Delta Challenges Workshop

Hydrodynamics

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Our central challenge is to have a correct view of how the estuary is functioning on which to base informed decisions.

We need decision support systems that can tell us what happened and why

Big Picture

What is hydrodynamics?

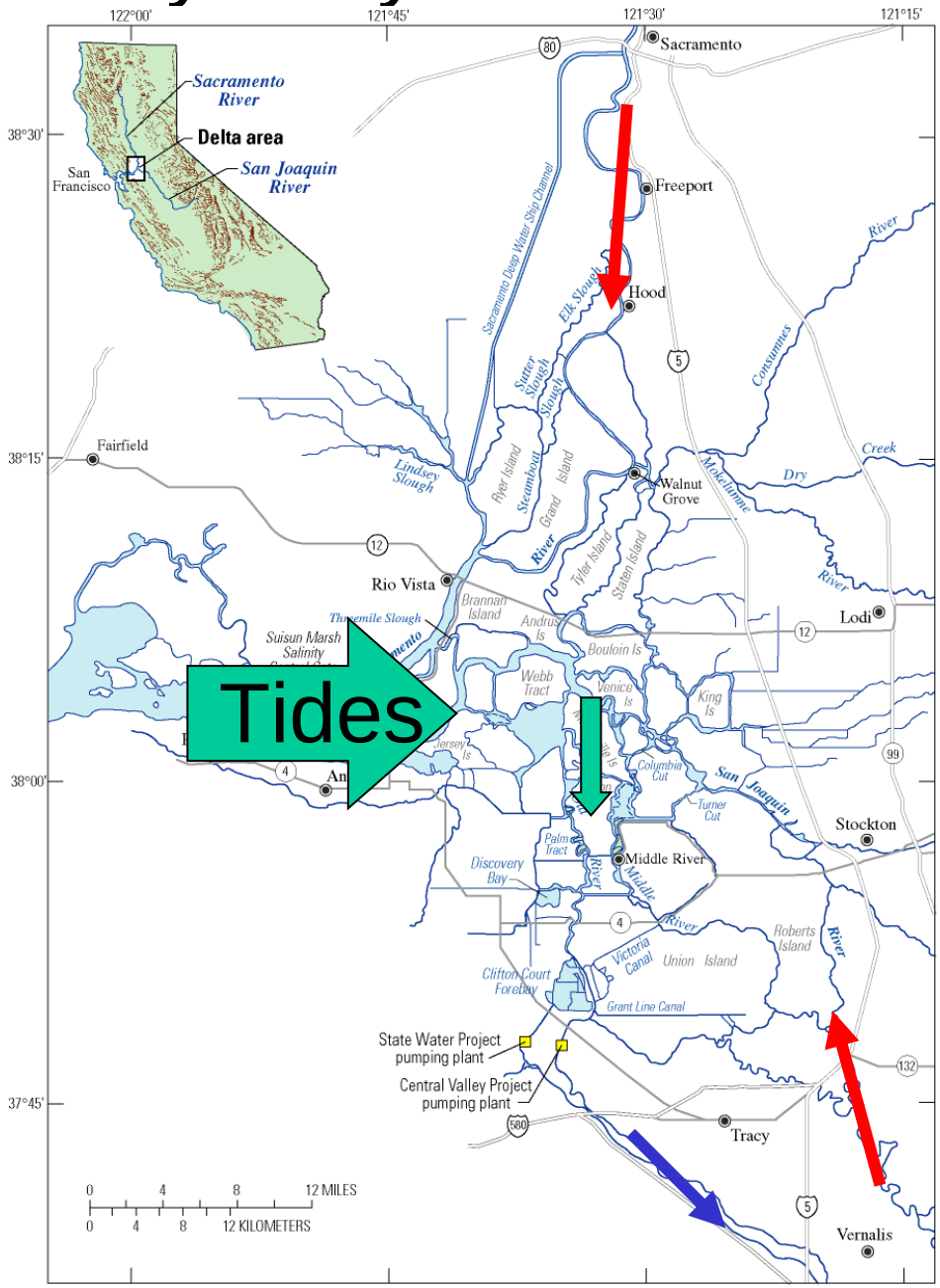
Interaction between

Landscape,

tides,

river flows,

exports



Location of flow station sites in the Delta Area of California.

Hydrodynamic processes interconnects the aquatic landscape

AND

Introduces high frequency variability into virtually all data we can collect

Which means we need to monitor and analyze physical and biological data at local, regional and delta scales to understand WHAT occurred and WHY

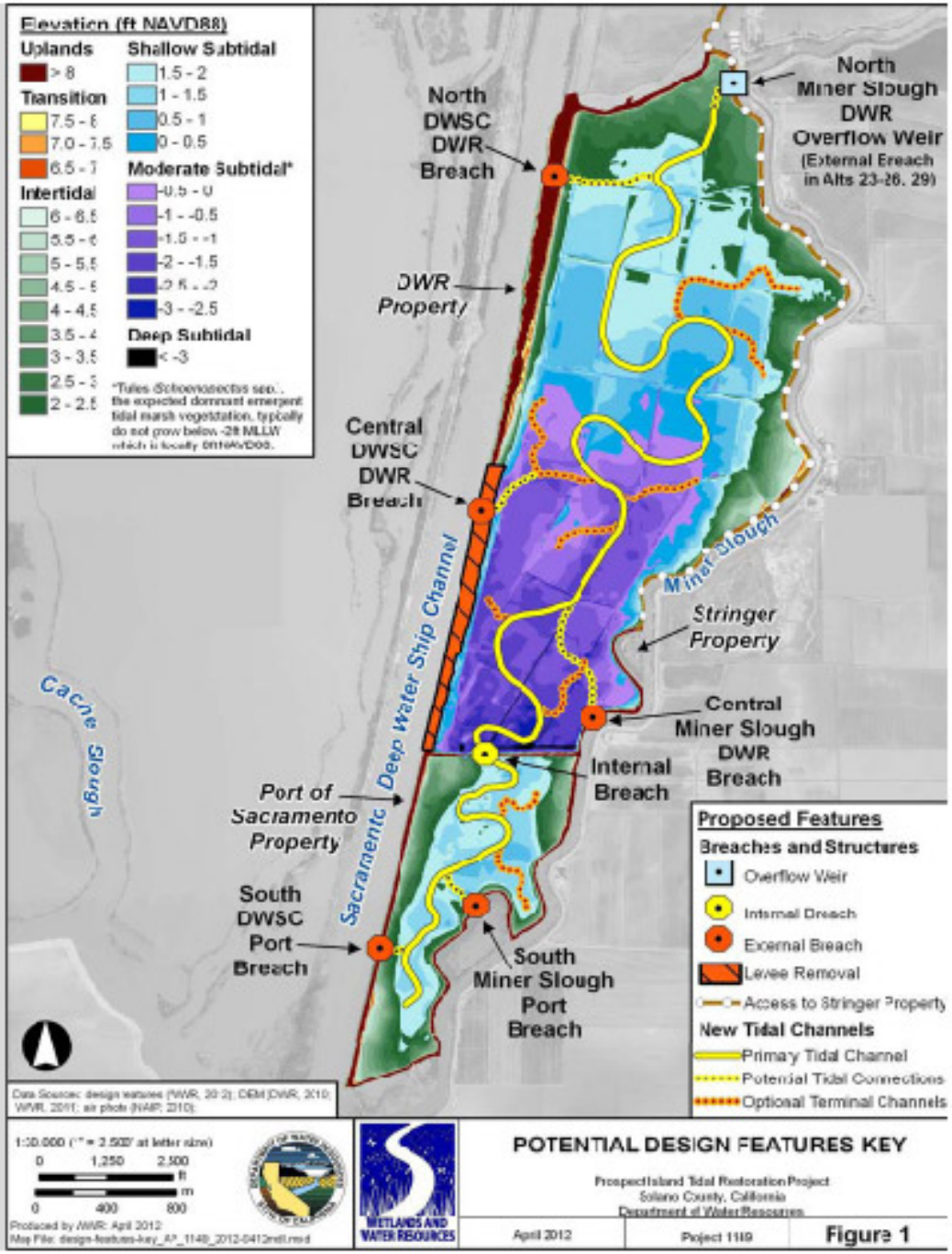
Restoration Example:
Prospect Island

~1,300 acres

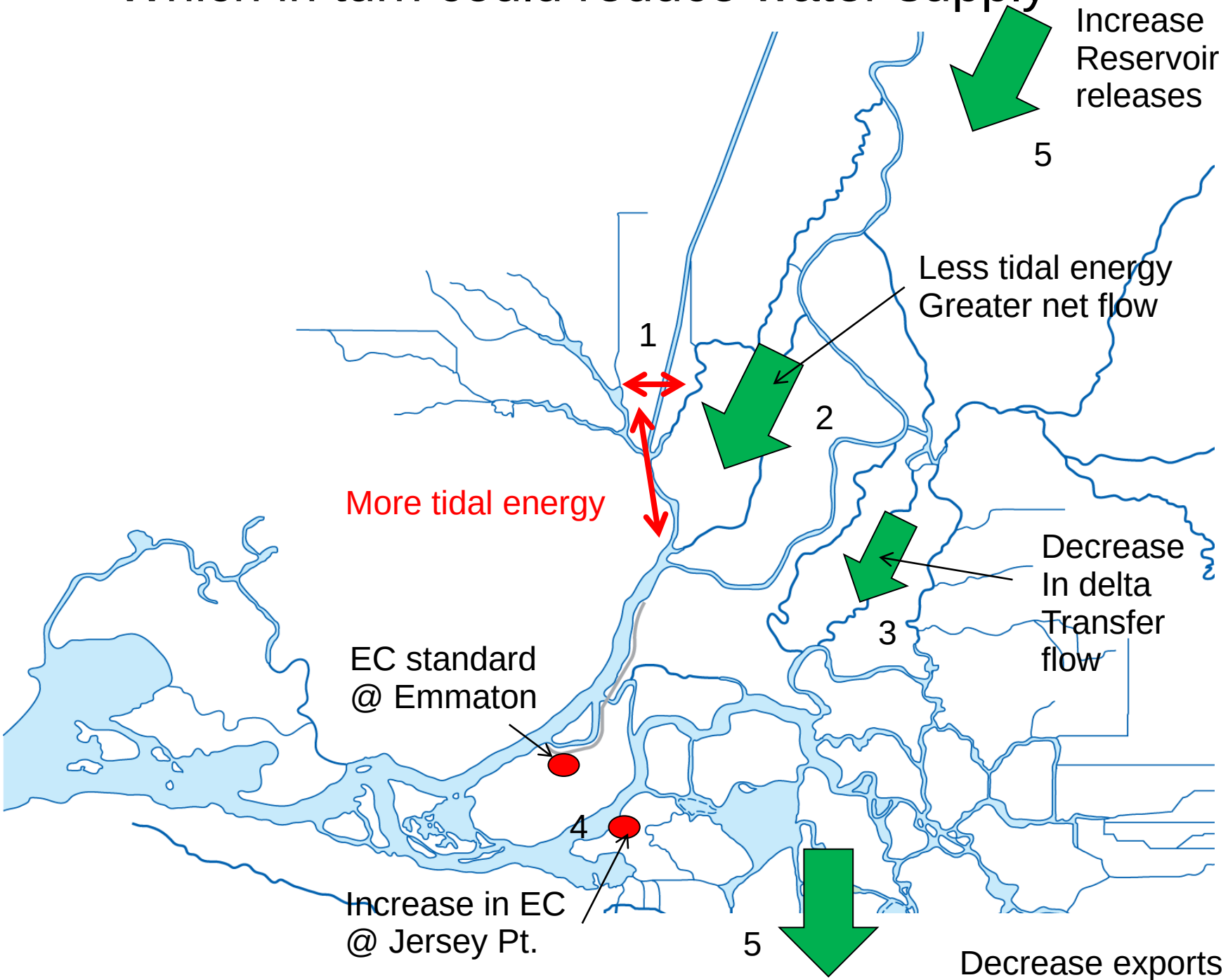
Prospect Island

Design Features Key

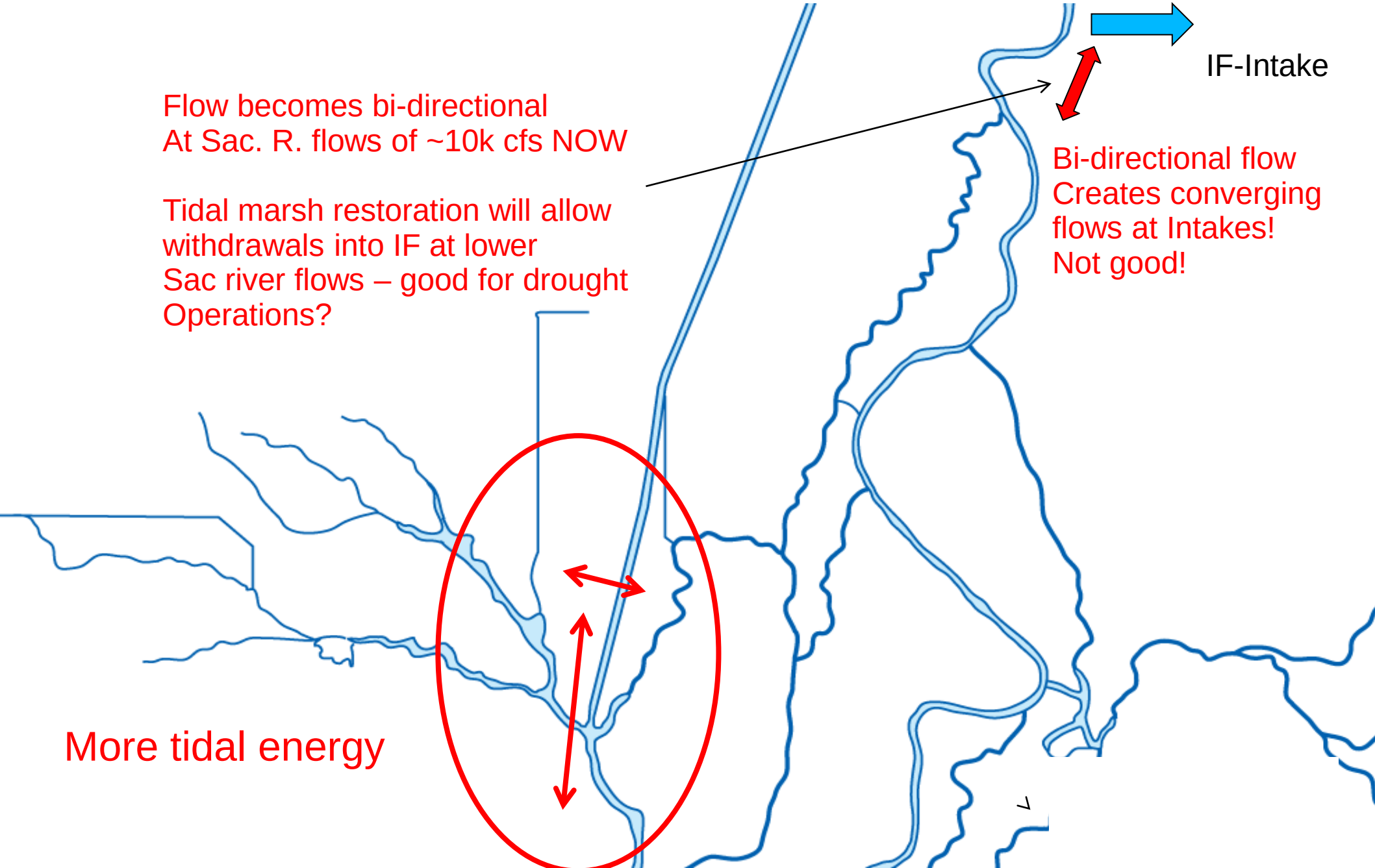
- Breaches
- Overflow weir
- Primary channels
- Secondary branch channels
- Connecting channels depending on selected breaches
- DWR and Port properties
- Adjacent property access



Effect on regional scale water quality? Which in turn could reduce water supply

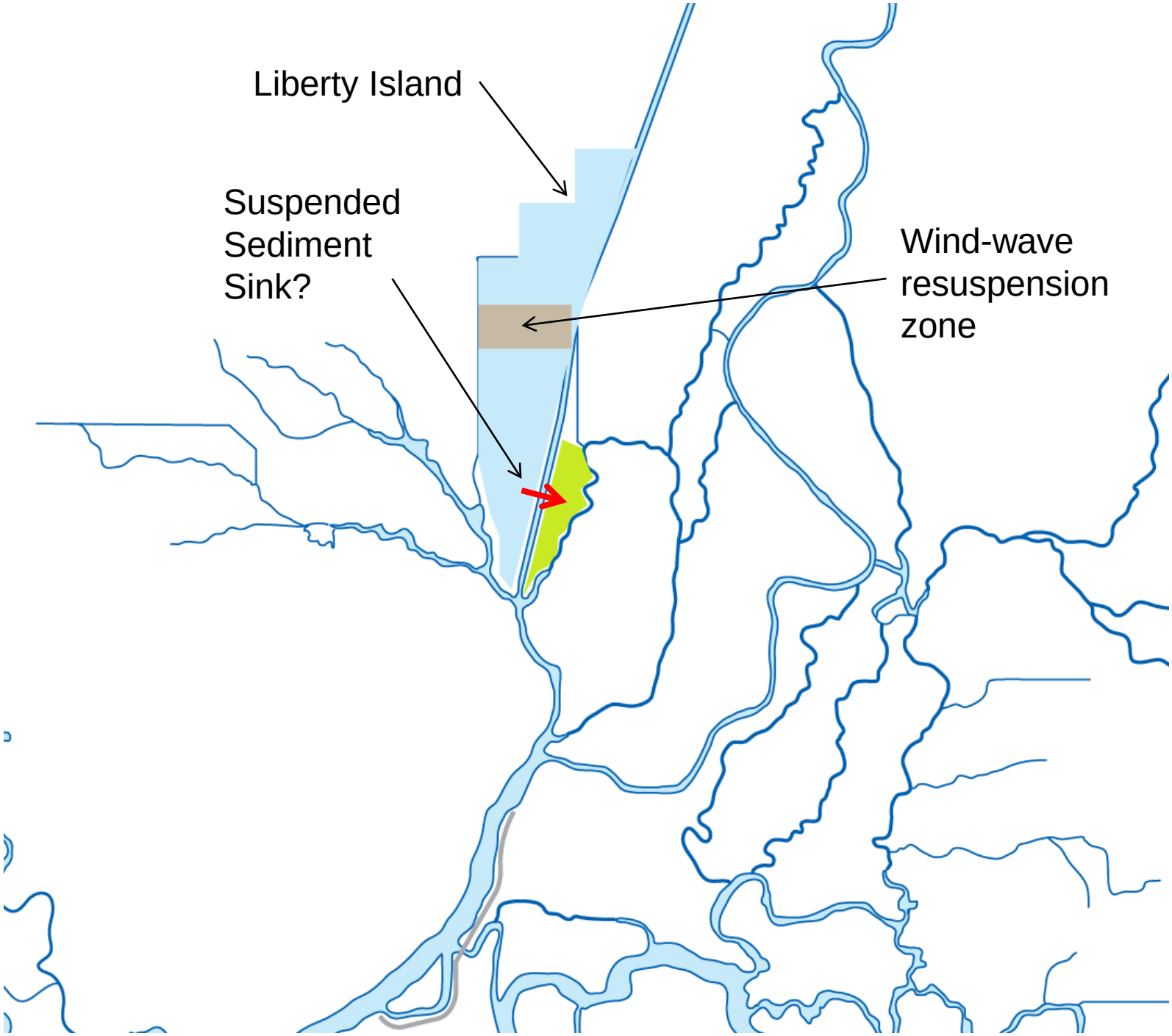


Greater water deliveries using The tunnels?



Effect on Salmon outmigration? Increased population level survival without a single smolt entering Prospect Island?

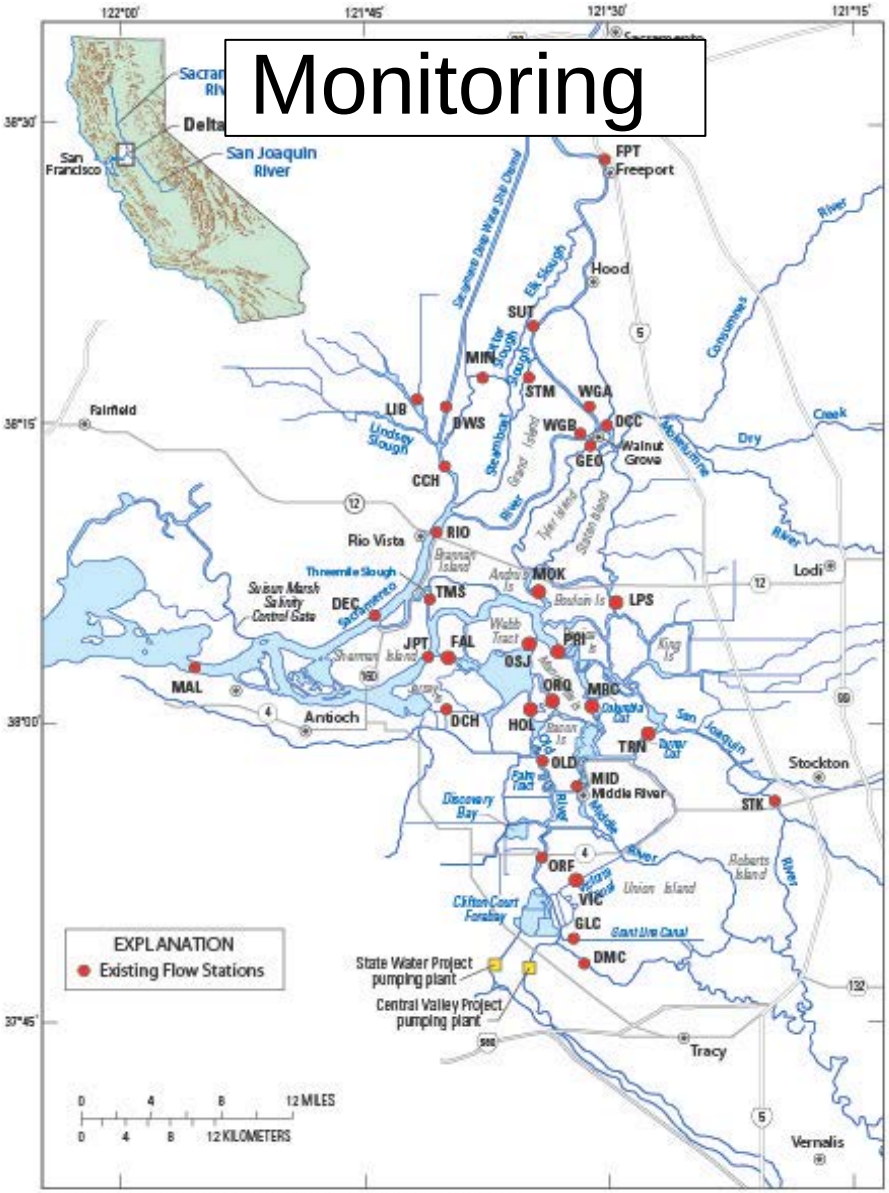
Effect on local turbidity field?



Good news – on the physical side:

we have it pretty much covered

Monitoring



Location of flow station sites in the Delta Area of California.

Modeling

What have we learned from the physical data collection?

Bio data should also be collected at high frequency to avoid aliasing

But… we can’t afford to do this, so we need to get clever re: how we collect bio data and combine it with physical data.

We haven’t figured out how to be clever, yet.

Collecting eco data at the appropriate time and space scales will be extremely challenging

We should be figuring out how to do process-based physical/bio monitoring at scale NOW

We need decision support systems that can tell us what happened and why

This can only be achieved by sampling at the appropriate temporal and spatial scales because the hydrodynamics introduces high frequency variability into our data AND interconnects the aquatic ecosystem