Cape Cod's Aquifer

Groundwater and Surface Water– A Single Resource

- Hydrologic framework
- Water table and the groundwater lenses
- Hydrologic connection between lakes and rivers and the aquifer
- Groundwater watersheds

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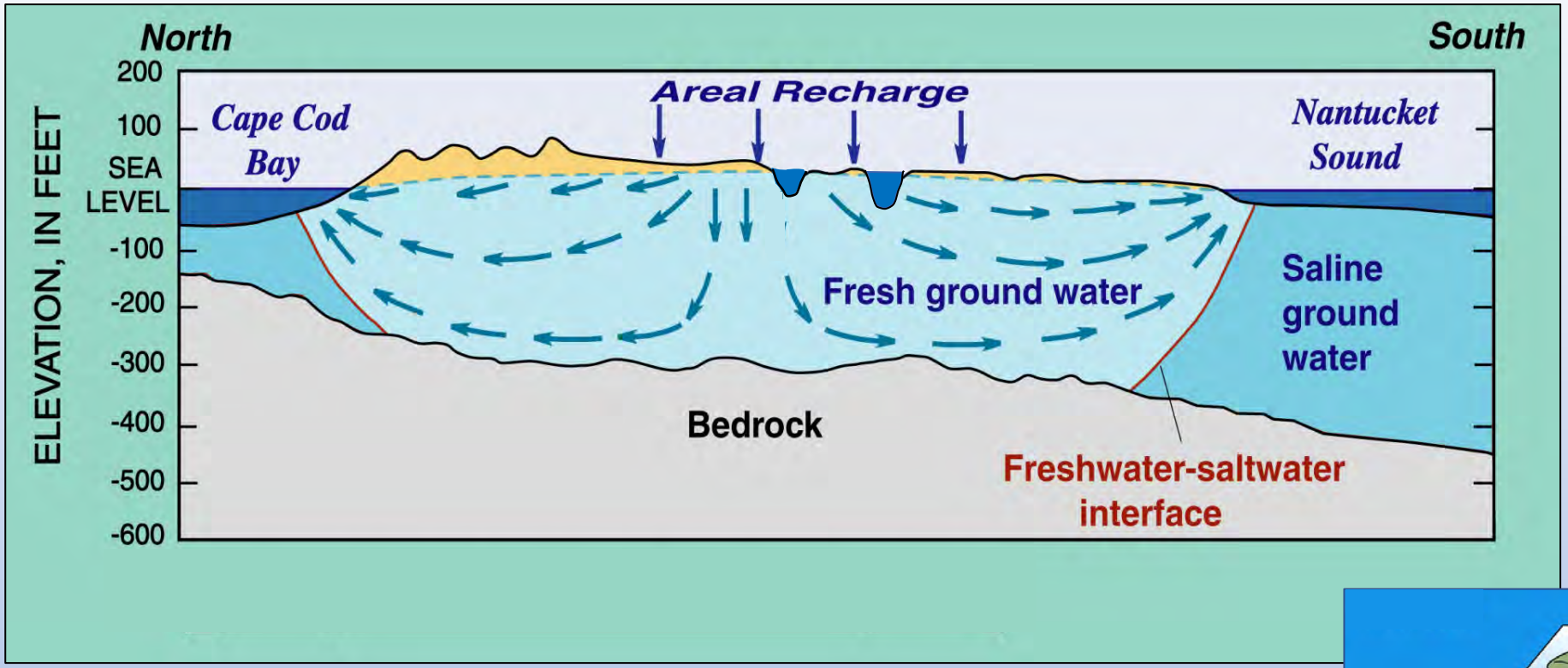
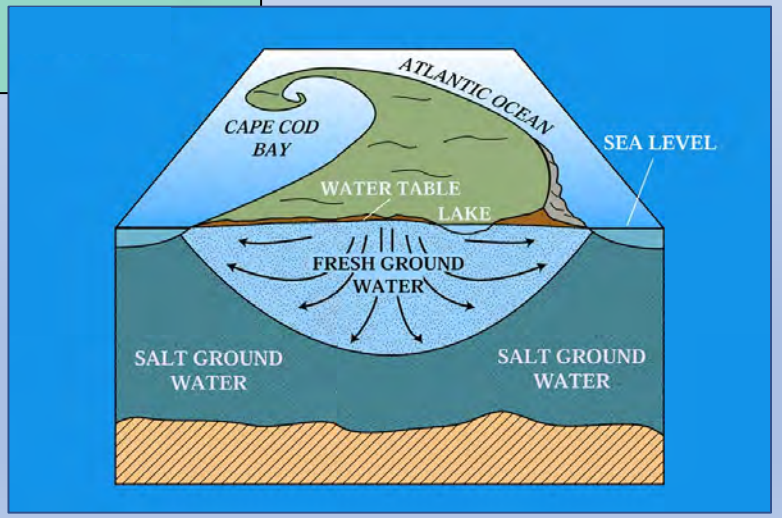


Cape Cod's Groundwater System

- Precipitation is the only source of freshwater
- The fresh groundwater system is bounded by the water table, bedrock, and saline groundwater



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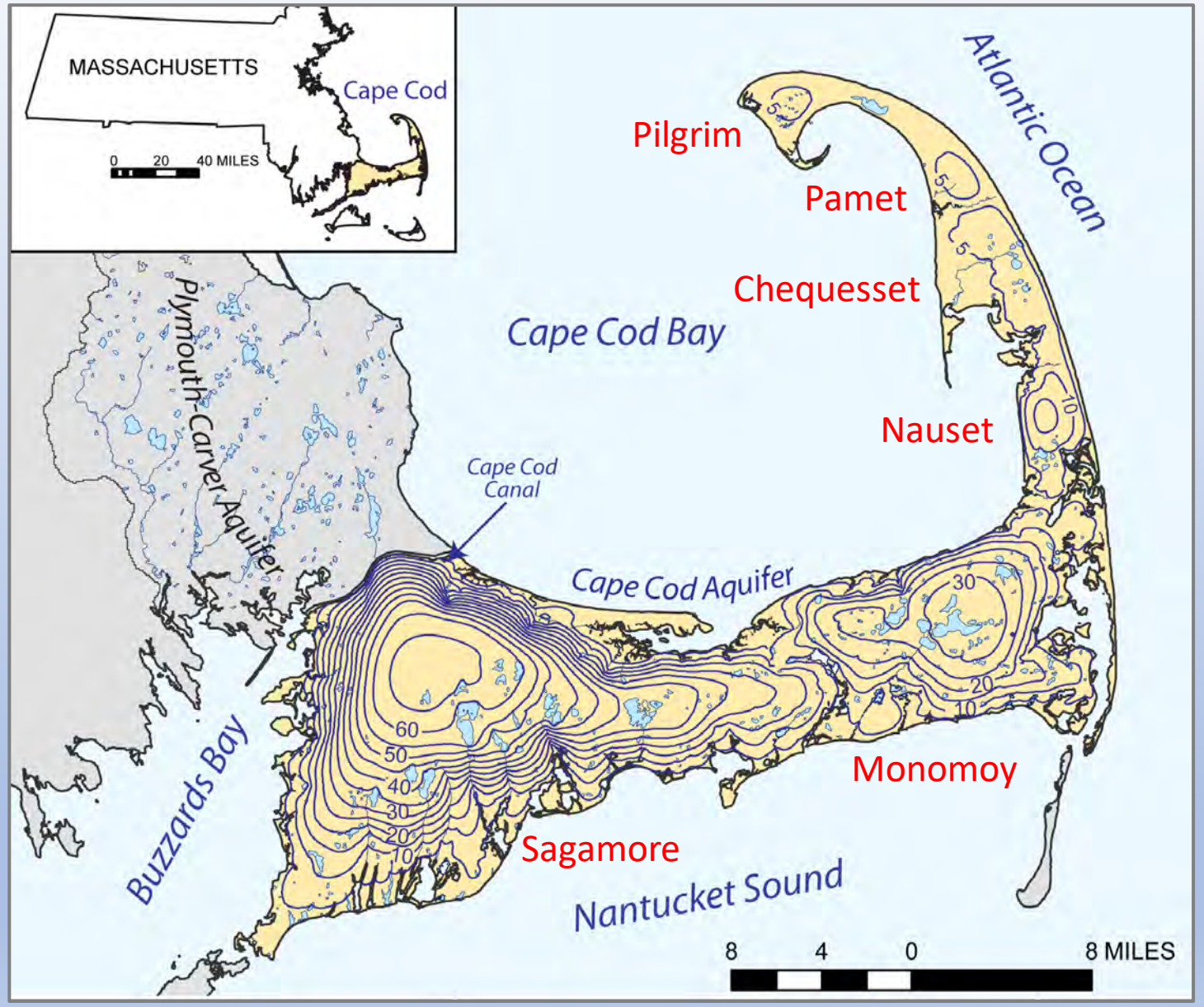
Cape Cod's Water Table

- The water table is the top of the saturated glacial deposits
- Cape Cod's freshwater system is cut off from the mainland by the Cape Cod Canal
- The water table forms six hydrologically separate flow cells, or mounds, separated by sea-level or near-sea-level topographic lows



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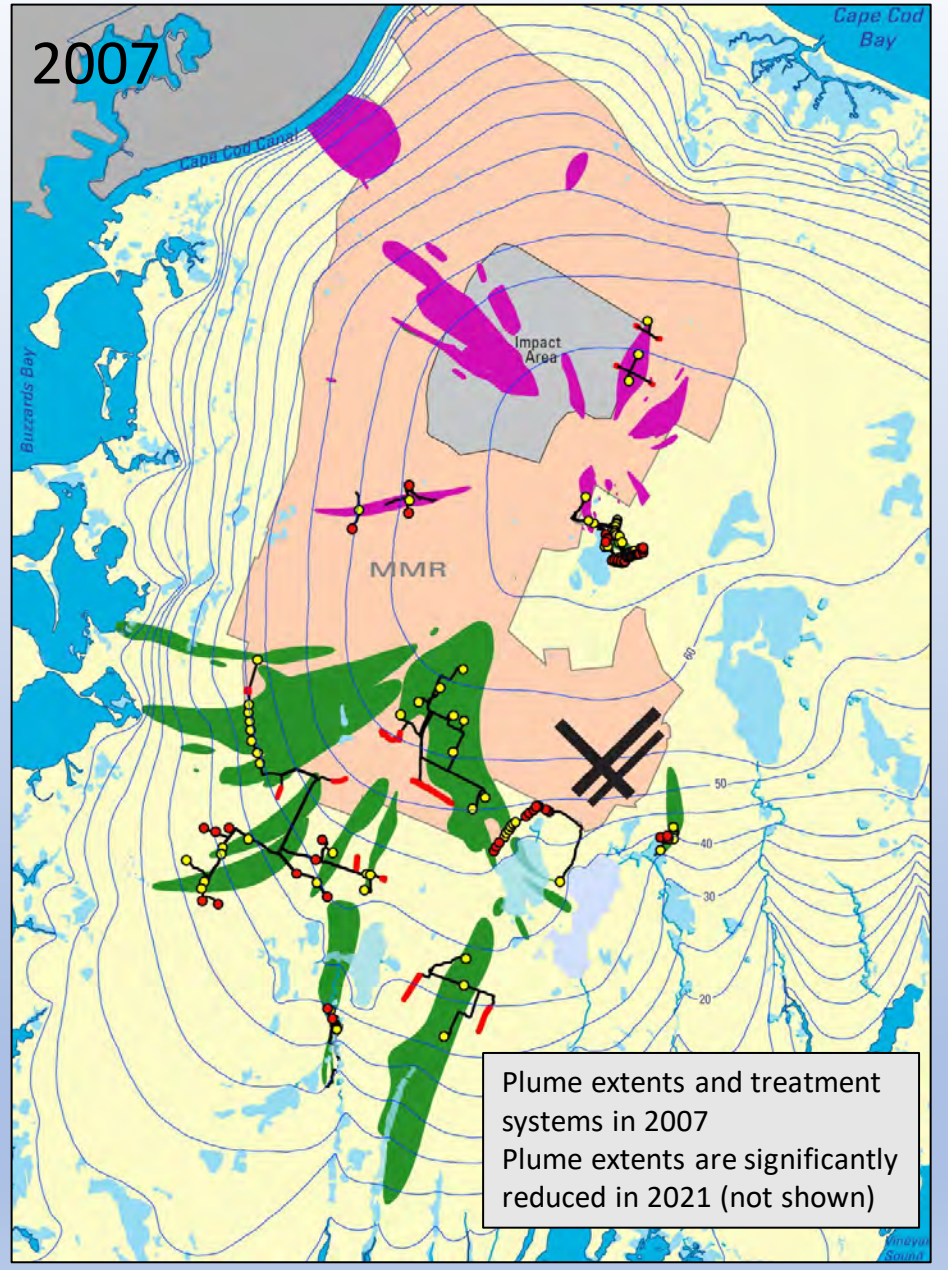
Groundwater Flow in the Cape Cod Aquifer

- Groundwater generally flows radially outward from the center of the flow cells toward the coast
- Groundwater-flow rates are typically 1-2 feet per day
- The diverging pattern of contaminant plumes at Joint Base Cape Cod is dramatic evidence of the flow directions



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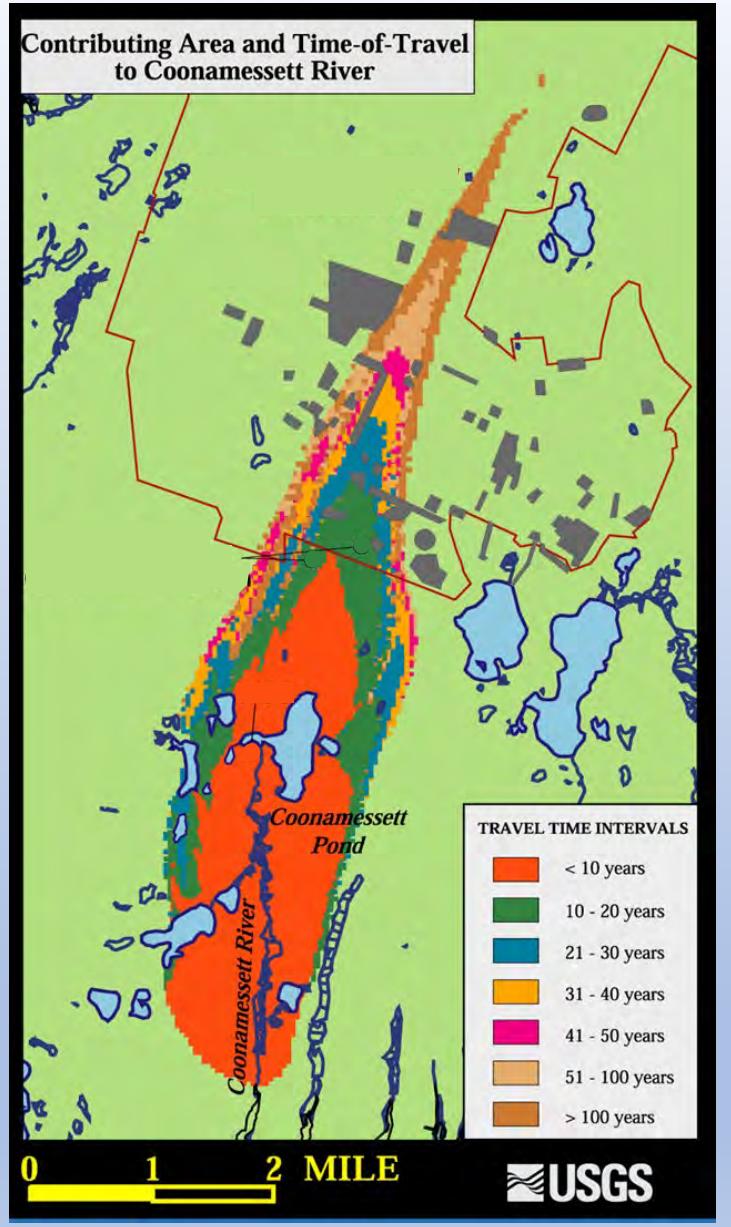
For information about environmental programs at Joint Base Cape Cod, see https://www.massnationalguard.org/JBCC/environ-overview.html

Cape Cod's Groundwater-Fed Streams

- Groundwater seepage causes most Cape Cod streams to gain flow with distance downstream



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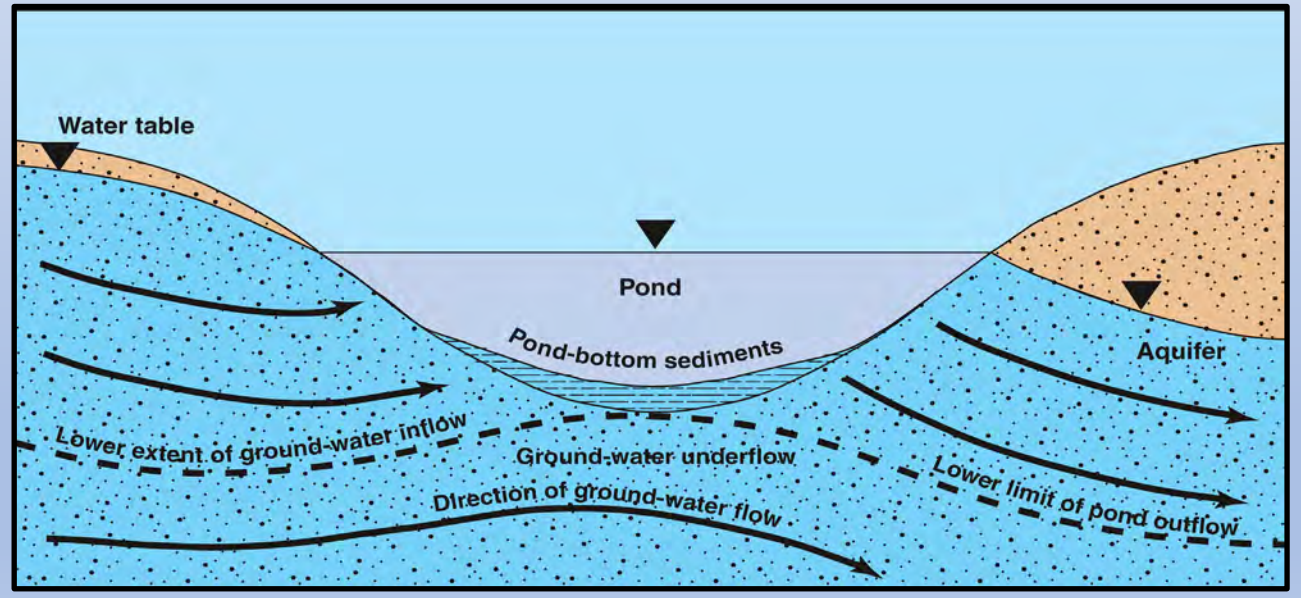
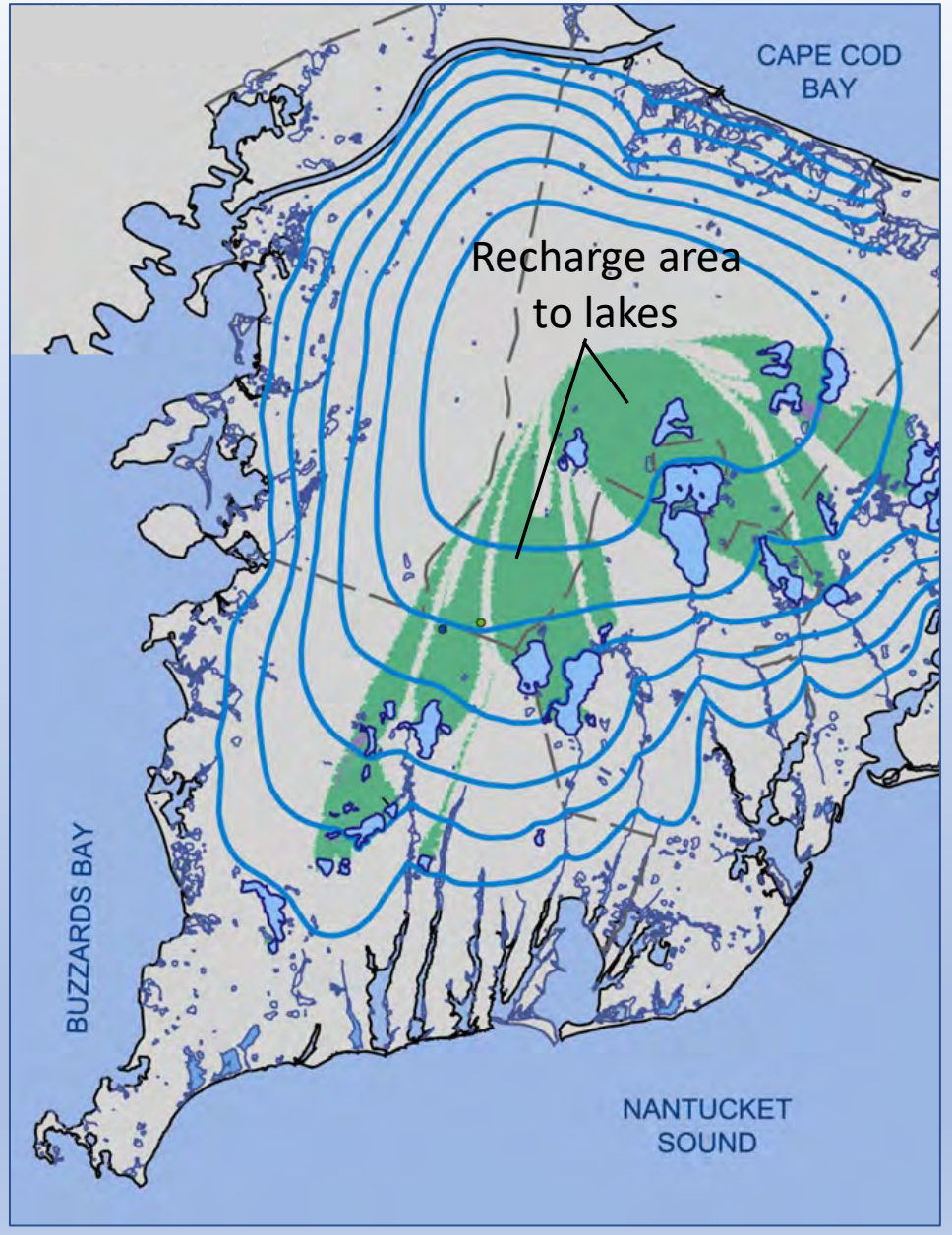
Cape Cod's Groundwater Flow-Through Lakes

- Groundwater recharge seeps into the lake on the upgradient side
- Lake water seeps into the aquifer on the downgradient side





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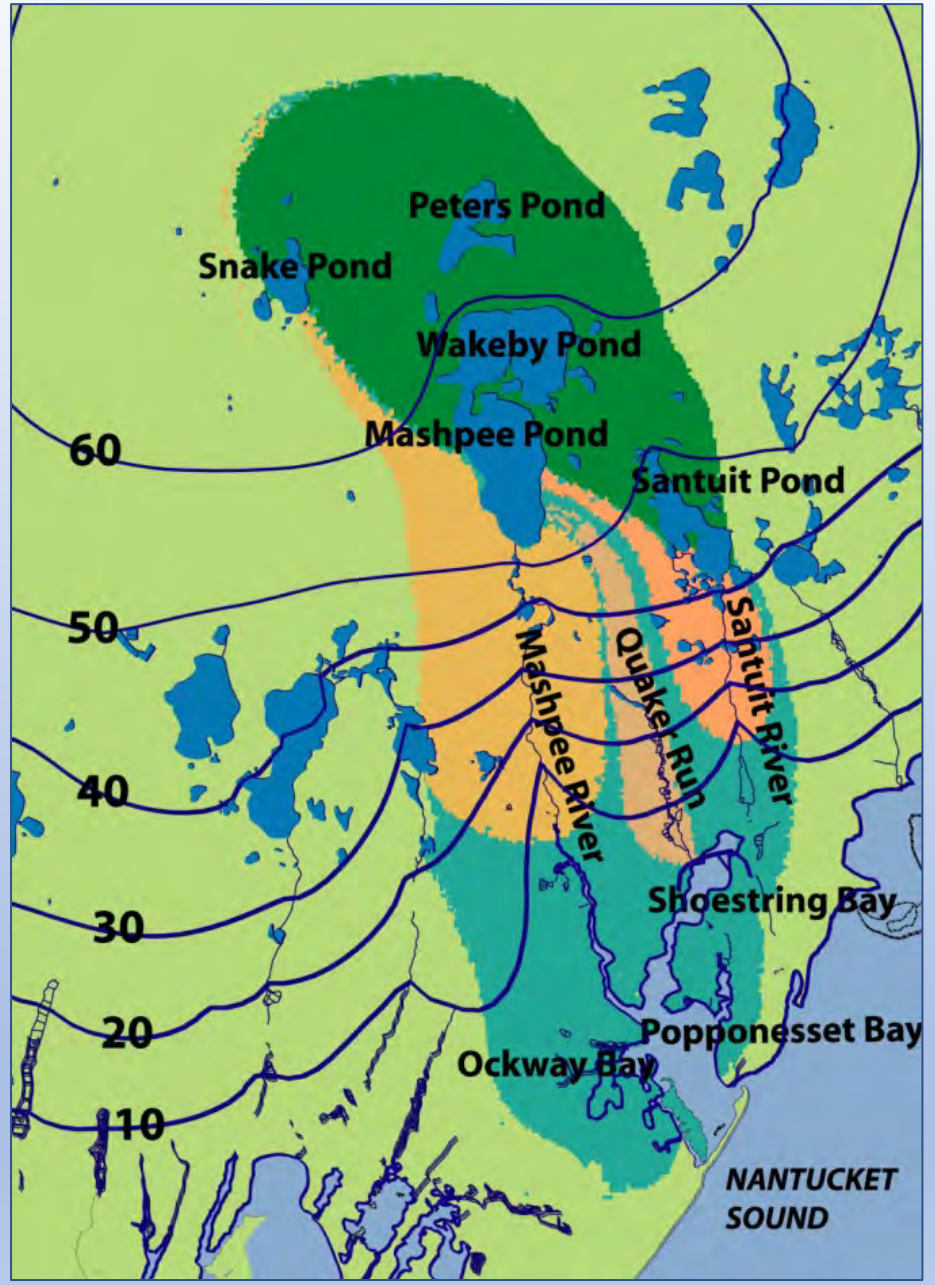
Groundwater Watersheds

- Watersheds are mapped by using groundwater models
- Not fixed like topographic watersheds because new stresses such as pumping wells can shift boundaries
- All the groundwater recharge is balanced by discharge from the aquifer at lakes, rivers, the coast, and pumping wells



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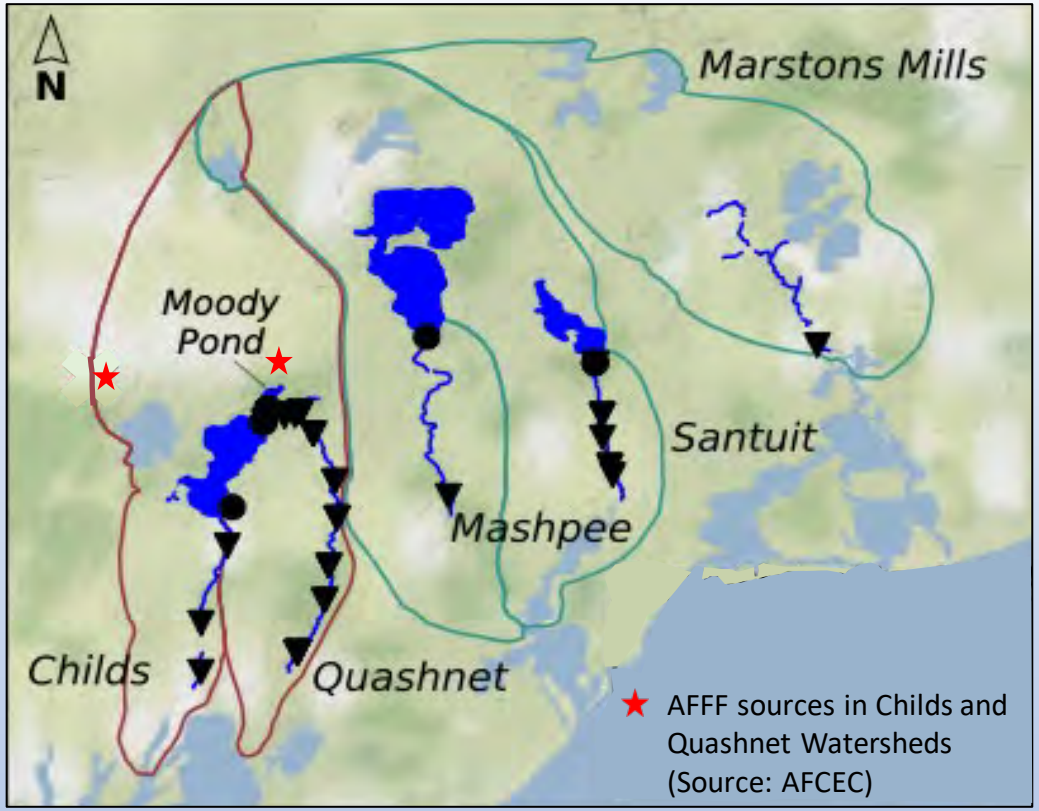

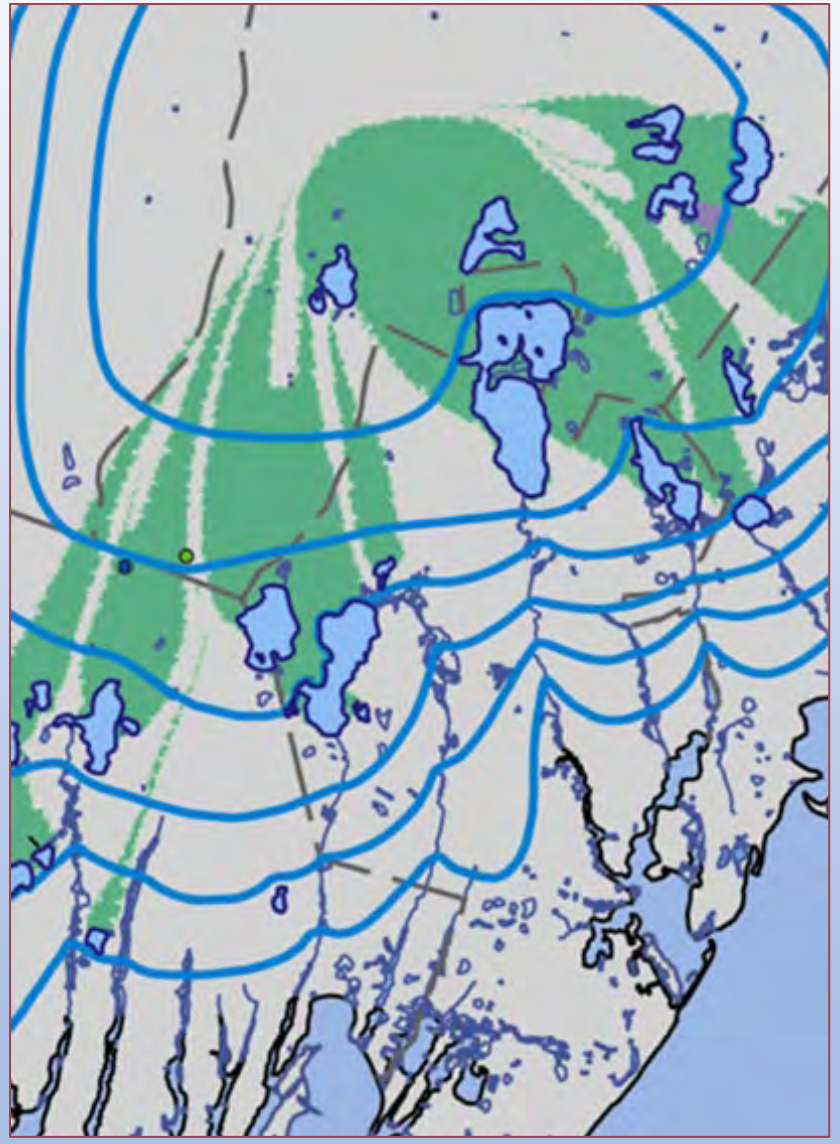

Groundwater Watersheds Can Be Complex

- Childs and Quashnet Rivers are fed by groundwater that recharges near the rivers and also by groundwater that first passes through Ashumet, Johns, and/or Moody Ponds

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Other Sources of Information

- Masterson, J.P., and Walter, D.A., 2009, *Hydrogeology and groundwater resources of the coastal aquifers of southeastern Massachusetts*: U.S. Geological Survey Circular 1338, 16 p.

  https://pubs.usgs.gov/circ/circ1338/

- Barbaro, J.R., Masterson, J.P., and LeBlanc, D.R., 2014, Science for the stewardship of the groundwater resources of Cape Cod, Massachusetts: U.S. Geological Survey Fact Sheet 2014–3067, 6 p.

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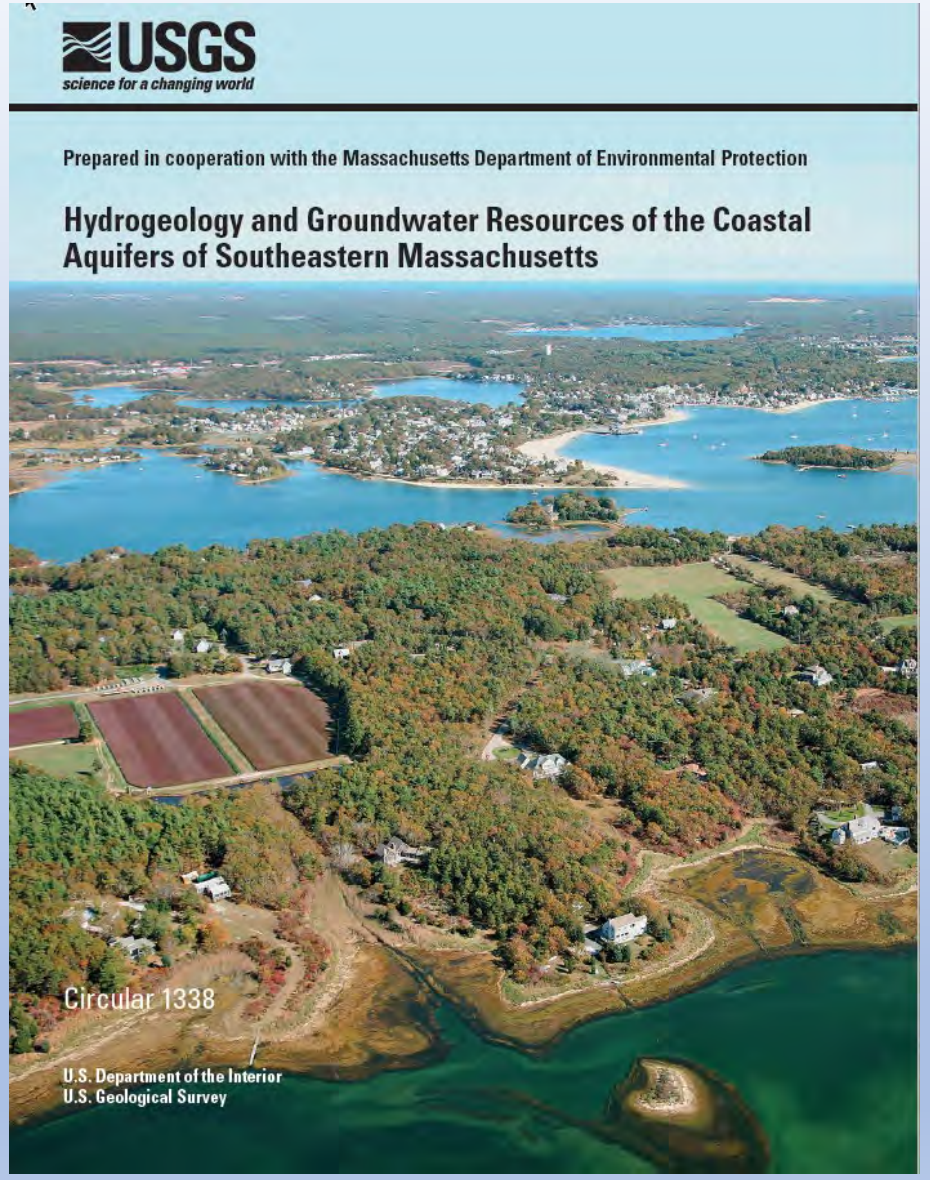

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