National Water Program

Tools for Adapting Water Programs to a Changing Climate

EPA Science Advisory Board; December 2013

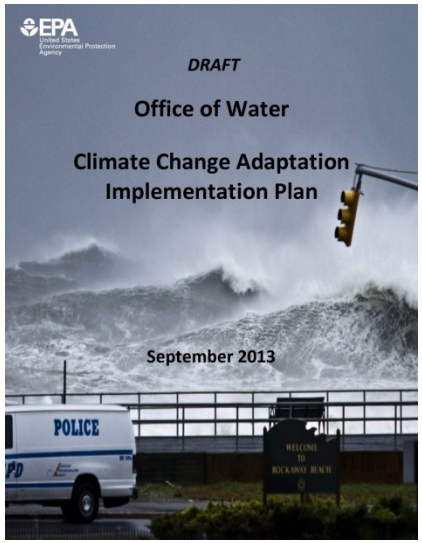
Climate Change Extension (CCX) to the Stormwater Calculator

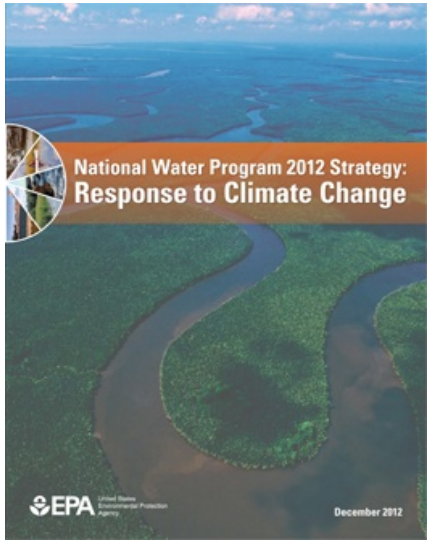
Big Picture:

- Office of Water released draft *Climate Change Adaptation Plan*

- Builds on *2012 National Water Program Strategy: Response to Climate Change*

-Tools Fit Larger Effort to Adapt Water Programs to a Changing Climate





Mission Statement

To provide the water sector (drinking water, wastewater, and stormwater utilities) with the practical tools, training, and technical assistance needed to adapt to climate change by promoting a clear understanding of climate science and adaptation options.




Climate Ready Tools & Resources

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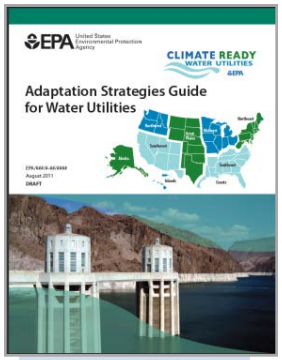
Climate Ready Process

Adaptive Response Framework

Explore Elements of Climate Readiness

Adaptation Strategies Guide



Learn Climate and Adaptation Basics

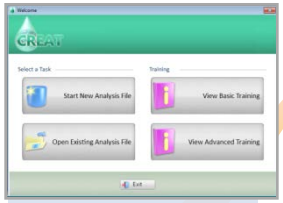
Toolbox

Research and Gather Information

Extreme Events Workshop Planner

Collaborate with Partners

Climate Resilience Evaluation and Awareness Tool



Assess Risks and Evaluate Opportunities

About CREAT

- Software tool for conducting **risk assessment** of potential climate change impacts at a water utility
- Multiple climate scenarios provided to help **capture uncertainty**
- Assessments will help inform **adaptation planning**
- Results from CREAT help utilities compare potential **costs, risk reduction and energy implications** of different options

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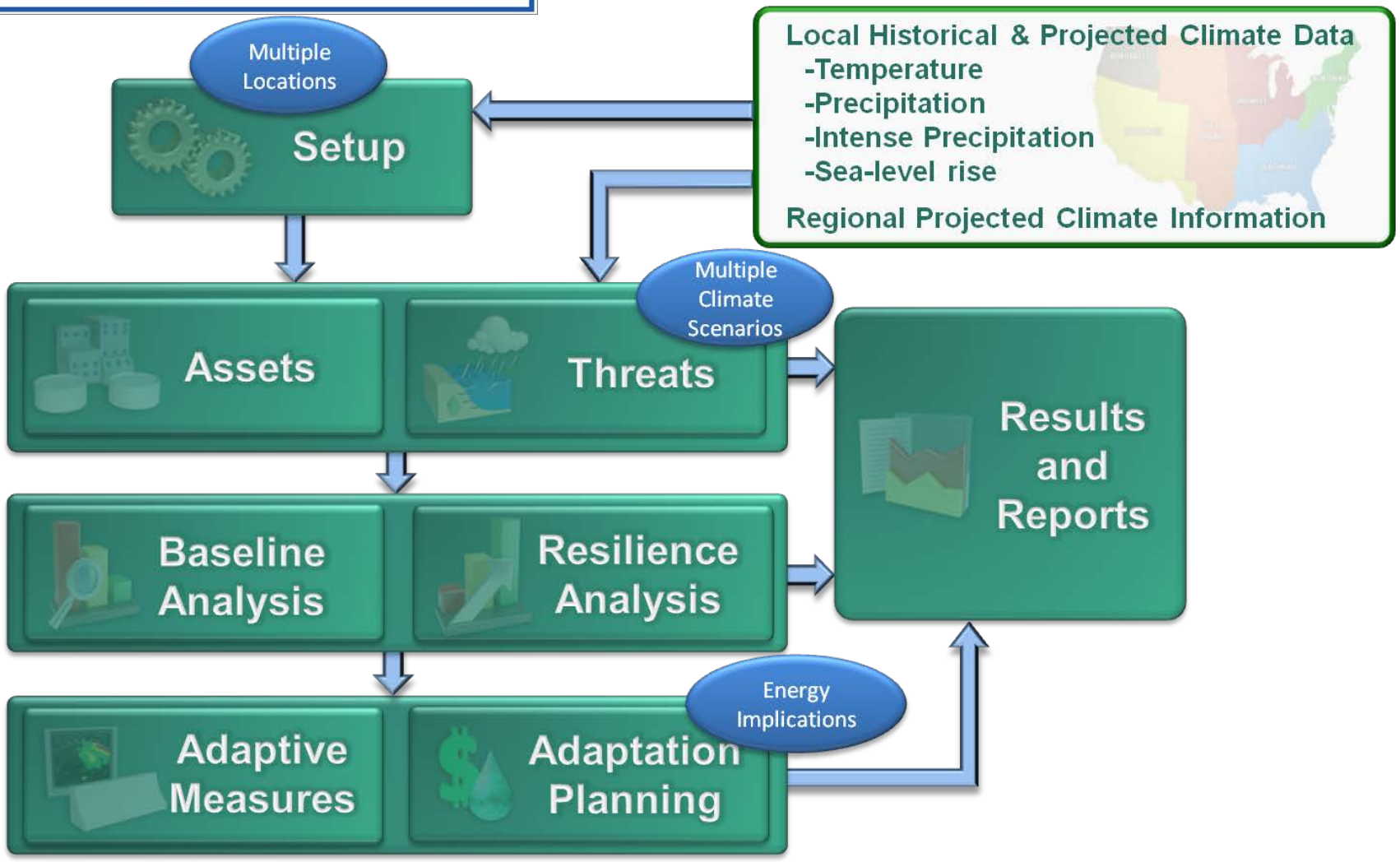
Process



What Can You Do In CREAT?

- Explore local climate data
- View links to publications, models and other tools

- Catalog data and assumptions
- Understand and assess climate impacts

- Compare adaptation options
- Generate reports to support decisions

Climate Data Sources

- Many sites provide access to climate projection data online
- Users may be uncertain about
  - Which data to use: Model? Time period?
  - How to access data?
  - How to apply data?
- CREAT provides data for utilities within a risk assessment framework
- If available, users can enter and use their own data as well

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Watershed Climate Change Adaptation Workbook

EPA United States Environmental Protection Agency

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The Climate Change Adaptation Workbook

Key takeaways—

- Designed as a tool for place-based organizations (communities, watershed groups, etc.).
- Meets EPA commitments to provide guidance on doing vulnerability assessments.
- Provides guidance for writing action plans based on the vulnerability assessments.
- Based on a risk management standard published by the International Organization for Standardization (ISO).

EPA United States Environmental Protection Agency

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WORKBOOK foundation

Every place-based organization is unique

- impacts, situation, context, purpose, resources
- need a generic system

Watershed organizations (e.g. NEPs) will probably face 100+ discrete risks

- need a system that will guide planning

NEP has four cornerstones:

(1) Focus on the watershed
(2) Integrate science into decision-making
(3) Foster collaborative problem solving
(4) Involve the public

EPA United States Environmental Protection Agency

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Why this WORKBOOK ?

Lots of recognition from experts that an iterative risk management and vulnerability assessments are the way to go for climate change adaptation.
(IPCC, NRC, ICCATF, NOP, GAO, etc.)

EPA has committed to develop tools and to help communities respond to climate change

- EPA Strategic Plan
- EPA Climate Change Adaptation Plan
- NWP climate change strategy
- Freshwater Action Plan
- National Ocean Policy implementation

EPA United States Environmental Protection Agency

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Climate Change Adaptation

For CRE, climate change adaptation has two parts

- Vulnerability Assessment
- Action Plan(includes executing the plan)

Vulnerability Assessments—

Assess climate risks: identify, analyze, evaluate

An Action Plan—

Uses the vulnerability assessment to set priorities, and to identify, develop, and implement responses

Adaptation reduces (eliminates) risks from climate change.

WORKBOOK contents, based on ISO 31000

Preface; Introduction
Step 1* Communication and Consultation
Step 2 Establishing the context for the Vuln. Assess.
Step 3 Risk Identification
Step 4 Risk Analysis
Step 5 Risk Evaluation: Comparing Risks
Step 6 Establishing the Context for the Action Plan
Step 7 Risk Evaluation: Deciding on a Course
Step 8a Finding Adaptation Actions
Step 8b Selecting Adaptation Actions
Step 9 Preparing and Implementing an Action Plan
Step 10 Monitoring and Review
Appendices

Climate Change Extension (CCX) to the Stormwater Calculator

Joint Project: Office of Water and Office of Research and Development

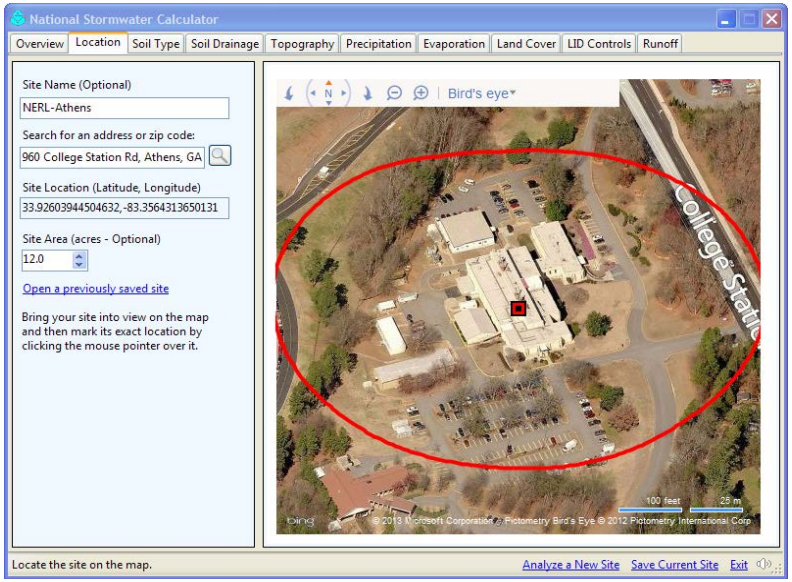
EPA's National Stormwater Calculator

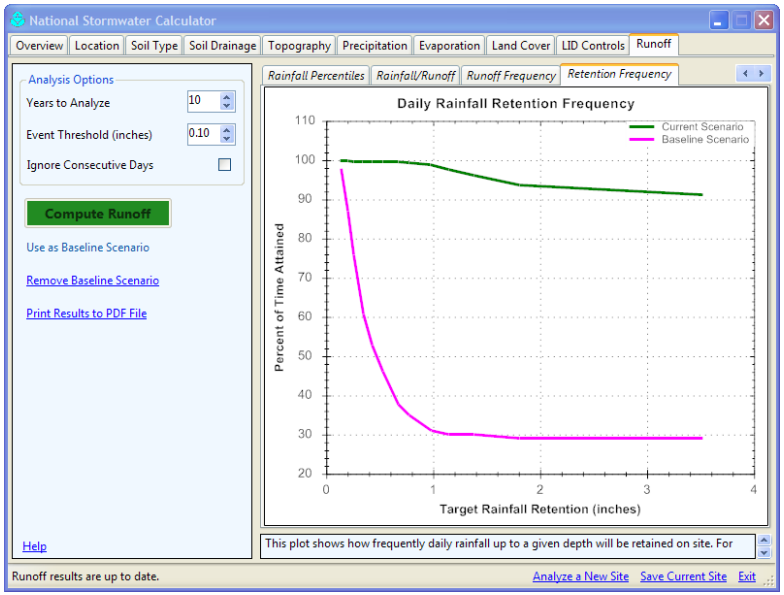
- **Description**

  Simple to use program for computing rainfall runoff from individual properties under different development and LID control scenarios.

- **Features**
  - Can be run by non-modelers.
  - Accesses national databases for local soil and meteorological data.
  - Includes LID controls (rain gardens, green roofs, porous pavement, etc.).
  - Runs SWMM in the background to simulate the site's response to a full set of hydrologic conditions.

- **Potential Uses**
  - EISA compliance at federal facilities
  - State post-construction retention stds.
  - Local stormwater fee credit programs





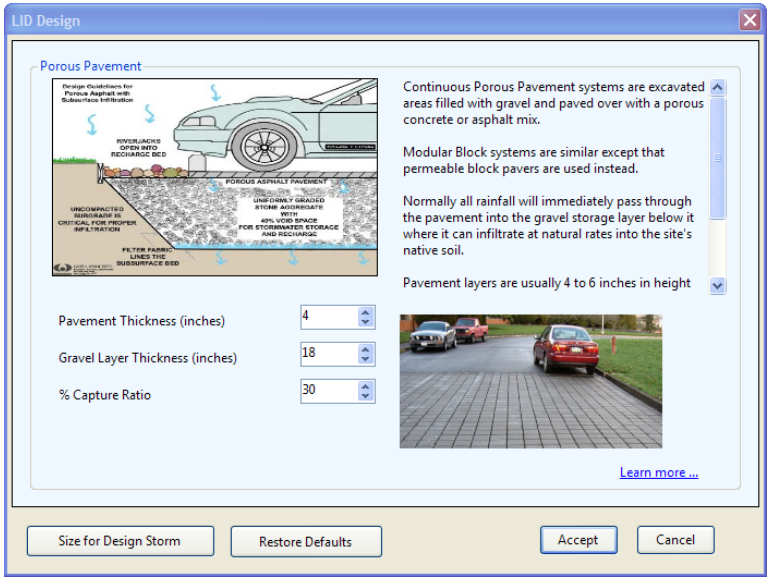
EPA's National Stormwater Calculator

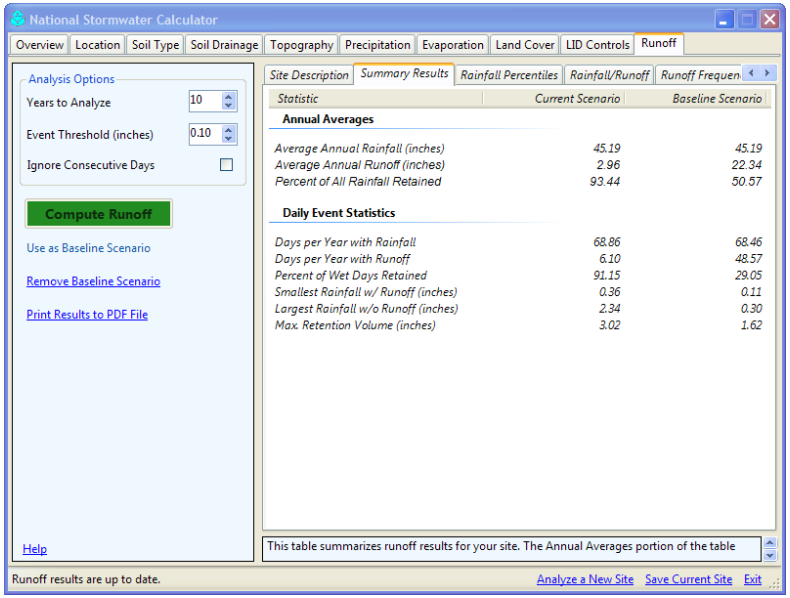
- **Limitations**
  - Applies only to individual properties, not to larger water/sewersheds.
  - Provides only screening level analysis.
  - Doesn't cover all types of GI solutions (swales, trees, compound LIDs).

- **Disclaimer (stated on opening page)**

  Users should check with their local stormwater control agencies as to whether its results will be accepted (e.g., EPA is NOT mandating its use).

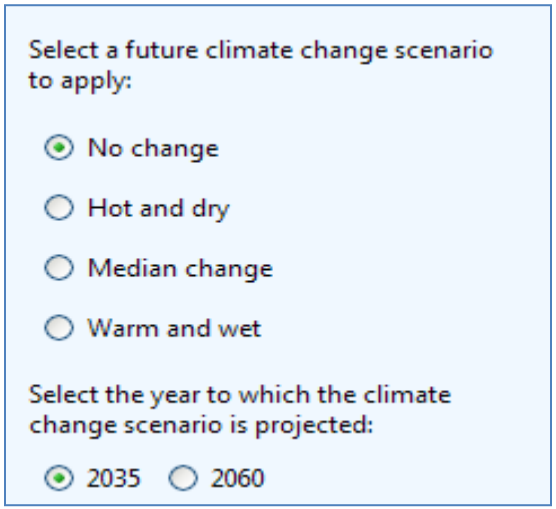
- **Outreach**
  - Launched July 24, 2013.
  - 4,000 downloads after one month.
  - Workshops and webinars held/planned.

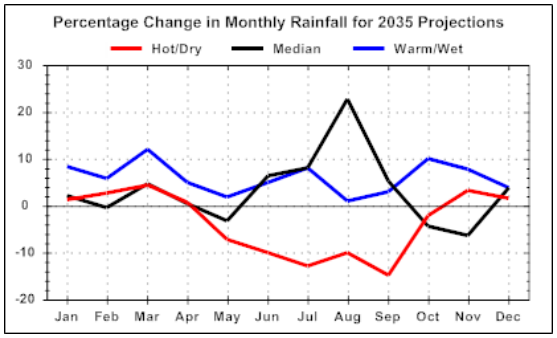


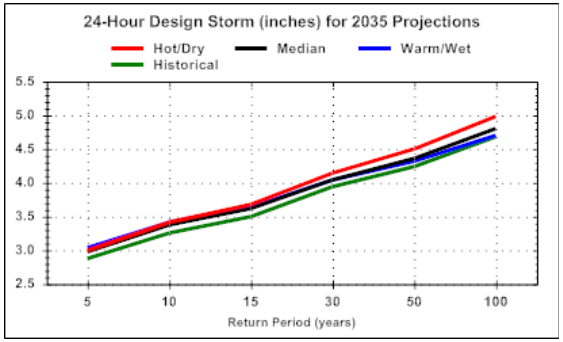


Climate Change Extension to the SWC (CCX)

- Adds a new tab to the existing SWC for Climate Change
- Allows user to select from six different climate change scenarios that span the outcomes from over 100 runs of the IPCC models.
- Uses the CREAT database to determine the change that each scenario has on both monthly mean rainfall and on the annual max. daily rainfall at different return periods for the site-specific local rainfall record.
- Calculates the long-term hydrologic response of the site to a rainfall record modified by the monthly mean changes.
- Calculates the response of the site to the climate-induced max. 24-hour rainfall at different return periods (5, 10, 15, 30, 50, and 100 years).
- Scheduled to be operational by December 2013.







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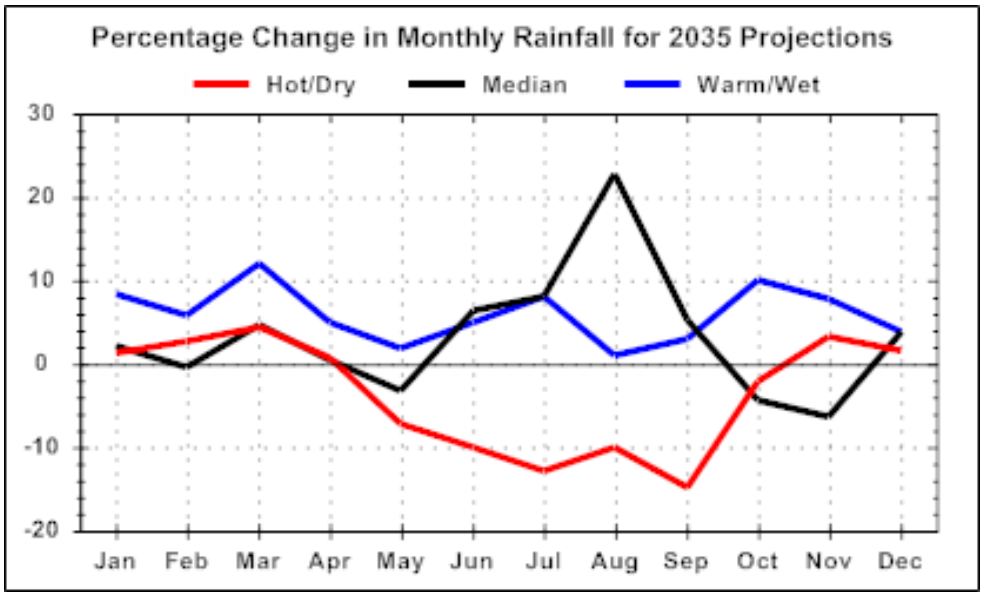

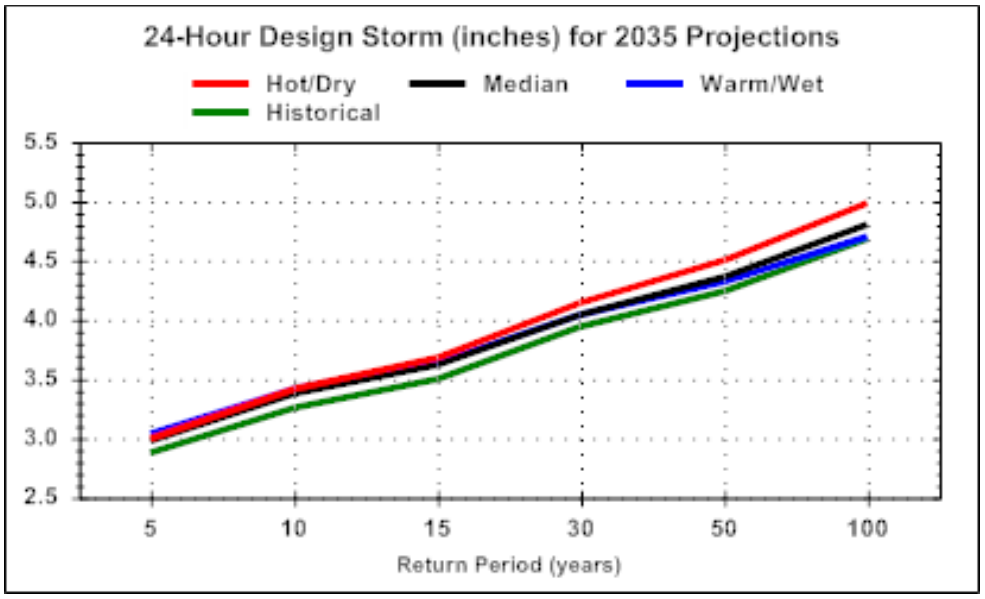

Thank you!

Water Program Climate Adaptation:

- Jeff Peterson; Office of Water

•Climate Ready Water Utilities:

- Curt Baranowski; Office of Groundwater and Drinking Water

Climate Workbook:

- Michael Craghan; Office of Wetlands, Oceans and Watersheds

•Stormwater Calculator:

- Rachael Novak, Office of Science and Technology
- Lewis Rossman, Office of Research and Development

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Climate Change Extension (CCX) to the Stormwater Calculator