



2024 New Jersey Statewide Water Supply Plan

DRBC Advisory Committee on Climate Change:
Current and Future Climate Implications

December 17, 2024

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Presentation Outline

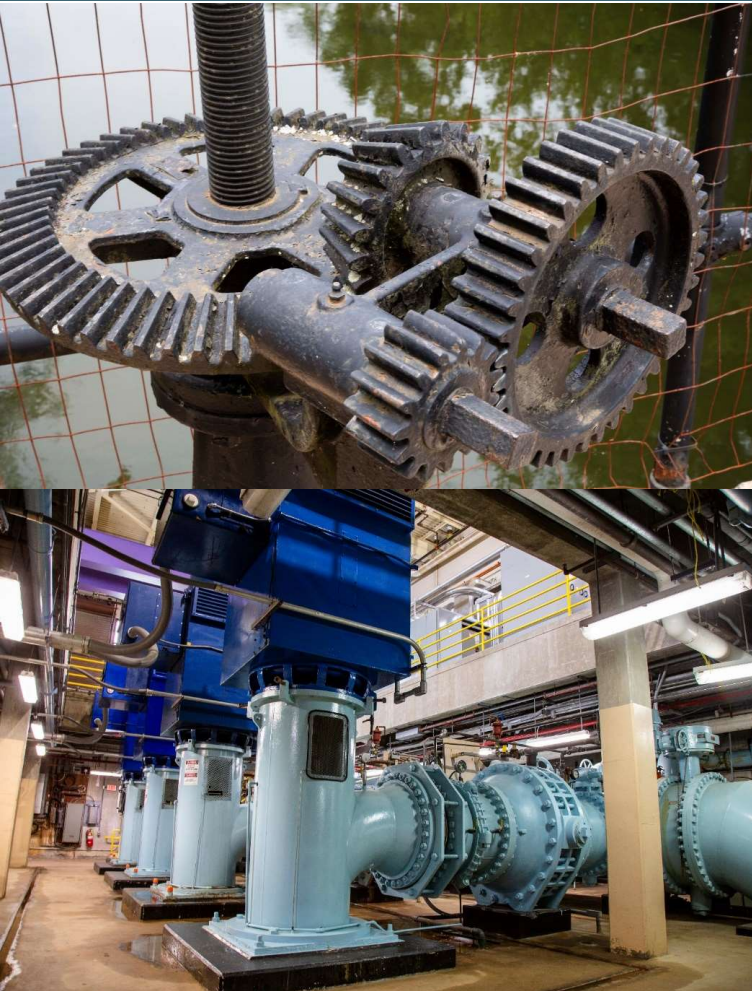


- Water Supply Planning in NJ
- Overview of the 2024 Plan
- NJ Climate Change Science Refresher
- Climate Change-Water Supply Analyses and Findings
 - Saltwater intrusion into aquifers and estuaries
 - Groundwater recharge
 - Reservoirs
- Water Supply Plan Response





Water Supply Planning

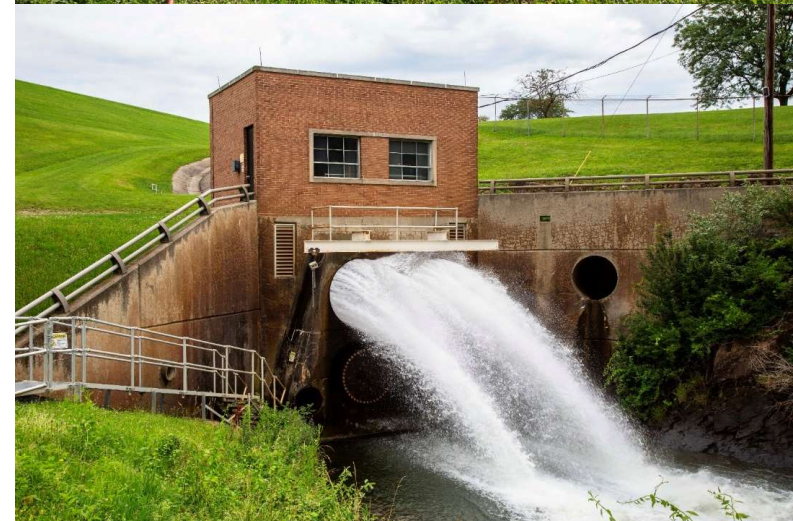
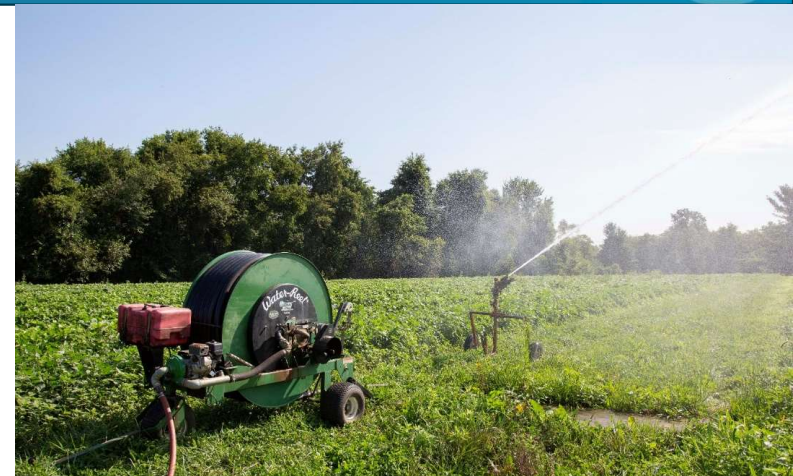


- 1981 Water Supply Management Act
 - Develop and periodically update a WSP
 - Historically focused on quantity
- 1982, 1996 and 2017 Plans
 - Numerous regional and statewide plans prior to 1982
- Fundamental Questions:
 - How much do we currently have and use?
 - How much will we need in the future?
 - What are the critical issues impacting supply?
 - What do we need to do to ensure adequate supply w/o unacceptable impacts?



2024 NJ Statewide Water Supply Plan

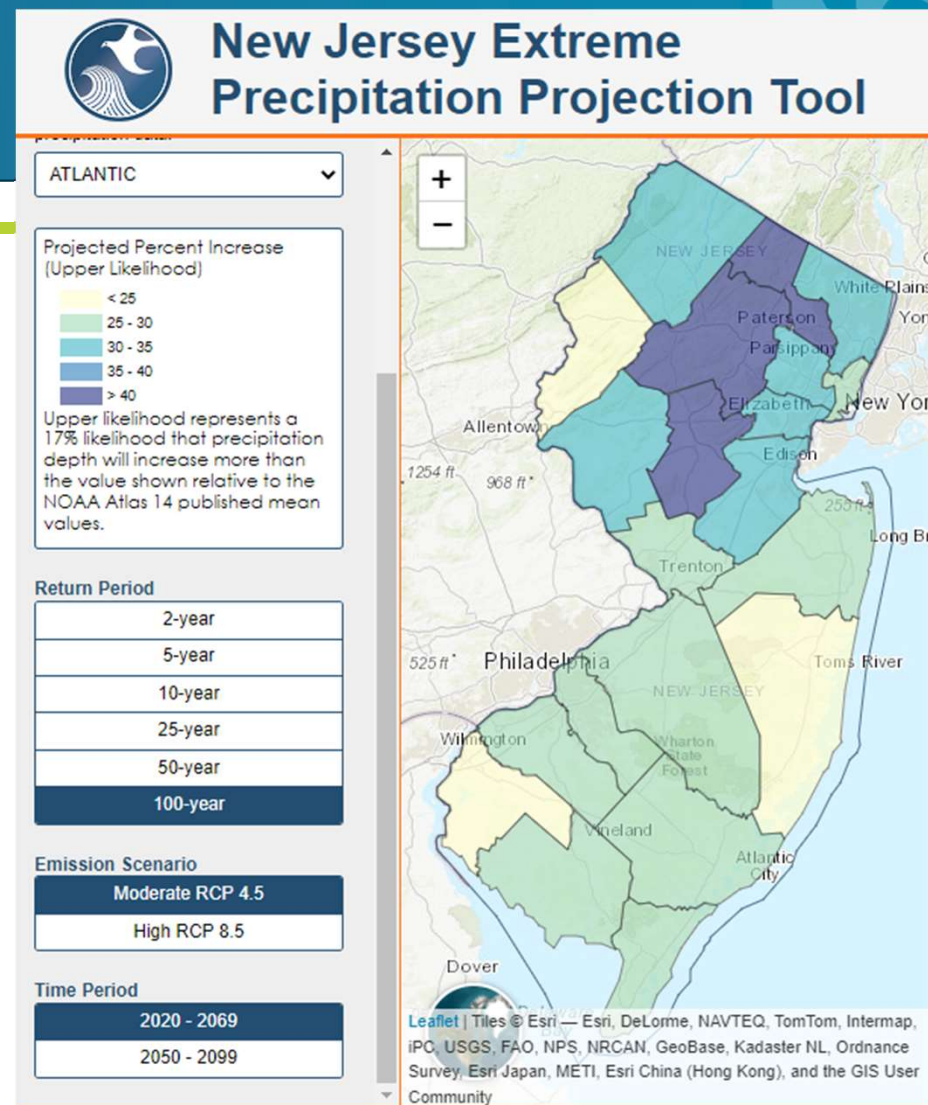
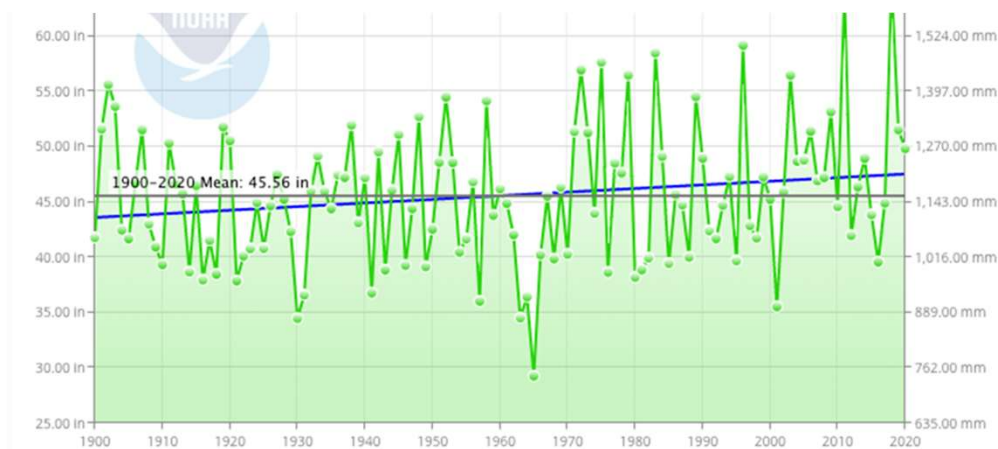
- 5-Year plan with 2050 planning horizon
- Addresses major comments on 2017 WSP
 - Lack of climate change evaluations
 - Limited public engagement and policy recommendations
- Major additions:
 - 5 more years of data
 - Climate change impacts to water availability
 - Statewide safe drinking water assessment
 - Environmental Justice/Overburdened Community water supply impacts
 - Detailed policy recommendations



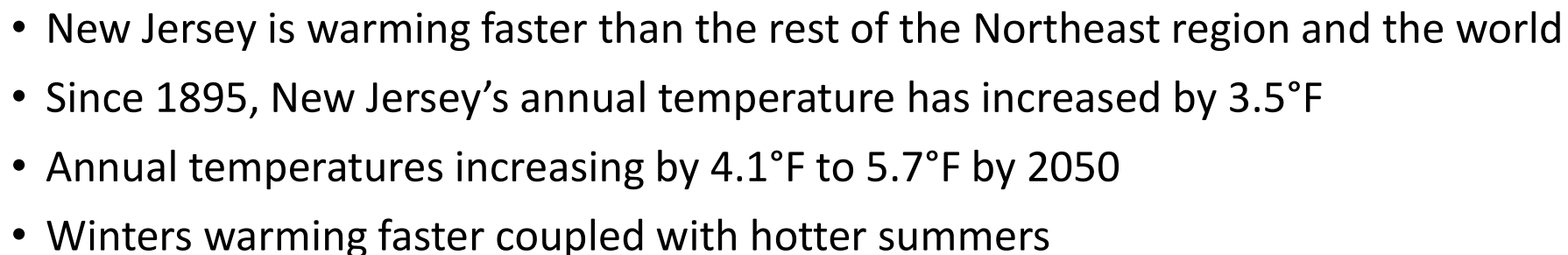


NJ Climate Science: Precip

- Already receiving more annual precipitation
 - Receiving 3+ inches more than last century
 - 4% to 11% more by 2050
- South and coast and fall and spring wetter
- Larger events more frequent
- Subregions show more variability +/-



<https://njprojectedprecipitationchanges.com/>





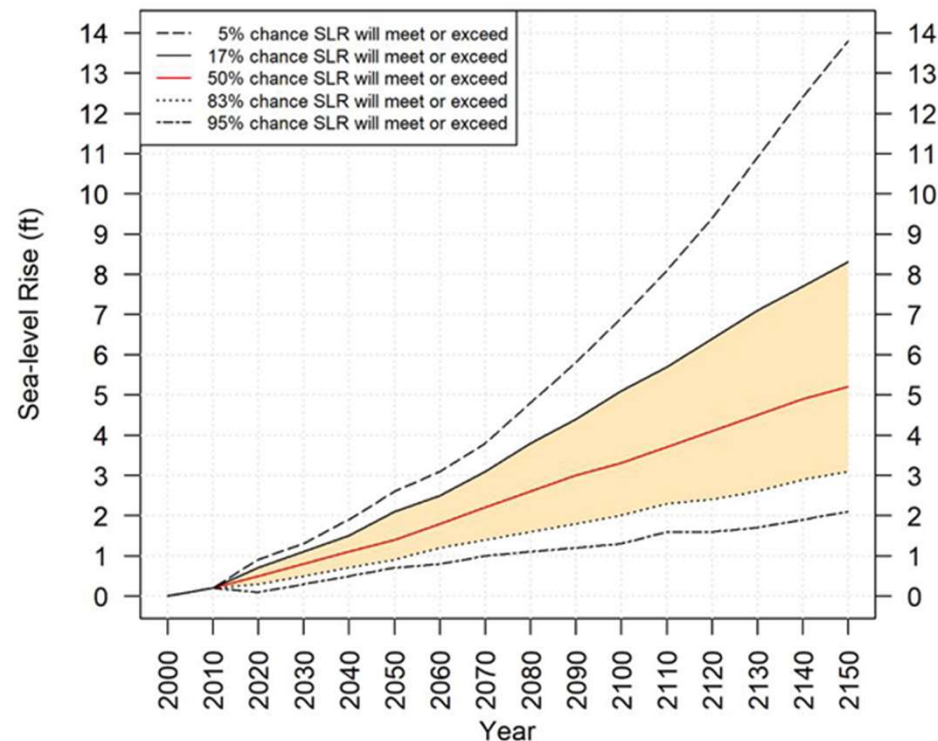
NJ Climate Science: Sea-Level Rise



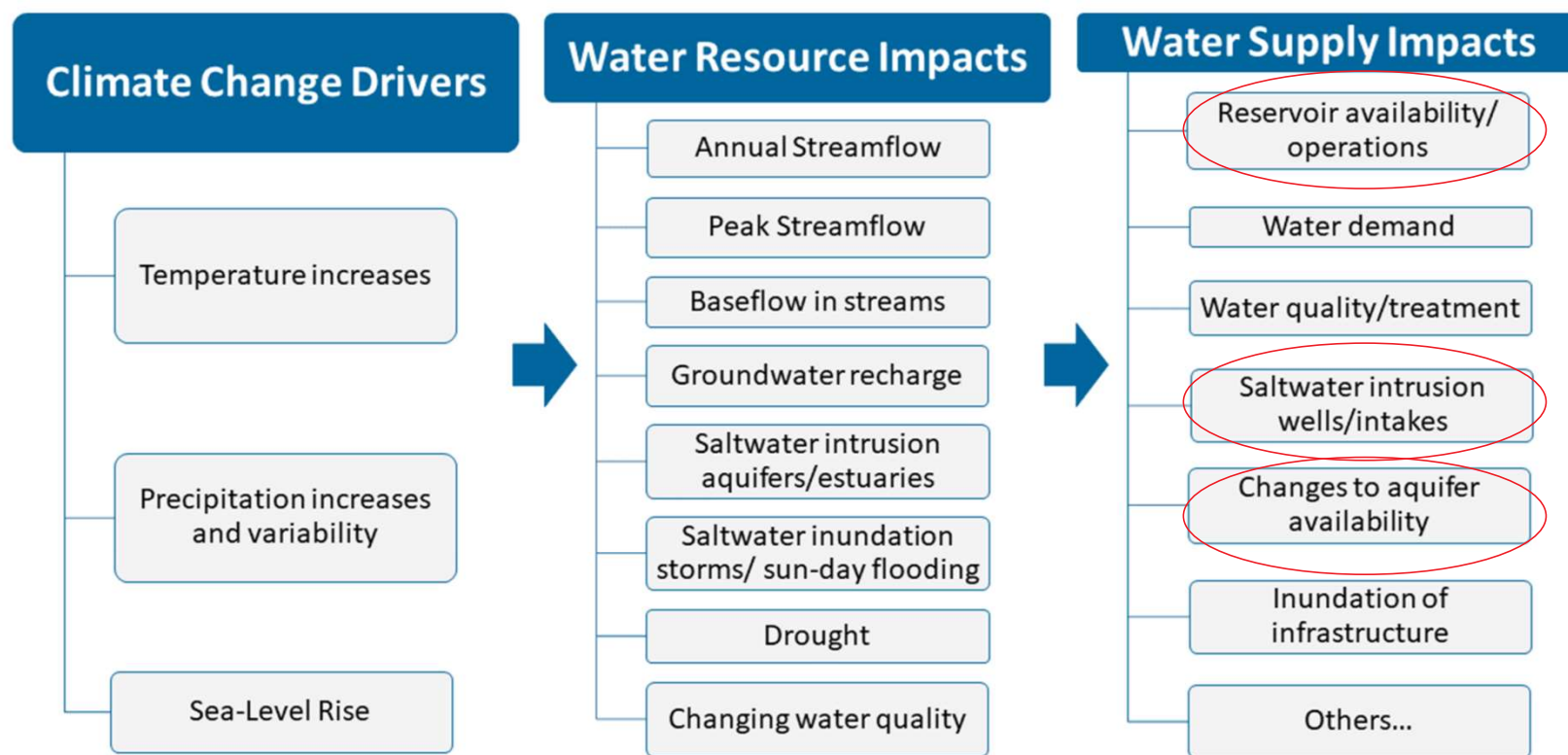
- Sea-levels are increasing at a greater rate in New Jersey than other parts of the world, in part due to:
 - Ice melt, thermal expansion, isostatic rebound, aquifer compaction, circulation, etc.
- By 2050, sea-level rise will likely rise between 1.4 and 2.1 feet.
 - Those levels increase to between 3.3 and 5.1 feet by the end of the century
 - "Sunny day flooding" will occur more often
- Hurricanes, Nor'easters, etc. likely to increase in frequency and severity

2020 NJ Scientific Report on Climate Change

<https://www.nj.gov/dep/climatechange/data.html>



Climate Change and Water Supply





Climate Change Findings

Statewide **water supply risks** from climate change **are manageable but only if** the state continues to take **actions to mitigate threats**.

The greatest concerns are associated with **saltwater intrusion** in near ocean-bay unconfined aquifers and estuaries.

Local problems do/will occur, and **resilient infrastructure** will be critical to withstand extreme events.

Assessments include:

- Sea level rise and saltwater intrusion/inundation
 - 2 ft ~2050 and 5 ft ~2100
- Groundwater recharge
- Streamflow trends and reservoir safe yields
- Still to do:
 - water quality
 - drought
 - downscaling and seasonal impacts

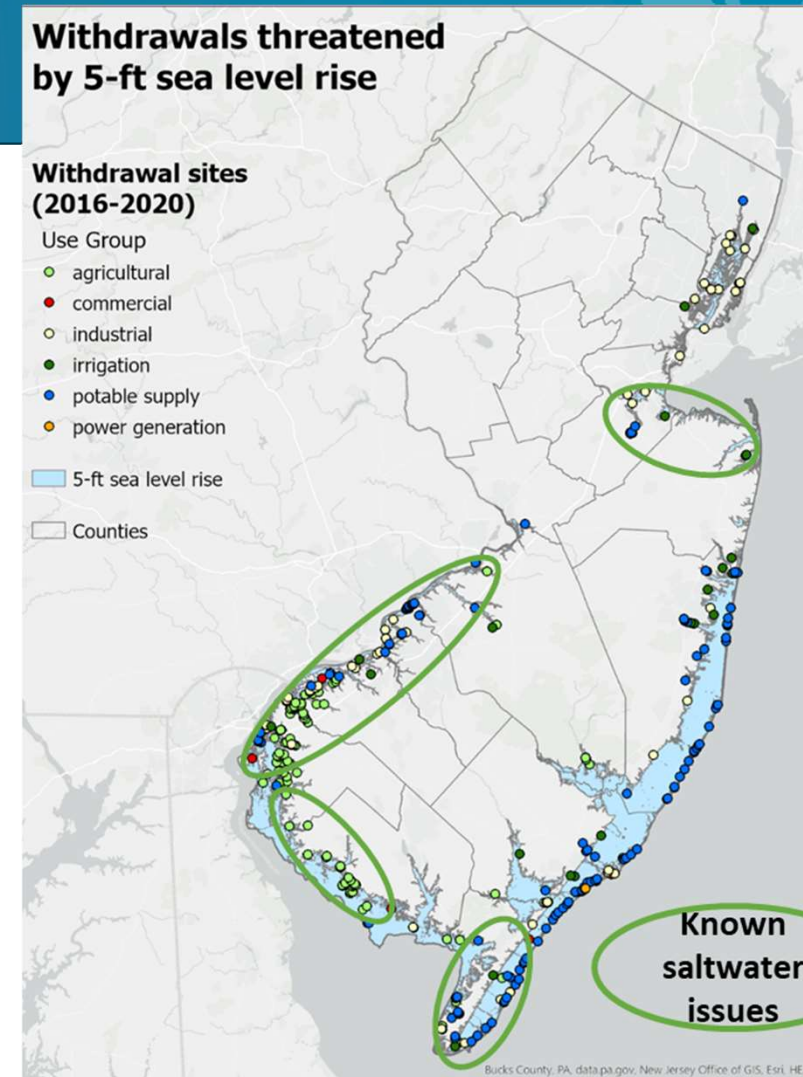
Withdrawals threatened by 5-ft sea level rise

Withdrawal sites (2016-2020)

- Use Group
- agricultural
 - commercial
 - industrial
 - irrigation
 - potable supply
 - power generation

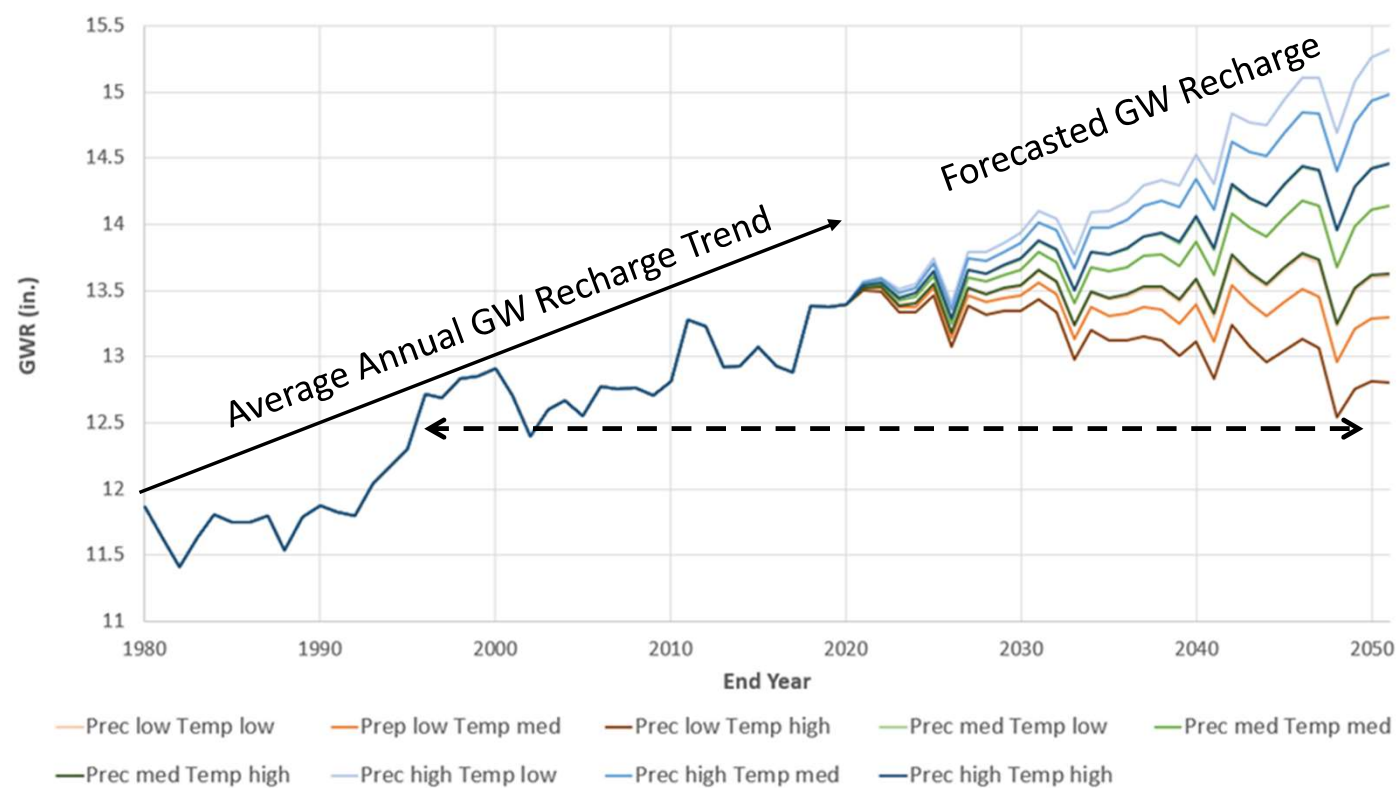
5-ft sea level rise

Counties





Climate Change and Impacts to Groundwater Recharge





Surface Water Supply Reservoir Systems



- Used the NJ RiverWare model to assess
- 'What if' climate change scenarios:
 - Increased demand (5-10%) and reduced streamflow (5-10%) during spring, summer and fall simulated in NJ RiverWare model
 - Results:
 - Increased water-supply drought frequency and duration
 - More water needs to be pumped, especially without draft reductions
 - Combined northeast storage adequate, but variations between systems
 - Draft reductions important
 - Raw and finished water interconnections important
- Surface Water System Findings:
 - Limited potential for adverse water supply impacts to systems
 - Better data needed for future streamflow and drought severity and duration
 - Water quality impacts need to be assessed
 - Climate change effects on demands need to be quantified and evaluated
 - Need adaptability to respond to extreme events- flooding, water main breaks, etc.





Overall Plan Findings



The plan concludes that, under normal conditions and in most regions, New Jersey has **adequate volumes of source water supply** and is **well-positioned** to address water supply **challenges** *as long as* the state **continues to take actions** to mitigate the **threats of climate change**, aging **infrastructure** and **emerging contaminants**.

The **availability** of surface water, unconfined groundwater, and confined aquifers, the use of which **varies geographically**, was modeled to investigate potential shortages. Although not evenly distributed throughout the state, total **natural water resource availability** (including reservoirs) remains about the same as the 2017 New Jersey Statewide Water Supply Plan determined. However, **current and forecasted use** did change, and a few regions showed **potential shortages**.



Considerations...



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- Uncertainties exist in forecasted climate conditions, especially beyond 2050, and current forecasts will change as the science evolves and information specific to NJ is improved
 - WSP water availability impacts evaluations were limited and need to be continued and enhanced to confirm findings
 - Normal and severe dry and wet events will still occur, floods likely to be worse, and infrastructure needs to be maintained and/or hardened to withstand these events
 - Raw and finished water transfers will be needed
 - More research is needed to characterize future drought frequency, duration, and severity, with increased occurrence of *flash drought-like* events (already happening?)



Considerations...

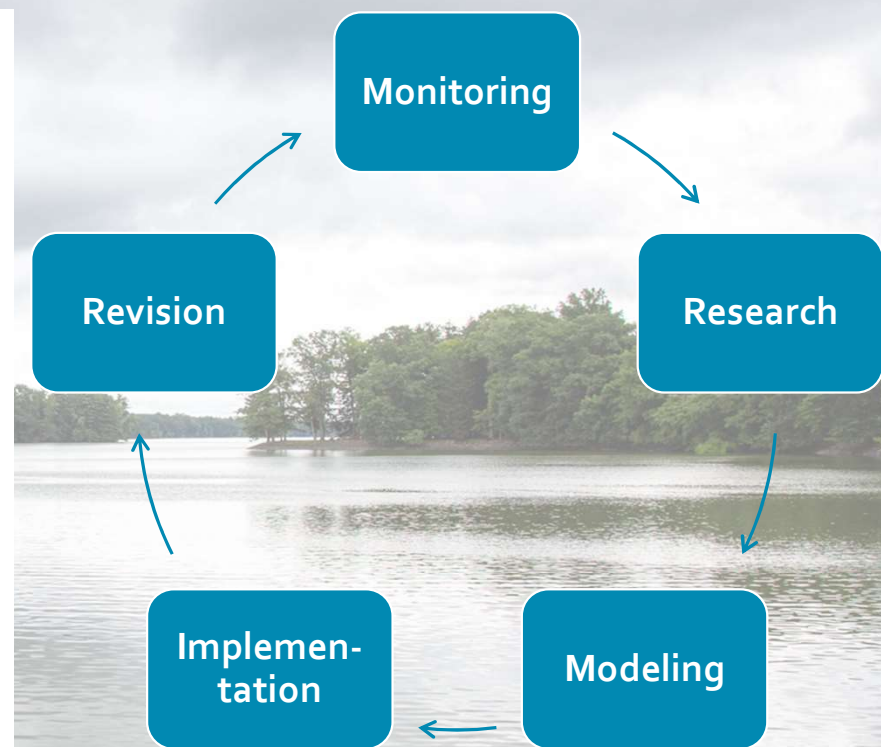


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- Existing saltwater problem areas still need to be assessed and actively managed
 - Water quality impacts (e.g. HABs) have not been quantified at this time, but are anticipated and need to be evaluated, results could be significant
 - Sea-level rise will impact unconfined potable aquifers and outcrop areas, and may inundate wells and related infrastructure
 - Saltwater will move further upriver and more often potentially impacting lower elevation dams, intakes and reservoirs
 - Future demands are expected to change in response to climate changes; e.g. longer growing seasons

What's Next....

WSP CC Potential Actions to Include

- Monitoring
 - e.g., real-time, climate, hydrologic...
- Research
 - e.g., global and downscaled climate forecasts, water quality, demands...
- Modeling
 - e.g., improved/confirmed CC impacts on water availability...
- Implementation
 - e.g., policies, mid-WSP updates, water allocation permitting...
- Revision
 - e.g., WSP revisions...





Thanks

- Water Supply Plan Team
 - Department Leads:
 - NJGWS Water Supply Modeling and Planning
 - Division of Water Supply and Geoscience
 - Water Resource Management
 - Water Supply Advisory Council
 - Rutgers, The State University
- More info
 - email: watersupplyplan@dep.nj.gov
 - website: <https://dep.nj.gov/water-supply-plan/>
 - New Jersey Water Withdrawal Data Summary Viewer
<https://experience.arcgis.com/experience/9da78182503e467989c280bfdf741d3a>

