

# Examining Increased Precipitation and Flood Frequency and Its Impact On Waste Water Treatment Facilities in The Pawtuxet River Valley of Rhode Island

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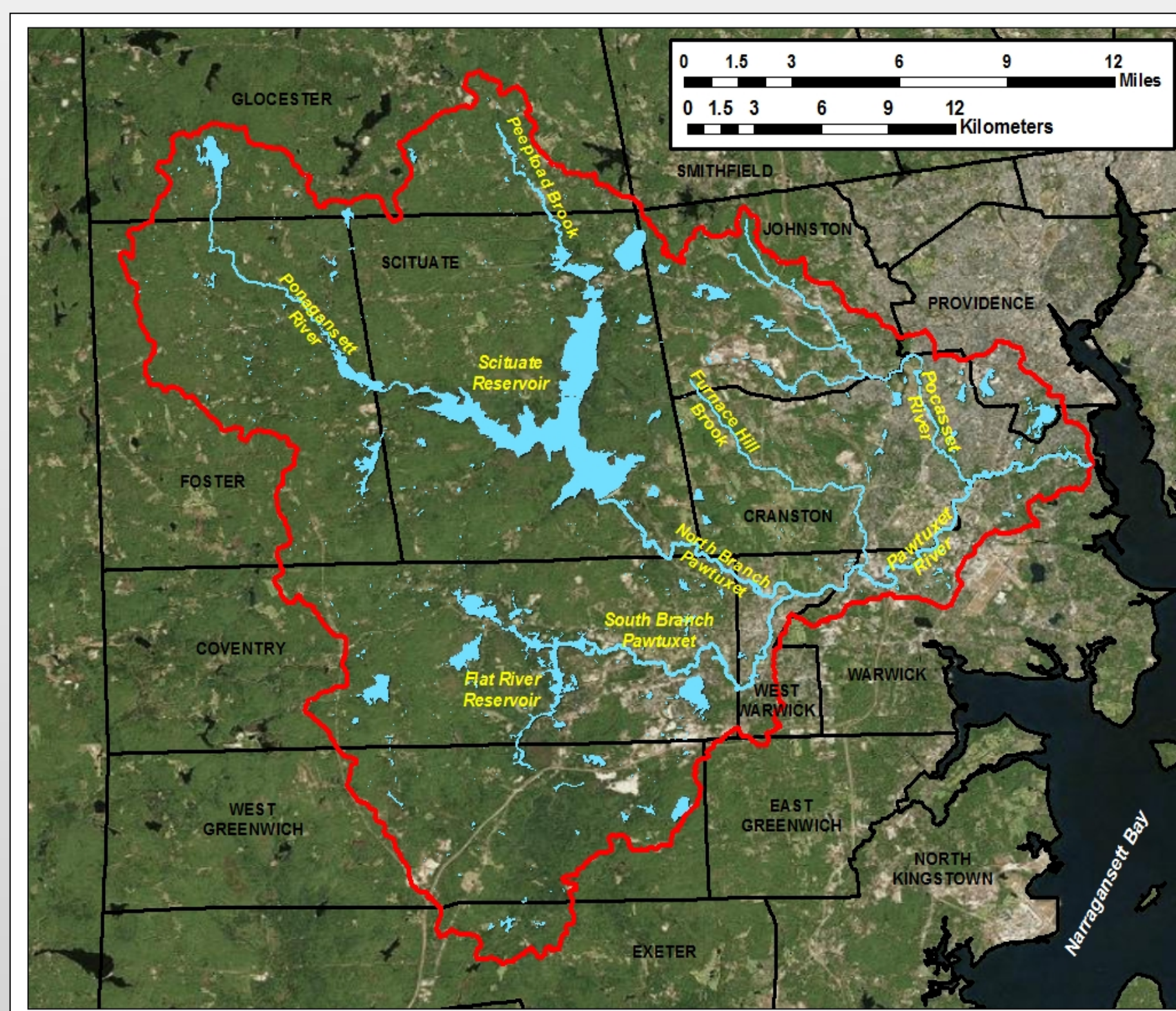
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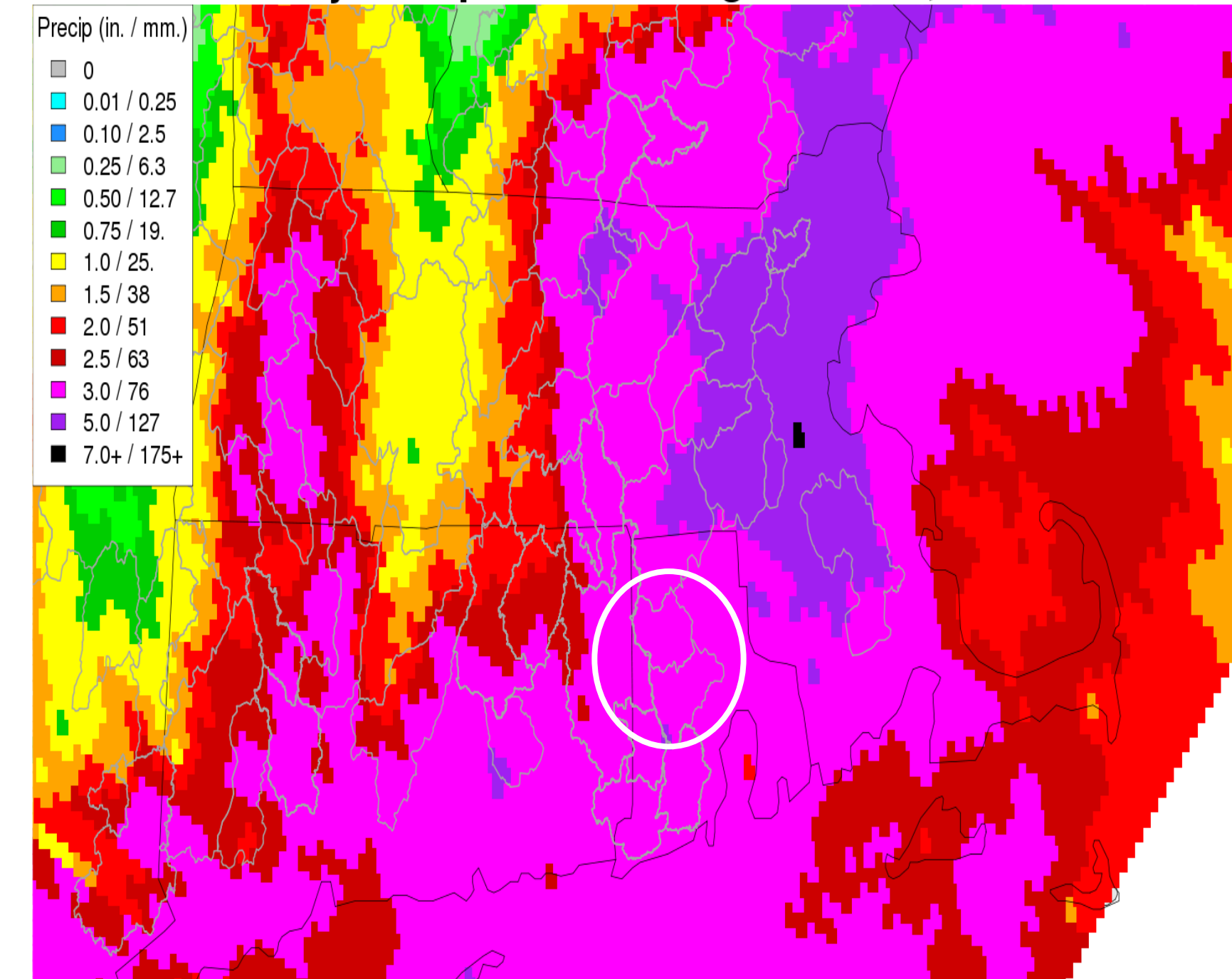
Torrential rainfall and record flooding struck the Pawtuxet River Valley of central Rhode Island in March 2010. Impacts on waste water treatment facilities in the towns of West Warwick and Warwick were severe. The Pawtuxet Valley has experienced significant urbanization since the late 1960s, including the addition of major shopping malls and two interstates in the lower portion of the basin. In addition, the basin has experienced a significant increase in annual precipitation and heavy rainfall episodes, while also experiencing a pronounced increase in the frequency and magnitude of floods. The combined impacts of urbanization and a wetter climate highlighted by the devastating floods in 2010 have brought to the forefront the tremendous challenges facing the area's waste water treatment industry. The Rhode Island Department of Environmental Management – Office of Water Resources has begun an extensive effort to conduct waste water treatment facility vulnerability assessments aimed at identifying at-risk infrastructure. The Office of Water Resources has also developed a robust training program for waste water superintendents to help them make informed decisions to address the challenges facing their individual systems.

## The Pawtuxet River Basin

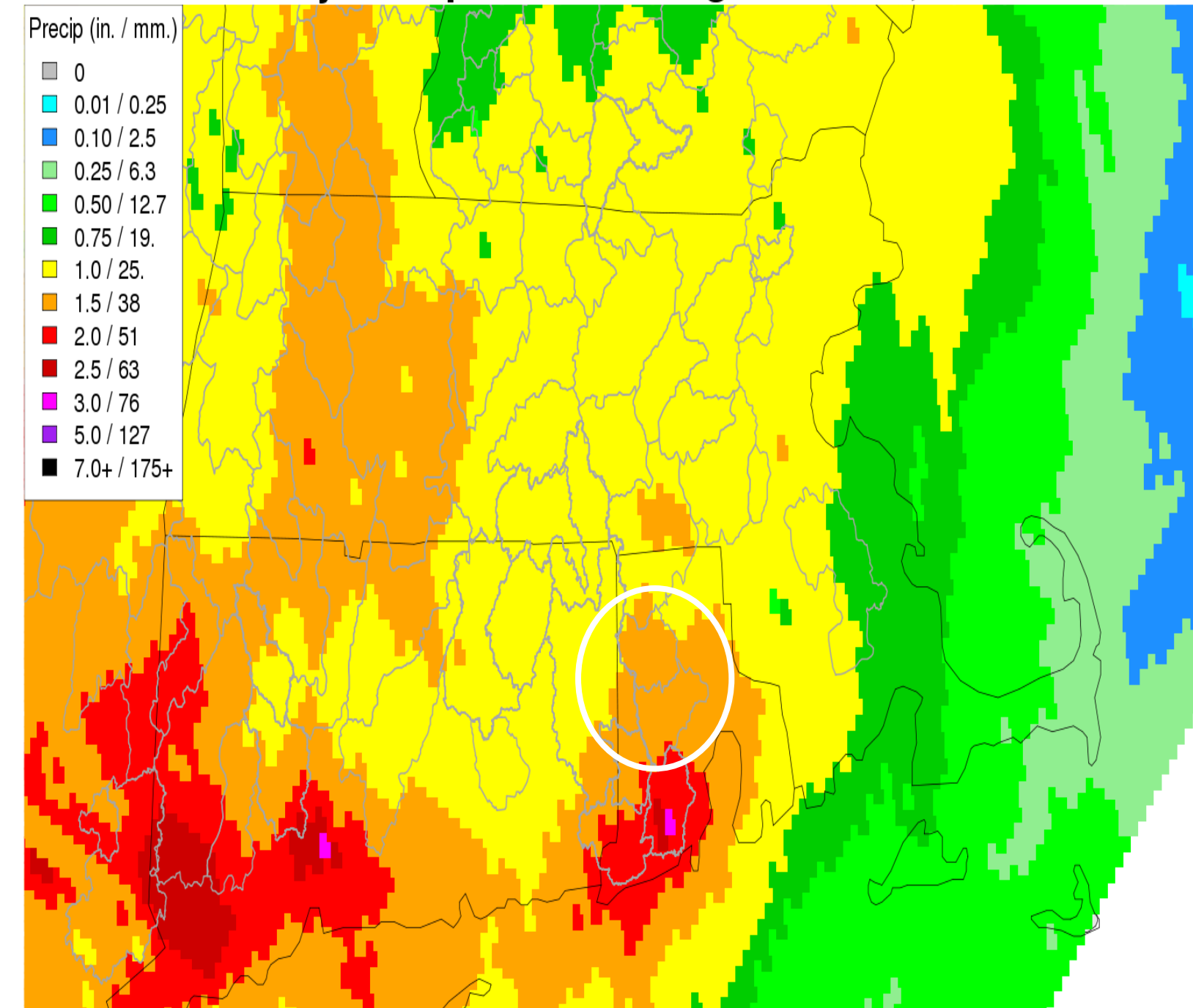


## Three Significant Rain Events

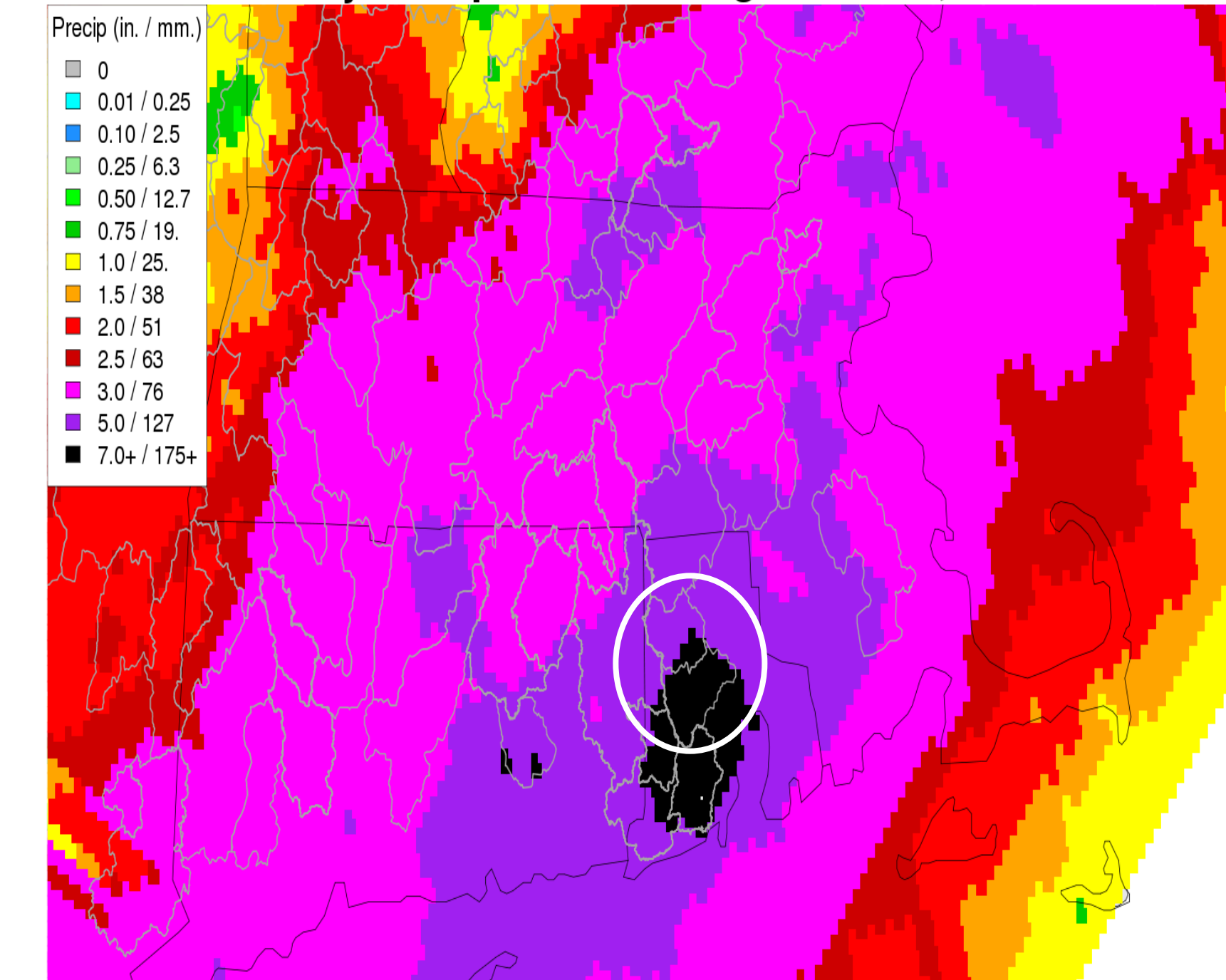
3 Day Precipitation Ending March 15, 2010



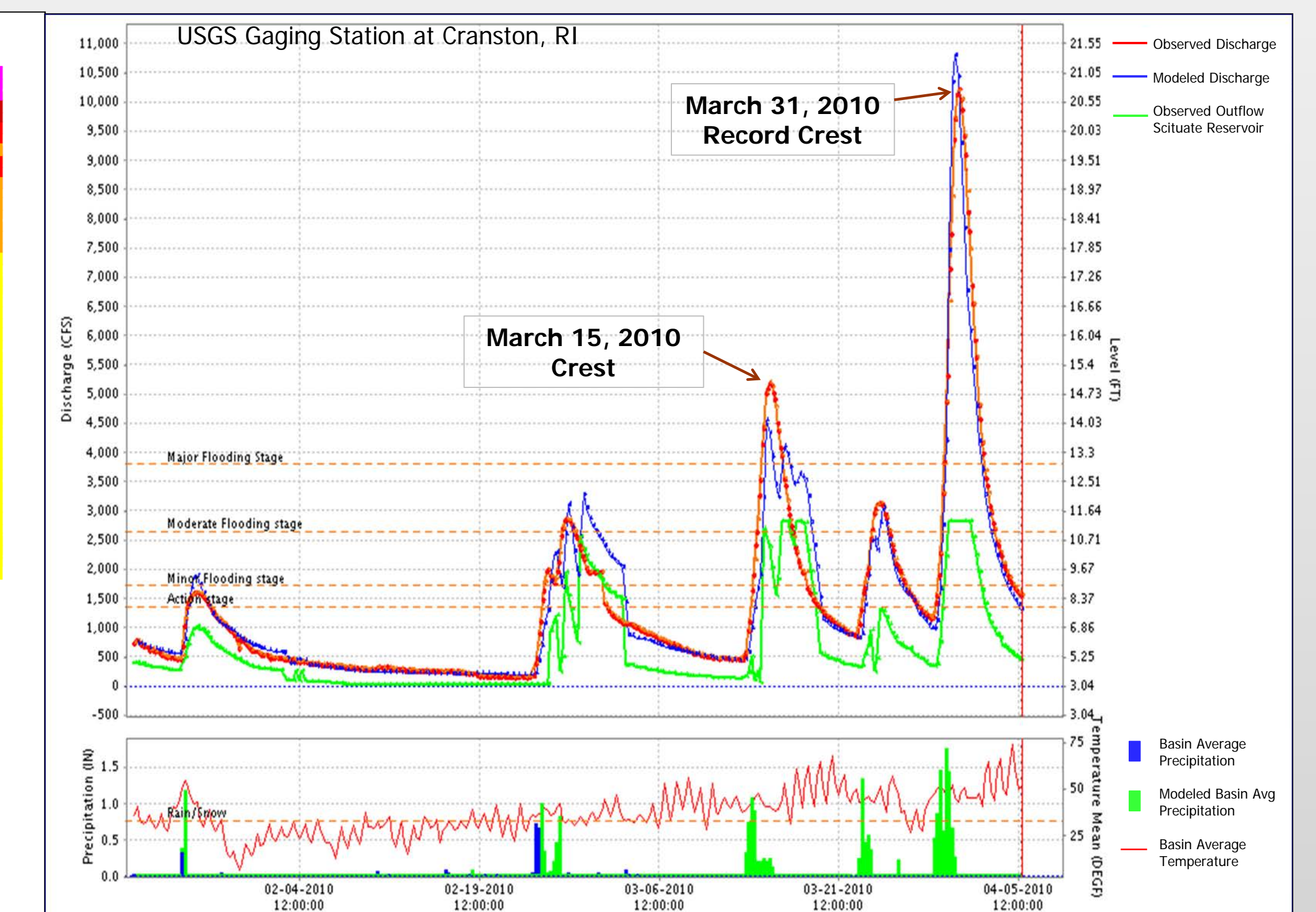
2 Day Precipitation Ending March 23, 2010



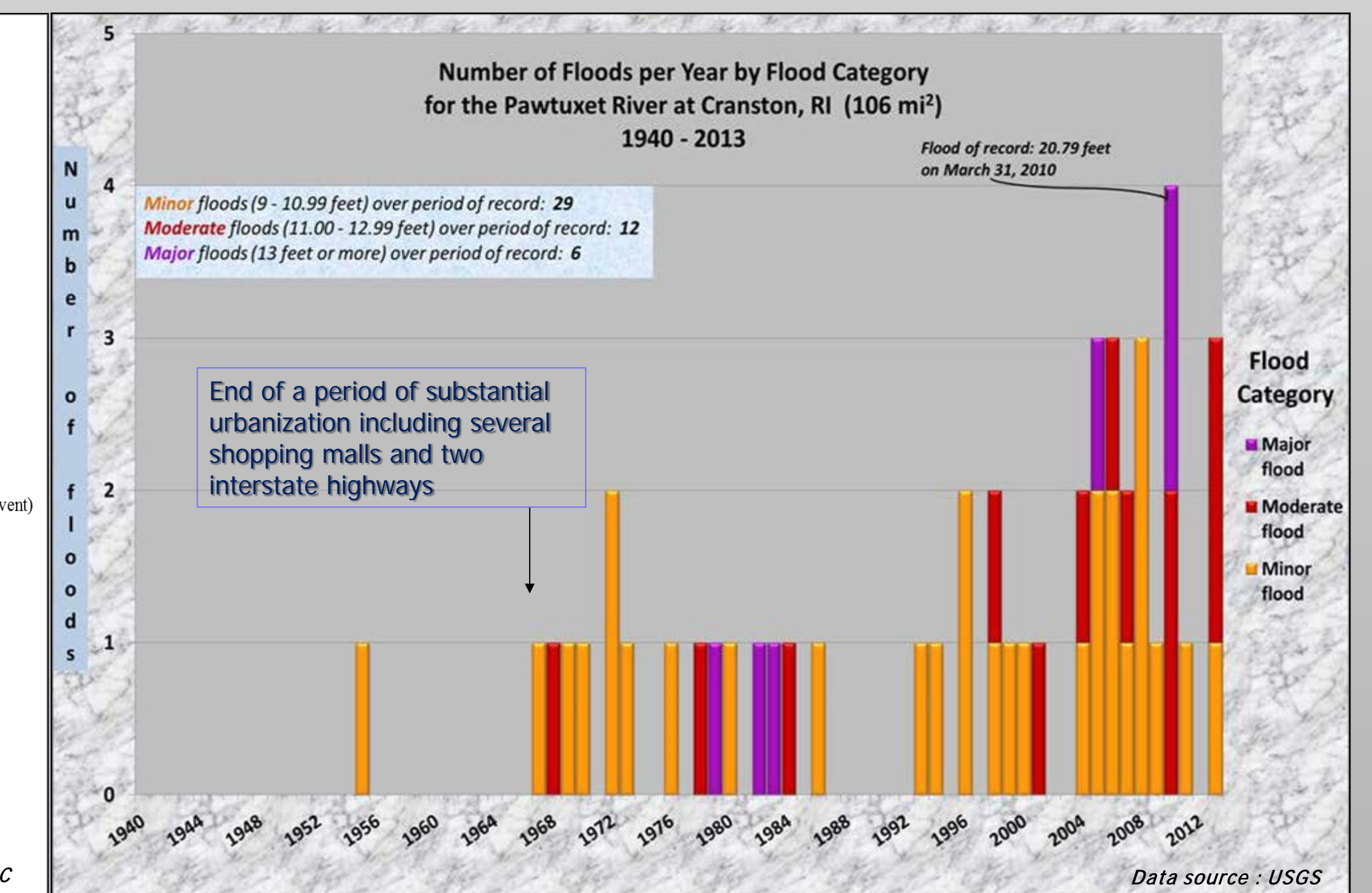
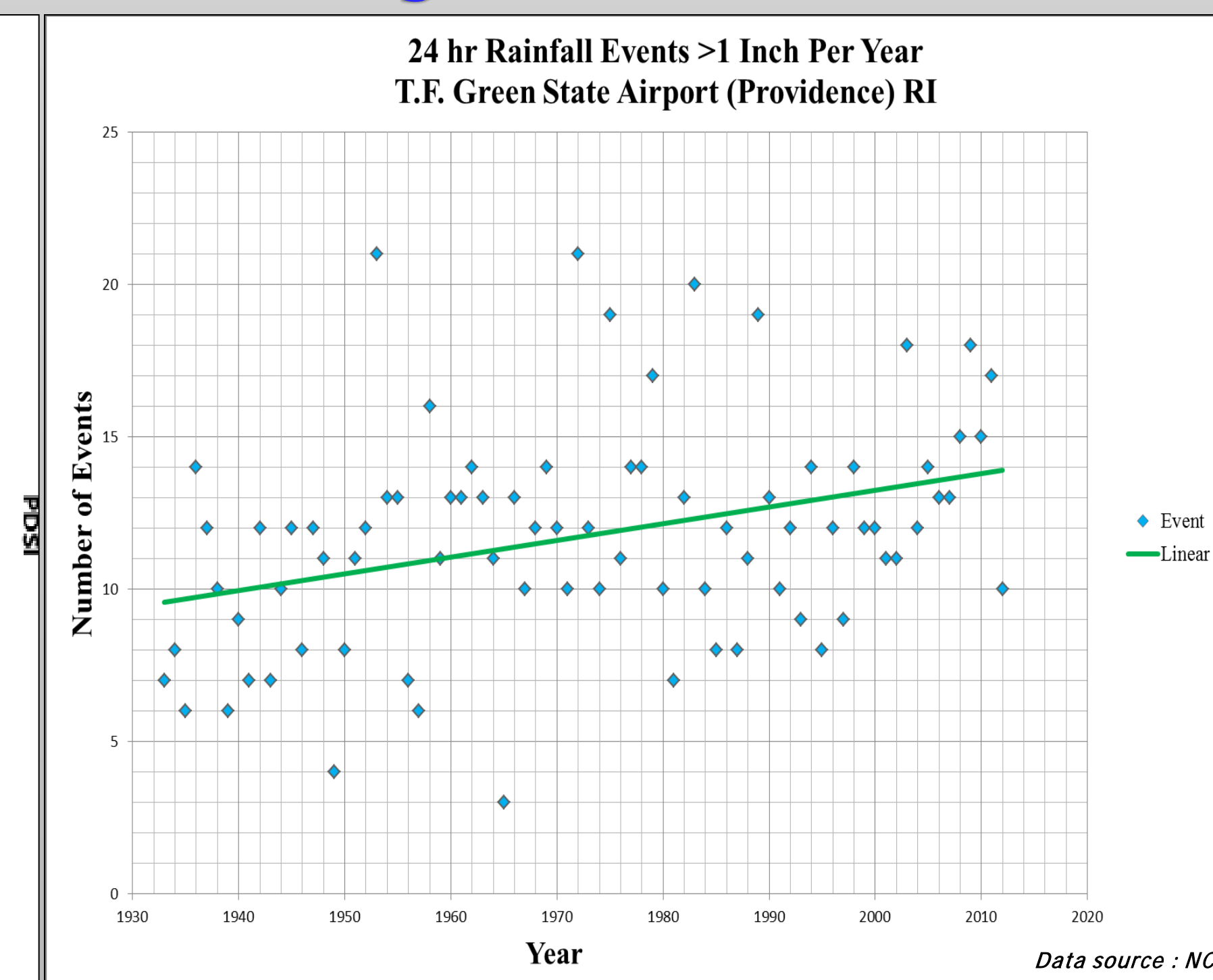
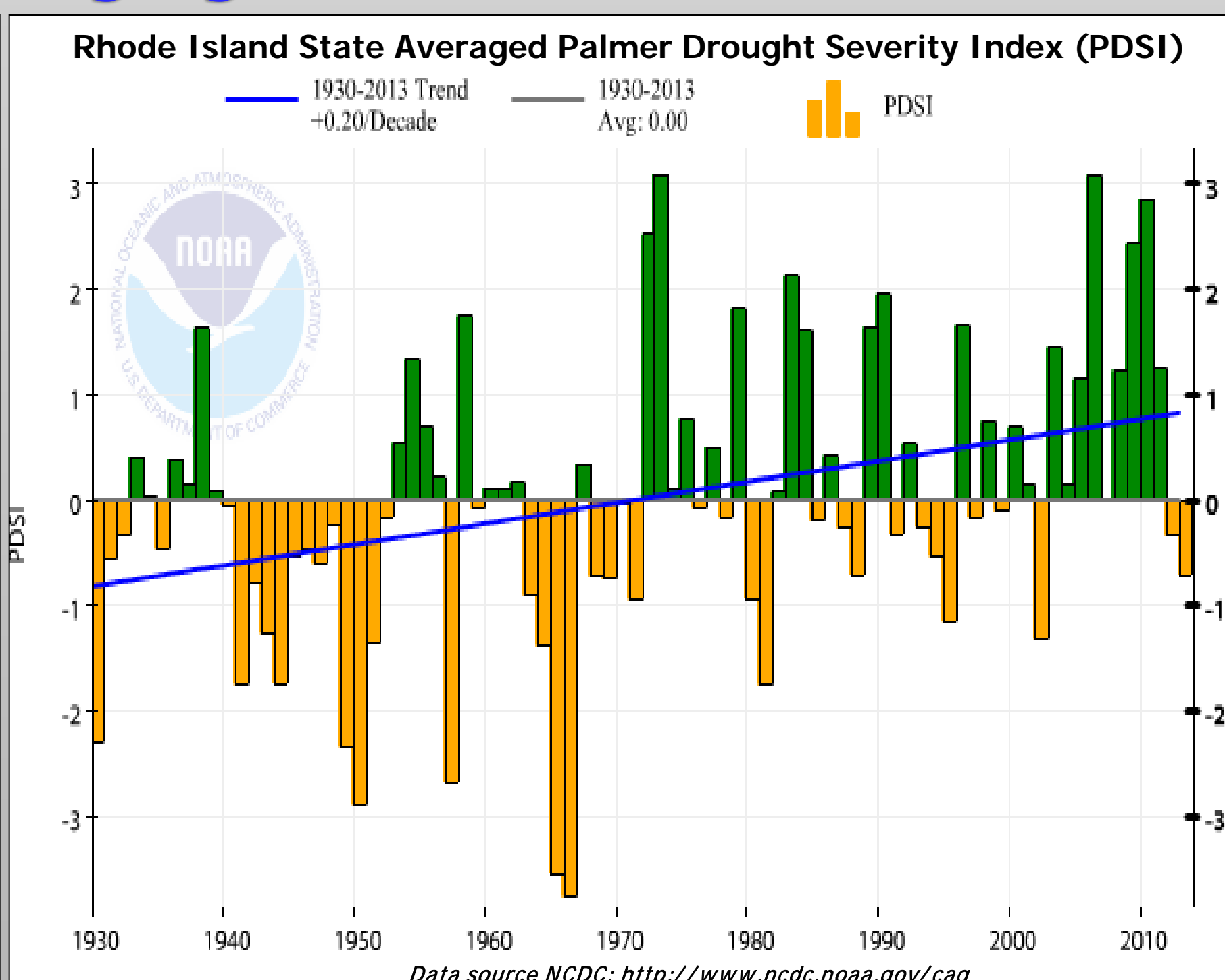
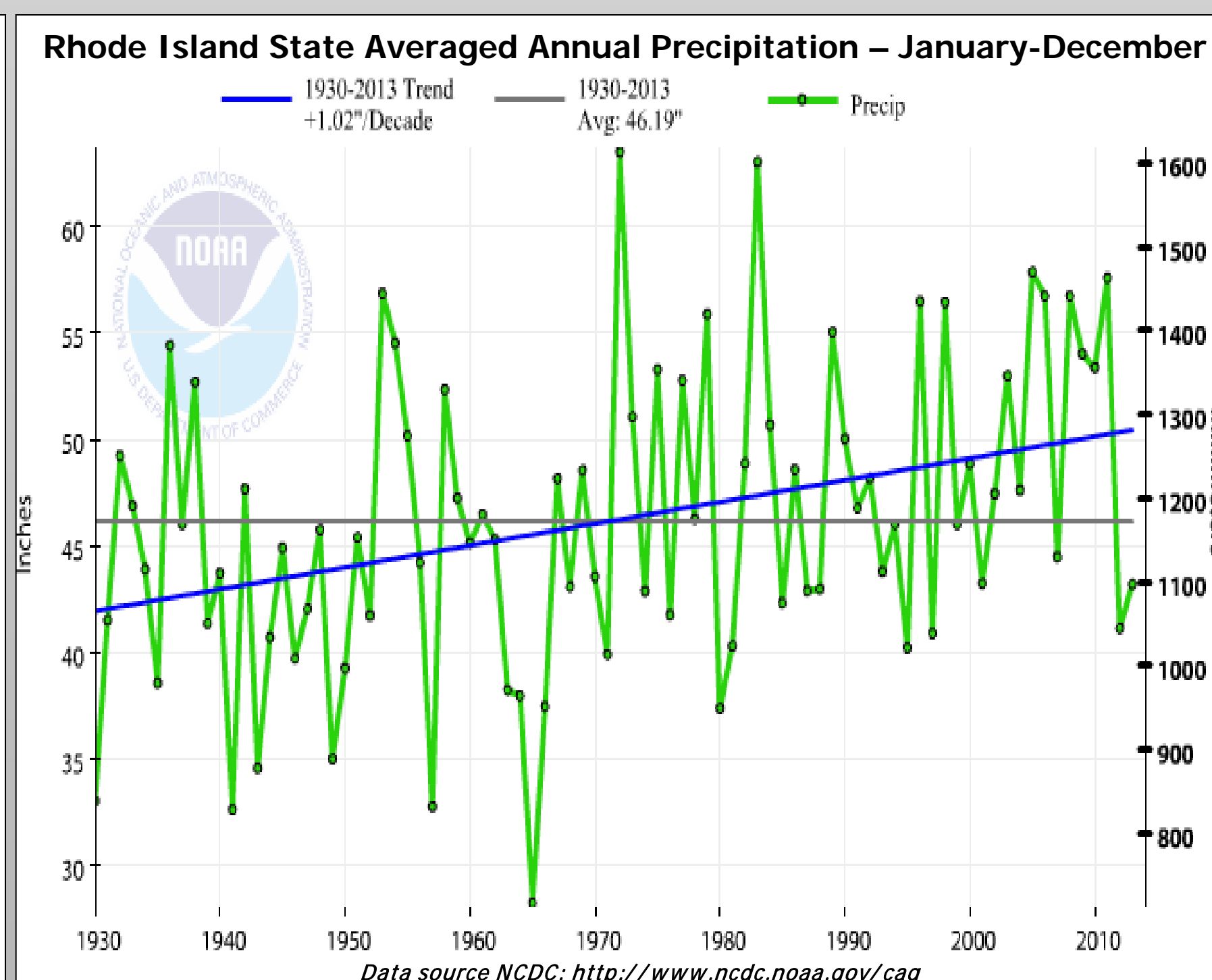
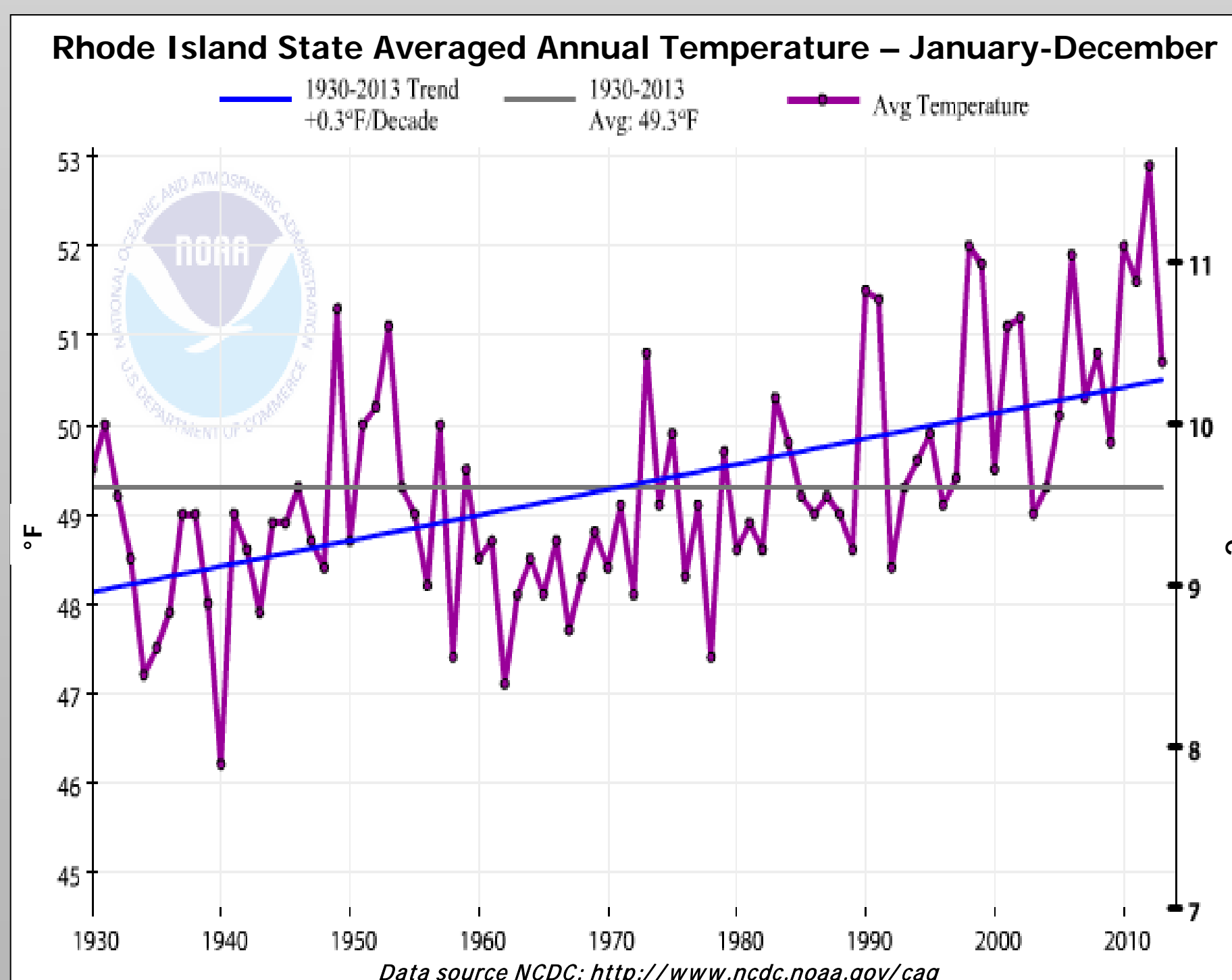
3 Day Precipitation Ending March 31, 2010



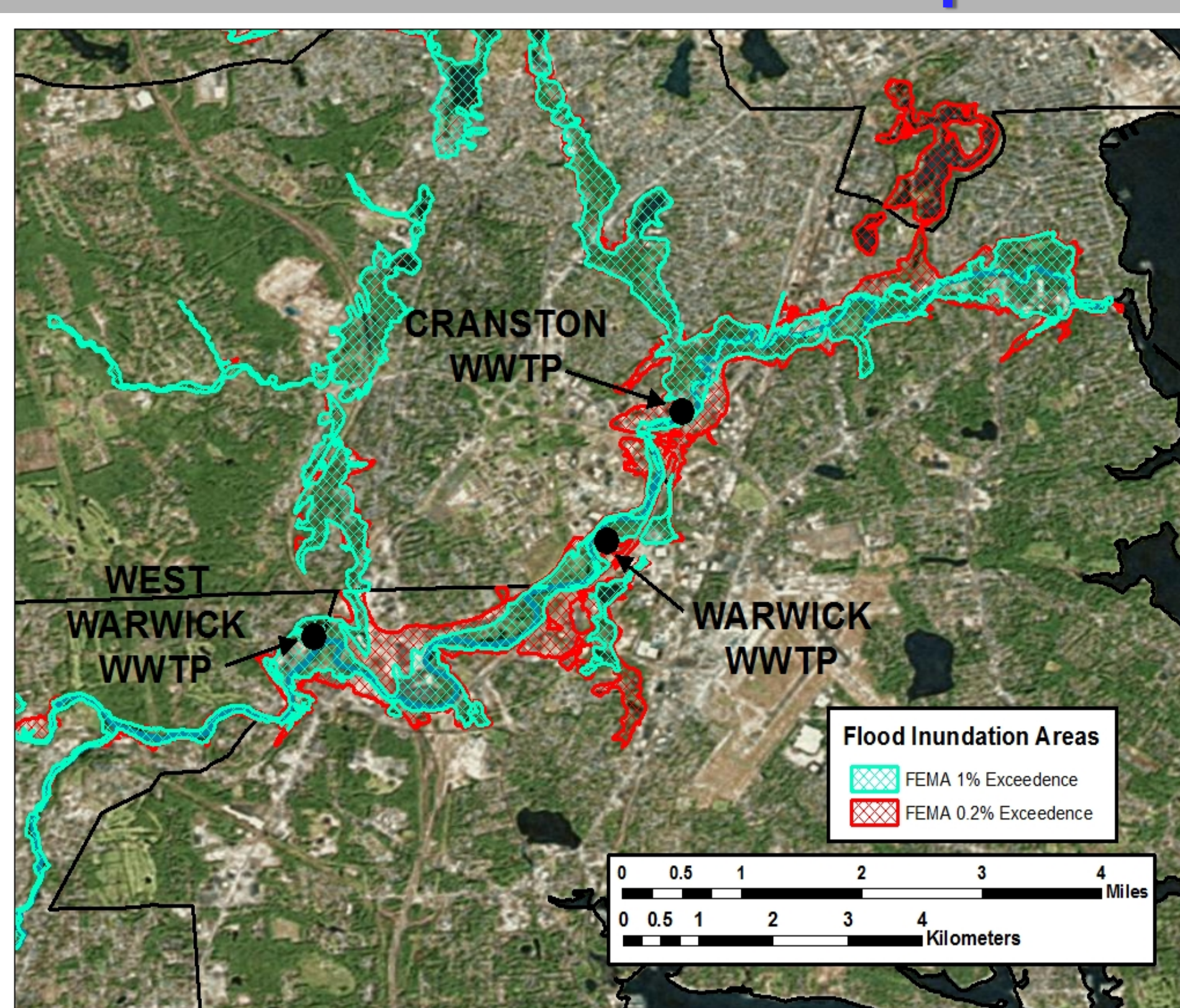
## Pawtuxet River's Record Response



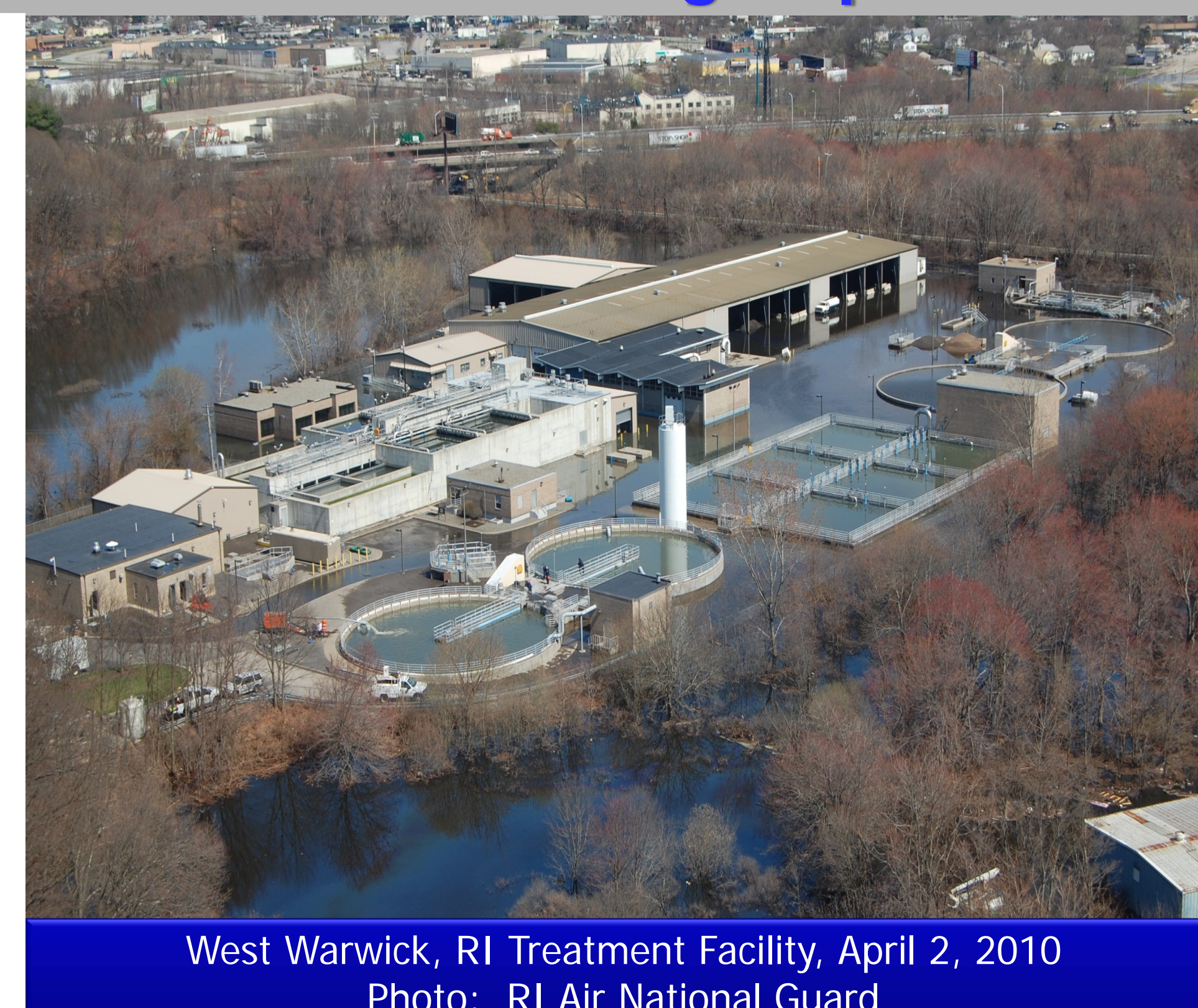
## The Changing Climate and Flood Behavior In The Region



## The Pawtuxet Basin Floodplain



## Devastating Impacts to Wastewater Treatment Facilities



West Warwick, RI Treatment Facility, April 2, 2010  
Photo: RI Air National Guard



Warwick Treatment Facility, April 2, 2010  
Photo: RI Air National Guard

## RI DEM's Response to Changing Climate & Flood Frequency

- Established a Climate Liaison in the DEM Office of Water Resources
- Educated wastewater superintendents on changing climate & flood behavior through partnership with NOAA/NWS.
- Established a "Boot Camp" to train plant operators and incorporated climate change impacts in the curriculum
- In partnership with RI Division of Planning and the RI Rivers, Bays, and Watersheds Coordination Team – launched a full-scale wastewater infrastructure vulnerability assessment related to climate change and natural hazards

Summary of Major Activities  
Following the Record Floods of March 2010



Graduates from the April 2014  
Wastewater Operator Boot Camp