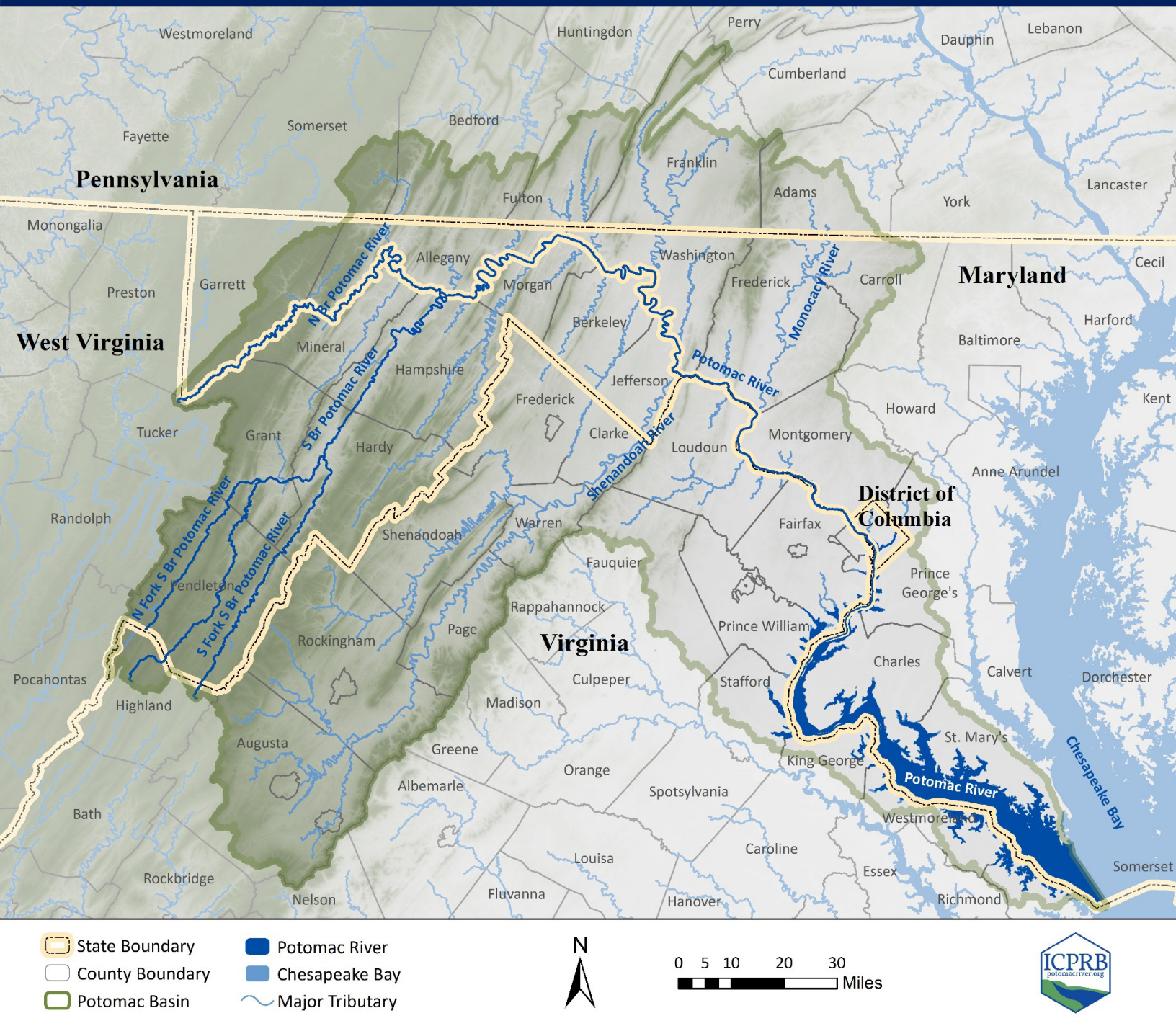
2023 Updates

Potomac River Basin

Comprehensive Water Resources Plan

Prepared by the Interstate Commission on the Potomac River Basin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Randolph
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Fairfax
Fauquier
Prince George's
Pendleton
Rappahannock
Prince William
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VISION

This plan provides a roadmap to achieving our shared vision that the Potomac River basin will serve as a national model for water resources management that fulfills human and ecological needs for current and future generations. The plan will focus on sustainable water resources that provides the water quantity and quality needed for the protection and enhancement of public health, the environment, all sectors of the economy, and quality of life in the basin. The plan will be based on the best available science and data. The ICPRB will serve as the catalyst for the plan's implementation through an adaptive process in collaboration with partner agencies, institutions, organizations, and the public.

PURPOSE

The purpose of this plan is to identify and develop management recommendations for water resources issues of interstate and/or basin-wide significance. It aims to facilitate achievement of common goals, including protection of water supplies, drinking water sources, water quality, and aquatic life.

Dedication

This five-year update to the 2018 Potomac River Basin Comprehensive Water Resources Plan is dedicated to Curtis Dalpra, former Director of Communications at the Interstate Commission on the Potomac River Basin (ICPRB). Mr. Dalpra worked at ICPRB for 41 years before passing away in March 2023. During his tenure, he championed good stewardship of the Potomac River through communication and education and was involved in the development of the basin-wide plan since its conception. He especially enjoyed canoeing, sailing, fishing, and photographing the Potomac River. In work, and in life, he was passionate about having a positive impact on the people and waters of the basin.

Commissioner Statement

We, the ICPRB Commissioners, unanimously adopted the Potomac River Basin Comprehensive Water Resources Plan in June 2018. Developed in conjunction with a wide range of stakeholders and in consultation with technical experts, the plan represents a shared vision for the Potomac and identifies Commission activities, in concert with other agencies and stakeholders, to help achieve the vision. In this revised and updated 2023 report, we affirm our ongoing commitment to proactively evaluating, balancing, and addressing challenges for sustainable water resources management, including protecting water supplies, drinking water sources, water quality, and aquatic life in the basin. We believe the report encapsulates and synthesizes a broad, scientifically informed consensus on a continuing and more broadly inclusive path forward. Specific details of this document may not, in all instances, reflect the official views or policies of ICPRB signatories. Implementation is voluntary and is subject to applicable laws and regulations.

Authors' Note

Five years of implementation of the Potomac River Basin Comprehensive Water Resources Plan has resulted in an impressive combination of technical and communication products as well as participatory events. At this time of reflection, it is evident that there are new and continuing challenges to sustainable water resources management in the Potomac basin. Due to the hard work of many, the basin is well situated to face these challenges. It is an honor to work with the plan's expert advisory committee, ICPRB's dedicated commissioners, and the stakeholders of the basin to develop and implement this plan.

Heidi Moltz, PhD, Director, Program Operations, ICPRB
Claire Buchanan, PhD, Emerita Director Program Operations, ICPRB
Stephanie Nummer-Fantozz, PhD, Water Resources Scientist, ICPRB
Michael Nardolilli, Executive Director, ICPRB

Acknowledgements

This five-year update to the Potomac River Basin Comprehensive Water Resources Plan is the result of a collaborative process between the plan's advisory committee; Kristin Rowles and Mark Masters with Policy Works LLC (the advisory committee facilitators); and ICPRB Commissioners and staff (see lists, following page). Funding for this effort was provided by ICPRB and by the US Environmental Protection Agency through ICPRB's Clean Water Act Section 106 grant.

Guest speakers for the advisory committee process included Alex Gorzalski, PhD, PE, with One Water Engineering; ICPRB Alternate Commissioner Kimberly Jones, PhD; Sujay Kaushal, PhD, with the University of Maryland; and Mark Symborski (also an advisory committee member) with Maryland – National Capital Park and Planning Commission.

Advisory Committee Members

Advisory committee members that participated in all or part of the 2023 plan update process are listed below along with their organizational affiliation at the time of participation. Members are listed in alphabetical order by jurisdiction and first name.

Name	Jurisdiction	Affiliation
Matt Gallagher	DC	District of Columbia Department of Energy and Environment
Tolessa Deksissa	DC	University of the District of Columbia
Willem Brakel	DC	American University
Mark Symborski	MD	Maryland – National Capital Park and Planning Commission
Matt Wessel	MD	Maryland Building Industry Association
Michael Weyand	MD	City of Gaithersburg, Maryland
Nancy Hausrath	MD	City of Hagerstown, Maryland
Robert Peoples	MD	Maryland Department of the Environment
Tom Hilton	MD	WSSC Water
Martin Gary	MD-VA	Potomac River Fisheries Commission
Beth Roach	National & VA	Sierra Club and Nottoway Tribe
Adam McClain	PA	Adams County Conservation District
Mark Guise	PA	Gettysburg Municipal Authority
Susan Weaver	PA	Pennsylvania Department of Environmental Protection
William Willis	PA	Mercersburg Academy
Greg Prelewicz	VA	Fairfax Water
Hannah Somers	VA	Virginia Department of Environmental Quality
Mark Peterson	VA	Loudoun Water
Meredith Keppel	VA	George Washington Regional Commission
Ryan Green	VA	Virginia Department of Environmental Quality
Frank Rodgers	WV	Cacapon Institute
Mindy Neil	WV	West Virginia Department of Environmental Protection

ICPRB Commissioners

Jurisdiction	Commissioners and Alternates
District of Columbia	Willem Brakel, Tiffany Potter, Jeffrey Seltzer; Alternates: Kimberly Jones, Hamid Karimi, James Tsai
Maryland	Governor Wes Moore and Catherine McCabe; Alternate: Lee Currey
Pennsylvania	Jessica Shirley, Representative Dan Moul, William Willis; Alternates: Susan Weaver, Adam McClain, Chris Ann Kimple
Virginia	Paul Holland, Delegate Alfonso Lopez, Michael Rolband; Alternates: Scott Morris and Mark Peterson
West Virginia	Harold Ward; Alternate: Mindy Neil
Federal Government	BG Thomas Tickner, Darryl Madden, Robert Sussman; Alternate: Amy Guise

Table of Contents

List of Figures

Photo Credits

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Abbreviations

AEESP	Association of Environmental Engineering and Science Professors
AWWA	American Water Works Association
BCEE	Board Certified Environmental Engineer
BMP	Best Management Practice
Chessie BIBI	Chesapeake Basin-wide Index of Biotic Integrity
CO-OP	Cooperative Water Supply Operations on the Potomac
DC	District of Columbia
DEIJ	Diversity, Equity, Inclusion, and Justice
DWSPP	Potomac River Basin Drinking Water Source Protection Partnership
ICPRB	Interstate Commission on the Potomac River Basin
ICWP	Interstate Council on Water Policy
LiDAR	Light Detection and Ranging
LLC	Limited Liability Company
MD	Maryland
MDE	Maryland Department of the Environment
MS4	Municipal Separate Storm Sewer System
No.	Number
NPS	National Park Service
PA	Pennsylvania
PE	Professional Engineer
PFAS	Per- and Polyfluorinated Substances
PhD	Doctor of Philosophy
PRRISM	Potomac Reservoir and River Simulation Model
SaMS	Virginia Salt Management Strategy
TMDL	Total Maximum Daily Load
US	United States
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
USDA	United States Department of Agriculture
VA	Virginia
WRDA	Water Resources Development Act
WV	West Virginia

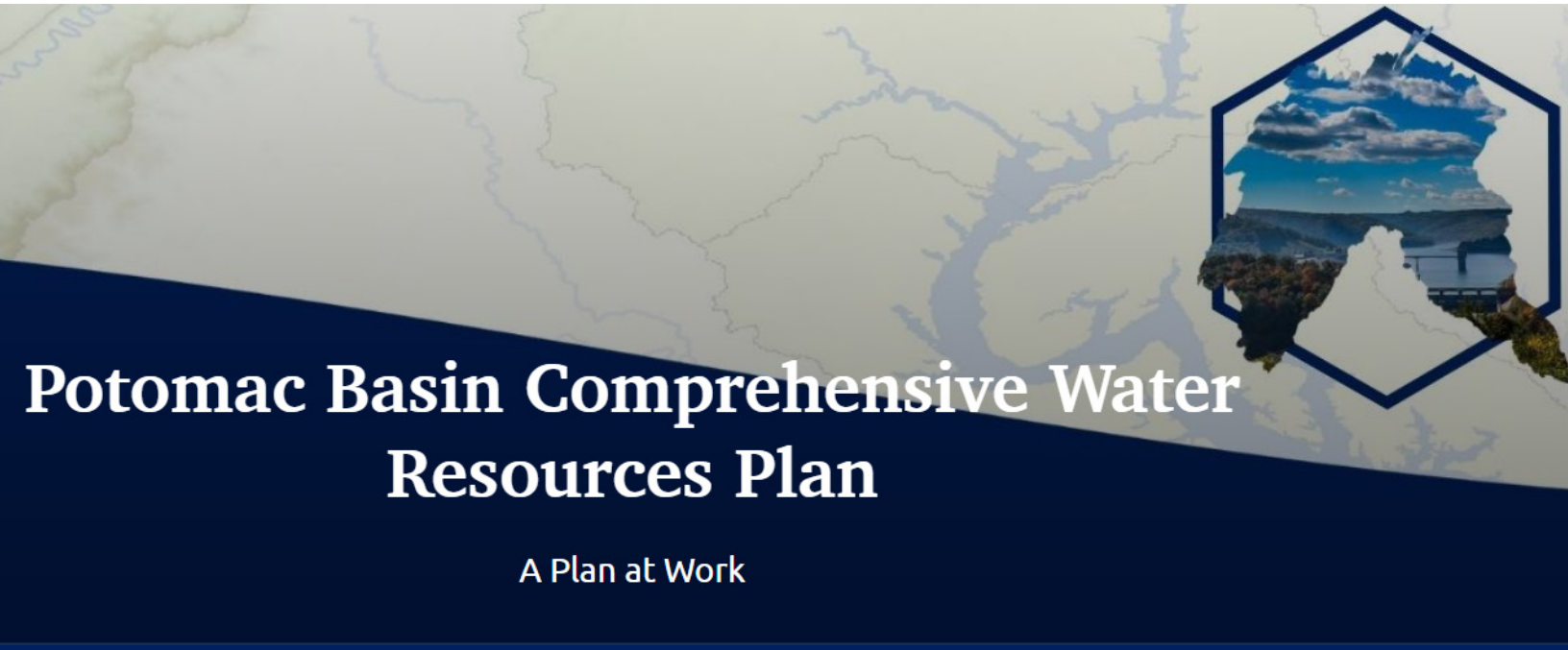
Introduction

The Interstate Commission on the Potomac River Basin (ICPRB) was authorized by an Act of Congress in 1940. The ICPRB's mission is to "protect and enhance the waters and related resources of the Potomac River basin through science, regional cooperation, and education." In this capacity, the Commission employs scientists, engineers, planners, and communicators to expand the scientific understanding of the basin and encourage dialogue with and between ICPRB, partner organizations, basin stakeholders, and the general public. The ICPRB website contains additional information about ICPRB's organizational structure, staff expertise, and staff contact information. In 2018, the ICPRB adopted a voluntary Potomac River Basin Comprehensive Water Resources Plan. The purpose and vision of that plan are shown on page 3 and page 4 of this document, respectively.

Reason for This Document

Over the past five years, staff at ICPRB, in collaboration with stakeholders from around the basin, have actively pursued a shared vision for the basin through implementation of the 2018 plan. A great deal has been accomplished during this time, including scientific and participatory products, available for use via ICPRB's interactive planning StoryMap.

The 15-year comprehensive plan calls for an interim review every five years to evaluate progress and identify actions for implementation over the next five years. This document details the results of the first five-year review and identifies desired ICPRB outcomes for the second five-year period, 2024-2028. While the activities of myriad basin organizations and individuals are needed to bring our shared vision for the future to life, this document articulates the five-year action plan for ICPRB.



The Introduction section of this document outlines stakeholder involvement in the process and describes a broadly inclusive implementation focus over the next five years. The next section, Summary of Water Resources Challenge Areas and Recommendations, reviews key components of the 2018 plan. The results of the 2023 stakeholder process are then presented; namely, the revised Milestones and Measure of Success for implementation over the second five-year period (2024-2028). For planning purposes, the "milestones" represent ICPRB's to-do list for the five-year period and the "measures of success" outline the tangible outputs of implementing that to-do list. The Communication Plan, an essential component of implementation, is then provided along with the next steps in the adaptive implementation process. Lastly, items discussed by the advisory committee not included elsewhere in the document are provided in the Complementary Activity Ideas appendix as a way of capturing potential future activities for ICPRB and other organizations.

While this document is intended to provide enough background information to be understood on its own, the 2018 plan remains in effect and provides a more in-depth description and reference for basin-wide sustainable water resources management. This document supplants only the milestones, measures of success, and communications sections of the 2018 plan. Through this document, ICPRB hopes to enhance interstate coordination of activities and leverage ongoing and anticipated work, thereby increasing internal and external efficiency. Basin stakeholders and interested parties are invited to review the Get Involved and Useful ICPRB Products appendices of this document, visit the interactive planning StoryMap to access the planning products, and/or contact ICPRB to learn more about how to get involved. There is a role for everyone to play in sustainably managing the basin's water resources.

Stakeholder Involvement

Achieving the shared vision articulated in the Potomac River Basin Comprehensive Water Resources Plan requires collaboration from the diverse stakeholders of the basin. The 2023 update process utilized a strategic approach for engagement designed around the plan's advisory committee and the ICPRB Commissioners. The advisory committee is comprised of representatives from each of the basin jurisdictions (the District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia). The members represent a wide range of expertise including fisheries managers; drinking water suppliers; developers; local, state, and regional governmental entities; academic institutions; and non-profit organizations. A complete list of advisory committee members is provided in the Acknowledgements section.

The advisory committee member recruitment process began in late 2022 with re-engaging original members, seeking nominations from the jurisdictional environmental agencies through the ICPRB Commissioners, and seeking nominations from the water suppliers involved in ICPRB's Section for Cooperative Water Supply Operations on the Potomac (CO-OP). New members were also sought to fill gaps in geography and expertise.

Advisory committee meetings were facilitated by an independent team from Policy Works LLC, under contract with ICPRB. The committee met seven times over the course of the year, twice in person and five times virtually according to the following schedule. The meetings included guest and staff presentations, facilitated discussions, small group activities, and review of draft

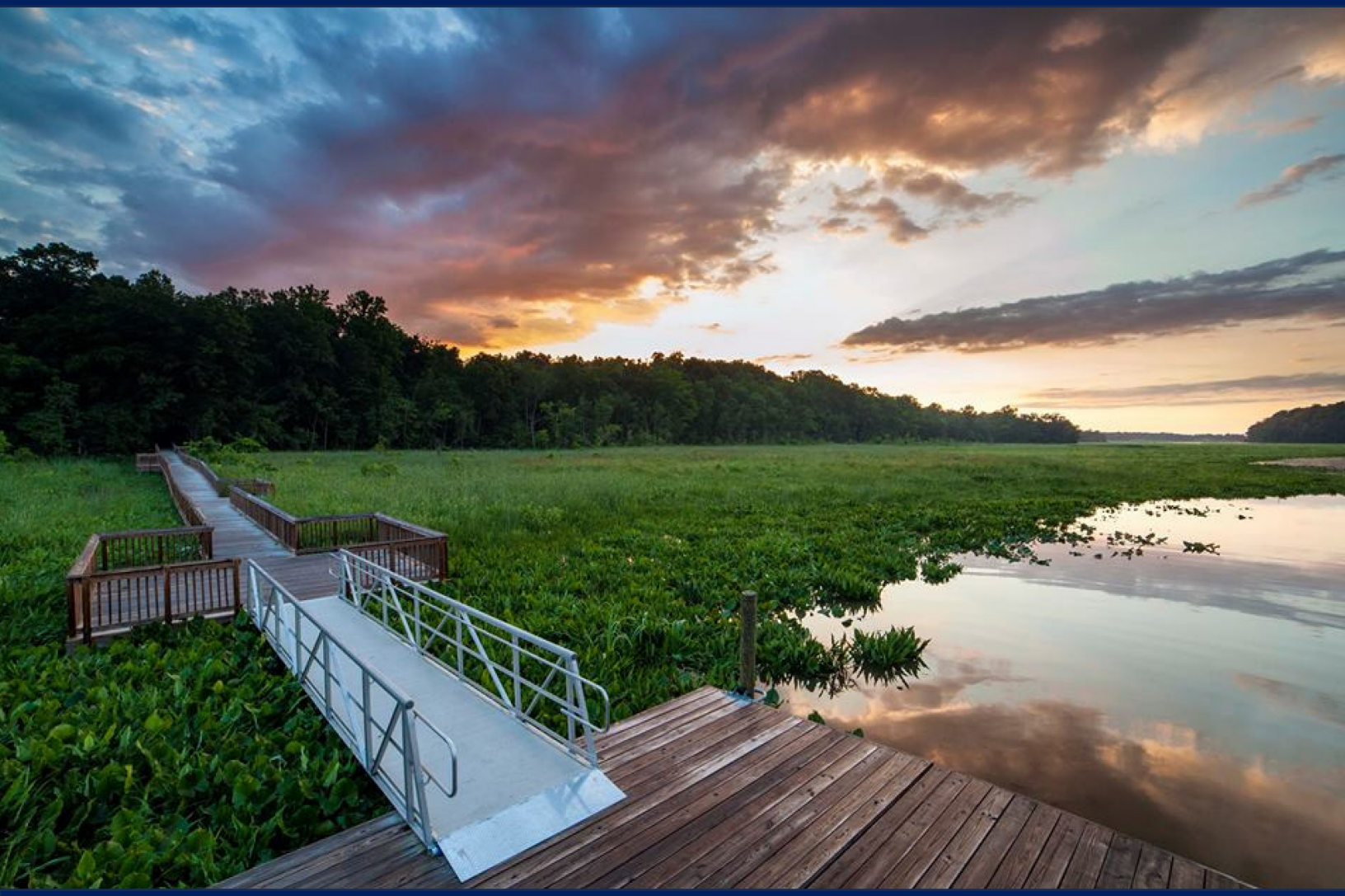
planning materials. Between meetings, ICPRB staff and the Policy Works facilitation team coordinated with members to ensure meaningful engagement. Members were asked to review and provide feedback on planning products and draft materials.

2023 Advisory Committee Schedule:

- January 19, 10am-3:30pm: Kickoff Meeting, In Person (Rockville, Maryland)
- March 14, 1-4pm: Water Use and Supplies, Virtual
- May 17, 1-4pm: Water Quality, Virtual
- July 13, 1-4pm: Ecological Health, Virtual
- September 26, 1-3:30pm: Land Use and Cross-Cutting Challenges, Virtual
- November 2, 10am-3:00pm: Document Review Workshop, In Person (Boyds, Maryland)
- December 12, 1-3:30pm: Closing Meeting, Virtual

The outputs of the advisory committee process include the Milestones, Measures of Success, and Communication Plan for implementation over the next five years (2024-2028, inclusive). Additional advisory committee implementation ideas that were discussed can be found in the Complementary Activity Ideas appendix of this document.

The ICPRB commissioners received briefings on advisory committee progress throughout the year-long effort, reviewed draft planning products, and adopted the plan update at the March 2024 business meeting. Six ICPRB commissioners served on the advisory committee.



"The process of stakeholder engagement with the ICPRB Comprehensive Plan Advisory Committee facilitated relationships between the headwaters and tidewaters folks. It allowed me, as a regional planner in the tidewater, to advocate for how upstream actions impact the environment and economy downstream. These relationships are critical for a Whole Basin approach."

Meredith Keppel, Environmental Planner II,
George Washington Regional Commission

The Potomac Belongs to All

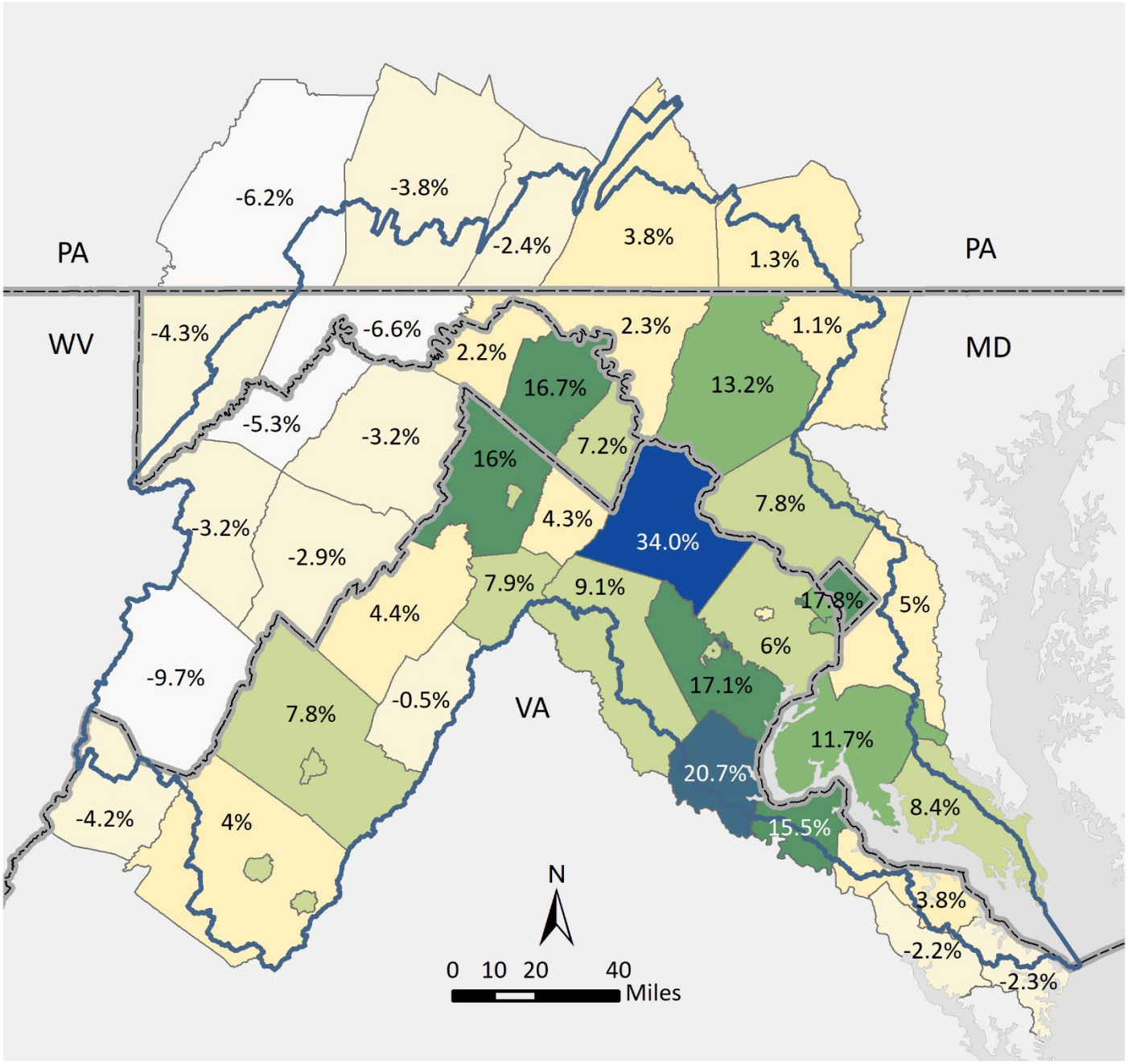
The people and communities in the Potomac basin are as wonderfully varied and unique as the aquatic and terrestrial environments they inhabit. As of 2020, the basin population was approximately 6.9 million, about a 13 percent increase since 2010. Nearly 87 percent of the population relies on the basin's surface waters for their drinking water. Populations have decreased in some areas of the basin and increased in others since 2010 (Figure 2). These shifts change relationships between humans and the natural world.

A focus of ICPRB activities is to reach the full complement of basin communities, with particular emphasis on those disproportionately affected by water resources issues. Characteristics of impacted communities vary widely and a plethora of geographic indicators are available for review through the EPA Environmental Justice Screening and Mapping Tool.

In 2020, the ICPRB welcomed the Chesapeake Bay Program Executive Council's Statement in Support of Diversity, Equity, Inclusion, and Justice. Further, the Commission adopted a Diversity, Equity, Inclusion, and Justice (DEIJ) policy in 2023, highlighting the importance of including DEIJ considerations in all activities.

The ICPRB commissioners and advisory committee members affirm that an ongoing commitment to DEIJ is a focus for comprehensive plan implementation. To align with this priority, several milestones and measures of success address the role that ICPRB can play in advancing DEIJ in the basin. Moreover, implementation of all milestones and measures of success noted in this document should occur with an eye towards diversity, equity, inclusion, and justice.

Human population fluctuations impact the waters, the lands, and the ecosystems of the Potomac.



ICPRB
potomacriver.org

Potomac Basin
State Boundary
County Boundary

Percent Population Change (2010 - 2020)

< -5.0	5.1 - 10.0	20.1 - 25.0
-4.9 - 0.0	10.1 - 15.0	> 25.0
0.1 - 5.0	15.1 - 20.0	

"I am excited to see an emphasis on inclusive decision-making and community engagement in the ICPRB Comprehensive Plan. These DEIJ principles prioritize equitable access to water for underserved and vulnerable communities and will be instrumental in addressing historical disparities in access and distribution of water resources in the Potomac River Basin. Implementing the plan will foster a more inclusive decision-making process and encourage active engagement with diverse stakeholders in decisions about water resource management across the Basin. These actions will benefit all citizens within the Basin."

Kimberly Jones, PhD, BCEE, F. AEESP
Associate Provost; Professor, Civil & Environmental Engineering; Howard University
Chair, DEIJ Committee; Commissioner, ICPRB

Summary of Water Resources Challenge Areas and Recommendations

Challenges to sustainable water resources management in the Potomac basin, as articulated in the 2018 Potomac River Basin Comprehensive Water Resources Plan, include four broad challenge areas; namely, to 1) ensure sustainable water use and supplies, 2) protect and improve water quality, 3) manage human land use for sustainability, and 4) protect ecological health, and one overarching recommendation that applies to all of these challenge areas. Each challenge area contains the same components: a desired outcome, principle statements, and articulated recommendations. These components are provided in this section as a reference. In addition, issues that transcend any one challenge area were designated as cross-cutting challenge areas. Cross-cutting challenges include floods and droughts, source water protection, climate change, and the water-energy nexus.

The 2018 plan specified an adaptive implementation process, including five-year updates in 2023 and 2028. The adaptive implementation process sets the focus of these updates on the following parts of the plan: the milestones, measures of success, and communication plan. In this 2023 update, therefore, the challenge areas and recommendations were not revised, but are provided here for easy reference in understanding the subsequent sections of this document. The plan will be fully reviewed and updated in 2033.

The recommendations from the 2018 plan are provided in shaded blue boxes along with their associated recommendation numbers in this section. These original numbers are also used in the Milestones section as a way to connect the updated milestones to the original recommendations from the 2018 plan (e.g., “Rec. 3.2.1 A”).

Overarching Recommendation

One recommendation is common to all challenge areas:

- Develop an inventory of roles, responsibilities, and areas of authority and discuss how effectively current programs and activities are being carried out (Rec. 3.2.1 A)

The recommendation pertains to all stakeholders in the river basin and includes the following three parts: 1) develop an inventory of roles, responsibilities, and authorities; 2) define specific water criteria [indicator] for which to compare progress related to current programs and activities; and 3) define subsequent planning efforts to evaluate progress and gaps in activities.

Ensure Sustainable Water Uses and Supplies

Desired Outcome

The diverse users of the basin's water resources have clean, reliable, and resilient water resources for current and future generations.

Principles

- Surface and ground water are linked as are water quantity and quality.
- Managing water resources requires balancing diverse, sometimes competing interests.
- Ensuring sustainable water resources has associated costs and benefits.
- High quality, long-term continuous measurements (e.g., streamflow, groundwater levels, and precipitation) are critical for effective management.
- Protecting source waters is desirable to ensure adequate, economical drinking water supplies.

Recommendations

These are the plan's recommendations to achieve the desired outcome for the Water Uses and Supplies challenge area. The primary focus is on further evaluating basin-wide conditions.

- Report on basin-wide water uses, projected demands, and consumptive demands (Rec. 3.3.2 A)
- Conduct additional studies on water uses falling below state water reporting thresholds (Rec. 3.3.2 B)
- Pursue a range of complementary actions that contribute to a more sustainable, resilient water supply (Rec. 3.3.2 C)

Actions that support Water Use and Supplies recommendations were highlighted in the 2018 plan and include:

- Develop a clearer understanding of current and anticipated future locations, amounts, and uses of surface and ground water.
- Consider upstream water uses in planning and achieving interstate objectives.
- Supplement planning efforts to ensure sustainable water use and supplies in watersheds throughout the basin.
- Evaluate the potential impact of climate change.
- Examine the efficacy of existing water use agreements (e.g., the Low Flow Allocation Agreement and the Water Supply Coordination Agreement).
- Protect groundwater from contamination and overuse.
- Encourage completion of complementary activities.

Protect and Improve Water Quality

Desired Outcome

The waters of the basin achieve or exceed water quality standards established by the states in accordance with the Clean Water Act. New and emerging threats are proactively addressed.

Principles

- Water quality directly impacts the amount of water available for human and ecosystem uses.
- Instream water quality is affected by instream and upland processes, conditions, and activities.
- Water quality is evaluated and managed within the existing multi-level regulatory framework.
- High quality, long-term water quality measurements are critical for effective management.
- Protecting source waters is essential to ensure adequate, economical drinking water supplies.

Recommendations

These are the plan's recommendations to achieve the desired outcome for the Water Quality challenge area.

- Promote water quality information sharing (Rec. 3.4.2 A)
- Educate citizens and professionals about water quality in the Potomac basin (Rec. 3.4.2 B)
- Pursue a range of complementary actions that would contribute to protecting and improving water quality (Rec. 3.4.2 C)

Actions that support Water Quality recommendations were highlighted in the 2018 plan and include:

- Make water quality data available to managers and others for decision-making.
- Provide inventory, mapping, and analysis tools to access data across jurisdictional boundaries; share information such as best management practice (BMP) success, water quality improvements, and information resources to assist basin-wide and interstate efforts.
- Assist basin stakeholders with obtaining and interpreting water quality data.
- Convene water quality experts in a workshop forum to share data, assess completeness and gaps, and provide recommendations and priorities.
- Develop web page(s) as a source of available information.
- Identify common water quality goals for the Potomac River mainstem.
- Establish potential roles and actions by entity that would best work towards those goals.
- Comment on proposed major infrastructure projects with potential basin-wide impacts.
- Address areas of uncertainty to assist states in resource management.
- Monitor and provide data on interstate waters.
- Encourage completion of complementary tasks.

Manage Human Land Use for Sustainability

Desired Outcome

Human land use in the basin supports sustainable water resource management.

Principles

- Human land uses can promote economic development, support thriving communities, and enhance social and cultural values.
- Human land use activities in the basin can impact water quality, quantity, and ecological health.
- Land use decision-making has human health implications, both positive and negative.
- Land use decision-making primarily occurs at the local level in the Potomac basin.

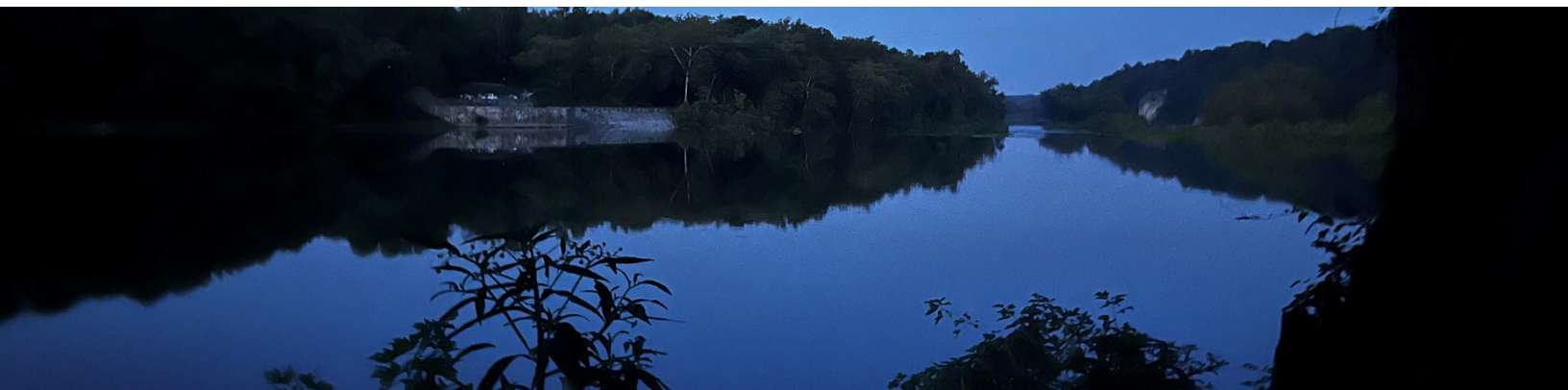
Recommendations

These are the plan's recommended goals to achieve the desired outcome for the Land Use challenge area. The goals primarily focus on further evaluating basin-wide conditions.

- Research timely land use related information for decision-making (Rec. 3.5.2 A)
- Effectively disseminate scientific data and information compiled by ongoing research (Rec. 3.5.2 B)
- Pursue a range of complementary actions that contribute to managing human land use for sustainability (Rec. 3.5.2 C)

Actions that support Land Use recommendations were highlighted in the 2018 plan and include:

- Compile scientific data and information on the complex relationships associated with human land use (natural resources, development, impervious cover, stormwater management, etc.).
- Identify creative, effective use of local, regulatory, programmatic, and financial tools to achieve goals.
- Develop guidance on getting "bang for your buck" out of preservation/conservation areas; improved ecosystem services in protected areas.
- Disseminate scientific data for local-level decision-making.
- Apply a watershed approach for mitigation and restoration, including tracking, promoting, and increasing riparian buffer protection in the basin.
- Encourage completion of complementary tasks.



Protect Ecological Health

Desired Outcome

The propagation and growth of balanced, desirable populations of aquatic life are ensured.

Principles

- A well-functioning ecosystem is an adaptable, self-managing network of relationships of living organisms to one another and to their physical environment.
- In-stream and watershed processes, conditions, and activities affect aquatic ecological health. The health of aquatic ecosystems, in turn, significantly impacts human quality of life, health, economics, and aesthetics.
- Long-term monitoring and interdisciplinary, holistic approaches are critical for effective management of aquatic ecosystems.
- Management actions should maintain or improve existing aquatic ecosystems (anti-degradation).
- Well-managed ecosystems should provide a range of goods and services to current and future generations (sustainable).
- Improved ecological health is expected to be an outcome of the strategies that address the challenges in other categories.

Recommendations

These are the plan's recommendations to achieve the desired outcome for the Ecological Health challenge area.

- Share across jurisdictions data, analysis results, and information on successful restoration approaches (Rec. 3.6.2 A)
- Coordinate across jurisdictions plans and programs that protect ecological value (Rec. 3.6.2 B)
- Support and coordinate programs that identify, protect, conserve, restore, enhance, and connect natural areas, especially along waterways (Rec. 3.6.2 C)
- Pursue a range of complementary actions that would contribute to protecting ecological health (Rec. 3.6.2 D)

Actions that support Ecological Health recommendations were highlighted in the 2018 plan and include:

- Use comparable sampling and (lab) analysis methods.
- Support for ongoing efforts to compile biological monitoring data in regional databases.
- Identify aquatic communities with high ecological value.
- Build common metrics and tools to assess ecological health (response metrics, indices).

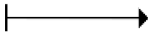
- Establish water quantity and quality levels that improve and maintain ecological health.
- Identify habitats and waters with high ecological value in all local land and water use planning.
- Update master plans and (local) government regulations to manage environmental impacts of development, ensure ecological protections, and meet state guidelines.
- Improve coordination among multiple, diverse restoration efforts (e.g., TMDLs, MS4, invasive species, conserve and protect lands, allocate water resources).
- Anticipate and prepare for the impacts of climate change and sea level rise through long-term planning.
- Support and coordinate programs that promote native aquatic species (e.g., brook trout).
- Restore and protect functioning wetlands to improve ecological health (not substitute for loss to development).
- Restore and protect oyster reefs to improve ecological health of tidal waters.
- Maintain thriving recreational fisheries to encourage more outdoor experiences and greater environmental stewardship.
- Identify factors increasing likelihood of harmful algal blooms and excess filamentous algae.
- Identify factors negatively impacting macroinvertebrate and fish communities in individual watersheds.
- Further identify factors harming fish health and leading to intersex fish and fish kills.
- Prioritize lands that support aquatic communities with high ecological value.
- Acquire and protect lands with high ecological value.
- Protect river segments with critical fish habitat.

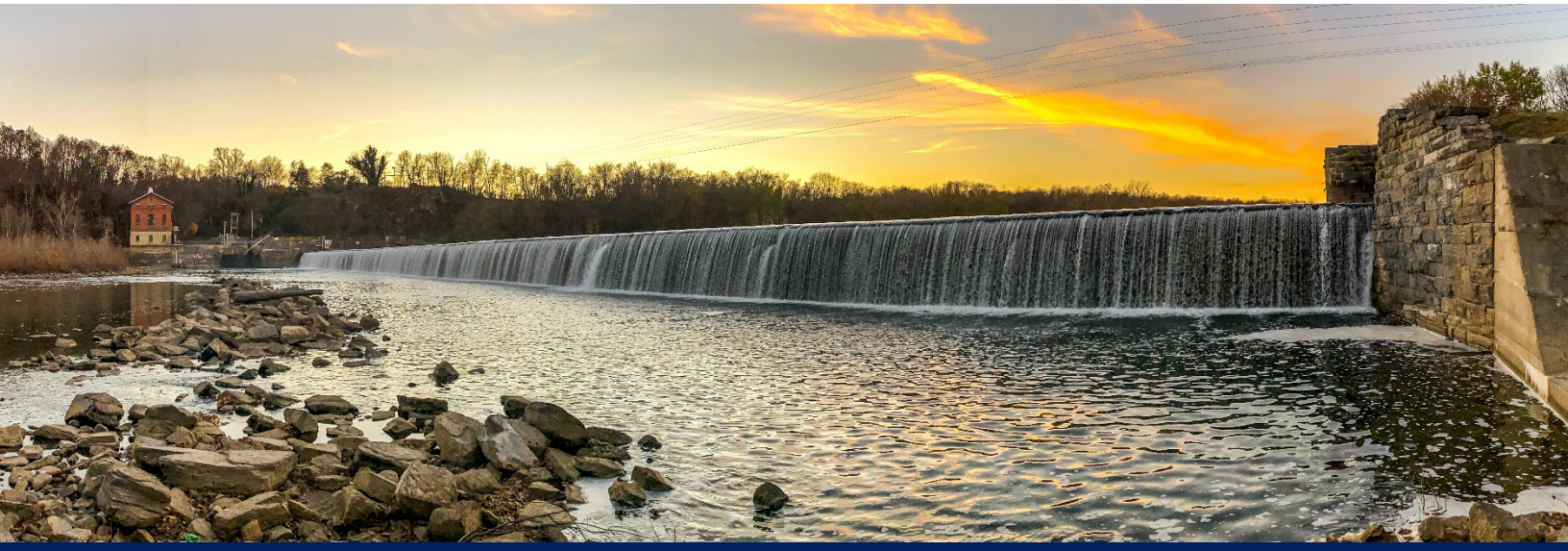
Cross-Cutting Challenge Areas

By nature, many of the milestones in this plan are interconnected. As examples, deteriorated water quality conditions impact water supplies for particular purposes and can degrade aquatic habitats and ecological health. Human land uses can impact water quality, quantity, and aquatic habitats. Similarly, improvements in one area can positively impact conditions in another. The 2018 plan discusses several challenges that transcend any one challenge area; specifically, floods and droughts, source water protection, climate change, and the water-energy nexus. In the 2018 plan, these cross-cutting challenges had no articulated desired outcomes, principles, or recommendations. Interconnections across the four main challenge areas and the cross-cutting challenge areas were a common theme of discussion during the 2023 advisory committee meetings. Their discussions pointed to a need for the plan update to reflect interconnections across the plan. Therefore, in this plan update report, milestones that address more than one challenge area or that address a cross-cutting challenge area are noted.

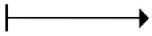
Milestones (2024-2028)

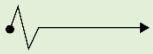
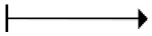
The tables below document the implementation milestones by challenge area for the next five-year period. Each section includes a short-term (2024-2025) and a long-term (2026-2028) milestone table. The related recommendation numbers from the 2018 plan are included for reference. The symbols used in the milestone tables are defined to the right of this text.

Symbol	Description
*	Once initiated, continues for the duration of the five-years
	Continued activity from the 2018 milestones
	Modified next-step activity from the 2018 milestones
	New activity since the 2018 milestones

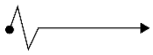
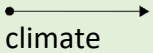
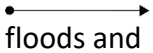


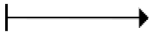
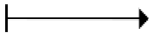
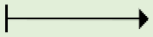
Overarching Recommendation

Short-Term Milestones, 2024-2025	
Description	Status
1. *ICPRB will document and share information on best practices in member jurisdictions to ensure that water resources planning, policy, and management activities consider impacts and benefits to the diverse communities within the basin, particularly those disproportionately affected by pollution. (Rec. 3.2.1 A.3)	
2. ICPRB will revise the prototype Tracking Environmental Progress StoryMap based on advisory committee feedback and will recommend optimal timing for subsequent updates to effectively track environmental progress over time. ICPRB will also develop a scope of work and implementation timeline for including environmental justice metrics in the StoryMap. (Rec. 3.2.1 A.2)	
3. *ICPRB will highlight environmental justice implications (e.g., equal access to high quality waters) in its work related to all of the plan's challenge areas. (Rec. 3.5.2 C)	
4. *ICPRB will collaborate with basin stakeholders and partners such as the Interstate Council on Water Policy to promote continued operation and maintenance of long-term USGS gages and other essential monitoring efforts. (Rec. 3.3.2 C)	

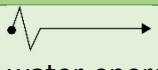
Long-Term Milestones, 2026-2028	
5. ICPRB will update the 2022 spreadsheet inventory of roles, responsibilities, and areas of authority. (Rec. 3.2.1 A.1)	
6. ICPRB will implement the scope of work to incorporate environmental justice metrics in the Tracking Environmental Progress StoryMap. (Rec. 3.2.1 A.2 and A.3)	
7. ICPRB will host an annual workshop or webinar to share information about DEIJ activities in the Potomac basin. This may be designed to build on regularly scheduled events such as a quarterly Commission business meeting, the land use webinar series, or other Commission activities. (Rec. 3.2.1 A.3)	

Ensure Sustainable Water Uses and Supplies

Short-Term Milestones, 2024-2025	
Description	Status & Intersections
1. ICPRB will prepare a draft scope of work for improving the withdrawal and consumptive use database and will seek input from basin jurisdictions. Proposed improvements may include a maintenance plan, a public sharing protocol, tabular and geospatial online querying tools for aggregate-level data, updated consumptive use rates by sector and location-specific consumptive use factors, agriculture-specific considerations, and an associated informational/educational component for decision-makers and the general public. (Rec. 3.3.2 A)	 water-energy nexus; floods and droughts
2. *The CO-OP Section of ICPRB will publish a water demand and availability forecast for the Washington Metropolitan Area in 2025, as it has done every five years since 1990 as required by the Water Supply Coordination Agreement. (Rec. 3.3.2 A)	 climate change; floods and droughts
3. The signatories to the Potomac River Low Flow Allocation Agreement will review and consider execution of the modified agreement as proposed by representatives of the governing parties. (Rec. 3.3.2 C)	 floods and droughts
4. The CO-OP Section of ICPRB will partially implement operational alternative seven‡ of the water supply alternatives study by documenting the benefits of its flow-dependent one-day river forecast in the new Potomac Reservoir and River Simulation Model (PRRISM). (Rec. 3.3.2 C)	 floods and droughts
5. The CO-OP Section of ICPRB will support partial implementation of operational alternative eight‡ of the water supply alternatives study and the requirements of Section 5019(e) of the Water Resources and Development Act of 2007 (Public Law 110-114) by modeling and documenting the benefits of a change in Jennings Randolph water accounting rules and continuing the dialog with the US Army Corps of Engineers (USACE) Baltimore District Office on implementation of a change. (Rec. 3.3.2 C)	 floods and droughts
6. *ICPRB, working through the Supplemental Storage Work Group and jointly with the Washington metropolitan area public water supply agencies, the Metropolitan Washington Council of Governments, and other regional stakeholders, will collectively work with members of Congress to solicit Water Resources Development Act (WRDA) appropriations for the feasibility study for "Project for Water Supply, Including Identification of a Secondary Water Source and Additional Water Storage Capability for the Washington Metropolitan Area, Washington, District of Columbia, Maryland, and Virginia" which was authorized in the 2022 WRDA Bill. If appropriated, the public water supply agencies and CO-OP section staff will work with USACE to sit in on the project team for the feasibility study. This study, once appropriated, will take three years to complete. (Rec. 3.3.2 C)	 source water protection; floods and droughts

7. *The CO-OP Section of ICPRB, working with the CO-OP public water supply agencies, may reconsider broadening the regional cooperative system which provides for cooperative drought planning and operations and shared funding of water supply storage. (Rec. 3.3.2 C)	floods and droughts
8. ICPRB will assist basin stakeholders in information sharing during drought events in the upper portion of the basin to supplement and enhance drought management activities for the Washington metropolitan area. (Rec. 3.3.2 C)	communication plan; floods and droughts
9. ICPRB will share information on drought forecasting with users. (Rec. 3.3.2 C)	 communication plan; floods and droughts
10. *ICPRB will work to increase public education on threats to water supply, including surface water and groundwater salinization. (Rec. 3.3.2 C)	 communication plan; water quality; ecological health
11. *During periods of drought or water supply emergency, the CO-OP Section of ICPRB will support coordinated water supply operations of the CO-OP public water supply agencies, required by the provisions of the Water Supply Coordination Agreement, and shall maintain and advance a suite of tools for demand and supply data collection and forecasting for the management of drought and other emergencies. (Rec. 3.3.2 C)	 floods and droughts
12. *ICPRB staff will communicate with the National Park Service and operators of Dams No. 4 and 5 on the Potomac River to discuss issues such as the effects of dam and hydroelectric operations on 1) water levels during times of drought and 2) the movement of migratory aquatic species like eels. Communication includes exchanging timely information like CO-OP daily drought monitoring and drought operation reports and meeting with the National Park Service and/or dam operators as needed to promote sustainable water supplies and healthy ecological systems. (Rec. 3.3.2 C)	 communication plan; water-energy nexus; ecological health

‡As listed in the ICPRB CO-OP Section's water supply alternatives study, Washington metropolitan area water supply alternatives 5-8 include: 5. Cooperative use of Quarry A [now Milestone Reservoir]; 6. Use of Beaverdam Reservoir for low flow augmentation; 7. Improved river flow forecasts by 10%; 8. Use of Jennings Randolph water quality storage for water supply during droughts.

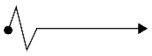
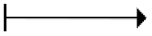
Long-Term Milestones, 2026-2028	
13. ICPRB will update the initial basin-wide water use summaries (reported and unreported) and recommend the optimal timing for the third update. (Rec. 3.3.2 A and B)	 water-energy nexus
14. ICPRB will implement the scope of work for improving the withdrawal and consumptive use database (as described in the short-term milestones). (Rec. 3.3.2 A)	

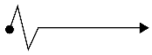
15. *ICPRB will encourage the Potomac jurisdictions to obtain and share consistent water use reporting and estimates across the Potomac basin. (Rec. 3.3.2 A and B)	→
16. The CO-OP Section of ICPRB, working with the CO-OP public water supply agencies, Loudoun Water, and Virginia Department of Environmental Quality, may move forward on the discussion of implementation of operational alternatives five and six‡ of the water supply alternatives study: cooperative use of Loudoun Water's Milestone Reservoir and use of Beaverdam Reservoir for low flow river augmentation. (Rec. 3.3.2 C)	floods and droughts
17. The CO-OP Section of ICPRB, working with the USACE Baltimore District Office and the CO-OP public water supply agencies, will support partial implementation of operational alternative eight‡ of the water supply alternatives study and the requirements of Section 5019(e) of the Water Resources and Development Act of 2007 (Public Law 110-114) by assisting in the development of a new Drought Contingency Plan for Jennings Randolph Reservoir that takes into account the impacts of climate change. (Rec. 3.3.2 C)	climate change; floods and droughts
18. ICPRB will encourage development of LiDAR bathymetric data for additional portions of the Potomac River and its tributaries to enhance spill modeling capabilities among other uses. (Rec. 3.3.2 C)	→ source water protection

"The US Army Corps of Engineers' current Drought Contingency Plan for Jennings Randolph Lake includes in its list of Authorities 'the Potomac River Basin Comprehensive Water Resources Plan, 2018.' This indicates that the Comprehensive Plan could be taken into consideration as drought-related management decisions for the reservoir are developed to implement Alternative 8 of ICPRB's *Washington Metropolitan Area Water Supply Alternatives* (2017) study."

Cherie Schultz, PhD, Director of CO-OP Operations, ICPRB

Protect and Improve Water Quality

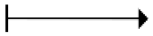
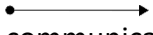
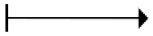
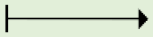
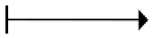
Short-Term Milestones, 2024-2025	
Description	Status & Intersections
1.*ICPRB will maintain and improve the Potomac Water Quality Data Inventory to promote access to Potomac basin water quality data. (Rec. 3.4.2 A)	
2. *ICPRB will develop and maintain a series of web pages, in close partnership with stakeholders, to serve as a resource for water quality decision-makers and the general public. (Rec. 3.4.2 B)	communication plan
3. *ICPRB will work to maintain, when possible, existing water quality monitoring locations and data collection efforts in the basin. (Rec. 3.4.2 C)	 source water protection
4. *ICPRB will participate in and contribute to inter-agency water quality initiatives like the Chesapeake Bay Program workgroups and goal implementation teams, the Interstate Council on Water Policy, the Association of Clean Water Administrators, national and state water monitoring councils, the Executive Committee on the Occoquan Sewershed, the American Water Resources Association, and the American Water Works Association among others. (Rec. 3.4.2 C)	communication plan
5. *ICPRB, through project-specific activities and the Potomac River Basin Drinking Water Source Protection Partnership (DWSPP), will stay abreast of timely water quality issues including, but not limited to, PFAS, salts, microplastics, emerging contaminants, harmful algal blooms, and nutrient issues like the impacts of septic tank failures to provide education and outreach as well as technical assistance to partners. (Rec. 3.4.2 C)	source water protection; water use and supplies
6. *ICPRB will coordinate and actively participate in DWSPP. In addition, ICPRB will assist in communication and outreach efforts associated with the Partnership. (Rec. 3.4.2 A, B, and C)	 communication plan; source water protection
7. *ICPRB will stay abreast of energy issues related to sustainable water resources management in the basin including acid mine drainage, coal ash ponds, hydroelectric projects and operations, and risks associated with truck, rail, and pipeline transportation of fuels to name a few. A page will be developed on the ICPRB website to communicate information on these topics with basin stakeholders. (Rec. 3.4.2 B)	communication plan; water-energy nexus; source water protection

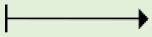
Long-Term Milestones, 2026-2028	
8. *ICPRB staff will continue to work with agency and volunteer monitoring programs and the Chesapeake Bay Program Data Center to compile water quality monitoring data in standardized, basin-wide databases. (Rec. 3.4.2 A)	
9. ICPRB will update the 2014 Potomac Water Quality Data Inventory report to effectively summarize basin water quality monitoring programs using interactive communication methods wherever possible. (Rec. 3.4.2 A)	
10. ICPRB will develop an interactive (e.g., StoryMap or similar) salt hub to communicate regional salt-related information to all audiences including the general public. (Rec. 3.4.2 B)	 communication plan; source water protection; water use and supplies
11. *The US Supreme Court decision in May 2023 in Sackett v. Environmental Protection Agency spoke to the geographic scope of the Clean Water Act to refine the definition of “waters of the United States." If requested by the jurisdictions, ICPRB may assist by serving as a clearinghouse on the ways that the basin jurisdictions are addressing this matter. In addition, ICPRB will explore the need for further analysis of impacts. (Rec. 3.4.2 C)	

"The ICPRB comprehensive plan is a great document assisting all communities with the complexities of water quality, from here in the rural head waters of Adams County, PA, to urban locations like Washington, DC."

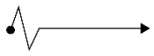
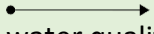
Mark L. Guise
Utilities Manager
Gettysburg Municipal Authority

Manage Human Land Use for Sustainability

Short-Term Milestones, 2024-2025	
Description	Status & Intersections
1. *ICPRB will identify and compile a land use related metric(s) for the Tracking Environmental Progress StoryMap and will integrate the metric(s) with those for the plan's other challenge areas. (Rec. 3.5.2 A and B)	 overarching recommendation; communication plan
2. *As it becomes available, ICPRB will compile and disseminate land use related information to stakeholders in a timely manner. Consider disseminating information to coincide with updates to local land use plans to inform stakeholder comment and local decisions. (Rec. 3.5.2 A and B)	 communication plan
3. *ICPRB will develop and maintain relationships with organizations to effectively disseminate land use related information to stakeholders. (Rec. 3.5.2 B)	 communication plan
4. *ICPRB will periodically convene basin stakeholders with responsibilities related to land use to encourage information exchange and broad engagement. Stakeholder discussion could include discussions on growth policies and impacts (e.g., growth patterns relate to road density relate to salt application/impact patterns); land use impacts on water resources (e.g., how data centers, which is a land use, require sustainable water); and opportunities for redevelopment versus greenfield development. (Rec. 3.2.1 A)	 communication plan
5. ICPRB will develop a communication and outreach strategy associated with ICPRB's flow alteration from impervious cover tool. (Rec. 3.5.2 C)	 communication plan
6. *ICPRB will promote the use of consistent land use data sets across the basin jurisdictions. Development and communication of the impervious cover tool and the land prioritization tool are examples of promoting consistency. (Rec. 3.5.2 C)	 communication plan
7. ICPRB will prepare a scope of work for updating the land prioritization tool taking into account the availability of new data sets, changes in buffer regulations, changes in land protection priorities, and advances in prioritization tools and techniques. ICPRB will also develop a communication and implementation plan for the roll-out of the updated land prioritization tool. (Rec. 3.5.2 C)	 source water protection; ecological health
8. *ICPRB will promote opportunities related to land use programs in the basin such as implementation of the Farm Bill, USDA Natural Resource Conservation Service Programs, and others. (Rec. 3.5.2 C)	 source water protection; water quality

Long-Term Milestones, 2026-2028	
9. ICPRB will identify updates related to local regulatory and programmatic approaches to managing human land use in the basin and will recommend the optimal timing for a subsequent update. This will include identifying and promoting innovative, creative, and effective land use management tools (regulatory, programmatic, and financial) to achieve goals. Ideas to consider include methods and incentives to avoid sprawl; conservation of open spaces; reusing/repurposing empty existing urban spaces; and encourage redevelopment versus greenfield development. This is a five-year update to the original review that was conducted. (Rec. 3.5.2 A)	
10. ICPRB will execute the scope of work for updating the land prioritization tool. The results of this work will be the five-year update to the original product. (Rec. 3.5.2 C)	 source water protection
11. ICPRB will implement the communication and outreach strategy for the impervious cover mapping tool. (Rec. 3.5.2 C)	 communication plan

Protect Ecological Health

Short-Term Milestones, 2024-2025	
Description	Status & Intersections
1. ICPRB will work with diverse stakeholders to coordinate and promote valuation of the river's ecological services and identify scientifically defensible biological benchmarks for healthy river ecosystems. (Rec. 3.6.2 C)	
2. ICPRB will work with Potomac basin partners to identify environmental conditions that increase the likelihood streams will form nuisance and/or harmful algal blooms (Rec. 3.6.2 D)	 water quality

Long-Term Milestones, 2026-2028	
3. ICPRB staff will continue to work with agency and volunteer monitoring programs and the Chesapeake Bay Program Data Center to compile biological monitoring data in standardized, basin-wide databases. (Rec. 3.6.2 A)	
4. ICPRB staff will continue to work with stakeholders to perform analyses and develop analytical computer scripts to evaluate habitat, water quality, BMP effectiveness, and biological data and indicators in consistent ways, and will encourage data and information exchanges. (Rec. 3.6.2 A, B)	water quality
5. ICPRB will continue to seek consensus on what is high ecological value, identify habitats and waters in the basin with high ecological value (references), and use reference-based approaches to develop metrics and tools for evaluating ecological health. (Rec. 3.6.2 B)	land use
6. ICPRB will continue to act as coordinators and facilitators of discussion regarding the multiple designated uses, particularly biological considerations, of the Potomac River and its tributaries. (Rec. 3.6.2 C)	communication plan
7. ICPRB will continue to disseminate ecological health related information to stakeholders in a timely manner. (Rec. 3.6.2 A)	communication plan
8. ICPRB will continue to investigate ecological flows and evaluate the impacts of altered flows on species and their biological communities (Rec. 3.6.2 B)	 climate change; floods and droughts

Measures of Success (2024-2028)

The tangible products of implementing the milestones in this plan update are listed below. Note that it is not possible to predict the products for all milestones. The products of implementation, those listed in the measures of success list below and other products of implementing the milestones, will be documented during an annual ICPRB implementation review and discussed during the next stakeholder five-year review.

Overarching Recommendation

- Report on DEIJ best practices in the Potomac basin.
- Revised Tracking Environmental Progress StoryMap.
- Updated spreadsheet inventory of roles, responsibilities, and areas of authority.
- Annual event to share information on DEIJ activities in the Potomac basin.

Ensure Sustainable Water Uses and Supplies

- Enhanced ICPRB withdrawal and consumptive use database.
- An ICPRB CO-OP demand study in 2025 and every five years after.
- Updated Potomac Reservoir and River Simulation Model (PRRISM) and documentation of the benefits of improved flow forecasts to system reliability.
- ICPRB CO-OP memo documenting effects of change in Jennings Randolph water accounting rules, as recommended in "Planning Assistance to the States Scoping Study Phase 2".
- ICPRB CO-OP drought-related information available on the ICPRB website.
- Monthly publication of the Water Supply Outlook from April through October each year.
- A drought contingency plan for Jennings Randolph Reservoir with documented benefits to CO-OP system reliability, as recommended in "Planning Assistance to the States Scoping Study Phase 2".
- ICPRB report on water uses, projected demands, and consumptive demands in the basin.
- ICPRB participation in the annual ICWP streamgage letter.

Protect and Improve Water Quality

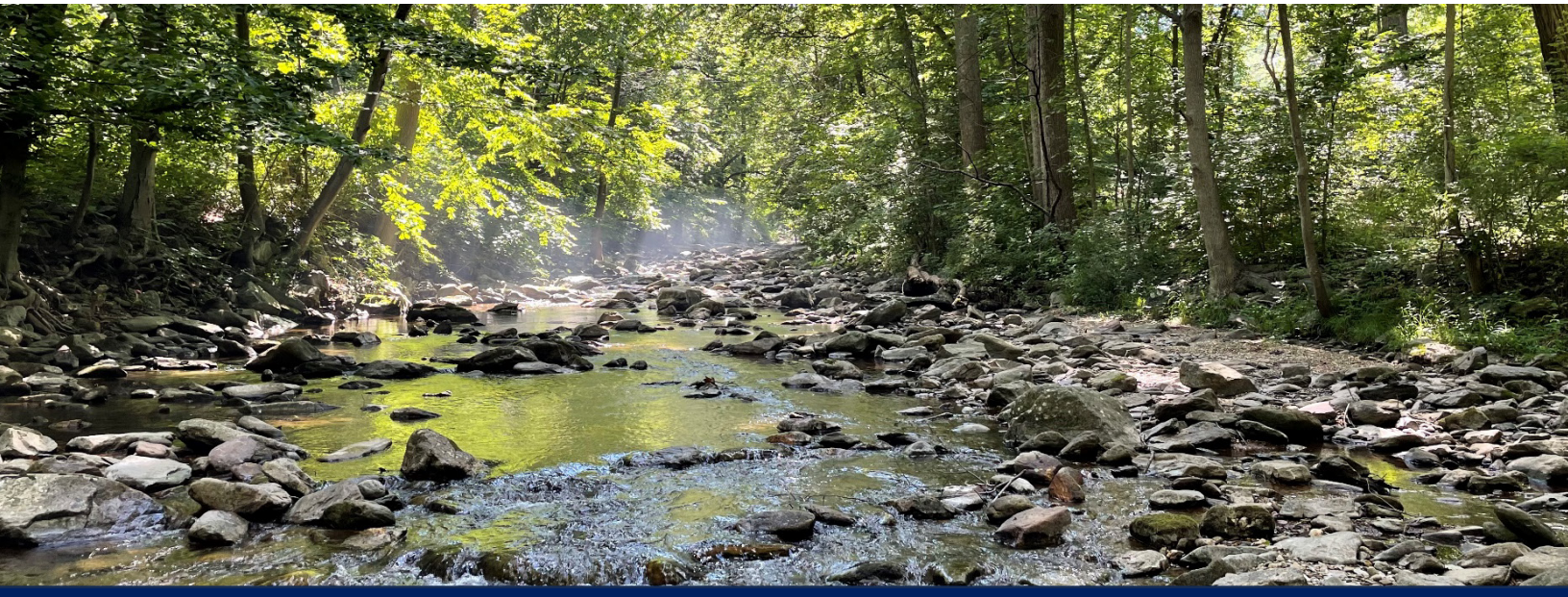
- Maintained and improved ICPRB Potomac Water Quality Data Inventory and associated interactive report.
- Publicly available ICPRB web pages to disseminate Potomac basin water quality resources.
- ICPRB participation in the annual ICWP streamgage letter.
- Revised Tracking Environmental Progress StoryMap.
- Accessible water quality databases and data documentation.
- Web page on water-energy related issues on the ICPRB website.
- Interactive regional salt hub published online; provide hyperlink to the salt hub on the Comprehensive Plan StoryMap.

Manage Human Land Use for Sustainability

- Revised Tracking Environmental Progress StoryMap.
- Stakeholder contact list for distribution of timely land use related information.
- Bi-annual webinars on timely topics for land use decisionmakers and other interested stakeholders.
- Revised communication materials for ICPRB's flow alteration from impervious cover tool.
- Updated ICPRB land prioritization tool.
- ICPRB report documenting updates to the 2020 publication "Integrating Sustainable Water Resource Management and Land Use Decision-Making".

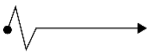
Protect Ecological Health

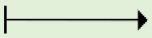
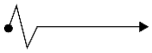
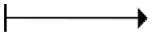
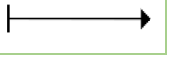
- Accessible biological databases and data documentation via websites and data requests.
- Maps and information on the ICPRB website about aquatic life in the Potomac River basin.
- Report that summarizes the Chessie BIBI index for the 2018-2023 time period and provides a progress update on the 2014 Chesapeake Watershed Agreement.
- Publications detailing the Chessie BIBI index development, delineation of index bioregions, and index change over time (progress in watershed health).
- Support for the completion of a report summarizing the current state of the North Branch Potomac River with updated policy considerations and stakeholder list.
- Field work generated datasets delivered to partnering agencies, made available upon request via the ICPRB website.
- Reports and guidance documents to assist Maryland Department of the Environment (MDE) in evaluating and implementing effective stormwater controls (MS4) to improve downstream water quality, streamflow, and ecological health.
- Report on relationships between stream macroinvertebrates, instream habitat, hydrologic alteration, and land uses.
- Report on the negative impacts of filamentous algae blooms on aquatic life in the Potomac's Cacapon River.
- Continued efforts to highlight the North Branch Potomac River as a region of ecological opportunity. ICPRB will continue hosting the North Branch advisory meetings, fill data gaps for state, federal, and regional partners to ultimately align management strategies in the region. Biological datasets and modeling expertise will be provided as stakeholders identify needs.



Communication Plan

This section describes efforts to engage the public about the plan and its implementation and promote engagement and ongoing support for these efforts. The importance of effective and timely communication was an ongoing topic of advisory committee discussion during this plan update. Communication efforts intersect all of the plan implementation activities. The strategies to successfully reach and engage people are listed on the following page using the symbols defined to the right of this text.

Symbol	Description
	Continued activity from the 2018 milestones
	Modified next-step activity from the 2018 milestones
	New activity since the 2018 milestones

Strategies	Status
1. Prioritize DEIJ considerations in communication material development and distribution.	
2. Release the plan updates in March 2024 by posting this report on ICPRB website and promoting the plan through existing ICPRB web-based publications and social media. This process will be continued as milestones are reached or as additional opportunities are presented.	
3. Provide tailored presentations to targeted stakeholders on the comprehensive plan. The comprehensive plan advisory committee and ICPRB staff will provide input to determine where presentations should be given (e.g., state, federal, and local government agencies; Metropolitan Washington Council of Governments committees; elected officials; and universities).	
4. Technical staff will submit articles about the plan to professional and/or academic journals.	
5. Reach out directly to the American Water Resources Association, Chesapeake Bay Program, water suppliers, Potomac Conservancy, DWSPP, etc., to enlist their support and participation in the plan.	
6. Use national social media campaigns to promote the plan, such as American Water Works Association's (AWWA) Drinking Water Week.	
7. Send press release to area papers, radio, and television.	
8. Reach out personally to journalists, bloggers, and podcasters to encourage coverage.	
9. Create video(s) based on plan action items for use on the web and social media.	
10. Meet outreach goal of at least four tailored presentations to targeted stakeholders during the first six months of outreach.	
11. Provide an annual update on the plan to other agencies and the public through methods described above.	
12. Create outreach materials for technical products developed under each challenge area of this plan to effectively distribute findings to elected officials, professional audiences, and the general public as appropriate.	
13. Use culturally competent language to effectively communicate materials to different groups.	
14. Convene the plan's advisory committee between five-year reviews to plan for timely topics as needed.	

Next Steps

This document is the product of the first five-year review of the 2018 plan. Implementation of the milestones and measures of success outlined in this document are expected to begin in spring 2024. The next five-year review will occur in 2028. The first full-plan review will occur in 2033, 15 years after adoption of the 2018 plan. The full-plan review process will engage ICPRB staff and Commissioners, the advisory committee, and a broad stakeholder base. All major sections of the plan will be reviewed and revised as needed at that time. The result of the full-plan review process will be the release of a new version of the plan after adoption by the Commission.

Appendices

Complementary Activity Ideas

This section was developed to document ideas discussed by the advisory committee that are not captured in the milestones and measures of success. This compilation provides examples of complementary activities for each challenge area based on advisory committee discussions during the review process and may serve as a repository for potential future effort ideas for ICPRB or other organizations. Complementary activities are other actions by ICPRB or partner organizations that would promote achievement of the desired outcomes for each challenge area.

Ensure Sustainable Water Uses and Supplies

- Investigate how to better use alternative water sources (e.g., infiltration of stormwater for aquifer recharge in the Coastal Plain)
- Enhance understanding of the effects of groundwater use on baseflow during drought conditions and the impacts of climate change on the groundwater/baseflow relationship
- Enhance understanding of the biological impacts of reused water
- Promote a commitment to watershed protection like forest protection, and minimizing potential or actual pollution sources
- Promote communication and information-sharing with local authorities to facilitate their water resources planning activities
- Promote the importance of drought contingency planning and assist water suppliers outside of the Washington metropolitan area in developing such plans

Protect and Improve Water Quality

- Evaluate options and recommendations for a Potomac early warning river monitoring system for spill preparedness
- Investigate salts in water distribution systems (e.g., manganese), effects on drinking water quality, and impacts to treatment processes and infrastructure
- Characterize and communicate sources of PFAS in the Potomac basin
- Research methods to incentivize riparian coverage
- Extend Virginia Institute of Marine Science's Virginia Wastewater Data Viewer to the Potomac basin or Chesapeake Bay watershed
- Investigate the impacts of climate change on water quality and flow variability

Manage Human Land Use for Sustainability

- Encourage economic valuation that includes ecosystem valuation not just the cost of land
- Support opportunities for stream restoration and daylighting and, more broadly, returning the landscape to more natural riparian and upland conditions
- Promote local financial incentives for redevelopment to prevent further sprawl
- Consider the possible impacts of the varied scales of local planning in the basin (municipality versus county)
- Seek opportunities to support and promote Chesapeake Executive Council Goals on stormwater, agriculture, and other areas
- Investigate and communicate potential impacts of climate change and planned land use changes on water resources in the basin
- Track and share information about the timing of updates and comment periods associated with local land use planning in the basin
- Identify and track land use related metrics such as number of farms, number of building permits, etc.

Protect Ecological Health

- Evaluate achievable biological lift (i.e., the amount of achievable improvement in the biology after remediation) and appropriate reference streams in urbanized areas
- Establish communication between upstream and downstream users to enhance understanding of and identify potential solutions for ecological impacts
- On an annual basis, provide a highlight of ecological success stories in the Potomac basin
- When conducting analyses, consider the impacts of emerging and non-conventional contaminants (e.g., PFAS, microplastics, and deicing salts) in addition to traditional pollutants like nutrients from point and non-point sources on ecological health
- Investigate the impacts of climate change on ecological communities (e.g., warming waters, increased hydrologic flashiness, fisheries)
- Promote interagency/interstate cooperation for the understanding of and inclusion of biological targets in the North Branch Potomac
- Further investigate habitat connectivity in the Potomac River system and the impacts of man-made structures in the river (e.g., dams, shoreline hardening) on biological communities, including migratory species (e.g., eels) and life stages that depend on migratory species (e.g., mussels)

Get Involved...

Everyone	• There is a role for everyone in implementing the plan. Find simple actions we all can do on the ICPRB website. • Visit the ICPRB website or Contact Us for more information
State and Federal Gov't	• Contribute expertise and data to ICPRB efforts on water supply withdrawal and consumptive use databases, algal blooms, road salts, land use, habitat and ecological services valuation, developing biological indicators, BMP effectiveness, DEIJ, and/or sources of water quality data. • Promote consistent water use reporting, land use datasets, and data sharing across jurisdictions; maintenance of long-term USGS gages; Water Resources Development Act (WRDA) appropriations for the supplemental water supply storage feasibility study; and development of LiDAR bathymetric data to enhance modeling of aquatic habitats and hazardous spills. • Support ICPRB's cooperative water supply operations during droughts with relevant data products. • Participate in the Potomac River Basin Drinking Water Source Protection Partnership. • Incorporate basin-wide water and consumptive use information into planning activities. • Educate the public on threats to water supplies.

Get Involved

Municipal Gov't

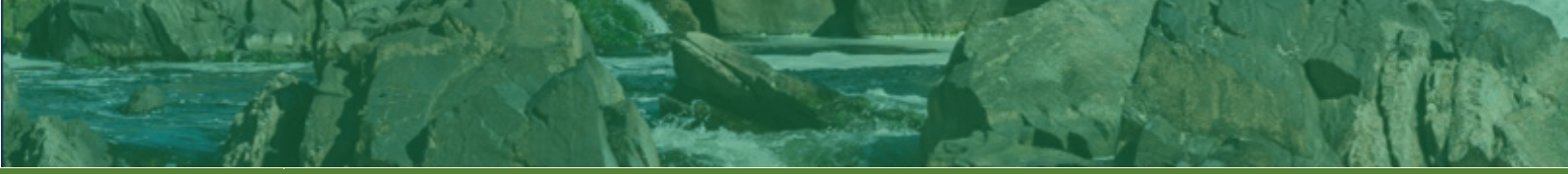
- Contribute expertise and data to ICPRB efforts on water supply withdrawal and consumptive use databases, sources of water quality information, and DEIJ.
- Share information with residents to increase awareness of threats to water supply, including surface water and groundwater salinization, and drought-specific information as needed.
- Work with other Potomac basin jurisdictions to use consistent land use datasets and incorporate this information into planning efforts, specifically from the impervious cover and land prioritization tools.
- Participate in information exchanges related to land use and sustainable water resources.

Public Water Supply Agency

- Contribute expertise and data to ICPRB efforts on water quality, withdrawals and consumptive uses, and DEIJ.
- Promote consistent water use reporting and data sharing across jurisdictions, the maintenance of long-term USGS gages, land use policies that support a sustained and clean water supply, development of LiDAR bathymetric data to enhance spill modeling, and Water Resources Development Act (WRDA) appropriations for the supplemental water supply storage feasibility study.
- Join the Potomac River Basin Drinking Water Source Protection Partnership.
- Educate the public on threats to water supply.

Get Involved

Conservation District	• Provide data and expertise to the Potomac River Basin Drinking Water Source Protection Partnership to foster an understanding of local conservation issues. • Promote local land use policies that support a sustained and clean water supply. • Increase awareness of the relationship between agricultural practices and water resources whenever possible.
Elected Official	• Promote consistent water use reporting and data sharing and for the maintenance of long-term USGS gages. • Share water supply and drought-related information with constituents. • Enact land use policies that support sustainable water resources like appropriate salt use in the winter. • Support efforts to secure Water Resources Development Act (WRDA) funding for the supplemental water supply storage feasibility study.
NGO and Academic	• Contribute expertise on Potomac water use and quality, ecological services valuation, biological indicators, algal blooms, land use policies, BMP effectiveness, water-related energy issues, and DEIJ activities. • Share information and products generated by the comprehensive planning process to your networks and students and incorporate them into your own work.



Useful ICPRB Products...

Planning Process

Reports

- An Inventory of Potomac Basin Entities with a Role in Sustainable Water Resources Management

Websites

- Potomac Basin Comprehensive Water Resources Plan: A Plan at Work
- Tracking Environmental Progress

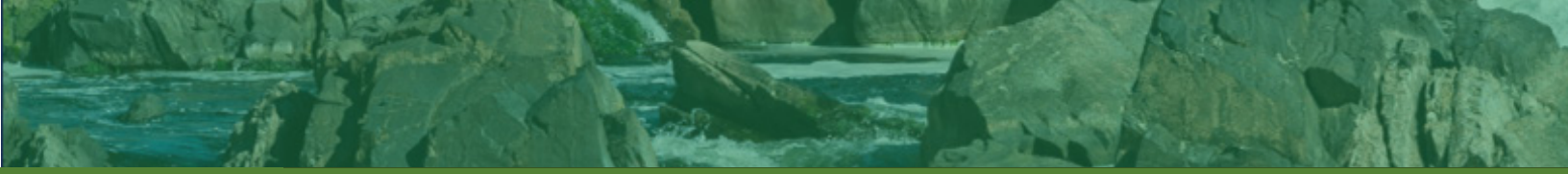
Water Use and Supplies

Reports

- Potomac Basin Reported Water Use
- Potomac Basin Unreported Water Use
- Potomac Basin Unreported Water Use: Supplemental Table
- 2020 Washington Metropolitan Area Water Supply Study

Websites and Maps

- Understanding Water Supply Conditions in the Basin
- Washington Metropolitan Area Drought Exercises
- Potomac Basin Precipitation Map
- Potomac River Basin Drinking Water Source Protection Partnership
- Potomac Drinking Water and Water Resources Information



Useful ICPRB Products...

Water Quality

Reports

- An Analysis of Pooled Monitoring Data in Maryland to Evaluate the Effects of Restoration on Stream Quality in Urbanized Watersheds
- Considerations for Monitoring Microplastics in the Non-Tidal Potomac River
- Potomac River Water Quality at Great Falls: 1940 – 2019
- Virginia Salt Management Strategy (SaMS)

Websites

- Potomac Basin Water Quality Data Inventory
- PFAS in the Potomac River Basin
- Potomac River Water Quality at Great Falls: 1940 – 2019

Conferences and Webinars

- 2022 Potomac Conference: A Conversation on PFAS
- Winter Salt Management Webinar

Land Use

(continues on next page)

Peer-Reviewed Articles

- Integrating Sustainable Water Resource Management and Land Use Decision-Making

Reports

- An Analysis of Pooled Monitoring Data in Maryland to Evaluate the Effects of Restoration on Stream Quality in Urbanized Watersheds

Useful ICPRB Products...

Land Use (continued)

Websites and Maps

- Land Conservation Prioritization for Drinking Water Protection (Map)
- Will Runoff Alter your Streamflow – A look at flow alteration from impervious cover (Map)
- Wandering the Watershed - historical, cultural, and recreational sites across the basin (interactive map)

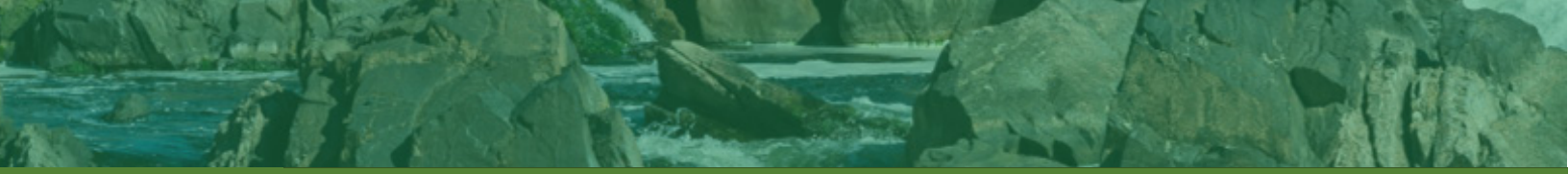
Webinars

- Innovations in Sustainable Agriculture webinar
- Combating Climate Change through Sustainable Development webinar
- Spring Into Nutrient Management webinar
- Healthy Watersheds

Ecological Health (continues on next page)

Peer-Reviewed Articles

- Stream Biological Health in the Chesapeake Bay Watershed
- Planning assistance to states, Jennings Randolph Lake, scoping study phase II report
- A Water Quality Binning Method to Infer Phytoplankton Community Structure and Function
- Nutrient limitation of phytoplankton in Chesapeake Bay: Development of an empirical approach for water-quality management
- Predicting biological conditions for small headwater streams in the Chesapeake Bay watershed
- Disentangling the potential effects of land-use and climate change on stream conditions



Useful ICPRB Products...

Ecological Health (continued)

- Linking Altered Flow Regimes to Biological Condition: an Example Using Benthic Macroinvertebrates in Small Streams of the Chesapeake Bay Watershed
- Development of a benthic macroinvertebrate multimetric index for large semiwadeable rivers in the Mid-Atlantic region of the USA

Reports

- The Influence of Jennings Randolph Lake and Dam Operations on River Flow and Water Quality in the North Branch Potomac River
- Rapid Response Survey of Cyanobacteria Toxin Levels Downstream of North Fork Shenandoah River Algal Bloom After Tropical Storm Ida, 2021

Maps

- Chessie BIBI Stream Health Index
- Bioregions of the Chesapeake Bay watershed


Mad River Canoe

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