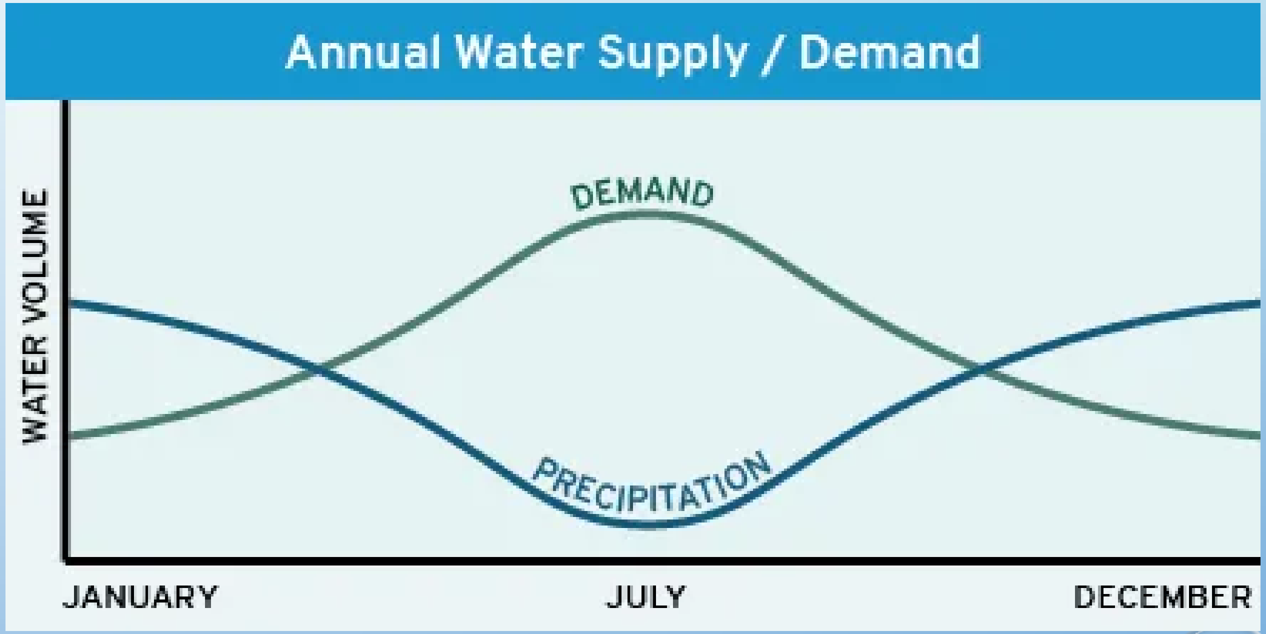
Water on Whidbey

Whidbey Island Conservation District

John Lovie

Supply and Demand

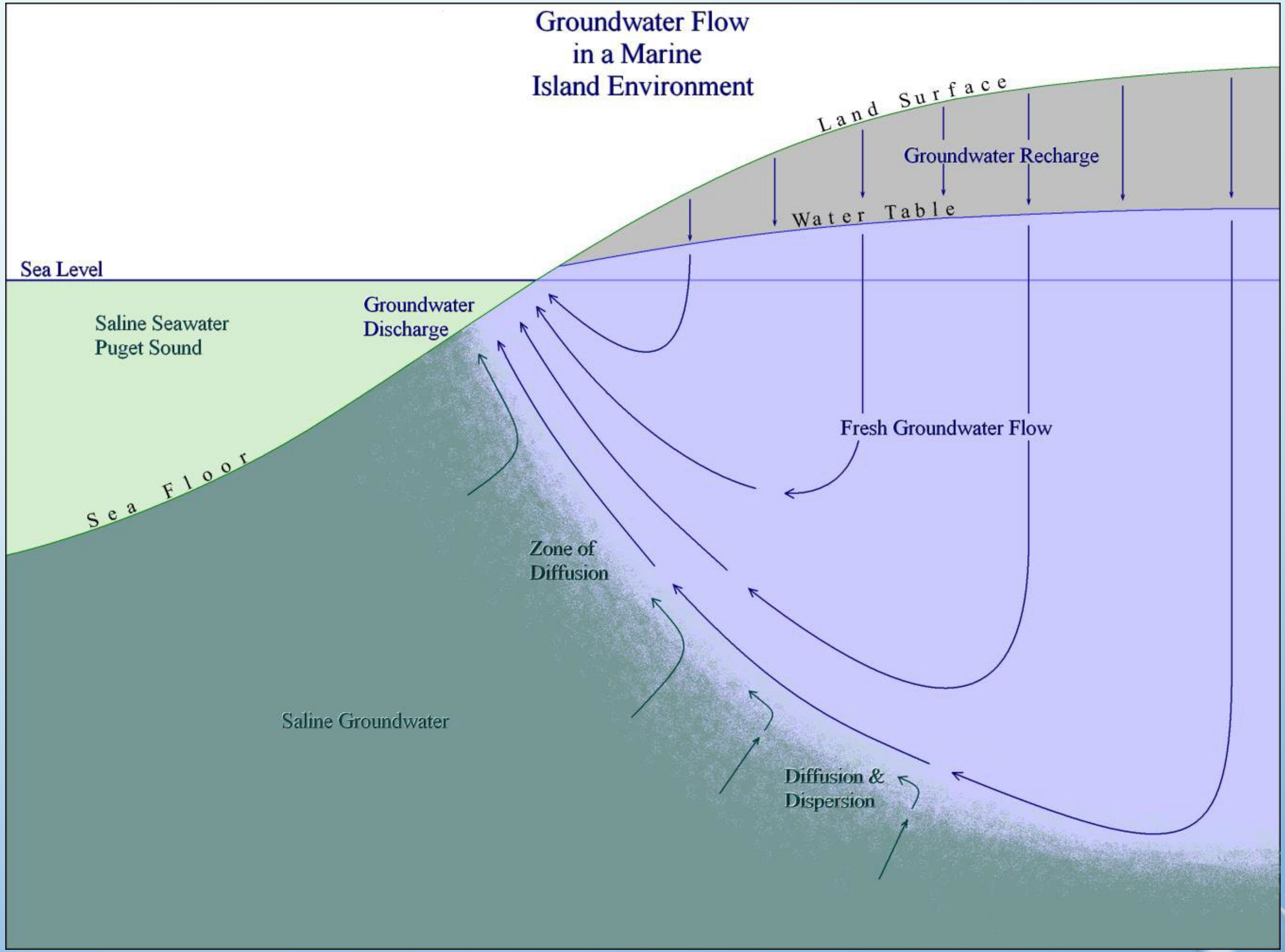
- Supply
  - Aquifer recharge
  - Contamination
- Demand
  - Consumption – Water Footprint
- Solutions
  - Community solutions



A Leaky Bathtub

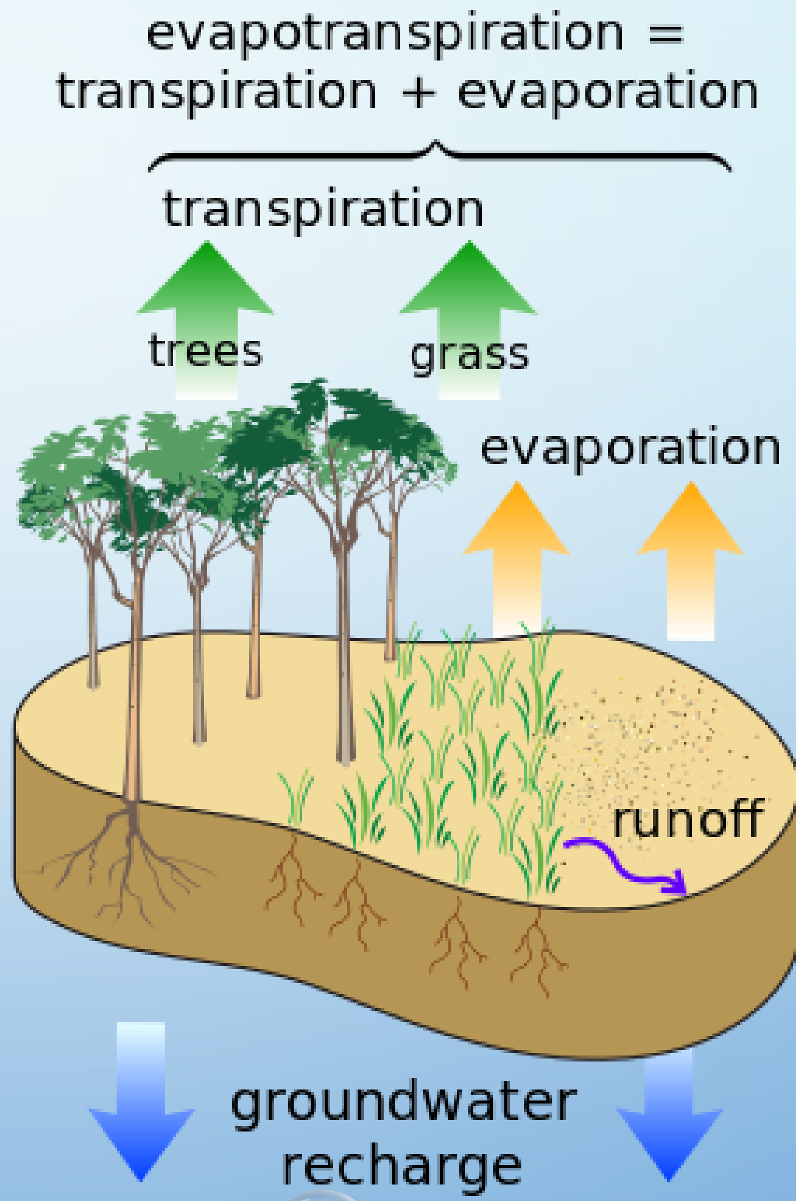
Fresh water exists on these islands in dynamic equilibrium with the saltwater around and under the islands. The unconsolidated layer containing the aquifer is between hundreds and several thousand feet deep, and at depth is saturated with salt water.

From Island County Water Resource Management Plan, 2005



Fate of Rainfall

Runoff in our case is augmented by interflow and seepage — groundwater exiting into salt water around and below the aquifer — a flow that is needed to keep the salt water at bay. The amount of recharge depends on rainfall, geology, soil type, and ground cover.



Average Annual Precipitation, in Inches

Figures from:

[Estimating Ground-Water Recharge from Precipitation on Whidbey and Camano Islands, Island County, Washington, Water Years 1998 and 1999](#).

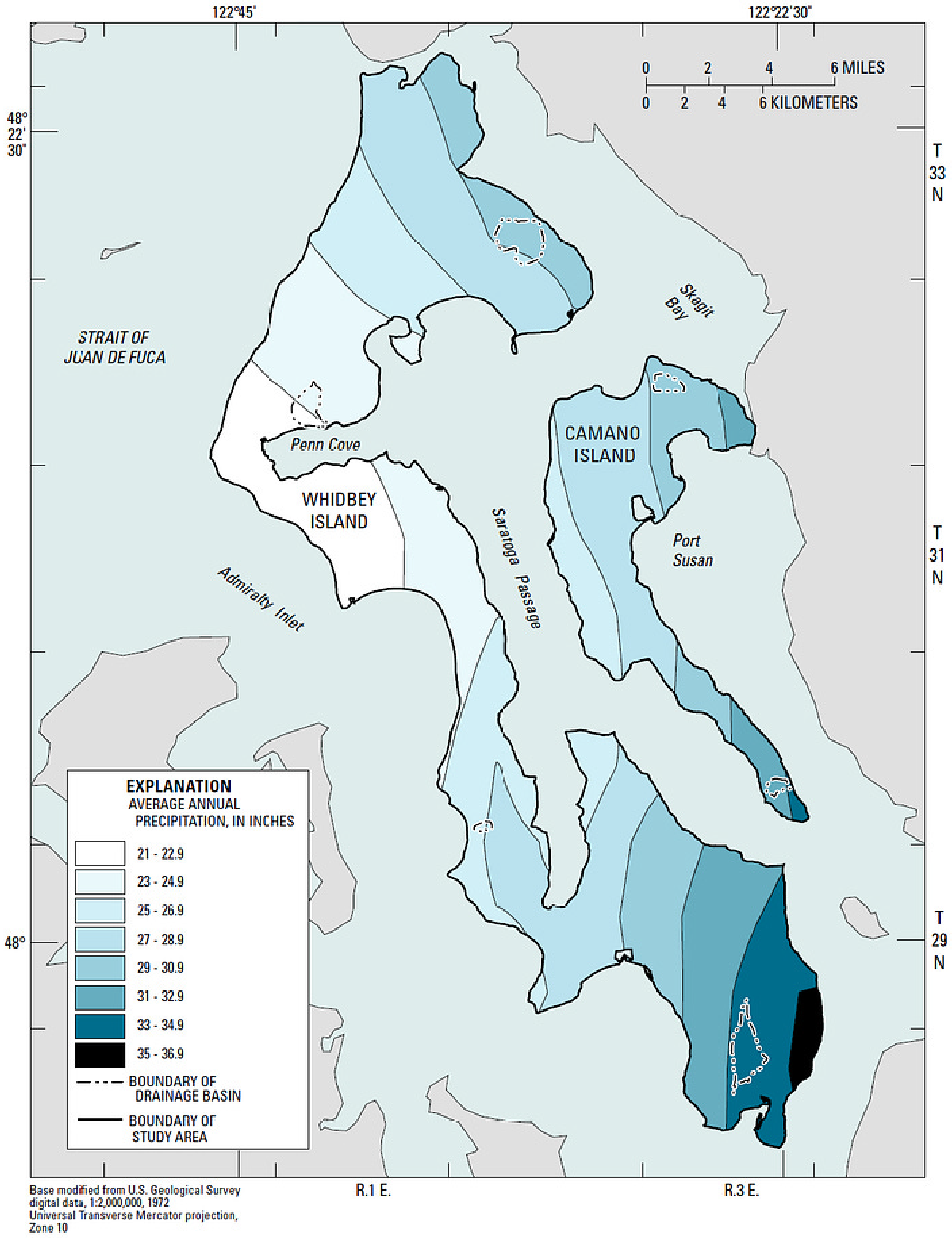
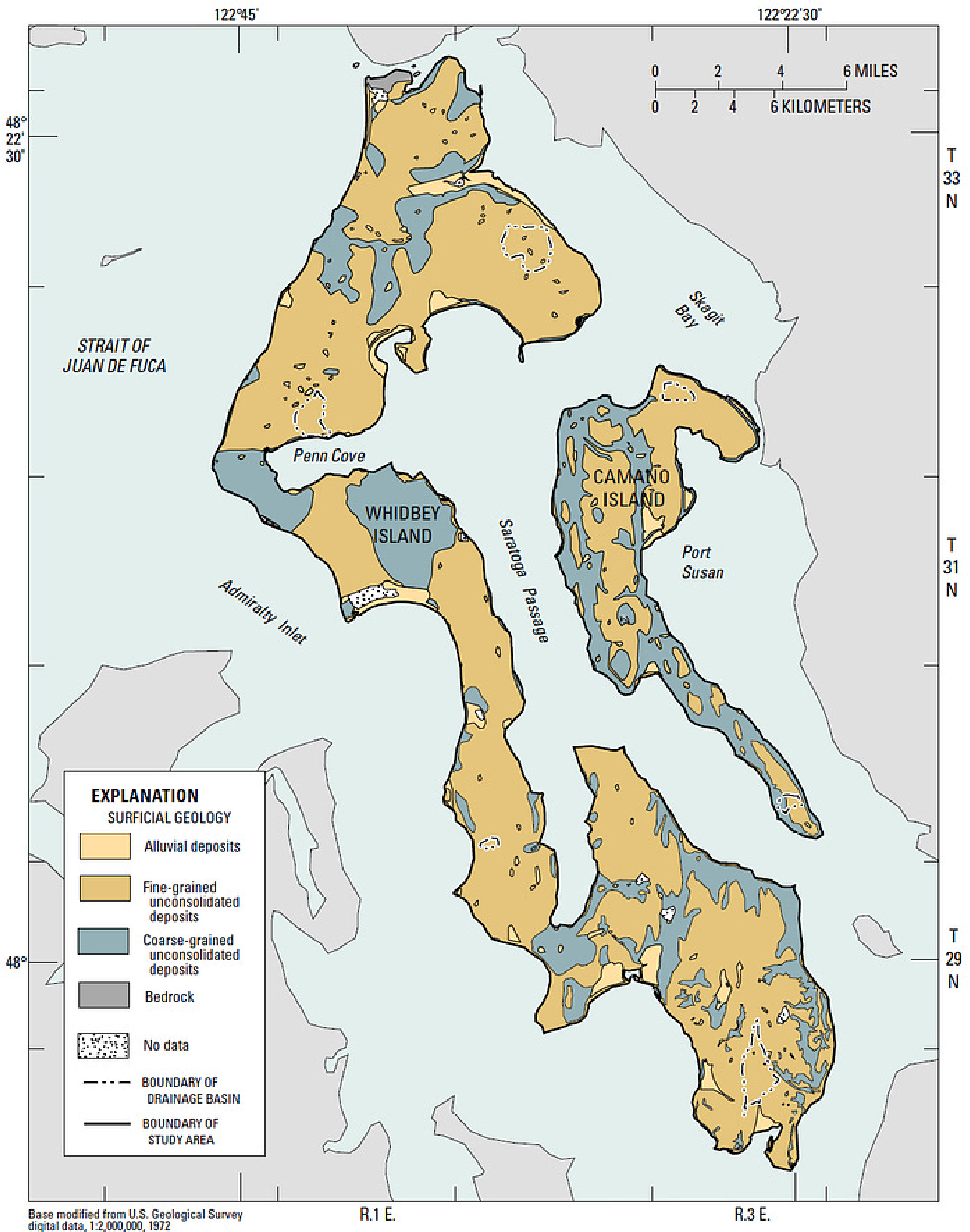


Figure 3. Average annual precipitation on Whidbey and Camano Islands, Island County, Washington. Precipitation values are from gridded values from PRISM (Oregon Climate Services, 1999) for 1961-90.

Surficial Geology

Almost all coarse- or fine-grained unconsolidated deposits



Base modified from U.S. Geological Survey digital data, 1:2,000,000, 1972
Universal Transverse Mercator projection, Zone 10

Figure 4. Generalized surficial geology of Whidbey and Camano Islands, Island County, Washington.

Soil Groups

See Table 8 in the paper.

4 in Whidbey Series:

[Official Series Description - WHIDBEY Series (usda.gov)]

"The Whidbey series consists of moderately deep to densic contact, moderately well drained soils formed in glacial drift overlying dense glaciomarine deposits. Whidbey soils are on hillslopes of glacial drift plains at elevations 0 to 90 meters. Slopes are 0 to 45 percent. Mean annual precipitation is about 610 mm. Mean annual temperature is about 9 degrees C."

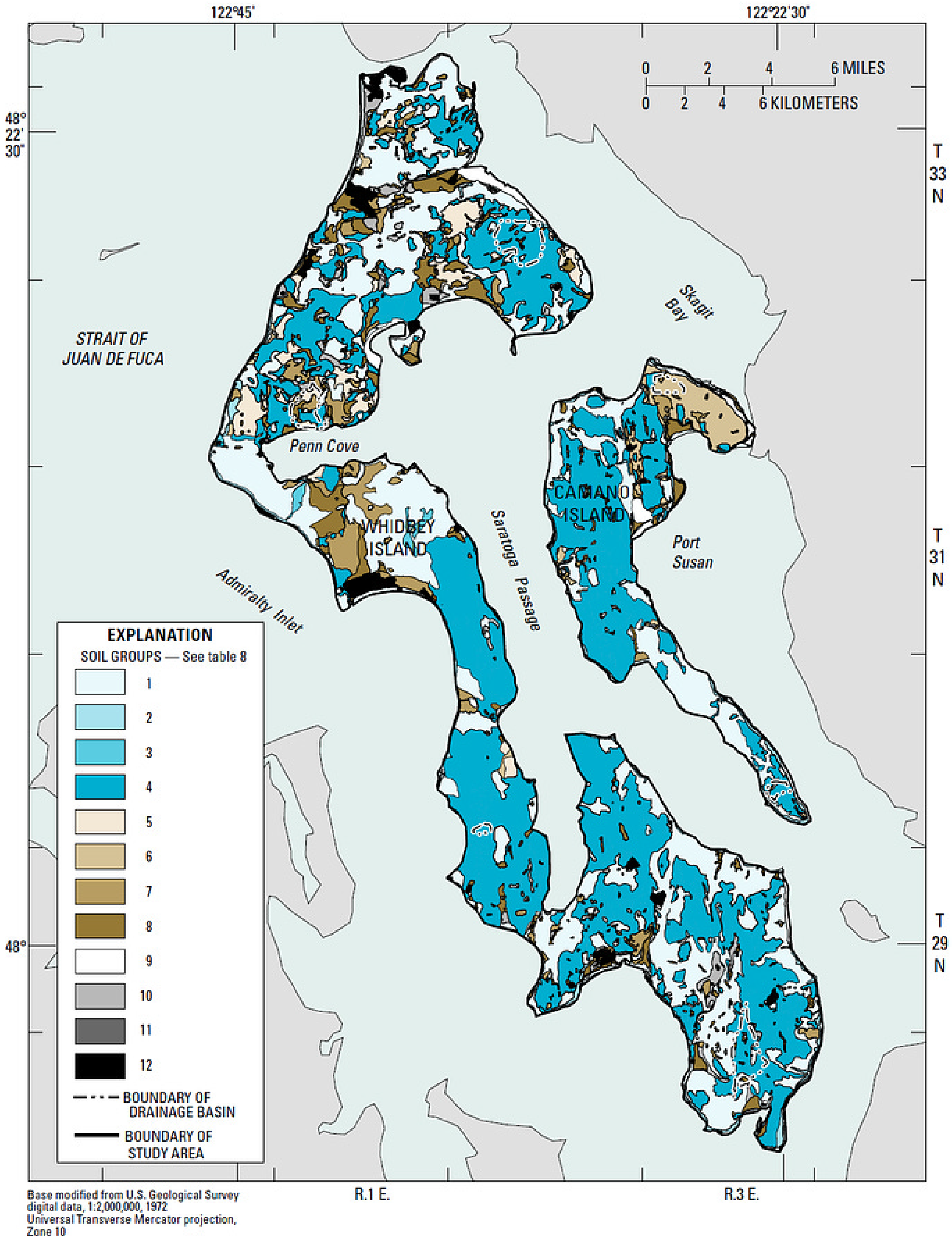


Figure 7. Generalized soil groupings of Island County soil series for Whidbey and Camano Islands, Island County, Washington.

Land Cover

Forested land has the highest recharge rate, but current rules require periodic timber harvests to qualify for a forestry tax break, leading to a proliferation of clear cuts and a degradation of recharge. Non-profit groups are pushing the idea of a credit here that recognizes the critical role forests play in maintaining our aquifer.

Note the large areas of alfalfa on the prairies and north end.

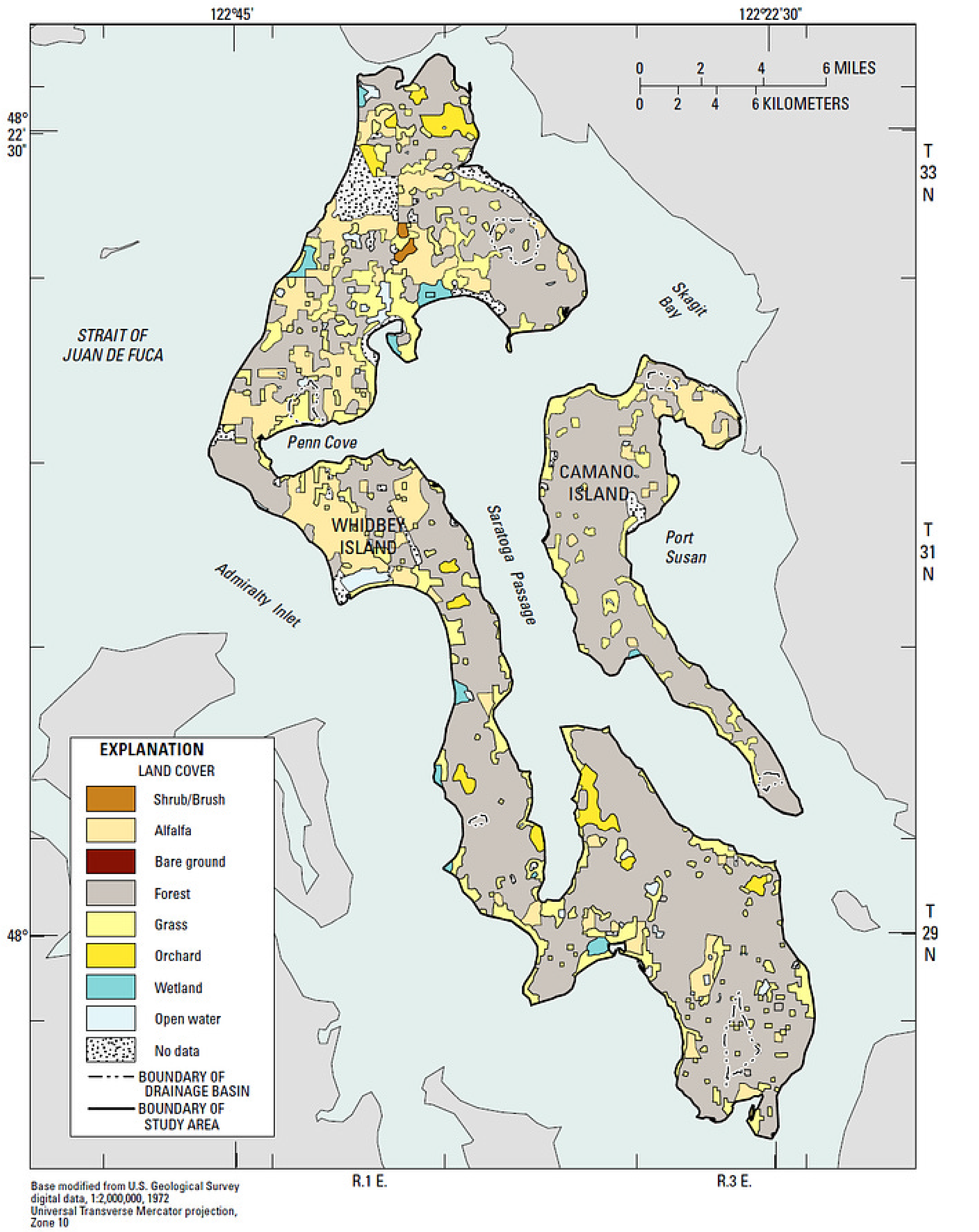


Figure 8. Distribution of land cover reclassified for the Deep Percolation Model for Whidbey and Camano Islands, Island County, Washington.

Simulated Annual Average Recharge, in Inches per Year

Note the high rates of recharge in the Lone Lake/Deer Lagoon, Maxwelton, Cultus Bay, Clover Valley, and Crescent Creek drainage basins, as well as in the Clinton - Deer Lake area.

Also note that all these discharge large amounts of fresh water to the sound, in the case of Lone Lake/Deer Lagoon and Clover Valley, via large pumps!

Much of the rest of the island, including the prairie, have lower levels of recharge.

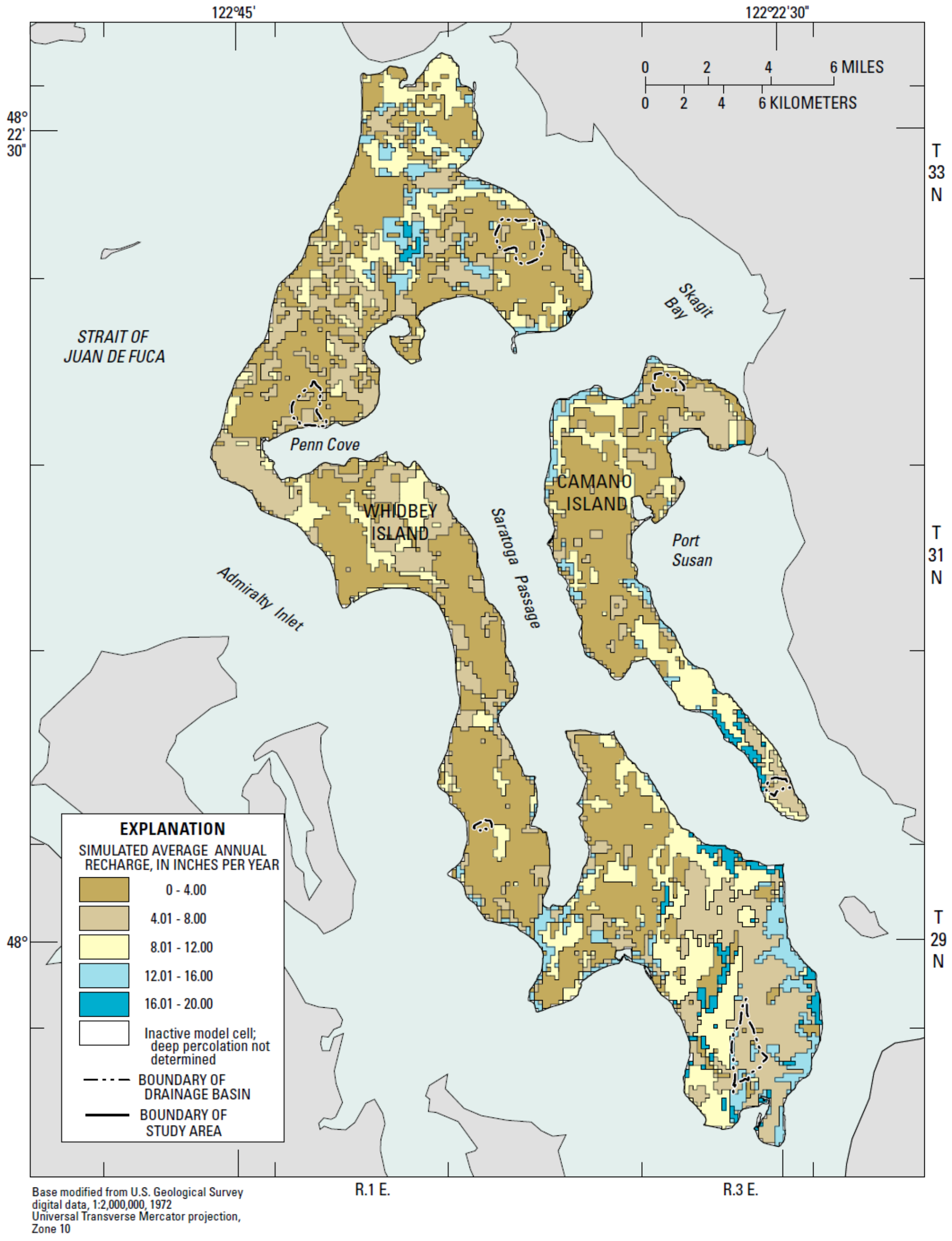


Figure 9. Distribution of average annual recharge simulated by the Deep Percolation Model, Island County, Washington.

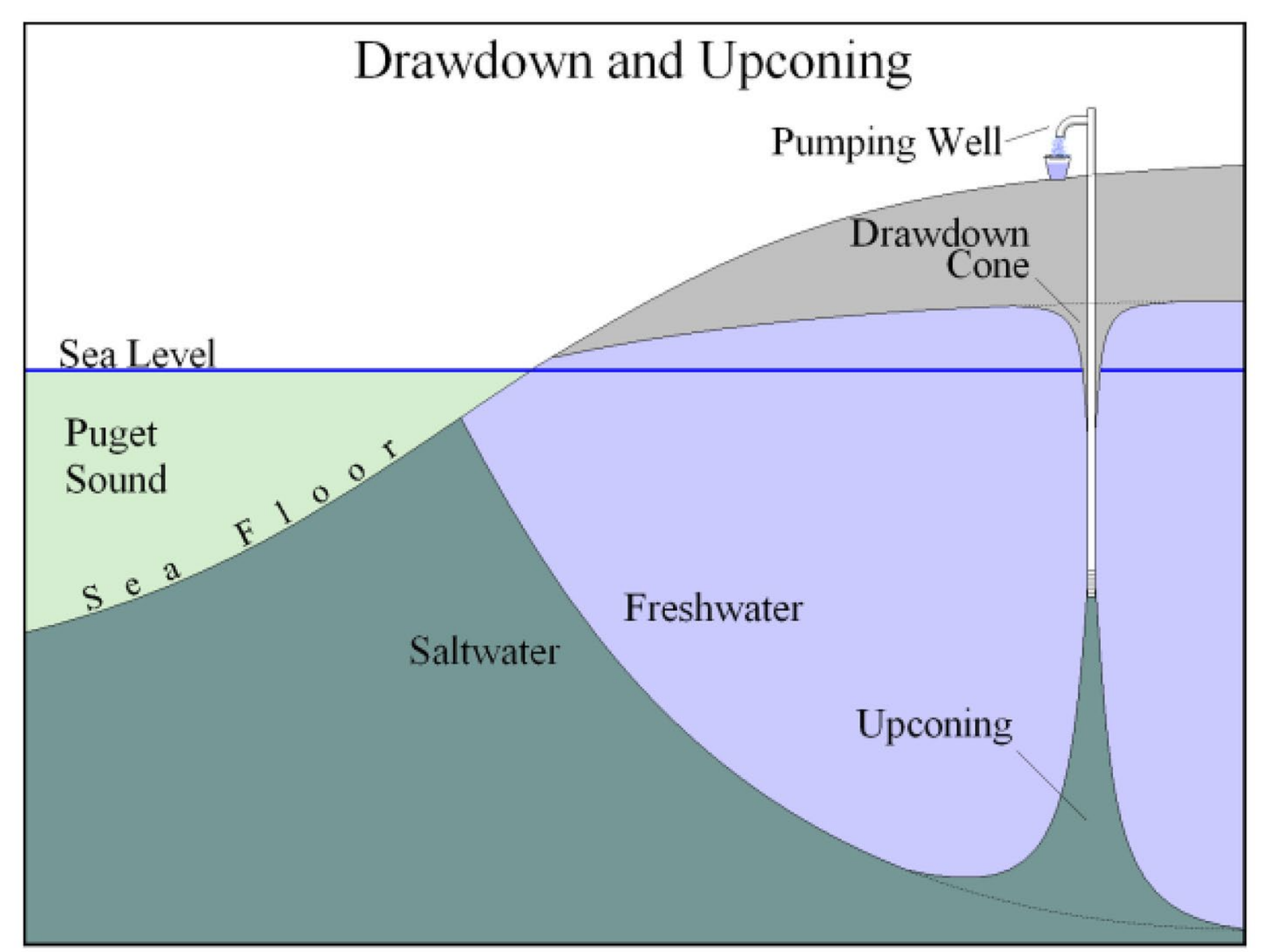
Climate Change Impacts

- Warmer, wetter winters
  - Increased rainfall, but…
  - Increased runoff?
- Hotter, drier summers
  - Increased irrigation need
  - Increased fire risk
- Sea level rise
  - Increased sea water intrusion risk
  - Increased flooding risk

Seawater Intrusion

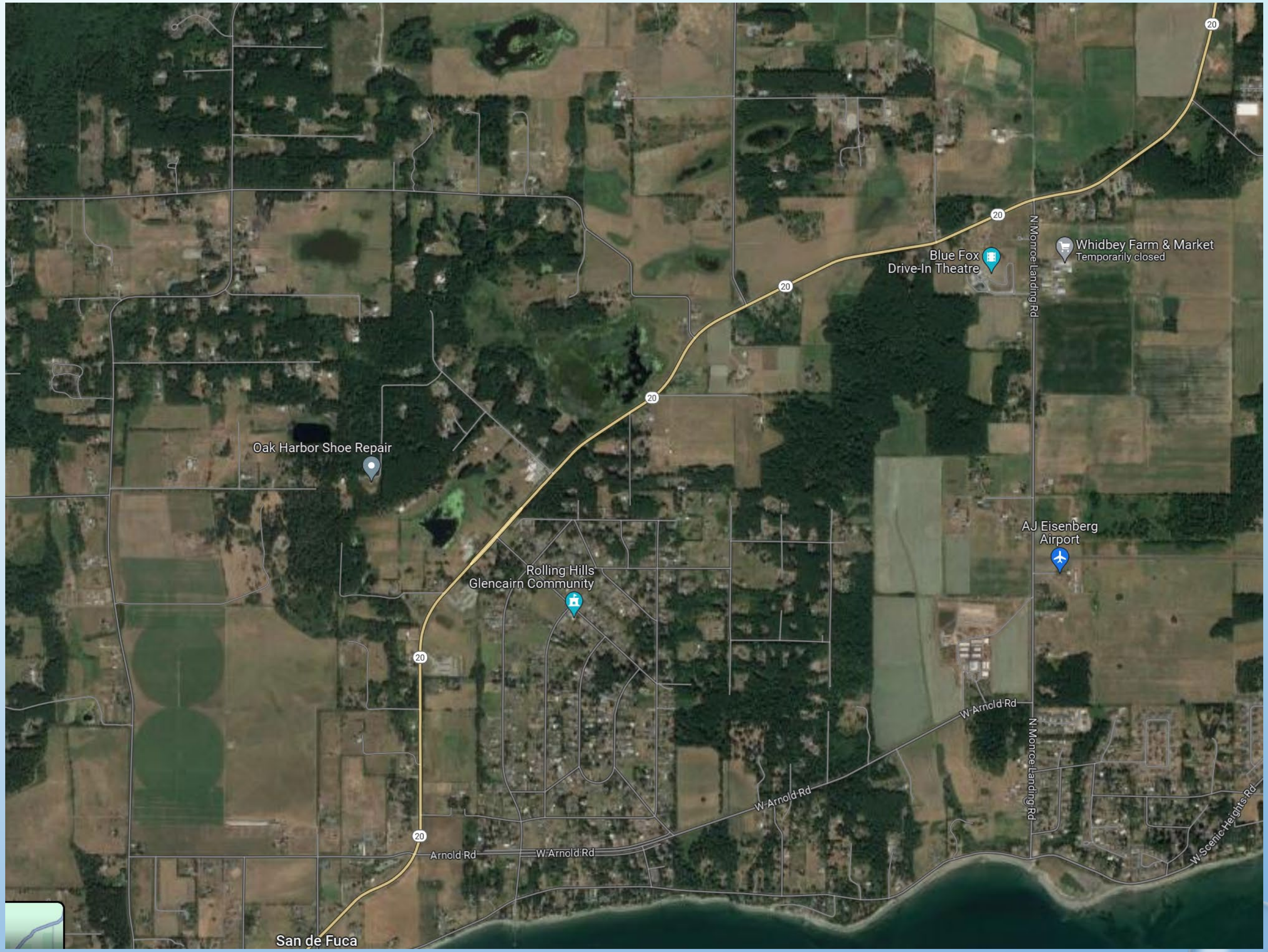
Usability of the aquifer is constrained in some areas by contamination. The most widespread of these is sea water intrusion. Wells near the shoreline are at risk of pulling sea water into the well, known as **upconing**. Increased pumping and sea level rise are increasing the risk. Majority of wells on Whidbey complete around sea level.

From Island County Seawater Intrusion Topic Paper



Nitrate and Related Contamination

Septic systems and animal feedlots have increased nitrate and related contamination in some areas.



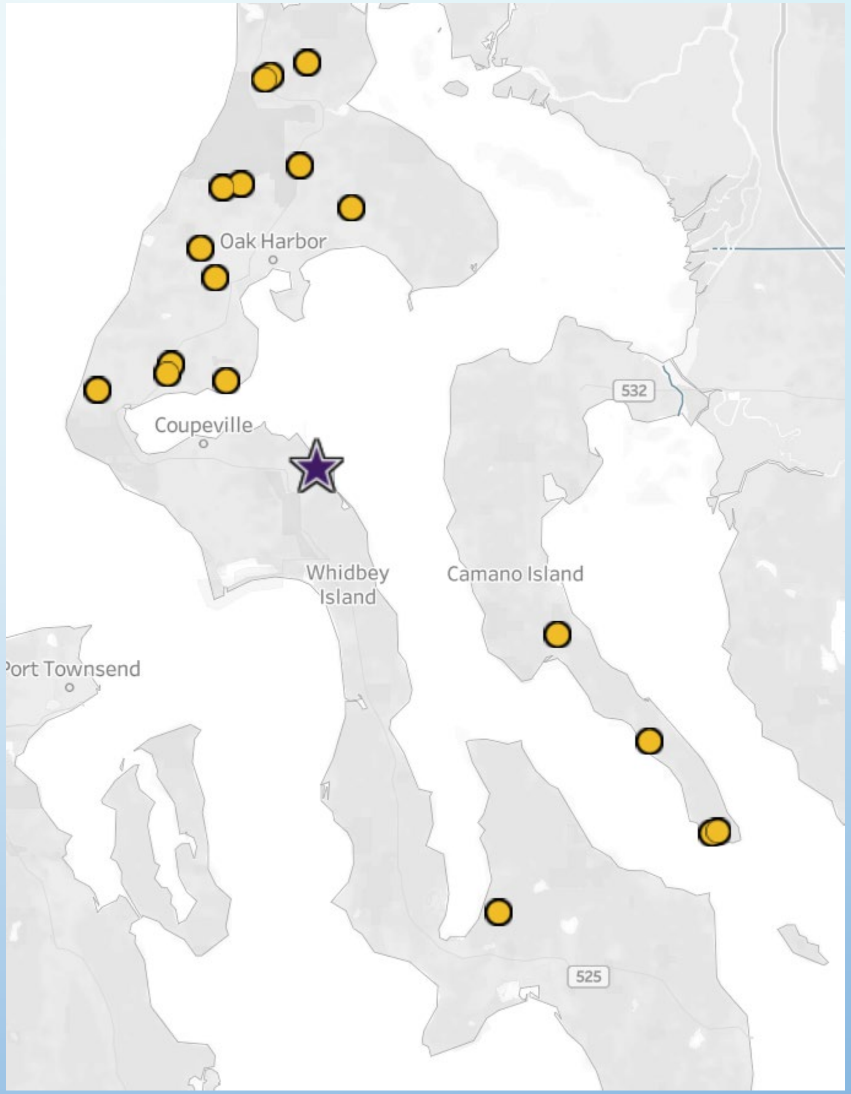
PFAS, “Forever Chemicals”

PFAS detections in Island County Group A water systems.

DOES NOT INCLUDE PFAS from OLF and Ault Field.

Both Clover Valley and Crescent Creek watersheds are contaminated with PFAS from Ault Field. Crescent Creek watershed is also home to the NAS Whidbey landfill.

Further testing may put other areas off limits.



Questions?

Contact info

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