

Delaware River Basin Commission

Developing Climate Change Priorities for the Delaware River Basin

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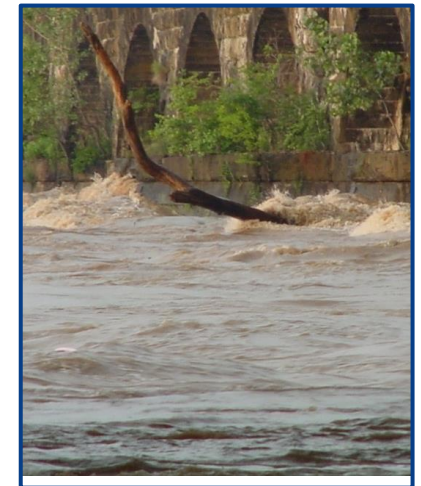
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August 3, 2021

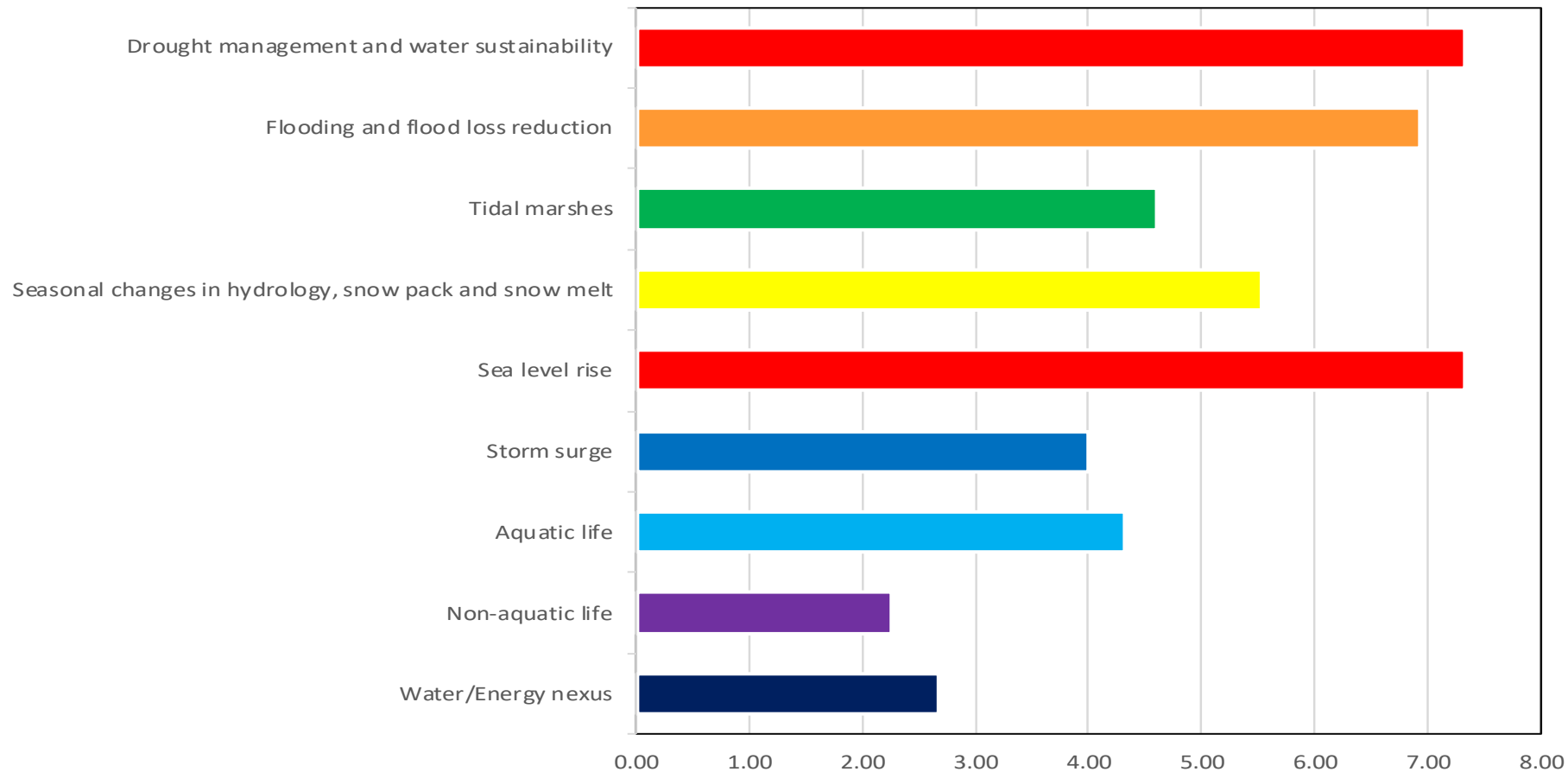
Advisory Committee on Climate Change

Presented to an advisory committee of the DRBC on August 3, 2021.
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Question to new ACCC members last year:

When considering the following climate change impacts and issues, please force rank what you believe the priorities should be for the DRBC in terms of water resources management.



Objectives of ACCC Per Resolution 2019-8

***Provide
Commission with
scientifically-based
information and
recommendations
for identifying and
prioritizing:***

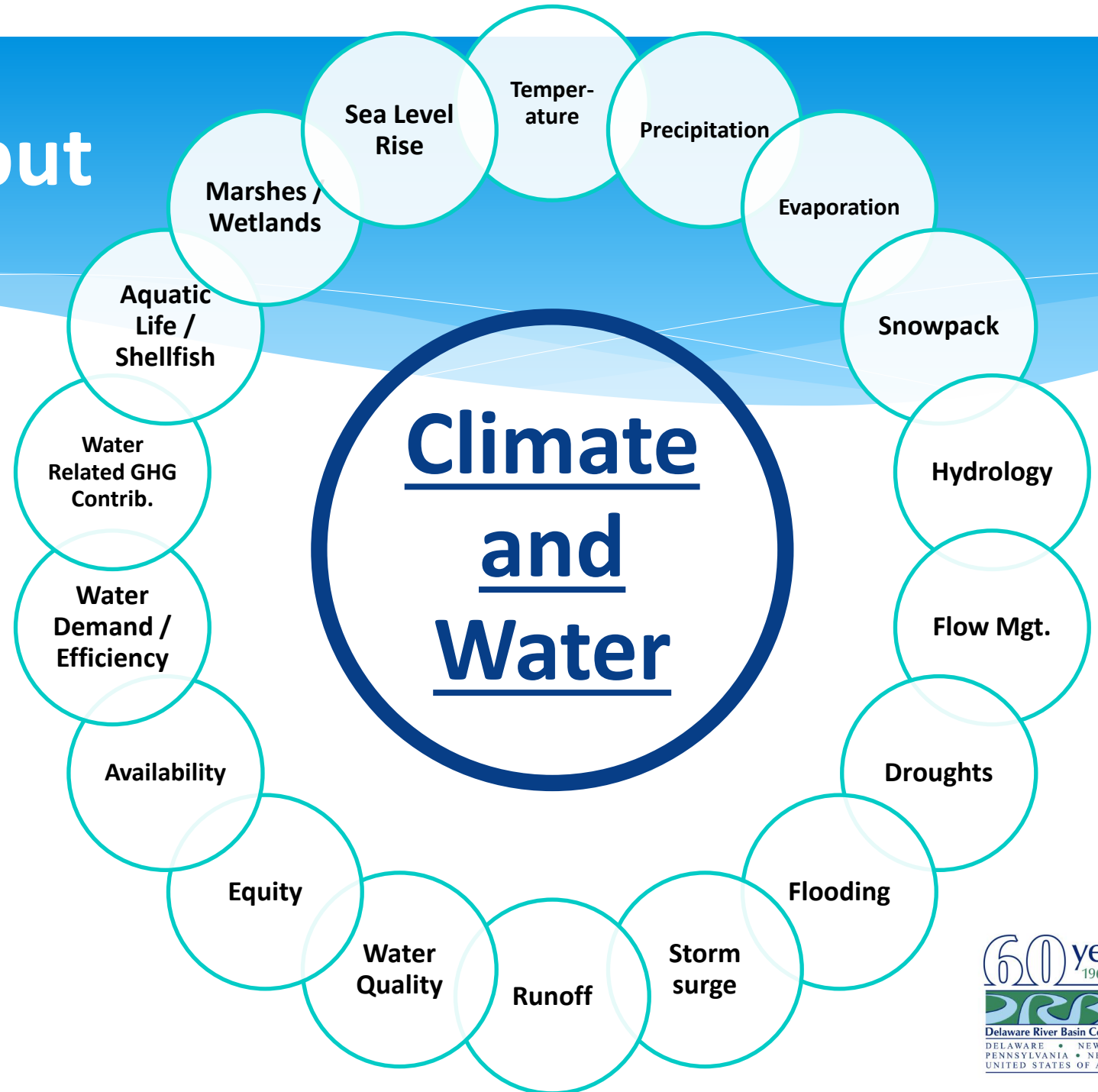
Threats and vulnerabilities affecting Basin's water resources due to climate change and sea level rise

Science-based future climate scenarios for Basin water resources planning

Planning, monitoring, research and regulations to support mitigation, adaptation, and resiliency

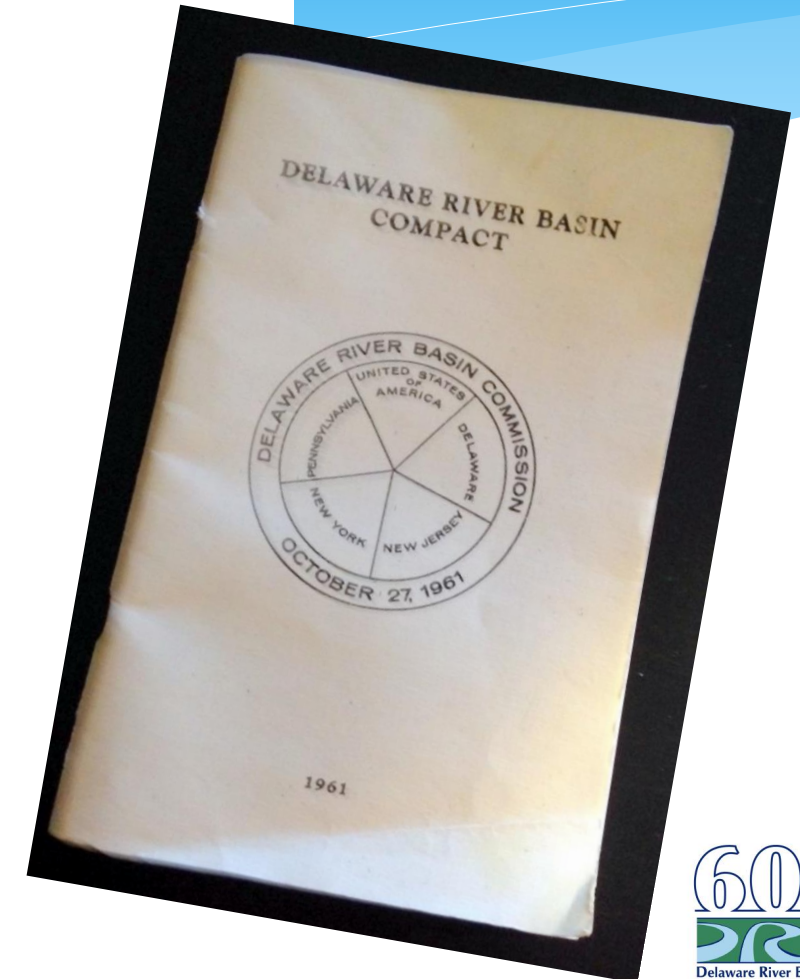
We Value Your Input

- *Stay in the water space*
- *Stakeholder input may not always be “in lane”, but it is always valuable*



Basic Charges of The Compact

- ***From the Compact Preamble***, a Comprehensive Plan administered by a basin wide agency will provide
 - **flood damage** reduction;
 - conservation and **development of ground and surface water supply**...;
 - development of **recreational facilities**;
 - **propagation of fish and game**;
 - promotion of related...**watershed projects**;
 - **protection to fisheries**...;
 - development of **hydroelectric power**;
 - improved **navigation**;
 - **control of movement salt water**;
 - **abatement and control of stream pollution**;
 - And **regulation towards the attainment of these goals**.



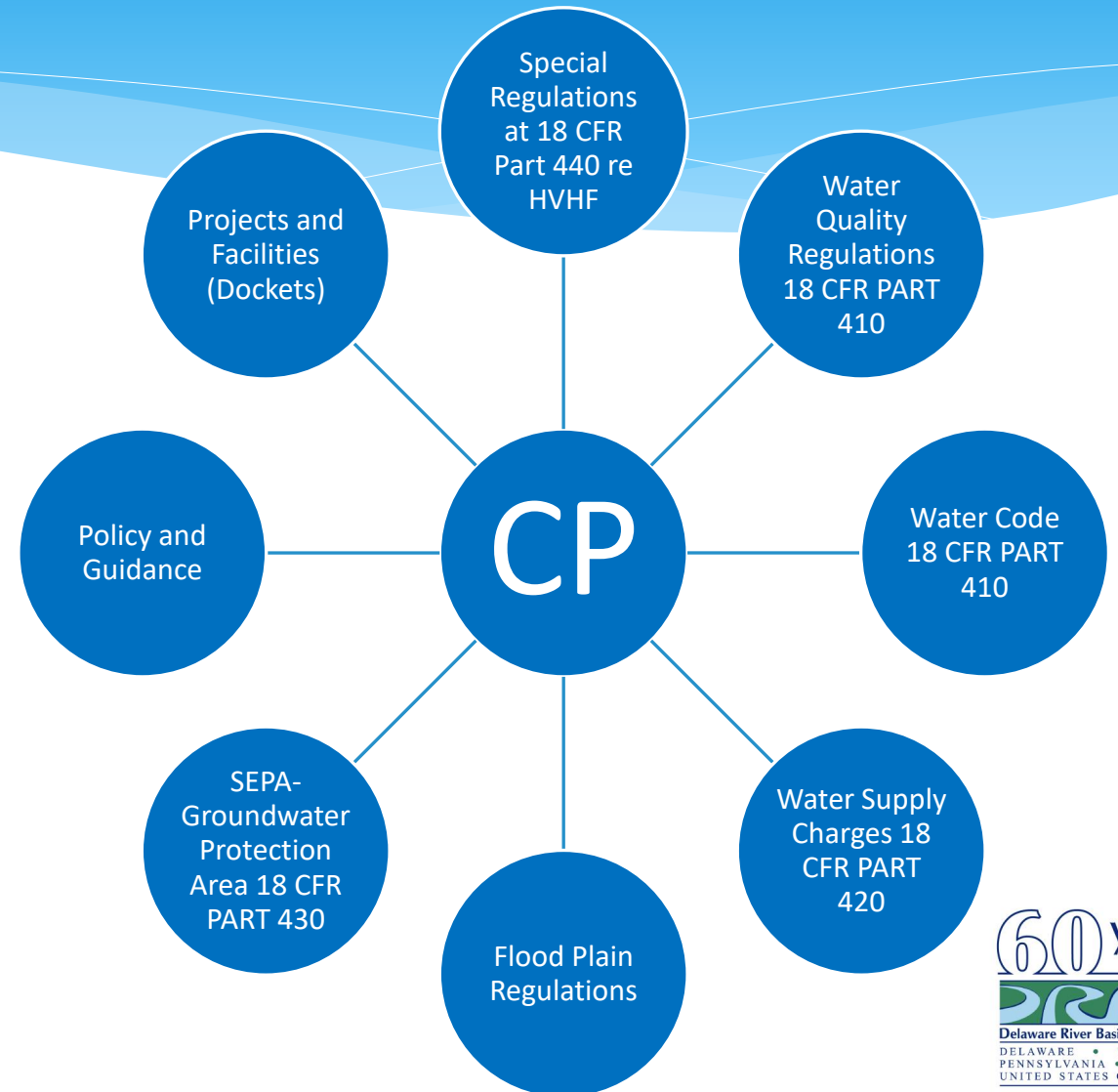
What is in the Comprehensive Plan (CP) and how is it implemented?

■ From § 13.1 of the Compact:

- The commission shall develop and adopt . . . a **comprehensive plan for the immediate and long range development and use of the water resources** of the basin. The plan **shall include all public and private projects and facilities** which are required . . . for the optimum planning, development, conservation, utilization, management and control of the water resources of the basin **to meet present and future needs.**

■ From § 3.8 of the Compact:

- The Commission **shall approve a project** whenever it finds and determines that such project **would not substantially impair or conflict with the comprehensive plan...**



Annual Water Resources Program

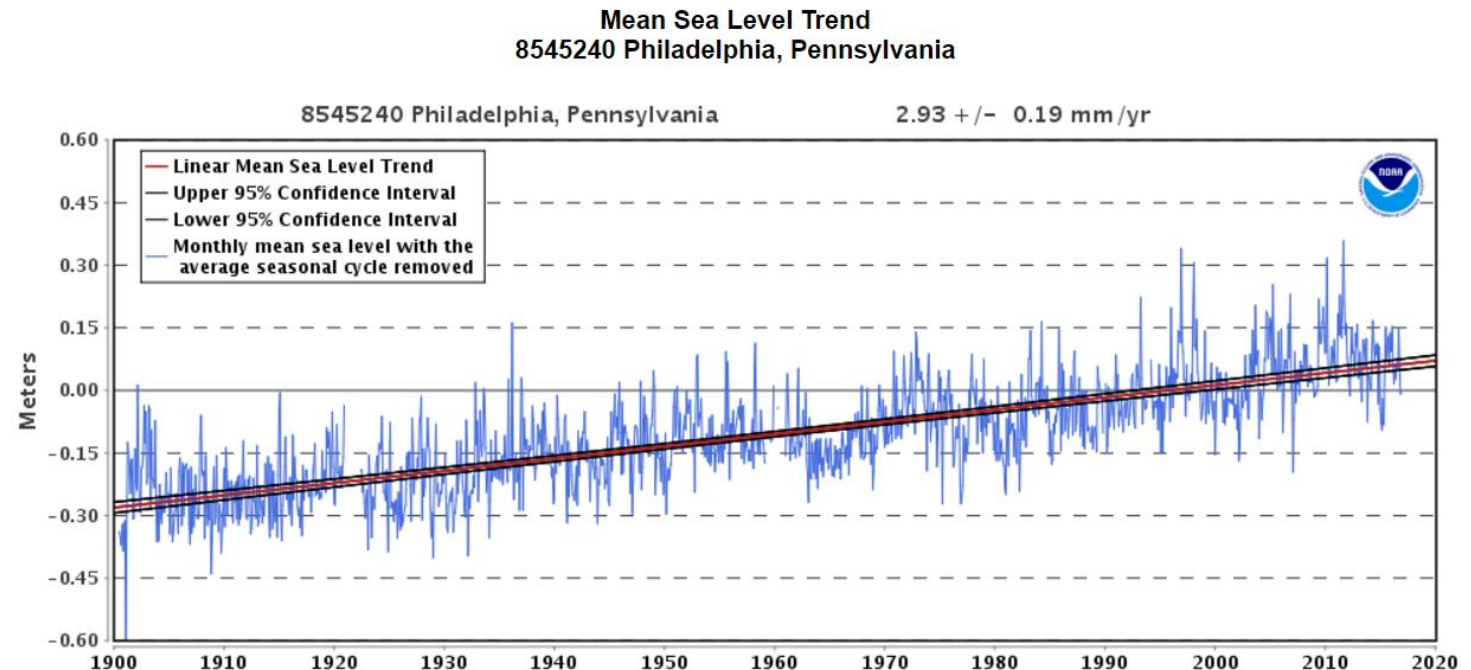
Planning	Operations	Science & Water Quality Mgmt	Project Review (Regulation)
Sustainable water availability	Flow / reservoir management	Water quality monitoring	Water withdrawals & wastewater discharges
Projecting future water withdrawals	Flood & Drought management	Water quality assessments	Imports and exports
Water use trends	Salinity control	Emerging contaminants & toxic pollutants	Flood plain
Consumptive water use	Decree parties	Fish consumption	Groundwater special protection
Water efficiency	Hydrologic models	Water quality modeling	Water quality standards - Interstate Waters
Water audits	Water charges	Designated uses	Special protection waters
Climate Change			

Current Climate Change Planning Efforts

- *Future hydrology with climate change – Water Availability*
- *Flow management evaluations – Drought Resiliency*
- *Sea level rise analyses – Water Suitability, Habitat*
- *Water withdrawal projections – Needs Assessment*
- *Water Sustainability 2060 Plan – Adaptation*
- *Storage studies (reservoir inventory, optimization, FE Walter) – Water Resiliency*
- *Advisory Committee on Climate Change - Guidance*

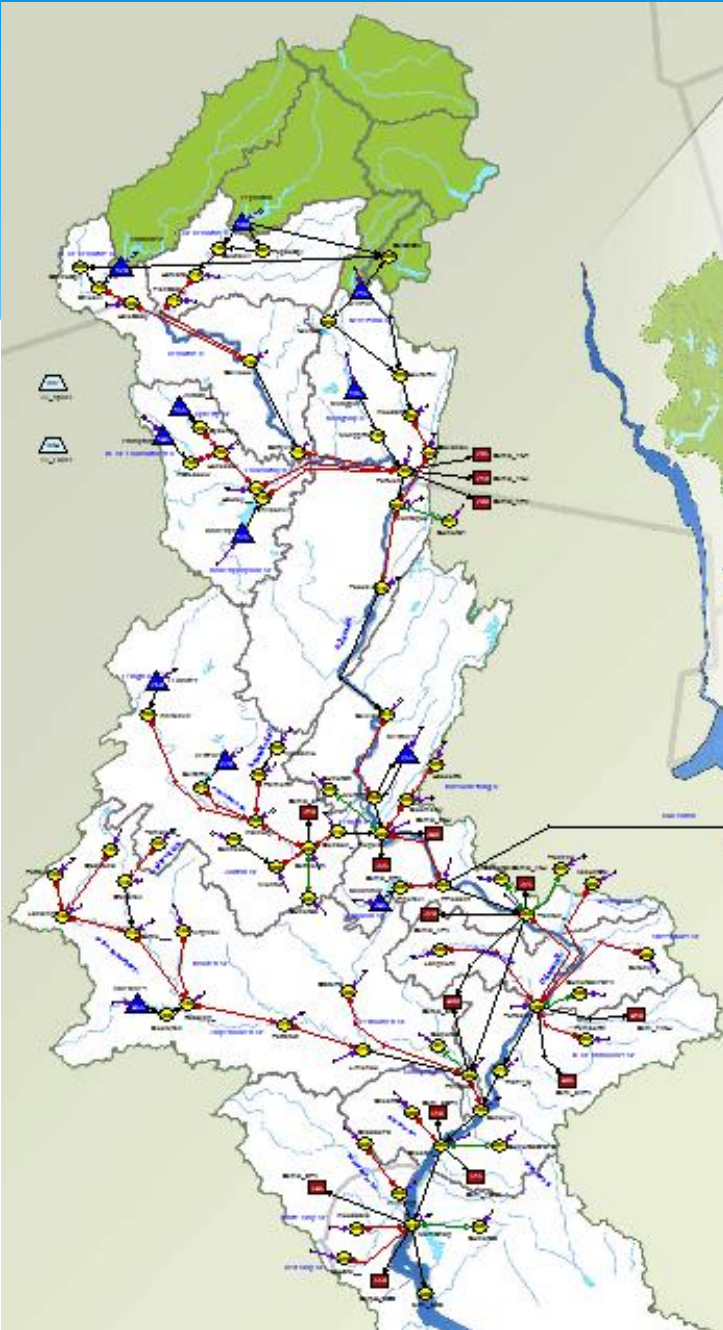
Basis of Climate Change Planning Assumptions

- *Sea level rise (SLR)*
- *More frequent dry periods (droughts)*
- *More intense heavy rains (flooding)*
- *Seasonal changes in hydrology, snowpack, and snow melt*
- *Increasing air temperatures*



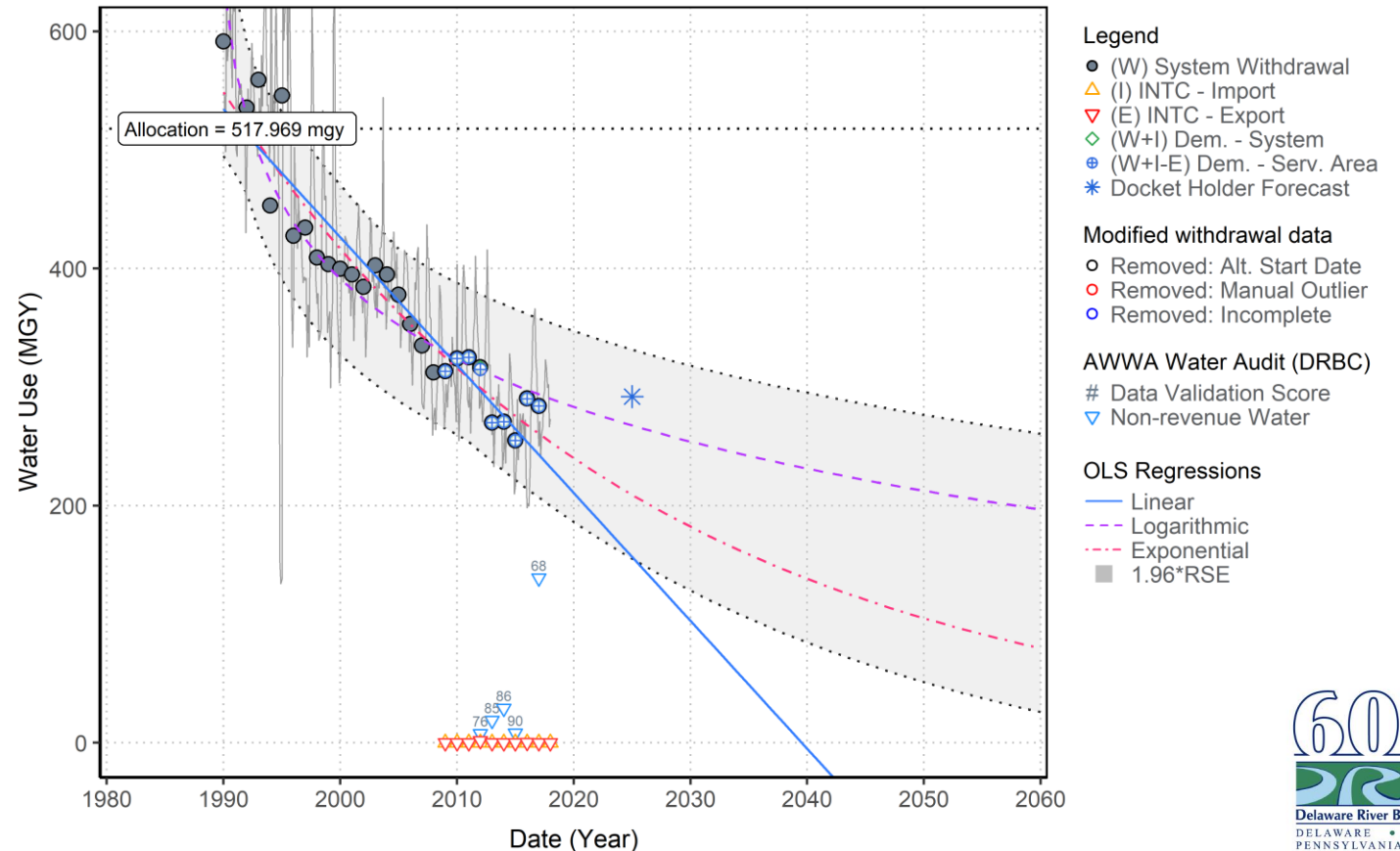
Climate-Impacted Hydrology

- *Historical/ Observed records*
- *Predicted future hydrology under climate change to use as inputs to flow models*
 - Downscaling Global Circulation Models (GCMs)
 - Updating calibration of HEC-HMS
 - Generate climate-impacted streamflows

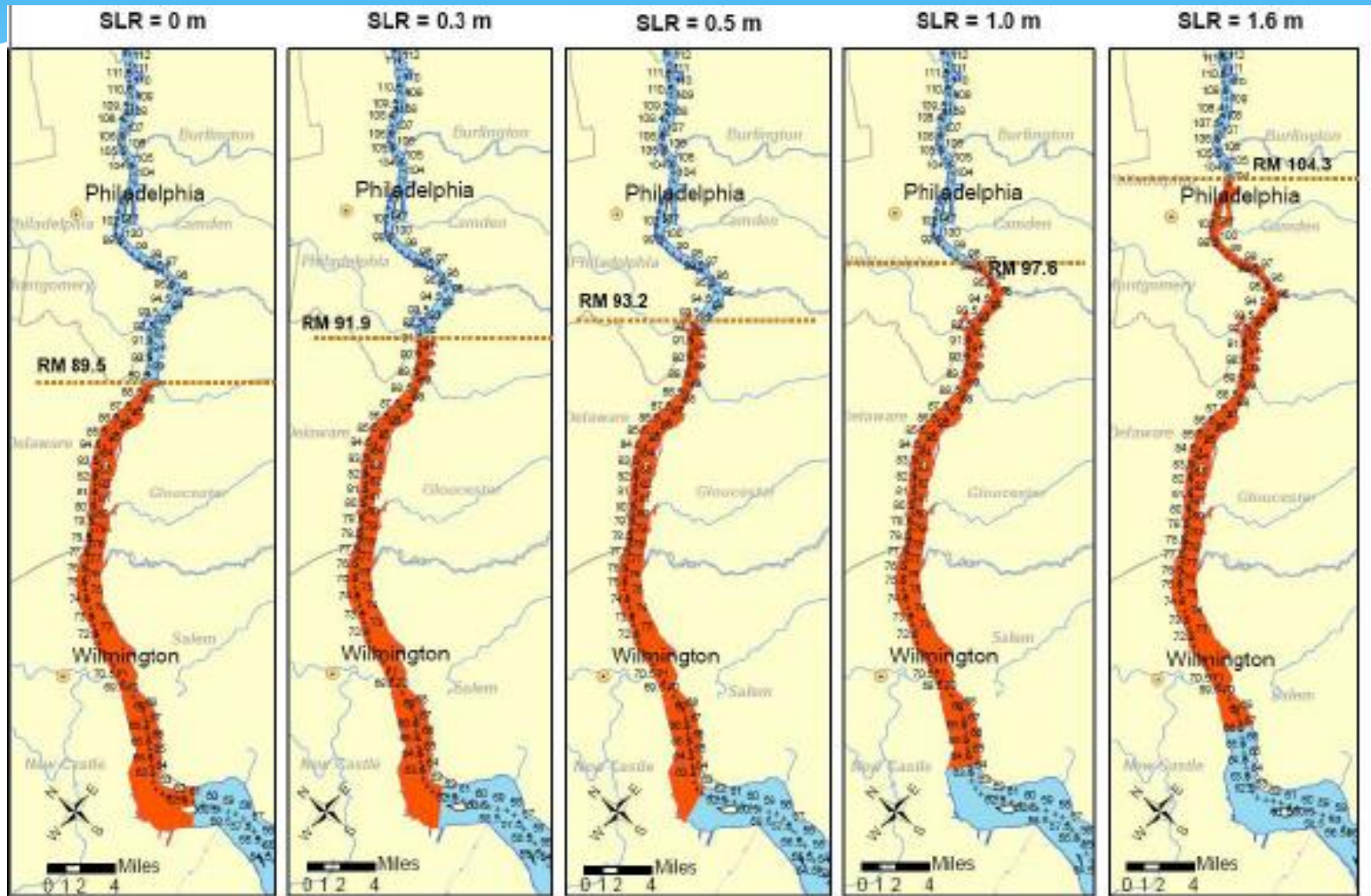


Future Water Withdrawals & Water Availability

- **Projected surface and groundwater withdrawals to 2060**
- **Evaluate sustainability of projected withdrawals against future water availability**
 - Using future climate-impacted hydrology to predict future water availability



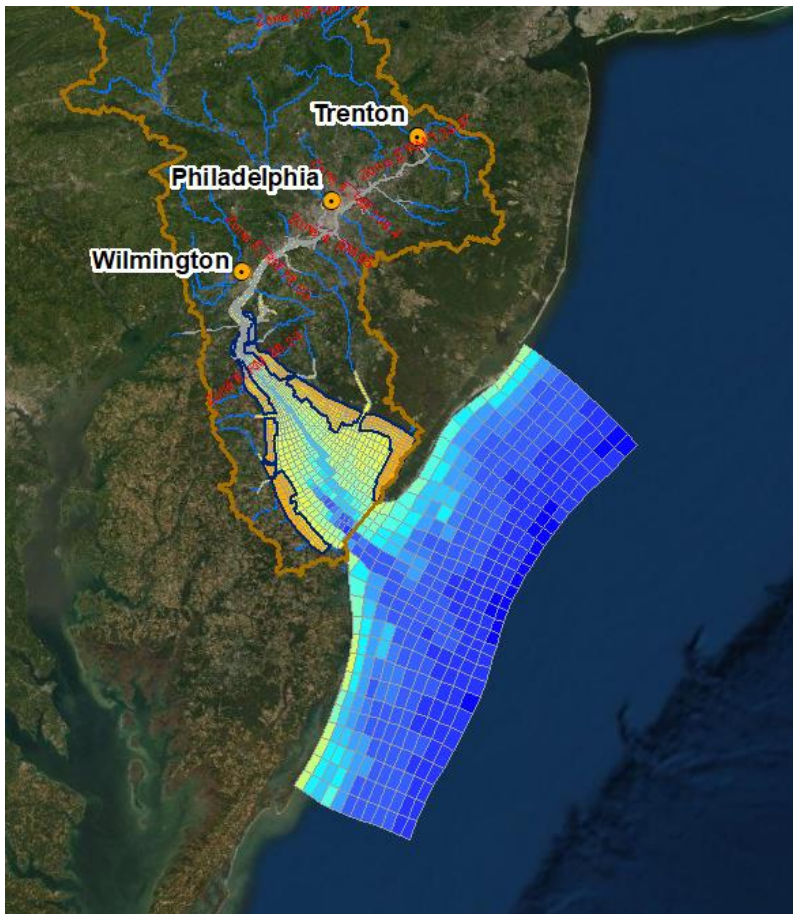
SLR Impacts on Salt Front Location and Flow Management



- *Simulated salt front range during four months of low flow conditions*

- Using a range of Sea Level Rise (SLR) from 0 m to 1.6 m

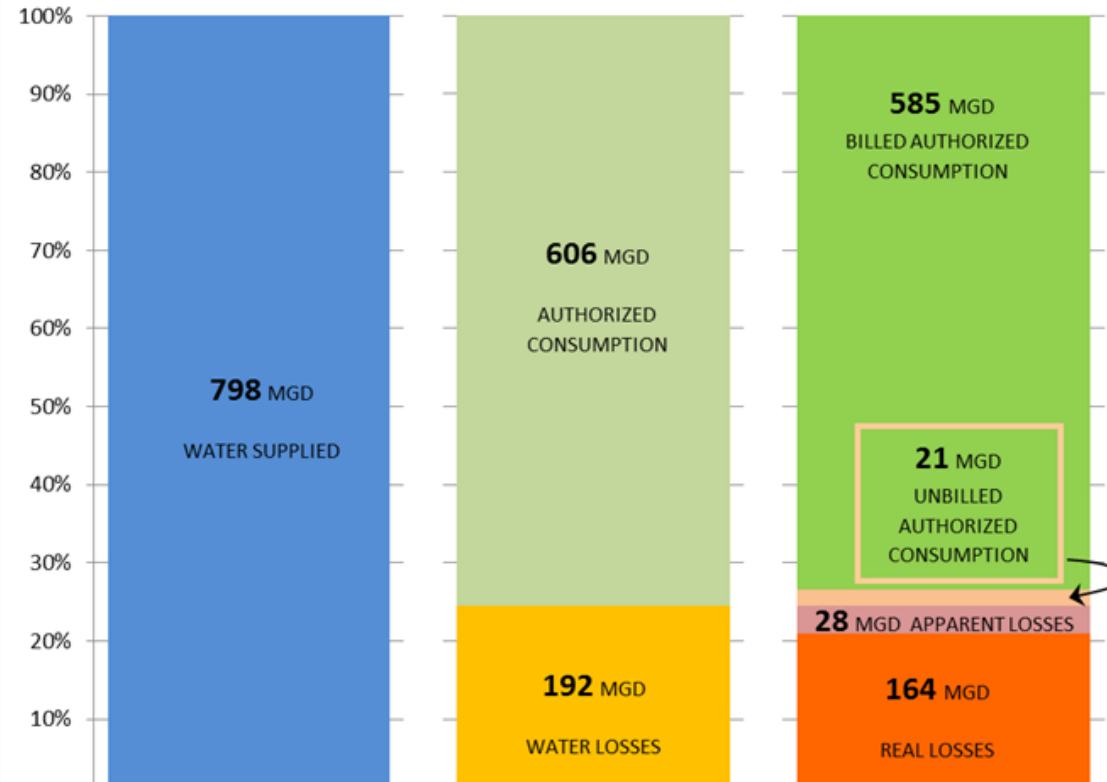
Future Estuary Water Quality & Hydrodynamics



- **3-D modeling of estuary salinity dynamics/physics – transport and movement**
- **Evaluating impacts of future climate-impacted hydrology and sea level rise on water quality - using a range of SLR from 0 m to 1.6 m**
 - salinity impacts to marine habitat (e.g., oyster beds)
 - marsh inundation frequency and salinity changes

Water Audits & Efficiency Standards

- **DRBC regulations require public water suppliers to complete annual AWWA water audit**
- **Could also consider:**
 - Updated water efficiency standards (WaterSENSE)?
 - Requirement for estimation of greenhouse gas emissions (GHG)?



Billed authorized: All consumption that is billed to customers of the utility; this includes metered and unmetered connections.

Unbilled Authorized: All consumption that is unbilled but is still authorized by the utility. This is likely to include water used in activities such as firefighting, flushing of mains and sewers, street cleaning and fire flow tests. It may also include water consumed by the utility itself in treatment or distribution operations, or metered water provided to civic or institutions free of charge.

Discharge Modeling to Support Docket Conditions



- ***Near/Far-Field Discharge Modeling***

- No Measurable Change (NMC) model for Special Protection Waters
- Acute mixing zone/dilution factors
- Heat dissipation areas
- TDS mixing zones

- ***Could also consider:***

- Future climate-change effects on ambient temperature and water quality
- Updated regulations

Project Review/Regulatory Activities

■ **Dockets**

- Water withdrawals & wastewater treatment/discharges
- Imports and exports
- Flood plain
- Other projects that may have a substantial effect on water resources of the basin
- Groundwater special protection – SEPA GWPA (permits)
- Water quality standards
- Special Protection Waters (SPW)

➤ **Consider:**

- New docket application/ reporting conditions (GHG emissions, identification of climate change risks/mitigation measures)
- Updated regulations



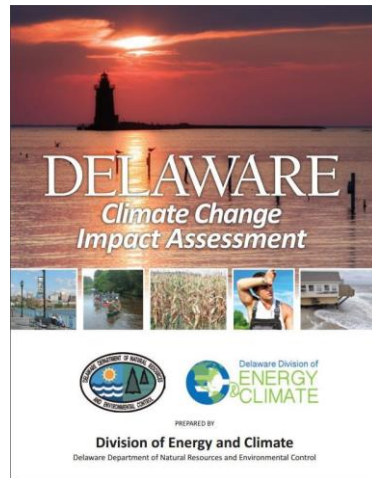
Basin State Climate Change Regulatory Actions

- **All four DRB states incorporate climate change into their regulatory activities outside of water policy**
 - Climate change regulations range from mandated studies of climate change impact to industry-specific regulations
- **Unanimous recognition of climate change impact on water resources**
- **Status of regulations regarding climate change and water resources varies**

State	Recognizes impact on water resources	Govt. required to consider climate change re water	Agency-level regulations regarding climate change and water
Delaware	✓	✗	✗
New Jersey	✓	✓ ¹	✗ ¹
New York	✓	✓	✓
Pennsylvania	✓	✗	✗

¹ NJ DEP in process of developing draft rules amending water resource regulations to incorporate climate change considerations pursuant to Executive Order No. 100 and Administrative Order No. 2020-01.

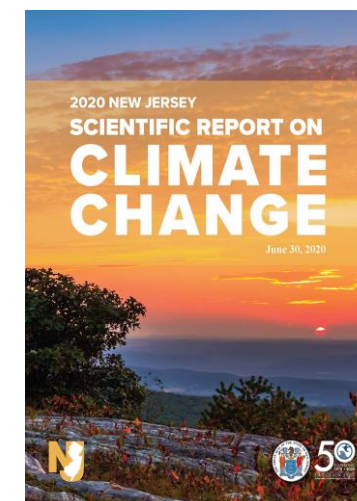
DE Climate Change and Water Regulatory Actions



- ***Delaware Climate Change Impact Assessment (Feb. 2014)***
 - Among other things, this assessment breaks down climate trends in Delaware and the resulting impact on water resources
- ***Recent rulemaking regarding air quality and hydrofluorocarbons cited climate change as basis***

NJ Climate Change and Water Regulatory Actions

- ***Executive Order No. 100 (Jan. 2020) and Administrative Order No. 2020-01 (Jan. 2020)***
 - Requires NJ DEP to, among other things, propose regulations incorporating climate change considerations into the **Coastal Zone Management, Freshwater Wetlands, Flood Hazard Control, and Stormwater Management** rules
- ***NJ DEP rules are under development***
 - Rule proposals expected in fourth quarter of 2021, followed by public comment period and response to public comments into the first half of 2022



NY Climate Change and Water Regulatory Actions

- ***Requires any project eligible for water pollution control revolving fund agreements and any program eligible for local waterfront revitalization program funds to demonstrate that the project/program considers future physical climate risk***
 - New York Environmental Conservation Law (“ECL”) § 17-1909.1.d(ii)(e); ECL § 54-1101.5
- ***Environmental impact statements under the State Environmental Quality Review Act must identify measures to avoid or reduce impacts of climate change and associated impacts***
 - 6 CRR-NY 617.9



PA Climate Change and Water Regulatory Actions

- ***Climate Change Impacts Assessment***

- Required by Climate Change Act of 2008

- ***2015 Report Update***

- Includes significant analysis of climate change impact on water quality, water-based recreation, and water resources, generally

- ***More recent updates focused on topics other than water resources***

- ***Outside of the water context, PADEP implementing rules to reduce greenhouse gas emissions from fossil-fuel-fired power generators***



Climate Change Adaptation at DRBC – *Beyond Planning & Modeling Assumptions*

- ***Time to recognize climate change in the Comprehensive Plan?***
- ***In context of Project Review, require/ allow evaluations of:***
 - Net GHG increase or decrease for new water and wastewater infrastructure (in lbs. CO2/yr.)?
 - 5-yr. evaluations of net change in GHG emissions from same?
 - Identification of future risks of climate change (flooding/drought, water quality) and mitigation/ adaptation actions?
 - Equity and justice/ disproportionate adverse impact?
- ***Require***
 - Updated water efficiency (e.g., WaterSense fixtures) for new hook-ups?
 - Outreach and education to include discussions of climate change?
 - Additional water quality monitoring (discharge or ambient)?