



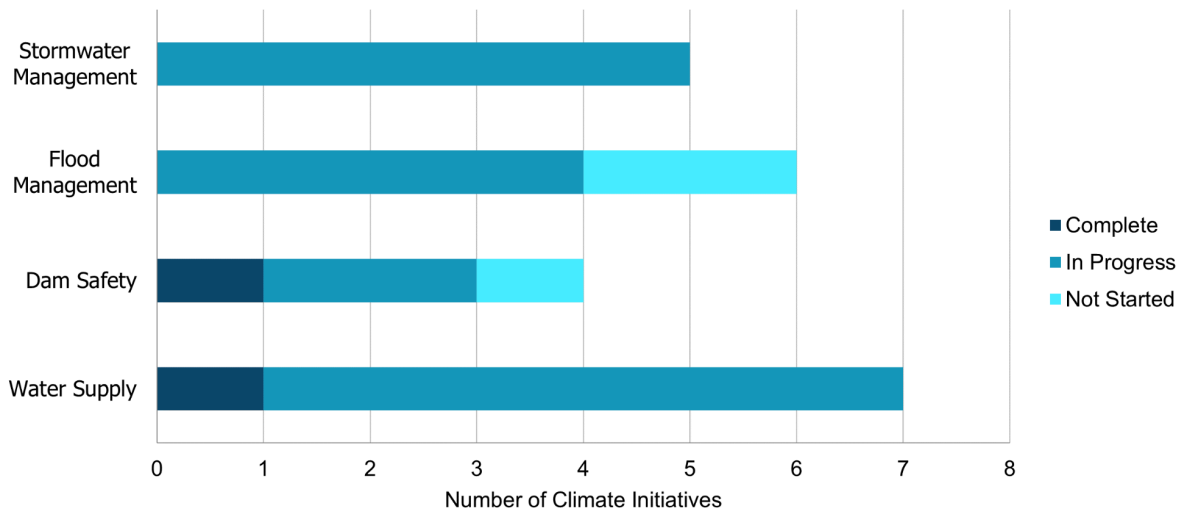
WSA Climate Change Adaptation Priorities

Priority Area 1: Leverage Science and Planning

Leverage science and planning to build climate resilience for MDE’s water resource management responsibilities. These include drinking water, dam safety, stormwater management, sediment and erosion control, and flood management.

Overall Progress

Area 1 Progress on Action Items
Updated 11/2023



Stormwater Management

The increased intensity of rainfall due to climate change is beginning to challenge the capacity of stormwater management systems designed to convey drainage and reduce pollutants. This challenge is predicted to become more pronounced in the future, and MDE WSA is taking proactive steps to meet this challenge.

- Environmental Site Design Stormwater Regulation Update (In Progress):** Update the State stormwater environmental site design (ESD) regulation to account for increased precipitation due to climate change. Although the capacity of ESD practices to offset climate impacts is limited, required enhancements can help contribute to reducing climate impacts and help protect the ESD practices from being damaged by more intense storms.
- NOAA Atlas 14 Stormwater Regulation Update (In Progress):** Update the State stormwater regulation to include the most recent Atlas 14 precipitation statistics.



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3. **Stormwater Quantity Management Plan (In Progress):** Conduct research and stakeholder engagement to develop options for stormwater quantity management requirements that account for climate change. Document the process and outcomes. This is intended to help prevent some types of flooding expected to become more frequent and severe due to climate change.
4. **Stormwater Quantity Management Draft Regulations (In Progress):** Develop draft stormwater quantity control regulations and associated updates to BMP and conveyance system design criteria for flood protection that account for climate change. This will help to control street and property flooding.
5. **Erosion and Sediment Control Standards and Specifications Plan (In Progress):** Develop a plan and identify resources needed for revising the State Erosion and Sediment Control Standards and Specifications to enhance resilience to climate change. The intent of these improvements is to anticipate and prevent sediment pollution associated with more intense rainfall at construction sites where the bare ground is susceptible to erosion.

Flood Management

Flood management consists of both structural methods, like dams and levees, and nonstructural approaches, like the wise siting of development and flood warning systems. In addition to overseeing the related management of stormwater runoff and dam safety, MDE WSA oversees Maryland's Comprehensive Flood Management Program codified in the Flood Hazard Management Act of 1976 (Env. Art. 5-801 to 5-809). WSA also oversees a local floodplain management program, which is linked to the National Flood Insurance Program (NFIP). MDE WSA recognizes the need to conduct studies and undertake planning to enhance the effectiveness of flood management considering weather extremes caused by climate change.

1. **Flood Characterization Methodology (In Progress):** Develop a methodology, with stakeholder involvement, to define, identify, and characterize flooding since 2000 for regulatory use. This initiative will help target solutions to pluvial flooding, which typically does not appear on flood insurance maps, yet can be very damaging.
2. **Watershed Flood Management Pilot Study – Model Development (In Progress):** Develop watershed flood analysis model(s) as part of a flood management pilot study, conditioned on funding availability.
3. **Watershed Flood Management Pilot Study – Impact Analyses (Not Started):** Conduct watershed flood analyses to assess impacts using model(s) developed as part of a pilot study, conditioned on funding availability. Flood mitigation project identification, which will follow impact analyses, is reflected in Priority Area 3: "Green, Blue, and Traditional Infrastructure".
4. **Flood Prioritization GIS Analysis (In Progress):** Develop a GIS-based methodology for prioritizing watersheds for the purpose of flood control planning and management. This prioritization will account for environmental justice factors.



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5. **Watershed Study Guidance (Not Started):** Develop guidance for conducting watershed studies based on experience with the pilot studies, conditioned on funding availability. This will help local governments conduct flood management studies in a consistent way that is most likely to lead to funding for remediation projects.
6. **Real Time Flood Forecasting Tool (In Progress):** Conduct a pilot project to demonstrate how real time weather forecasting information can be combined with riverine floodplain models to predict river level rises and notify county emergency managers of potential road flooding. If successful, this could be combined with cell phone notification and mapping technology to warn people of predicted or existing road closures.

Dam Safety

The extremes of climate change place additional stresses on aging dams and levees, particularly those of earthen construction. This increasing risk heightens the importance of inspecting and maintaining dams. Many dams have private owners, some of whom are financially challenged to afford this maintenance. A division of MDE WSA is responsible for overseeing dam safety management requirements.

1. **Maryland's Probable Maximum Precipitation (PMP) (In Progress):** Dams must be designed to safely pass the largest theoretically possible rainfall event, which is changing due to climate change. WSA will develop updated PMP estimates, to include a future climate projection, for use in dam design standards.
2. **Earthen Spillway Design Criteria (Not Started):** Based on PMP results, develop updated earthen spillway design criteria. This will help ensure their resilience under more frequent and intense rainfall patterns associated with climate change.
3. **Dam Removal Guidance (Completed):** Develop updated guidance on technical, financial, and regulatory aspects of dam removal. This will help expedite the dam removal process thereby reducing risks associated with extreme rainfall and improving natural stream habitat .
4. **Dam Inundation Area Mapping (In Progress):** Develop and publish dam inundation area maps, which identify land that would be flooded by a dam failure. A GIS layer will be created for all high- and significant-hazard dams in Maryland for use by local planning and emergency management agencies, the Maryland Department of Emergency Management (MDEM), and the public.

Water Supply

The early phase of climate change is predicted to be characterized, in part, by weather extremes of drought and heavy precipitation. Droughts reduce water availability and flooding can damage water supply systems. WSA is taking steps that anticipate these risks and build resilience into Maryland's water supply systems.

1. **Increase State Water Supply Program Capacity – Staffing (Completed):** Ensure Maryland's Water Supply Program has adequate staffing to take proactive measures to help community water supply utilities build resilience to climate change stresses.



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2. **Funding to Manage Water Appropriation and Use Permits (In Progress):** Explore options for enhanced funding of the division responsible for water appropriations and use permits to support climate change resiliency.
3. **Funding to Oversee Public Water Treatment Plant Operations (In Progress):** Explore options for funding enhanced oversight and technical assistance for community water supplies and associated water treatment plant operations.
4. **Establish an Indirect Potable Reuse Pilot Program (In Progress):** Develop permitting that enables indirect potable reuse of municipal wastewater effluent via a pilot program (implement [SB407](#)). By December 2024, the MDE Water Supply Program will provide a status report to the Governor's Office on a pilot program to permit indirect potable reuse of reclaimed water (treated municipal treatment plant effluent). This pilot program is intended, among other goals, to establish technical and administrative procedures for developing alternative water sources that build drought resilience.
5. **Drought Monitoring and Response Plan Review (In Progress):** Conduct a review of the [State Drought Monitoring and Response Plan](#). Include an assessment of the groundwater monitoring well network and recommend enhancements, which will build climate resilience.
6. **Water Audit Program Development (In Progress):** Develop and adopt updated guidance on methods and tools to be used by community water supply system utilities for water accounting. More precise water accounting will better inform options for controlling water losses and conservation thereby making water systems more efficient and resilient to climate change impacts.
7. **Water Infrastructure Climate Resilience Assessment Initiative (WICRA) (In Progress):** Establish a voluntary federal, state and local cost-share arrangement to conduct systematic climate vulnerability and mitigation alternatives assessments of community water supply and wastewater infrastructure across Maryland.