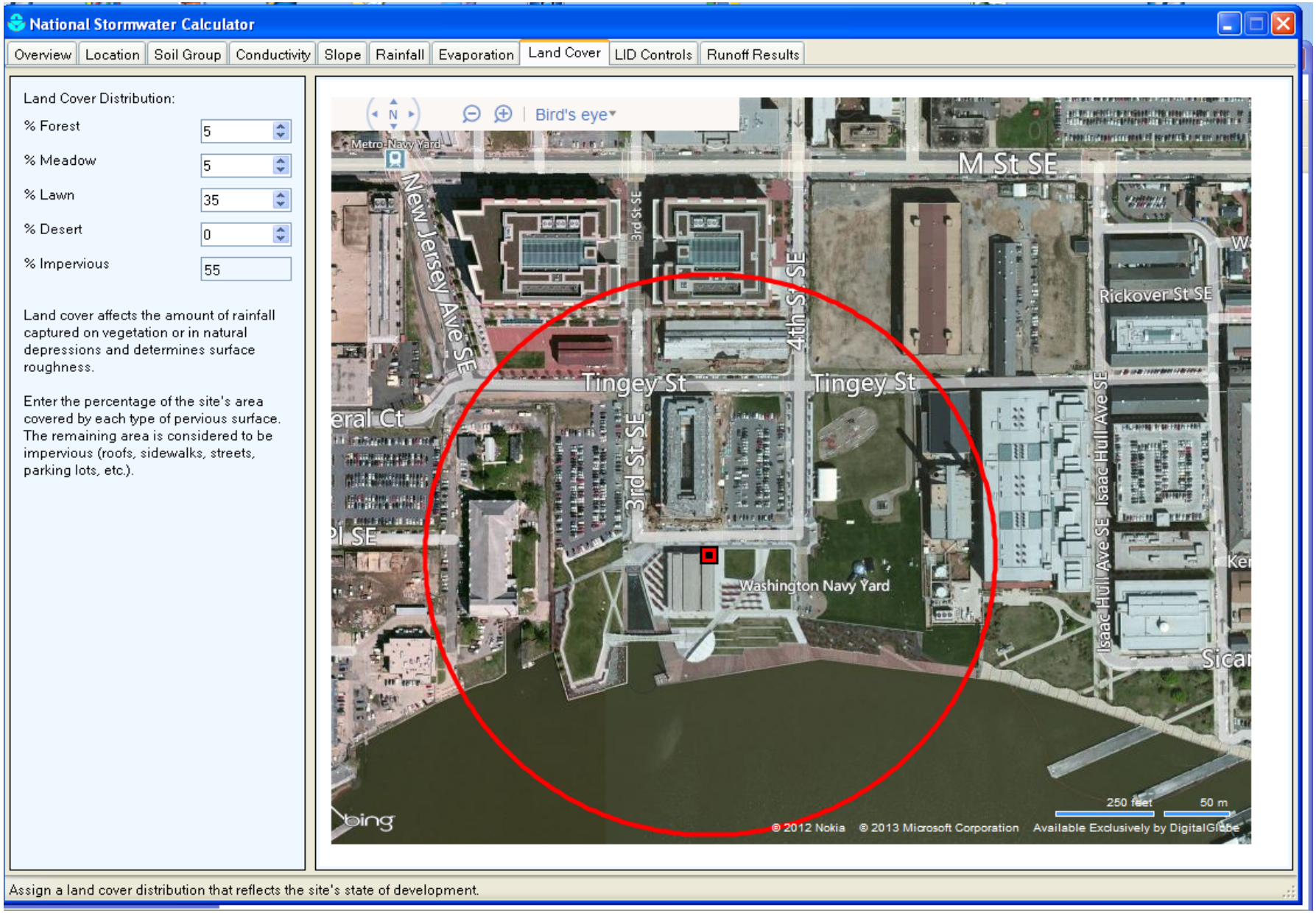
Hydrologic Soil Groups



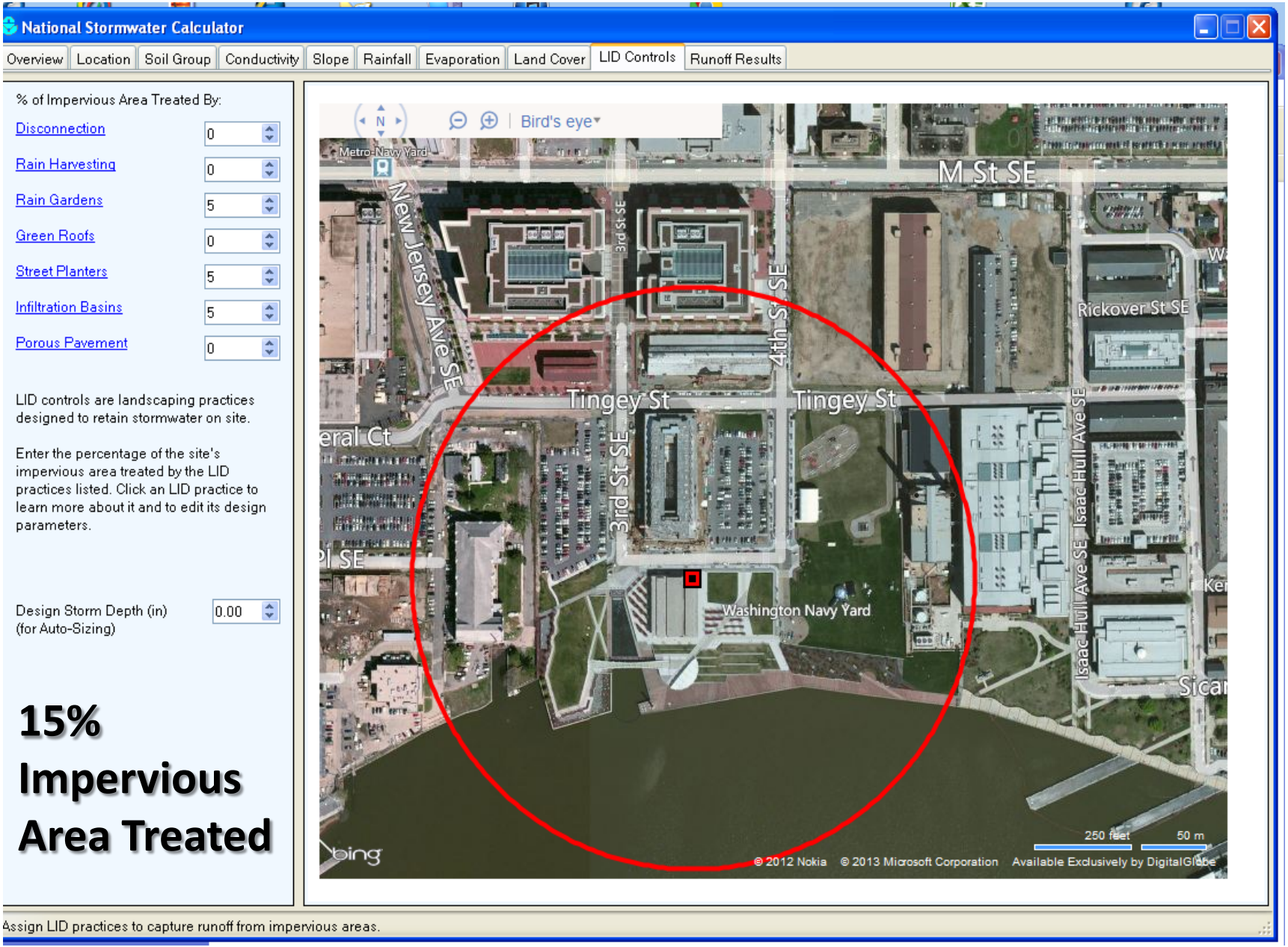
Meteorological Data: Precipitation & Evaporation



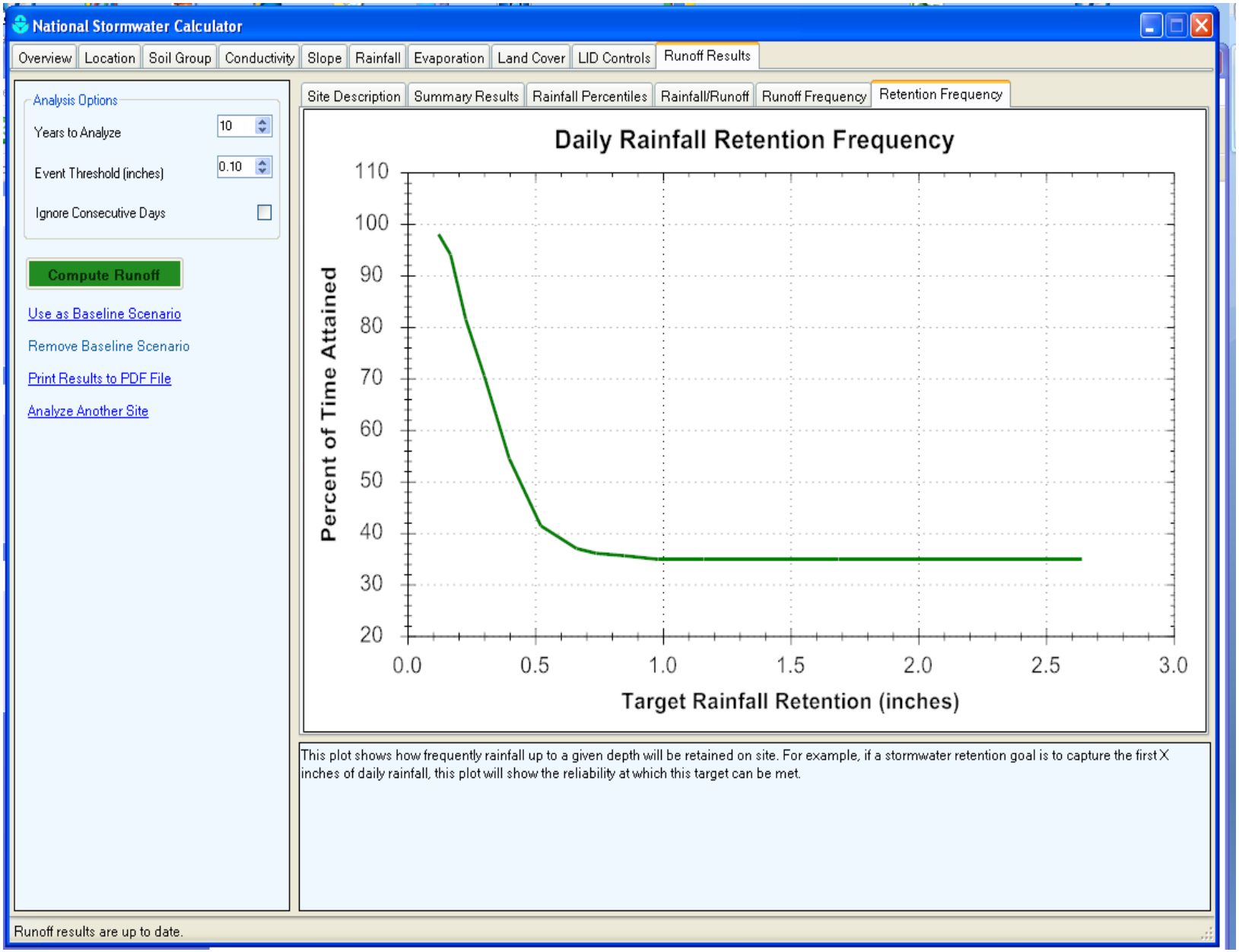
Existing Land Cover



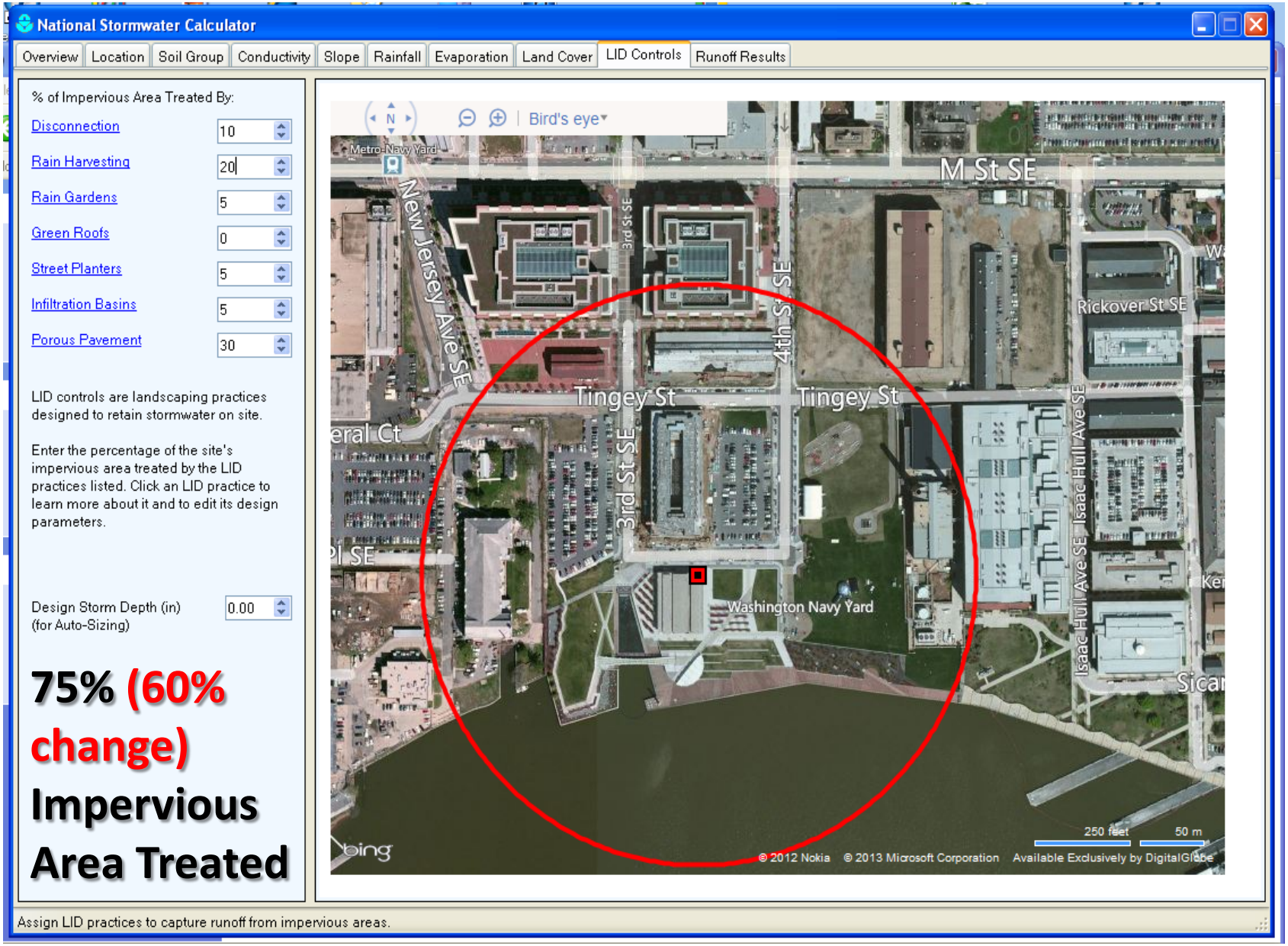
Existing Low Impact Development (LID) Controls



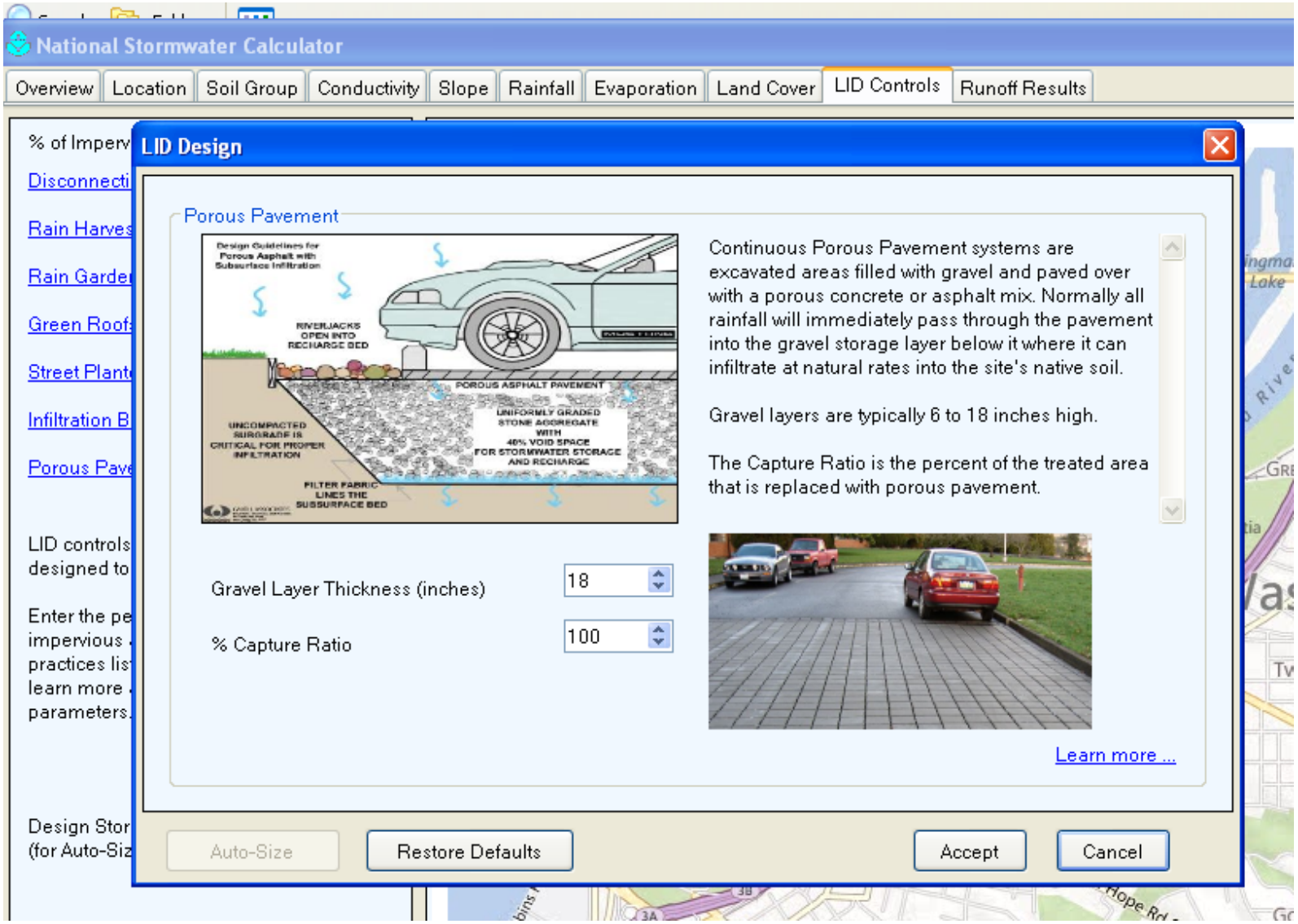
Baseline Stormwater Runoff Results



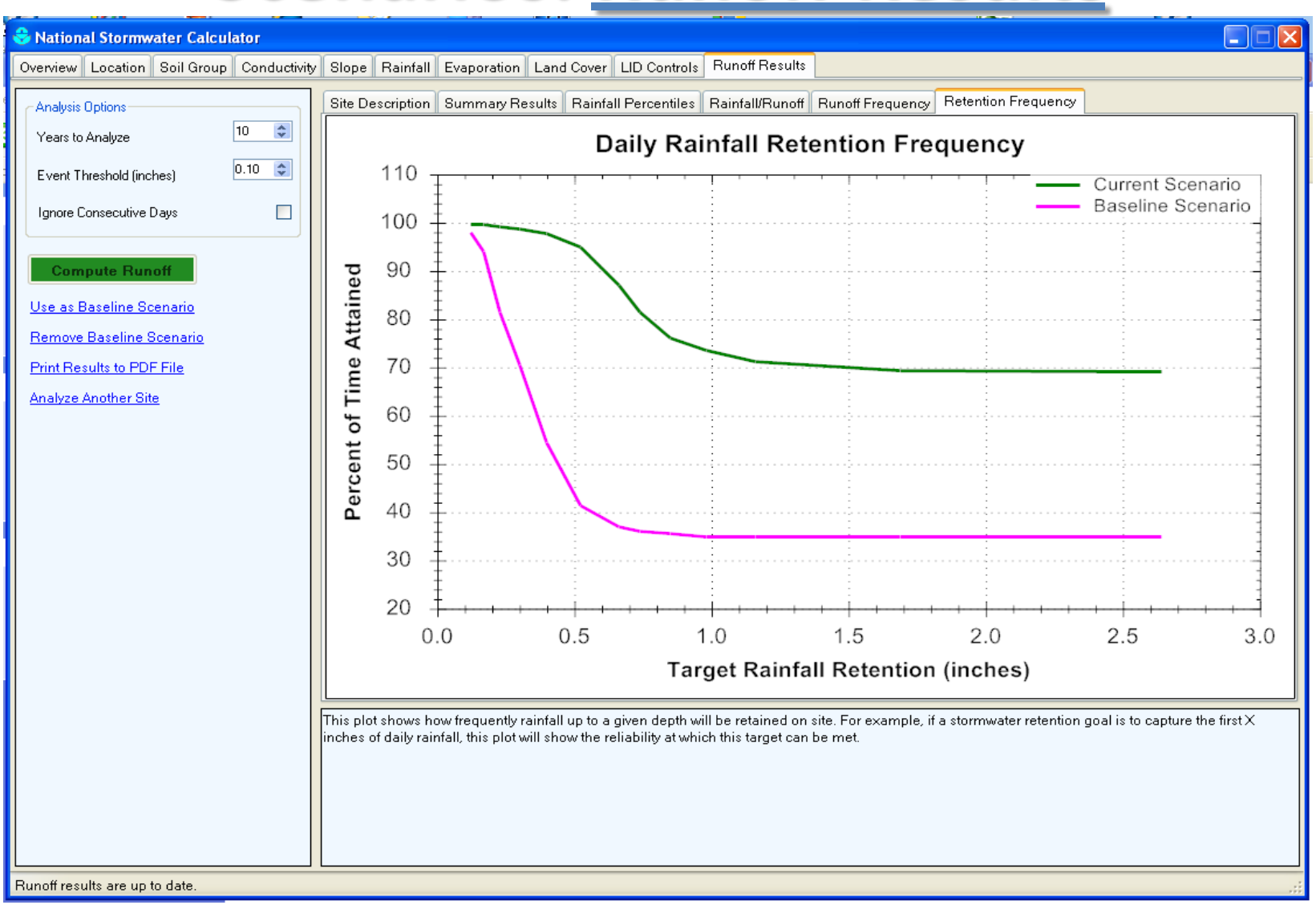
Redevelopment/Retrofit Scenario



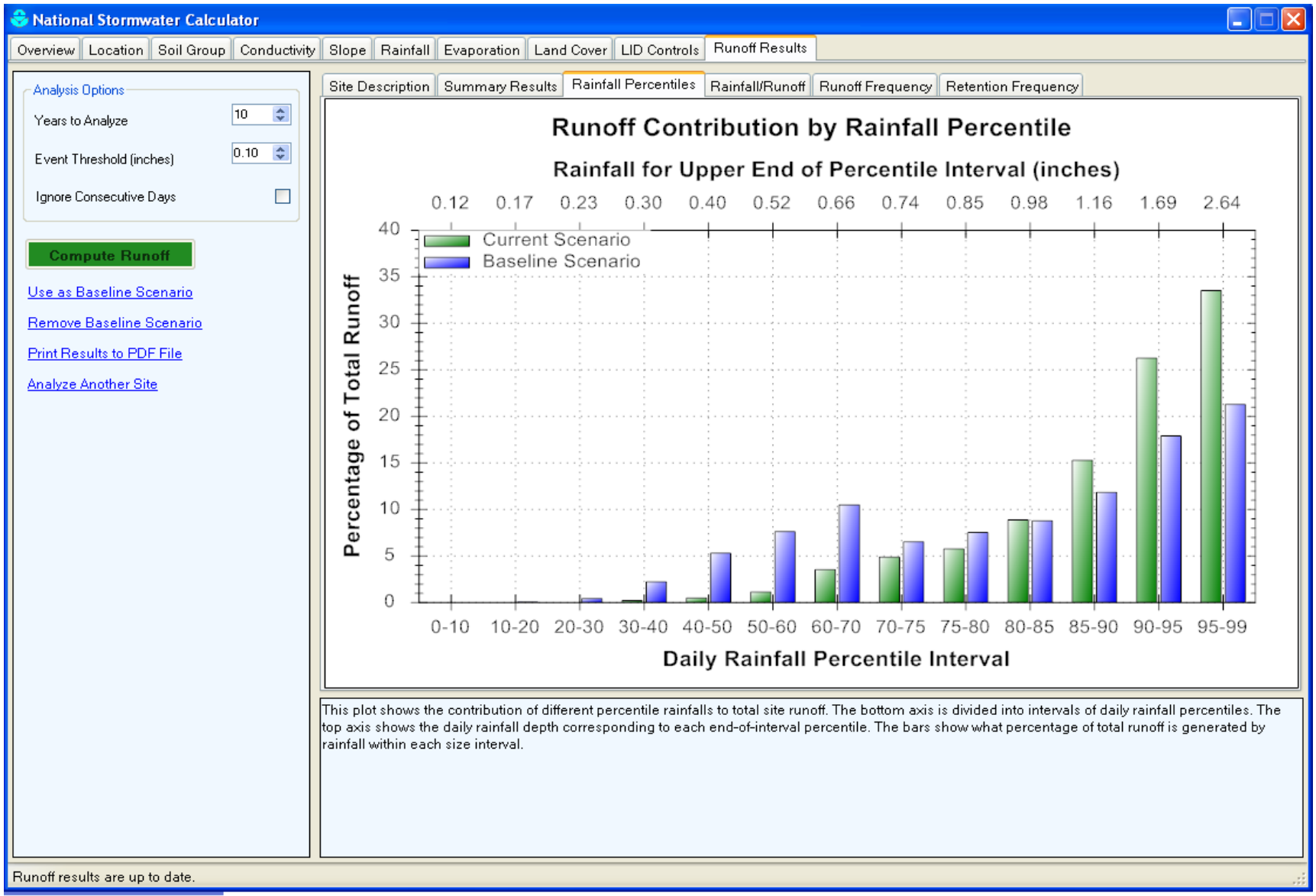
LID Control Design Specifications



Baseline and Retrofit/Redevelopment Scenarios: Runoff Results



Baseline and Retrofit/Redevelopment Scenarios: Runoff Results



Development of Climate Assessment Tools (CATs) and Climate Change Scenario Data for SWMM and the Stormwater Calculator

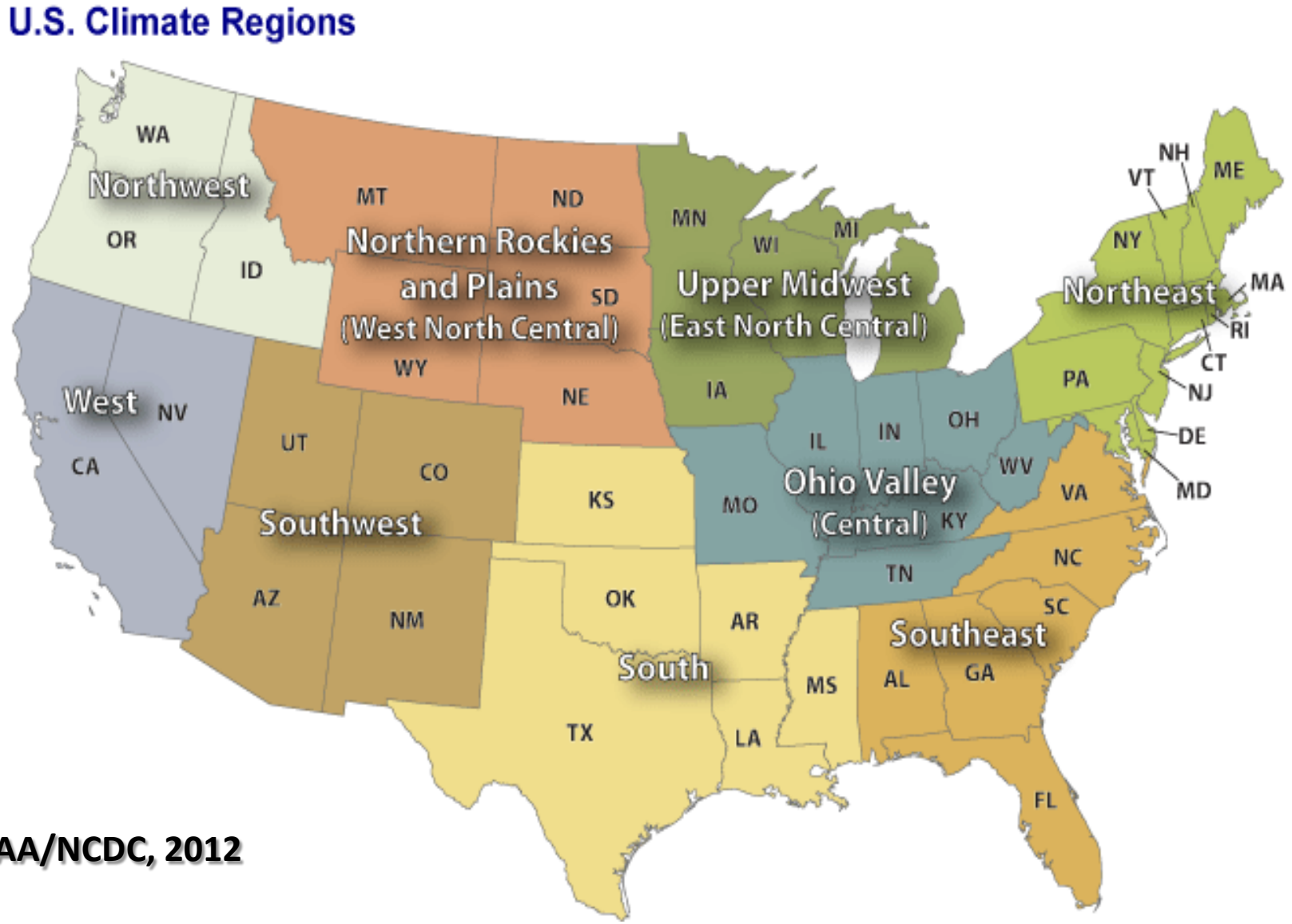
- **EPA BASINS CAT: ability to adjust existing NOAA National Climate Data Center meteorological data (precipitation and temperature)**

- **Ability to input user provided climate projection data**

Regional Climate Projection Data:

CREAT 2.0 (Climate Resilience Evaluation & Awareness Tool)

Precipitation & Temperature

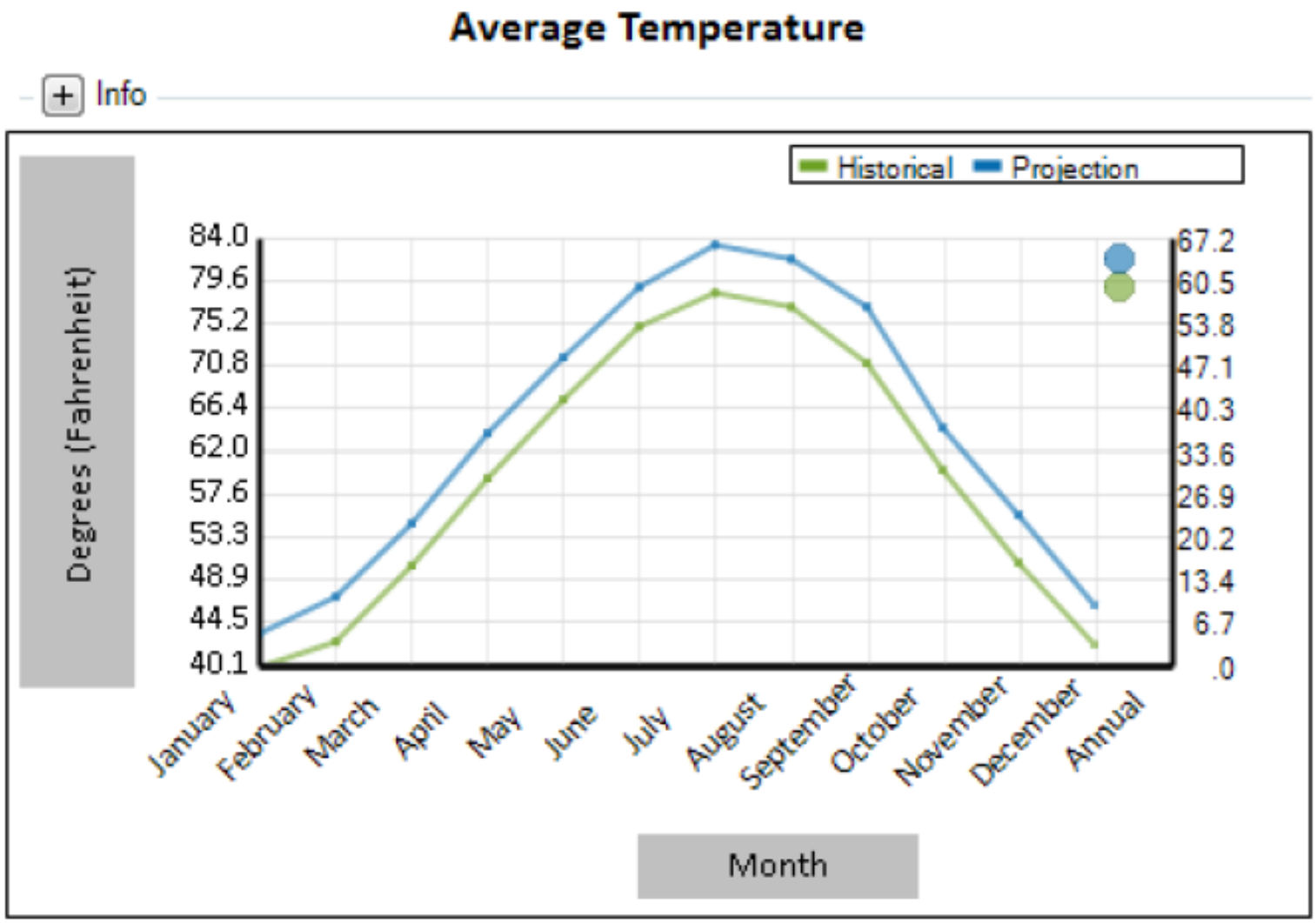


NOAA/NCDC, 2012

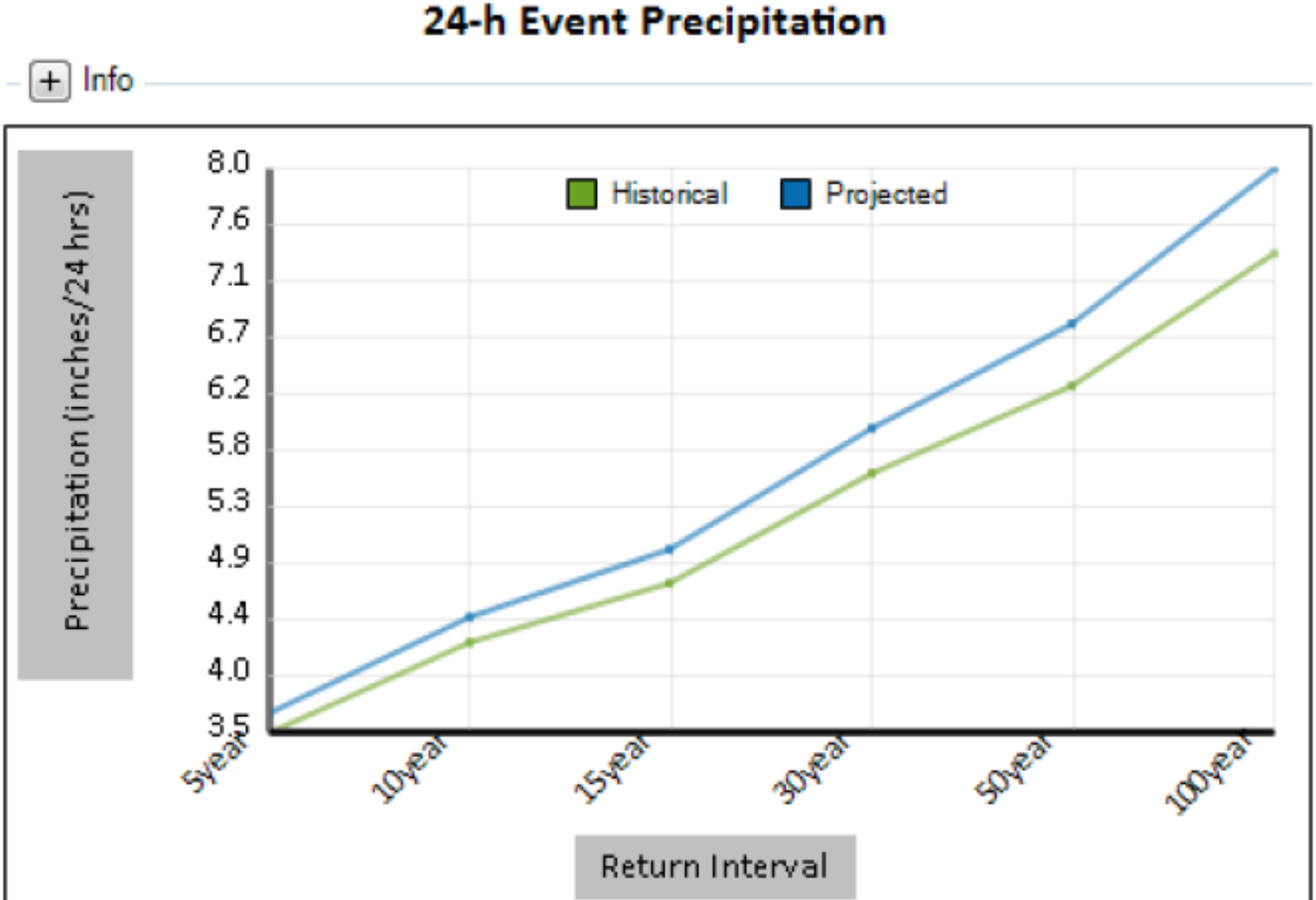
Regional Climate Projection Data

- **Based on IPPC (Intergovernmental Panel on Climate Change) models and U.S. Global Change Research Program literature values**
- **Hot and Dry, Middle, and Wet climate projection values for precipitation and temperature**
  - **Compare with historical NCDC/NOAA meteorological data**
  - **May assist with the design or retrofit of LID/green infrastructure stormwater management technologies for CSO or MS4 communities**

CREAT 2.0 Regional Climate Projection Temperature Example Data (Hot and Dry, Chapel Hill, NC):



CREAT 2.0 Regional Climate Projection Precipitation Example Data (Hot and Dry, Chapel Hill, NC) :



Questions and Contact Info

- **Jason T. Berner (OW, Office of Science and Technology): berner.jason@epa.gov , 202-564-9868**
- **Lewis Rossman (ORD, National Risk Management Research Laboratory): rossman.lewis@epa.gov, 513-569-7603**
- **Thomas Johnson (ORD, Global Change Research Program): johnson.thomas@epa.gov,703-347-8618**