

Presentation on outfall as the preferred effluent disposal alternative

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Water Quality Management Committee

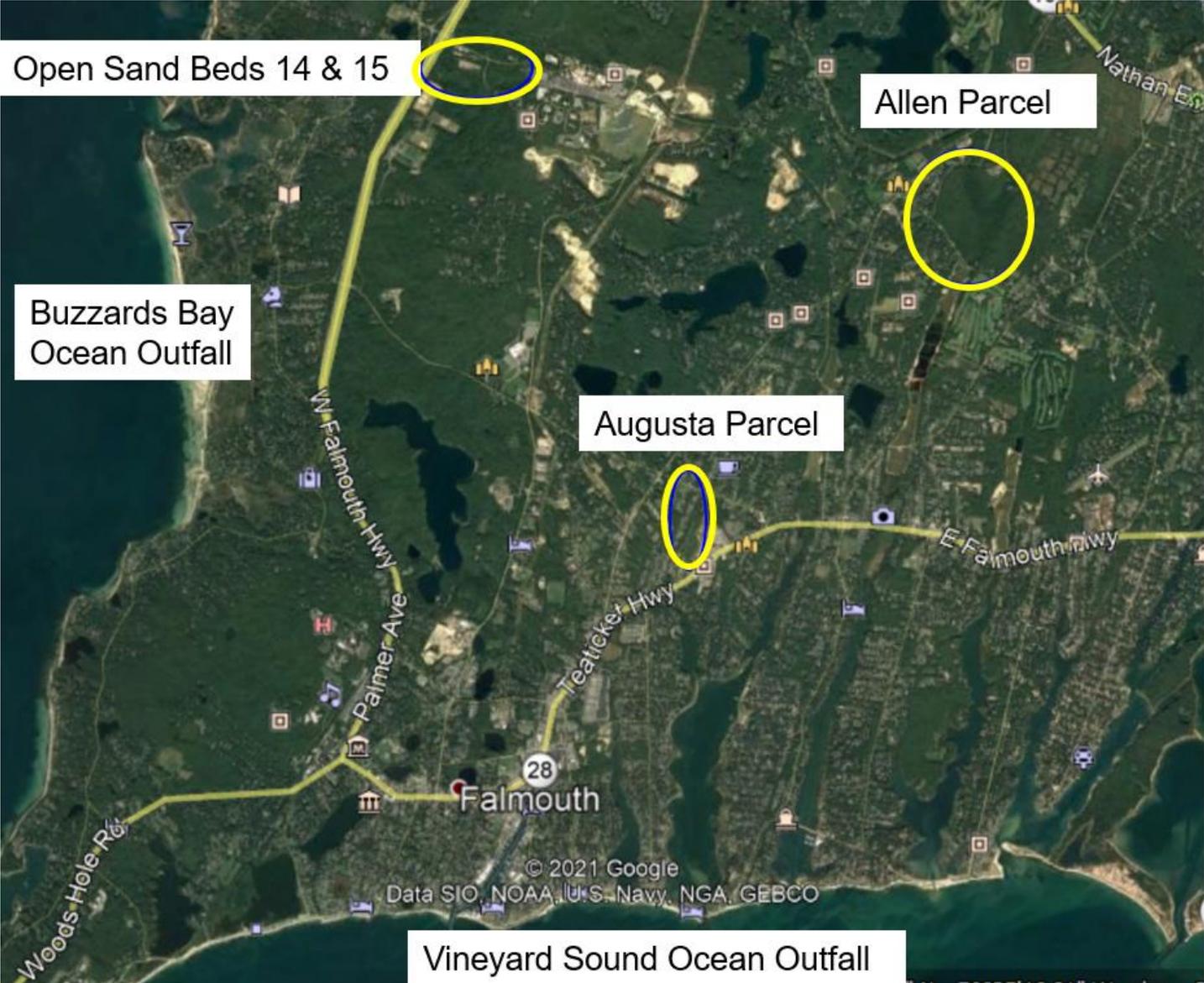
April 3, 2023

Effluent Discharge Plan

Select Board voted 12-6-21 (WQMC voted 11-22-21)

- Designate existing open sand beds 14 & 15 as the treated effluent discharge site for the projected ESRA/TASA flows in the short-term contingent on the MEP report results for Herring Brook
- Consider ocean outfall options in Buzzards Bay and Vineyard Sound, along with land-based options at the Allen and Augusta parcels, for projected mid-term and long-term wastewater flows

Potential future treated effluent discharge sites



Buzzards Bay outfall no longer under consideration

- Significantly less current in Buzzards Bay than in Vineyard Sound
- Because less current, outfall has to extend further from shore to achieve the same goals (small zone of influence, no impact onshore, no return of nitrogen to coastal ponds)
- Outfall length (offshore) is a much bigger factor in outfall cost than force main length (onshore)
- On the Buzzards Bay side, the moraine (boulders) would add more uncertainty/risk/cost to outfall construction

For discussion: outfall (not land-based sites) is the preferred plan for mid- and long-term flows

- Land-based discharge sites are very constrained:
 - Limited discharge capacity (gallons per day) based on available area, required setbacks, hydraulic conductivity of soils
 - All available land-based sites are upgradient of (in the watershed to) a salt pond
 - Most land-based sites are also upgradient of a freshwater body

Allen Parcel

Pros:

Capacity 1,600,000 gpd

Con:

Four miles from WWTF

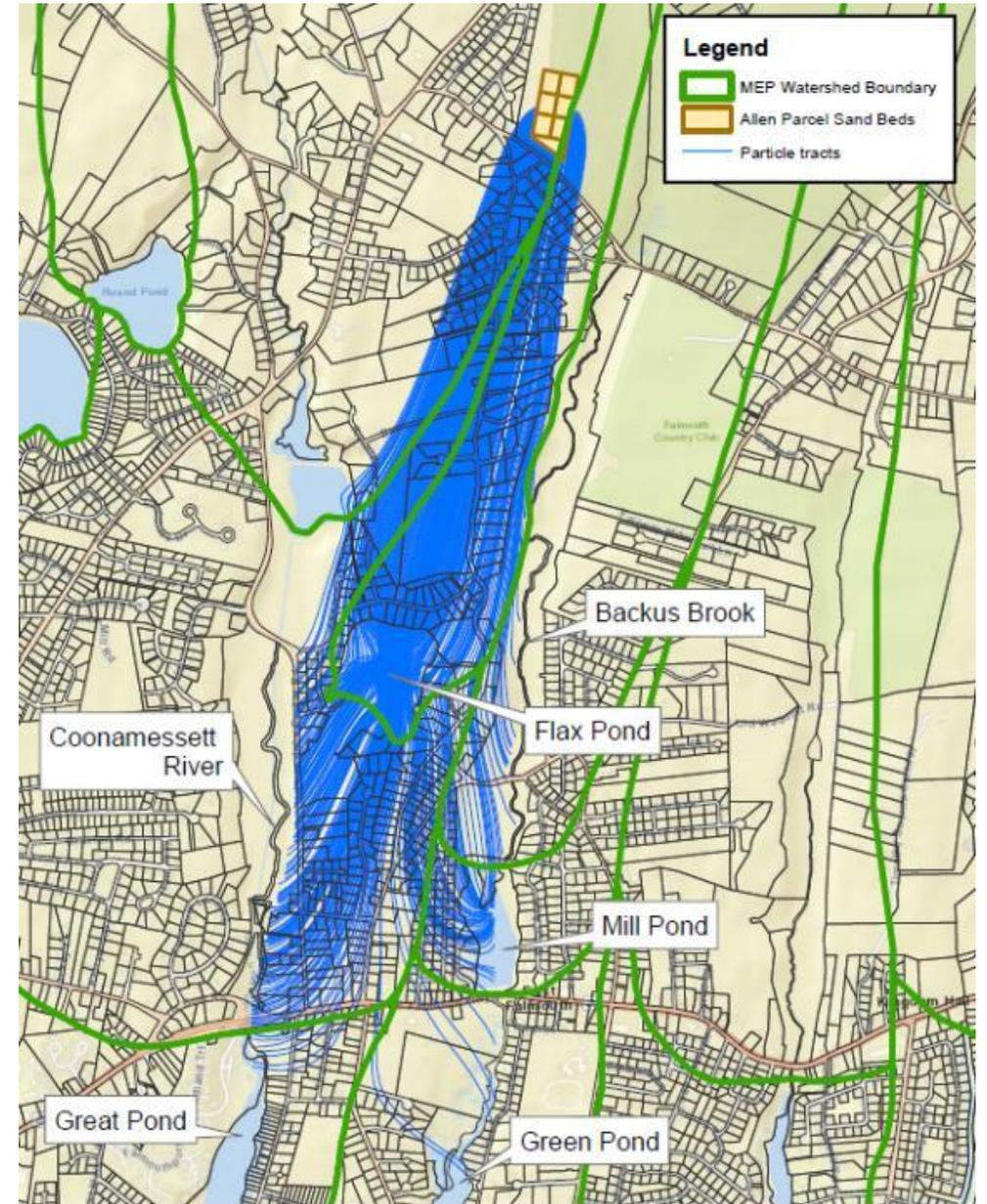
Some N returns to Great and Green Ponds

Upgradient of freshwater systems

Undeveloped woodlands

Near some residences

Cost: \$29.5 million



Augusta Parcel

Pro:

Capacity 1,030,000 gpd

Not upgradient from freshwater systems

Potential recreational fields

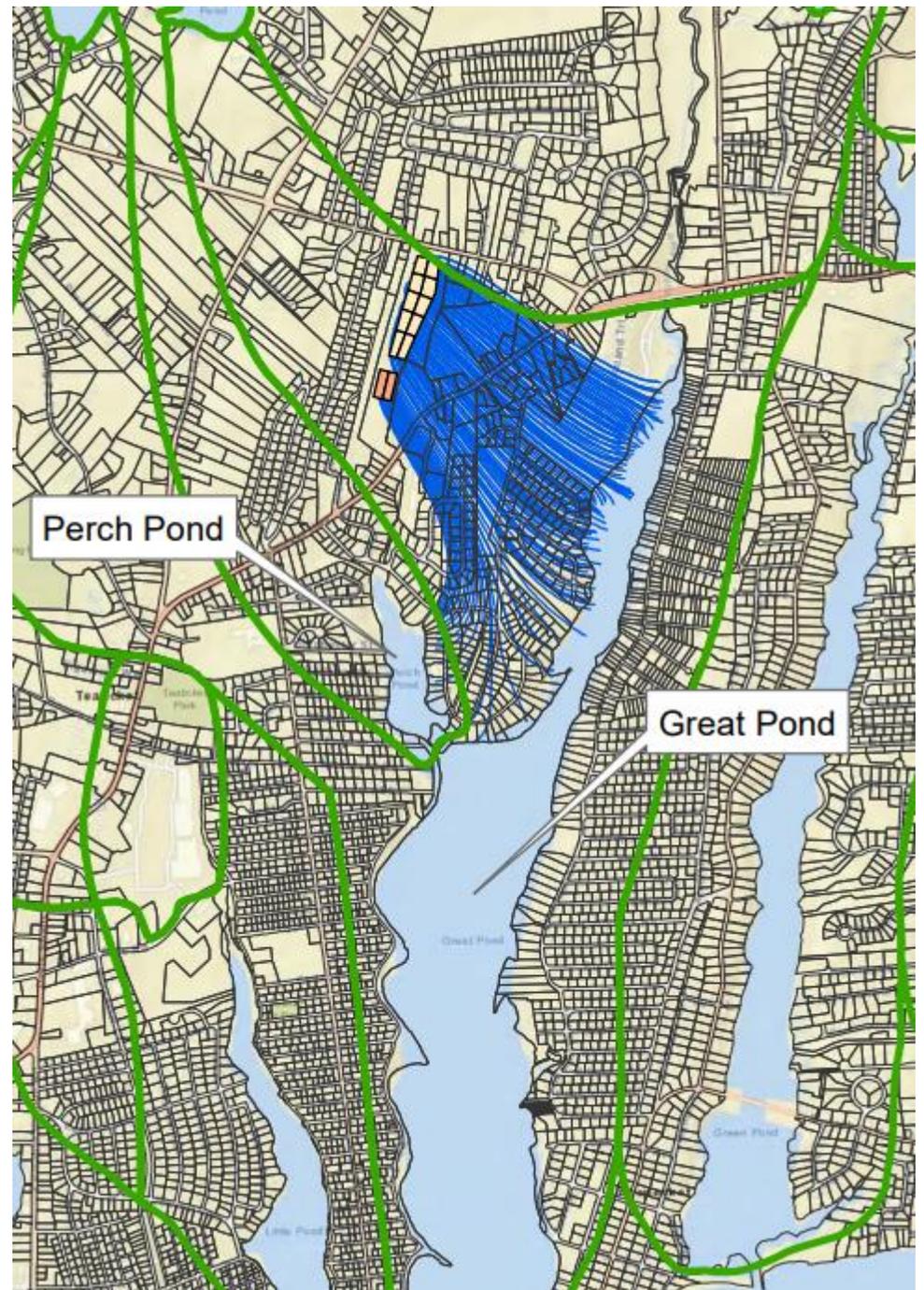
Con:

Four miles from WWTF

Some nitrogen returns to Great Pond

Near some residences

Cost: \$27.4 million



Expanded Sand beds 14 & 15

Pro:

0 miles from plant, no lift station needed

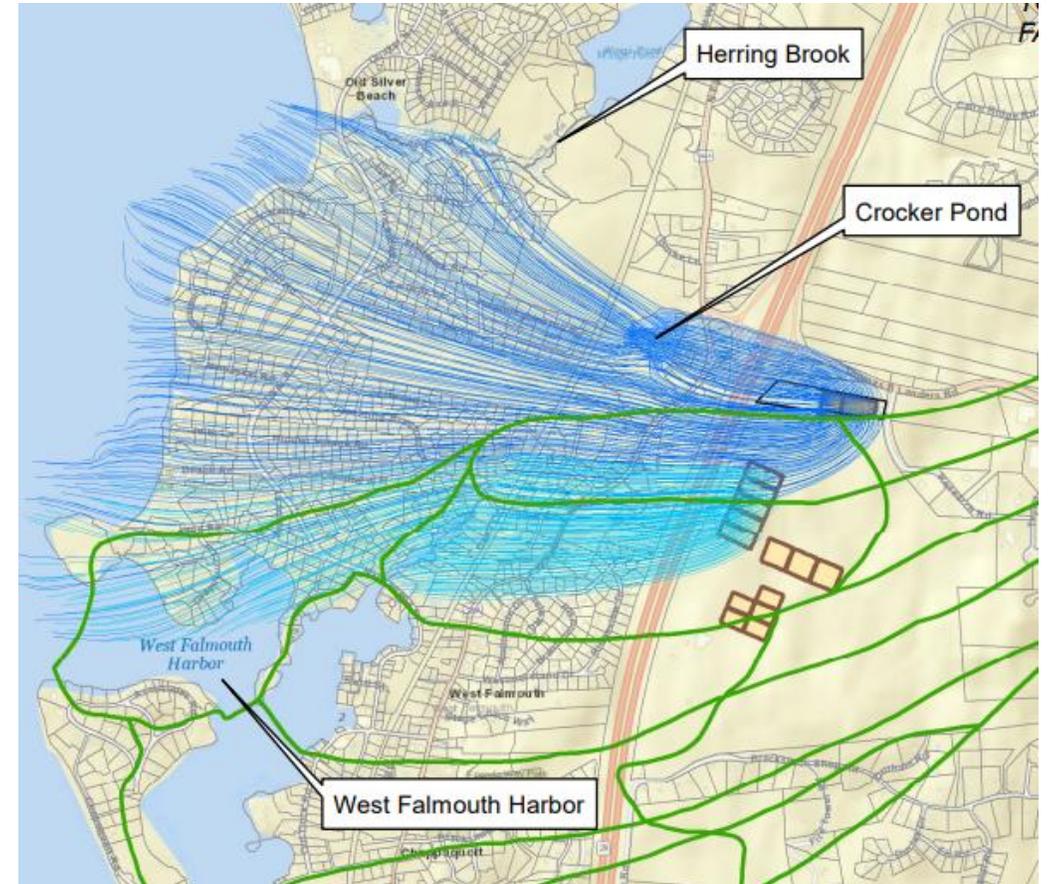
Additional capacity 500,000 gpd

Cost: \$1.4 million

Con:

Upgradient of a freshwater system

Some nitrogen goes to Herring Brook



THIS CONTINUES TO BE THE PLANNED DISCHARGE SITE FOR SHORT-TERM FLOWS (Teaticket, Acapesket and Existing Sewer Redevelopment Area)

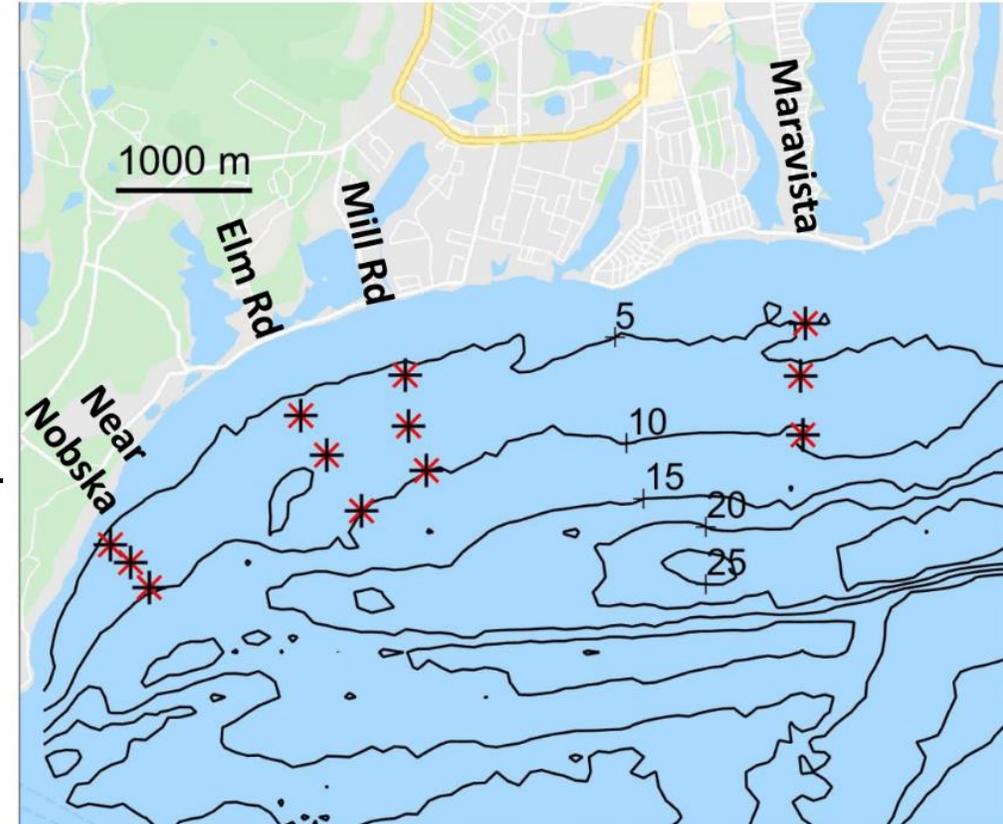
Outfall

Pro:

- Removes all treated discharge from watersheds
- Eliminates impacts to fresh and saltwater ponds
- Virtually unlimited discharge capacity

Con:

- Lengthy permitting process
- ~~Undetermined length from shore to avoid impacts~~
- Land distance from WWTF 2 – 7 miles
- Unknown public acceptance
- Cost: \$unknown**
\$59-80M



→ Evaluating locations and design to minimize impacts and cost

Vineyard Sound Outfall Modeling to-date

- Modeled landfall locations: Nobska Point, Elm Road, Shore Drive Beach Lot, Central Park, Worcester Ave
- Modeled discharge at various distances from shore and two discharge rates (4 MGD and 2 MGD)
- Looked at 1000:1 dilution area
 - Concept used in shellfish regulation
 - Size of 1000:1 dilution area is mainly a function of ocean current at discharge location (volume rate of flow) and wastewater discharge rate of flow
- Results for the locations were similar at the different locations for the same distances from shore

Zone of < 1000:1 Dilution

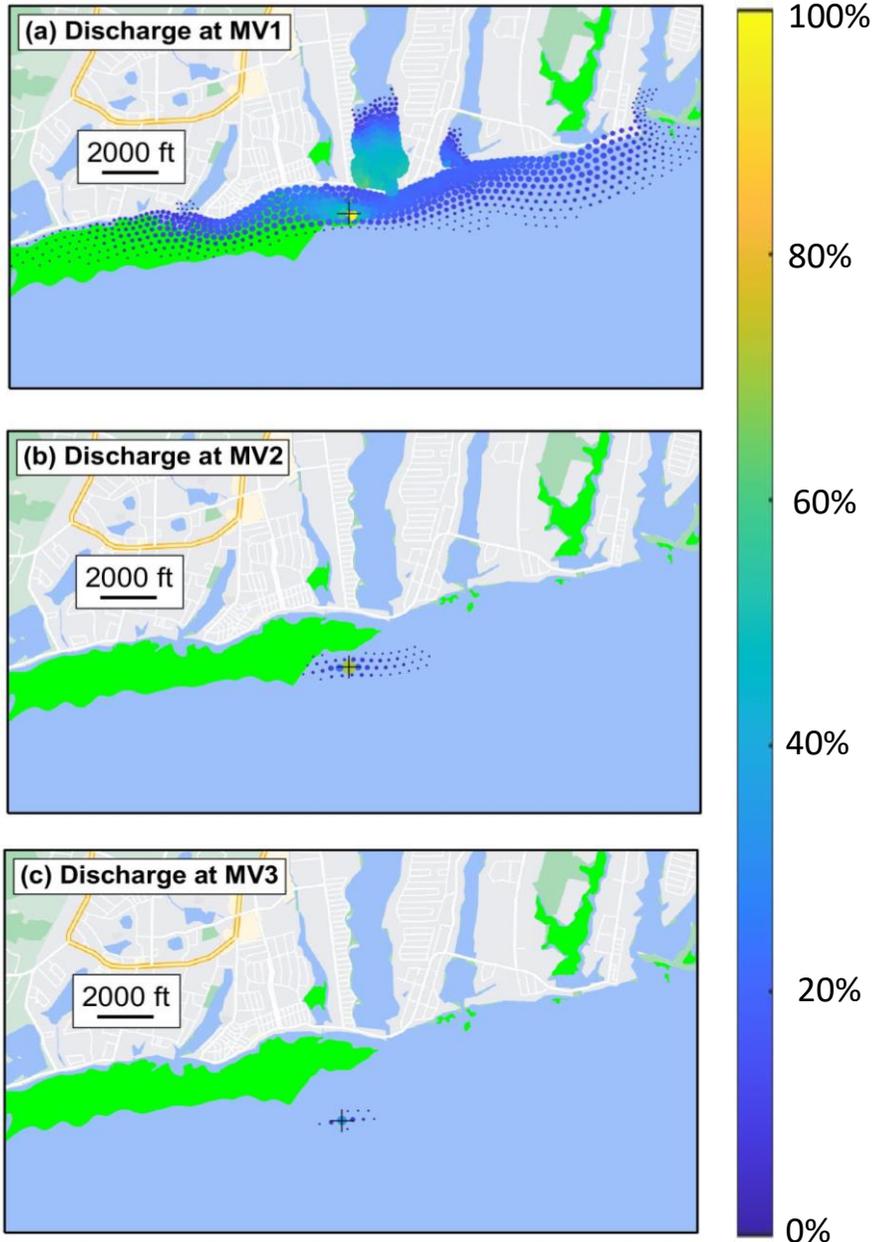
Discharge modeled at three distances from shore at a discharge rate of 4 MGD

All Figures:

Green area is eelgrass area mapped by DEP

+ is the discharge location

Dots show: at each model cell, the percent of time in which the dilution ratio is less than 1000:1



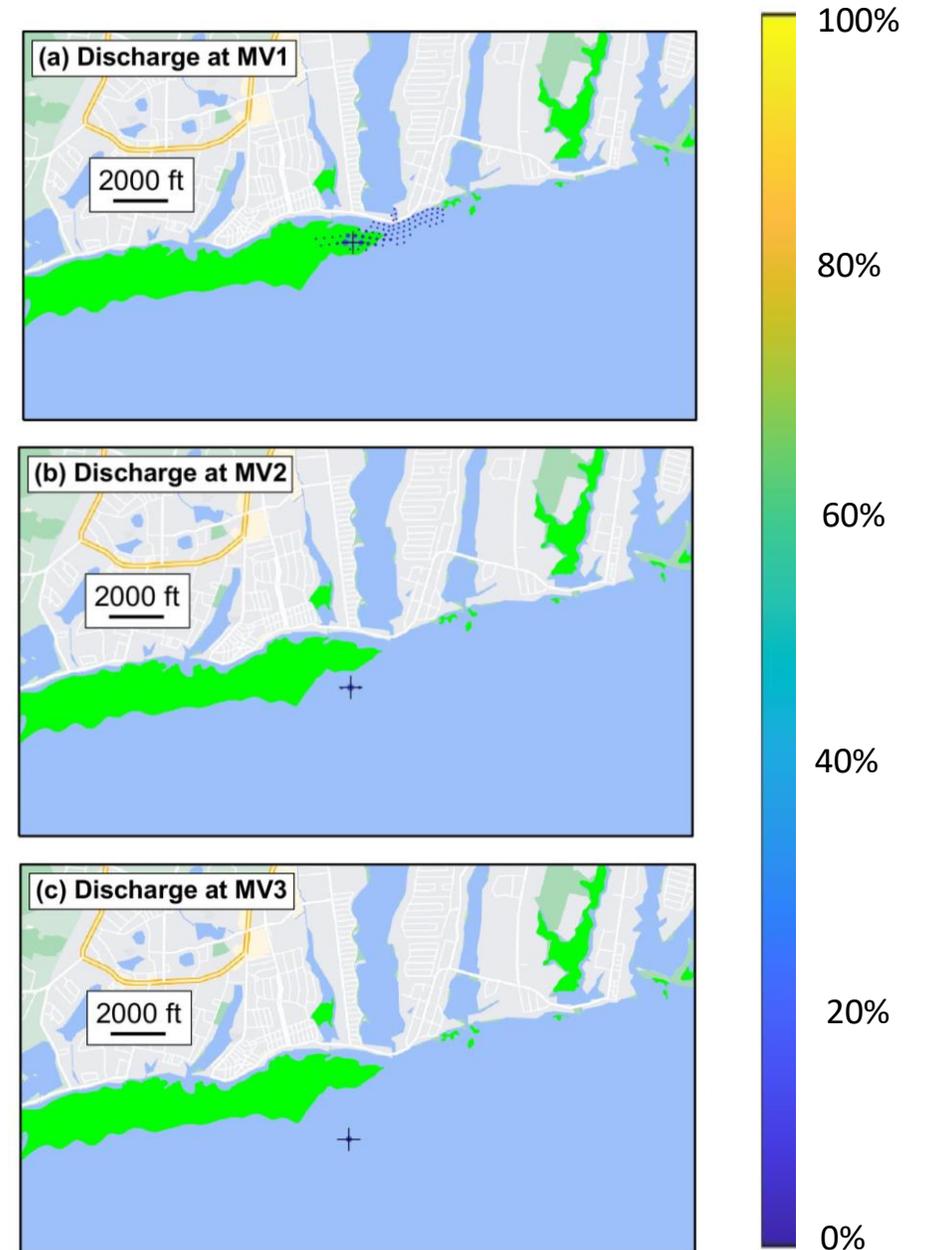
Zone of < 1000:1 Dilution Discharge modeled at three distances from shore at a discharge rate of 2 MGD

All Figures:

Green area is eelgrass area mapped by DEP

+ is the discharge location

Dots show: at each model cell, the percent of time
in which the dilution ratio is less than 1000:1



Outfall report is in progress



Additional Next Steps

- WQMC vote to prioritize outfall as preferred discharge option for mid and long term flows
- Organize work done to date into an initial evaluation document – in progress
- Present findings to Select Board, Falmouth Heights Association and other concerned parties
- Place a “reservation” on real estate needed for pipes and installation
- Continue to collect data and resolve permitting requirements with regulators
- Fall Town Meeting article to proceed with geotechnical evaluation, and prepare and submit MEPA and NPDES permits

Updated Effluent Discharge Plan

Voted by WQMC 4/3/23

- In order to continue to make progress in cleaning up our estuaries, designate expanded existing open sand beds 14 & 15 as the treated effluent discharge site for the projected ESRA/TASA flows in the short-term contingent on the MEP report results for Herring Brook
- The Town's preferred option for mid and long-term discharge of all treated wastewater is an outfall in Vineyard Sound, and the Town will proceed with permitting and implementing an ocean outfall.