



Water – A Template for a New Landscape

While topographic changes were relatively minor except for removal of levees, ditches, and roads and creation and realignment of tidal channels, the degree of hydrologic change has been dramatic. These changes in hydrology or pattern and duration of tidal and flood flows are the templates for which a new landscape will be created in the newly restored Giacomini Wetlands. The water-driven changes are occurring even without the help of flood flows: no overbank flooding occurred last year during our dry winter and spring, but, in the future, they, along with the tides, will carve a new landscape out of the 550-acre former Waldo Giacomini Dairy ranch.



Louis Jaffe



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And
Channels to
Direct Flow



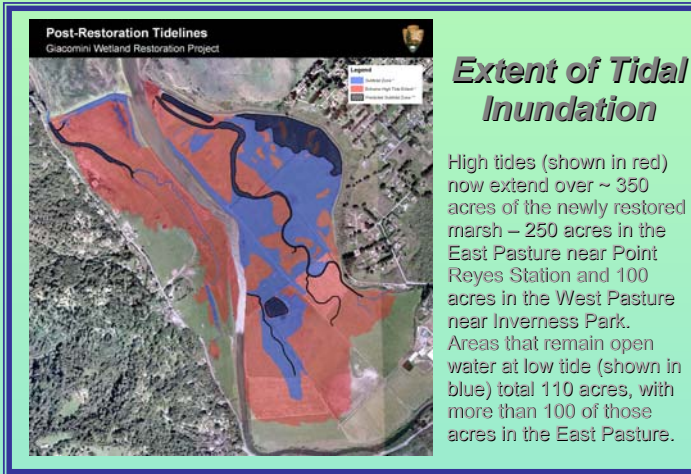
Robert Campbell Aerial Photography

Just Add
Water.....

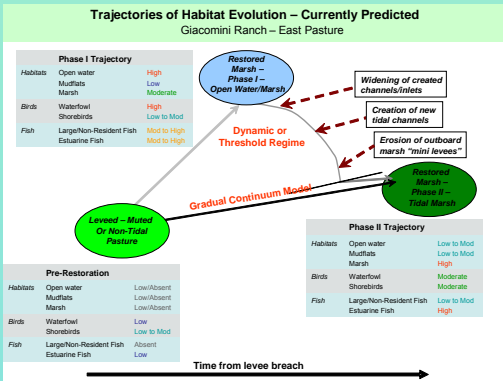


Results?

A Template for a New Landscape – One Forged by Water

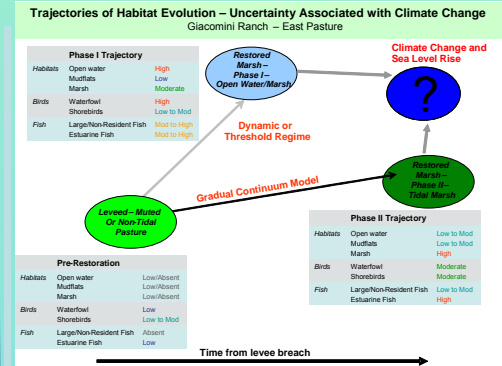


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Habitat Evolution Not a Linear Process

It was originally estimated that conversion to natural tidal marsh would take a minimum of 10- to 20 years – possibly longer – and would involve establishment of some transitional habitats. These estimates were based on a Gradual Continuum Model of ecosystem evolution. This model assumes a linear model of change from the disturbed condition (diked pasture) to a more natural state (tidal marsh). While not necessarily envisioned as a so-called classic successional process, the evolution of the Giacomini Wetlands was anticipated to occur more or less in a linear fashion or along some type of continuum of change (i.e., A→AB→B).



Predicted Tides under Phase II

High tides (shown in red) would remain similar, but under Phase II Tidal Marsh, areas that remain open water at low tide (shown in blue) would drop dramatically.



Since breaching of the levees, however, it is apparent that the transition to tidal marsh will not necessarily follow this Gradual Continuum Model of habitat evolution, but more of what is being called a Threshold or Dynamic Regime Model (Hobbs and Suding 2008). While also often assuming progression from a disturbed condition to a more natural state, this model differs in that progression is not assumed to be linear or to occur along a continuum of conditions. Rather, change occurs in a more discrete, step-like fashion, often with abrupt transitions between different states or conditions that require certain "thresholds" to be passed for movement from one state or condition to the next.

What Does the Future Really Hold?

The big wild card in all evaluations of the future of this landscape is climate change and sea level rise, which could transform the restored wetlands from either Phase I or Phase II into an entirely different landscape. See companion poster on recent studies on effects of sea level rise in Tomales Bay.



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