Potomac Interceptor Spill
What can modeling tell us?

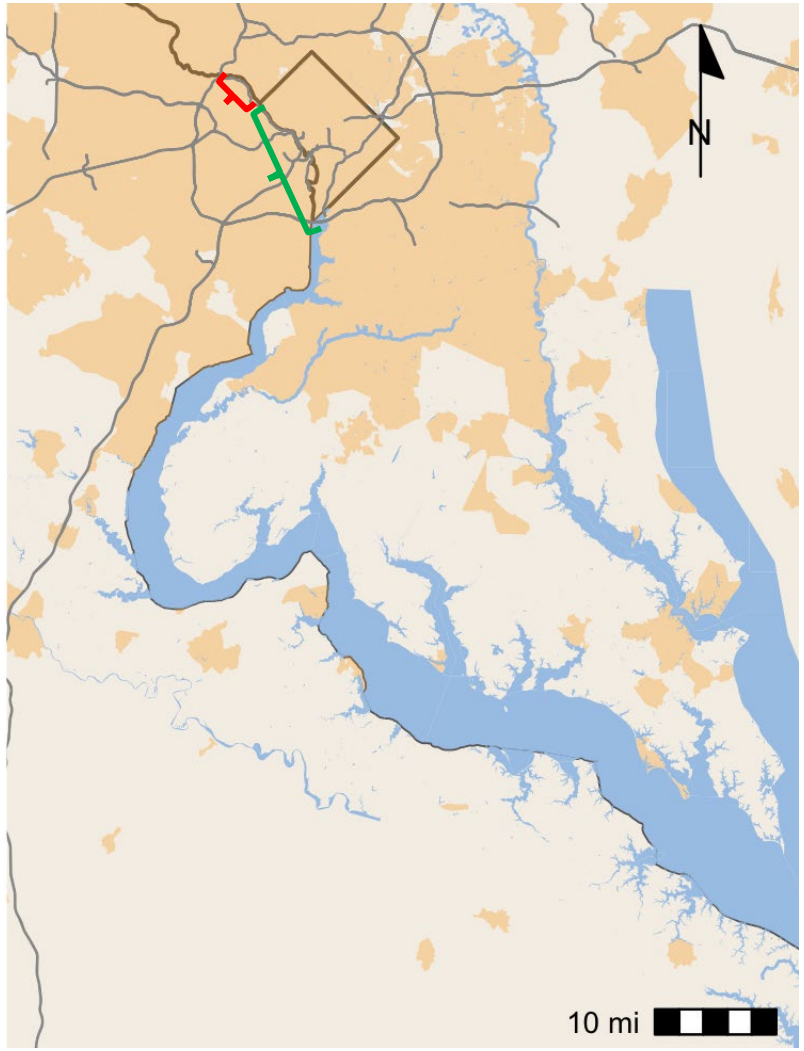
MWCOG Briefing
February 23, 2026
Cherie Schultz and Sarah Ahmed
Interstate Commission on the Potomac River Basin

Recent ICPRB modeling by area

1. Pathogen levels in vicinity of break (I-495 at Clara Barton to Chain Bridge) ⇦ Preliminary modeling of fecal coliform at request of MDE/EPA

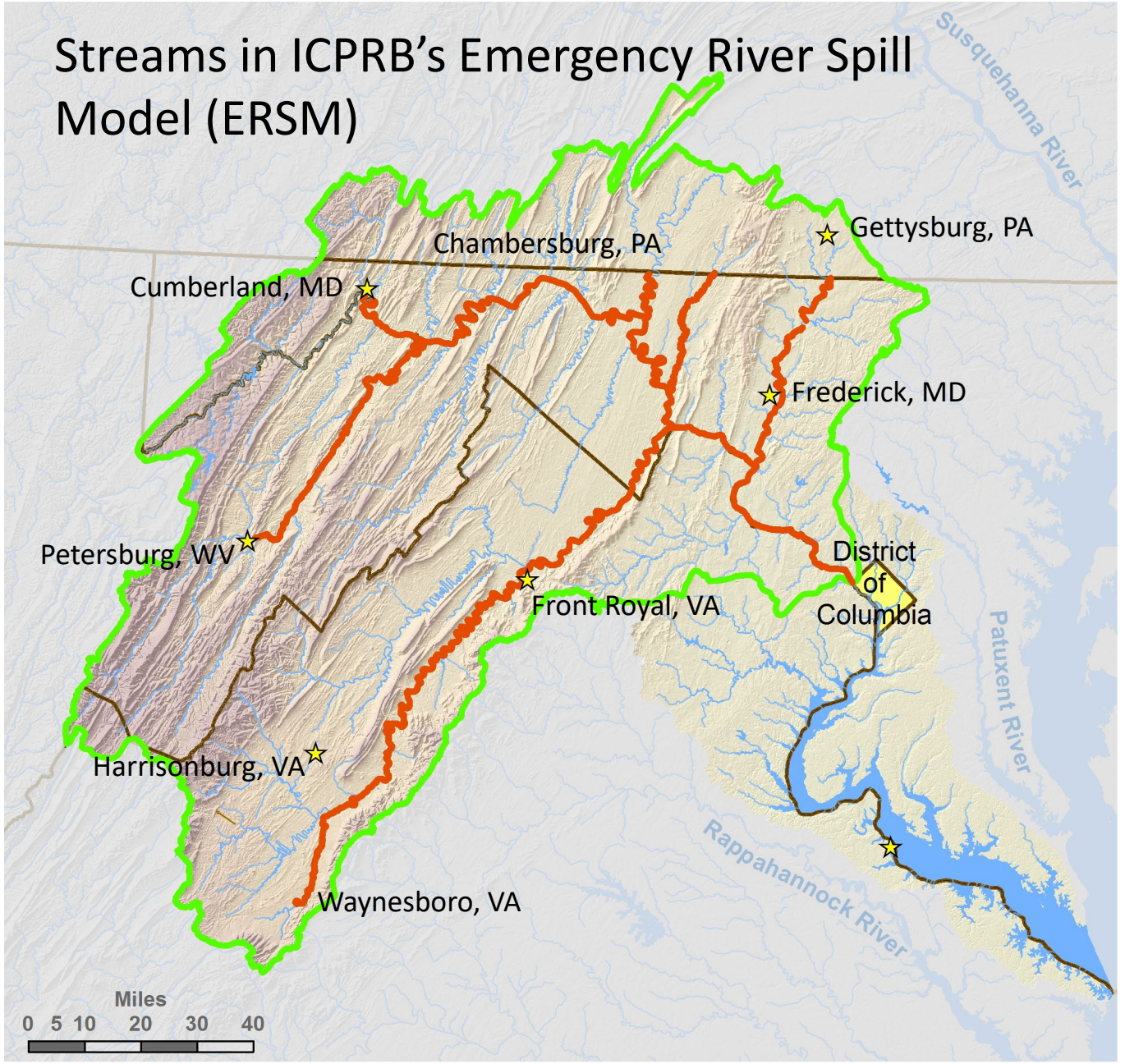
2. Pathogen travel speeds in vicinity of DC (Chain Bridge to Alexandria) ⇦ Preliminary modeling of travel speeds at request of DOEE

3. Potential environmental issues in Potomac estuary



What's ICPRB's spill modeling role?

- Typically when a spill occurs, ICPRB provides estimates to water suppliers
  - When will the contaminant reach my intake?
  - How high will contaminant concentrations be at my intake?
- January 19th Potomac Interceptor break
  - ICPRB received notice and determined that sewage release was downstream of currently-used water supply intakes
  - On January 25th, MDE and EPA Region 3 requested ICPRB modeling analysis



1. Modeling pathogen levels in vicinity of break

- Used ICPRB's Emergency River Spill Model (ERSM) to investigate bacteria concentrations downstream of Interceptor break
- ERSM's downstream extent is Chain Bridge
- Modeled fecal coliform bacteria as an "indicator" of pathogen presence
- **Estimates and simplifying assumptions include**
  - Release of sewage began January 19 - 4 PM and lasted 5 days (120 hours)
  - Release rate: 40-60 MGD (million gallons per day)
  - Bacteria uniformly mixed laterally and vertically in river channel
  - Potomac River flow was ~2000 cubic feet per second – pretty low
  - Concentration of fecal bacteria in raw sewage ~ 10 million/100 milliliters
  - Bacteria die-off rate is pretty rapid: for 1°C, half-life ~3 days and 90% reduction in ~10 days

1. Key take-aways from ERSM fecal coliform analysis

Release was downstream of all water supply intakes except Little Falls (Washington Aqueduct's "backup" intake)

Model results estimated Potomac River coliform levels of 200,000-400,000/100 ml and E coli levels of 70,000-125,000/100 ml

When sewage stops flowing into river, predicted bacteria concentrations fall quickly to near background levels – due to die-off and flushing by river flow

- At Little Falls: between ½ to one day
- At Chain Bridge: in about one day

Caveats: considerable uncertainties in modeling assumptions include

- Concentration of bacteria in sewage
- Bacteria die-off rate is uncertain and depends on temperature
- Deposition of solid material onto riverbed, which may prolong impacts

2. Modeling pathogen travel speeds in vicinity of DC

- Used ICWATER (currently maintained by Leidos for US Army)
- Looked at estimated net mean velocities of water in the Potomac estuary
- Objective was to estimate mean travel speed of a contaminant release
- **Estimates and simplifying assumptions include**
  - Release location: near I-495 and Clara Barton Parkway
  - Bacteria uniformly mixed laterally and vertically in river channel
  - Typical Potomac River flow this time of year 10,400 cubic feet per second

2. Key take-aways from ICWATER travel speed analysis

In the event of a short-term release from Interceptor break, peak pathogen levels flow past DC's southern boundary in less than one day

Caveats: model does not consider processes which may prolong impacts, including

- Transport by tidal currents
- Deposition of solid material onto riverbed

3. Potential future issues in Potomac estuary

- Possible application of Chesapeake Bay estuarine model?
- Potential impacts in future months and years including
  - Nutrients from sewage may increase growth of algae and likelihood of harmful algal blooms
  - Deposition of sewage sludge may increase biological oxygen demand of sediments and likelihood of fish kills

Final take-aways

Water supply

- Timely completion of repairs important because Washington Aqueduct's Little Falls intake is backup, especially in case of drought
- Some sections of Potomac Interceptor are above essential water supply intakes and should be prioritized for future repairs (Letter from M. Nardolilli to EPA Region 3, 1/29/2026)

Public health

- When sewage stops entering river, bacteria concentrations are expected to fall to near background levels quickly – due to die-off and flushing by river flow
- Modeling and monitoring have complementary roles
- Risk from residual solid material remaining on riverbed uncertain

Environmental issues in Potomac estuary

- Risks include elevated likelihood of fish kills and harmful algal blooms
- Analyses needed to understand potential magnitude of environmental impacts in Potomac estuary

Questions?

ICPRB Spill Response Team

- Sarah Ahmed: sahmed@icprb.org
- Heidi Moltz: hmoltz@icprb.org
- Alimatou Seck: aseck@icprb.org
- Cherie Schultz: cschultz@icprb.org
- Renee Bourassa: rbourassa@icprb.org
- Renee Thompson: rthompson@icprb.org