CLIMATE ADAPTATION FORUM

Lessons Learned: How We Adapt on the Road to Climate Adaptation

EBC Environmental Business Council of New England

UMass Boston Sustainable Solutions Lab

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Regional Coordinator for Greater Boston, Municipal Vulnerability Program
Executive Office of Energy and Environmental Affairs
Commonwealth of Massachusetts

Strategies for Water Supply and Water Treatment Adaptation In Response to Climate Change and Decarbonization Goals

Scott Struck

Principal Scientist/Engineer

National Renewable Energy Laboratory (NREL)

EBC Environmental Business Council of New England | UMass Boston Sustainable Solutions Lab

Quarterly Climate Adaptation Forum | October 12, 2023

Strategies for Water Supply and Water Treatment Adaptation In Response to Climate Change and Decarbonization Goals

This work was authored by the National Renewable Energy Laboratory, operated by Alliance for Sustainable Energy, LLC, for the U.S. Department of Energy (DOE) under Contract No. DE-AC36-08GO28308. Funding provided by the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy Offices. The views expressed in the presentation do not represent the views of the DOE or the U.S. Government, only those of the author.

Scott Struck, Ph.D., ENV SP, F.EWRI
Integrated Water Systems
National Renewable Energy Laboratory
Golden, Colorado

Overview

- Water-Energy nexus
- Impacts of climate change on water systems
- Adaptations for water systems
- Beneficial capture and use?
- Policy / regulatory landscape
- Changing the paradigm: alternative water sources research directions

Climate Change is Happening!

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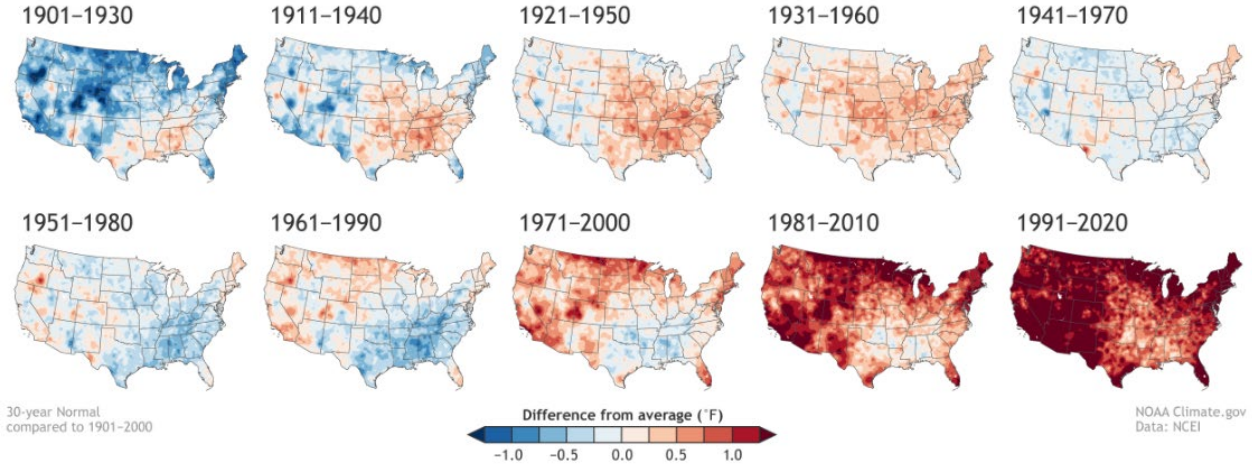
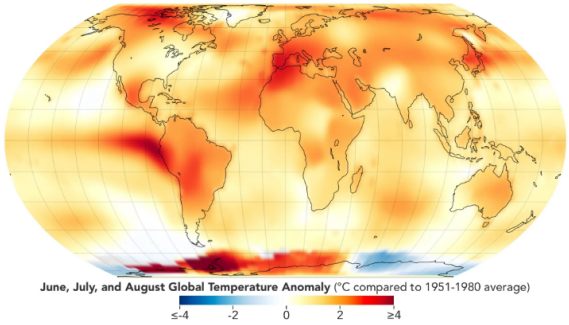
U.S. ANNUAL TEMPERATURE COMPARED TO 20th-CENTURY AVERAGE



GLOBAL CLIMATE CHANGE
Vital Signs of the Planet

NEWS | September 14, 2023

NASA Announces Summer 2023 Hottest on Record



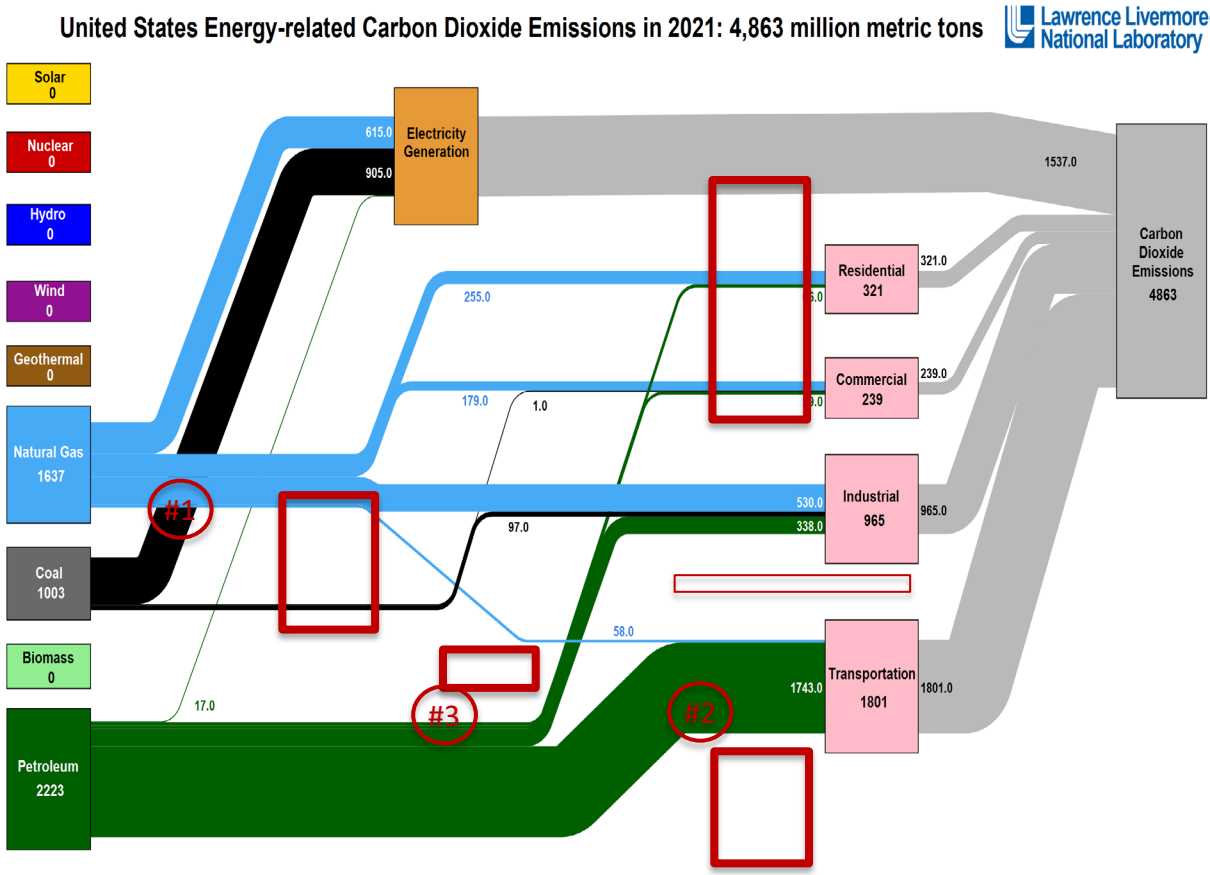
This map depicts global temperature anomalies for meteorological summer in 2023 (June, July, and August). It shows how much warmer or cooler different regions of Earth were compared to the baseline average from 1951 to 1980. Credit: NASA's Earth Observatory/Lauren Dauphin

Summer of 2023 was Earth's hottest since global records began in 1880, according to scientists at NASA's Goddard Institute of Space Studies (GISS) in New York.

The months of June, July, and August combined were 0.41 degrees Fahrenheit (0.23 degrees Celsius) warmer than any other summer in NASA's record, and 2.1 degrees F (1.2 C) warmer than the average summer between 1951 and 1980. August alone was 2.2 F (1.2 C) warmer than the average. June through August is considered meteorological summer in the Northern Hemisphere.

Water – Energy Nexus

- **Energy Use in 2021**
  - Coal: ↑ 14%
  - Petroleum: ↑ 9%
- Increase due to:
  - ↑ in NG prices
  - Transportation
- ↑ 20% in Solar
- ↑ 11% in Wind
- ↓ 12% in Hydro
- ↓ 4% in Geothermal



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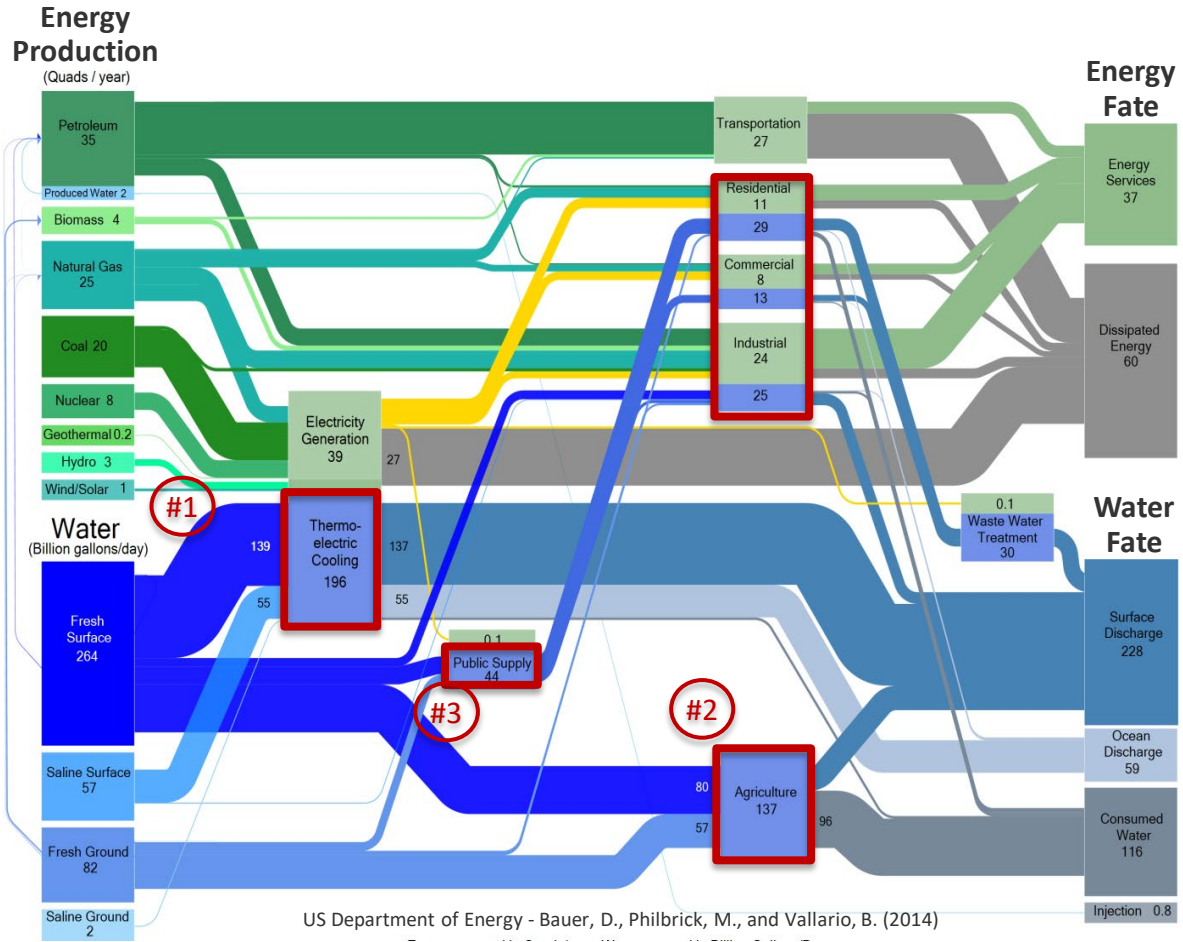

Water – Energy Nexus

Texas on top!

- **Energy Use in 2021**
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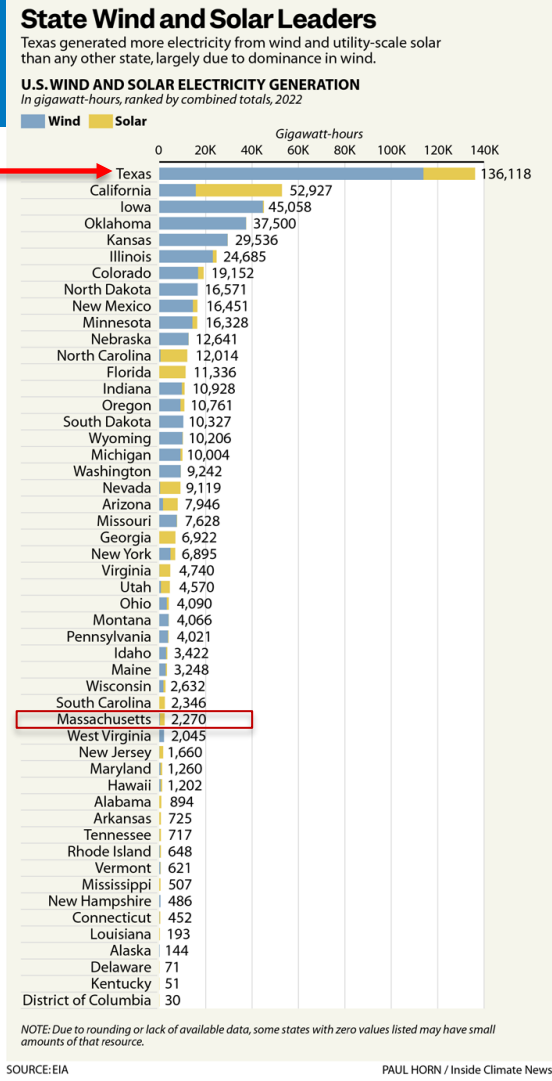


Climate Adaptation Has Started!

Climate Adaptation Plans

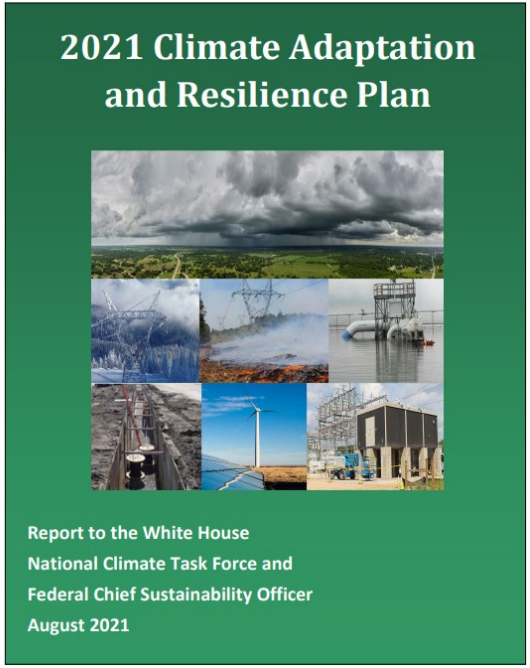
In 2021, EPA released its US EPA's Climate Adaptation Plan: October 2021 (pdf) (2.31 MB, October 2021, 231-R-210-01) in response to Executive Order (E.O.) 14008: *Tackling the Climate Crisis at Home and Abroad*. EPA's Climate Adaptation Action Plan accelerates and focuses attention on five priority actions the Agency will take over the next four years to increase human and ecosystem resilience as the climate changes and disruptive impacts increase:

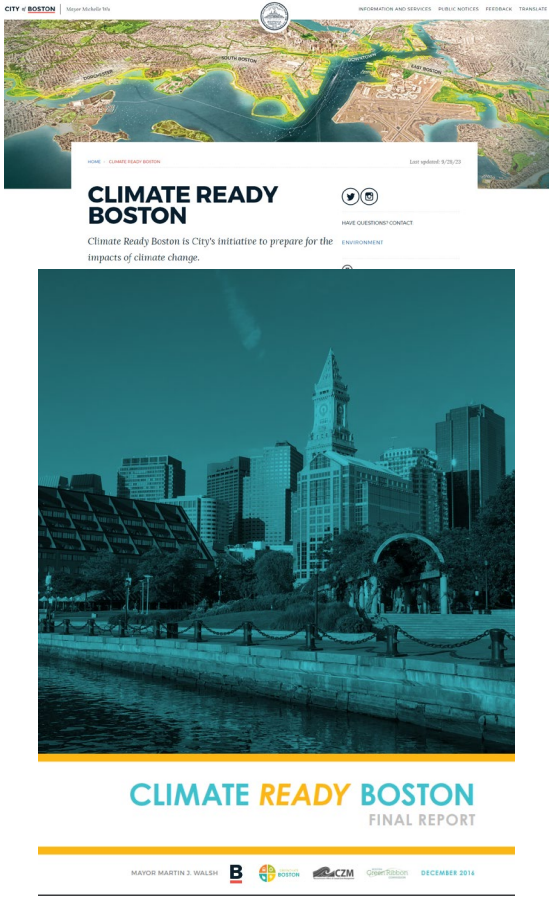
PHOTO DESCRIPTION: PARTICIPANTS PROVIDE FEEDBACK AT THE RESILIENCE SCHOOLS CONSORTIUM 2ND SCHOOL SUMMIT AT BROOKLYN COLLEGE. PHOTO CREDIT: TERI BRENNAN.

1. Integrate climate adaptation into EPA programs, policies, rulemaking processes, and enforcement activities.
2. Consult and partner with Tribes, states, territories, local governments, environmental justice organizations, community groups, businesses, and other federal agencies to strengthen adaptive capacity and increase the resilience of the nation, with a particular focus on advancing environmental justice.
3. Implement measures to protect the Agency's workforce, facilities, critical infrastructure, supply chains, and procurement processes from the risks posed by climate change.
4. Measure and evaluate performance.
5. Identify and address climate adaptation science needs.

Check out the EPA Climate Adaptation Website: EPA.gov/Climate-Adaptation

U.S. DEPARTMENT OF ENERGY





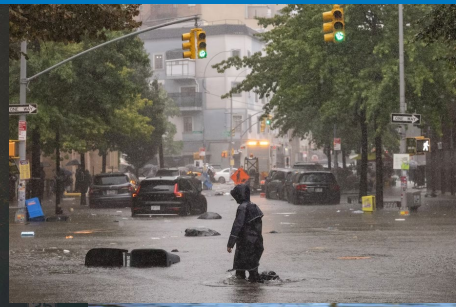
Urban and Suburban Adaptations

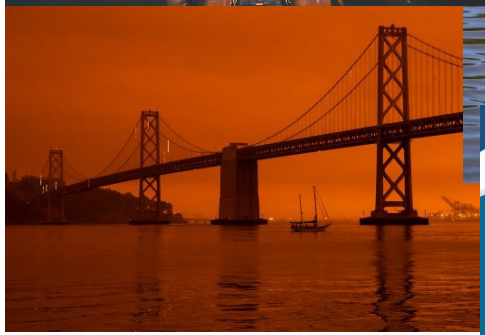
Observations

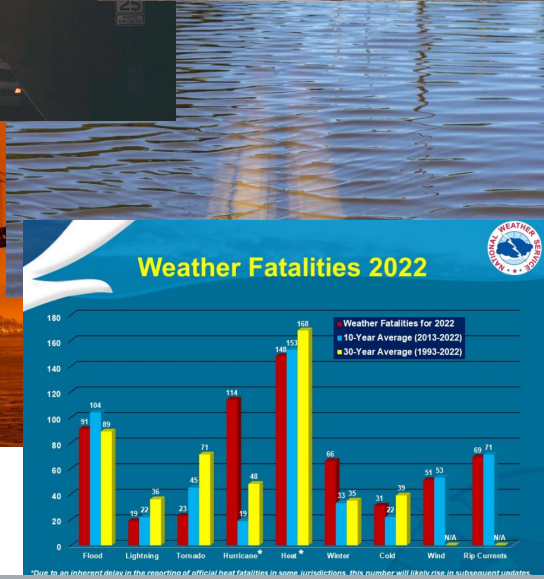
- Extreme weather events (heatwaves, floods, droughts)
- Increased air pollution
- Sea level rise

Impacts

- urban heat island generation
- Infrastructure damage and failure
- Power outages
- Forced displacement
- Increased pressures on mental health
- Increased hunger and poor nutrition
- Increased disease and premature mortality







Among weather-related fatalities, heat was the cause of more deaths between 1999-2018 in the US than any other natural hazard

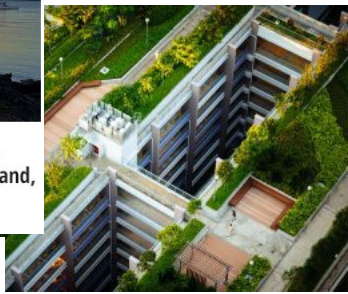
Urban and Suburban Adaptations

Adaptations

- Climate smart build by considering projected climate changes
- Green infrastructure and nature-based solutions
- Living shorelines and beneficial use of dredged material
- Invest in cooling techniques
- Consider vulnerable populations
- Embrace urban growth with clean energy solutions

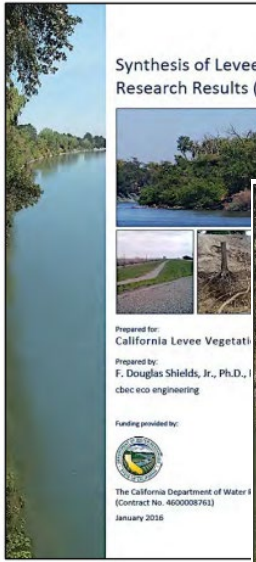
ASCE AMERICAN SOCIETY OF CIVIL ENGINEERS

EWN Researchers Will Share Expertise In The Second Of Three Webinars Hosted By The American Society For Civil Engineers.



Shoreline Stabilization And Habitat Enhancement At Nolan River Lake

EWN Workshop Explores Nature-Based Solutions At Saint Croix Island, Maine: Balancing Resilience And Preservation



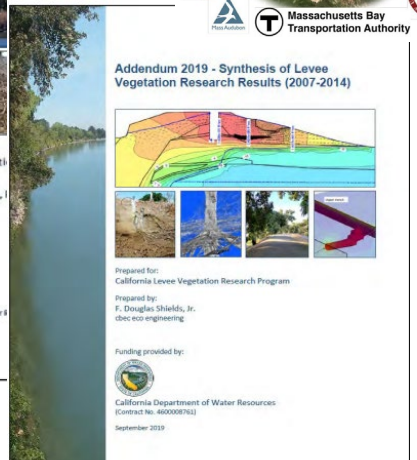
Synthesis of Levee Vegetation Research Results (2007–2014)

Prepared for:
California Levee Vegetati

Prepared by:
F. Douglas Shields, Jr., Ph.D.,
cbec eco engineering

Funding provided by:

The California Department of Water
(Contract No. 4600008761)
January 2016



Addendum 2019 - Synthesis of Levee Vegetation Research Results (2007-2014)

Prepared for:
California Levee Vegetation Research Program

Prepared by:
F. Douglas Shields, Jr.
cbec eco engineering

Funding provided by:

California Department of Water Resources
(Contract No. 4600008761)

September 2019

Mystic River WATERSHED ASSOCIATION

The Nature Conservancy

Friends of Belle Isle Marsh

Massachusetts Bay Transportation Authority

Application Of Engineering With Nature® To Enhance Urban Marsh Resiliency, Biodiversity, And Habitat

Engineering With Nature®/Coastal Inlets Research Program/Regional Sediment Management/Dredging Operations and Environmental Research

Proceedings from the US Army Corps of Engineers (USACE) 2021 Beneficial Use of Dredged Material Virtual Workshop

Taylor Cagle, Emily Russ, Kelsey Fall, Amanda Tritinger, Burton Suedel, Katie Brutsché, and Todd Bridges

August 2023

Agricultural Adaptations

Observations

- Annual average and seasonal air temperatures are increasing
- Seasons are shifting
- The number of hot days and hot nights are increasing
- Precipitation patterns are changing

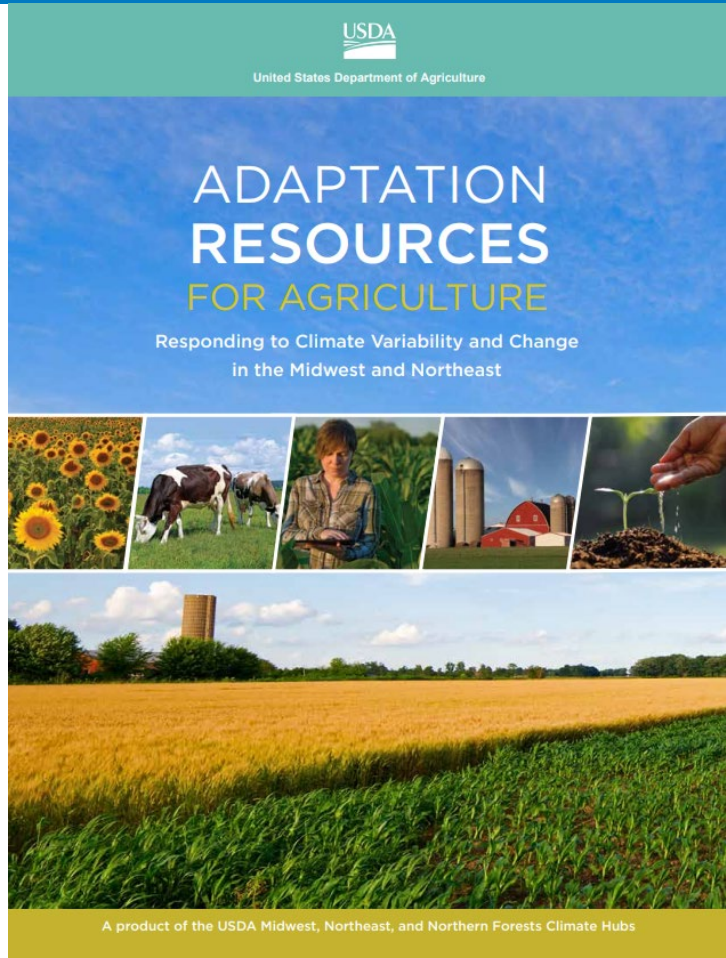
Impacts

- An increase of extreme precipitation events increases risk of damage to crops, soils, and infrastructure
- An increase of flood damage
- Severe wind and storm hazards may increase
- Warmer temperatures increase the potential for soil moisture stress and drought
- Changes in weed species and distribution
- Pest and disease pressures increases

Agricultural Adaptations

Adaptations

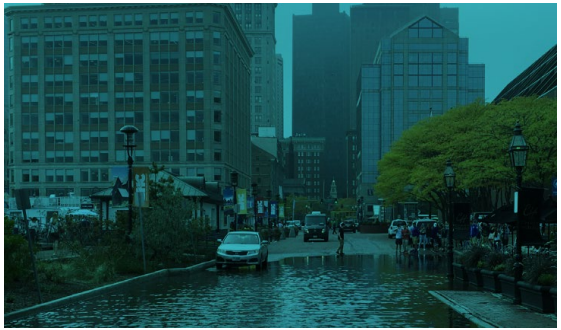
- Change selection of crops, timing, and location of field operations
- Match management practices to water supply and demand
- Increased pest management and control of invasive plant species
- Diversifying crop species and rotations with new conditions
- Integrating livestock with crop production systems
- Reduce peak flow, runoff velocity, and soil erosion and improve soil quality
- Minimizing off-farm flows of nutrients and pesticides
- Implementing more efficient irrigation practices



Adaptation Challenges – Significant, Difficult to Predict

Maui has no landfills certified to take hazardous waste. So, the EPA is forced to ship hazardous waste to licensed disposal sites on the West Coast.

Since 1991, Boston has experienced 21 events that triggered federal or state disaster declarations.



RESEARCH ARTICLE | ENVIRONMENTAL SCIENCES

Growing impact of wildfire on western US water supply

A. Park Williams, Ben Livneh, Karen A. McKinnon, +7, and Dennis P. Lettenmaier Authors Info & Affiliations

Edited by Andrea Rinaldo, Laboratory of Ecohydrology, School of Architecture, Civil and Environmental Engineering, Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland; received July 29, 2021; accepted January 10, 2022

February 22, 2022 | 119 (10) e2114069119 | https://doi.org/10.1073/pnas.2114069119

10,562 | 16

Significance

How will increasing wildfire activity affe
United States (WUS)? Among basins wh
significantly enhanced by an average c

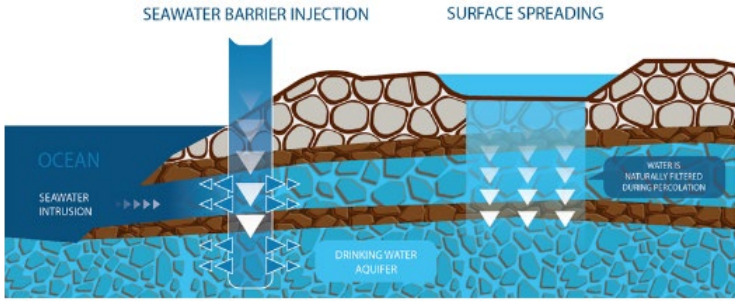
t the next 3 decades will
20, which set a modern
ience more streamflow
posing hazard
elated hazards must

Plastic pipes are polluting drinking water systems after wildfires – it's a risk in urban fires, too

Published December 14, 2020 2.27pm EST

Adaptations for Water Supply – Capture, Use, Reuse, and Recover

Aerial photos of the LA County Department of Public Works Rio Hondo Spreading Grounds



Graphic showing the two means of groundwater water replenishment: surface spreading inland and freshwater injection along the coast.

Alternative Water Supplies in California

Henry McCann, Alvar Escriva-Bou, and Kurt Schwabe

ENGLISH PDF | PDF EN ESPAÑOL

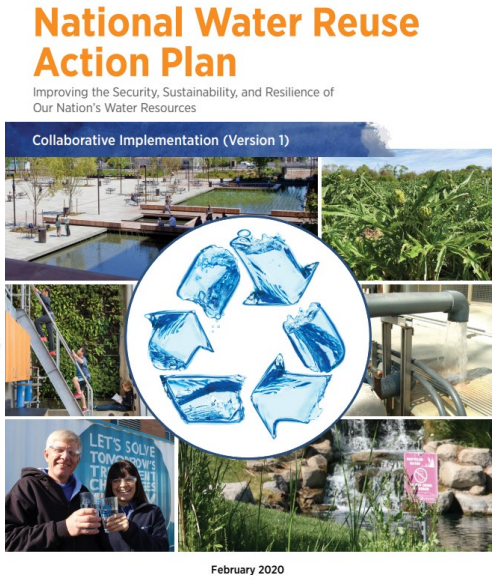
Supported with funding from the S. D. Bechtel, Jr. Foundation and the US Environmental Protection Agency (under Assistance Agreement No. 83586701)

➤ **Alternative supplies are a small but important part of the state's water portfolio.**
Alternative water sources—recycled wastewater, urban stormwater, and desalinated seawater and brackish water—now provide 2–3% of the state's urban and farm water supply, and they are growing rapidly. Recycled water use has more than doubled since the late 1980s to 700,000 acre-

Can We Capture, Use, Reuse, and Recover Water?

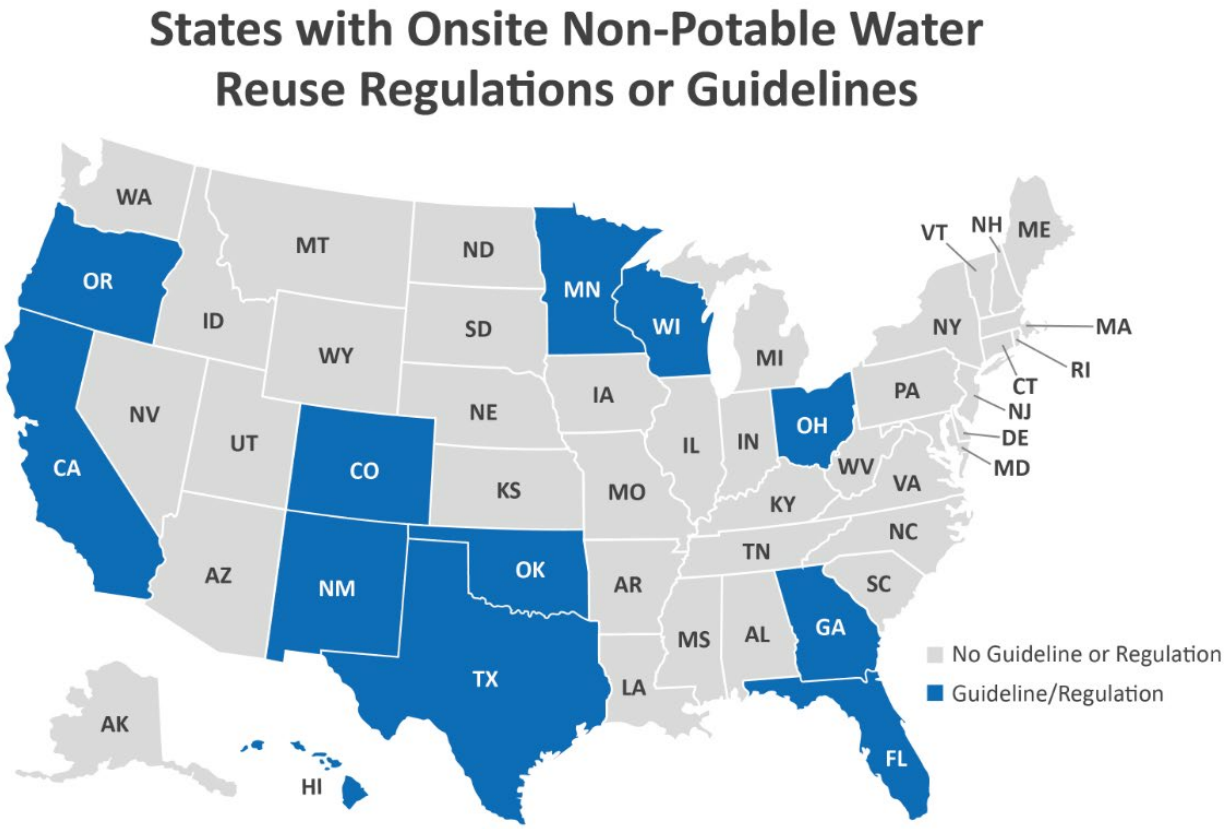
- Kind of… Perhaps… Mostly… Depends… Yes!!!
- Information and Tools
- But…regulations matter!

Introducing the REUSExplorer: A Tool to Examine Water Reuse Regulations



https://www.epa.gov/system/files/documents/2022-03/wrap-pure-potential-report.pdf

Regulations – Reuse (Independent of Water Source)



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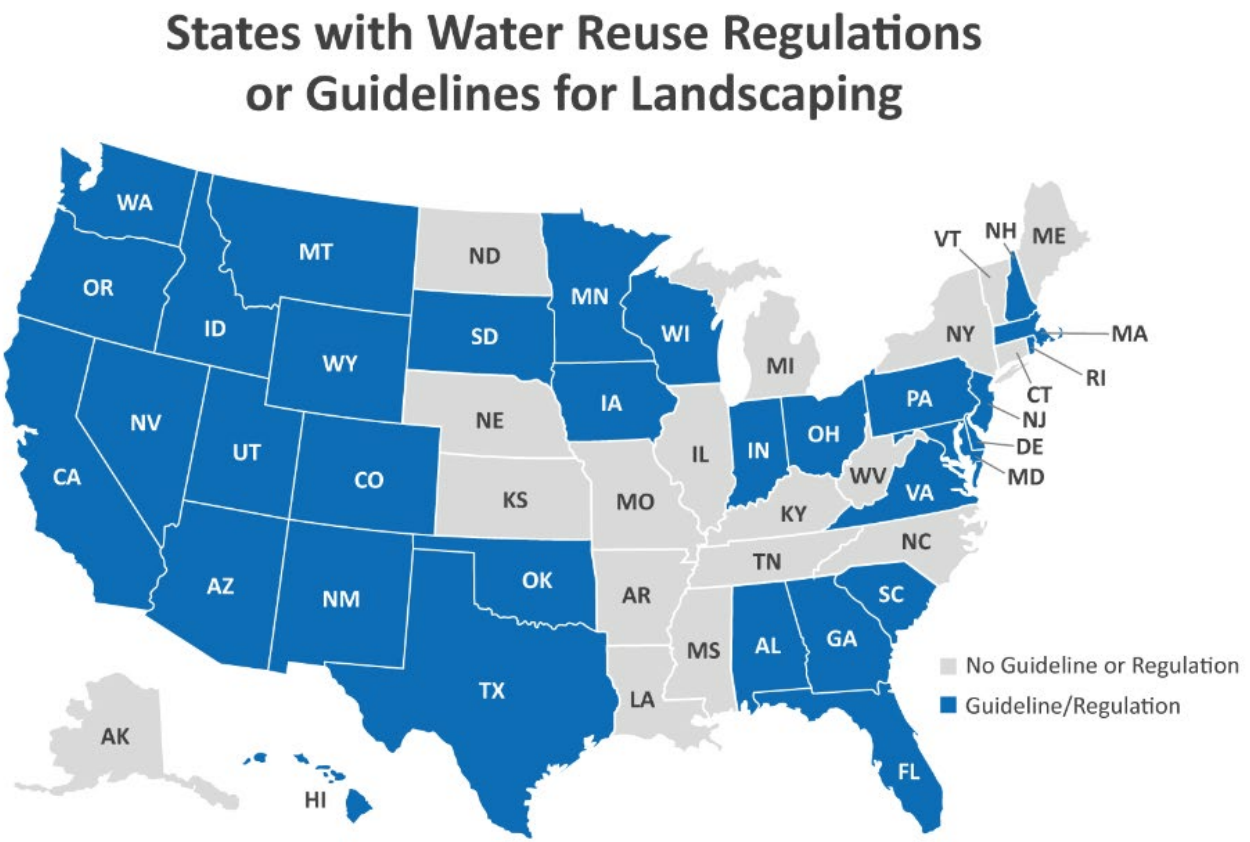

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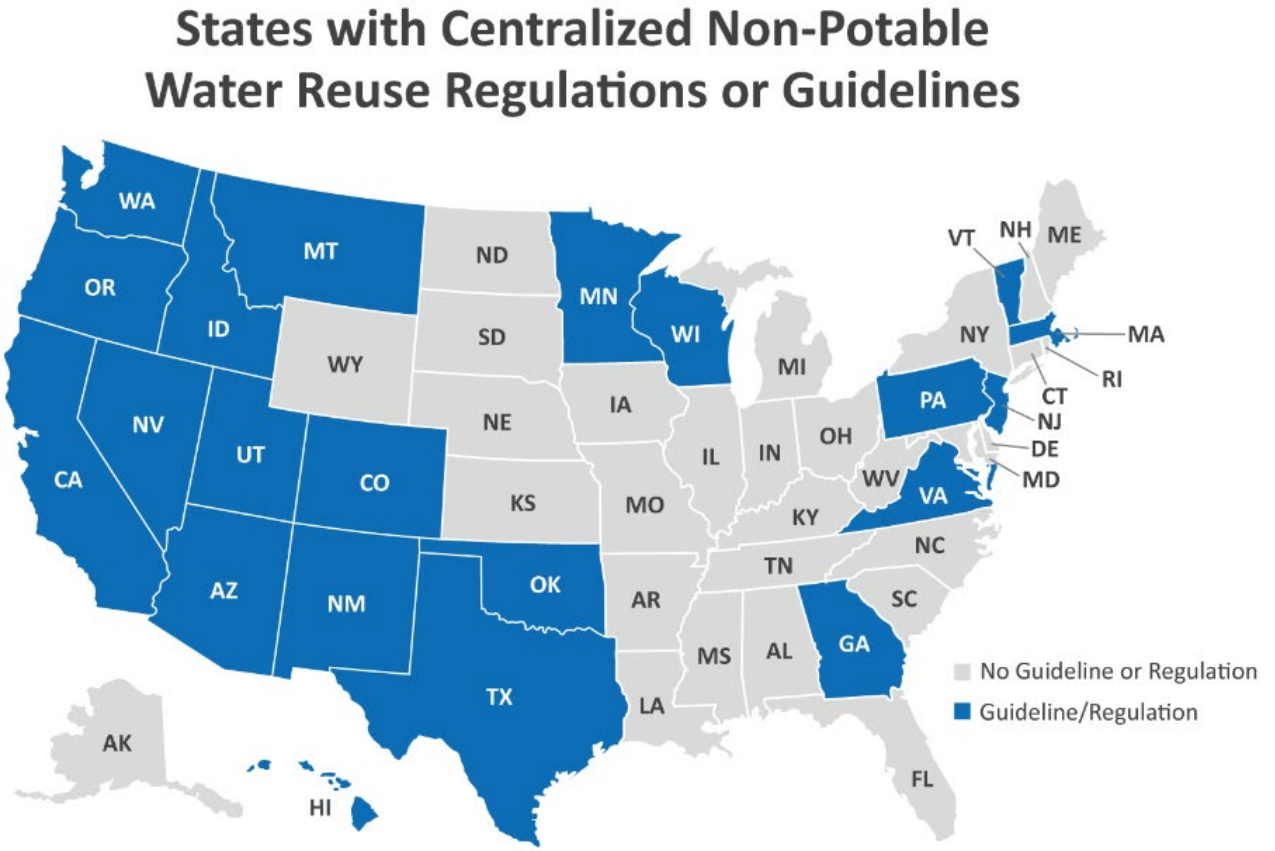
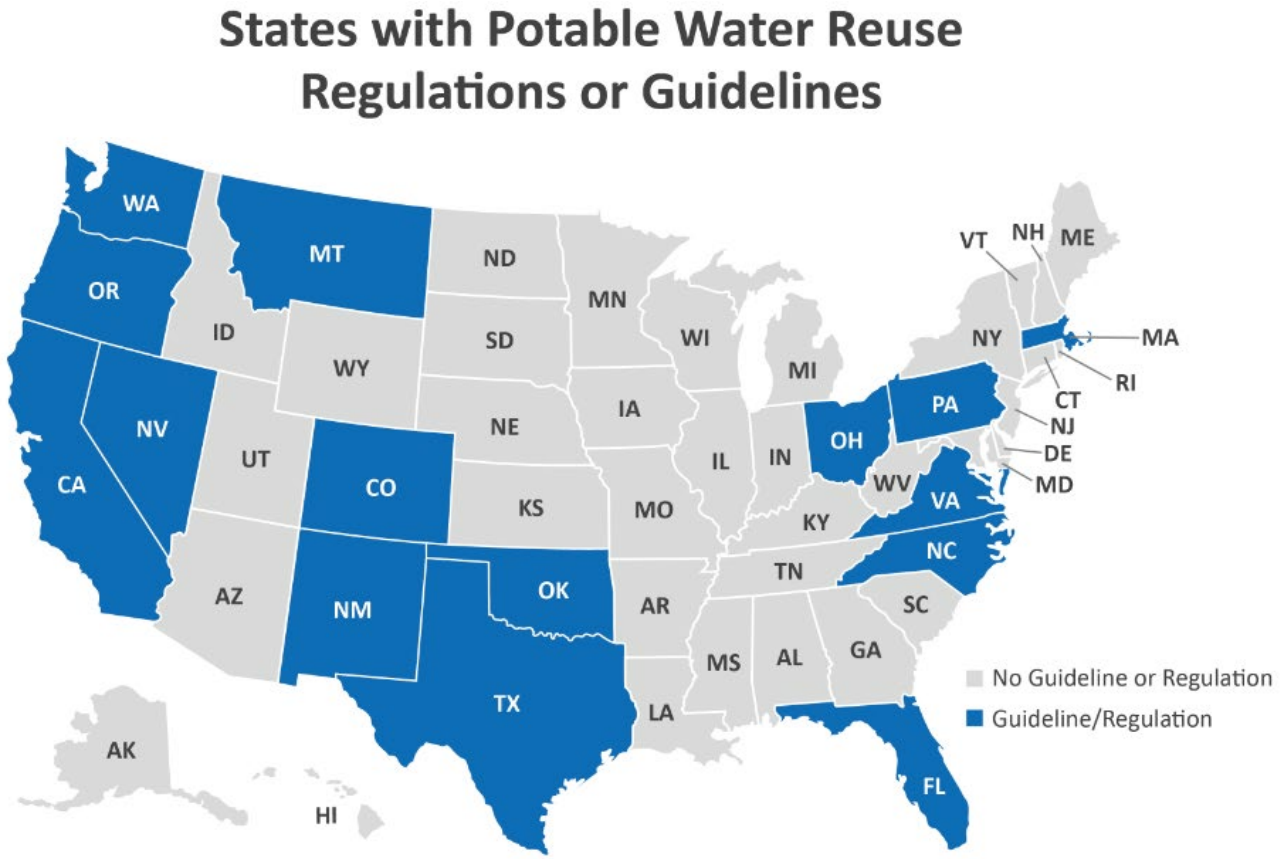


Date created: March 2023

Find more information at www.epa.gov/reusexplorer

Regulations – Reuse (Independent of Water Source)

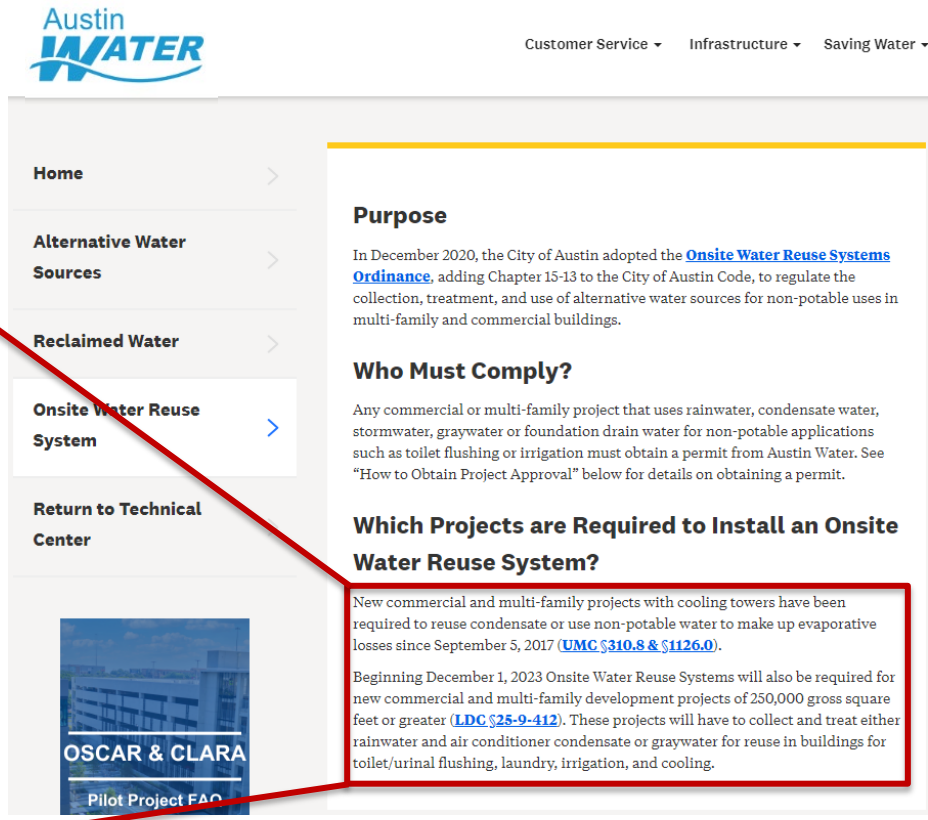


Example Regulatory Requirement

- Austin, TX

New commercial and multi-family projects with cooling towers have been required to reuse condensate or use non-potable water to make up evaporative losses since September 5, 2017 (**UMC §310.8 & §1126.0**).

Beginning December 1, 2023 Onsite Water Reuse Systems will also be required for new commercial and multi-family development projects of 250,000 gross square feet or greater (**LDC §25-9-412**). These projects will have to collect and treat either rainwater and air conditioner condensate or graywater for reuse in buildings for toilet/urinal flushing, laundry, irrigation, and cooling.



Integrated Water Systems Research

Water Sources

Climate Variability
Supply – Demand – Quality


Surface Water


Groundwater


Rainwater/Stormwater Capture and Use


Industrial Wastewater Reuse & Recovery


Ocean | Saline | Brackish


Other Alternative Supply

Water Quality Technologies & System Management

Operations and Maintenance

Passive

Pretreatment

Technology A

Technology B

Treatment Train

Technology D

Technology C

Polishing

Energy
Grid | Renewables | Storage

Materials
Transmission
Treatment
Storage

Waste
Liquid | Solid
Gas

Fit-For-Purpose Benefit

Use of Water

- Internal Onsite/Offsite Potable
- Internal Onsite/Offsite Non-Potable
- Irrigation (Non-potable)
- Centralized/Distributed Non-potable
- Potable Industrial
- Non-Potable Industrial
- Agricultural
- Environment

Water Security & Resiliency | Circular Economy | Decarbonization | Environmental & Social Equity

Research Priorities: MA(A)D Water

- Modular, Adaptive, (Autonomous), Decentralized Water Systems
  - Modular: Fit-for-purpose, easily replicable, can be expanded or reduced with need, often mobile
  - Adaptive: Can be quickly and responsively modified to meet immediate needs
  - Decentralized: Dispersed, distributed, and localized

MAD water: Integrating modular, adaptive, and decentralized approaches for water security in the climate change era

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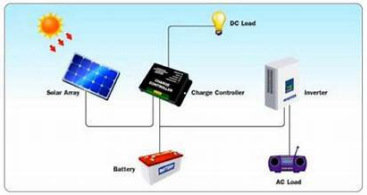
https://wires.onlinelibrary.wiley.com/doi/10.1002/wat2.1680



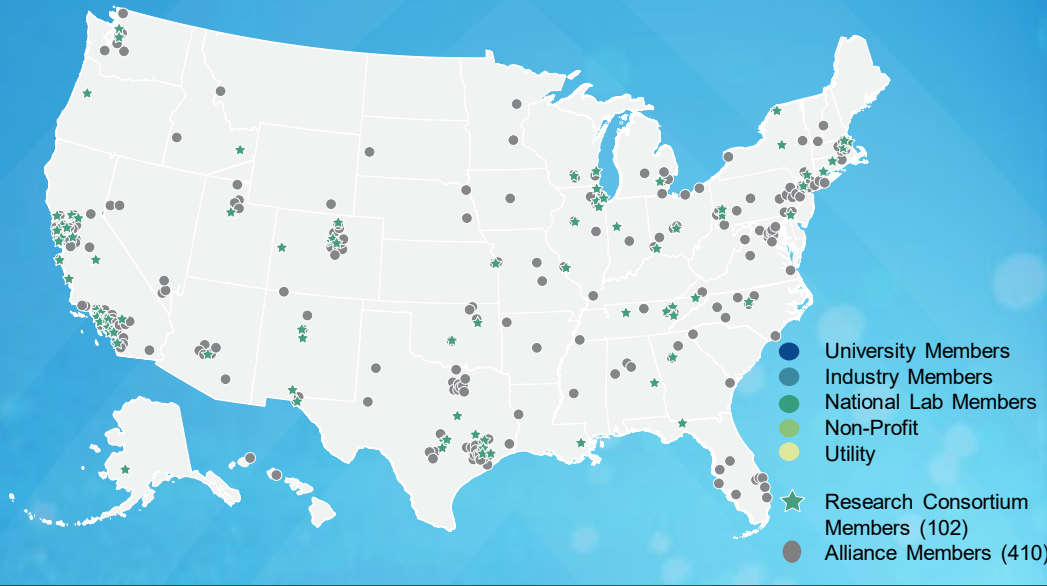
Autonomous?

NAWI

National Alliance
for Water Innovation

The Largest Federal Investment in Desalination, Water Reuse, and other Non-traditional waters R&D since the 1960's

- 5-Year, $110M+ "early-stage applied research" program from **DOE's Advanced Manufacturing Office**
- $23 million in cost share support
- Goal: 75% reduction in cost and energy of beneficial use of non-traditional waters



Nearly 1,500 individuals have joined the (free) NAWI Alliance

NAWI Purpose

Climate change will be felt through the water and energy systems!

Adaptation: Securing water supplies with non-traditional waters

Mitigation: Reducing the cost and carbon intensity of advanced treatment

NAWI

NAWI Goals and Approach

Autonomous

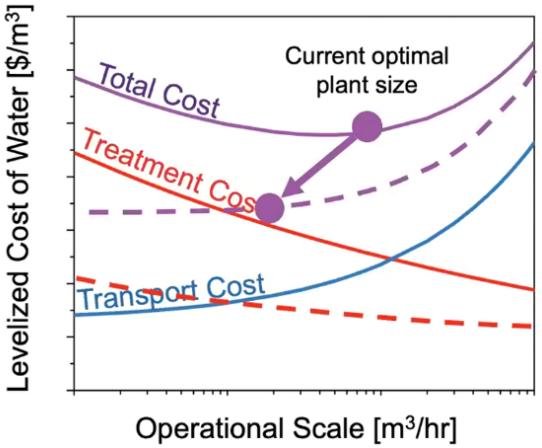
Precise

Resilient

Intensified

Modular

Electrified



NAWI's Goal: Research and innovation to develop products that enable cost-effective distributed water treatment and reuse

NAWI

Transformation Happening in the Energy Sector

Centralized Systems

Planning: Long lead time

Design: Custom-designed

Cost: $B

Distribution: 1 -3 per city

Impact: large but susceptible

Distributed Systems

Planning: Short lead time

Design: Modular / Manufactured

Cost: $K

Distribution: small systems

Impact: smaller and resilient

NAWI & NREL Integrated Water Systems Research

Energy uses for water & wastewater:

- Treatment (FFP)
- Power/Pumping (with RE)

Mitigation of energy impacts:

- Storage
- Time-of-use operations
- Decentralized systems
- Efficient treatment
- Pump maintenance & VFDs

Centralized Systems

Access: long / challenging

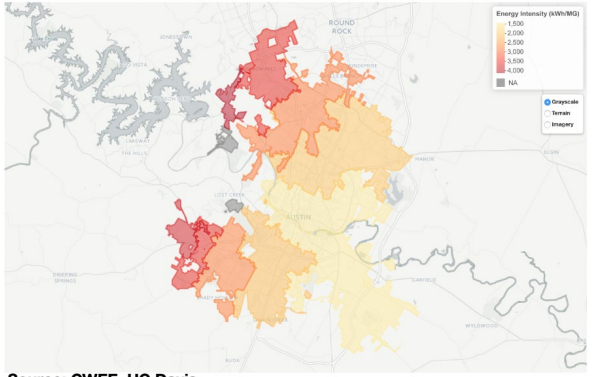
Design: custom

Cost: $B

Distribution: 1 - 5 per city

Impact: large but susceptible

Embedded Energy Map



Source: CWEE, UC Davis

Distributed Systems

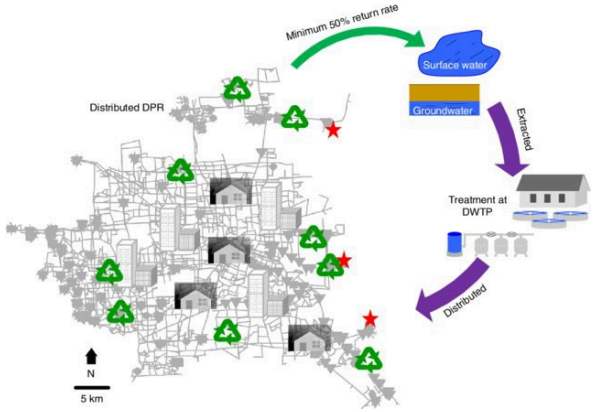
Access: short / easy

Design: modular / scalable

Cost: $K

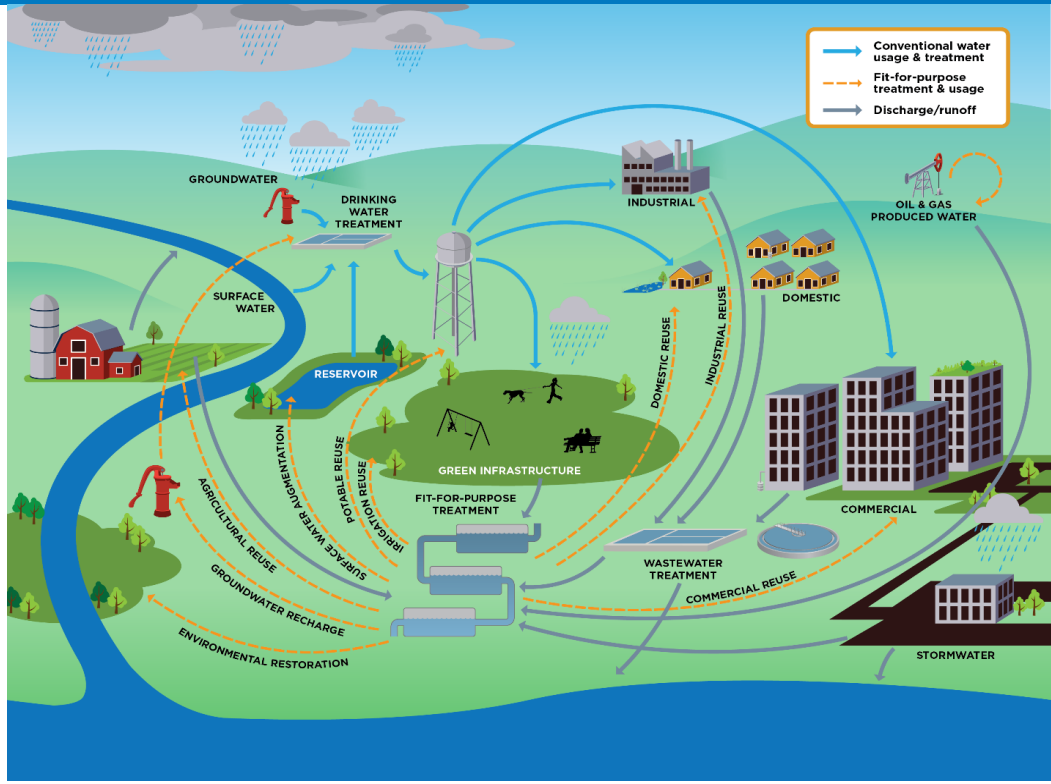
Distribution: 1 per building/community

Impact: smaller but resilient



Conclusion

- Capture and Use/Reuse must be a part of a resilient water portfolio
- Policy / Regulatory Landscape
  - Complex
- Leading Treatment Technologies and Approaches
  - Disruptive Technology
- Convergence Research
  - Social and economic
- Holistic Understanding



Water and energy efficiency comes from conservation, technological advances, and treatment appropriate for fit-for-purpose uses.

Thank You

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https://www.nrel.gov/research/staff/scott-struck.html

NREL
Transforming ENERGY

Funding and Technical Assistance for Climate Resilient Communities

Robyn DeYoung

Lead of Green Infrastructure Program
US Environmental Protection Agency (EPA)

Funding and Financing Green Infrastructure for Resilient Communities

Robyn DeYoung,
U.S. EPA, Office of Water
Green Infrastructure National Program Manager
October 12, 2023

Sustainable and Resilient

Communities

Stormwater Smart

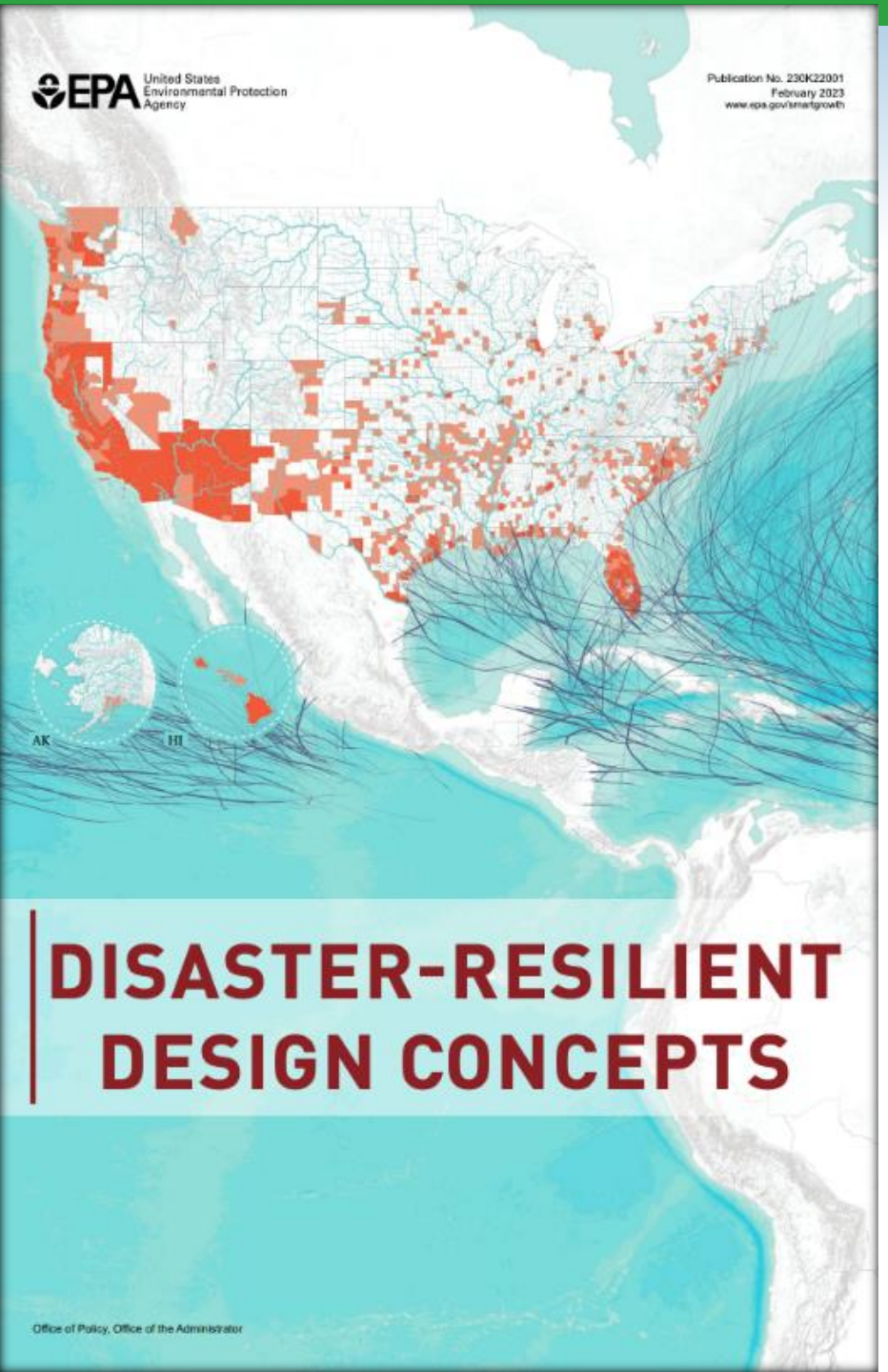
Communication tools to enhance stormwater managers' public education and engagement

INCREASE AWARENESS of Stormwater Effects

PROMOTE PRACTICES to Manage Stormwater

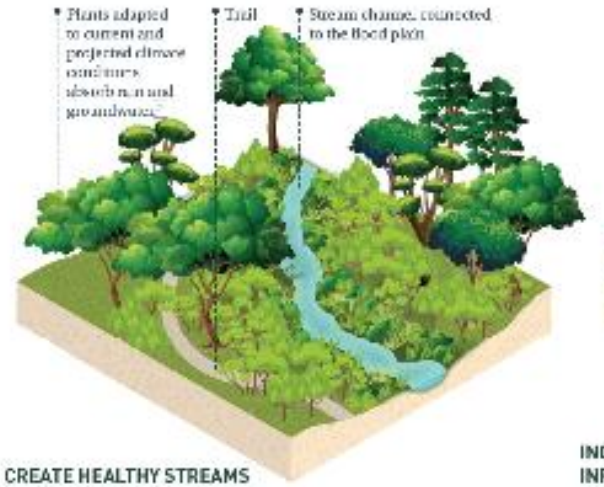
INSPIRE INVESTMENT in the Community

https://www.epa.gov/npdes/stormwater-smart-outreach-tools



- **A set of design concepts that can help communities address natural hazards, adapt to climate change, and achieve a range of economic, environmental, and equity goals.**

- **Intended to be an engaging, easily accessible resource that complements more detailed policy guides and planning resources.**



CREATE HEALTHY STREAMS

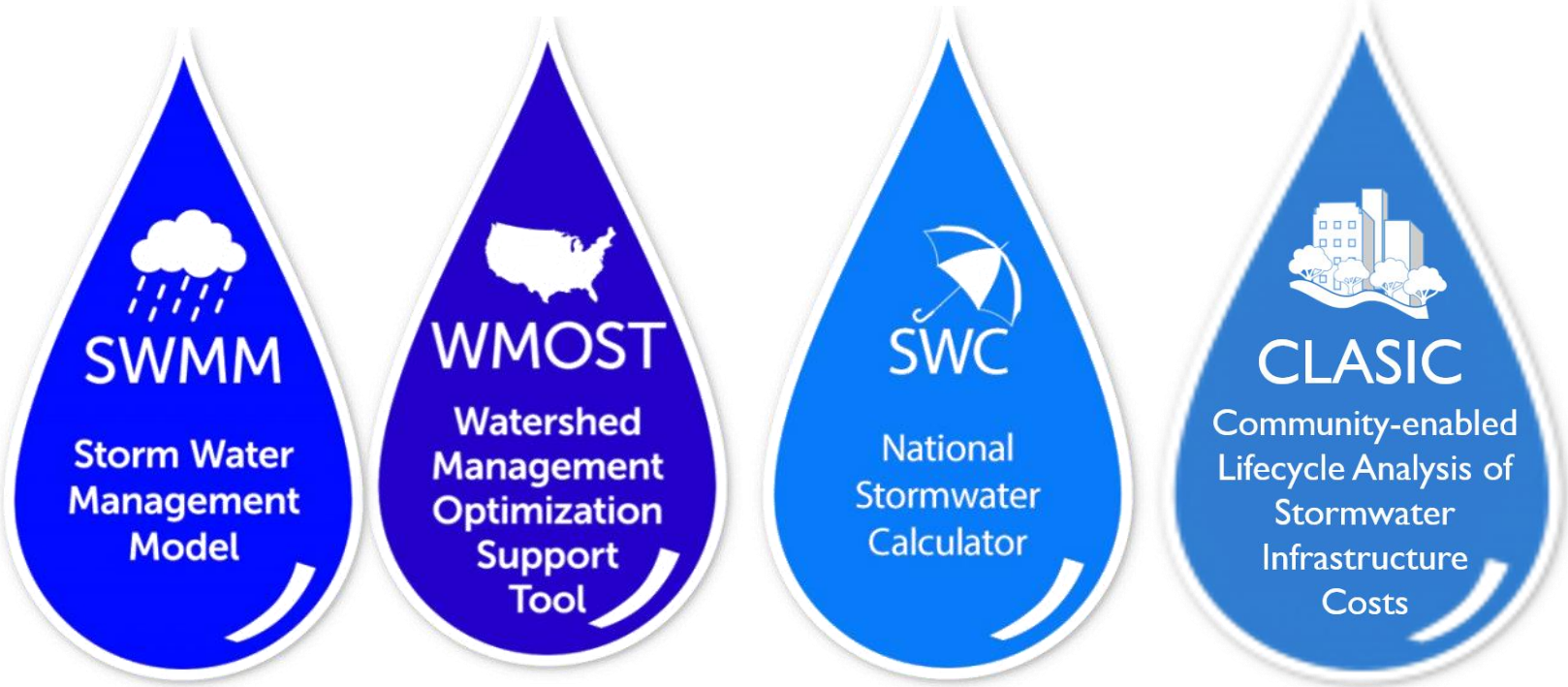
Use vegetated stream buffers to slow water during storm events, lowering downstream flood risk.

INCORPORATE GREEN INFRASTRUCTURE ON SITE

In developed areas, bioswales, rain gardens, and tree canopies help reduce runoff, which lessens flooding.

Estimating the Costs and Performance of Green Infrastructure

EPA's Green Infrastructure Modeling Toolkit



Visit: https://www.epa.gov/water-research/green-infrastructure-modeling-toolkit

Funding and Financing

Bipartisan Infrastructure Law

State & Tribal Grants	Total = $55.426 billion
Clean Water State Revolving Fund Traditional	$11.713 billion
Drinking Water State Revolving Fund Traditional	$11.713 billion
Lead Service Lines Drinking Water State Revolving Fund	$15 billion
PFAS Clean Water State Revolving Fund	$1 billion
PFAS Drinking Water State Revolving Fund	$4 billion
PFAS Small & Disadvantaged	$5 billion
Underground Injection Control Grants	$50 million
Brownfields	$1.5 billion
Pollution Prevention	$100 million
Save Our Seas 2.0	$275 million
RECYCLE Act	$75 million
Clean School Buses	$5 billion

Environmental Programs & Management	Total = $1.959 billion
Geographic Programs	$1.717 billion
Great Lakes Restoration	*$1 billion*
Chesapeake Bay	*$238 million*
San Francisco Bay	*$24 million*
Puget Sound	*$89 million*
Long Island Sound	*$106 million*
Gulf of Mexico	*$53 million*
South Florida	*$16 million*
Lake Champlain	*$40 million*
Lake Pontchartrain	*$53 million*
Southern New England Estuaries	*$15 million*
Columbia River Basin	*$79 million*
Other, Pacific Northwest	*$4 million*
National Estuary Program	$132 million
Gulf of Mexico and MS and OH Rivers Hypoxia	$60 million
Class VI Wells/Underground Injection Control	$25 million
Battery Recycling Best Practices	$10 million
Battery Recycling Labeling	$15 million

Superfund	Total = $3.5 billion
Remedial Cleanups	$3.5 billion

Environmental Finance Centers Supporting Communities with BIL funding

- Delta Institute
- Hawaii Community Foundation
- National Rural Water Association
- Rural Community Assistance Corporation, West Sacramento
- Southeast Rural Community Assistance Project, Inc.
- Syracuse University
- University of Maine System
- University of Maryland
- University of New Mexico
- University of North Carolina at Chapel Hill
- Wichita State University
- WSOS Community Action Commission, Inc.
- Moonshot Missions
- Rural Community Assistance Partnership, Washington, DC
- Sand County Foundation
- U.S. Water Alliance

Contact: WaterTA@epa.gov

Stormwater and Green Infrastructure BIL Technical Assistance

Planning and Asset Management Technical Assistance

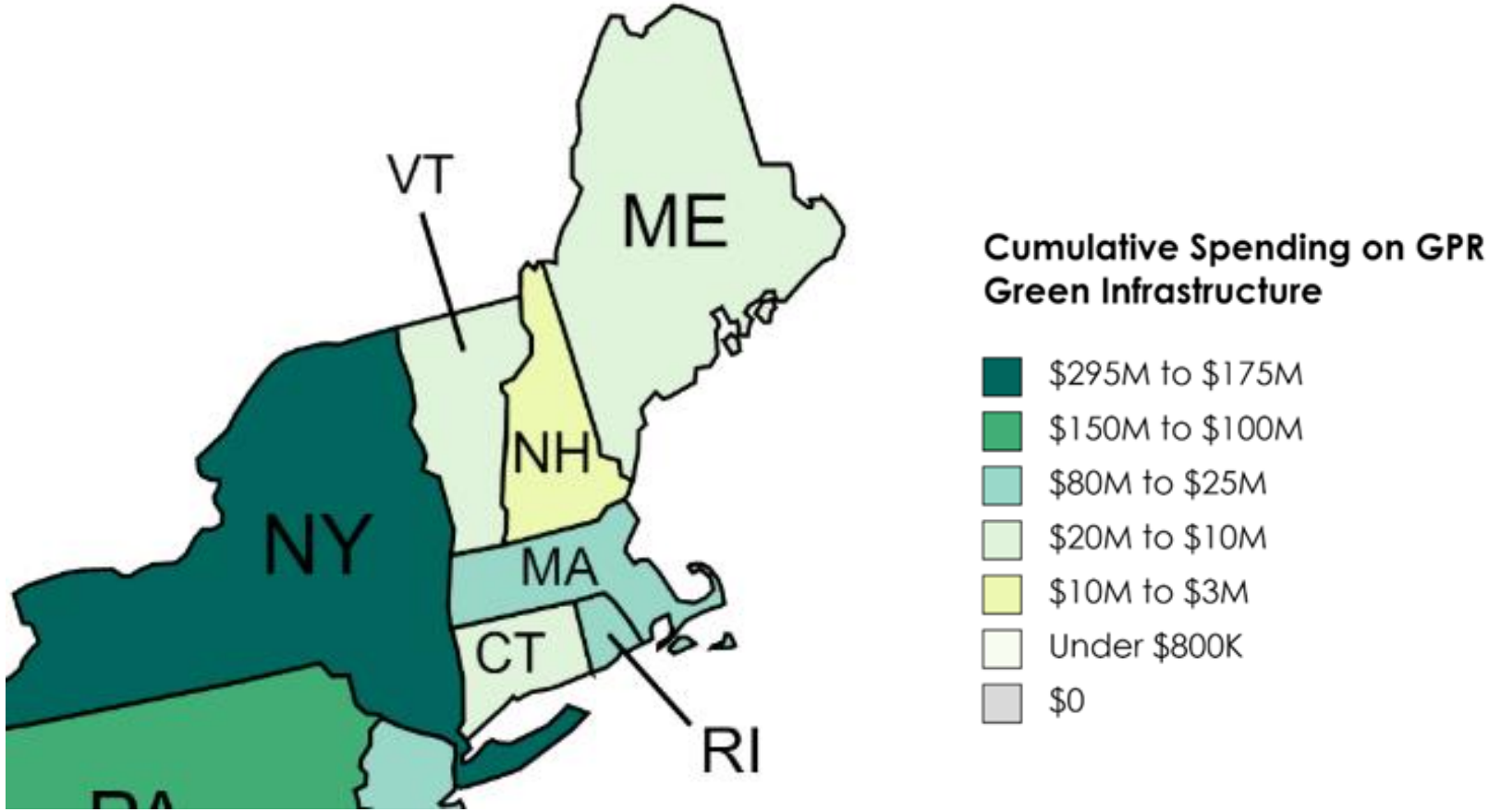
Plan Development

- Assist with identifying infrastructure projects in a holistic, sustainable approach, tailored to community needs:
  - Municipal Integrated Plans/Long-Term Stormwater Plans
  - Green infrastructure opportunities analyses
  - Vulnerability and Risk Assessments
  - Watershed Management Plans
- Coordinate and stack other community improvement efforts.

Asset Management

- Develop maps of stormwater, and wastewater systems.
- Assist water systems in locating assets and developing inventories.
- Develop an asset management plan
- Develop O&M plans
- How to factor in plant establishment period using CW SRF Funding

Clean Water SRF
States Funding Green Infrastructure through the Green Project Reserve, 2009-2022



Contact: WaterTA@epa.gov

Inflation Reduction Act Summary

EPA received $41.5 billion in appropriations to support 24 new and existing programs. This makes EPA the second largest recipient of discretionary funding after USDA. Additionally, Superfund will receive ~$11.7+ billion in tax revenues.

Six new EPA programs account for 98% of this total funding:

- **Climate Pollution Reduction Grants ($5 billion)** – Provide grants to states, territories, municipalities, and Tribes to develop plans to reduce greenhouse gas emissions and implement those plans. At least one grant will go to an eligible entity in every state.
- **Greenhouse Gas Reduction Fund ($27 billion)** – Capitalize existing and new grantees that will invest in emission reduction projects at the state and local level.
- **Environmental and Climate Justice Block Grants ($3 billion)** – Fund community-based nonprofit organizations to support a wide range of climate and environmental justice activities.
- **Grants to Reduce Air Pollution at Ports ($3 billion)** – Award rebates and grants for ports to purchase and install zero-emission technology and develop climate action plans.
- **Methane Emissions Reduction Program ($1.5 billion)** – Fund grants and technical assistance to accelerate emissions reduction from petroleum and natural gas systems. Also establish a methane waste emissions charge starting at $900 per ton in 2024 and increasing to $1,500 per ton by 2026.
- **Clean Heavy-Duty Vehicles ($1 billion) –** Provide grants, rebates, and contract support to replace heavy-duty vehicles with zero emission alternatives. $400 million is specifically for nonattainment areas.

Environmental Justice Thriving Communities Technical Assistance Centers (TCTACs)

There are 17 regionally and nationally based TCTACs to provide assistance benefiting overburdened communities throughout the US.

This network of Regional and National Technical Assistance (TA) Centers will provide **free technical assistance, training,** and **capacity-building** support to communities and stakeholders who need it most.

Visit: https://www.epa.gov/environmentaljustice/environmental-justice-thriving-communities-technical-assistance-centers

Examples of EJ Technical Assistance

- Grant proposal preparation assistance
- Manage federal grants (e.g., accounting, policies, controls)
- Identify funding sources to apply for (federal, state, local, private)
- Navigate SAM.gov and Grants.gov registration process and other portals related to grants
- Provide capacity building to engage with decisionmakers at all levels of government

Funding Opportunities for Green Infrastructure

Stacking Funding and Financing Options

Green Infrastructure Federal Collaborative

Navigating Federal Funding for Green Infrastructure and Nature-Based Solutions

AGENCY	PROGRAM	PLANNING & DESIGN	IMPLEMENTATION OR CONSTRUCTION	OPERATIONS & MAINTENANCE	MONITORING
EDA	American Rescue Plan Program: Economic Adjustment Assistance Funds	YES	YES	NO	NO
EDA	Public Works and Economic Adjustment Assistance Funds	YES	YES	NO	NO
EPA	Clean Water State Revolving Fund (CWSRF)[1]	YES	YES	NO	NO
EPA	Environmental Justice Collaborative Problem-Solving Cooperative Agreement Program	YES	YES	NO	YES
EPA	Environmental Justice Government-to-Government (EJG2G) Program	YES	YES	NO	YES
EPA	Brownfields Grants	YES	YES	NO	NO
EPA	Great Lakes Restoration Initiative (GLRI) Funds	YES	YES	NO	NO
EPA	Green Streets, Green Jobs, Green Towns (G3) Grant Program	YES	YES	NO	NO
EPA	Sewer Overflow and Stormwater Reuse Municipal Grants (OSG)	YES	YES	NO	NO
EPA	Section 319 Nonpoint Source Grants	YES	YES	YES	YES
EPA	Water Infrastructure Finance and Innovation Act (WIFIA)	YES	YES	NO	NO
FEMA	Building Resilient Infrastructure and Communities (BRIC)[2]	YES	YES	NO	NO
FHWA	Surface Transportation Block Grant (STBG) Program – Transportation Alternatives	YES	YES	YES	NO
FHWA	Promoting Resilient Operations for Transformative, Efficient, and	YES	YES	NO	NO

SCAN ME

Building Next Generation Workforce

CAMPUS RAINWORKS CHALLENGE

Next Generation Workforce

EPA

The Campus RainWorks Challenge 11th Year is live!

Team registration: Jan. 2-31, 2024
Entries due: May 24th 2024
Winners announced: Summer 2024

$50,000 Prize money for winners

Rainworks@epa.gov

2020 Campus RainWorks 1st Place UPenn

"I learned economics. Campus RainWorks is not just a competition for us, we are actually implementing projects on the ground, so funding is a big part of it."

-

Mrinalini V.

CAMPUS RAINWORKS CHALLENGE

Innovative Water Infrastructure Workforce Development Grant Program

Over $20 million in grant funding is now available for eligible organizations interested in building a stronger pool of skilled and diverse workers in the water and wastewater utilities sector.

- **Project Area 1:** Targeted internships apprenticeships for skilled water utility trades.
- **Project Area 2:** Education programs designed for elementary, secondary, and higher education students.
- **Project Area 3:** Regional industry and workforce development collaborations to hiring qualified candidates.
- **Project Area 4:** Leadership development, occupational training, mentoring, or cross-training programs that support career advancement.
- **Project Area 5:** Education and training programs designed for decentralized (septic) water workers to support public health for communities that rely on private wells for drinking water or septic systems.
- **Project Area 6:** Training and development for workforce development programs that reduce greenhouse gas emissions and other air pollutants to benefit disadvantaged communities.

Apply Before November 17, 2023

Centers of Excellence for Stormwater Infrastructure Technologies Grant Program

Authorized in FY23 budget, EPA is working internally to build this new grant program.

- Conduct research on and create an inventory of new and emerging stormwater control infrastructure technologies;
- Analyze innovative financial programs supporting stormwater infrastructure implementation;
- Provide technical assistance to states, tribal communities, and local governments who want to implement innovative stormwater infrastructure technologies;
- Collaborate with educational institutions as well as public and private organizations including community-based public-private partnerships; and
- Establish and maintain a national electronic clearinghouse center to collect data and disseminate information and findings from CESITs to the stormwater sector.

Coming Soon!

EPA posts all grant opportunities on https://www.epa.gov/grants & grants.gov.






Thank you!

Robyn DeYoung

U.S. EPA Green Infrastructure Lead

Deyoung.robyn@epa.gov

Get updates from us!

Join greenstream, an EPA listserv featuring updates on green infrastructure publications, training, and funding opportunities, send an email to join-greenstream@lists.epa.gov

MODERATED DISCUSSION

Carolyn Norkiewicz

Forum Co-Chair

Regional Coordinator for Greater Boston
Municipal Vulnerability Program
Executive Office of Energy and Environmental Affairs
Commonwealth of Massachusetts

SAVE THE DATE!

Historical examples of successful quick mobilization to address critical environmental challenges – What does it take to shift a cultural mindset?

November 30, 2023

EBC Environmental Business Council of New England | UMass Boston Sustainable Solutions Lab

Quarterly Climate Adaptation Forum | October 12, 2023