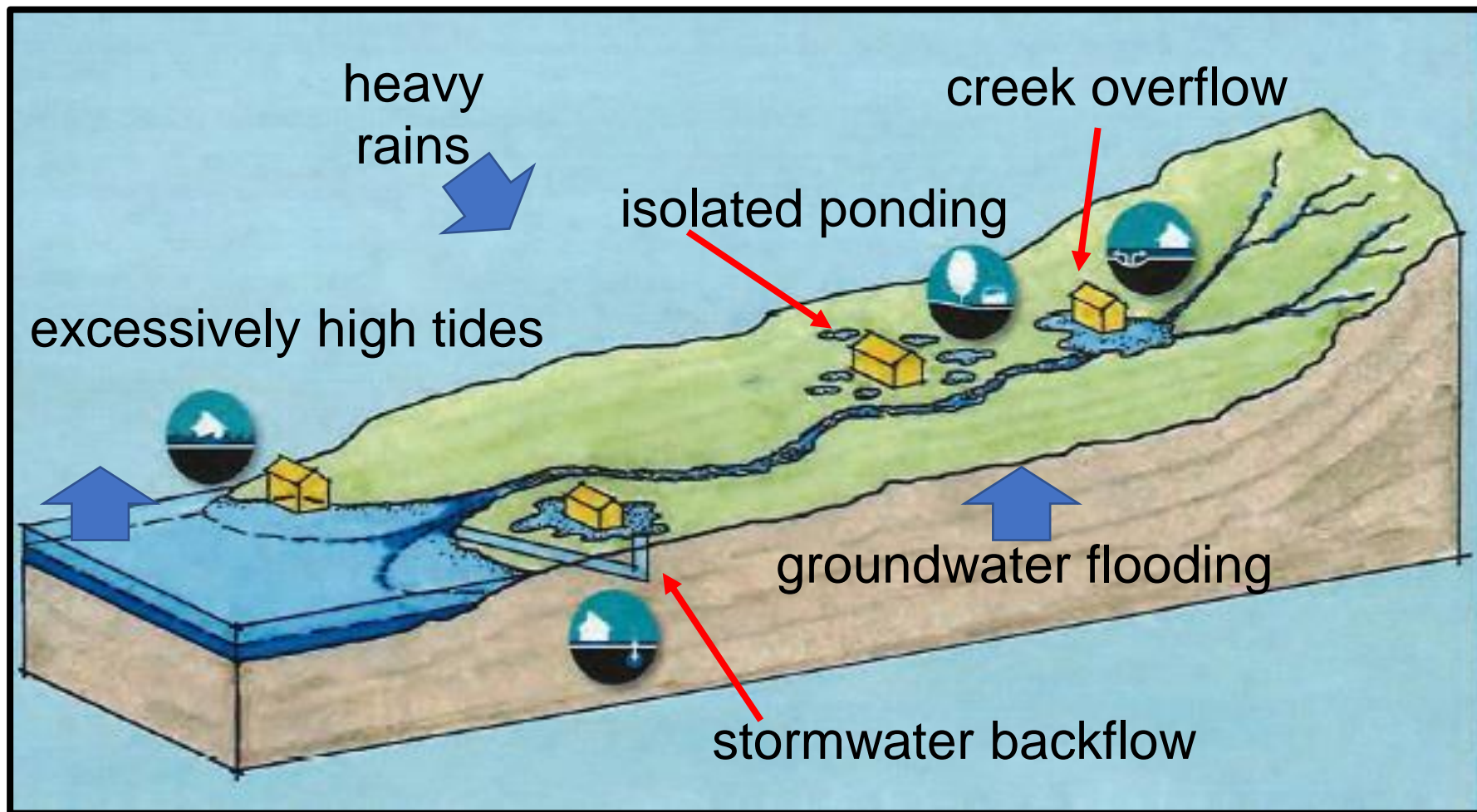


Opportunity for Observations and Data Collection for Citizen Science Volunteers and Volunteer Properties in Tam Valley

Jim Jacobs jaajacob@ucsc.edu



See - Shoot - Share



... The Flood

... The Photo

... To The Website



Citizen Science Volunteer Project

Sponsor - NOAA California Sea Grant

Location: Tam Valley and Manzanita – 11/17/22 TVCC

Team Leader - Jim Jacobs, UCSC PhD Program

Community Mentor for NOAA Grant

Stephanie Moulton-Peters, Supervisor, Marin County

Steffen Bartschat, President, Tamalpais Community Services District (TCSD)

Ted Barone, Leader, Neighborhood Response Group (NRG)



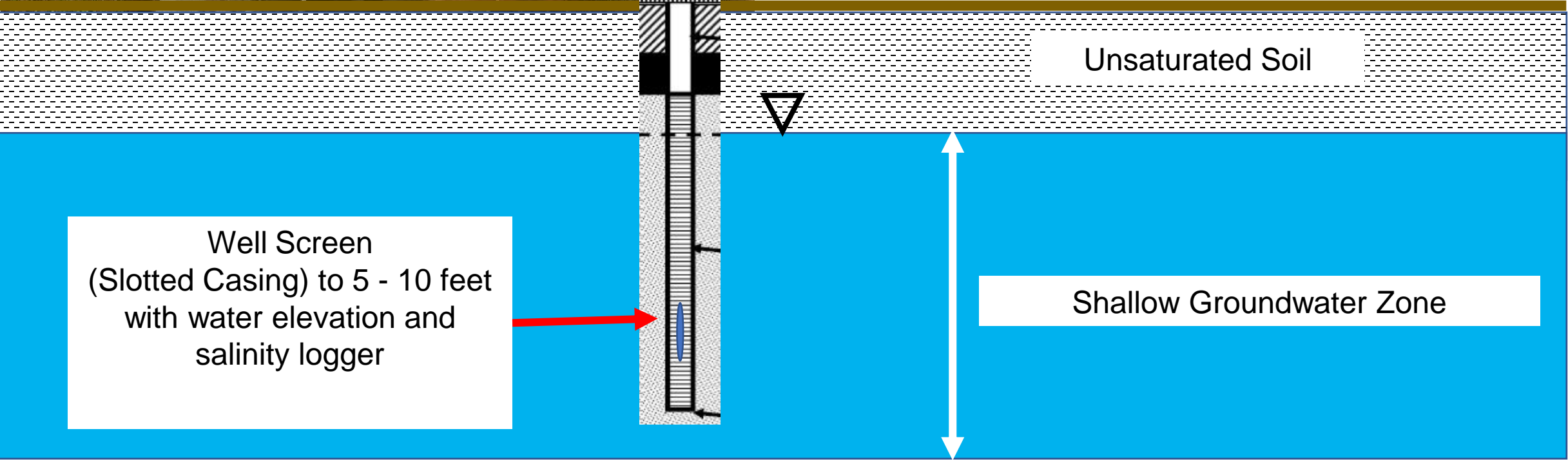
Ponded right of way, Manzanita



Richardson Bay Bridge Pile Cap and Settling

Opportunity B - Collect Groundwater Data

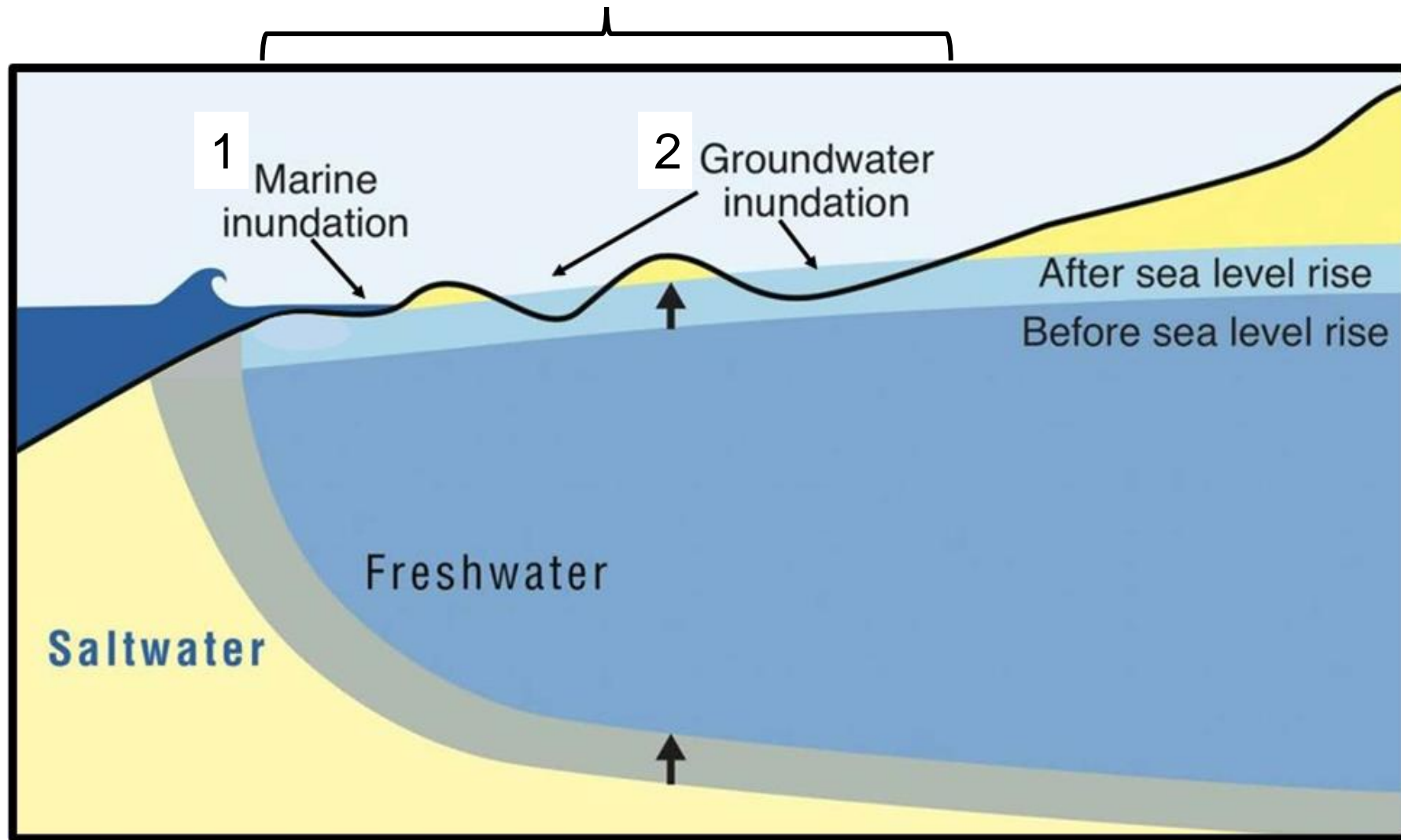
Install shallow 1-inch diameter well and measure groundwater in well (not to scale)



Well Screen (Slotted Casing) to 5 - 10 feet with water elevation and salinity logger

Shallow Groundwater Zone

Concepts of Sea Level Rise, Extreme Rain, and Groundwater Inundation



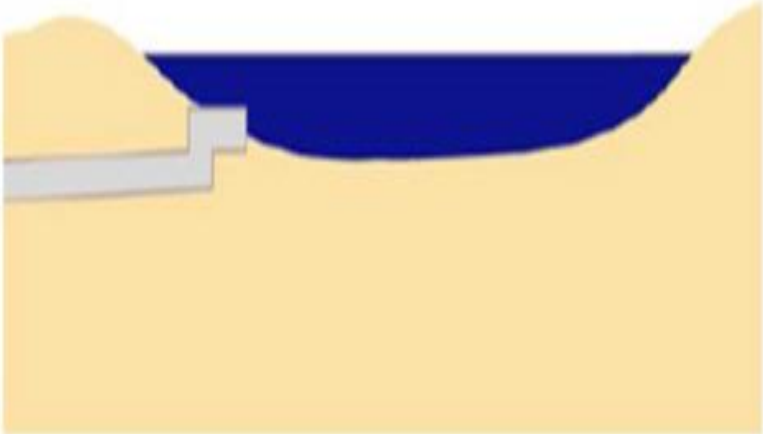
From C. Fletcher, Univ. Hawai'i, Mānoa, Coastal Studies Group

Concepts of Sea Level Rise Flooding

Direct Marine Flooding



Drainage Backflow



Groundwater Flooding



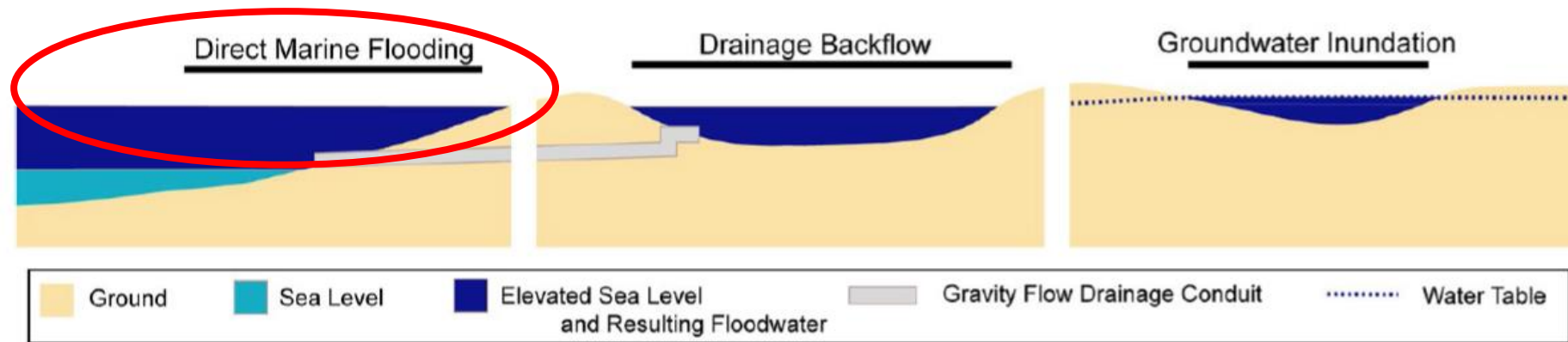
 Ground	 Sea Level	 Elevated Sea Level and Resulting Floodwater	 Gravity Flow Drainage Conduit	 Water Table
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From C. Fletcher, Univ. Hawai'i, Mānoa, Coastal Studies Group

Local Evidence of Direct Flooding During King Tides (Nov. 2020)



Flooded Bike Path (former RR bed)



From C. Fletcher, Univ. Hawai'i, Mānoa, Coastal Studies Group

Jim Jacobs jaajacob@ucsc.edu

Evidence of Direct Flooding “King Tides”

Beginning of Drainage Grate Flooding



During Drainage Backflow: Height is 10-inches over grate

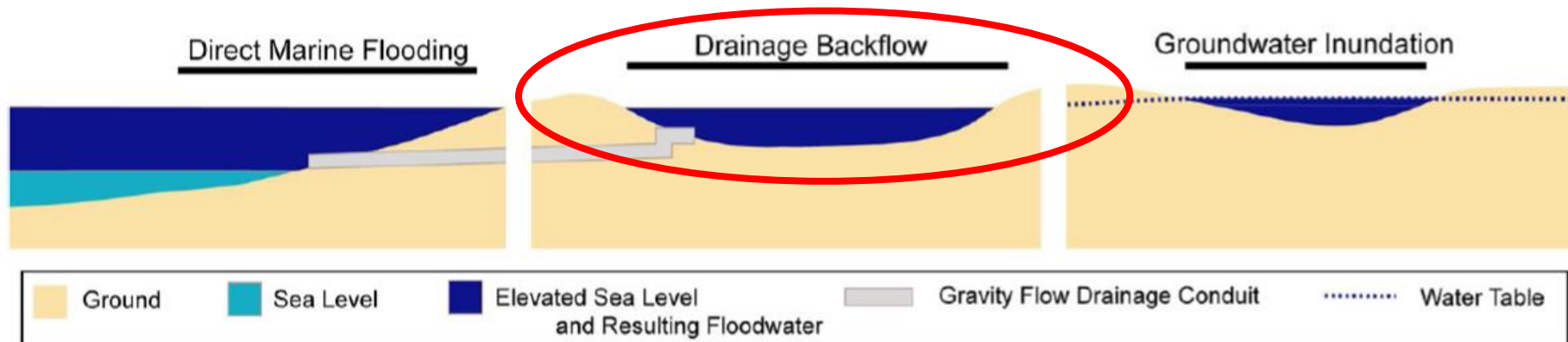


End of Drainage Flooding



- Drainage backflow into parking lot
- Nearby, Caltrans ponded water is not timed with this flood event
- Complex subsurface water connections

8

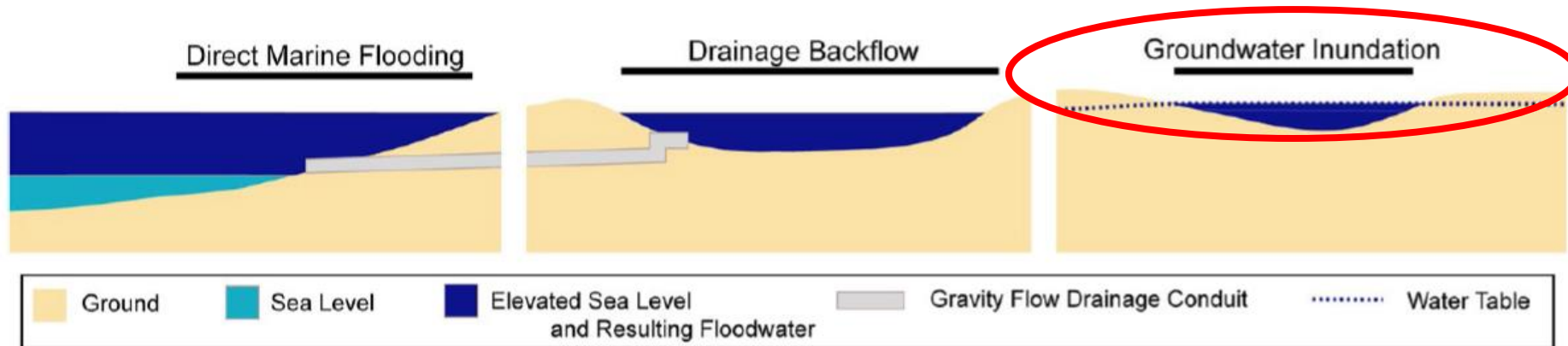


Evidence of Groundwater Inundation



Easement next to Flamingo Park

- Verdant vegetation during period of drought
- Ponded water without clear source



From C. Fletcher, Univ. Hawai'i, Mānoa, Coastal Studies Group

Evidence of Groundwater Inundation* (During Drought)



Water wicking up pavers, walls and fences



Sump pumps running constantly; discharge to the street (irrigation contribution?)

*Also Called: Groundwater Flooding, Emergent Groundwater

Results of Sea Level Rise

Examples of Evidence of SLR

- Sanitary sewer overflow
- Stormdrain backflow
- Creek overflow
- Isolated ponding
- Crawlspace or basement flooding
- Underground urban structures such as parking lots and tunnels may be flooded
- Leaking buried electrical utilities may short out from salty groundwater
- Groundwater may enter homes through leaky sewer lines
- Seawater may enter and corrode and impair functioning underground electric, gas, communications, water and wastewater infrastructure
- Dome-shaped heave caused by tidal pumping
- Fine sediment boils
- Fractures formed in asphalt or concrete surfaces due to erosion underneath or pneumatic pressure
- Ghost forests and dead vegetation
- Emerging groundwater may cause building foundations to settle unevenly or raise building foundations up from grade
- Groundwater may pool on either side of sea walls or levees, coming to the surface
- Erosion of coastal dunes or walls

What You Can Do - Citizen Science Volunteers in Tam Valley

Opportunity A - Take Photographs of
Sea Level Rise Evidence

www.jamesajacobs.net

Jim Jacobs

510-590-1098

jaajacob@ucsc.edu

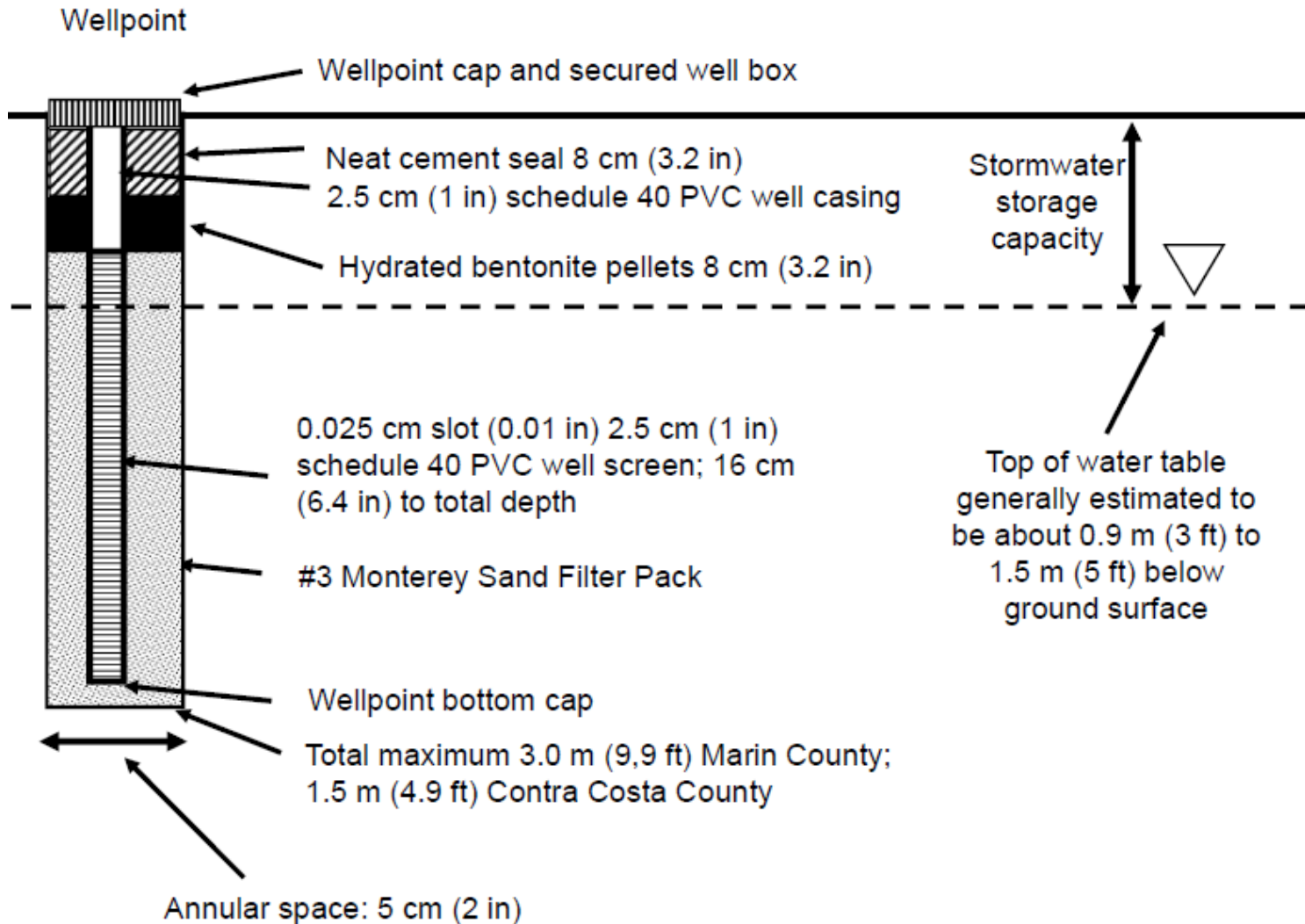
Photo Submission Form
In English and Spanish

See – Shoot - Share

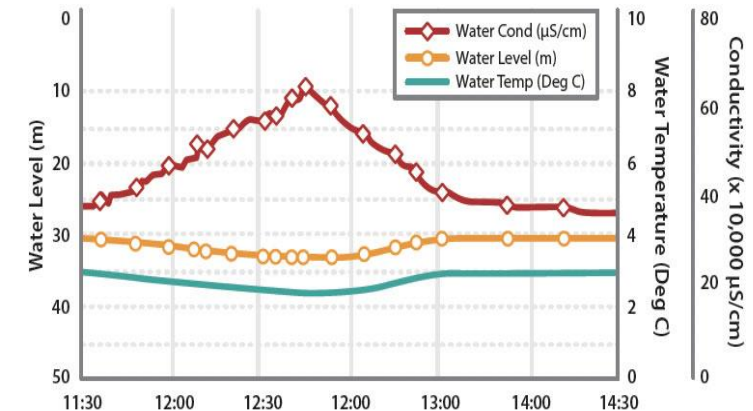


What You Can Do - Citizen Science Volunteers in Tam Valley

Opportunity B. Have a wellpoint on your property – network of wells with sensors: costs about \$2,500 for data logger and well supplies (no labor)



Diameter 1/2"



Data Collected