MANAGER NEEDS IN ADDRESSING WETLAND RESPONSE TO SEA LEVEL RISE

Major Feared "Impacts":

- Loss of habitats themselves/wildlife values if/where marshes can't keep up with SLR

- Loss of co-benefits : flood protection and water quality

- Damage to/loss of restoration investments

- Loss of funding support due to challenges to restoration project sustainability

Information Gaps:

- Sediment budget projections useable for driving projections of long-term marsh evolution

- Spatial evolution of marsh edges/extent – interactions with mudflats and subtidal areas

- Abilities/liabilities of living shorelines in terms of providing an appropriate shoreline protection/habitat combo

- When/where does infrastructure backing a marsh provide opportunities for movement/ alteration and where/when does it not?

- Clear understanding in management community of the limitations and assumptions of the models

- How should managers cope with the uncertainties in the science in addressing their vulnerabilities? Some vulnerabilities are very high cost to address – potential for uncertainty paralysis.
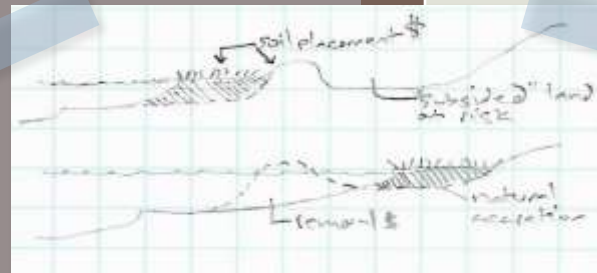
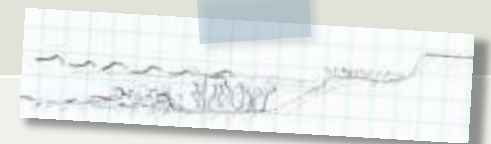| Manager Needs:	Associated Modeling/Analytical Capability:
Clear understanding of geomorphic settings – relative rates of SLR and sediment budget futures	• Need models that can be applied consistently/well to wide range of predicted SLR rates and sediment regimes (particularly variable across the state) • Need high quality inputs on those parameters
"Edge"/erosional effects to marshes – storm surge related or hydrological shifts; ability to dynamically model marsh edges and slough evolution	• Information needed to inform protection strategies – living shorelines • Need process-based understanding of marsh and bed dynamics, either as grounding to check parameterizations or for investigating site specific designs
Where will the marshes go? What do we lose if we don't act? Where could they go if we did?	• Analysis of projected changes to existing marshes/Analysis of opportunities to migrate wetlands inland – where are there low-cost options (or high avoided-cost options) • Requires understanding of "in-board" environment – ecotone, levee heights/conditions, infrastructure • Analytical support for nourishment strategies • Understanding of legal/mitigation constraints
Cost/benefit analysis of the above – needed to prioritize potential restoration investments	• Need ability to address/incorporate understanding of near-shore land uses (and land use plans), and replacement/maintenance schedule of shoreline structures • Cost information on restoration/adaptation strategies – sediment placement needs and $$
Linkages to other Climate Change effects	• Even if there in future, how will they change? – impacts to functioning: salinity, freshwater input changes, vegetation and habitat assemblage changes • Changes in other physical factors – watershed sediment/hydrology and timing, beach dynamics and saltwater flows (particularly with seasonal closures)

Pitfalls...

- Under-simplifying (over-specifying) model results for application at hand

- Lacking clarity about projections (of potential scenarios) versus predictions (of outcomes)
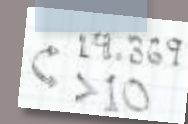
...And Best Practices in Representing Uncertainty

- Bracketing management options

- Confidence estimates and other uncertainty measures

- Analyzing overlap and concurrence among scenarios, without simply "shooting for the mean"

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