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Integrated Regional Wetlands Monitoring (IRWM) Pilot Project

Project Overview

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California Bay-Delta Authority Science Program

Talk Outline

- Project Purpose and Approach
- Regional Forcing Functions
- Conceptual Model Tiering, Sites
- Project Organization and Teams
- Overview of Each Team's Activities
- Where Next

Project Purpose

- **Primary CALFED Question:**

  How are tidal marsh restoration efforts throughout the region affecting ecosystem processes at different scales?

- **Secondary Question:**

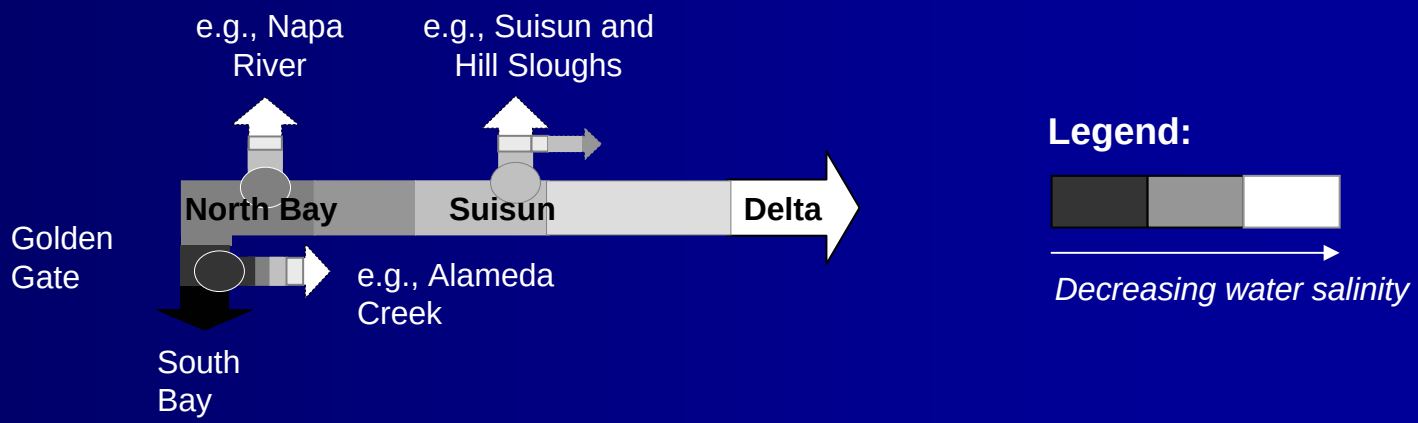
  How best can we carry out cost-effective, informative monitoring of tidal marsh ecosystem restoration efforts to provide long-term answers to the first question?

Overall Approach

- Intensive, detailed sampling and data collection programs across multiple disciplines at six sites
- Integrate results across disciplines to generate predictive models toward answering primary CALFED question
- Make results available as quickly as possible – watch ***www.irwm.org***

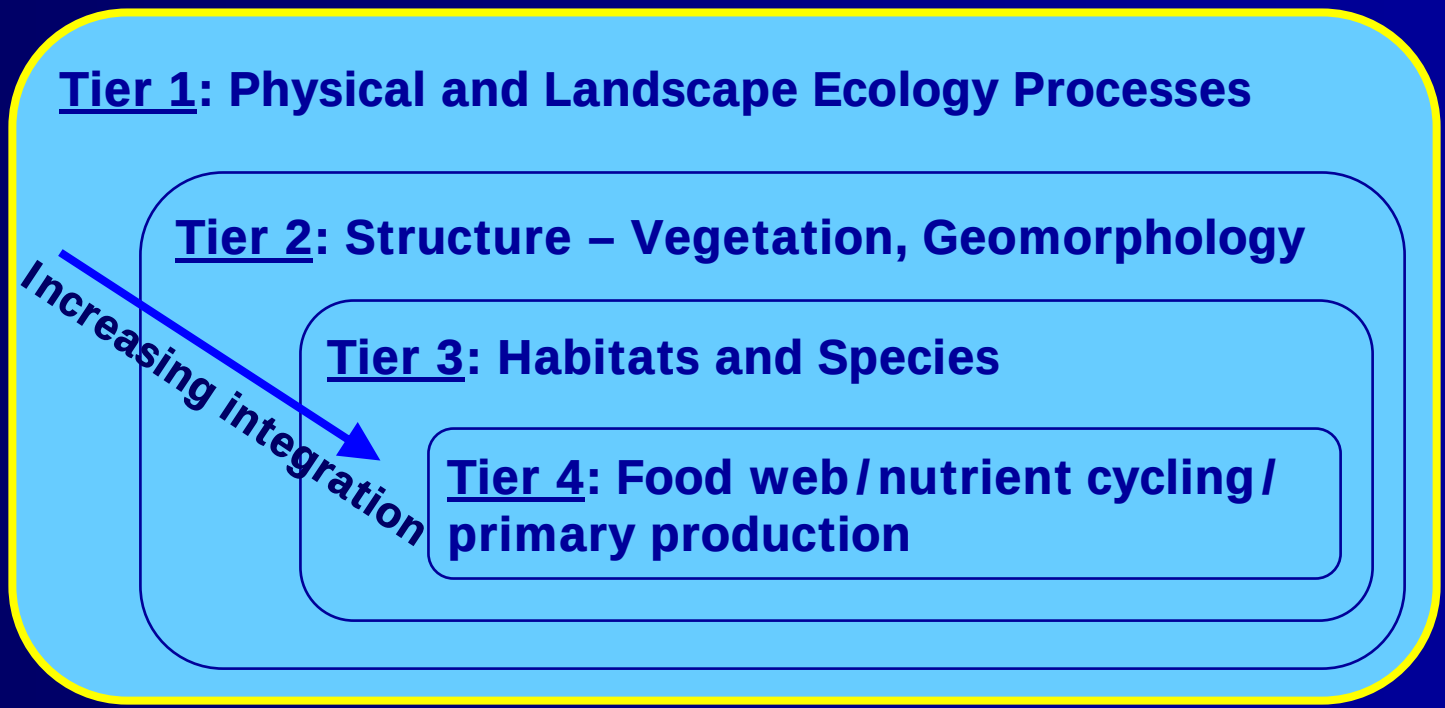
Regional Forcing Functions

- **Estuarine Salinity Gradients**



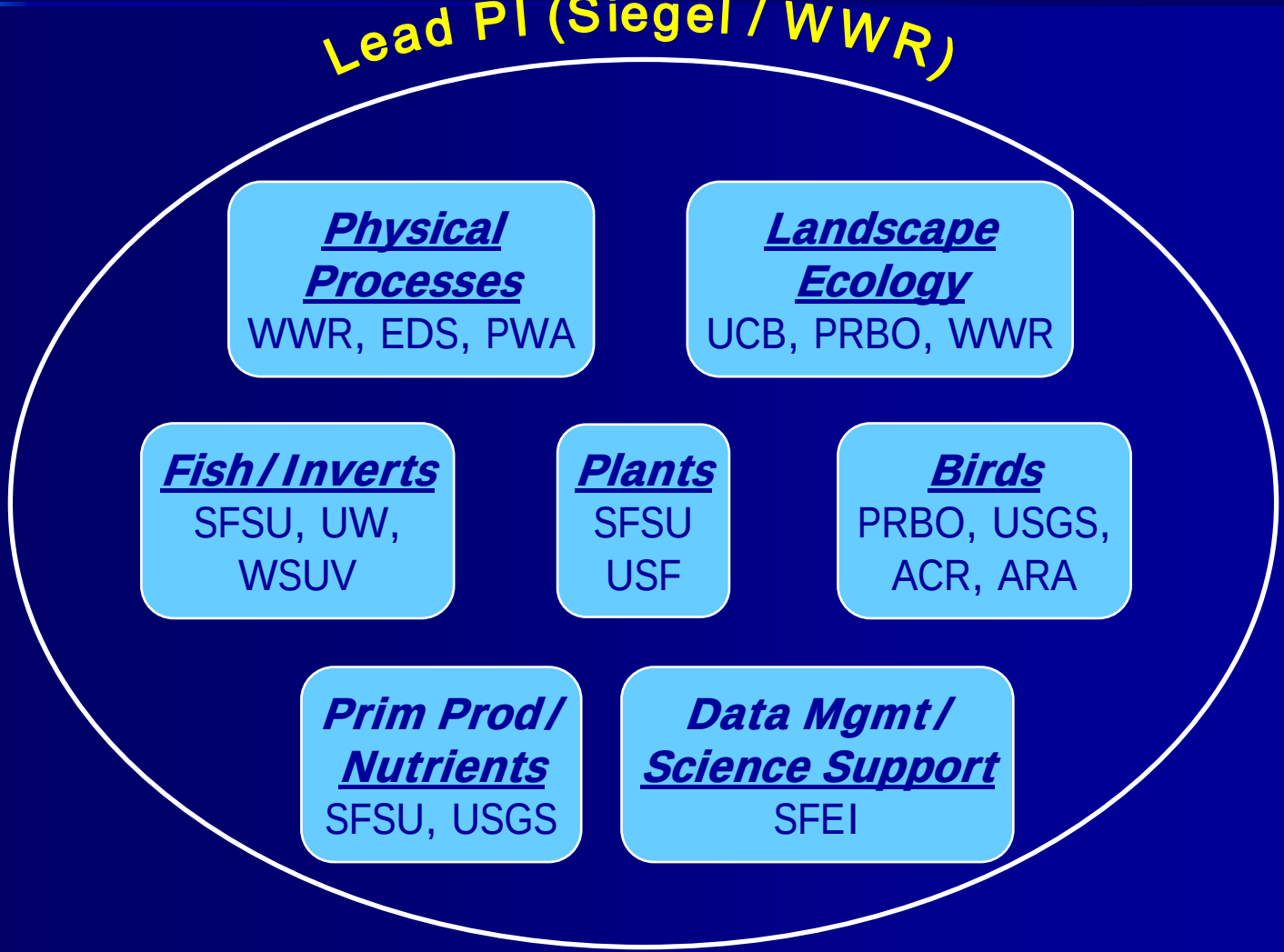
- **Tidal Range Gradient**
- **Sediment Supply**
- **Local Watershed and Delta Outflows**
- **Climate**

Conceptual Model Tiering



Produced by Wetlands and Water Resources, Oct. 2003
GIS Production/Cartography by Jake Schweitzer
Map File: Landsat-Vicinity_1067_B-L_092403.mxd

Team Organizations and Project Participants

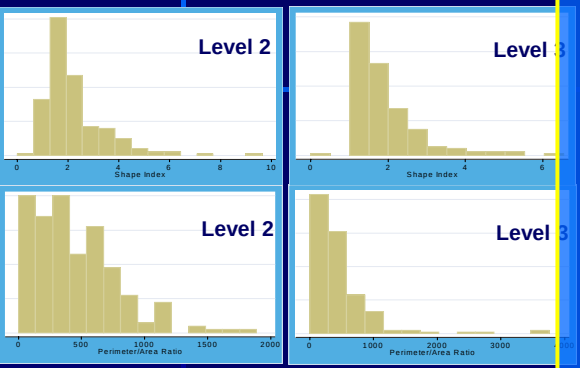


Physical Processes

Questions:

- What are the inundation regimes and their variability within and between sites
- What are surface and pore water salinities and their seasonal variations
- What are the geomorphic characteristics and their evolution at each site
- What is the soil chemistry

Landscape Ecology



Measurements:

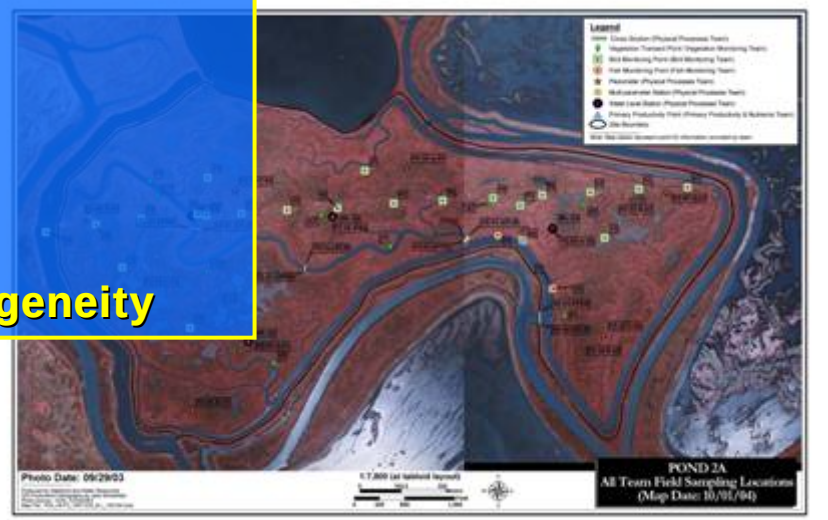
- Air photos
- GIS data many sources

Maps / data extraction:

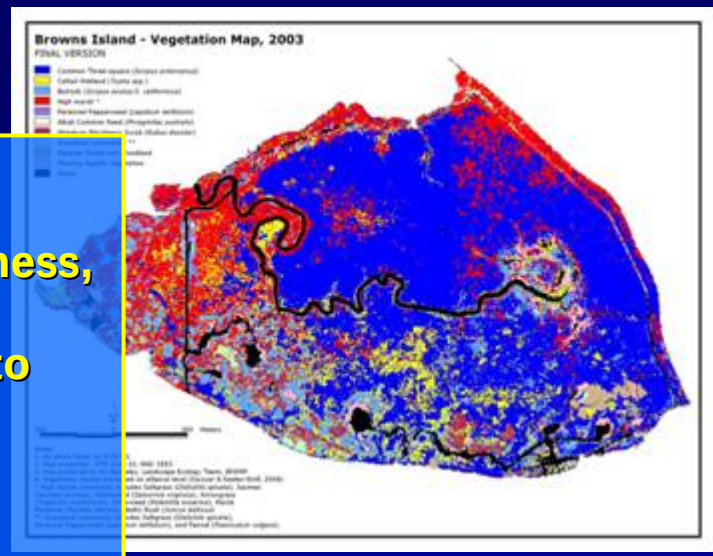
- Sampling maps
- Geomorphology
- Regional

Site and landscape spatial metrics:

- Shape
- Edge
- Channel networks
- Landscape context, connectivity, heterogeneity



Vegetation / Marsh Plain Production



Questions:

- Patterns of species richness, composition, and productivity in relation to channel proximity, inundation, and salinity
- Wetland restoration influences on these patterns
- Compare sampling methodologies
- What is the smallest number of metrics that can predict these patterns

Birds

Methods:

- Point counts and area surveys
- Point counts and transects
- Banding and re-sighting
- Nest searching and monitoring

Processes:

- Abundance and density
- Habitat availability and use
- Survival and dispersal

Fish

Measurements:

- Composition
- Abundance
- Diet
- Habitat Use

Processes:

- Trophic interactions
- Fluxes between marsh and open water

Invertebrates

Measurements:

- Plankton tows
- Neuston tows
- Benthic cores
- Fish stomach contents

Processes:

- Community structure
- Fish prey availability
- Seasonal community changes
- Between-marsh community differences

Nutrients, Primary Production

Nutrients:

- NO_3^-, NH_4^+, $Si(OH_4)$, PO_4^{3-}

Productivity:

- Low marsh vegetation
- Phytoplankton and benthic microalgae
- SAV and macroalgae

I RWM Next Steps

- Integrate our detailed data sets together to:
  1. Re-evaluate conceptual models
  2. Evaluate model-driven hypotheses
  3. Calibrate efficient methodologies
  4. Develop predictive metrics
  5. Test these metrics
- Apply this integration effort to the two project purposes
- Make methods, data and results available via IRWM web site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