

IRWM General Conceptual Model Abridged Version

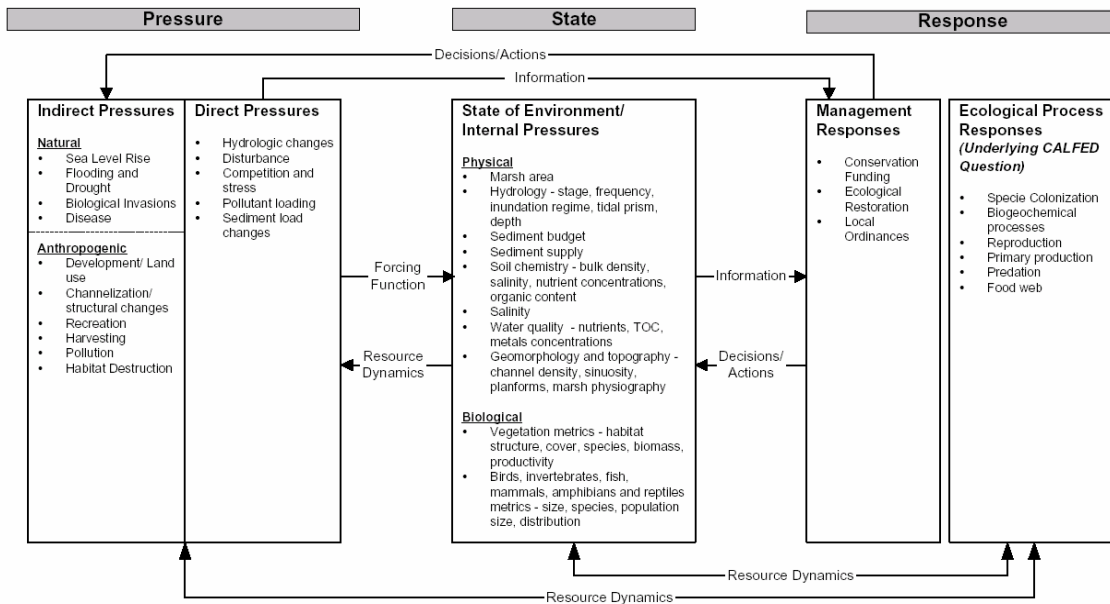
Shown in Oct 2003 State of the Estuary Conference Poster

The development of a Core Conceptual Model was necessary to guide field methodology and data interpretation for the IRWM project. This Core Conceptual Model is based on the conceptual model developed by the Physical Processes Team (PPT), which will be the basis for developing a shared conceptual model, and the Landscape Ecology Team (LET) conceptual model, which will be the core for addressing scale issues.

The PPT's conceptual model uses the Pressure-State-Response model (Figure CM-1) as a guide to examine interactions between external forcing pressures, internal site states, and the integrated responses the outcome of which is tidal marsh evolution following restoration. It begins by identifying the three fundamental external processes – *inundation, estuarine salinity gradient, sediment supply* (Figure CM-2). It discusses the myriad and often poorly understood linkages between these external processes, external and internal biological processes, and internal physical processes (Figure CM-3). It concludes with a hypothesis about the role of initial site conditions in affecting pathways of evolution at restoration sites that has been used to help guide site selection.

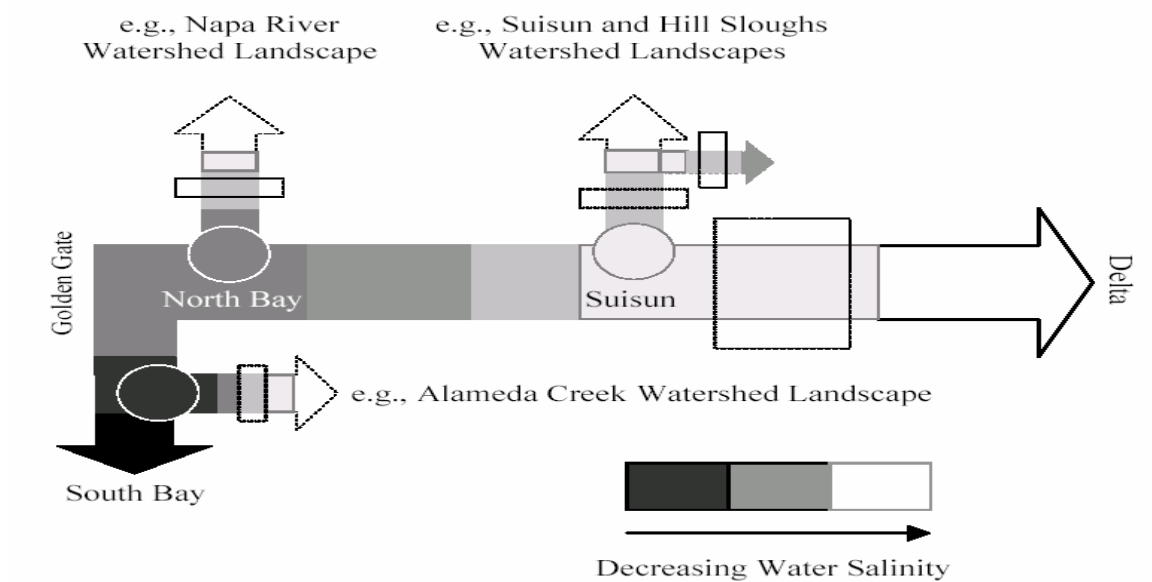
The LET conceptual model puts forward the premise that "...structure, function, and change of patches across landscape mosaics affect fundamental ecosystem processes, which determine the trajectories of wetland restoration... At the landscape scale, the spatial configuration of wetland patches – e.g., their size, shape, and connectivity – and the composition of surrounding uplands are the key components of structure."

Figure CM-1. Generalized Pressure-State-Response Model Evaluating Ecosystem Response of Marsh Restoration:



Notes.
1. Resource Dynamics defined as changes in resource status over time.

Figure CM-2. Diagram of Primary and Secondary Estuarine Salinity Gradients



This diagram contains three critical elements for our site selection discussion:

1. Salinity gradients occur along the main estuarine axis from the Golden Gate to the Delta and along the secondary axes of the larger watersheds.
2. Circles represent amplification of the tidal range due to standing waves near the mouths of local rivers and streams.
3. Dashed rectangles represent zones of anticipated turbidity maxima based on traditional estuarine models (and we acknowledge the recent USGS work that sheds greater light on these models). We acknowledge that specific site landscape configuration also affects sediment supply relative to available sources.

Figure CM-3. Conceptual Model of “State” Interactions:

