



## **EPA National Water Program Climate Adaptation Tools**

*A summary of tools developed by the EPA National Water Program for state, tribal, and local governments and others to adapt their clean water and drinking water programs to a changing climate.*

### **Climate Ready Estuaries**



#### **Being Prepared for Climate Change: A Workbook for Developing Risk-Based Adaptation Plans**

The workbook provides guidance for conducting risk-based climate change vulnerability assessments and developing adaptation action plans. It is an ideal tool for organizations that manage places, watersheds or coastal environments.

**Available at:** <http://www2.epa.gov/cre/risk-based-adaptation>

#### **Rolling Easements Primer**

This document is a primer on more than a dozen land use and legal tools for ensuring that intertidal habitats (wetlands, mudflats and beaches) can persist even as sea level rises.

**Available at:** <http://www2.epa.gov/cre/climate-ready-estuaries-rolling-easements-primer>

#### **Synthesis of Adaptation Options for Coastal Areas**

This guide provides a brief introduction to key physical impacts of climate change on estuaries and a review of on-the-ground adaptation options available to coastal managers to reduce their systems' vulnerability to climate change impacts.

**Available at:** <http://www2.epa.gov/cre/synthesis-adaptation-options-coastal-areas>

### **Climate Ready Water Utilities**



#### **Climate Resilience and Awareness Tool (CREAT)**

CREAT is a software tool that assists drinking water and wastewater utility managers in understanding potential climate change threats, assessing the related risks at their individual utilities, and developing adaptation strategies

**Available at:** <http://water.epa.gov/infrastructure/watersecurity/climate/creat.cfm>

#### **Storm Surge Inundation Map and Hurricane Strike Frequency Map**

This an interactive map that illustrates the current worst-case storm surge and inundation scenarios on the American Gulf and Atlantic coasts, including Puerto Rico and the U.S. Virgin Islands.

**Available at:** <http://water.epa.gov/infrastructure/watersecurity/climate/stormsurge.cfm>

#### **Scenario-Based Projection Map**

This is an online map that provides easy access to localized scenarios of projected changes in annual precipitation, precipitation intensity, annual average temperature, 100-year storm events, and sea-level rise.

**Available at:** <http://water.epa.gov/infrastructure/watersecurity/climate/scenario.cfm>

#### **Adaptation Strategies Guide**

This interactive guide helps drinking water and wastewater utility managers gain a better understanding of what climate-related impacts they may face in their region, and what adaptation strategies can be used to prepare their system for those impacts.

**Available at:** <http://water.epa.gov/infrastructure/watersecurity/upload/epa817k15001.pdf>

## **Preparing for Extreme Weather Events: Workshop Planner for the Water Sector**

The Workshop Planner contains all of the materials needed to plan and conduct a customized workshop focused on planning for more frequent and intense extreme events.

**Available at:** <http://yosemite.epa.gov/ow/SReg.nsf/WorkshopRegistrar?OpenForm&Download=WORKSHOP>

## **Emergency/Incident Planning, Response, and Recovery**

### **Flood Resilience Guide: A Basic Guide to Water and Wastewater Utilities**

Targeted to small and mid-size utilities, the Flood Resilience Guide outlines a simple, 4-step assessment process to help any water utility know their flooding threat and identify practical mitigation options to protect their critical assets.

**Available at:** <http://water.epa.gov/infrastructure/watersecurity/emerplan/upload/epa817b14006.pdf>

### **Water Utility Response *On-The-Go* mobile website**

The mobile website allows water and wastewater utility personnel to easily access critical emergency response information, facilitating water sector response from the field.

**Available at:** <http://watersgeo.epa.gov/responseotg/>

### **Water Sector Incident Action Checklists**

These checklists outline critical measures that drinking water and wastewater utility personnel can take immediately before, during, and after an emergency to protect their systems.

**Available at:** <http://water.epa.gov/infrastructure/watersecurity/emerplan/index.cfm#pp29>

## **Water Quality Tools**

### **National Stormwater Calculator Climate Assessment Tool (SW-CAT)**

The SW-CAT is a desktop application that estimates the annual amount of rainwater and frequency of runoff at a specific site. It informs site developers, landscapers and homeowners on how to meet a desired stormwater retention target with and without the use of green infrastructure. It estimates runoff at a site anywhere in the United States (including Puerto Rico) based on available information such as soil type, landscape and land-use information, and weather.

**Available at:** <http://www2.epa.gov/waterresearch/national-stormwater-calculator>

### **Storm Water Management Model Climate Adjustment Tool (SWMM-CAT)**

SWMM is widely used throughout the world as the "gold standard" in the design of urban wet-weather flow pollution abatement approaches. It is a dynamic hydrology-hydraulic water quality simulation model used for single event or long-term (continuous) simulation of runoff quantity and quality from primarily urban areas, and allows users to include any combination of low impact development (LID)/green infrastructure controls to determine their effectiveness in managing stormwater and sewer overflows. SWMM-CAT is a simple to use add-on that applies monthly climate adjustment factors onto historical precipitation and temperature data to consider potential impacts of future climate on stormwater.

**Available at:** <http://www2.epa.gov/water-research/storm-water-management-model-swmm>

### **BASINS 4 Climate Assessment Tool (BASINS-CAT)**

BASINS is a multi-purpose, environmental analysis system that integrates a geographical information system (GIS), national watershed data, and state-of-the-art watershed modeling tools, including the Hydrologic Simulation Program FORTRAN (HSPF) model, Soil and Water Assessment Tool (SWAT), and Stormwater Management Model (SWMM) into one package. BASINS-CAT is a plug-in available for use with the pre-existing, calibrated BASINS model that provides flexible capabilities for creating climate change scenarios, allowing users to quickly assess a wide range of what-if questions about how weather and climate could affect streamflow and water quality endpoints.

**Available at:** <http://water.epa.gov/scitech/datait/models/basins/download.cfm>

### **Coming Soon: HAWQS-Climate Initiative (HAWQS-CI)**

The Hydrologic and Water Quality System, or HAWQS is a national water quality modeling system that integrates the latest environmental data with state-of-the-art computer technology. It can model seven categories of pollutants, including nutrients and sediment. Input data is organized around the National Hydrography Dataset stream reaches and catchments and includes historical weather data from across the nation. When data on soils, crops, land use, and nutrients in a watershed are combined with the climate data, future impacts of climate change on water quality and quantity can be estimated.