DRBC's Water Resources Resilience Plan (WRRP): **Progress Update**

August 26, 2026
Advisory Committee on Climate Change

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Water Resources Resilience Plan

- ✓**P1:** A Framework for DRBC's WRRP
  - Overview and workplan for all 3 phases

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Water Resources Resilience Plan

Phase 2 kicked off in April 2026

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- ▫ **P2:** Advancing Resilience of the Delaware River Basin's Water Resources to Climate Change

Ramboll in brief

Ramboll is a global architecture, engineering, and consultancy company, delivering expertise and sustainable solutions to clients and partners.

Our ownership by The Ramboll Foundation ensures the long term and independent development of Ramboll, its employees, and the communities we serve.

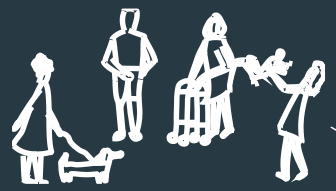
Our experts create sustainable solutions across Buildings, Transport, Water, Environment & Health, Architecture & Landscape, Energy and Management Consulting.

Across the world, Ramboll combines local experience with a global knowledgebase to create sustainable societies where people and nature flourish.

We call it:
Bright ideas. Sustainable change.

300

global offices in 35 countries; 70 offices across three countries in the Americas; 13 offices in NY, NY, and PA.



18,000 employees

2,100 people in the Americas

Ramboll's expertise for the Water Resources Resilience Plan:

- Experience working with regional water resource infrastructure and agencies.
- Holistic biodiversity and ecosystems practice.
- Multi-disciplinary approach to watershed-scale climate resilience assessments.
- Expertise analyzing climate model data to assess current and future risk.

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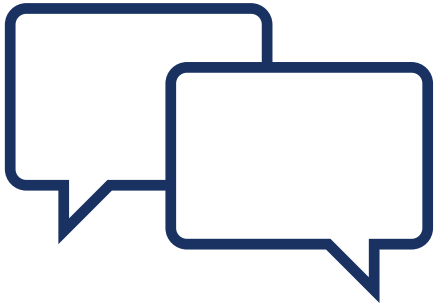
- ▫ **P2:** Advancing Resilience of the Delaware River Basin's Water Resources to Climate Change
- ▪ **P3:** Advancing Resilience of the Delaware River Basin's Water Resources to Additional Challenges
  - Expand framework to non-climate related hazards

Water Resource Assets

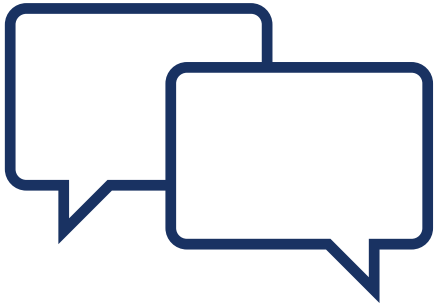
Vulnerability Assessment



Stakeholder Engagement

Water Resource Assets

Vulnerability Assessment



Stakeholder Engagement

The WRRP will focus on protecting and managing **three Basin-wide water resource assets**

WATER AVAILABILITY	**High-quality water supply throughout the Basin that supports human needs**
AQUATIC ~~LIFE~~ ECOSYSTEM	**Habitat that supports** species that live in and/or rely on water bodies in the Basin
~~LANDSCAPE~~ BUILT ENVIRONMENT	Water-adjacent **~~land and~~** infrastructure that supports quality of life and recreation

- Renaming and adjusting definitions to better match their use and applications

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- Renaming and adjusting definitions to better match their use and applications
- Asset inventory for each: Which **individual components** of these water resource assets will we evaluate?

AQUATIC ECOSYSTEM

Habitat that supports species that live in and/or rely on water bodies in the Basin

- Asset inventory is designed around **specific habitats that many species rely on**
- For each, we will independently evaluate climate change impacts to:
  - Salinity
  - DO + temperature
  - Flow
  - Sediment + turbidity

	Habitats	Selected representative species
1	**Open-water Bay**	Sturgeons, flounders, sea turtles
2	**Coastal Bay**	Blue crabs, oysters, osprey
3	**Tidal freshwater - mainstem**	Sturgeons, striped bass, catfishes
4	**Tidal freshwater - tributaries/wetlands**	American eel, bowfin, red-bellied turtles
5	**Nontidal warmwater mainstem**	Eastern elliptio, American shad, smallmouth bass
6	**NYC reservoir tailwaters**	Brown trout, rainbow trout, dwarf wedgemussel
7	**Small coldwater tributaries**	Brook trout, macroinvertebrates

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BUILT ENVIRONMENT

Water-adjacent infrastructure that supports quality of life and recreation

- Asset inventory is designed around **recreation, facilities, and transportation**
- Water-adjacent = within 500-year floodplain
- For each, we will evaluate tidal and non-tidal portions of the Basin independently

	Category	Components
1	Water-Adjacent **Recreation**	**Water-based recreation infrastructure** (boat launches, docks, piers)
2		**Recreation space** (parks, trails, waterways)
3	Water-Adjacent **Facilities**	**Ports**
4		**Buildings** (manufacturing, commercial, institutions, residences, critical facilities, and others)
5		**Thermoelectric power generation** (nuclear, coal, natural gas, oil)
6	Water-Adjacent **Transportation**	**Rail**
7		**Roads**
8		**Bridges** (mainstem only)

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ASSET INVENTORY

Which **individual components** of each water resource asset will we evaluate?

- Asset inventories are designed around **the value that each water resource asset provides**
- Asset inventories reflect the **Basin-scale nature** of DRBC's Water Resources Resilience Plan
  - Complement and build on other local and regional resilience planning efforts at finer spatial scales
- Chosen components reflect DRBC's regulatory role, relevance to stakeholders across the Basin, and vulnerability to climate change hazards
- Additional components may be addressed in the gap analysis

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Asset inventories are underway and will be a foundation for the vulnerability assessment

Vulnerability Assessment

Stakeholder Engagement

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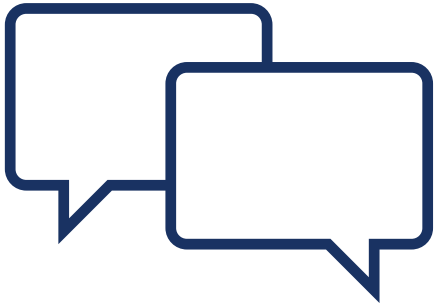
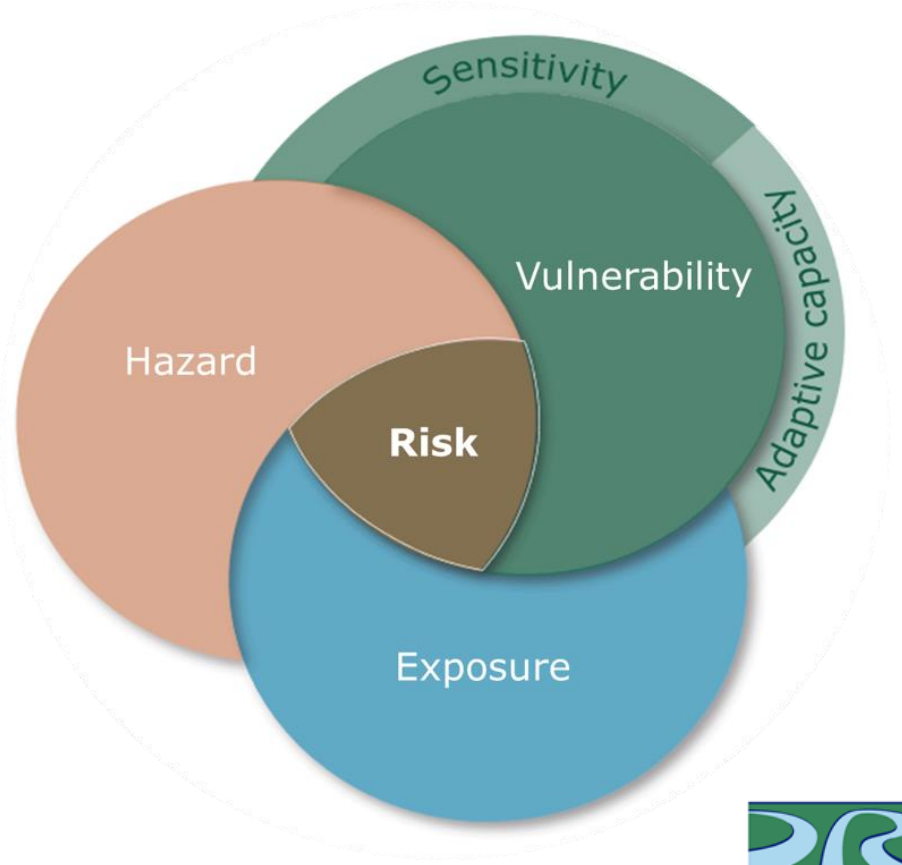
Vulnerability Assessment



Stakeholder Engagement

Vulnerability Assessment

- The purpose of the Vulnerability Assessment (VA) is to understand the Sensitivity and Adaptive Capacity of Water Resource Assets to specific climate hazards.
- The VA will identify which water resource assets are most vulnerable to each hazard.
- To develop the Asset Inventory and assess sensitivity and adaptive capacity for this project, we are considering:
  - **Does DRBC have a regulatory role or jurisdiction over this type of asset?**
  - **Would this asset be impacted (or cause impacts to other assets) by specific hazards from climate change?**



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Vulnerability Assessment

Methodology and Components of the VA

1 Asset Inventory

Establish a standardized asset framework across the Basin.

2 Climate Hazard Indicators

Physical climate hazards that could cause adverse impacts to Water Resource Assets

3 Sensitivity

Evaluate how asset categories respond to hazards.

4 Adaptive Capacity

Evaluate the ability of assets to withstand and recover from climate impacts.

5 Vulnerability Assessment

Integrate sensitivity and adaptive capacity to determine comparative asset vulnerability ratings.

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Climate Hazard Indicators

Hazards to water resource assets

- **Water temperature increase**
- **Changing winter weather**
- **Drought**
- **Wildfire**
- **Flooding** (episodic)
- **Land inundation** (tidal flooding)
- **Salinity intrusion**

Example indicators for drought

Standardized Precipitation Evapotranspiration Index (SPEI)

Dry spell frequency: Frequency of dry periods of 10 days or more, during which accumulated rainfall is less than 1.0 mm

Maximum dry spell length: Maximum number of days in a row with less than 1 mm of rainfall

Total dry spell length: Total length of dry periods of 10 days or more in each year

Dry days per year: Number of days per year with less than 1 mm of rainfall

Warm and dry days: Days with maximum temperatures above 90F and precipitation less than 1 mm

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Sensitivity

The degree to which a system is affected, either adversely or beneficially, by climate variability or change, assuming the hazard will occur.

How directly and severely would a hazard impact the asset and the communities and ecosystems that rely upon it?

- Example questions to assess **Sensitivity**:
  - How well does the asset tolerate the presence of a given hazard?
  - What consequences occur in response to a given hazard?
  - Are threatened or endangered species reliant on the asset to thrive?
  - Does the asset have particular commercial and/or recreational importance (including impact on commercially or recreationally important species)?
  - Are there interdependencies between this asset and others?

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Adaptive Capacity

The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.

How capable is the asset to respond, recover, and adapt with protective measures that are in place today?

- Example questions to assess **Adaptive Capacity**:
  - Does this asset have inherent controls in place to mitigate against the hazard and limit sensitivity?
  - Could a control be put in place to help a specific asset respond/protect/mitigate a given hazard?
  - How well can the asset recovery from a given hazard? Is it able to bounce back quickly to normal operations, or would there be adverse impacts (either to the asset and/or to humans or wildlife species that rely on the asset)?

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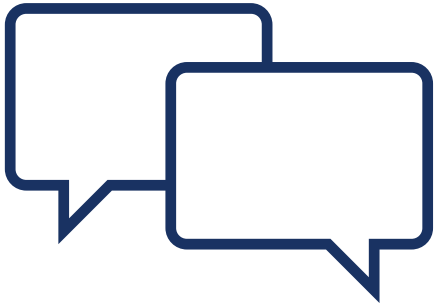
Asset inventories are underway and will be a foundation for the vulnerability assessment

The vulnerability assessment will evaluate sensitivity and adaptive capacity of each water resource asset



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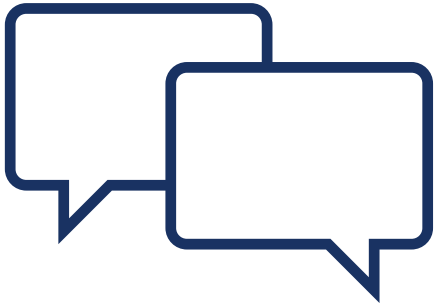
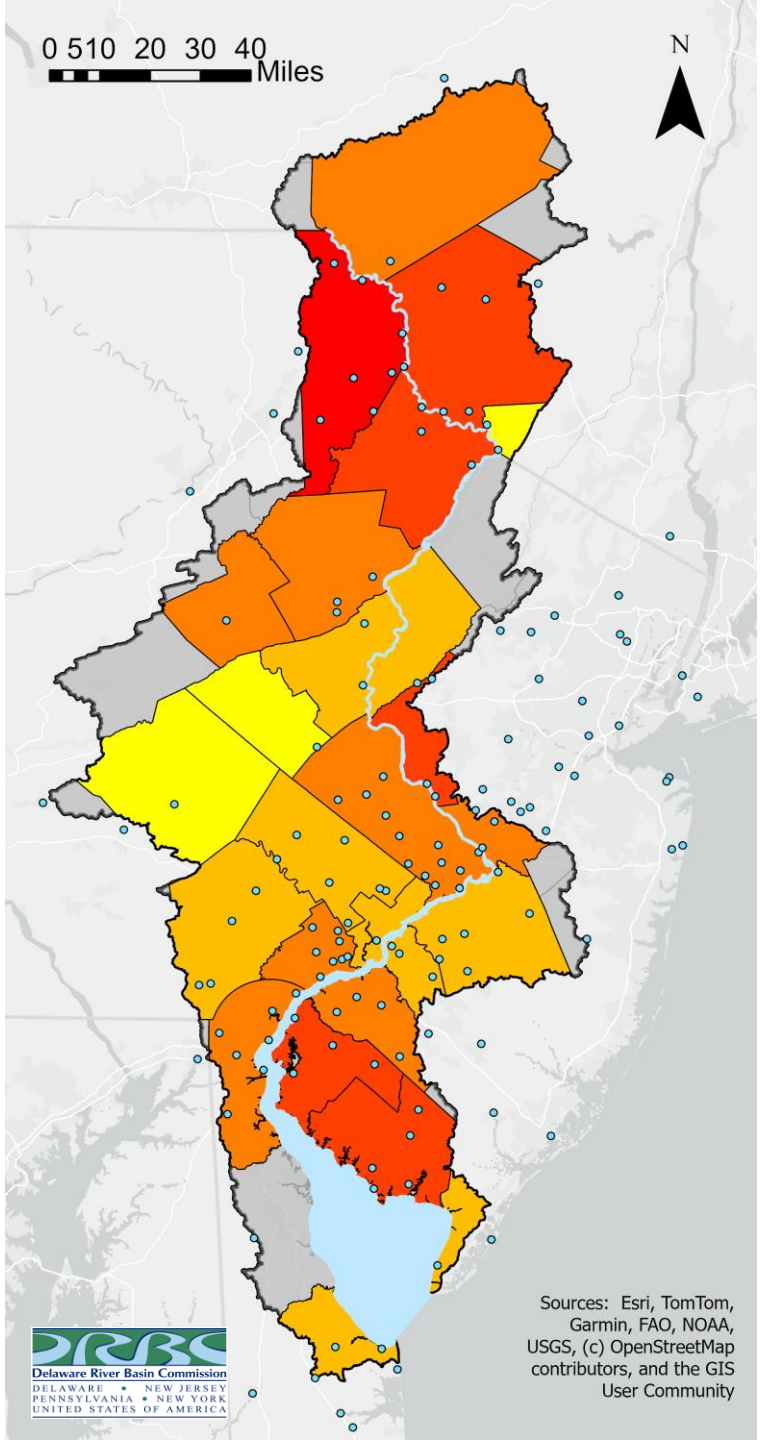


Stakeholder Engagement

Initial stakeholder engagement will inform decisions throughout Phase 2

- Goal: What do stakeholders think is **most important** for us to address?
- This feedback will inform the **asset inventory**, **vulnerability assessment**, and **recommendations**
- Short survey: Awareness and ranking of climate change concerns



Phase 2 Survey Responses Collected by County
(as of 8/18/26)

Survey Submission

% of Pop Surveyed ($\times 10^{-3}$)
0
0.01 – 0.26
0.26 – 1.69
1.69 – 4.84
4.84 – 11.63
11.63 – 17.53

Hundreds around the Basin have completed our Phase 2 survey

- Complete survey in-person on iPad
  - Limited edition sticker!
- 9 in-person events attended
- 276 survey responses
- Wrapping up in October

Phase 2 Survey

tinyurl.com/
WRRP-Phase-2-Survey

You'll find us at...

Sept 2	*Our Founding Waters* Festival (PA)
Sept 3	Parks on Tap – Penn Treaty Park (PA)
Sept 10	Parks on Tap – Borski Park (PA)
Sept 12	FUDR River Fest (NY)
Sept 12	Trenton River Days (NJ)
Sept 26	Delaware River Festival (PA + NJ sides)
Sept 30	Delaware River Watershed Forum (DE)
Oct 4	Delaware Coast Day (DE)

...And more! ***Stay tuned.***

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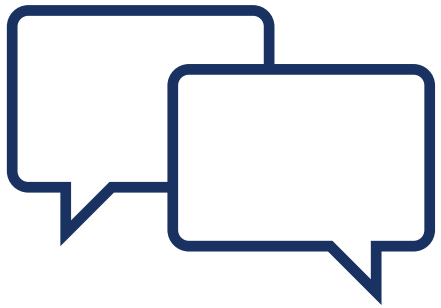
DRBC is planning a series of **Phase 2 listening sessions**

- Hear from participants about **perceived gaps in resilience planning efforts** and **resources of which we should be aware**
- Target audience: Resilience professionals and engaged public
- **Looking for co-hosts!**

Asset inventories are underway and will be a foundation for the vulnerability assessment

Vulnerability Assessment – take home message



276 have shared their thoughts and we'll continue to collect broad input

PRELIMINARY TIMELINE

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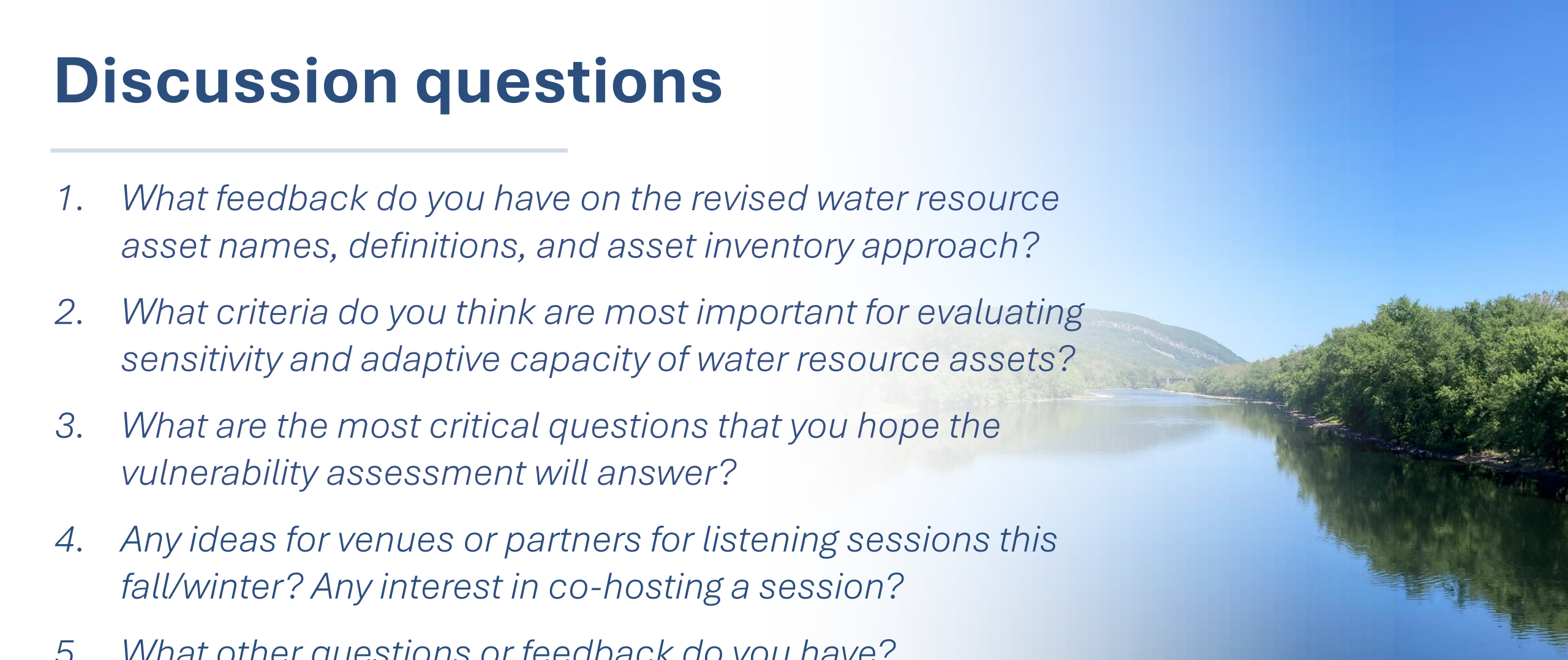
Activities and Milestones	
Fall 2026	• Complete vulnerability assessment • Complete Phase 2 ranking survey • Kick off listening sessions ○ 9/30 at Delaware River Watershed Forum
Nov/Dec 2026 ACCC meeting (virtual)	• Share results from Phase 2 ranking survey • Share results from vulnerability assessment • Preview methodology for gap analysis
Mar/Apr 2027 ACCC meeting (*in person*)	• Share results from Phase 2 listening sessions • Share results from gap analysis • Preview methodology for prioritization

Discussion questions

1. *What feedback do you have on the revised water resource asset names, definitions, and asset inventory approach?*
2. *What criteria do you think are most important for evaluating sensitivity and adaptive capacity of water resource assets?*
3. *What are the most critical questions that you hope the vulnerability assessment will answer?*
4. *Any ideas for venues or partners for listening sessions this fall/winter? Any interest in co-hosting a session?*
5. *What other questions or feedback do you have?*



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