



City of Bainbridge Island

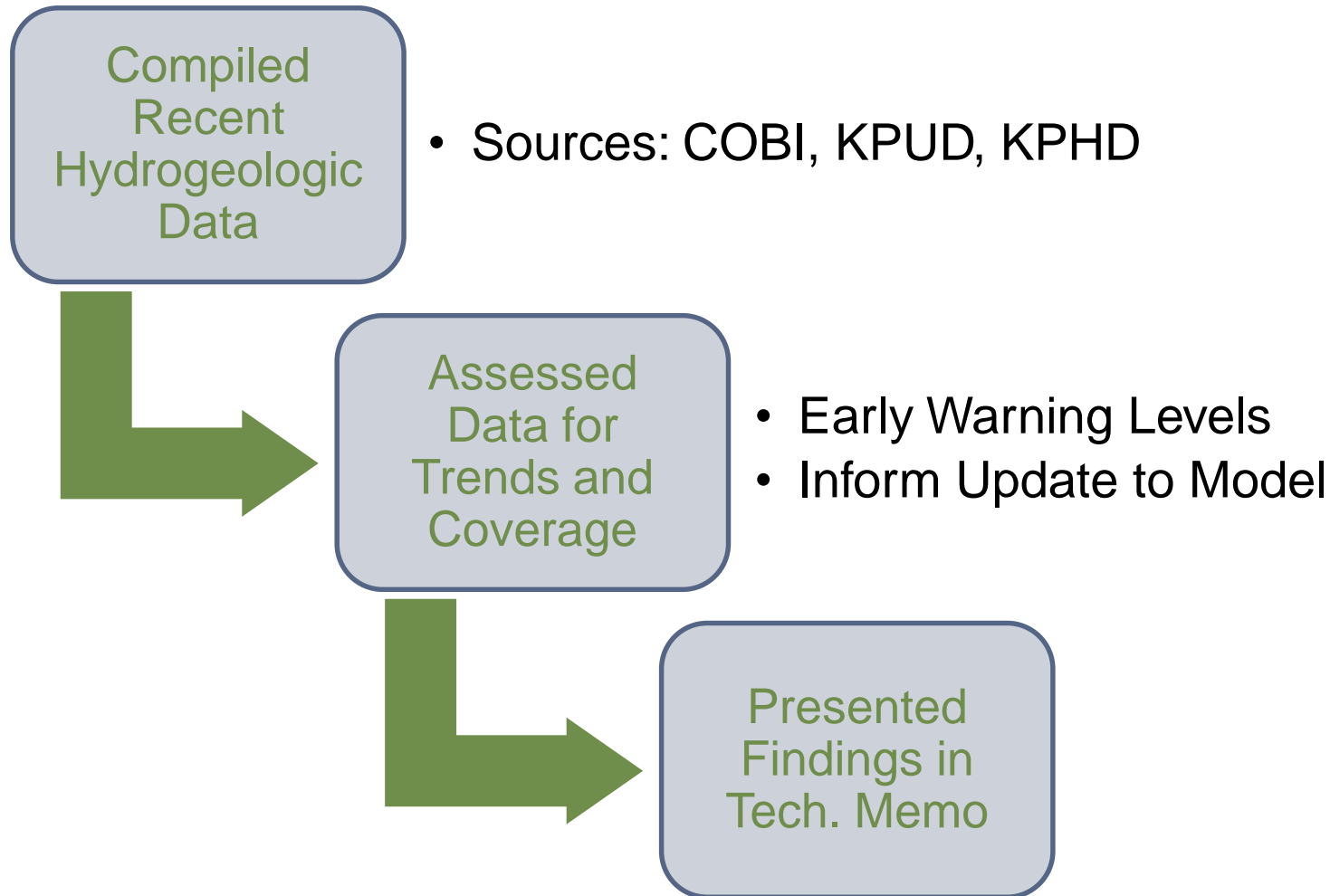
# Aquifer System Carrying Capacity: Concepts and Findings

March 17, 2016

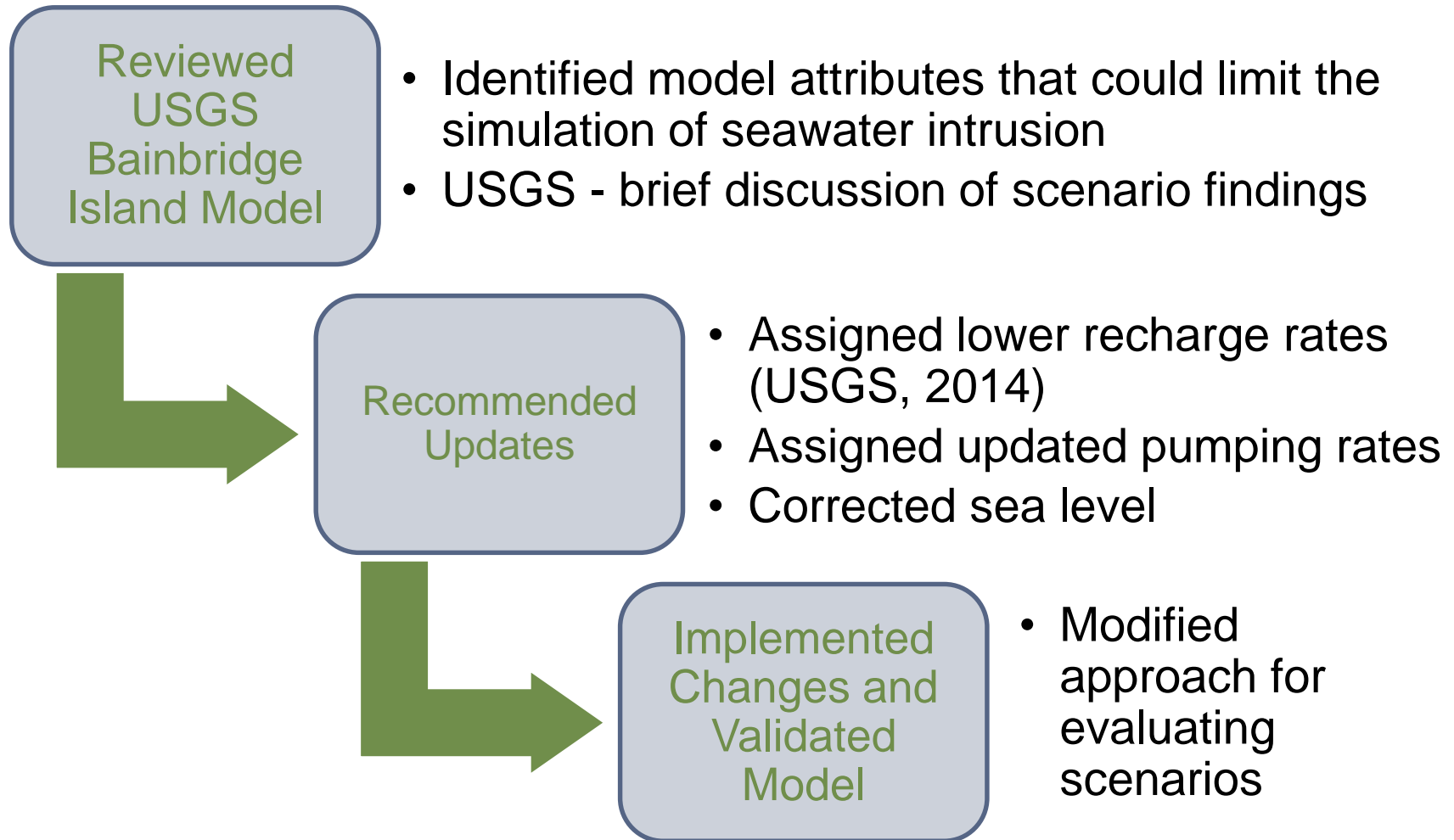
Presented by  
Peter Bannister, PE  
Tim Flynn, LHG



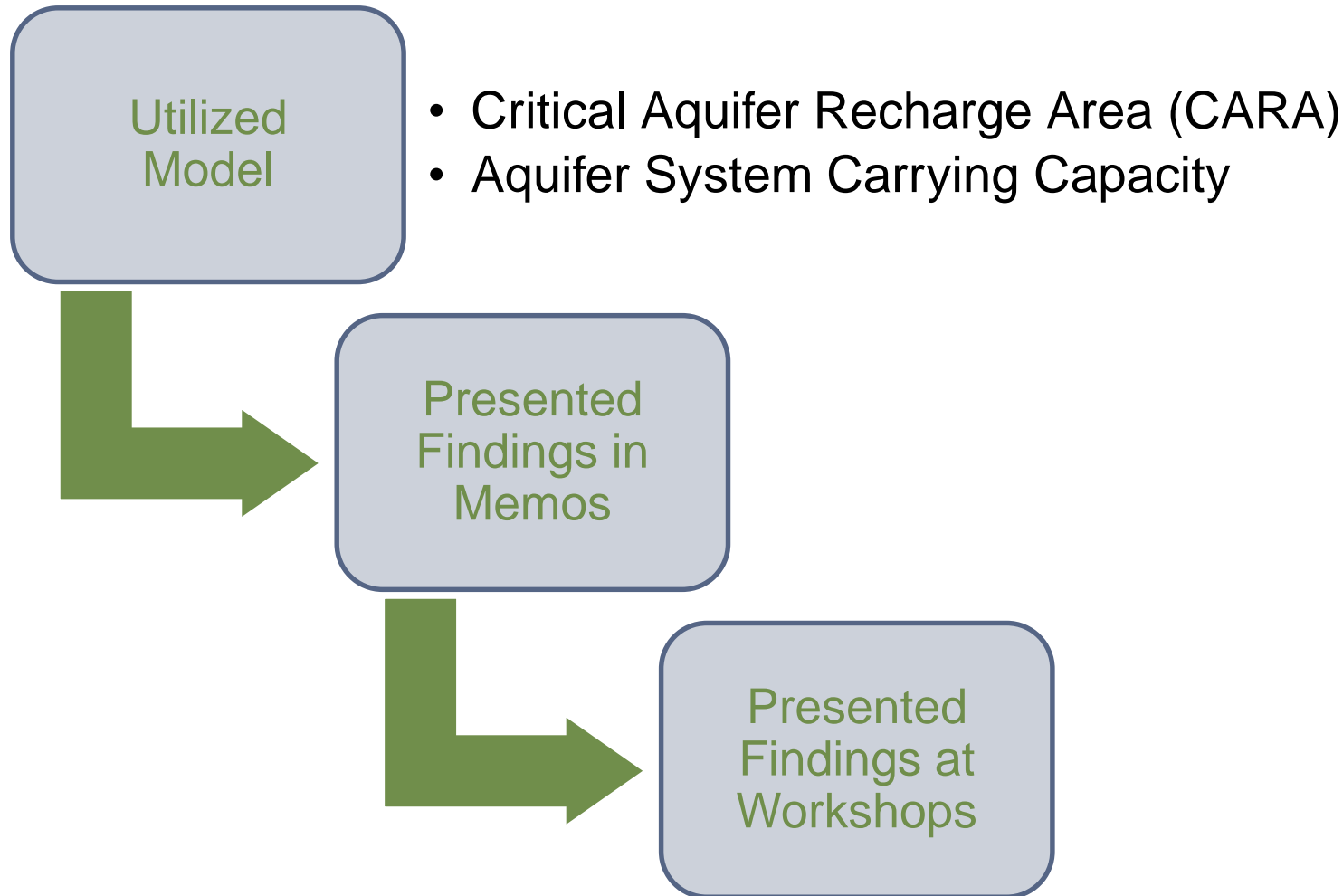
# Aspect Scope of Work – Task 1



# Aspect Scope of Work – Task 2



# Aspect Scope of Work – Task 3

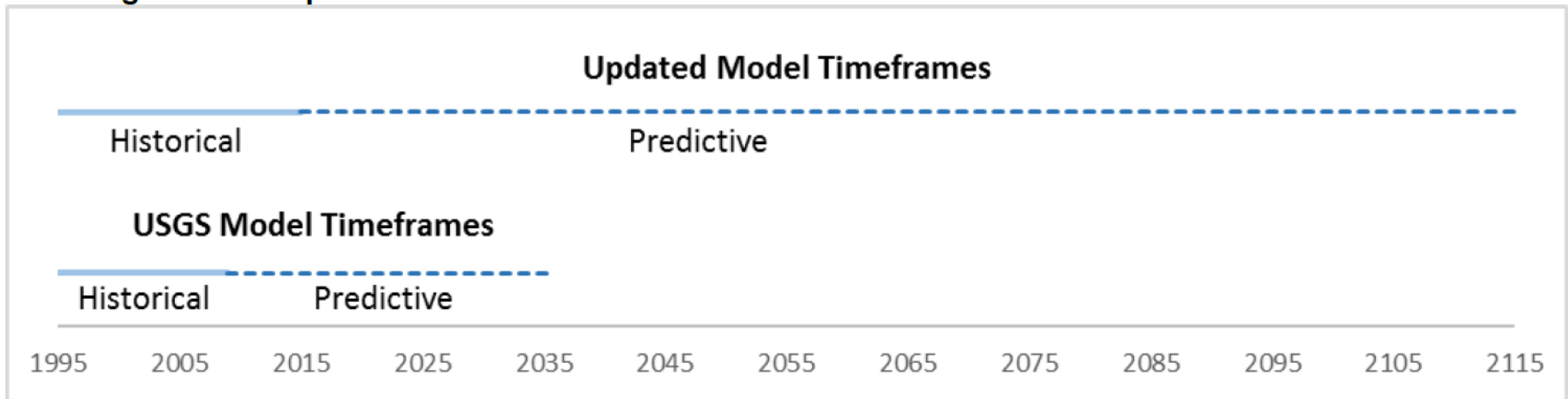


# Aquifer System Carrying Capacity

## Use of the GW Model to Assess Safe Yield

# Predictive Timeframe

**Figure 1: Comparison of Model Timeframes**



# Example of Long-term Changes Over Time



<http://bainbridgehistory.org/featured-exhibits/virtual-exhibits/>

Informal portrait of workers standing on and around the houseboat Lotus in the Winslow shipyard; 1915. B/W toned print 129



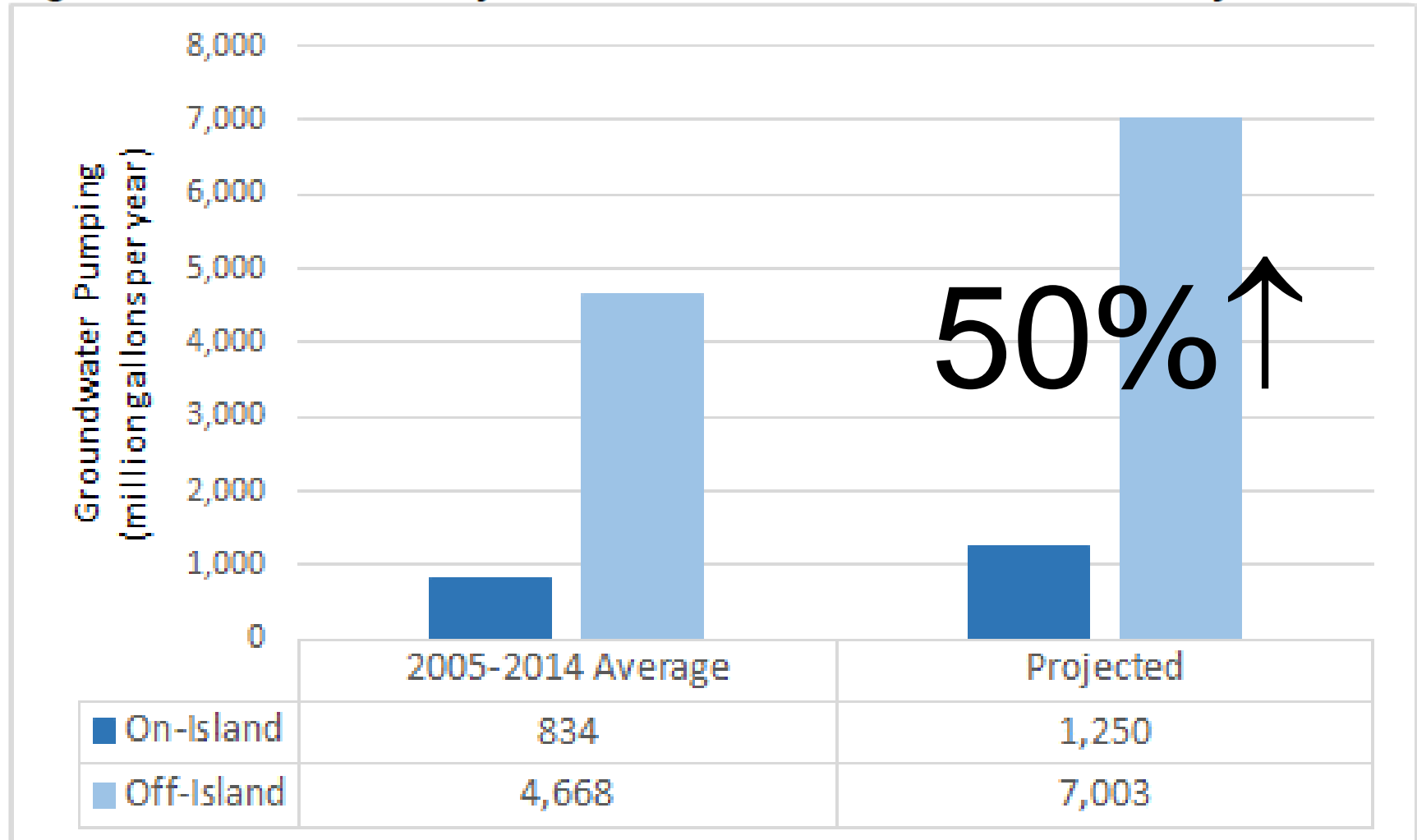
<http://visitbainbridge.com/>

2115?



# Regional Groundwater Withdrawals

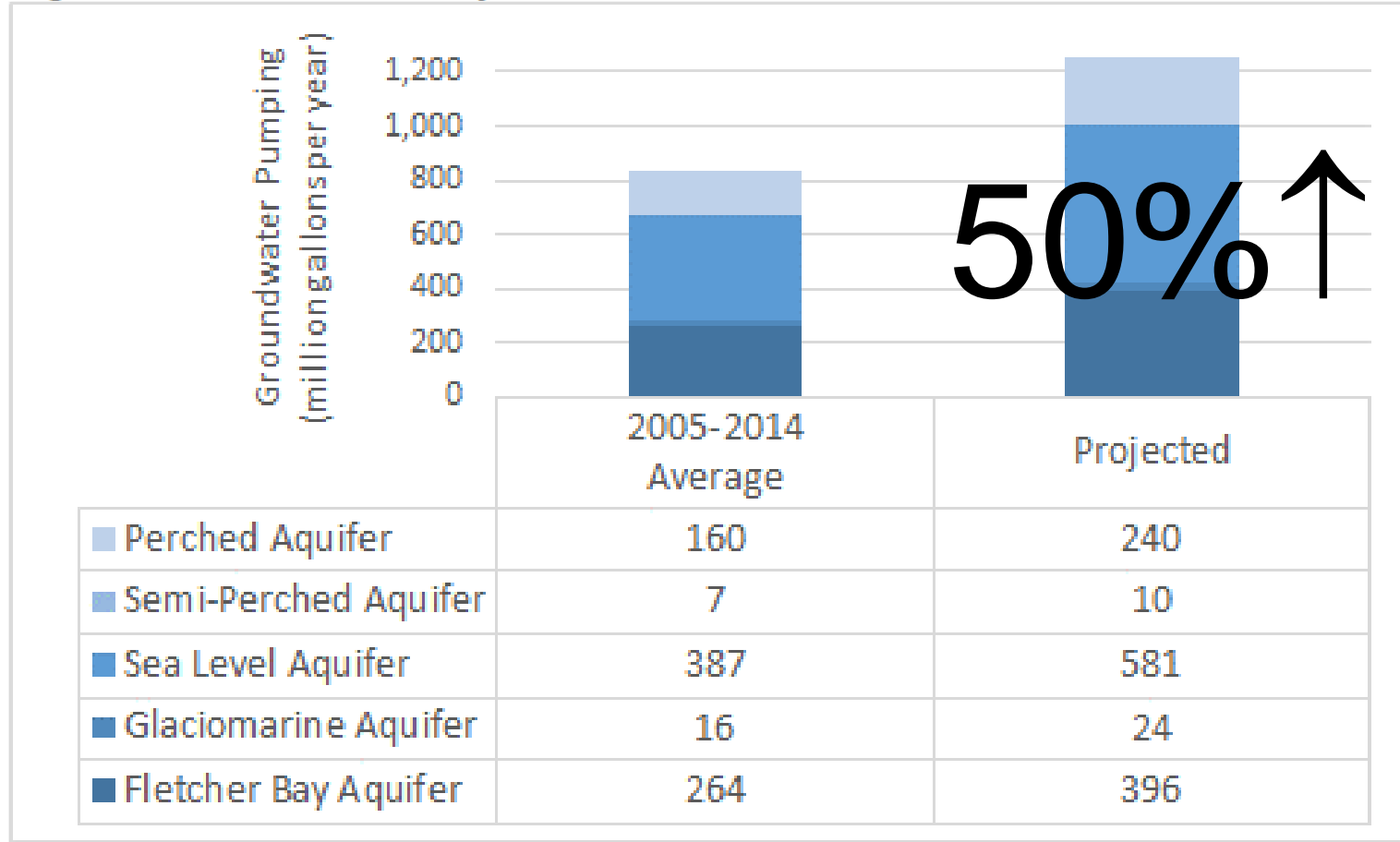
Figure 2: Current and Projected Groundwater Withdrawal Rates by Location





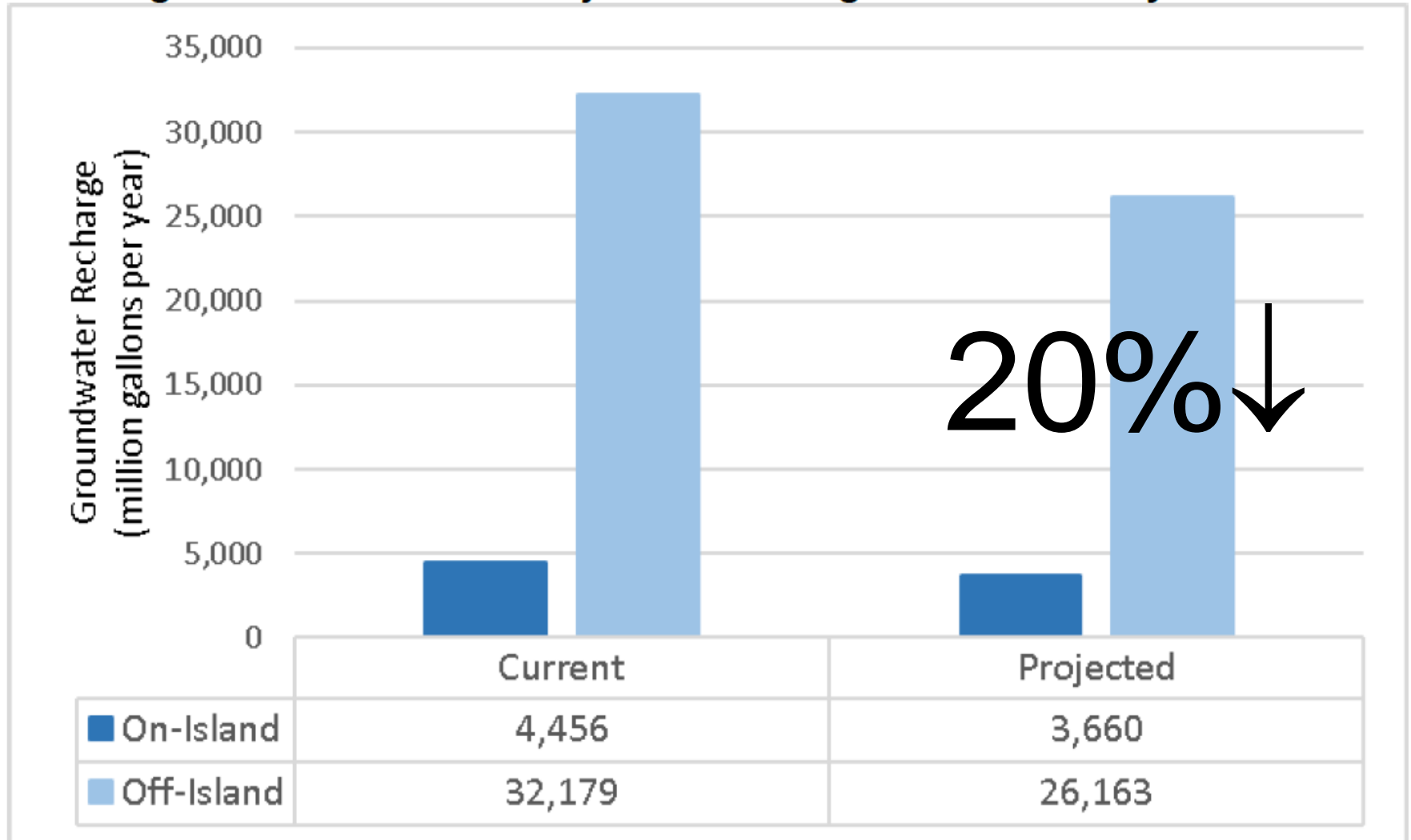
# On-Island Groundwater Withdrawals

Figure 3: Current and Projected On-Island Groundwater Withdrawal Rates by Aquifer



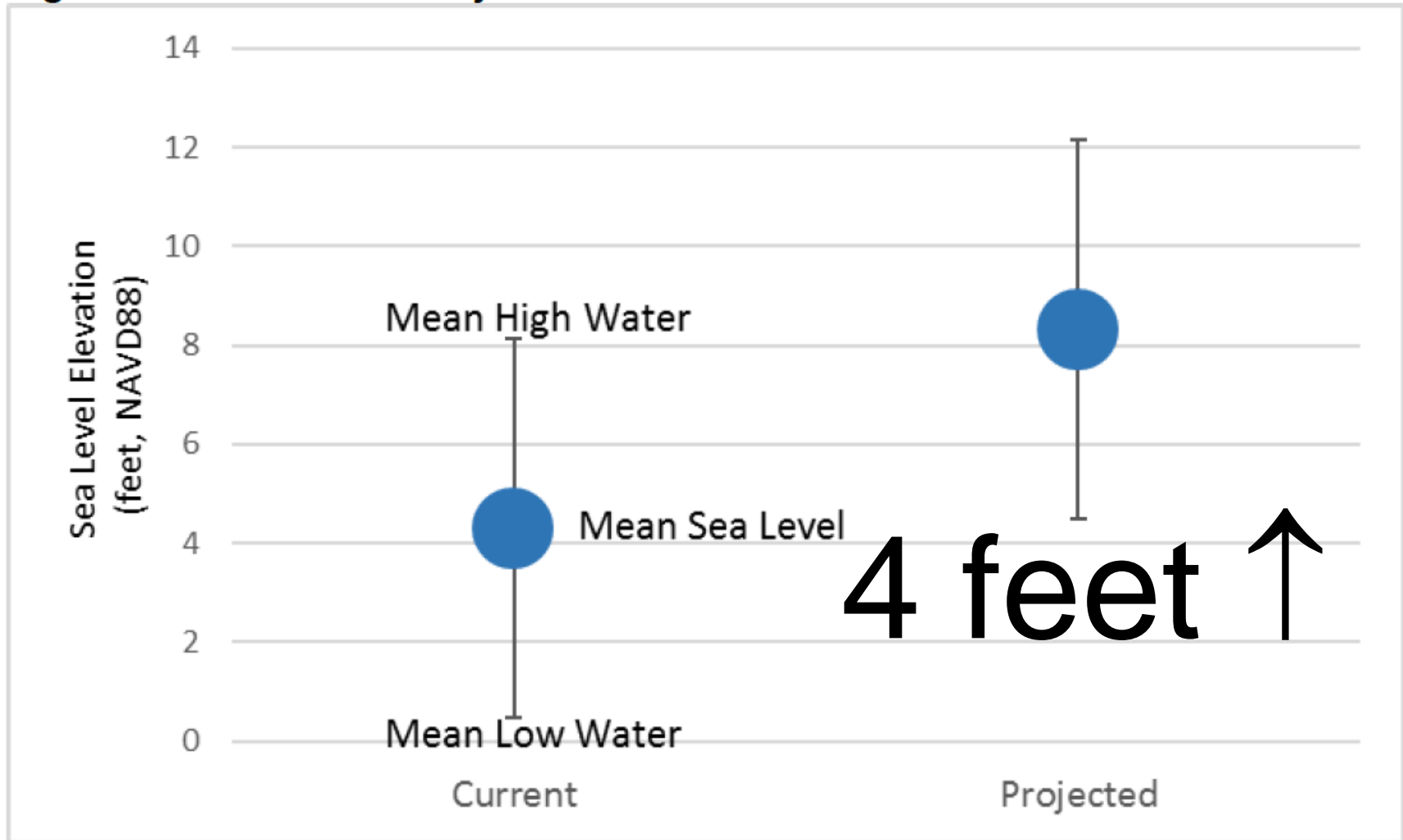
# Aquifer Recharge

**Figure 4: Current and Projected Recharge Distribution by Location**

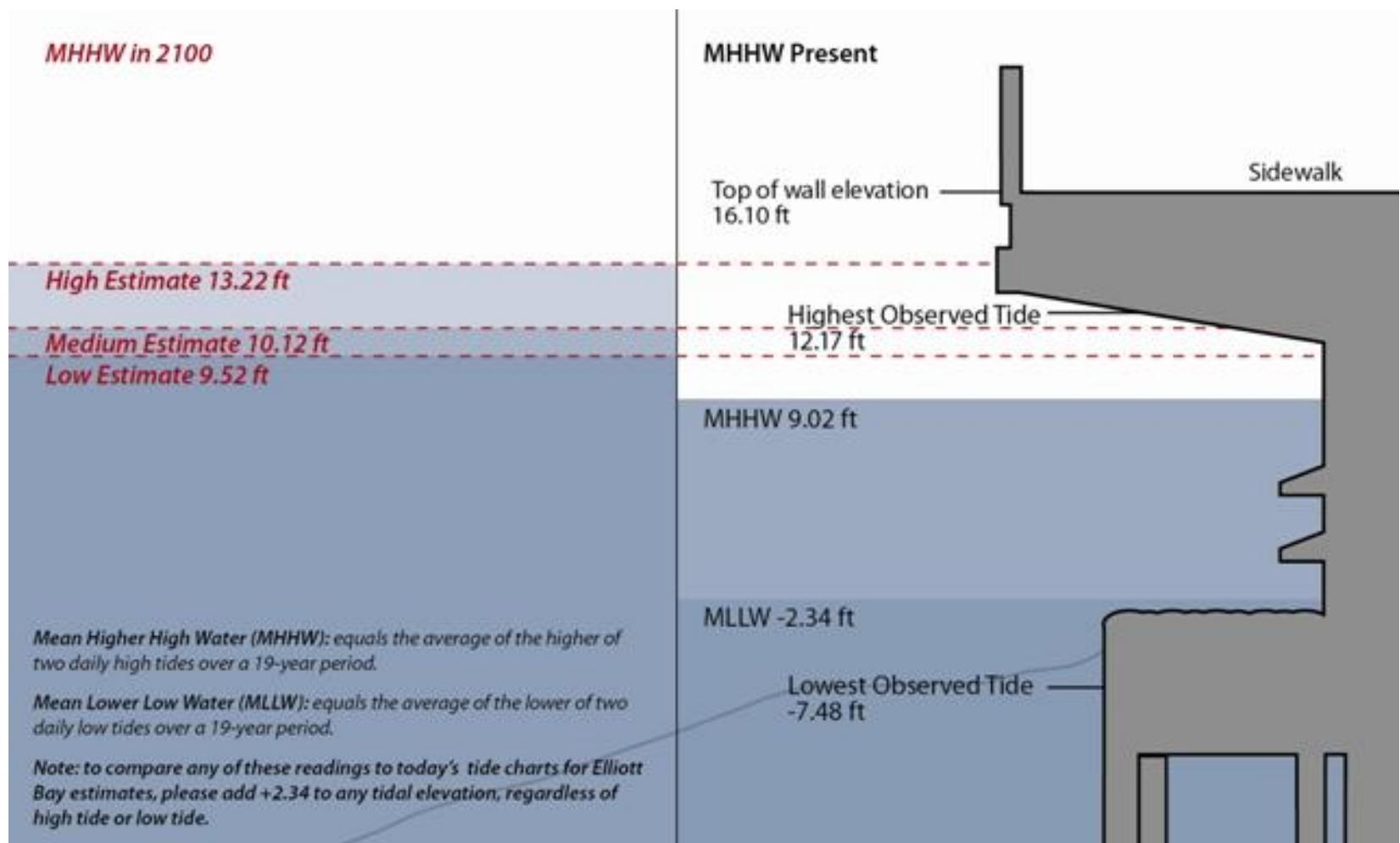


# Sea Level Rise

Figure 5: Current and Projected Sea Level



# Sea Level Rise



<http://sdotblog.seattle.gov/2013/01/23/sea-level-and-the-seawall/>

# Findings re: Seawater Intrusion

## No Seawater Intrusion based on model results.

Continued monitoring is recommended.

**Findings re:**

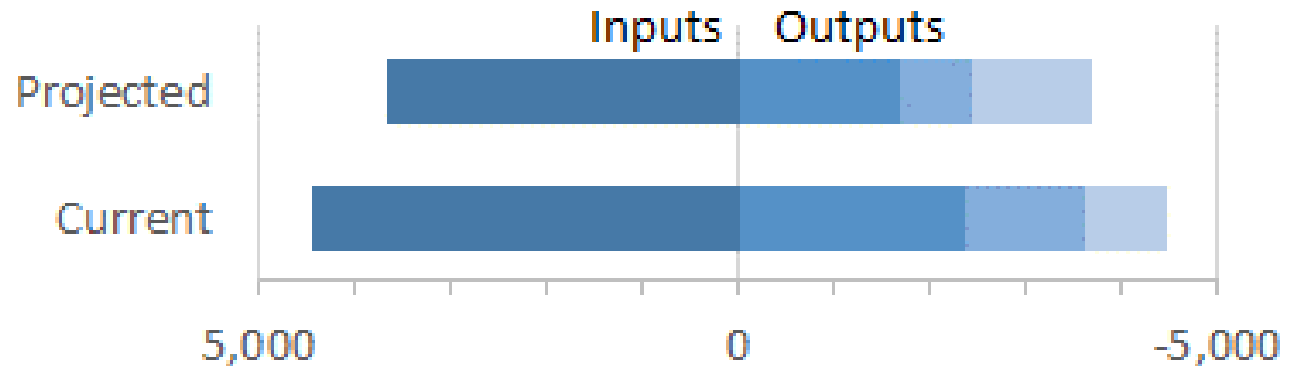
**Rate of Groundwater Level Changes**

**Rate of Groundwater Level  
Change less than EWL**  
based on model results.

Continued monitoring is recommended.

# Findings re: Groundwater Balance Changes

**Figure 6: Current and Projected Groundwater Balance Components**



	Current	Projected
■ Recharge	4,456	3,660
■ GW underflow	-2,362	-1,673
■ Drainage, Surface Water	-1,261	-751
■ Well Pumping	-834	-1,251

Water Balance Components  
(million gallons per year)

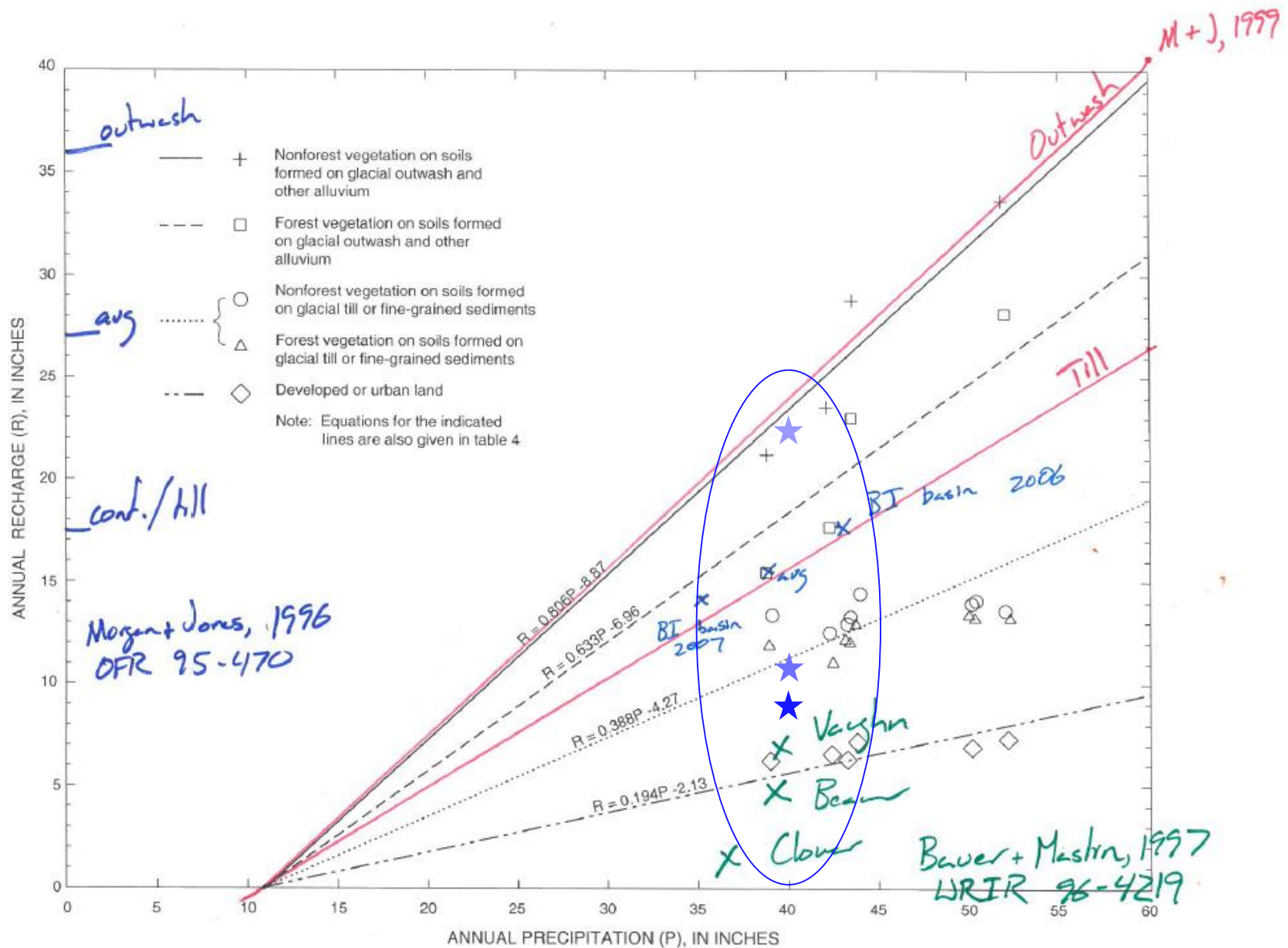


# Additional Recommendations

- Refine and periodically utilize predictive tool.
- Evaluate a range of projected groundwater withdrawal rates.
  - Evaluate a range of projected recharge rates.
- Assess the projected effects on shallow wells (e.g. domestic).
  - Assess the projected effects on individual streams.

# Questions?





**Figure 10.** Annual recharge for selected combinations of soil and land-cover types, annual precipitation, and lines depicting relations between annual recharge and annual precipitation.