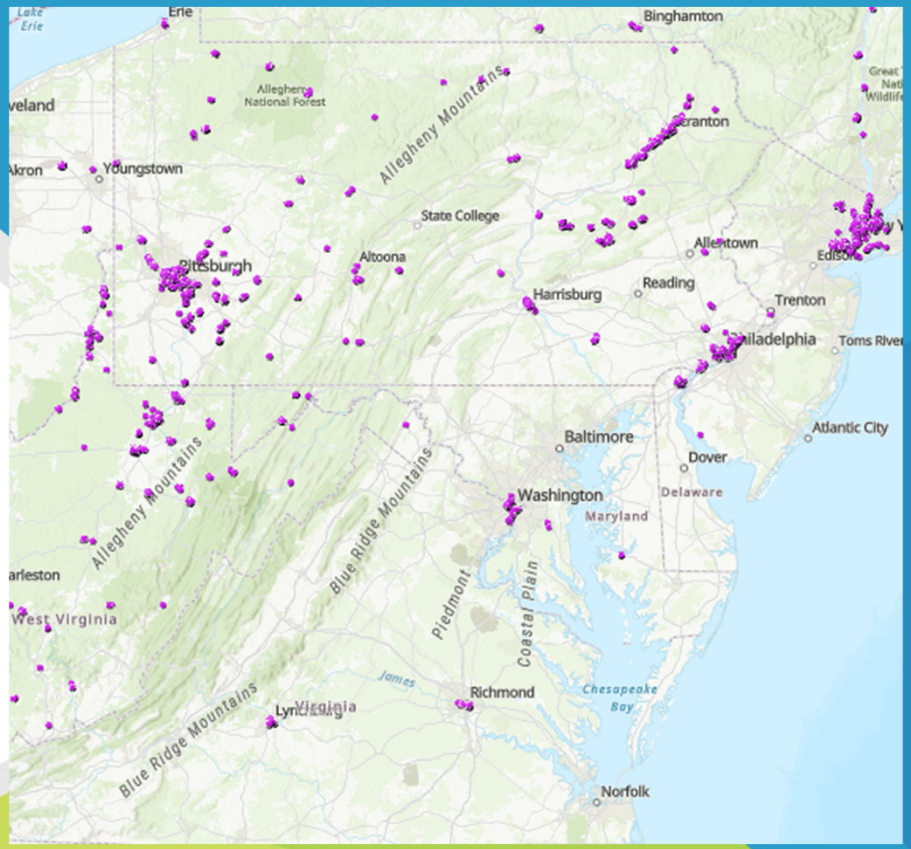
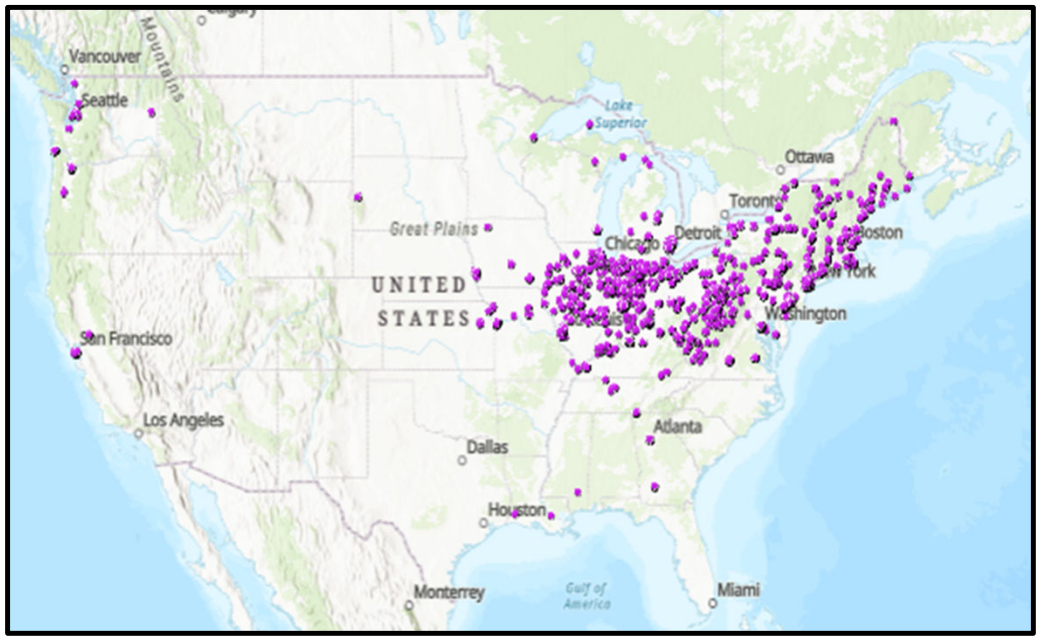
CBC overview Combined Sewer Systems the Chesapeake Bay

January 2026

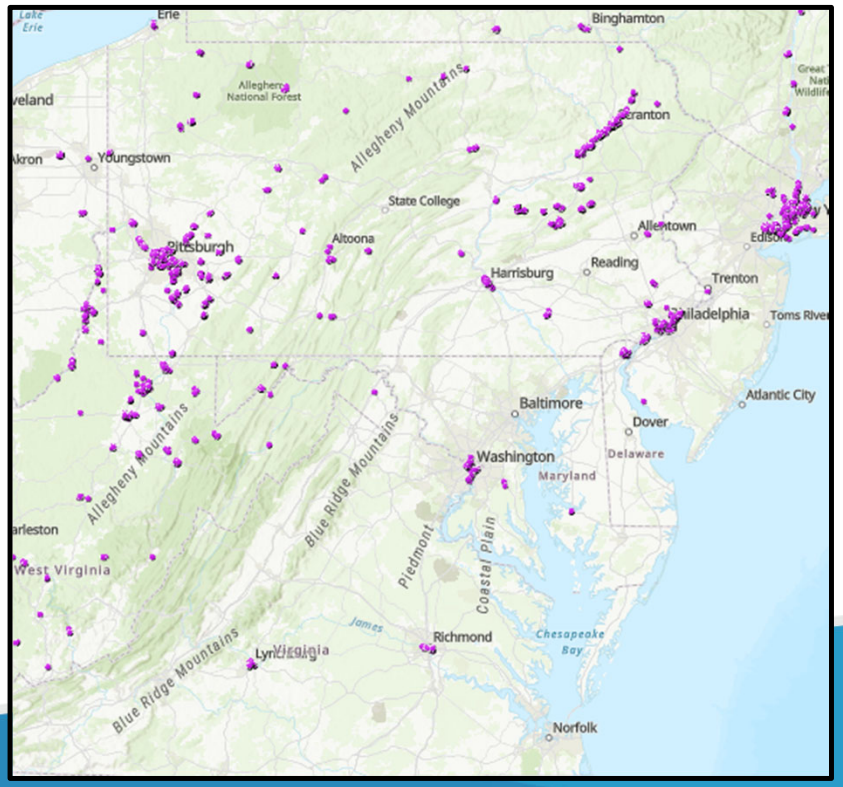


Overview of Combined Sewer Systems

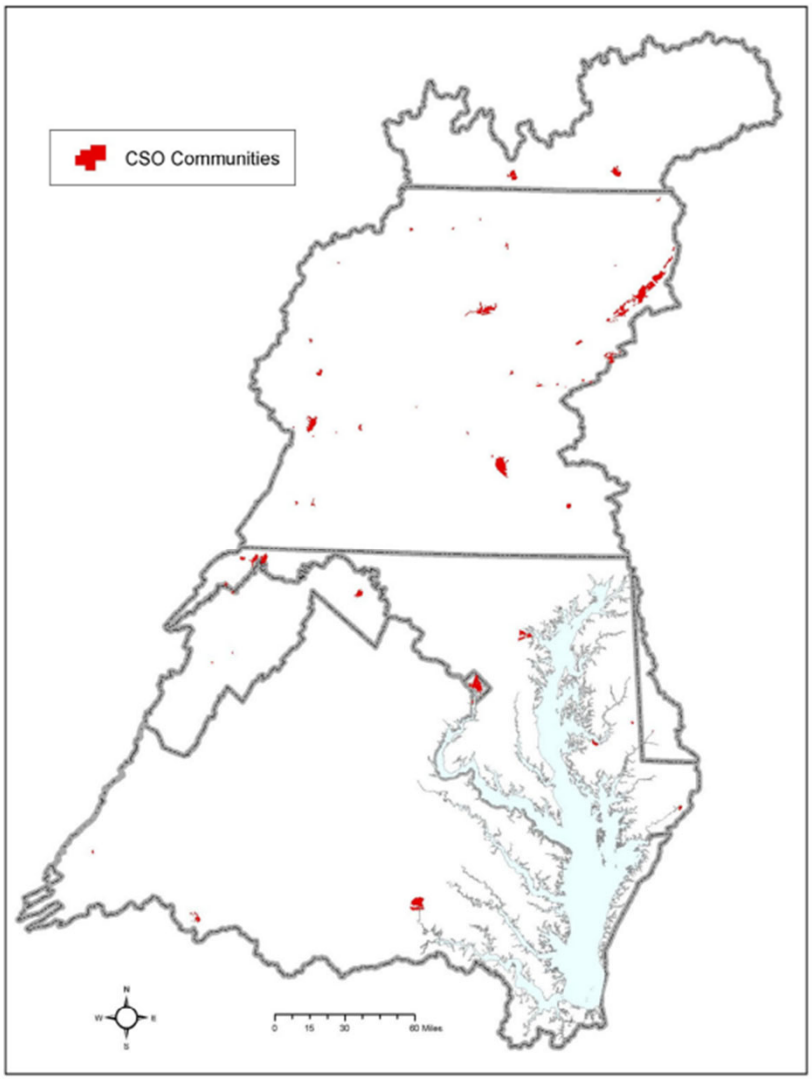
National overview of CSS systems



CSS systems in the Mid-Atlantic



- 64 CSO systems identified in the 2010 Chesapeake Bay TMDL
- Point sources assigned Waste Load Allocations
- Overflow volumes and pollutant loading dependent on the service or catchment area of the combined system.
- Overflow volumes vary depending on system design and capacity.



Source: Phase 5.3 Chesapeake Bay Watershed Model 2009 Scenario

Combined Sewer Systems

Collect sewage and rainwater in the same pipes

- More common in older cities
- Threat to public health and the environment
  - Causes fish kills
  - Causes increased nutrient loading contributing to algal blooms
  - Impacts designated uses for waterbodies (e.g., recreation)
  - Basement backups
- Results in discharge of untreated sewage during wet weather events. May contain:
  - Disease-causing pathogens (e.g., E.coli)
  - Toxic pollutants
  - Floatables and other suspended solids
  - Oxygen-demanding organic compounds
  - Oil and grease
  - Nutrient loading
  - Industrial wastes

Illustration of a Separate Sanitary Sewer System

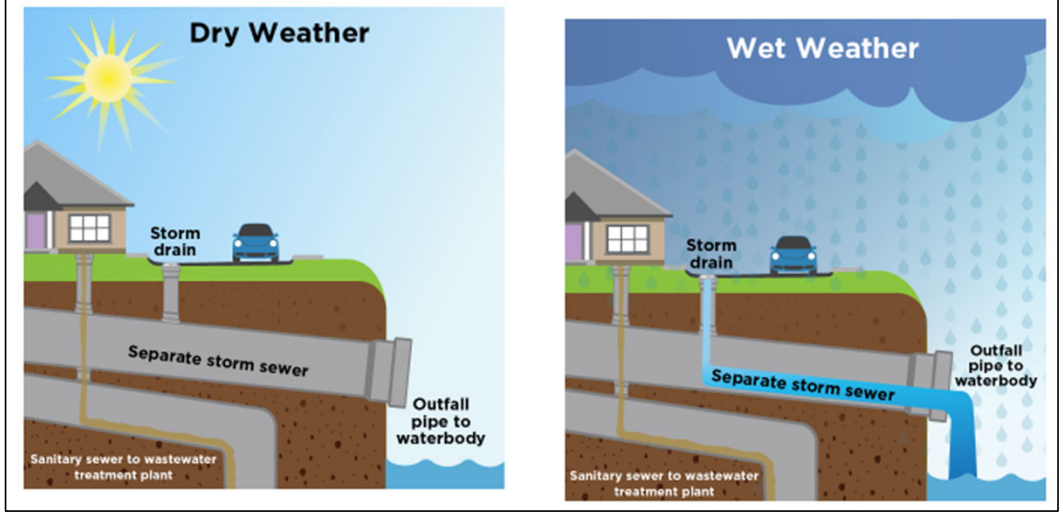
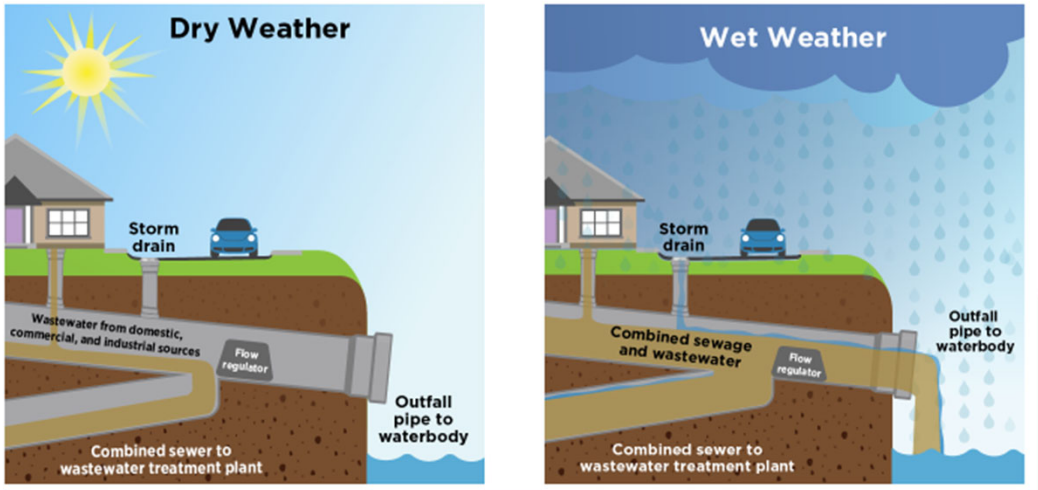


Illustration of a Combined Sewer System



Regulation of CSOs

- EPA's 1994 CSO policy codified into Clean Water Act Section 402(q) in Wet Weather Water Quality Act of 2000.
- **Phase I:** Develop Nine Minimum Controls (technology-based controls) and Long-Term Control Plan (LTCP) to achieve compliance with water quality standards
- **Phase II:** 1) Implement Nine Minimum Controls; 2) Implement LTCP and 3) Conduct monitoring to verify water quality standards are being met
- **Phase III:** Post Construction Monitoring (verification to ensure compliance with CWA permit limits)

Nine Minimum Controls	
	Proper operation and regular maintenance programs for the sewer system and CSOs
	Maximum use of the collection system for storage
	Review and modification of pretreatment requirements to assure CSO impacts are minimized
	Maximization of flow to the POTW for treatment
	Prohibition of CSOs during dry weather
	Control of solids and floatable materials in CSOs
	Pollution prevention
	Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts
	Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls

LTCP

- Understand the current system
- Seek feedback
- Choose the End Point
- Execute and evaluate the plan

1.System Characterization: Monitoring & Modeling and Baseline Conditions:
2. Public Participation
3.Nine Minimum Controls
4.Development & Evaluation of Alternatives: Alternatives and Evaluation Factors
5.Selection & Implementation: Choose and execute the plan.

NPDES Program Authorizations in Region 3

Before state/territorial/tribal program approval:

- EPA issues permits
- EPA conducts compliance and monitoring activities
- EPA enforces
- State/territory/tribe reviews permits and grants CWA section 401 certification

After state/territorial/tribal program approval:

- State/territory/tribe issues permits
- State/territory/tribe conducts compliance and monitoring activities
- State/territory/tribe enforces
- EPA provides administrative, technical and legal support
- EPA ensures state program meets federal requirements
- EPA offers NPDES program training
- EPA oversees grants to states (e.g., CWA section 106)
- EPA reviews permits and, as necessary, comments or objects
- EPA oversees and, as necessary, assumes enforcement of permits

EPA may authorize qualified state, territorial, or tribal government agencies to implement all or parts of the NPDES program.

State	Authorized Agency
Delaware (partial)	Department of Environmental Protection
District of Columbia	EPA Region 3
Maryland	Maryland Department of the Environment
Pennsylvania (partial)	Department of Environmental Protection
Virginia	Department of Environmental Quality
West Virginia	Department of Environmental Protection.

Challenges

- Funding and capital shortfalls
- Changing Environmental Conditions – Unpredictable weather
- Aging infrastructure and physical constraints
- Institutional and operations barriers

Opportunities

- Digital & Smart Sewer Technologies
- Predictive Analytics
- Nature based solutions/Green Infrastructure
- Gray Infrastructure
- Advanced treatment technologies

Funding opportunities for Wastewater

- **Clean Water State Revolving Funds (SRFs):** EPA provides funds to states, who then offer low-cost loans or grants for local projects.
- **Community Grants** - Congress appropriated resources for specifically named community water infrastructure projects identified as Congressionally Directed Spending (CDS) and Community Project Funding (CPF) items (Community Grants) in Appropriations Acts. Funding is provided in the State and Tribal Assistance Grants (STAG) account for these drinking water, wastewater, stormwater infrastructure, and water quality protection Community Grants projects.
- **Water Infrastructure Finance and Innovation Act (WIFIA):** Long-term, low-cost loans for large-scale water infrastructure projects.