FIELD STUDIES OF PFAS RETENTION AT FRESHWATER / SALTWATER INTERFACES

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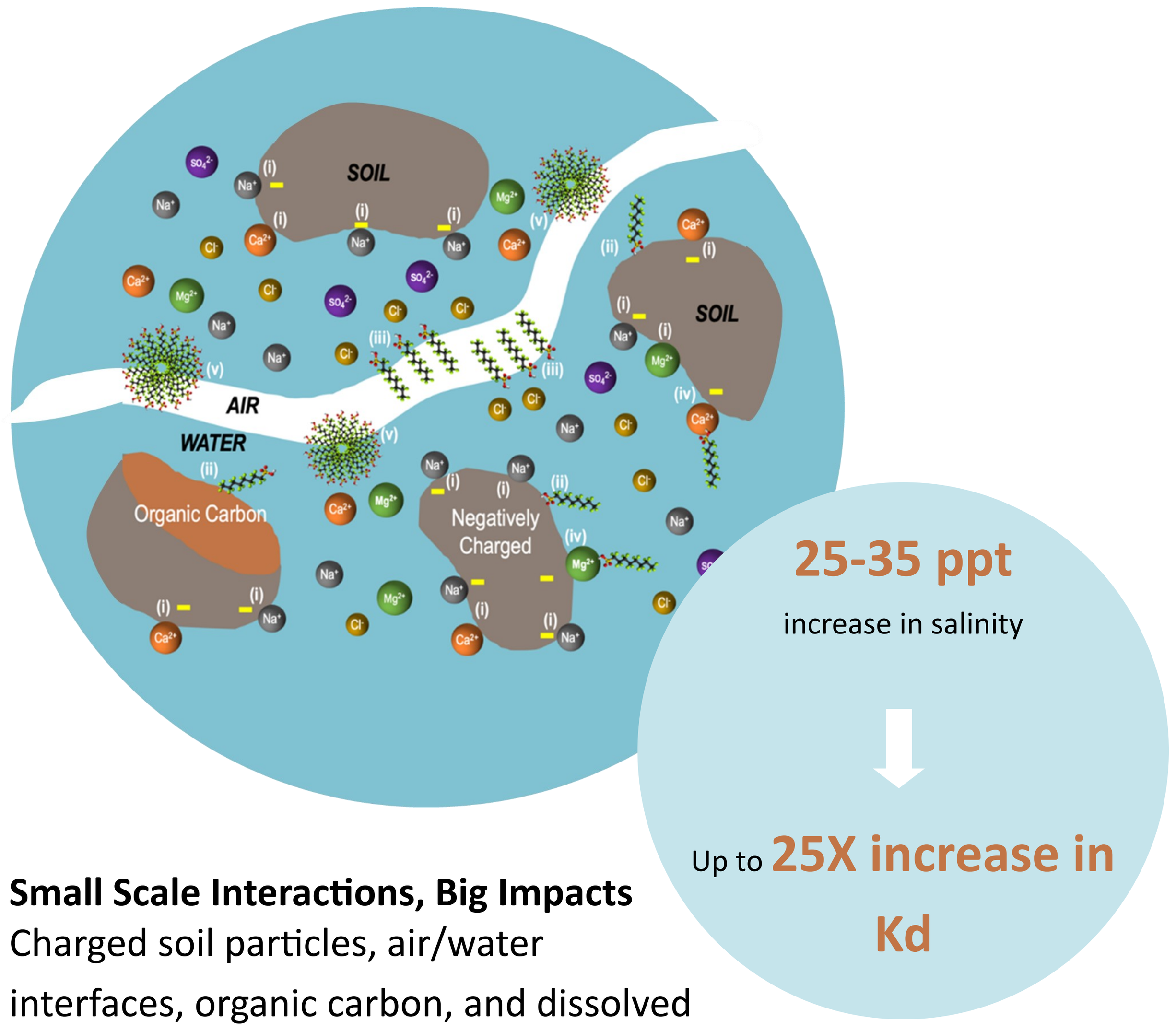
POSTER GROUP 2

SERDP Project ER22-3275 “Retention of PFAS Groundwater Plumes at Freshwater/Saltwater Interfaces.”

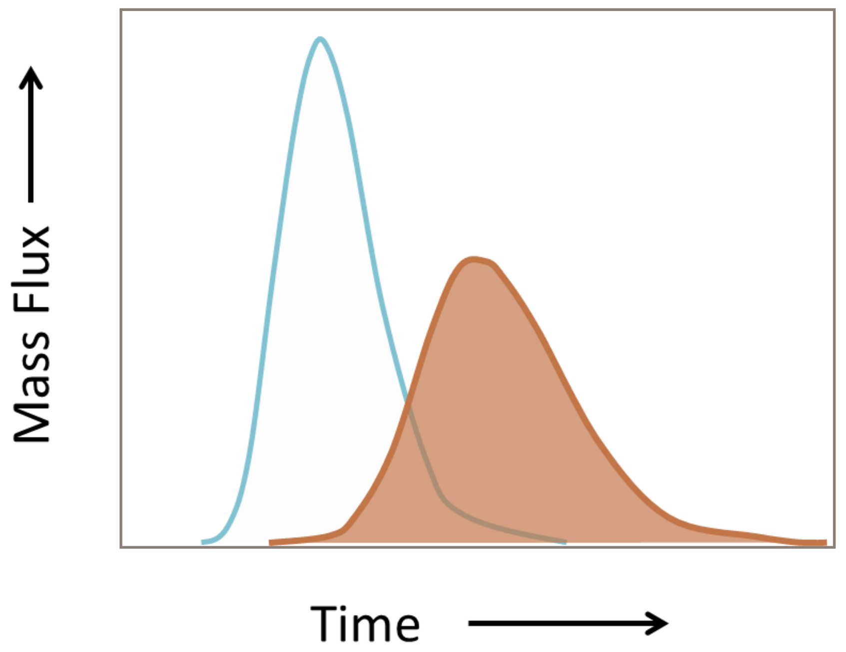
WHAT IS SALTING OUT?

The aqueous solubility of some organic compounds generally displays an inverse dependency on ionic strength, a chemical phenomenon known as **salting out**.



Small Scale Interactions, Big Impacts
Charged soil particles, air/water interfaces, organic carbon, and dissolved ions determine partitioning to each phase

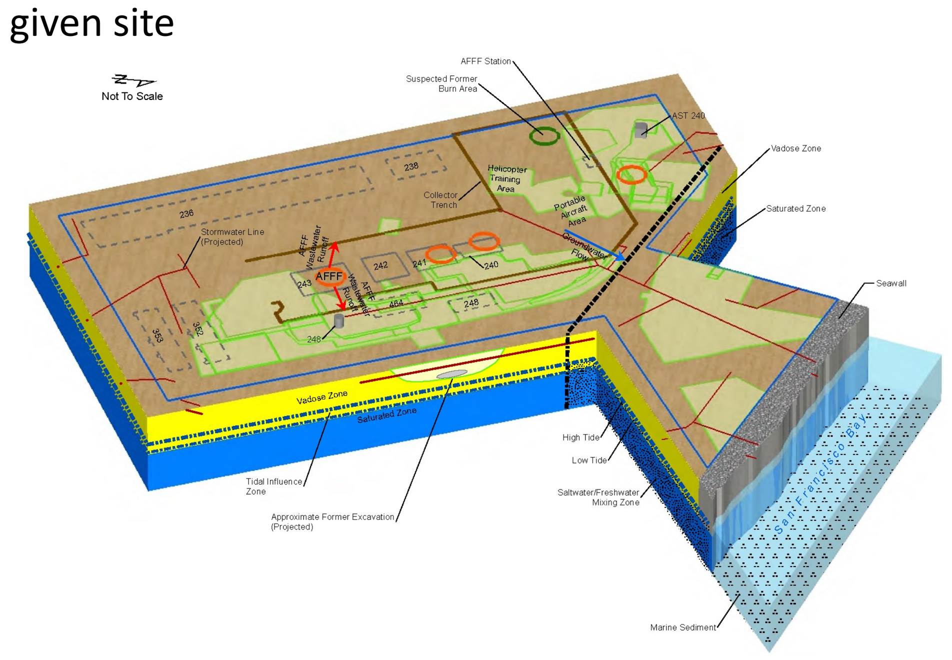
Peak Shaving
Discharge of PFAS to saline water causes a reduced maximum mass flux, but extends the duration of PFAS presence



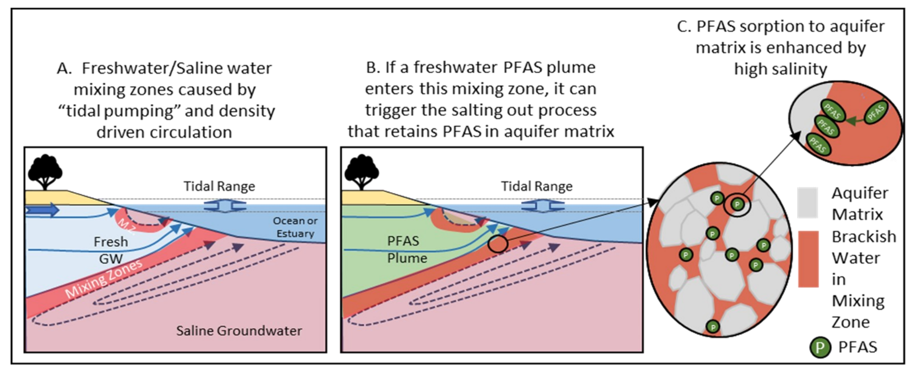
WHERE DOES SALTING OUT OCCUR?

We expect that salting out may be a significant effect in areas where terrestrial groundwater discharges to marine environments. Saline water may mix well inland of the shoreline, creating an environment for salting out.

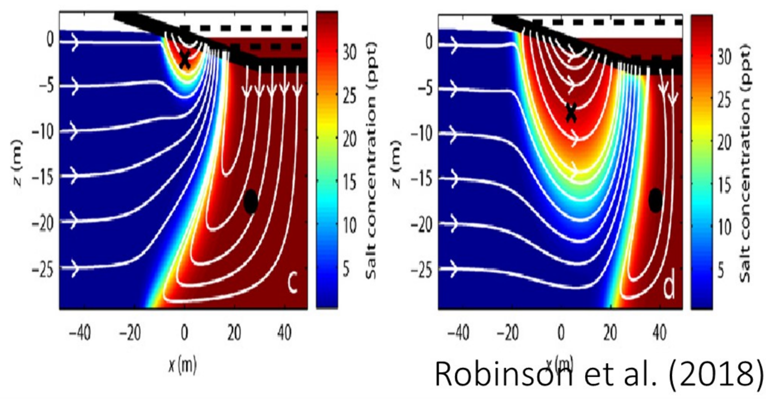
Conceptual Site Model
Developing a well-supported CSM is critical to determining whether salting out may be occurring at a given site



Freshwater/Seawater Mixing Zone
Current research is developing quantitative models to predict the size and shape of mixing zones based on rates of groundwater discharge and tidal ranges.



Newell et al., 2022 “Enhanced Attenuation (EA) to Manage PFAS Plumes in Groundwater” (Remediation Journal)



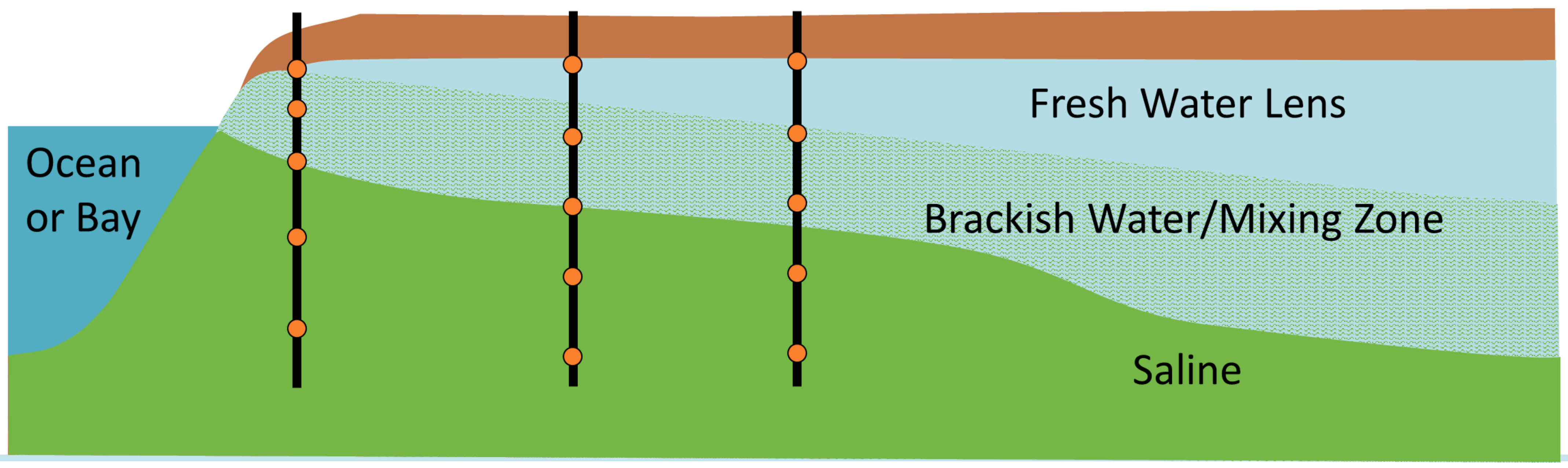
Robinson et al. (2018)

High Resolution Field Studies of the Impact of Salting Out on Groundwater Fate and Transport

Objectives:
- Quantify how salting out changes the mass flux of PFAS
- Increase understanding of how to manage PFAS plumes in nearshore environments.

Method:
- Select sites based on PFAS and tidal data
- Profile vertically and horizontally from source zone to shoreline
- Collect and analyze co-located groundwater and soil samples

High Resolution Profile
Soil samples are being collected at selected depth intervals (orange dots) to vertically profile at each location.
A temporary well is installed nearby and groundwater samples are collected at the same depths as the soil samples.



Sample Collection
A direct-push rig can be used in most cases for shallow near-shore sampling.

FIELD WORK COMPLETED

A Field Investigation at Naval Air Station North Island was completed in Fall 2022

FIELD WORK UNDERWAY

A second Field Investigation at former Naval Station Treasure Island in San Francisco will be completed in Spring 2023

ATTRIBUTION & REFERENCES

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