

# Building Resilience and Planning for an Uncertain Future

New Jersey Small Water Systems Training

Chris Sturm, New Jersey Future

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# New Jersey Future

Creating strong,  
healthy, resilient  
communities for  
everyone



# Your Water Challenges

Lead pipes

Sewer overflows and back-ups

Cyber-security threats

PFAs and other contaminants

Water/sewer main breaks and leaks

Silver tsunami & licensed operator shortage

Polluted, unreliable water supply

Climate change

Lead pipes

**Asset management**

**Permit compliance**

**Emergency response planning**

**Capacity development**

Polluted, unreliable water supply

Climate change

# Agenda

01 Climate impacts

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02 Assessing climate risks

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03 Solutions for climate resilience

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04 Laying the groundwork for  
funding

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05 Connecting

# Climate Impacts

**2021**

**Jersey Water Works Conference**

**Session: Resilient Water Systems in the  
Face of a Changing Climate**

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**Impacts from the Remnants of Hurricane Ida**

December 10, 2021

James F. Cosgrove, Jr., P.E.

Vice President/Principal



# Somerset Raritan Valley Sewerage Authority

## September 2, 2021

### 23 MGD Treatment Plant under water!

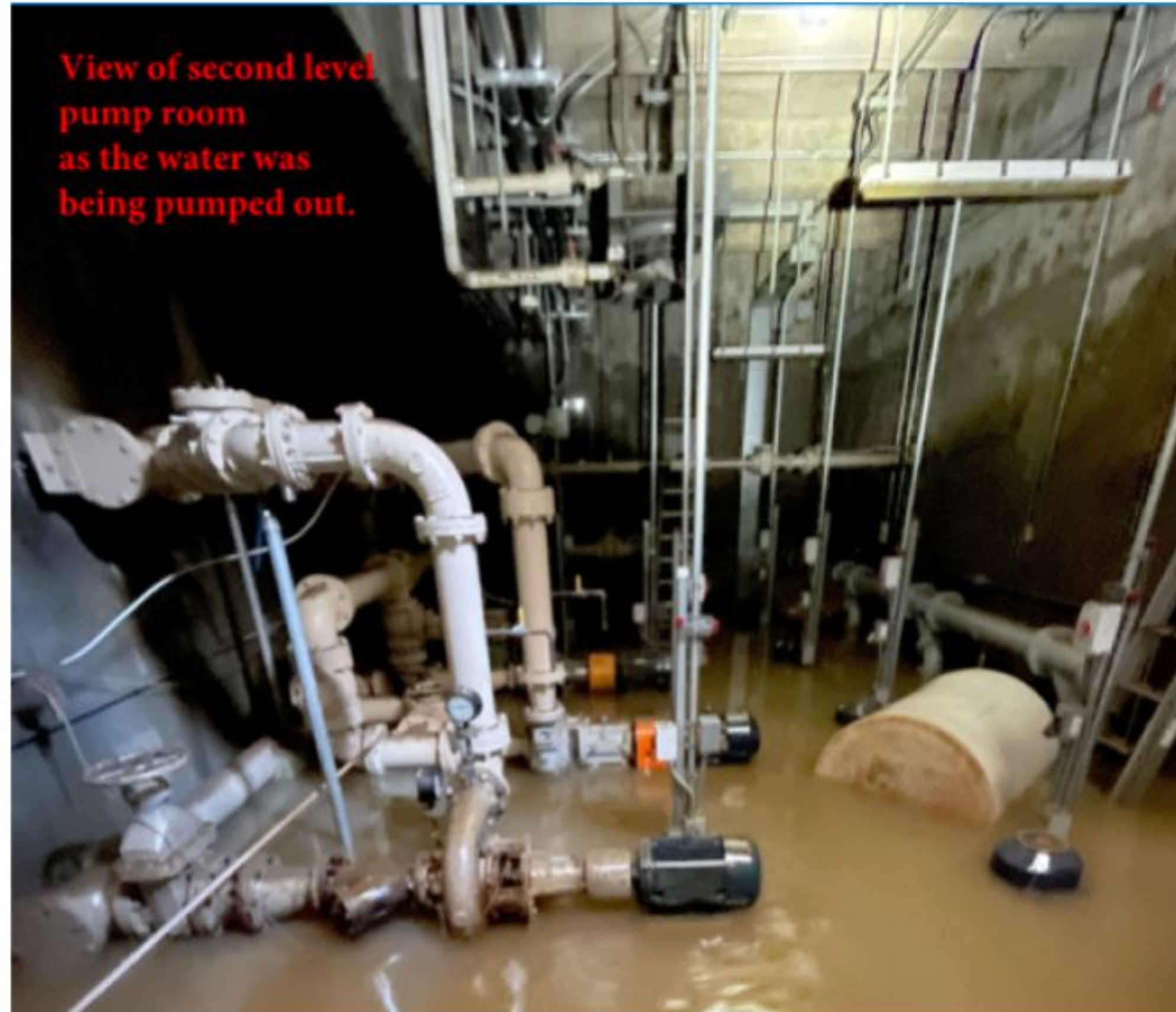
- Highest flood elevations ever recorded
- Effluent quality impacted
- Tremendous safety risk to operators
- Hundreds of thousands of dollars in damage



# Stony Brook Regional Sewerage Authority - Pennington WWTP September 3, 2021

0.5 MGD treatment plant flooded to  
historic levels!

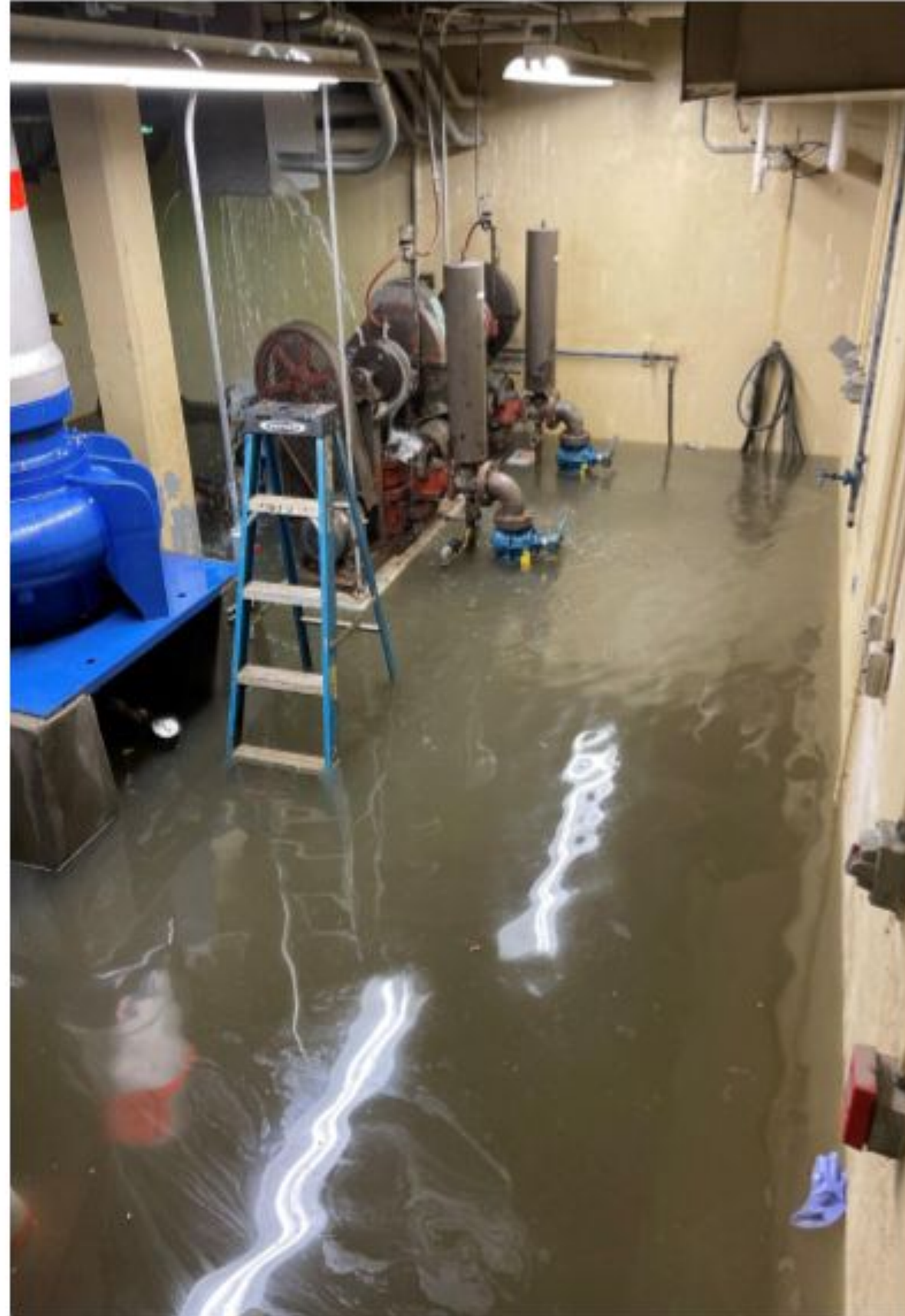
- Pump motors and other equipment destroyed
- Chemical feed tanks overturned
- Effluent quality impacted



# Madison Chatham Joint Meeting WWTP September 2, 2021

## 3.5 MGD WWTP Under Water!

- Electric Equipment Damaged
- Electronic/Computer Equipment Damaged
- Process Impacted



# Poll #1 - Climate Concerns

# Assessing Climate Risks

# Assessing Flood Risk

- Lifetime of infrastructure projects suggests planning for 2100
- Precipitation: intensities in northern NJ are likely to increase 30% - 35% by 2100
- Sea-level rise: expected to be 5 feet by 2100

Sources: DEP [Rainfall Studies](#), the [Scientific Report on Climate Change](#), [Climate Change Resilience Strategy](#) and [Sea-Level Rise Guidance](#).

[NJDEP: NJ PACT Stakeholder Session on Utilities and Climate Change \(Sept. 2021\)](#).

# Changes to DEP rules, guidance, and plans

## 1. **NJ PACT Part One: Amending Flood Hazard Area Control Act Rules and Stormwater Rules (Second Quarter 2022)**

*See: NJ PACT Stakeholder Session on Utilities and Climate Change (Sept. 2021)*

- Define new inundation risk zone, tidal flood hazard area, and fluvial flood hazard area
- Propose more protective design and construction standards for critical facilities and infrastructure, such as requiring a higher elevation and/or floodproofing.
  - Coastal: Plan for 5' sea-level rise
  - Fluvial: NOAA'S current 500-year 24-hour precipitation intensity or the future 100-year rainfall plus 25%

# Changes to DEP rules, guidance, and plans

**2. NJ PACT Part Two: Consider changes to water and wastewater construction regulations**

**3. Amending flood resilience guidance for projects funded by the SRF consistent with new climate data**

- Recently released [Rainfall Studies](#), the [Scientific Report on Climate Change](#), [Climate Change Resilience Strategy](#) and the Department's [Sea-Level Rise Guidance](#).

**4. Updating NJ Water Supply Master Plan (Fourth Quarter 2022)**



# Utility Solutions

# EPA Resilient Strategies Guide for Water Utilities

## Planning strategies

- Stormwater management is part of the solution

## Operational strategies

- efficiency improvements, monitoring, inspections, conservation, demand management and flexible operations

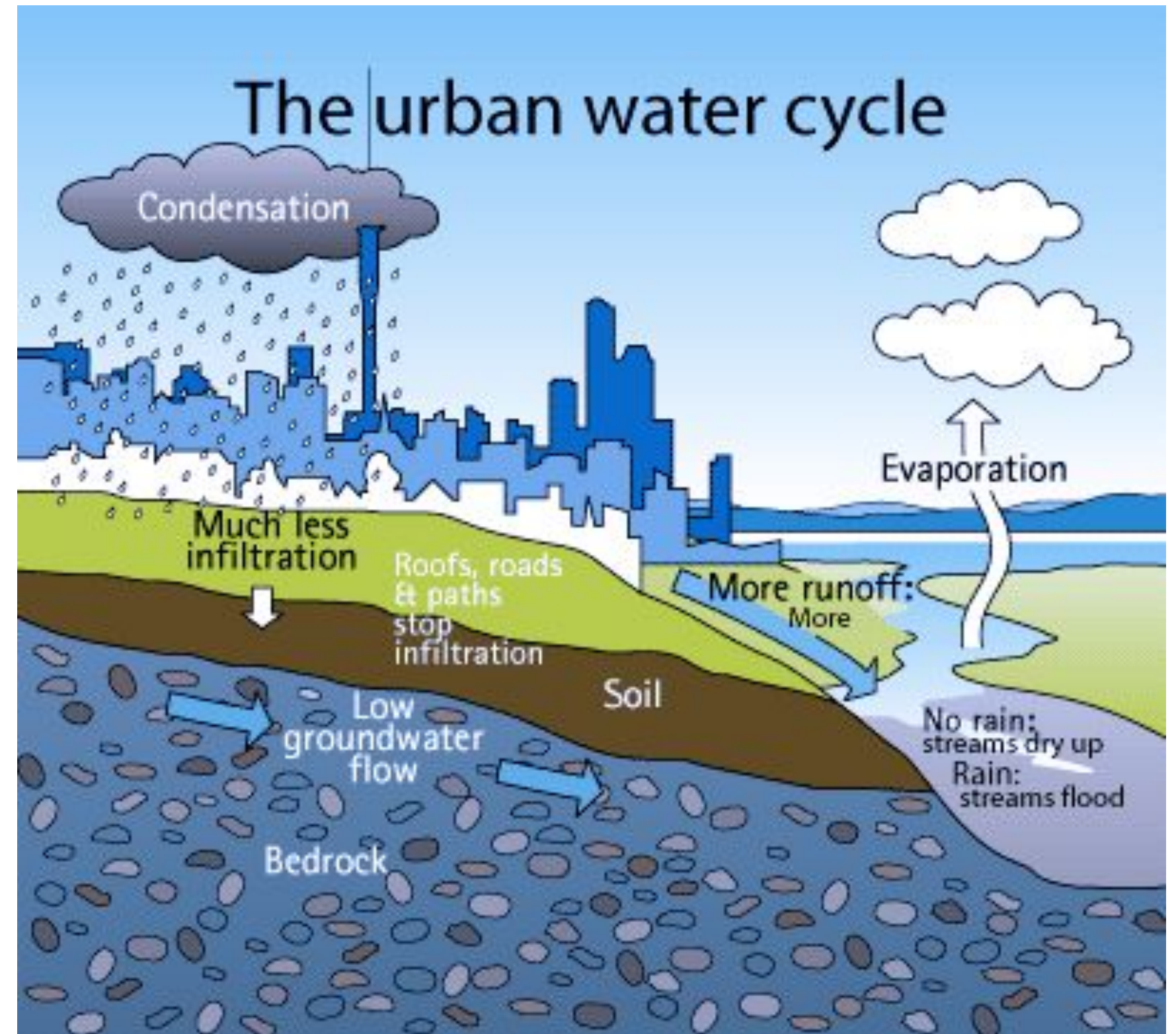


Image Source: Living Architecture Monitor

# EPA Resilient Strategies Guide for Water Utilities

**Capital strategies:** incorporate resiliency planning into new designs *and* existing facilities:

- Floodwalls for treatment plants
- Elevating and hardening pumps
- Fix weak points (example water mains)
- Water supply protection and diversification
- Resilient/redundant power sources (Andy Kricun)



## Seawall and Resiliency Projects

*Presented by Rick Dovey, ACUA, at 2021 JWW Conference*

# ACUA Sea Level Wall Project

*Presented by Rick Dovey, ACUA, at 2021 JWW Conference*



- **\$3.7 million investment**
- **Funded through the NJEIT**
- **Surrounds low-lying areas of the facility**
- **Top of wall set 11 ft. above sea level**





## ACUA Inflatable barriers

- 24-inch tubes filled with water that can be stacked
- Act as temporary barriers for flooding events
- Can be easily placed at pump stations or other areas as needed







**NEW JERSEY  
AMERICAN WATER**

## **The Raritan-Millstone WTP and Hurricane Ida**

**Resiliency improvements undertaken post  
Hurricane Irene to protect the R-M WTP**

Oleg Kostin – Director of Operations  
[oleg.kostin@amwater.com](mailto:oleg.kostin@amwater.com)

**10 December  
2021**



**RANKED HIGHEST  
IN CUSTOMER  
SATISFACTION  
WITH LARGE  
WATER UTILITIES IN  
THE NORTHEAST.**

For J.D. Power 2021 award information, visit  
[jdpower.com/awards](https://www.jdpower.com/awards)

# NJ American Fortification Project - Raritan-Millstone Water Treatment Plant



## 2018 Hurricane Irene

Literally an inch away from disaster



# Post-Irene Resiliency Project

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- Flood wall project
- Cost benefit analysis determined that raising the flood wall to the 500-year flood elevation (0.2% risk) was most cost-effective solution
- Final cost: \$32.4 million
- Concurrently undertook emergency power upgrade at a cost of \$16.6 million

# Hurricane Ida



# New Resources

- [Building Resilient Infrastructure and Communities | FEMA.gov](#)
- Energy Efficiency programs from power utilities
- Stormwater utilities *www.stormwaterutilities.njfuture.org*
- American Rescue Plan funds: state, county, municipality
- New Water Bank programs (WIIP)

# Connecting

- Partnerships to lower costs

- Jersey Water Works

[www.jerseywaterworks.org](http://www.jerseywaterworks.org)

- NJ WaterCheck

[www.njwatercheck.com](http://www.njwatercheck.com)



Poll #2 - How helpful would each of the following be?

# Start Now

Some resiliency planning is better than none!



# DEP Contacts

- For Water Bank/Intended Use Plan questions: [WaterBankInfo@dep.nj.gov](mailto:WaterBankInfo@dep.nj.gov)
- Land Use Contacts: [NJDEP-Division of Land Resource Protection-Contact](#)
- Water Supply: [NJDEP-Division of Water Supply & Geoscience \(state.nj.us\)](http://state.nj.us)





# Thank you!

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