



# National Stormwater Policy Forum

April 24, 2023 | Washington, D.C.

## WiFi Information

Network: NLCGuest

Password: NLCguestaccess

- Water Environment Federation
- National Municipal Stormwater Alliance
- National League of Cities
- National Association of Counties



# **DEQ Stormwater Projects**

## **National Stormwater Policy Forum**

**April 24, 2023**

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# Agenda

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- **Today's DEQ and Stormwater**
- **Selected Projects and their Status**
  - Consolidated ESC/SWM Regulation
  - 2023 Virginia Stormwater Management Handbook
  - Virginia Runoff Reduction Method
  - Commodity Trading Platform
- **Opportunities for Engagement**

# Today's DEQ & Stormwater

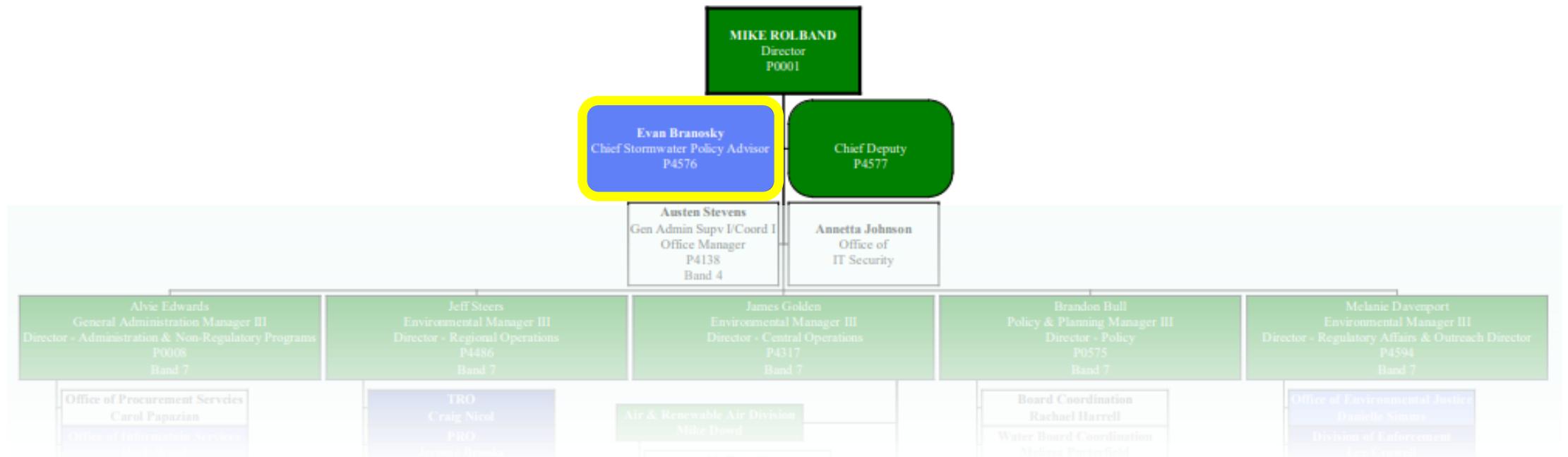
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Healthy state and local economies, and a healthy environment of Virginia, are integrally related; balanced economic development and the protection of our environment are not mutually exclusive.



# Today's DEQ & Stormwater

- One of three political appointees focuses full-time on Stormwater
- Position manages projects with combined value of approx \$5 million



# Consolidated ESC/SWM Regulation

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## Regulation

Virginia Stormwater Management Regulations

Erosion and Sediment Control Regulations

## Statute

Virginia Stormwater Management Act

Erosion and Sediment Control Law

## Permit

Municipal Separate Storm Sewer System (MS4)

Construction General Permit

# 2023 VA Stormwater Management Handbook



to



- Produce **Best In Class** Stormwater Handbook
- Bring **Ideas, Solutions & Specific Instructions** to DEQ & Contractor
- Avoid Issues Requiring **Statutes, Rulemakings, or Guidance**
- Contribute **Technical Content**
- **Volunteer** for Ad-Hoc Subcommittees
- **Seek Input** from Colleagues

# 2023 VA Stormwater Management Handbook (cont'd)

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*Additions?*

*Reprioritize?*

*Removals?*

# 2023 VA Stormwater Management Handbook (cont'd)

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- Chapter 1 – Introduction
- Chapter 2 – Why Erosion and Sediment Control and Stormwater Management Matter
- Chapter 3 – Laws and Regulations
- Chapter 4 – Regulatory Compliance Process
- Chapter 5 – Erosion and Sediment Control and Stormwater Management Requirements
- Chapter 6 – Site Design and BMP Selection
- Chapter 7 – Design Specifications for Erosion and Sediment Control
- Chapter 8 – Design Specifications for Stormwater Management
- Chapter 9 – BMP Construction
- Chapter 10 – BMP Inspection and Maintenance
- Appendices

# VA Runoff Reduction Method

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- August 2022 Interagency Contract with Virginia Tech
  - Expand three existing land covers to four;
  - Assign 49 CAST load sources to four VRRM land uses;
  - Prepare new compliance spreadsheets and user guide/guidance document; and
  - Support public comment.
- February 2023 Addendum
  - Adjust/finalize VRRM loading rates; and
  - Recalculate the target TP load.

# VA Runoff Reduction Method (cont'd)

CURRENT

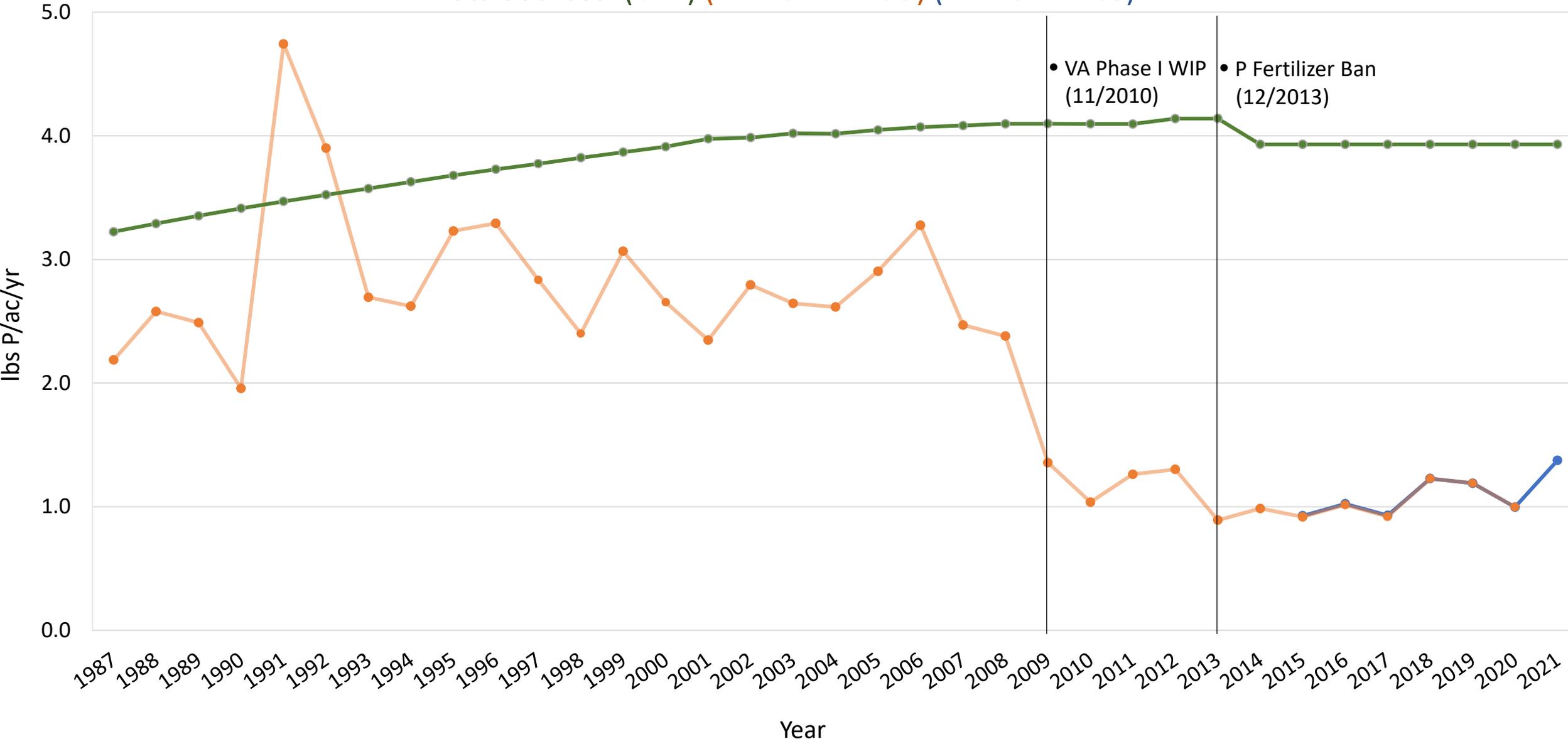
Loading Rates (lb/ac/year)				
Category	A	B	C	D
Forest	0.050	0.070	0.090	0.110
Managed Turf	0.340	0.460	0.500	0.570
Impervious	2.170	2.170	2.170	2.170

DRAFT  
INITIAL

Category	A	B	C	D
Forest	0.042	0.064	0.085	0.106
Mixed Open	0.103	0.345	0.390	0.549
Managed Turf	1.053	1.403	1.544	1.754
Impervious	0.797	0.797	0.797	0.797

# Phosphorus Fertilizer Use on Turfgrass in VA Chesapeake Bay Watershed Localities

Data Sources: (CBP) (VA via AAPFCO) (VA via VDACS)



# VA Runoff Reduction Method (cont'd)

CURRENT

Loading Rates (lb/ac/year)				
Category	A	B	C	D
Forest	0.050	0.070	0.090	0.110
Managed Turf	0.340	0.460	0.500	0.570
Impervious	2.170	2.170	2.170	2.170

DRAFT  
INITIAL

Category	A	B	C	D
Forest	0.042	0.064	0.085	0.106
Mixed Open	0.103	0.345	0.390	0.549
Managed Turf	1.053	1.403	1.544	1.754
Impervious	0.797	0.797	0.797	0.797

DRAFT  
FINAL

Category	A	B	C	D
Forest	0.042	0.063	0.084	0.105
Mixed Open	0.239	0.341	0.385	0.454
Managed Turf	0.479	0.639	0.703	0.799
Impervious	0.794	0.794	0.794	0.794

# Commodity Trading Platform

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- Develop trading platform for water-related commodities to provide transparency for permittees with regard to prices as well as supply and demand
- Assist market in meeting demands of a strong economy
- **Coming in 2024!**



# Opportunities for Engagement

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- Virginia DEQ Website: <https://www.deq.virginia.gov/>
- Virginia Regulatory Town Hall: <https://townhall.virginia.gov/>



Evan Branosky  
[evan.branosky@deq.virginia.gov](mailto:evan.branosky@deq.virginia.gov)  
(804) 584-6265

# Congressional Update

## National Stormwater Policy Forum

April 24, 2023 | Washington, D.C.

- Water Environment Federation
- National Municipal Stormwater Alliance
- National League of Cities
- National Association of Counties



# NOAA Atlas 15

## Update to the National Precipitation Frequency Standard

Sandra Pavlovic

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NWS Office of Water Prediction

*April 24, 2023*



OWP | OFFICE OF  
WATER  
PREDICTION

# Precipitation Frequency Data Serve as a Foundation for Built Infrastructure Nationwide and Supports Prediction Mission

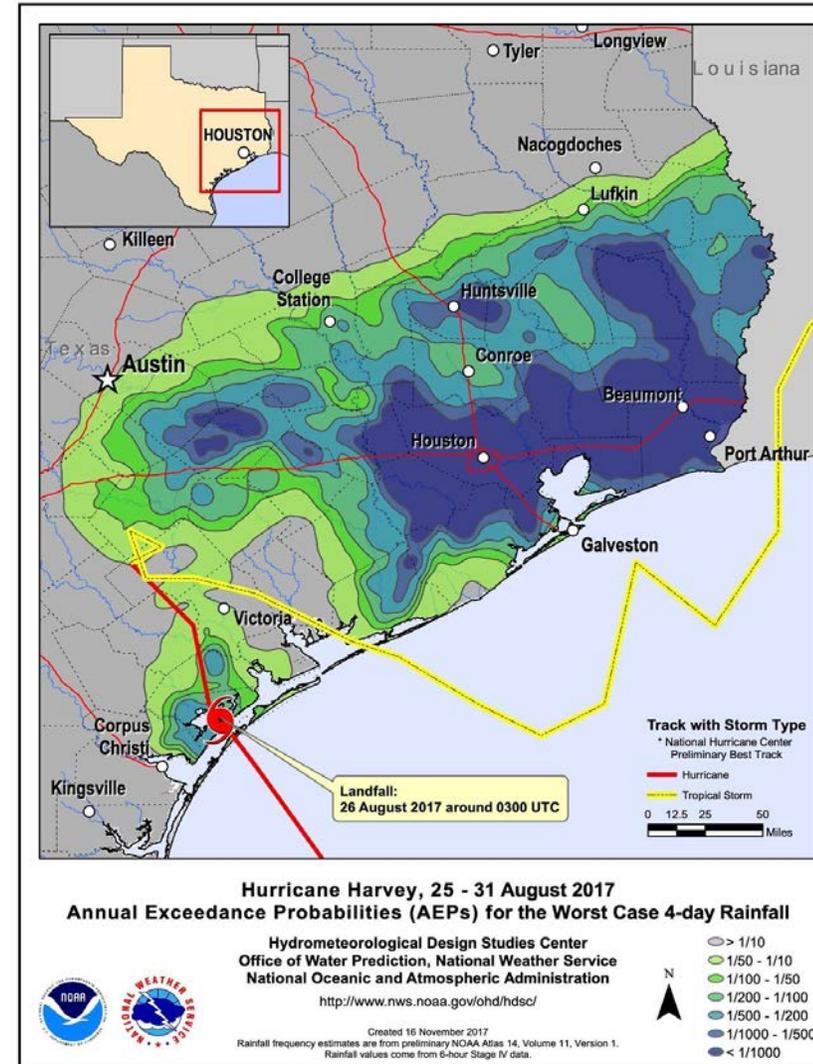
## Hurricane Harvey Example

Type of structure	Return period (years)
<b>Highway culverts</b>	
Low traffic	5-10
Intermediate traffic	10-25
<b>High traffic</b>	<b>50-100</b>
Highway bridges	
Secondary system	10-50
Primary system	50-100
Farm drainage	
Culverts	5-50
Ditches	5-50
Urban drainage	
Storm sewers in small cities	2-25
Storm sewers in large cities	25-50
Airfields	5-10

- Majority of built infrastructure leverages precipitation frequency data for design and planning under federal, state and local regulations

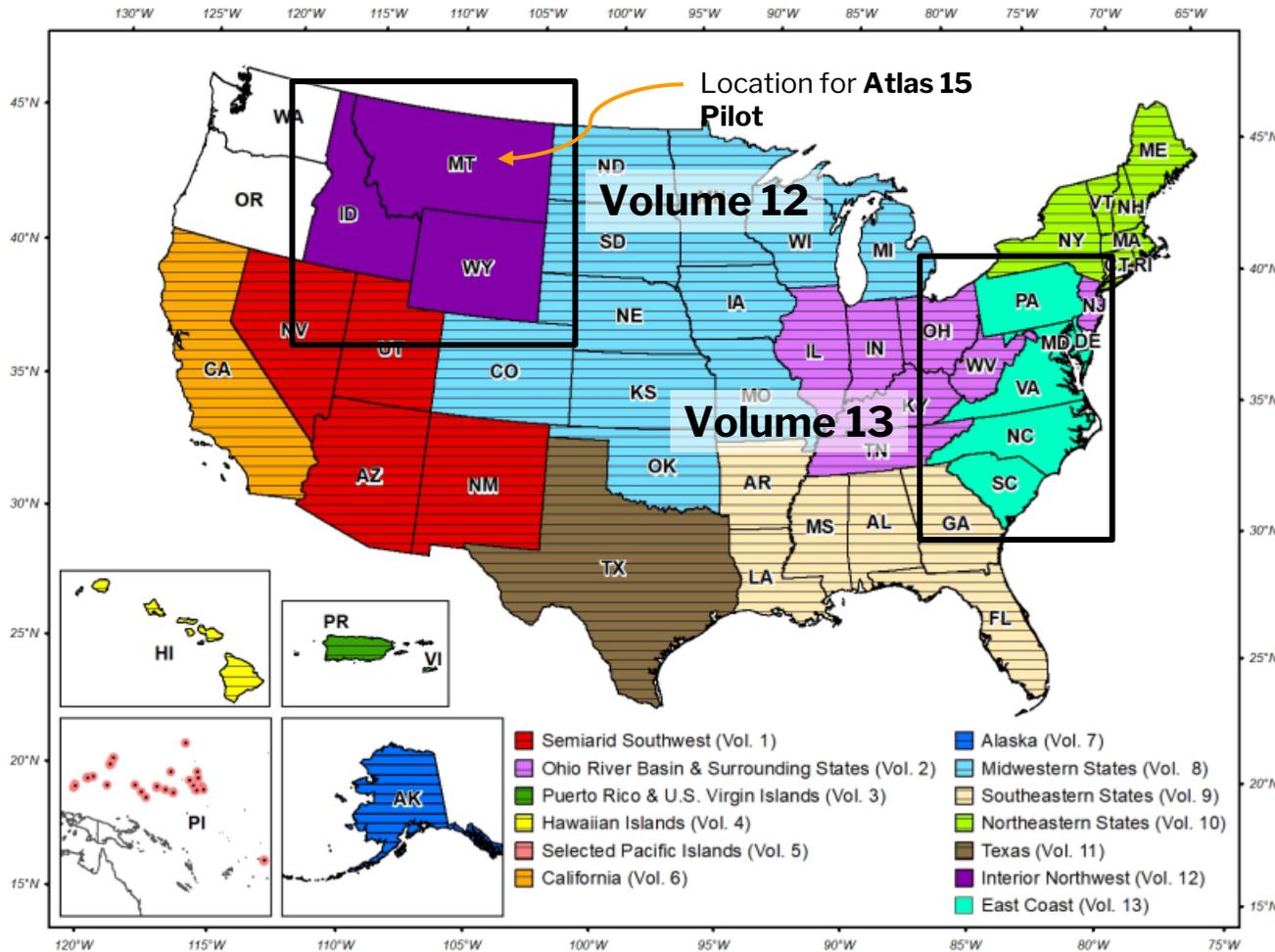
- Stormwater
- Transportation
- Development and building code

- FEMA National Flood Insurance Program
- Risk management and Reinsurance Industry



Precipitation Frequency Data facilitates the comparison of observed and forecast precipitation with threshold precipitation to quantify the severity and spatiotemporal nature of extreme events and their impacts.

# NOAA Atlas 14 Product Suite



<https://www.weather.gov/owp/hdsc>

## Hydrometeorological Design Studies Center (HDSC)

- Since 2003, develops and updates precipitation frequency estimates for the United States and territories
- Part of Office of Water Prediction (NWS, NOAA)

## Funding Approach

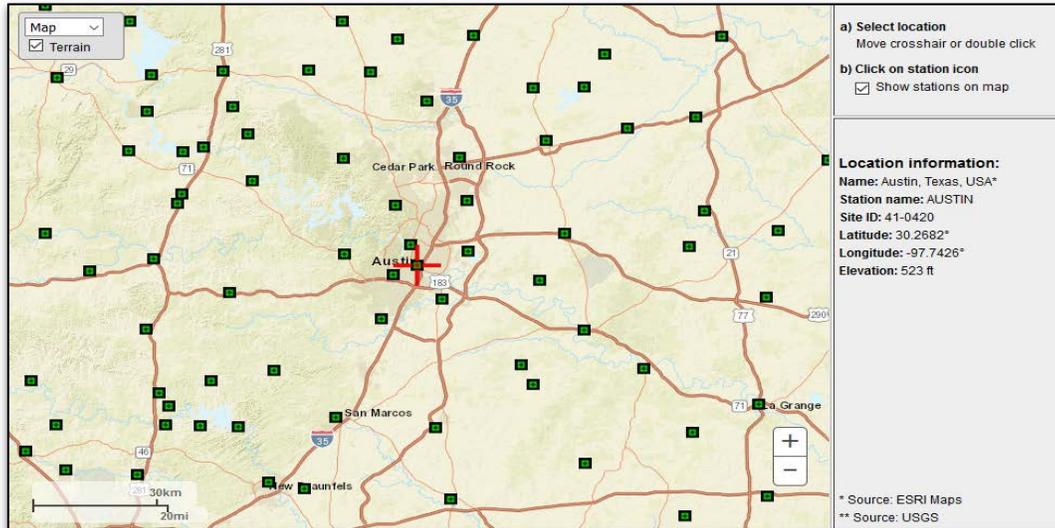
- Performed at request of and funded by states through FHWA - not from NWS appropriation
- Discontinuities at volumes' boundaries, and irregular update cycle creates issues for users

## Volumes

- Volume 1 (2004): Semi arid Southwest
- ....
- Volume 11 (2018): Texas
- **Volume 12 (2024):** Montana, Idaho, and Wyoming
- **Volume 13 (2025):** Mid-Atlantic



# NOAA Atlas 14 Features



## Product Features

- from 5 minutes to 60 days
- recurrence intervals of 1 to 1000 years
- confidence intervals
- high spatial resolution (~800 m)
- spatial interpolation (account for terrain, coastal proximity, etc.)
- numerous internal consistency checks
- regional approach that allows for the development of rare frequency
- denser rain gauge networks with longer periods of record, and extensive quality control

PF tabular | PF graphical | Supplementary information | Print page

PDS-based precipitation frequency estimates with 90% confidence intervals (inches)<sup>1</sup>

Duration	1	2	5	10	25	500	1000
5-min	0.431 (0.327-0.570)	0.525 (0.398-0.679)	0.671 (0.510-0.879)	0.798 (0.599-1.06)	0.973 (0.712-1.38)	1.69 (1.10-2.61)	1.89 (1.19-2.98)
10-min	0.685 (0.518-0.904)	0.834 (0.632-1.08)	1.07 (0.812-1.40)	1.27 (0.954-1.69)	1.56 (1.14-2.15)	2.67 (1.73-4.11)	2.96 (1.87-4.67)
15-min	0.969 (0.688-1.15)	1.06 (0.800-1.37)	1.35 (1.02-1.76)	1.60 (1.20-2.13)	1.96 (1.42-2.69)	3.35 (2.17-5.16)	3.73 (2.36-5.90)
	1.50 (1.14-1.94)	1.90 (1.45-2.49)	2.25 (1.69-3.00)	2.75 (1.99-3.77)	3.67 (2.69-5.02)	4.72 (3.07-7.28)	5.29 (3.35-8.36)
	1.97 (1.49-2.54)	2.51 (1.91-3.29)	2.99 (2.24-3.96)	3.67 (2.69-5.02)	4.81 (3.53-6.55)	6.45 (4.21-10.0)	7.34 (4.64-11.6)
	2.45 (1.83-3.06)	3.15 (2.41-4.07)	3.82 (2.89-5.04)	4.81 (3.53-6.55)	6.31 (4.67-8.64)	8.31 (5.07-14.2)	10.7 (6.78-16.7)
3-hr	2.11 (1.62-2.74)	2.70 (2.03-3.34)	3.53 (2.72-4.54)	4.33 (3.30-5.69)	5.56 (4.11-7.55)	11.3 (7.40-17.2)	13.1 (8.34-20.4)
6-hr	2.42	3.17	4.19	5.21	6.77	14.4	16.8

24-Hour → 100-Year (8.99 - 17.5)

## Assumptions

- Assumes stationarity in data and methodology; doesn't account for climate change

<https://www.weather.gov/owp/hdsc>

# Bipartisan Infrastructure Law (BIL): First Direct Federal Funding

**Bipartisan Infrastructure Law summary:** "Shall be for coastal and inland flood and inundation mapping and forecasting, and next-generation water modeling activities, **including modernized precipitation frequency and probable maximum studies.**"

“To support the design, development, and operation of our nation’s built infrastructure, from new power plants to transportation systems, NOAA **will update and revise precipitation frequency atlases for the United States that account for climate change...**”



For the first time, NOAA now will apply a nationwide update for precipitation frequency data – a long standing and highly sought need for the future of our nation’s infrastructure

# NOAA Atlas 15

## National Precipitation Frequency Update

### NOAA's Atlas 15 estimates will...

- Leverage support from Bipartisan Infrastructure Law (BIL) FY22-26
- Leverage results and recommendations from the research project, performed in collaboration with academia, "[Assessment Report](#)".
- Develop a national seamless spatial analysis using a non-stationarity assumption with latest precipitation observations
- Information to be presented as two national volumes

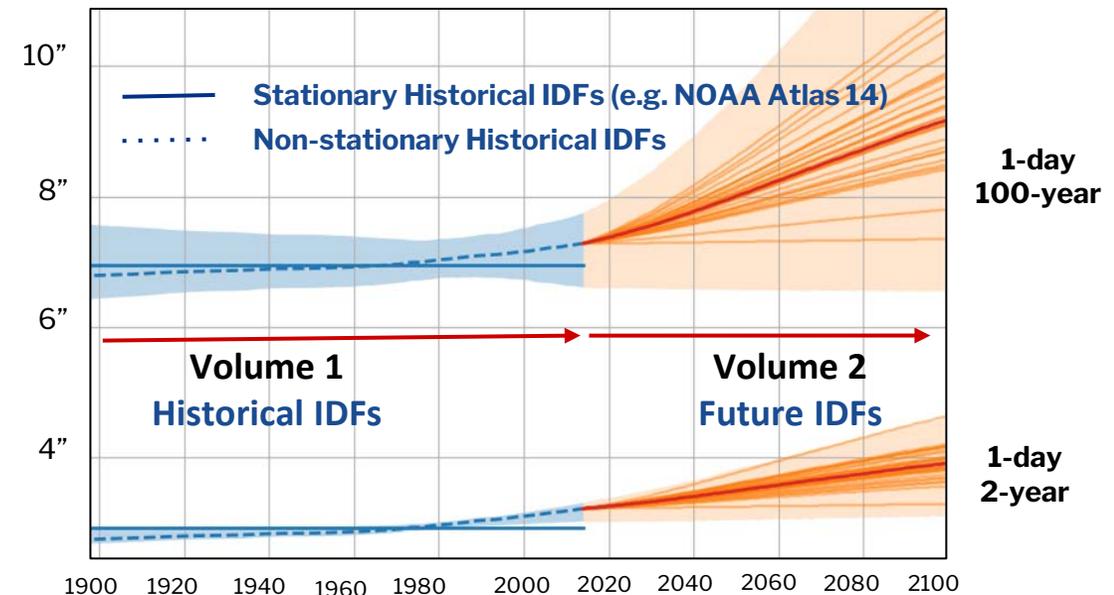
**Atlas 15 to be delivered with robust web visualizations and data services.**

#### **Volume 1: Based on historical gages and observed trends**

- Integrated terrain information
- Models trend in historical observations (when it exists) to account for short-term non-stationary temporal changes

#### **Volume 2: Incorporates climate projection adjustment factors**

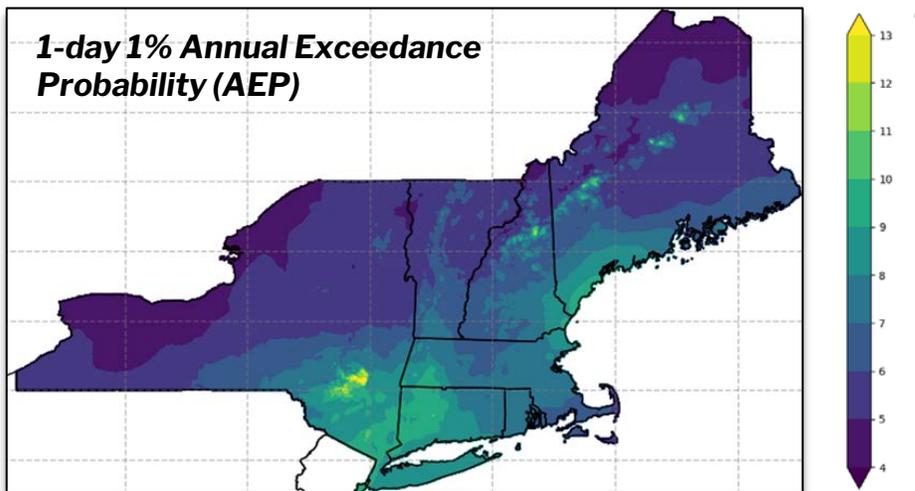
- Future precipitation informed by global climate models, modeled non-stationary temporal changes
- Provides adjustment factors to Volume 1 to calculate future estimates



# The NOAA Atlas 15 Product

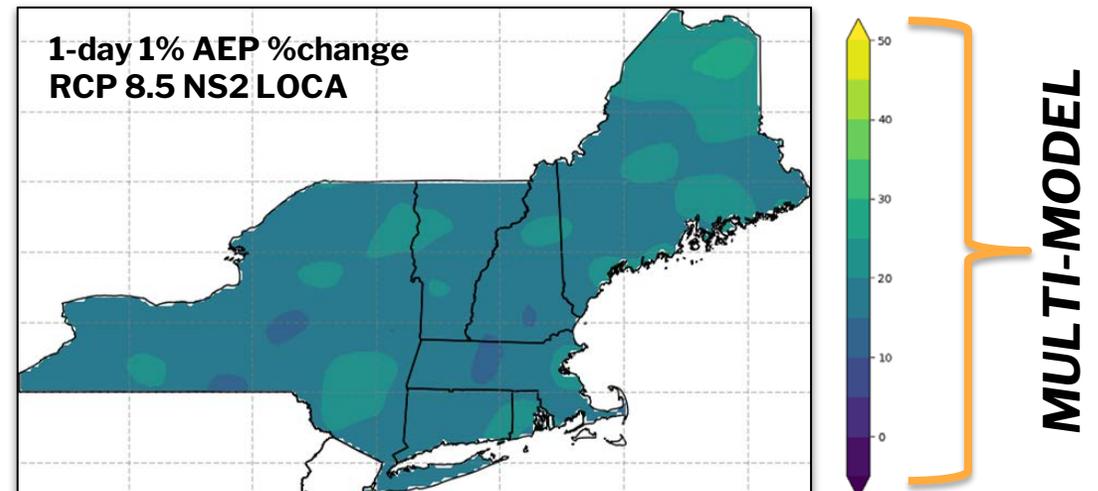
**Volume 1:** Based on historical gages and observed trends

- First-ever, nationally-consistent, precip frequency data that serves as the basis for Volume 2
- Integrated terrain information
- Accounts for trends in historical observations (when it exists)
  - Non-stationary trends represents a major enhancement from Atlas 14

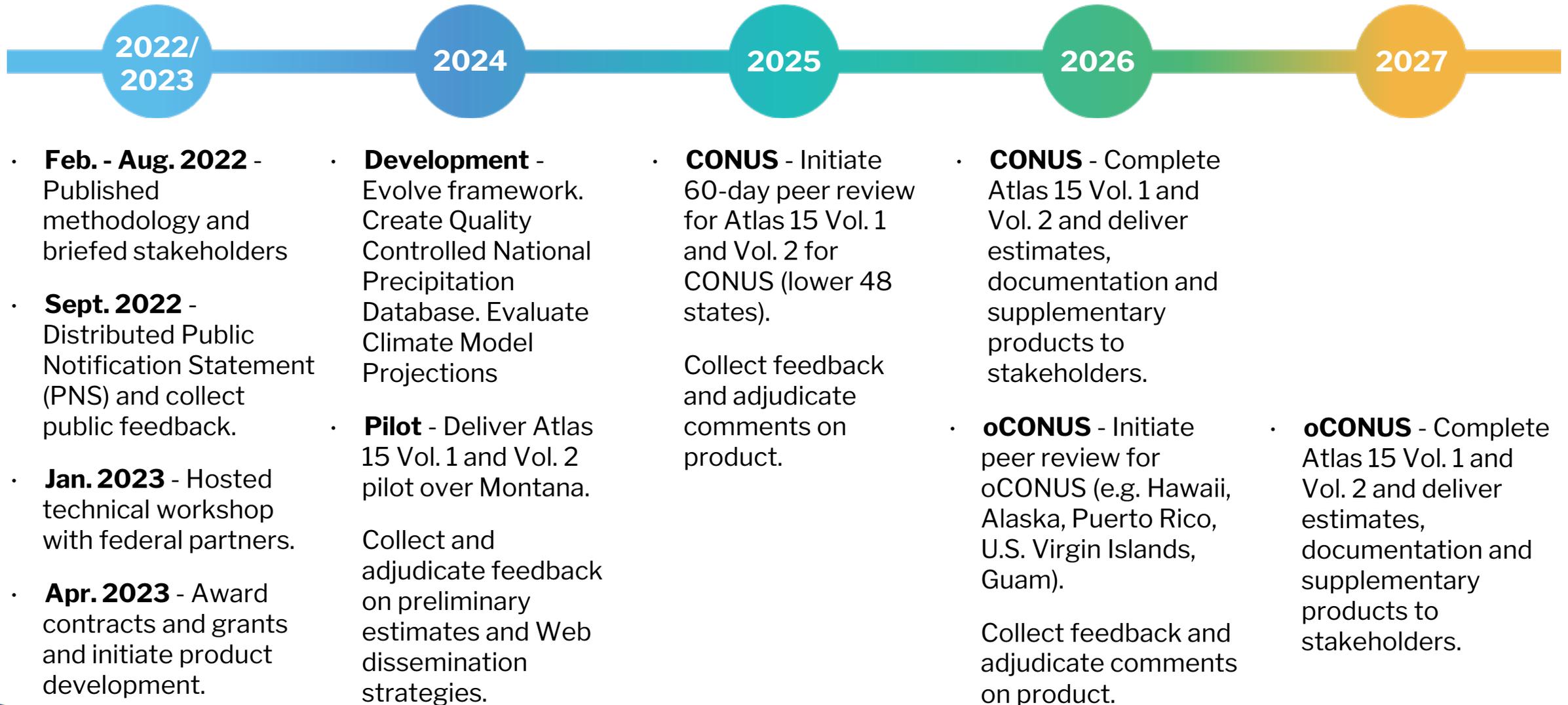


**Volume 2:** Incorporates climate projection adjustment factors

- Future precipitation informed by global climate models, modeled non-stationary temporal changes
- Provides adjustment factors to Volume 1 to calculate future estimates



# NOAA Atlas 15 Road Map



# The 2022 FLOODS Act

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## Flood Level Observation, Operations, and Decision Support (FLOODS) Act

### SEC. 12. ESTIMATES OF PRECIPITATION FREQUENCY IN THE UNITED STATES.

(a) DEFINITIONS.—In this section:

Establish ... **“NOAA Precipitation Frequency Atlas of the United States”**, to compile, estimate, analyze, and communicate the frequency of precipitation in the United States.

- shall better inform the public and provide information on—
  - (A) temporal and spatial distribution of heavy precipitation;
  - (B) analyses of seasonality in precipitation; and
  - (C) trends in annual maximum series data; and
- shall be conducted **not less frequently than once every 10 years**
- published on a publicly accessible website of the National Oceanic and Atmospheric Administration

**While authorizing language exists, an appropriation has yet to be made.**



# Contaminants of Emerging Concern

Using High-Throughput Toxicity Data and Bioeffects Monitoring To Rapidly Prioritize and Screen CECs in Stormwater

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DALMA MARTINOVIĆ-WEIGELT, PH.D.

UNIVERSITY OF ST. THOMAS, ST. PAUL, MN



Environmental samples are complex mixtures of chemicals including poorly characterized chemical metabolites



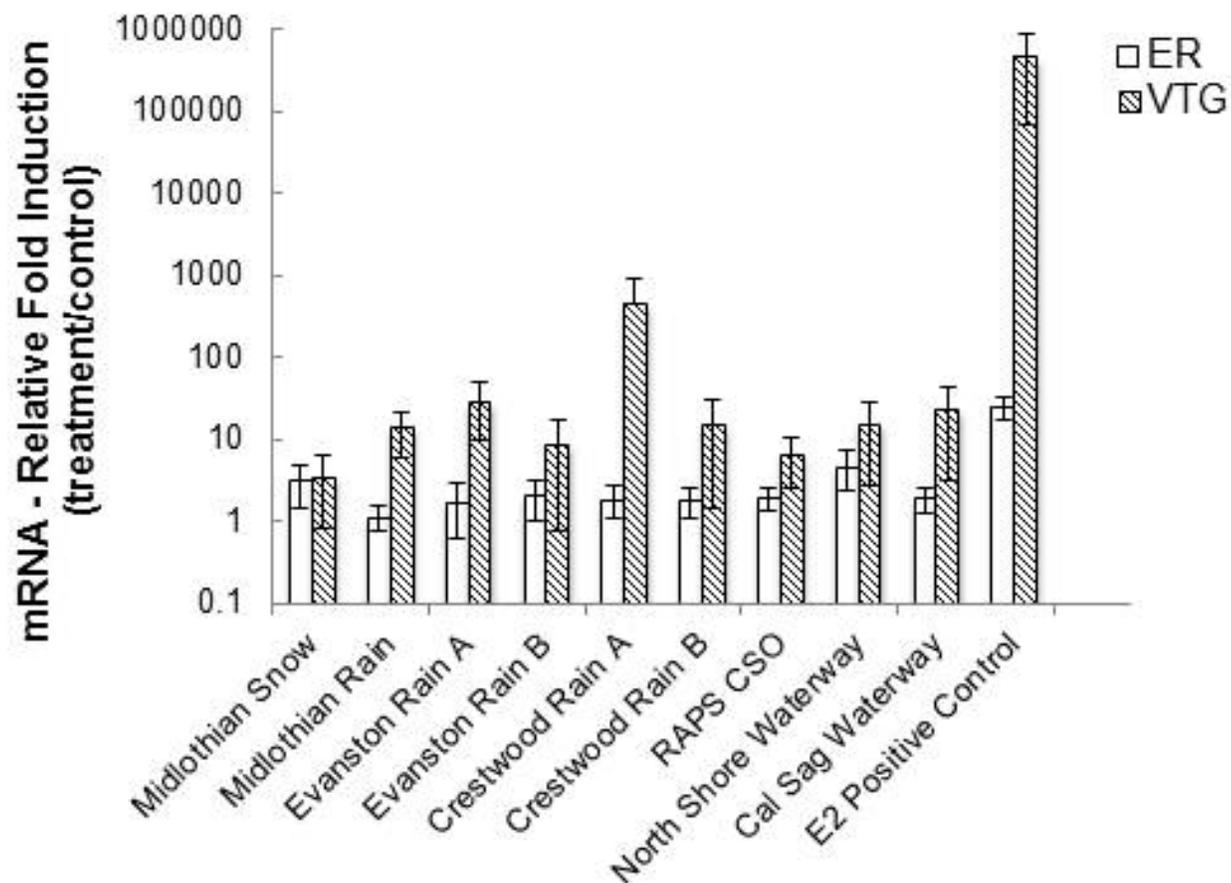
Assessing toxicity one by one is not an effective approach - cost and time



Can we use novel, rapid, methodologies that integrate effects of chemicals?

Challenge

# Where we started: Using a small subset of high-throughput tools - endocrine potential of environmental samples

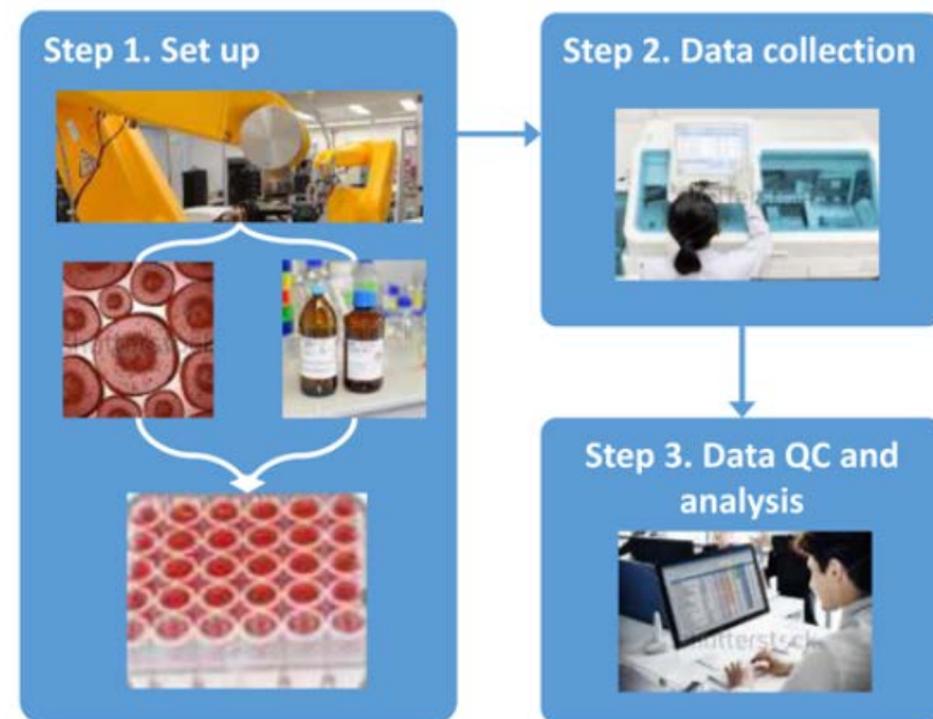
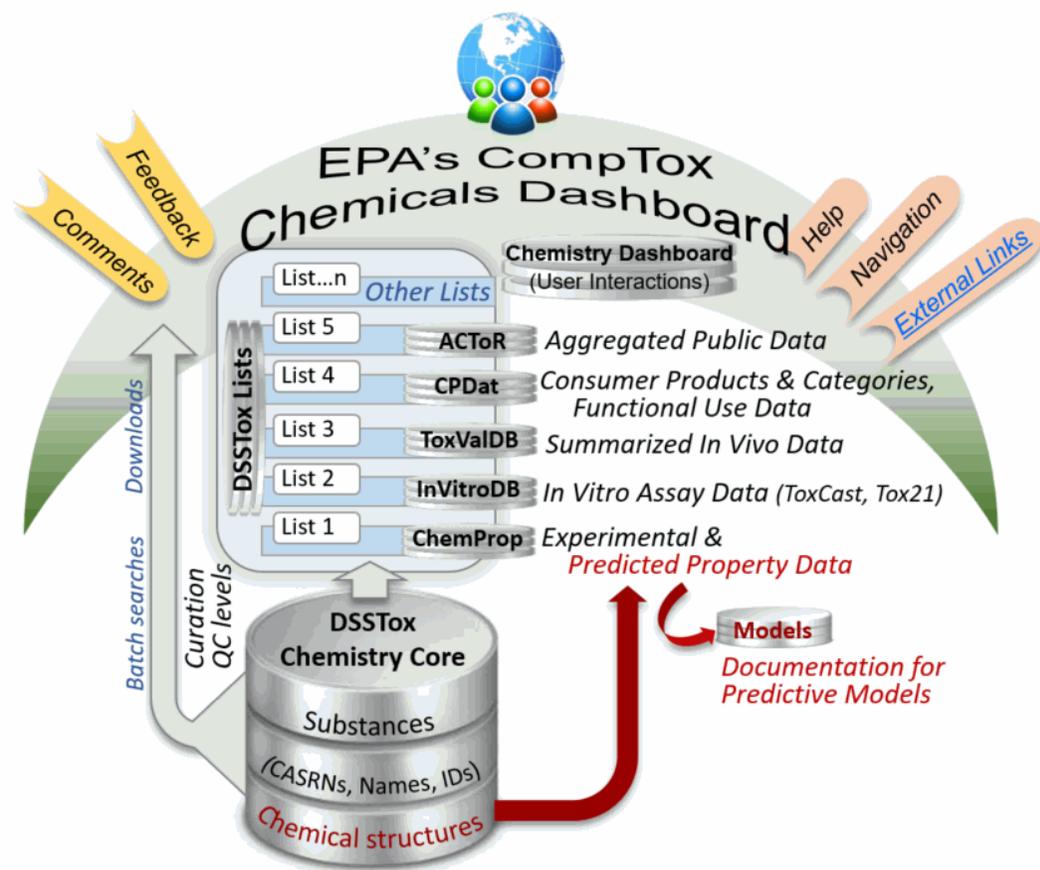


- Chicago Waterways - successful screening strategy when conducted with well-characterized assays and optimized sample processing pipeline
- Limited in scope, cost

Martinovic et al., 2007. Temporal variation in the estrogenicity of a sewage treatment plant effluent and its biological significance. *ES&T* 42, 3421-3427

Martinovic-Weigelt et al. 2013. Environmental estrogens in an urban aquatic ecosystem: I. Spatial and temporal occurrence of estrogenic activity in effluent-dominated system. *Environ International* 61, 127-13

# New data and tools available: We can rapidly assess effects on hundreds of biological targets (e.g., all nuclear hormone receptors)





**ENVIRONMENT  
AND NATURAL RESOURCES  
TRUST FUND**



**CLEAN  
WATER  
LAND &  
LEGACY  
AMENDMENT**

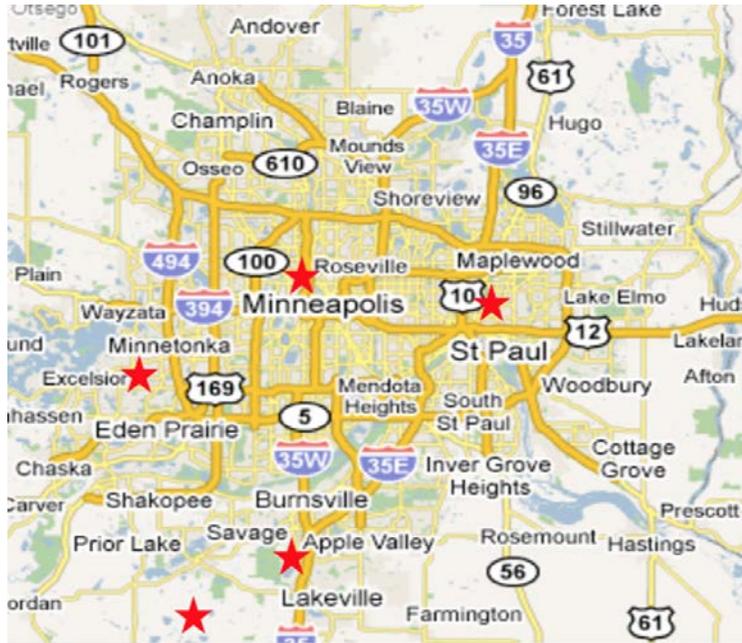
# Current Work

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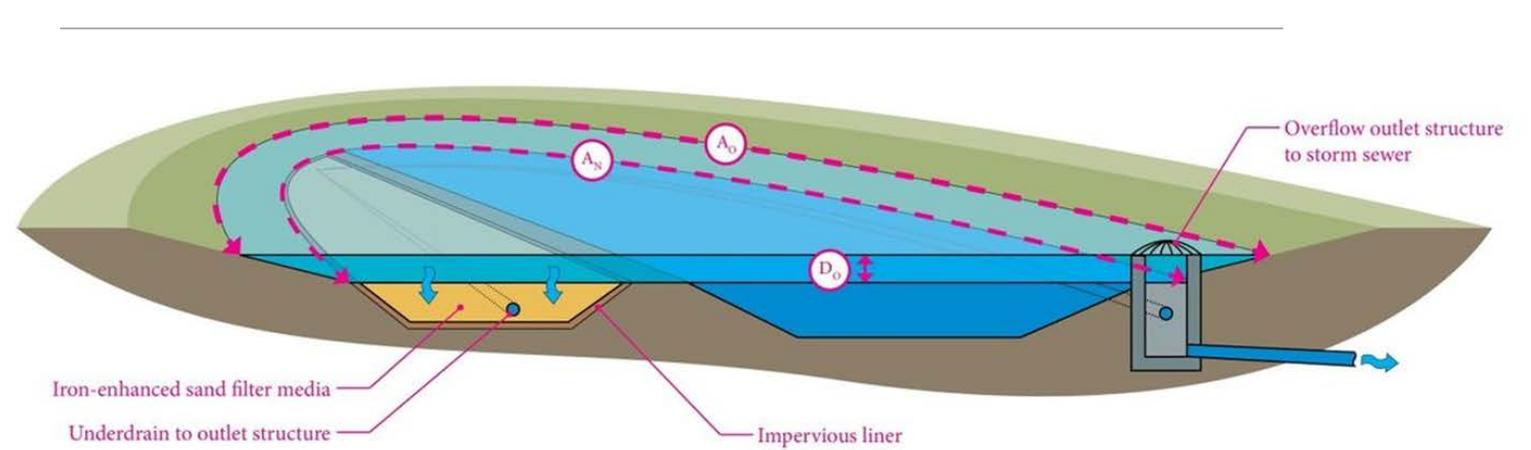
Use Toxicity Data and Novel Bioeffects Monitoring Tools to Prioritize Chemicals and Biological Effects in Stormwater

Is the Tire Chemical 6PPDq Killing Minnesota's Fish?

# Using Toxicity Data and Novel Bioeffects Monitoring Tools to Prioritize Chemicals and Biological Effects in Stormwater



**CompTox Chemicals Dashboard**  
Search 1,200,059 Chemicals



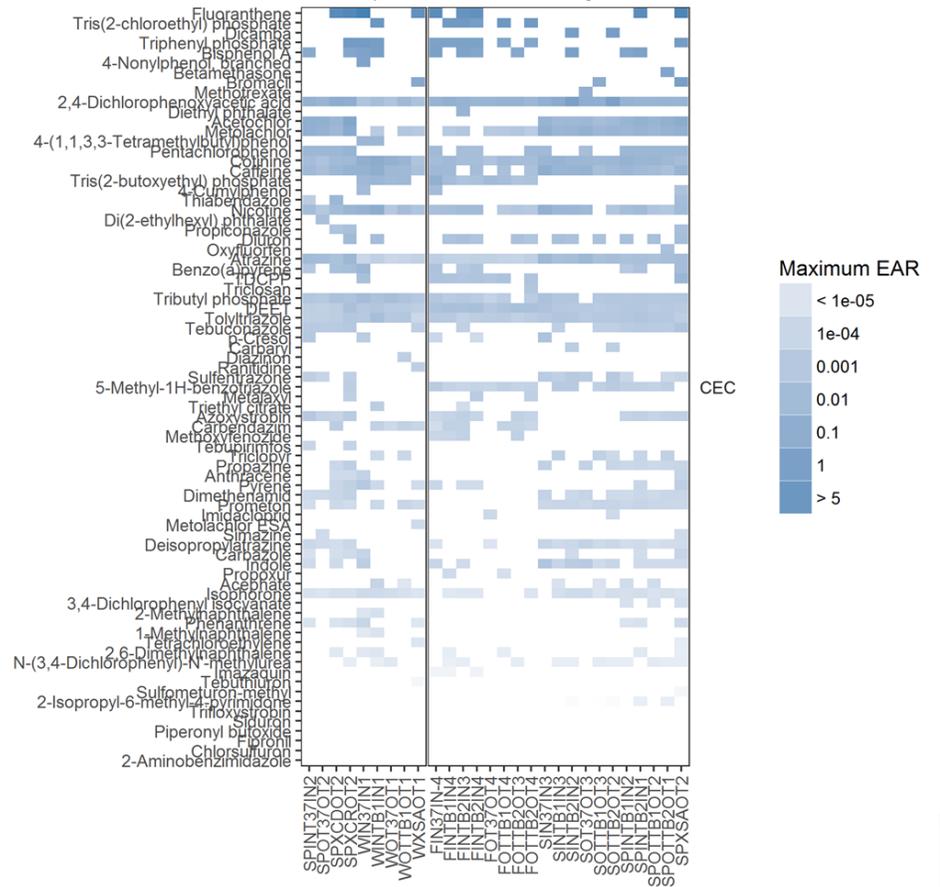
Iron Enhanced Sand Filter Bench in Wet Pond

David Fairbairn, Minnesota Pollution Control Agency, MN  
Mark Ferrey, Minnesota Pollution Control Agency, MN  
Dalma Martinović-Weigelt, U of St. Thomas, MN

# Stormwater- Prioritizing Chemicals of Concern

EAR >1 overall across all sites and seasons

Site ID	Chemical	max EAR
WIN37IN1	Fluoranthene	230.3444165
SPXSAOT2	Fluoranthene	117.7315906
SPXCROT2	Fluoranthene	71.66270735
SPXCDOT2	Fluoranthene	35.83135367
FIN37IN-4	Fluoranthene	30.71258886
SPINTB2IN1	Fluoranthene	30.71258886
FINTB2IN4	Fluoranthene	15.35629443
WXSAOT1	Fluoranthene	15.35629443
FINTB2IN3	Fluoranthene	10.23752962
WINTB1IN1	Tris(2-chloroethyl) phosphate	5.59166573
FOTTB1OT4	Tris(2-chloroethyl) phosphate	4.659721442
FINTB1IN4	Tris(2-chloroethyl) phosphate	2.795832865
FINTB2IN3	Tris(2-chloroethyl) phosphate	2.795832865
FOTTB2OT4	Tris(2-chloroethyl) phosphate	2.795832865
SPXCROT2	Triphenyl phosphate	2.346466688
SPXSAOT2	Triphenyl phosphate	1.955388907
WIN37IN1	Triphenyl phosphate	1.955388907
FINTB2IN4	Tris(2-chloroethyl) phosphate	1.863888577
WINTB1IN1	Triphenyl phosphate	1.564311126
SINTB2IN2	Dicamba	1.467734716
SOTTB2OT2	Dicamba	1.365808694
WINTB1IN1	Bisphenol A	1.331180923
SINTB2IN2	Bisphenol A	1.124618366
SPXSAOT2	Bromacil	1.024586166
SINTB2IN2	2,4-Dichlorophenoxyacetic acid	1.008873207

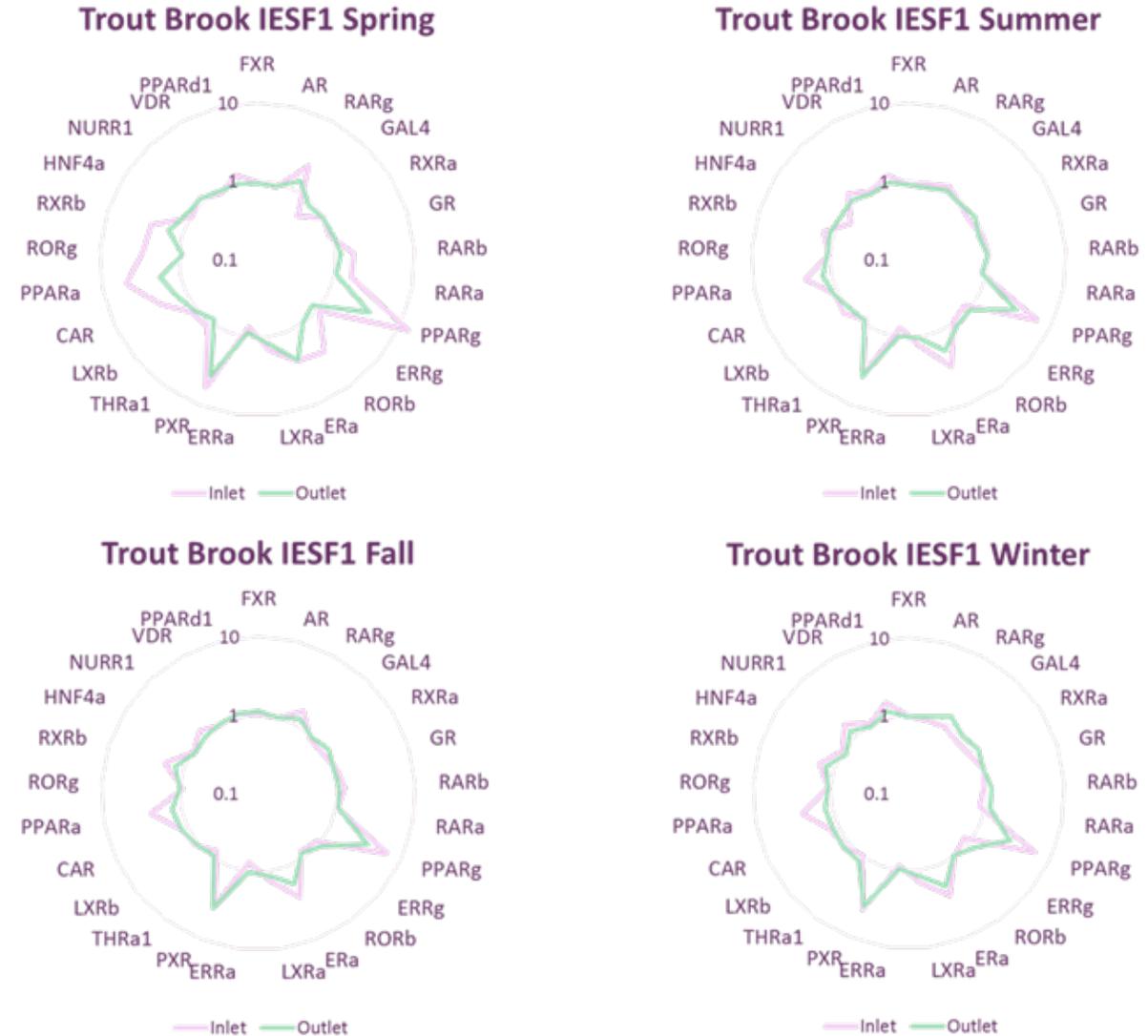


# Stormwater - Bioeffects

The magnitude of target activation was higher than, or comparable to, that of the treated municipal effluent samples from a large urban center (Chicago).

BMP treated samples occasionally exhibited lower activity than the inlet samples, but complete removal of toxicity was rare, and very variable (site-, season-, molecular target-dependent).

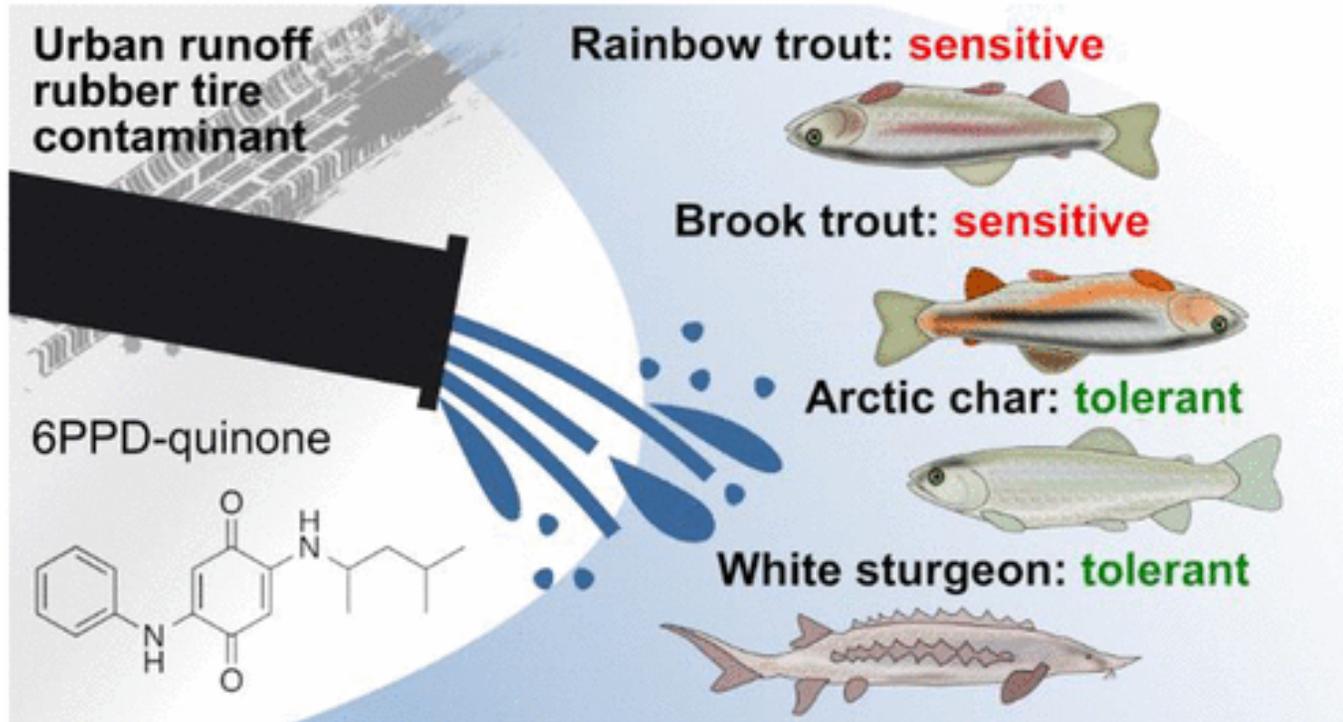
% reductions in BMP chemical outflows were highest in February (38%) and September (36%), and lowest in May (2%); bio-effects data did not reflect those patterns. Bioeffects and chemistry data are needed for complete assessment.



## Common tire chemical implicated in mysterious deaths of at-risk salmon

Coho salmon in urban streams have been dying in the U.S. Pacific Northwest

3 DEC 2020 • BY ERIK STOKSTAD

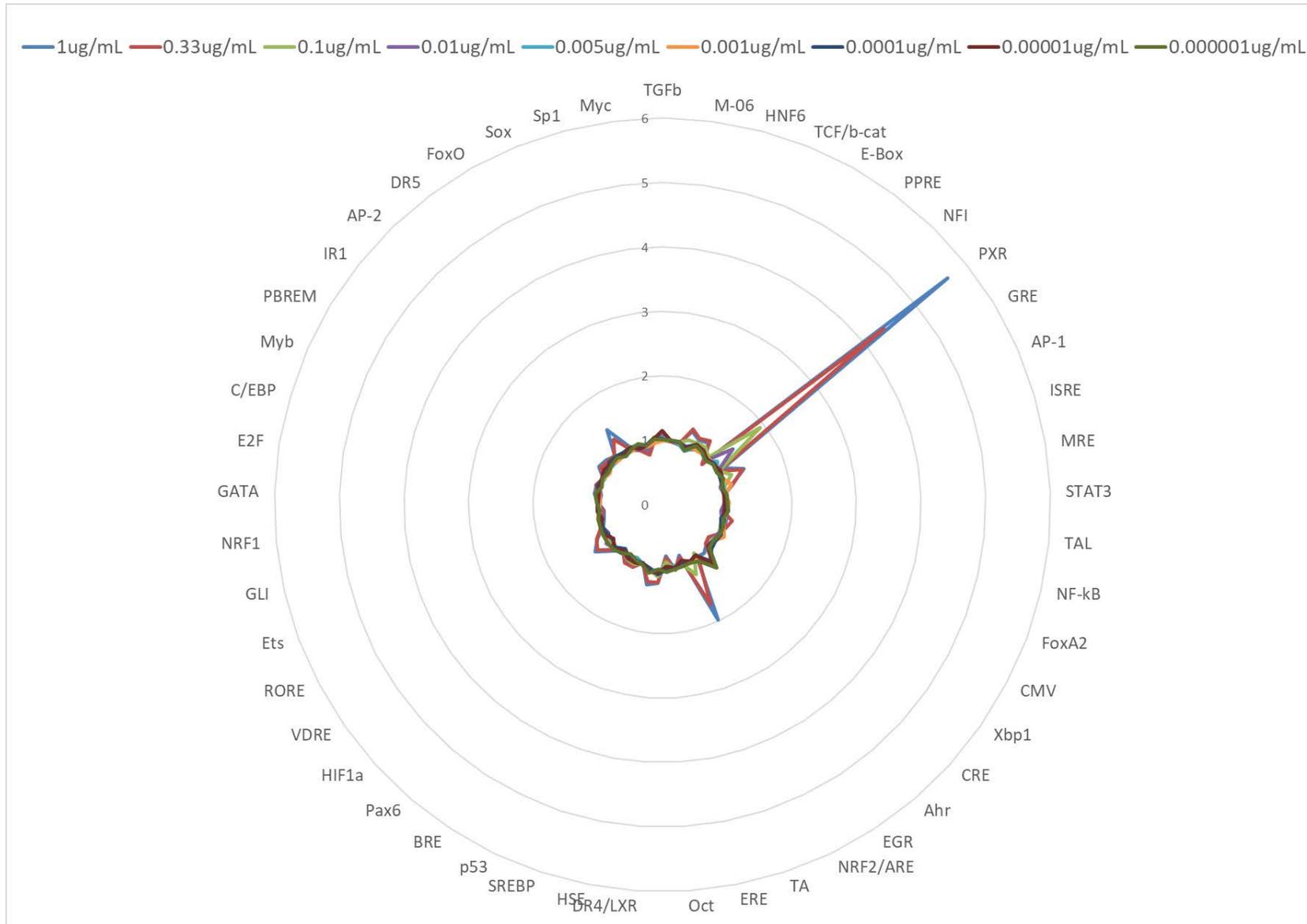


Brinkmann et al., *Environ. Sci. Technol. Lett.* 2022, 9, 4, 333–338

# Is the Tire Chemical 6PPDq Killing Minnesota's Fish?

Nicholas Phelps, University of Minnesota  
Dalma Martinović-Weigelt, University of St. Thomas  
Edward Kolodziej, University of Washington  
Mark Ferrey, Minnesota Pollution Control Agency  
Seth Moore, Grand Portage Band of Lake Superior  
Chippewa  
Mark Jankowski, U.S. Environmental Protection Agency

# Bioeffects - 6PPDq



- Further support for species-specific toxicity
- Low toxicity in human hepatic cell line model
- Nrf2 response potentially indicative of chemical metabolism activation
- Highlights need for use of variety of species/models/tools for toxicity assessment
- New, more versatile and accessible tools are needed, and some are under development (Attagene Inc.)



# Winter Weather Headlines

April 16, 2023  
4:27 AM

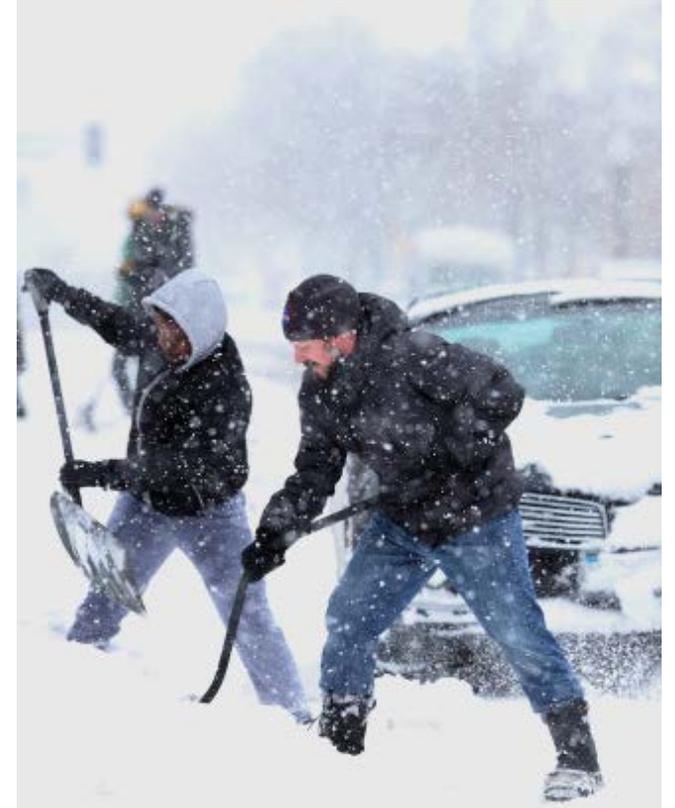
Snow northwest WI and east-central MN and Mixed Precip MN Arrowhead

## Snow Details

- Temperatures will be near freezing. Accumulations will be highly dependent on temperatures.
  - Accumulations today during the daytime will be very limited
  - **Best potential for accumulating snow is tonight into Monday morning**
- Snow will be wet and heavy

## Ice Details

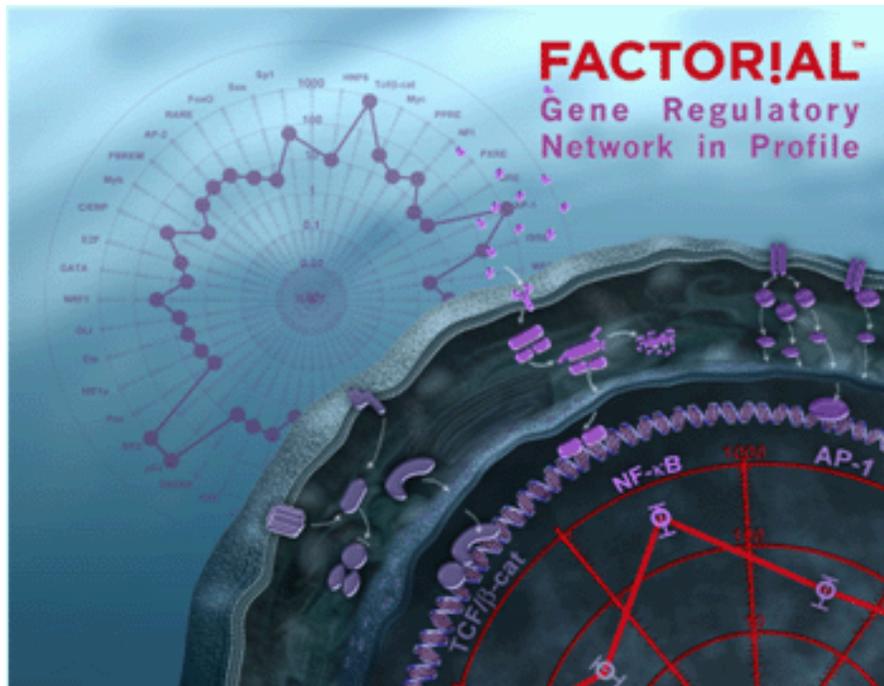
- **Ice accumulation potential** is highest in the **Minnesota Arrowhead this morning through the afternoon**
- Ice accumulations around one tenth of an inch may be observed by this afternoon from the wintry mix in the Arrowhead.



THANK YOU!

# New, more versatile and accessible tools are needed, and some are under development

The next-generation portable platform retains all the unique qualities of the FACTORIAL but is more user-friendly and readily affordable for individual researchers.



- October 21, 2020 - ATTAGENE unveils a groundbreaking technology to screen for chemical hazards to humans and wildlife ([link to the paper](#))
- September 26, 2018 - Attagene researchers publish groundbreaking research in Science Advances ([press release](#))
- January 16, 2017 - Attagene Receives Tibbetts Award at White House Ceremony ([press release](#))

# PFAS in Surface Waters

Gary Belan – American Rivers



**AMERICAN  
RIVERS**

# The Problem with PFAS

- Poly- and perfluoroalkyl substances (PFAS) are human-made, organic compounds that have been manufactured for use in non-stick coatings, waterproof fabrics, firefighting foams and other industrial uses
- Typically found in surface and drinking water near spill sites or industrial areas
- They are highly resistant to degradation and have documented toxicity to animals and likely carcinogenic to people



# PFAS in stormwater



- Industrial inputs to stormwater, but also wastewater and biosolid sources (as a result of industrial uses)
- Studies have even found levels in rainwater
- Unknown impacts on wildlife but it does bioaccumulate



# The regulatory process



- Current regulatory efforts are focused on drinking water
- Need to focus on sources of contamination
- More research needed for ecosystem impacts



# Life Depends on Rivers<sup>SM</sup>



**AMERICAN  
RIVERS**

# Stormwater Program Updates

## National Stormwater Policy Forum

April 24, 2023

Lisa Biddle

Municipal Branch, Water Permits Division  
Office of Wastewater Management



# Recent MS4 Stormwater Resources

- Off-Site Stormwater Management
  - New Off-Site Stormwater Management [website](#)
  - New Publication (2022): [Compendium of MS4 Permitting Approaches: part 7: Off-Site Stormwater Management](#)
- BMP Fact Sheet Updates:
  - Recently updated fact sheets on representative practices that can successfully achieve the stormwater six minimum control measure ([BMP Fact Sheets](#))
- Small MS4 rule clarification [underway](#) (slide 3)
- Outreach & education communication tools:
  - Stormwater Smart (slide 4)



# NPDES Small MS4 Urbanized Area Clarification

Mar.  
2022

The Census Bureau finalized revisions to their program criteria that, among other things, eliminated the distinction between “urbanized areas” from other “urban areas” in the 2020 Census and beyond.

Dec.  
2022

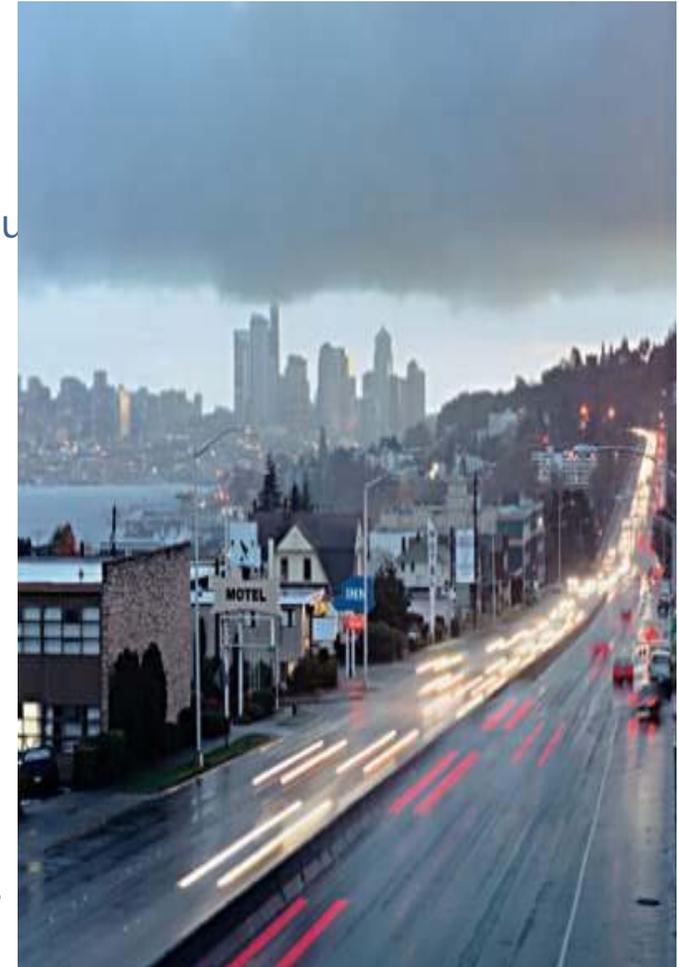
EPA published two Federal Register Notices to clarify its regulations that maintains program continuity and consistency.

Feb.  
2023

Effective 2/22/23, EPA withdrew the direct final rule given the receipt of an adverse comment. [Link to Federal Register Notice.](#)

Now

EPA is in the process of finalizing updates to its regulations and will respond to the comment as part of any final action.



# Stormwater Smart

*Communication tools to energize MS4 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>

# Increase Awareness

- Know What Happens When it Rains Brochure
- Stormwater Flow infographic
- Social media posts/graphics



*Where stormwater flows, everything goes. Soap from car washing products contains chemicals that can harm fish and other critters. Be #StormwaterSmart!*

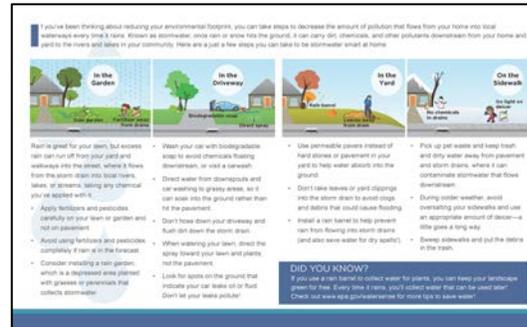


*Where stormwater flows, everything goes. Oil and grease leaked from cars wash down drains and into waterways. Be #StormwaterSmart!*

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

# Promote Practices

- Take Steps to Protect Our Waterways brochure series
- Stormwater Smart infographic
- Social media posts/graphics
- One page tip sheets for small businesses



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

# Inspire Investment

- Invest in Your Community brochure
- Be Stormwater Smart PowerPoint
- Stormwater Investment Benefits infographic
- Social media posts/graphics
- Green Infrastructure in Action Case Studies



### CASE STUDY | Taking Steps to Protect Our Communities

## IOWA ACQUATIC CENTER MAKES A SPLASH WITH PERMEABLE PAVERS

After rainstorms in Monona, Iowa, stormwater runoff used to flow off the gravel parking lot and driveway of the Monona Aquatic Center, picking up pollutants as it flowed into a local river tributary. The City of Monona used funds from Iowa's Clean Water State Revolving Fund, a state-wide clean water loan program, to finance a green infrastructure project to replace the lot with permeable pavers to absorb the stormwater runoff. This project helped to improve local water quality, enhance the parking lot, and reduce site maintenance.

**BACKGROUND**

Originally, the Monona Aquatic Center's driveway and parking lot were made of packed gravel. During rainstorms, stormwater would travel from the parking lot and down the driveway picking up sediment, debris, and oil and chemicals from cars. This contaminated runoff would drain into a local river tributary and then into Silver Creek, which at the time was considered an impaired waterway. During the summer, the heat from the gravel would warm up the stormwater runoff, which would increase the temperature of the local river tributary and disrupt aquatic life.

The parking lot was also unpleasant for guests of the Aquatic Center because it was on a steep hillside. The gravel surface could be hot and uncomfortable for visitors in the summer months. The city wanted to improve the site and use the project to help improve the water quality of nearby streams and rivers. In conjunction with the local Turkey River

**AT-A-GLANCE**

**PROJECT NAME:** Monona Aquatic Center

**TIMELINE:** 2014

**LOCATION:** Monona, Iowa

**POPULATION:** 1,549

**PROJECT FOOTPRINT:** 1,835 square yards of permeable pavers

**GREEN INFRASTRUCTURE:** Permeable pavers

**RESULTS:** Reduced runoff rates during a 100-year storm event from six cubic feet per second to 0.1 cubic feet per second, added 15 parking spots, and improved usability.

**BENEFITS:** Improved water quality, enhanced aesthetics, reduced maintenance, increased parking.

**IMPAIRED WATERWAYS** are bodies of water that do not meet water quality standards.

SEPTEMBER 2022

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

# Stormwater Smart

INCREASE  
**AWARENESS**  
of Stormwater Effects

PROMOTE  
**PRACTICES**  
to Manage Stormwater

INSPIRE  
**INVESTMENT**  
in the Community

Help us get the word out and get the materials into the hands of  
MS4 program managers.

Let us know your ideas

**Contact:**

Rachel Urban

urban.rachel@epa.gov

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

# Green Infrastructure Resources



Stay in touch: GreenStream List Serve  
[join-greenstream@lists.epa.gov](mailto:join-greenstream@lists.epa.gov)

## New EPA Publication (Released Mar 29):

- [Disaster-Resilient Design Concepts](#), showcases disaster-resilient designs to help communities reduce the impact of climate related disasters and create safer, more equitable places to live. **Green Infrastructure** is a key design concept for greater climate resilience.

## Green Infrastructure Webcast Recording (Mar 2):

- Using Green Infrastructure to Prevent Flooding from Intensified Storms in New York and New Jersey ([link](#)).

## Green Infrastructure Federal Collaborative:

- **Priorities include:** Coordinating technical assistance in regions; building regional permitting networks with expertise in nature-based solutions; expand training to municipal stormwater, floodplain, and emergency managers on green infrastructure topics. ([more info](#))

**Green Infrastructure [website](#):** Build | Learn | Partner

# Stormwater Research & Priorities

- Climate, extreme weather, & equity
  - Tools for the NPDES program ([website](#))
  - Mapping & analysis: [EJ screen](#)
  - Research areas: Managing Stormwater in the Face of Climate Uncertainty, Alternative Water Sources for Climate Adaptation (see: [Safe and Sustainable Water Resources research area](#))
- Pollution prevention
  - Resources: [Industrial stormwater fact sheet updates](#) underway
  - Funding: [Pollution Prevention \(P2\) grants](#)
  - Innovation support: [EPA Small Business Innovation Research \(SBIR\)](#)
- Source control
  - Information resources: [Safer Choice](#), [Safer Chemical Ingredients list](#), [Sustainable Products Marketplace](#), [PAHs and Coal Tar Sealants stormwater BMP fact sheet](#)
  - Voluntary initiatives: [copper free brake initiative](#)
  - Showcasing effective street sweeping programs ([Clean Sweep](#); Seattle, WA Integrated Planning [Case Study](#))
- Emerging contaminants (PFAS, microplastics, 6PPD-quinone)
  - Research: analytical methods, research regarding fate, transport toxicity, and treatment

# Integrated Planning

- EPA's Integrated Planning website:
  - Report to Congress | Fact sheets | Plans already developed | Case studies |
  - Toolkit for permitting authorities (Spring 2023 release)
    - Technical assistance piloting the new toolkit
- Long-term Stormwater Planning
  - Resources (Fall 2023 release): Guide | Worksheets | Examples
  - Focus Areas:
    -  Asset management
    -  Financing/funding
    -  Green infrastructure opportunities analysis
    -  Incorporating green infrastructure into roadways



# About the Integrated Planning Toolkit

- The **Integrated Planning Permitting Authority Toolkit** includes three modules and a workbook, each designed to help a permitting authority promote and support integrated planning for permittees:



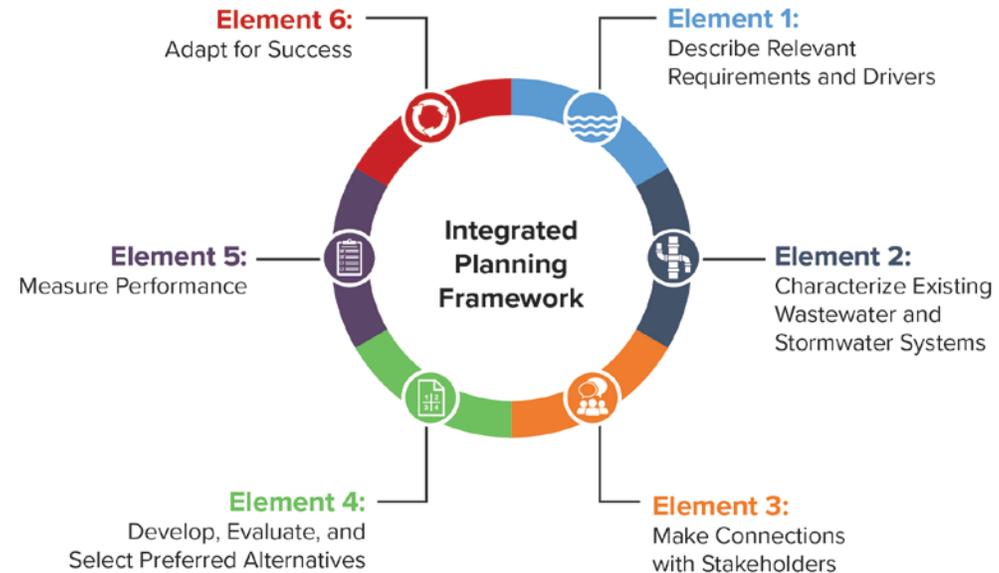
Informing



Collaborating



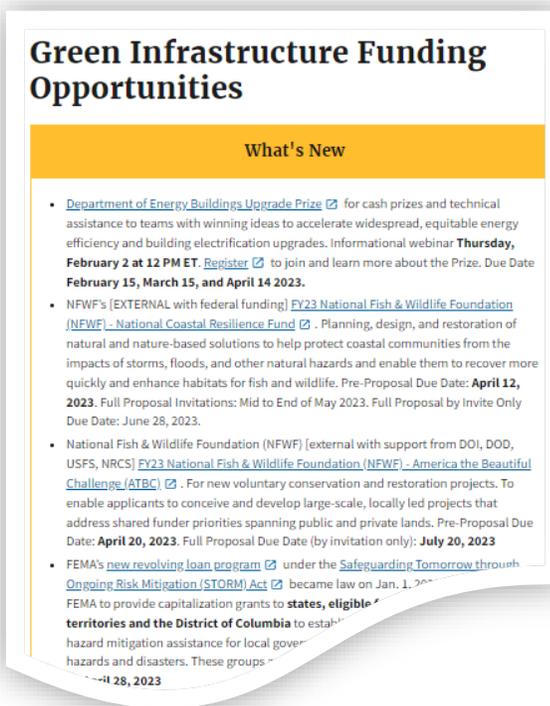
Incorporating



- To request **technical assistance** working through the integrated planning toolkit and process, states and municipalities can email [huddle.heather@epa.gov](mailto:huddle.heather@epa.gov) by **August 31**.

# Funding & Financing

- Green Infrastructure Funding Opportunities [webpage](#)
  - [Master Summary](#) for Navigating Federal Funding for Green Infrastructure – list identifying project phases the funds can be applied to (planning & design, construction, O&M, monitoring)
- [Water Finance Clearinghouse](#): Web-based portal of funding sources & resources on financing mechanisms
  - [Stormwater Funding and Financing Webinar Series](#)
- SRF & BIL Resources for Clean Water
  - CWSRF BIL emerging contaminants set-aside: [details & resources](#)
  - Recent Fact Sheet: [Increasing Climate Resilience and Mitigation with the CWSRF and WIFIA Program](#) (2023)
- Grants - EPA posts all grant opportunities on <https://www.epa.gov/grants> & [grants.gov](https://www.grants.gov).
  - **Centers of Excellence for Stormwater Infrastructure Technologies** (in the works): Authorized in FY23 budget, EPA is working internally to build this new grant program





**Stormwater never travels alone.**

**Thank you!**

[Biddle.lisa@epa.gov](mailto:Biddle.lisa@epa.gov)

[Urban.rachel@epa.gov](mailto:Urban.rachel@epa.gov)

[Deyoung.robyn@epa.gov](mailto:Deyoung.robyn@epa.gov)

[Goss.heather@epa.gov](mailto:Goss.heather@epa.gov)

# Clean Water State Revolving Fund and Bipartisan Infrastructure Law

Opportunities for Funding Stormwater Infrastructure

April 24, 2023



Clean Water  
State Revolving Fund

# The Clean Water State Revolving Funds (CWSRFs)

- Federal/state partnerships designed to create, in each state, a perpetual source of financing for wastewater and stormwater infrastructure
- Combines federal and state funds to provide low-cost financing for water quality improvement projects
- State implemented and operated
- Flexibility in assistance provided
  - Type of assistance: loans, refinancing, loan guarantees, technical assistance
- Availability of special financing terms to disadvantaged communities to help address equity and affordability

# State Revolving Funds: Roles

## EPA's Role

Awards capitalization grants to states

Provides grant terms and conditions

Provides guidance

Program oversight

## States' Role

Design SRF programs to reflect the needs of their state

Accept applications

Score and rank projects

Select projects for funding

## Communities' Role

Understand program eligibilities and requirements

Apply for funding for the state SRF program

Participate in the SRF public review process

# Bipartisan Infrastructure Law

- Signed by President Biden on November 15, 2021.
- Historic investment in key programs and initiatives implemented by the U.S. Environmental Protection Agency to build safer, healthier, cleaner communities.
- Includes \$50 billion to the EPA to strengthen the nation's drinking water and wastewater systems – the single largest investment in water that the federal government has ever made.
- Approximately \$43.4B of this funding through the existing CWSRFs and DWSRFs.

# CWSRF Funding in the BIL: Overview

EPA is making \$12,713,000,000 in **additional** capitalization grants available to the state CWSRFs over the next five years.

Most of this money may fund any project eligible under the CWSRF; some funding is targeted towards projects focused on “emerging contaminants.”

**States have the authority to waive repayment on some of this new funding** (e.g., forgive some or all of the loan’s principal or provide grants).

<b>Clean Water for Communities</b>	<b>\$12.7 billion</b>
<b>General:</b> Clean Water State Revolving Funds	\$11.7 billion
<b>Addressing Emerging Contaminants:</b> Clean Water SRFs	\$1 billion

# CWSRF Additional Subsidization

**CWSRF Base Program:** 10-40% of the capitalization grant amount must be given as additional subsidy

**CWSRF General Supplemental:** 49% of the capitalization grant amount must be given as additional subsidy

**CWSRF Emerging Contaminants:** 100% of the capitalization grant amount must be used as additional subsidy

## **Additional subsidy may be provided for:**

- Municipalities that meet the state's affordability criteria OR
- **Stormwater**, energy and water efficiency, and sustainable project planning, design, and construction

# CWSRF Eligibilities: Base and General Supplemental

## Gray Infrastructure

- Traditional pipe, storage, and treatment systems
- Real-time control systems for CSO management
- Sediment controls including:
  - Filter fences
  - Storm drain inlet protection
  - Street sweepers
  - Vacuum trucks

## Green Infrastructure

- Green roofs, green streets, and green walls
- Rainwater harvesting collection, storage, management, and distribution systems
- Real-time control systems for harvested rainwater
- Infiltration basins
- Constructed wetlands, including surface flow and subsurface flow (e.g., gravel) wetlands
- Bioretention/bioswales (e.g., rain gardens, tree boxes)
- Permeable pavement
- Wetland/riparian/shoreline creation, protection, and restoration
- Establishment/restoration of urban tree canopy
- Replacement of gray infrastructure with green infrastructure including purchase and demolition costs

# CWSRF Eligibilities: BIL Emerging Contaminants

**Eligible:** CWSRF-eligible projects that address substances and microorganisms, including manufactured or naturally occurring physical, chemical, biological, radiological, or nuclear materials, which are known or anticipated in the environment, that may pose newly identified or re-emerging risks to human health, aquatic life, or the environment.

**Not Eligible:** Projects that address contaminants with water quality criteria established by EPA under CWA section 304(a), except for PFAS.

# How Do I Apply for SRF Funding?

## **Develop your plans and identify needs.**

Develop a capital improvement plan.

State SRFs may provide planning and development assistance.

## **Engage with your state SRF program.**

Each state has a process and timeline for applications.

Discuss funding options (SRF base, SRF BIL, state funding, etc.) to build a plan for your community.

## **Build an ongoing relationship with the state SRF.**

BIL funds are over FY 2022-2026.

Base SRF programs are ongoing.

# Green Project Reserve

Requires all CWSRF programs to use a portion of their federal capitalization grants for **green infrastructure, water and energy efficiency projects, and other environmentally innovative activities**

- American Recovery and Reinvestment Act of 2009 to FY 2011: 20% Requirement
- FY 2012 to FY 2023: 10% Requirement

# Innovative Financing Mechanisms



- Co-Funding
- Grant Match
- Sponsorship Financing
- Programmatic Financing
- State Incentives
- Linked Deposit
- Pass-Through Lending

# EPA-Sponsored Technical Assistance for CWSRF for NPS

Since 2017, EPA has provided technical assistance to state CWSRF programs to address priority nonpoint source (NPS) pollution needs by providing nature-based solutions. Examples include:

- **Vermont** – to create NPS pollution sponsorship program for green stormwater infrastructure
- **Kansas** – to help kick-start adoption of no-till cover crop agriculture
- **Arizona** – for watershed protection/forest thinning projects to reduce wildfire risk in high priority drinking water supply watersheds
- **Maryland** – to incentivize reforestation on private lands and implement the Chesapeake Bay TMDL
- **Minnesota** – to establish easements in sensitive wellhead protection areas and convert crops to those that act as nitrogen sinks (e.g., soybeans)
- **Wisconsin** – to encourage wastewater utilities to develop watershed financing partnerships to reduce nutrients by bundling NPS projects distributed throughout a watershed and to encourage more water quality trading between utilities and the agricultural community.

## CWSRF Best Practices Guide for Financing Nonpoint Source Solutions

*Building Successful Project Funding Partnerships*



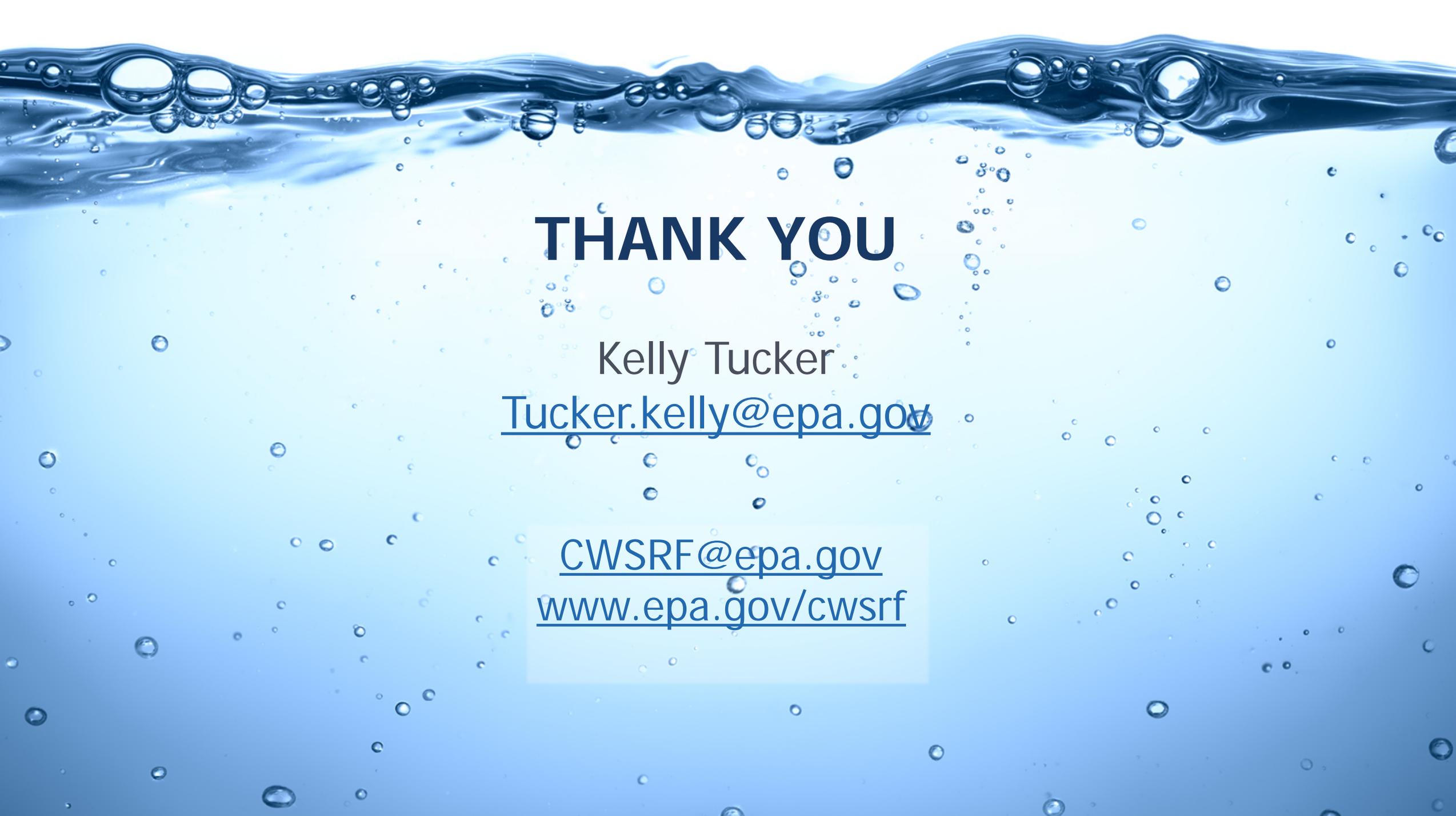
# CWSRF Best Practices Guide for Financing Nonpoint Source Solutions

EPA released this guide to help state CWSRF programs address nonpoint source priorities, particularly nature-based solutions

The guide can help state programs overcome challenges such as:

- Identifying a repayment source (point source utilities have revenue streams for repaying loans whereas NPS projects must get creative)
- State-imposed restrictions on lending to NGOs and other partners
- Higher administrative burdens associated with smaller loan sizes and greater # of projects (think “Ag BMPs vs POTW upgrades”)
- Capacity constraints at state CWSRF agencies to explore new directions, especially with BIL-related demands

Available at [www.epa.gov/cwsrf](http://www.epa.gov/cwsrf) and [www.epa.gov/nps](http://www.epa.gov/nps)



**THANK YOU**

Kelly Tucker

[Tucker.kelly@epa.gov](mailto:Tucker.kelly@epa.gov)

[CWSRF@epa.gov](mailto:CWSRF@epa.gov)

[www.epa.gov/cwsrf](http://www.epa.gov/cwsrf)



# Stormwater Enforcement

---

Sean Ireland  
Water Enforcement Division  
Office of Enforcement and Compliance Assurance

# The Flow of Information

Enforcement Process

Partners and Oversight

By the Numbers

Areas of Focus

Level the Playing Field



# Initial Investigations



## DATA COLLECTION

Permits  
Permittee Info  
Monitoring Results  
Regulator Reports



## DATA ANALYSIS TARGETING

Industry  
Socioeconomic  
Impairments  
Complaints



## INSPECTIONS

Reconnaissance  
Offsite Review  
Compliance Evaluation  
Audit



## INFORMATION REQUESTS

Self Reporting  
Monitoring Data  
Contract Agreements  
Enforcement History

# Enforcement Actions

## Informal Enforcement

- Areas of Concern / Deficiencies
- Notices of Violation

## Formal Enforcement, independently enforceable

- Administrative Orders (unilateral or on consent)
- Consent Agreement / Final Order (CA/FO)
- Consent Decrees (DOJ, Complaint)

## Headquarters role

- Nationally Significant Issues (NSI cases)
- Independent actions



# Penalty Policies

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## Comprehensive Penalty Policies

1995 CWA  
Penalty Policy

Industrial  
Stormwater

Construction  
Stormwater

## Expedited Settlement Agreements

Industrial Nonfiler  
ESA

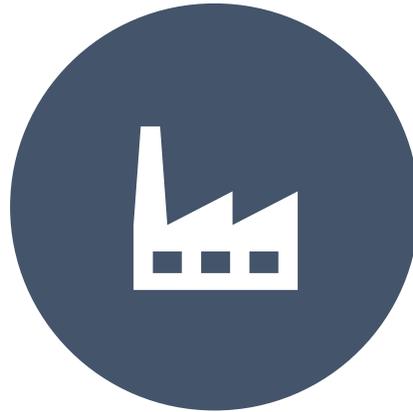
Industrial MSGP  
ESA

Construction  
ESA

# Stormwater Universe of Permittees



7,250 MS4s  
LARGE AND SMALL



132,000 INDUSTRIAL



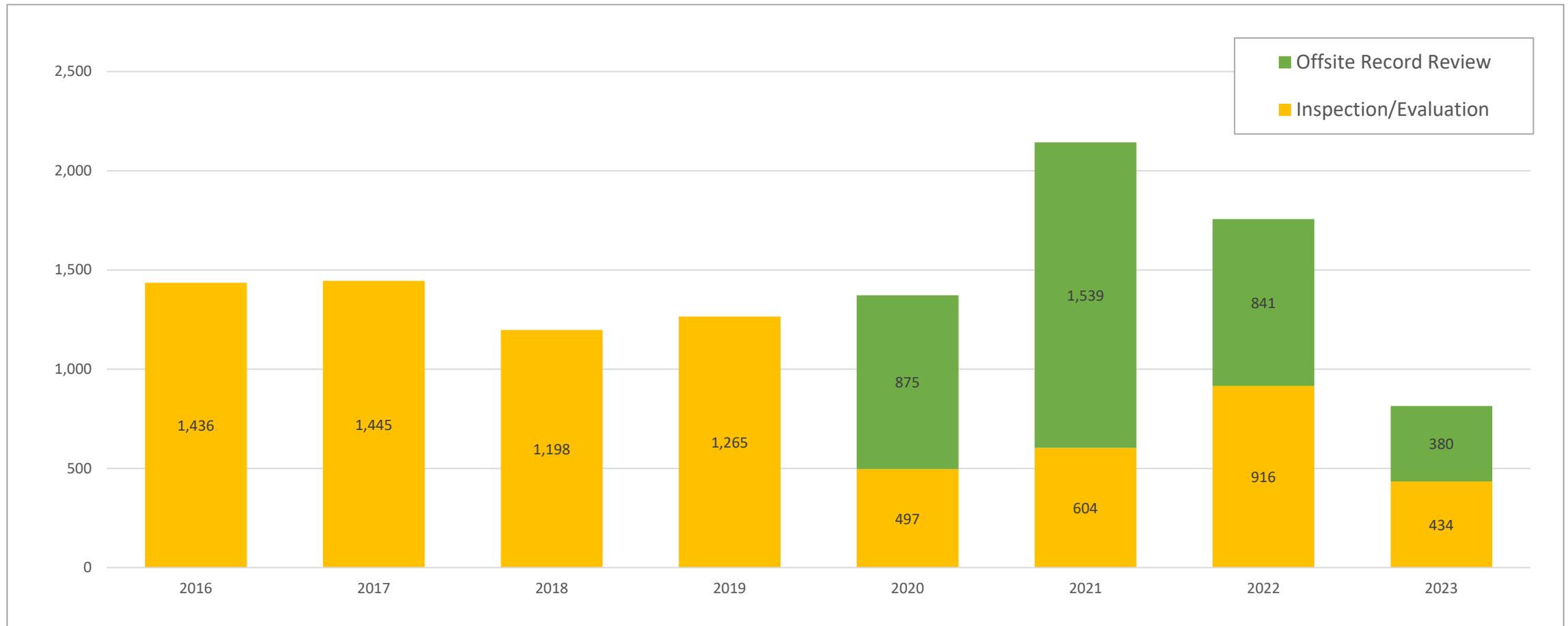
500,000 CONSTRUCTION

# Partners and Oversight

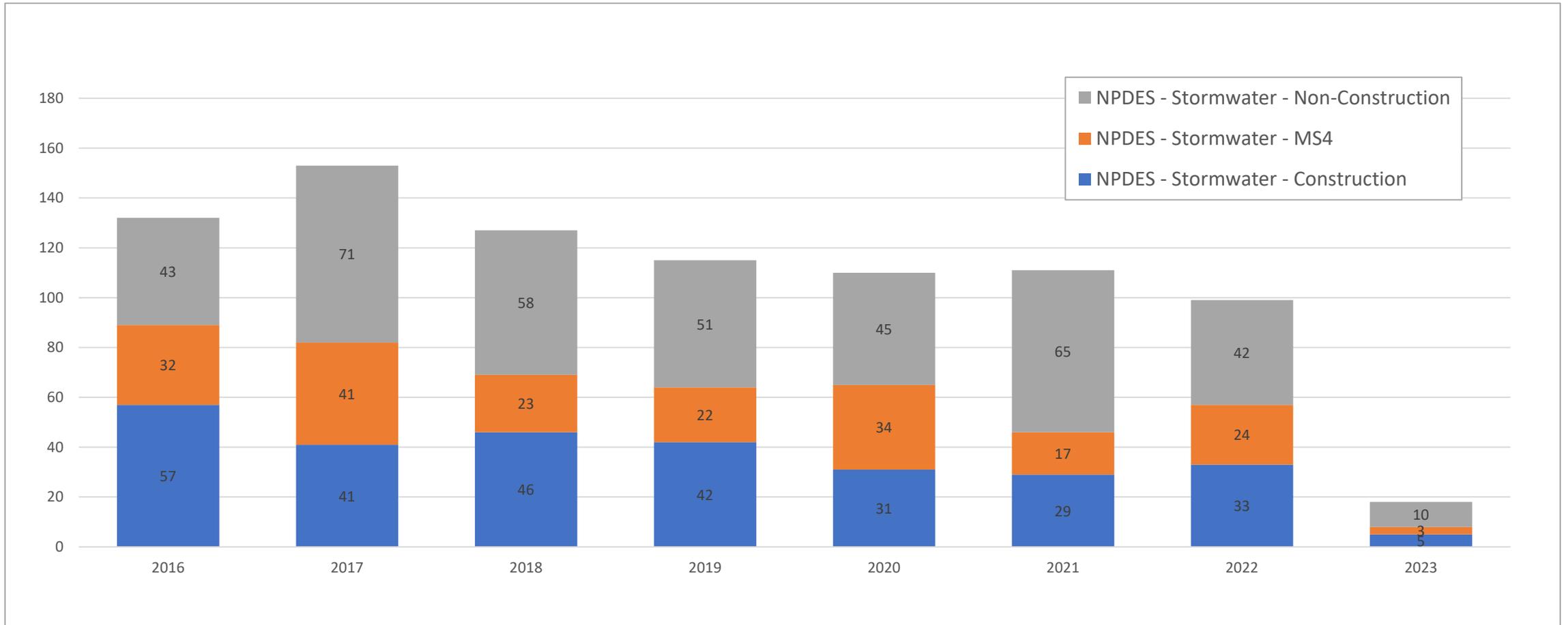
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- Compliance Monitoring Strategy, stormwater inspection frequency
  - 10% Construction
  - 10% Industrial
  - 20% MS4s
- States carry a heavy load
- State Review Framework (SRF) <https://www.epa.gov/compliance/state-review-framework>
  - To consistently assess state enforcement. Designed collaboratively in 2004 by EPA and the Environmental Council of the States (ECOS)
- Municipality collaboration is imperative

# EPA Compliance Monitoring – All NPDES Programs



# EPA Formal Enforcement Actions – Stormwater Only



# EPA Areas of Focus

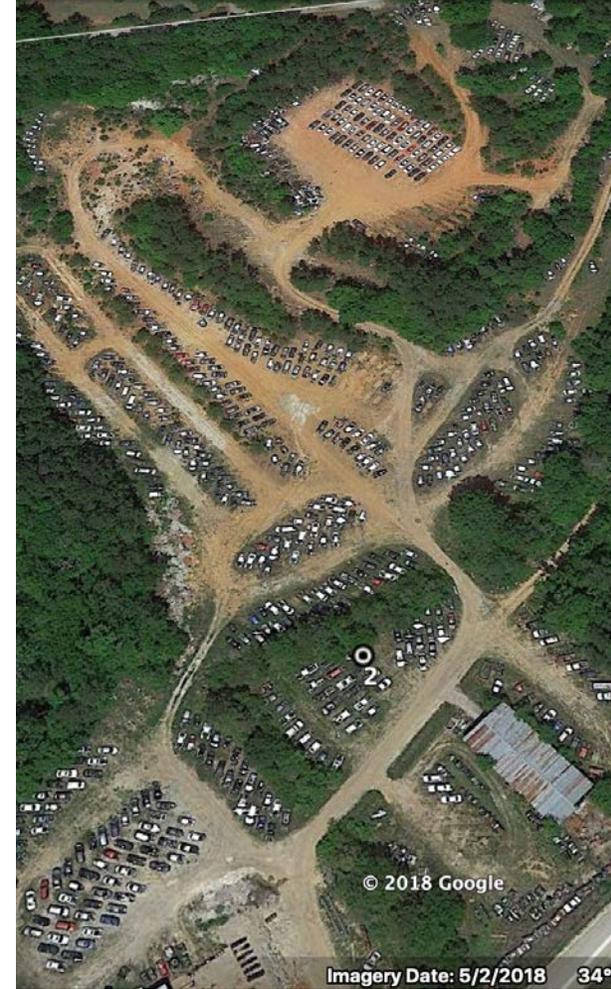
## EPA Strategic Plan FY22-FY26

- Environmental Justice, Drinking Water, PFAS, Climate Change

## National Enforcement and Compliance Initiatives

- Construction
  - Major homebuilders
  - Big box stores
- Municipal Separate Storm Sewer Systems
  - Assess and address all Phase Is
  - Continued efforts with Phase IIs
- Significant Noncompliance – wastewater emphasis

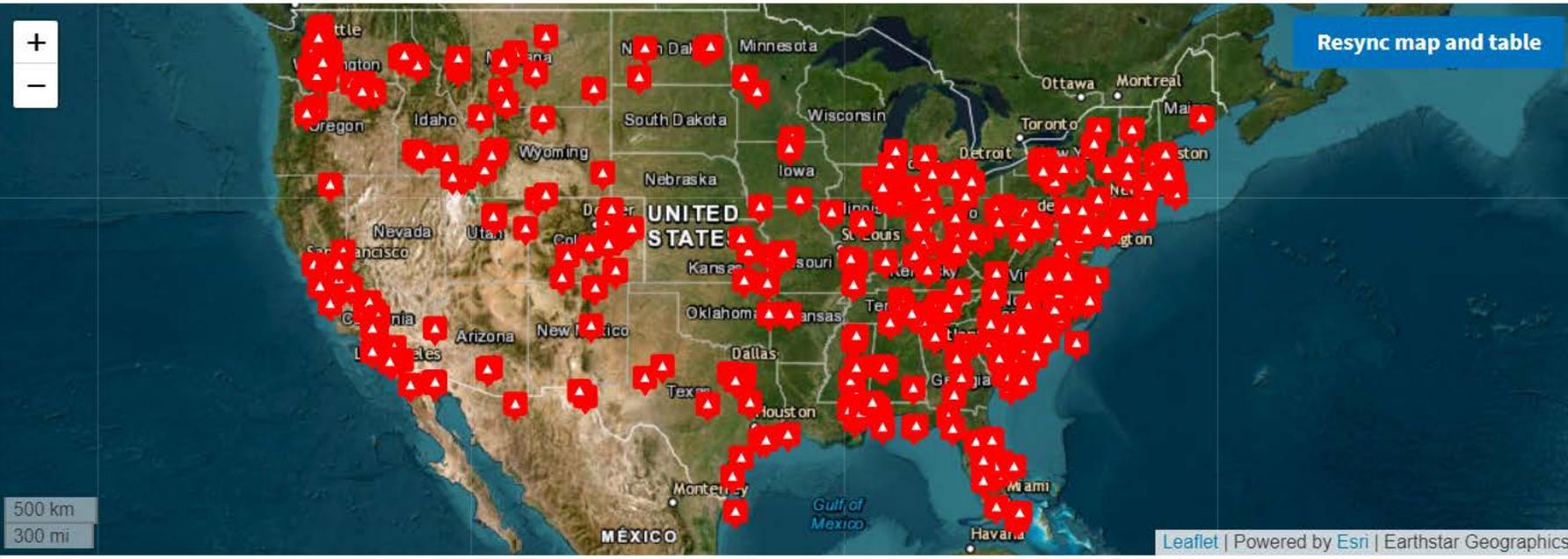
## Industrial Stormwater, informal focus



# Industrial Stormwater Nonfilers

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Map Legend | Basemap Options | Reset Map and Table | Save Search



Customize Columns | Download Data | Reset Map and Table | Save Search | Results Guide

User-Assigned Priority	Notes	Flag/Notes Last Updated	Facility Name (Standardized)	Potential FRS Matches	Primary Address	City	State	Primary US SIC Code	Primary US NAICS Code	Number of Employees	Primary Industrial Stormwater Sector (Derived)
	<a href="#">View/Edit</a>	08/04/2022 09:48:14 AM						3295	327992	80	E

**Layers**

Each map layer requires a specific map scale for display. Layers are only available for selection if the map is zoomed in to a sufficient scale. Zoom in further to enable selection of additional layers. Note that adding multiple overlapping map layers may cause performance issues in the browser and display.

Do not show again

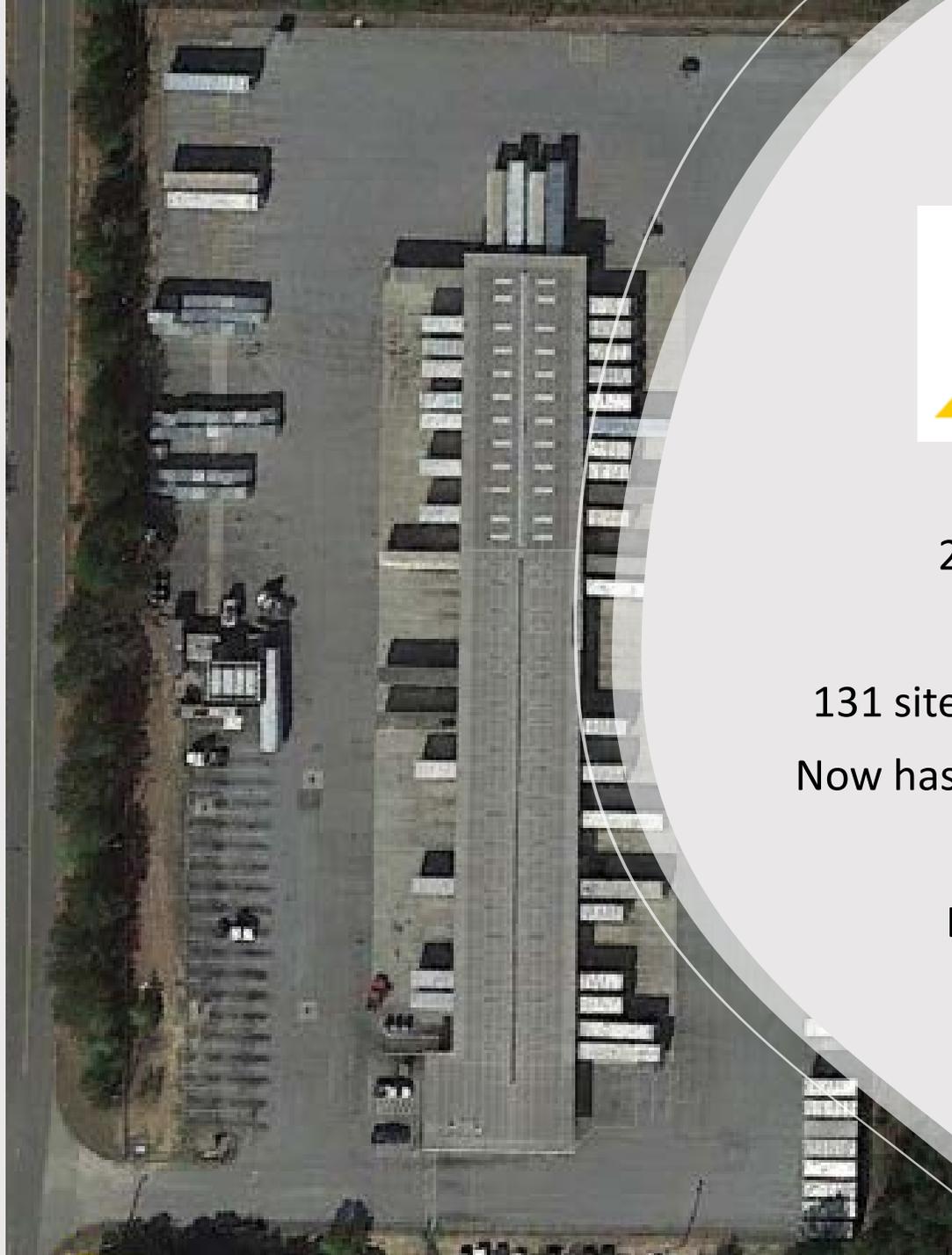
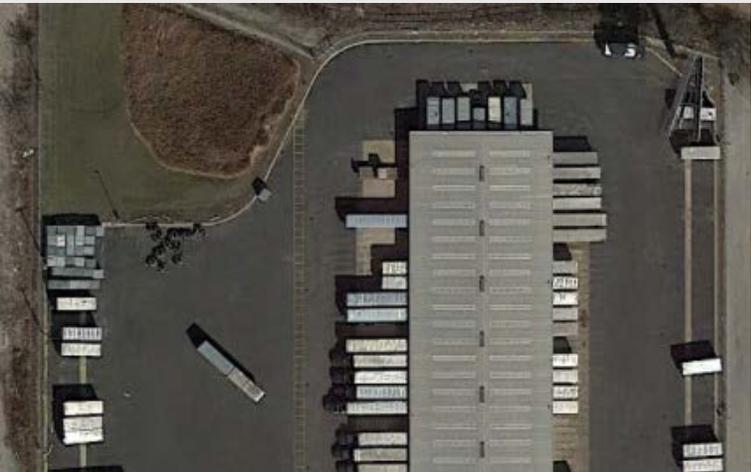
Current Zoom: 17%

- ▶ Permitted Facilities
- ▶ EJSscreen Maps
- ▶ Air Maps
- ▶ Surface Water Features
- ▶ Water Maps
- ▶ Places
- ▶ Boundaries
- ▶ Endangered Species Act Critical Habitat

---

**Filter User-Assigned Priorities**

- 497 High Priority
- 1,125 Medium Priority
- 2,260 Low Priority
- 14,799 No Interest
- 890,735 Non-Flagged



236 facilities nationwide

Self-disclosed

131 sites were without an NOI or NEC

Now has 45 NOI sites and 191 NEC sites

\$535,000 penalty

Lodged March 20, 2023

A close-up, shallow depth-of-field photograph of rain falling onto a dark, wet surface, likely asphalt or pavement. The raindrops are captured in mid-air, creating a misty, dynamic effect. In the background, there is a dense layer of green foliage, possibly bushes or trees, which is softly blurred. The overall scene is overcast and rainy.

Laws without enforcement are  
merely well-intended suggestions

Sean Ireland  
ireland.sean@epa.gov  
202-564-2923



# WEF Stormwater Institute Briefing

Scott Taylor, P.E.  
*Advisory Committee Chair*



# MMS4 AWARDS

National Municipal Stormwater and  
Green Infrastructure Awards Program

# Designed to Showcase High-performing MS4 Programs



- **Developed and implemented in 2015**
  - Phase I and Phase II programs are eligible
  - Selection by an expert panel
- **Three award categories each for Phase I and Phase II**
  - Overall program
  - Program management
  - Innovation
- **Program is an important PR tool**
- **Aids in technology transfer**
- **Demonstrates ROI for MS4 Programs**

# 2022 Award Winners

## MS4 Phase I:

- Overall: Anne Arundel County Department of Public Works, Maryland
- Program Management: City of Colorado Springs Stormwater, Enterprise, Colorado
- Innovation: Anne Arundel County Department of Public Works, Maryland

## MS4 Phase II:

- Overall: City of Frisco, Stormwater Division, Texas
- Program Management: St. Louis MS4 Co-permittee Group, Missouri
- Innovation: City of Richmond, Stormwater Utility, Virginia



# 2023 Application

## Timeline:

- Application opens: April 24, 2023
- Application closes: June 5, 2023
- Winners' notification: August 1, 2023

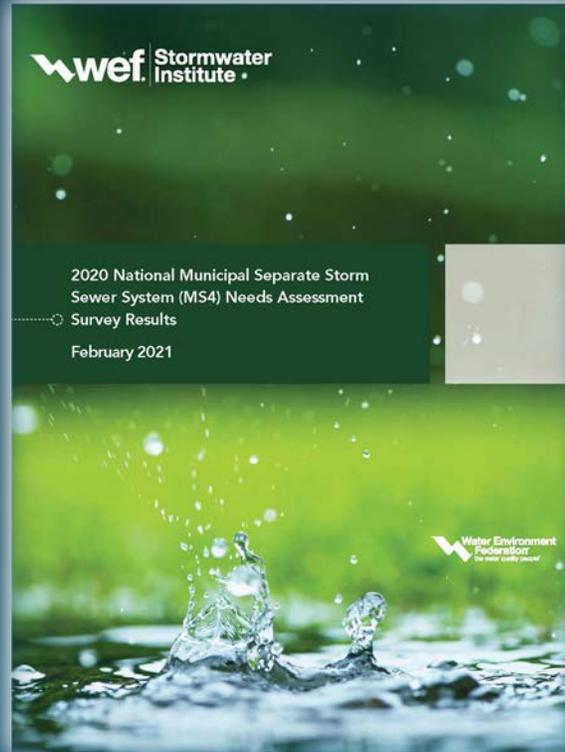
## Recognition:

- At WEFTEC 2023
- When: September 30 – October 4
- Where: McCormick Place | Chicago, IL

Apply Here! →



# MS4 Needs Assessment



category or question as well as across varying permittee types. These metrics include a weighted score for responses using the 1 through 5 rating criteria utilized in several

question frameworks, a ranking of each response based upon weighted score, and a percentage of respondents who express strong to very strong support for the

Table 3 - Breakdown of 2018 and 2020 Survey Respondents by Permittee Type

MS4 Permittee Type	2018 Population by Permittee Type	2018 % by Permittee Type	2020 Population by Permittee Type	2020 % by Permittee Type
Phase I	155	25%	1	1%
Phase II	404	65%	5	5%
Phase II Non-traditional	44	7%	1	1%
State DOT	19	3%	1	1%
Total	622	100%	8	100%

Table 4 - Breakdown of 2018 and 2020 Survey Respondents by EPA Region

EPA Region	States in EPA Region	2018 Count	2018 %	2020 Count	2020 %
1	CT, ME, MA, NH, RI, VT	1	0%	0	0%
2	NY, NJ, PA, VA, WV, DC	1	0%	0	0%
3	DE, MD, PA, VA, WV, DC	1	0%	0	0%
4	AL, GA, KY, MS, NC, TN, FL, SC	1	0%	0	0%
5	IL, IN, MI, MN, OH, WI	1	0%	0	0%
6	AR, LA, OK, NM, TX	1	0%	0	0%
7	IA, MO, KS, NE	1	0%	0	0%
8	CO, MT, ND, SD, UT, WY	1	0%	0	0%
9	AZ, CA, HI, NV, Guam, Samoa	1	0%	0	0%
10	AK, ID, OR, WA	1	0%	0	0%

The 2018 survey report used the last of these three metrics but did not use the weighted score. The reason for using this method is to provide a more granular measure of support, as the use of percentage supporting at a strong or very strong level may not capture the level of strength of support for the response. More information is available in the additional online resources on how the weighted scores were determined and how the scores provide more insights on the level of support of a given response.

Table 6 - Responses to Inquiry on the Presence and Number of Co-Permittees by Varying Permittee Type and Grouping (Question 8)

Permittee Group/Type	Yes (%)	Total Count	Total Permittees
All Permittees	25%	143	2043
Phase I and Phase II	81%	131	1975
Phase I	65%	63	1167
Phase II	87%	68	808
Phase II Non-traditional	89%	6	45
State DOT	79%	4	21
All Permittees - EPA Region 3	92%	3	41
All Permittees - EPA Region 5	84%	31	373
All Permittees - EPA Region 9	71%	11	374

Table 7 - Responses to Inquiry on the Population Served by Communities for All Permittees in the Survey (Question 9) Including 2018 Survey Data

Population Group	2018 Survey by Population Group	2020 - All Permittees	
		Count	Percentage
Less than 10,000	18%	142	18%
10,000 to 49,999	38%	346	43%
50,000 to 99,999	17%	121	15%
100,000 to 499,999	15%	142	18%
500,000 to 999,999		25	3%
1 million to 1,999,999	11%	14	2%
2 million or greater		18	2%
Total	100%	804	100%

## FINDINGS FOR SURVEY TOPIC AREAS

### MS4 PROGRAM CHALLENGES

Question 10 in the survey focused on stormwater program challenges. Table 8 shows a summary of responses. In reviewing the summary of responses provided for this question provided in the additional online resources, a number of conclusions can be drawn.

The response option of "Other" is the top ranked option. This suggests that the options provided may not capture completely the universe of responses needed. These responses suggest a wider array of response options should be provided in future surveys for policy/regulatory challenges that go beyond the existing options available ("increasing or expanding regulations"

and "permit requirements are unclear").

The SWI informally reviewed and categorized the nearly 100 responses provided in the "Other" category. A majority of the responses were focused on policy/regulations (43), with other response categories such as resources/funding (33), programmatic challenges (16) and education/training (10) filling out the balance.

While it is not appropriate to provide all the individual responses, consistent themes emerged. For instance, several responses reflect challenges between existing permitting programs and the ability to fit local programs to meet regulatory requirements. These responses also

<https://wefstormwaterinstitute.org/programs/ms4survey>

# Community and Survey Data Info

- **643 respondents**

- Phase I (134 / 21%)
- Phase II (462 / 72%)
- Phase II Non-traditional (28 / 4%)
- DOTs (19 / 3%)

- Most respondents are located in **Public Works Dept (46%)**

- Second is stormwater utility (14%)

- Most Phase II non-traditional are **universities/colleges**

- Vast majority of respondents (85%) are the **sole permittee** (no co-permittee)

- For those with co-permittee, the majority have less than 5 co-permittees

# MS4 Challenges

- **Aging infrastructure, funding needs, and workforce and staffing needs are top three challenges**
  - Aging infrastructure (weighted score = 3.82, significant or very significant = 63%)
  - Funding needs (weighted score = 3.79, significant or very significant = 64%)
  - Workforce and staffing needs (weighted score = 3.77, significant or very significant = 63%)
- **Regulations are a relatively low challenge** (weighted score = 3.17, significant or very significant = 39%)

# MS4 Program Drivers

- **Water quality is top driver** (weighted score = 3.73, significant or very significant = 62%)
- **Aging infrastructure and land development are high drivers**
  - Aging infrastructure (weighted score = 3.69, significant or very significant = 60%)
  - Land development (weighted score = 3.55, significant or very significant = 56%)
- **Pluvial flooding** is a moderate driver (weighted score = 3.33, significant or very significant = 50%)

# MS4 Information Needs

- **Top technical information resources needs are:**
  - **Funding and financing** (weighted score = 3.79, significant or very significant = 62%)
  - **Asset management** (weighted score = 3.38, significant or very significant = 49%)
  - **Green infrastructure and innovative BMPs** (weighted score = 3.29, significant or very significant = 46%)
- **Top technical information resources needs per minimum control measures:**
  - **Post-construction** (weighted score = 3.30, significant or very significant = 48%)
  - **Monitoring and evaluation** (weighted score = 3.25, significant or very significant = 45%)
  - **Good housekeeping** (weighted score = 3.03, significant or very significant = 35%)

# MS4 Program Characteristics

- Most stormwater programs (52%) use **watershed-based planning** with only 30% who do not (19% do not know)
- **Lack of consensus on asset management planning**
  - 44% say yes, 45% say no, and 11% say I don't know
- Most stormwater programs (55%) have **TMDL requirements in NPDES permit** with only 35% who do not (10% do not know)

# Resilience

- **Over 90% of communities have not prepared resilience plan**
  - Over 60% are not sure if they will do so in the future
  - Only ~20% are planning on doing so in the future
- **Nearly 75% of communities have not updated design standards associated with resilience planning**
  - There is no consensus on design standards updated for resilience
    - Rainfall depths (22%)
    - IDF Curves (14%)
    - Storm Duration (16%)
    - Sizing Rules (22%)
    - Other (26%)
- **Lack of funding for resilience planning is biggest future challenge to preparing for resilience (45% of total)**
  - Second largest challenge is lack of information on climate change impacts and uncertainty (20%)

# Most/Least Developed Aspects of Stormwater Programs?

- Most **well-developed** parts of stormwater programs include:
  - Construction inspection/enforcement (17.3%)
  - Public engagement & outreach (14.5%)
  - IDDE (12.1%)
  - Street sweeping (10.9%)
- **Least-developed** parts of stormwater programs include:
  - GI/LID (17.8%)
  - Funding/financing (17.0%)
  - Asset management (16.6%)
  - Post-construction program elements (11.6%)

# Innovations in Any Observed Stormwater Programs?

- No clear consensus on innovative elements
- Most **innovative elements** observed in any stormwater program include:
  - GI/LID (20.5%)
  - Mapping technologies / Technological advancements implementation (20.5%)
  - Incentives / Offsets / Trading / Market-based programs (19.3%)
  - Regional planning and collaboration and implementation (19.3%)

# MS4 Challenges – Comparative Analysis

- Top challenges include:
  - **Aging infrastructure** identified as the top challenge in two of the three surveys
  - **Funding needs or availability of capital** is the top challenge in one survey and second in other two
- Secondary drivers include:
  - Regulation, policies and/or legal issues
  - Public awareness and support
- Additional challenges include political awareness and support as well as workforce and staffing needs
  - Note that **workforce/staffing needs is identified as a higher challenge in 2022 survey**, but that may be due to change in survey language from “aging workforce” to “workforce and staffing needs”

# Funding Needs in Stormwater Sector

## Funding Gap in the Stormwater Sector

Estimated total annual 2018 funding gap	Estimated total annual 2020 funding gap	Estimated total annual 2022 funding gap	Estimated average total annual 2018, 2020, 2022 funding gap
\$7,500,000,000	\$8,500,000,000	\$6,200,000,000	\$7,400,000,000

## Can the Federal MS4 Program Meet Clean Water Goals in the Long Term?

Yes (%)	No (%)	Unsure (%)
30%	41%	29%

Top factor limiting efforts to meet Clean Water Act goals:

- Lack of funding and investment (58.6%)
- Community/public support (17.7%)
- Access to physical land or space for projects (12.7%)

# MS4 Survey Take-Aways

- It is a difficult survey to administer
- Half of the programs don't have enough money
- Half of the programs don't know much about their infrastructure
- Most agree the infrastructure is nearing the end of its service life

# Thoughts for the Future

- It is unclear if the current program will meet our end goal – clean water
- Opportunity to change how we manage stormwater
  - Aging infrastructure
  - Resilience planning
- Opportunity to change how the public views stormwater
- Opportunity for a new national model

# Updates on NMMSA

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— April 24, 2023 —

Seth Brown, PE, PhD | Executive Director  
**National Municipal Stormwater Alliance**





# Agenda

- **Background on NMSA**
- **General Updates and Activities**
- **Update on Stormwater Testing and Evaluation for Products and Practices (STEPP)**

# Overview of National Municipal Stormwater Alliance (NMSA)



- **Who/What is NMSA?**

- *501.c.3 formed in 2018*
- *A national coalition focusing solely on MS4s*
- *Members are organizations, not individuals*

- **Motivation for Formation**

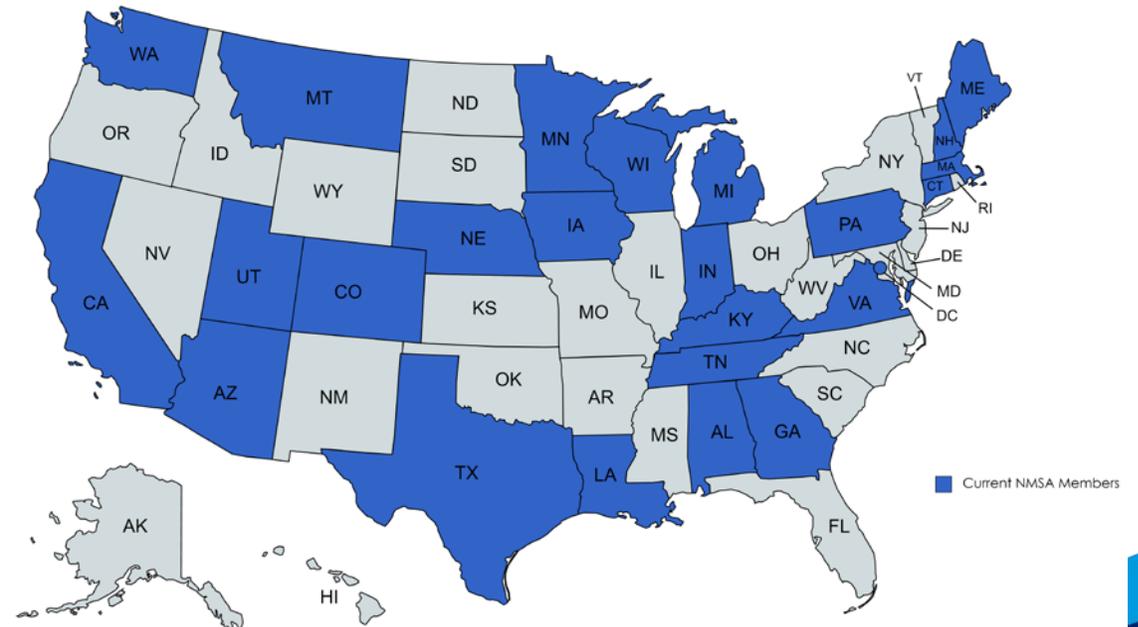
- To represent MS4 permittees at the national level by providing a **unified voice**
- To lead changes in regulation both **proactively and reactively**
- To **connect and unite** MS4 programs
- To promote stormwater as a **resource**
- To improve the **public image of stormwater**
- To create opportunities for **multi-benefit and multi-use stormwater projects**

- **Vision for Organization**

# Member Groups



- **State/regional groups of MS4 permittees**
- **25 state groups currently members of NMSA**
  - In discussion with several more
  - Over 4,000 MS4s in network
- **3 MS4s (Washington, DC; Baton Rouge, LA; Thurston County, WA)**
- **26 Affiliate Members**



# Impactful Activities and Issues



## Focus Areas:

- Policy/Advocacy
- Communications and Messaging
- Education
- Sector Support & Information

NMSA Action Areas

 <b>SECTOR SUPPORT &amp; INFORMATION</b>	 <b>POLICY &amp; ADVOCACY</b>
<ul style="list-style-type: none"><li>• Pursue projects at a national scope that are of interest to and benefit MS4 permittees.</li><li>• Transfer information and technology between state and regional MS4 groups.</li><li>• Communicate with member MS4s about multiple topics using a variety of platforms to disseminate information.</li><li>• Assist in managing existing or forming new state- and regional-level MS4 organizations.</li><li>• Coordinate with national organizations that impact the MS4 sector, including WEF's Stormwater Institute and its member associations.</li></ul>	<ul style="list-style-type: none"><li>• Speak directly with U.S. EPA staff and provide a conduit to federal regulatory and legislative contacts.</li><li>• Provide strategic support on regulatory and legislative actions at the state and local levels.</li><li>• Provide formal comments on federal regulatory proposals from the perspective of MS4 permittees.</li><li>• Provide timely communications on pending and ongoing regulatory and legislative actions impacting the MS4 community.</li><li>• Provide policy analyses to the MS4 community.</li><li>• Coordinate and work with other national groups to amplify messages on MS4 issues.</li></ul>
 <b>EDUCATION</b>	 <b>MESSAGING &amp; COMMUNICATION</b>
<ul style="list-style-type: none"><li>• Provide forums for exchanging information, experience, and materials among MS4 permittees.</li><li>• Create or support the development of technical reports and guidance materials.</li><li>• Host technical forums and support member activities and conferences.</li><li>• Support and expand public education for stormwater.</li></ul>	<ul style="list-style-type: none"><li>• Distribute information about court rulings and new rules and regulations.</li><li>• Collect, create, and distribute public education materials related to MS4 programs and policies.</li><li>• Explore national media campaigns and other initiatives to expand and amplify public education for stormwater.</li></ul>

# NMSA Focus Areas

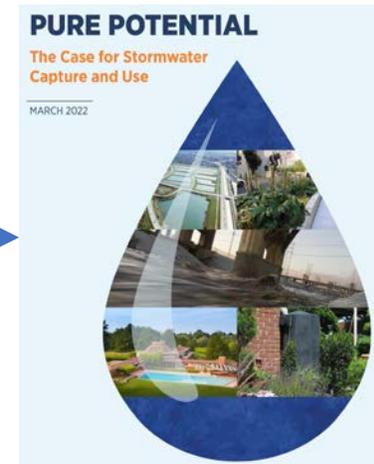


## Policy/Advocacy

- Legislation
  - Bipartisan Infrastructure Law
  - Regular engagement on stormwater issues



- Regulation/Policy
  - Clean Watershed Needs Survey
  - E-reporting
  - Trash-Free Waters / Stormwater and Trash/Plastics
  - Water Reuse Action Plan / Stormwater Reuse



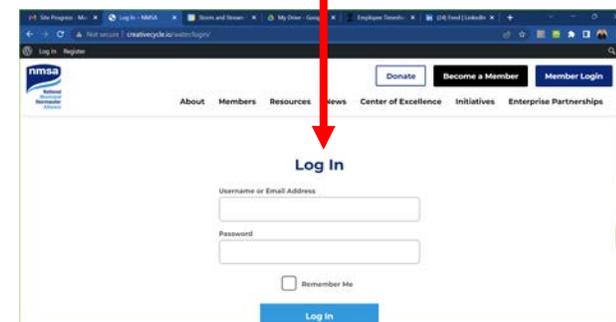
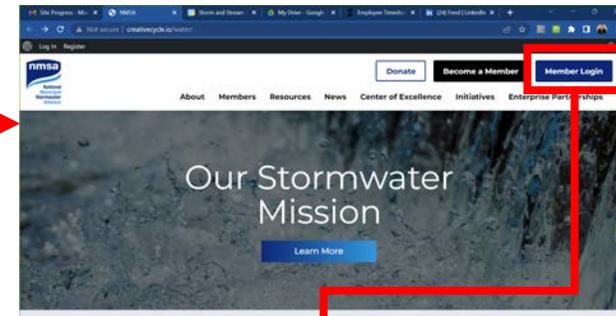
# NMSA Focus Areas

## Communications and Messaging

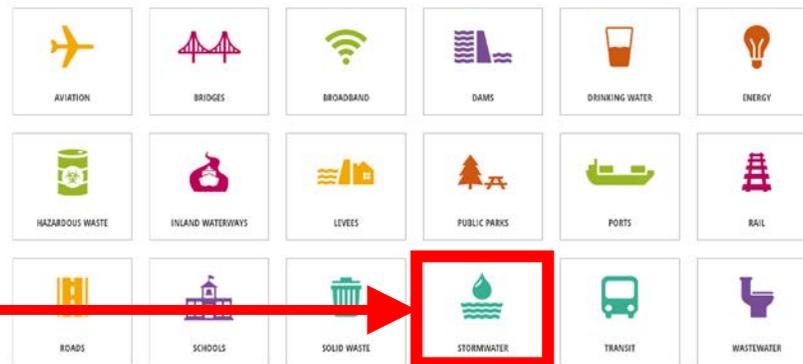
- 2021 ASCE Infrastructure Report Card
- WEF National MS4 Needs Assessment Survey
- Economic Analysis of Stormwater Infrastructure Investments
- Newsletters
- Website updates



THE VALUE OF STORMWATER  
INFRASTRUCTURE  
INVESTMENTS:  
A NATIONAL SCALE INPUT-  
OUTPUT ECONOMIC ANALYSIS  
FOR GREEN INFRASTRUCTURE  
April 2021



### 2021 REPORT CARD FOR AMERICA'S INFRASTRUCTURE



# NMSA Focus Areas



## Education

- Online MS4 Resource
- Support for cost-effective MS4 trainings
  - **Learning Management System (LMS)**
    - Automated reporting for MS4 compliance
    - Municipal, Construction, and Industrial Trainings
    - Topics:
      - IDDE, Construction Inspection, Basics of Stormwater Management
    - Pilot program partners
    - Partnerships with NMSA state organizations and external organizations



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# NMSA Focus Areas



## Sector Support and Information

### The Community-Based Public-Private Partnership (CBP3) Center for Water, Energy and Equitable Economic Resilience



- Promotes the CBP3 program approach through:

- Direct community technical assistance
- Development of resources and community support material
- Administers the CBP3 Professional Certificate
- <http://nationalstormwateralliance.org/cbp3/>



### The National Center for Stormwater Testing and Evaluation

- The home for the STEPP initiative within NMSA

- Promotes the development of performance testing standards and third-party verification of stormwater products and practices
- Hosts critical data and information as well as documents and policies regarding STEPP
- <http://nationalstormwateralliance.org/stepp/>



# Background on STEPP



A large, dark blue, curved arrow on the left side of the slide points from the top section down to the "Problem Statement" section.

A Simple Question...

**How well do stormwater products and practices work?**

Problem Statement

**There is no national organization that provides consistent, technical/credible and objective testing and verification of stormwater practices and products.**

A decorative blue wave graphic is located at the bottom right corner of the slide.

# Stormwater Testing and Evaluation of Products and Practices (STEPP)



**Goal:** Develop a national testing/evaluation and verification program for stormwater products **and** practices

- Increase overall performance
- Create level/higher playing field
- Provide greater confidence in performance of stormwater systems
- Improve water quality

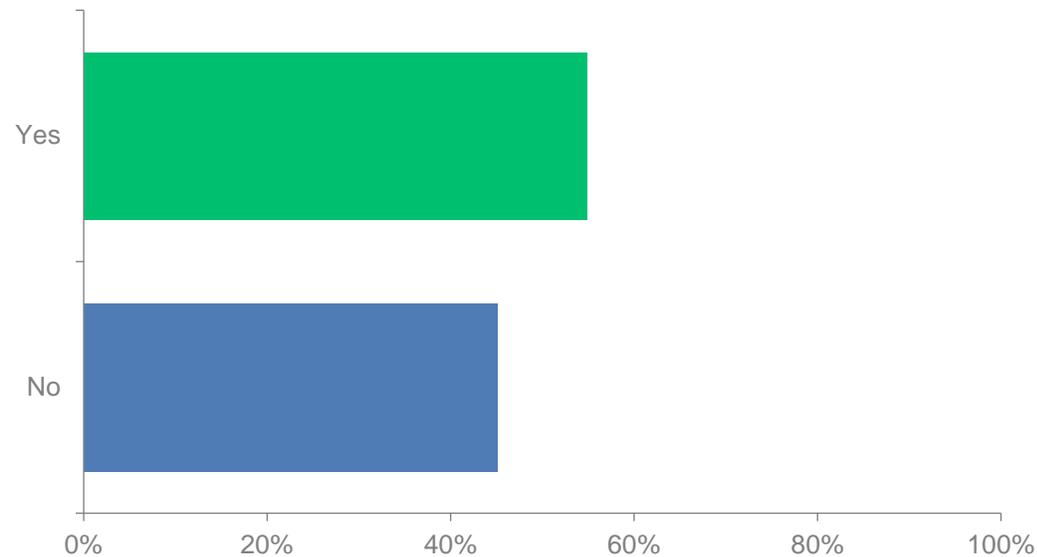


# National STEPP Survey

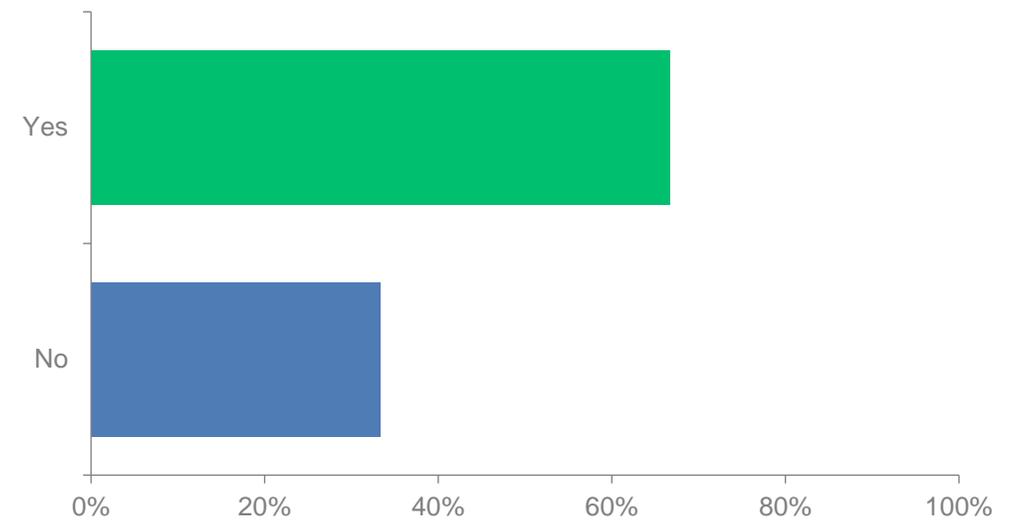


Does your program currently rely on a performance-based testing and evaluation program when making decisions on approval for the use of stormwater products and practices and/or treatment crediting?\*

## *MS4 Results*



## *State Results*



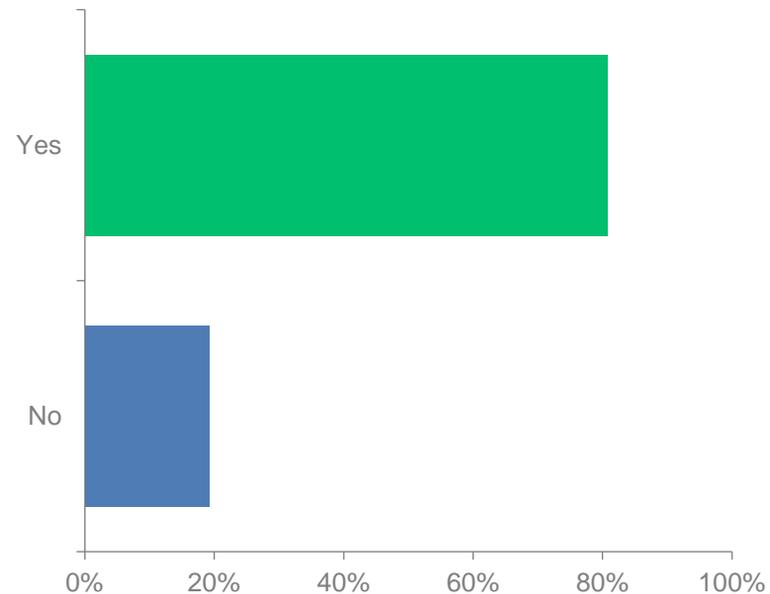
\*Examples include TAPE, NJCAT/NJDEP, TARP, International Stormwater BMP Database etc.

# National STEPP Survey

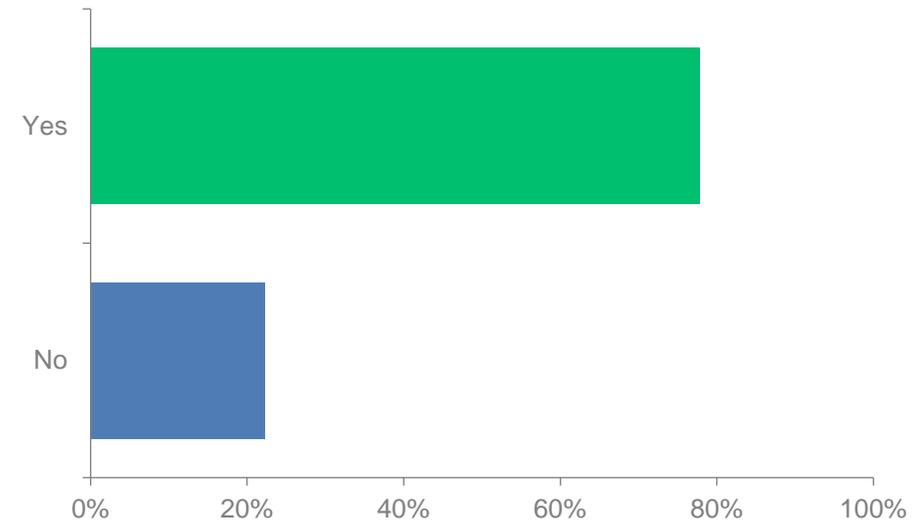


If a national performance testing and evaluation program for stormwater products and practices were available, would your program defer to it?\*

***MS4 Results***



***State Results***



\*Assuming this program utilizes similar or identical protocols used in existing state or regional programs (TAPE, NJDEP)

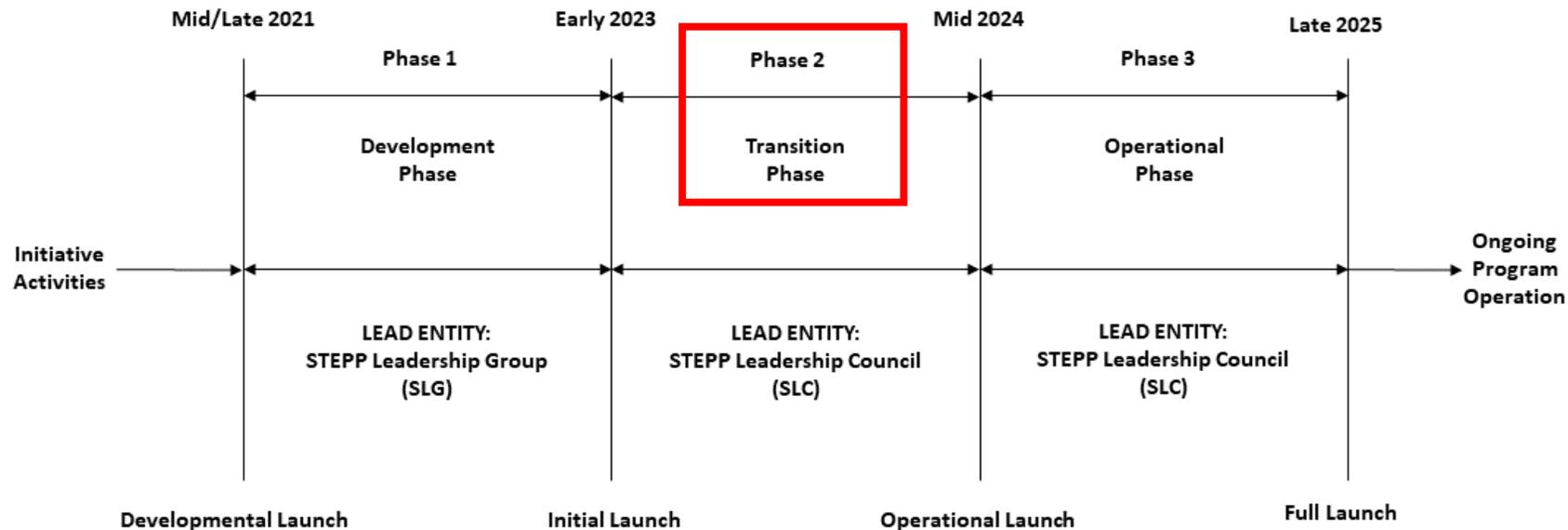
# Updates on STEPP

# Schedule / Pathway



## Multi-phase plan

- Phase 1 (2021-2022) = Development Phase
- Phase 2 (2023-2024) = Transition Phase
- Phase 3 (2024-2025) = Operational Phase



# STEPP Updates of Note

## UPDATES

- *Phase 2 fundraising successful*
- *STEPP to focus on trash capture technologies for soft launch on July 1!*
  - Establishing governance bodies
  - Finalizing and establishing verification processes and documentation



# STEPP Updates of Note



## UPDATES

- Phase 2
  - Engagement/Outreach
    - Continued engagement w/state, MS4s and EPA
    - Congress to provide \$3M/year for Centers of Excellence for Stormwater Infrastructure Technologies (CESITs)
  - Sediment via lab testing will be included in STEPP by late 2023/early 2024
  - Continuing to develop field testing aspect of program



# Questions?

For more information, visit our website at:

[www.nationalstormwateralliance.org/](http://www.nationalstormwateralliance.org/) or [www.ms4nmsa.org](http://www.ms4nmsa.org)

Seth Brown, PE, PhD – NMSA, Executive Director

[seth.brown@nationalstormwateralliance.org](mailto:seth.brown@nationalstormwateralliance.org)

# Wrap Up

## National Stormwater Policy Forum

April 24, 2023 | Washington, D.C.

- Water Environment Federation
- National Municipal Stormwater Alliance
- National League of Cities
- National Association of Counties

