



**San Francisco Bay Regional CHARG: Coastal Hazards Adaptation Resiliency Group
 March 16, 2016 Adaptation Strategies Working Group Meeting Minutes
 Hayward City Hall Council Chambers, 777 B Street, Hayward**

Participants

Chuck Anderson	Schaaf & Wheeler
Dale Kerper	DHI Water & Environment
Dan Matthies	Wood Rodgers, Inc.
Gina Blus	Climate Ready Solutions
Hilary Papendick	San Mateo County Office of Sustainability
Jeff Carson	City of Hayward - Water Pollution Control Facility
Kathy Schaefer	UC Berkeley
Lauma (Jurkevics) Willis	California Department of Water Resources
Mark Stacey	UC Berkeley
Michelle Iblings	Alameda County Flood Control and Water Conservation District
Patrick Barnard	USGS
Rohin Saleh	Alameda County Flood Control and Water Conservation District
Rosalyn Yu	San Francisco International Airport
Sybil Hatch	Convey, Inc.
Ani Thompkins	Convey, Inc.

Presentations: Review of San Francisco Bay Regional Models and On-Going Studies

- Patrick Barnard: see presentation slides (attached).
 - § Overview of various hydrodynamic models available today; they basically accomplish the same thing but are used differently. High level of sophistication, boundary conditions consider event coincidence.
 - § USGS CoSMoS model completed in 2014; ***“Our Coast Our Future” web tool*** available. Includes hydrodynamic flow, erosion, dredging, and fate of sediment in the system at the Golden Gate. Net flow of sediment goes through aggregate mining spot in the Bay and is a direct relationship to the erosion just outside the Bay. Couples watershed flooding with bayshore flooding using flexible mesh approach to create forecasting capabilities.
 - § Model simulates discrete events (e.g. 24 hour). Fluvial discharge information comes from all the major watersheds in the Bay. Tide gage at Golden gate dates back to the 1850s; Most well-characterized storms date back to mid 1980’s (gage data prior is unreliable). Use photographs from historic events (e.g. King tide) where available to help inform 2-D flood extents.

- § Biggest areas of uncertainty is variable bed friction/ bottom roughness. Also only considers existing watershed conditions (to-date).
- § **EO 13690** dictates limits on federal funds for buildings and homes (100-year plus 2-3 feet; 500-year; best available climate science; etc). CoSMoS would be able to run these scenarios to produce a boundary within which the EO complies. Give this to HUD, EPA, etc.
- Mark Stacey: see presentation slides (attached).
 - § RISER is a new 4-5 year project motivated by earlier work (SUNTANS modeling) that show decisions made about the shoreline could have regional impacts. Built with **CoSMoS framework** with some refinement; method by which we can alter shorelines. Defines two impacts from local/regional actions (e.g. shoreline modifications): (1) how they affect regional hydrodynamics, and (2) what disruptions will occur to transportation systems that will impact the region.
 - § Project includes a **governance model** including regional, county, and local agencies to determine how well-suited the governing structure is to address SLR impacts.
 - § Working with USGS (Patrick Barnard) to build DELFT model capability for shoreline scenarios, then look at how it will impact bayside, local / transportation interruptions, and businesses. Working to understand how decisions are made about the shoreline.
 - § Mitigation strategies in the system: explore local actions and **at what scale a project causes regional impacts**. Model allows user to explore made-up scenarios. Simultaneously collect the community's views on the impacts. For example, compare hard and soft structures at locations requiring a levee. May use **simplified models** to quickly measure/compare the scale of impact.
 - § **NSF guidance** and funding requirements may affect case study locations and mitigation strategies.
- Dale Kerper: see presentation slides (attached).
 - § FEMA Regional Model (DHI) used for FEMA flood zone mapping (regulatory model for the bay, suited for flood insurance purposes).
 - § Output (still water levels) from regional, 54 year model that considers tide, storm surge, wind waves, and swell waves is scaled to a local 2D model (detailed analysis) to obtain FEMA transect WSEL.
 - § Local 2D models have been developed in the south bay to include detailed floodplain storage inland of the outboard levees.
 - § Baywide **Response to SLR** for range of Levee assumptions: 12 scenario model runs coupled 3 levee conditions (infinite levee, existing levee, no levee) with 4 SLR (0, 50, 81, 140 cm) scenarios.

Group Discussion of Needs and Scope of Studies

- Rohin Saleh: see presentation slides (attached).
 - § FEMA released its report showing flood inundation and mapped zones. Need to consider our regional response. Regional solutions must be **scalable and adaptable**.
 - § BCDC and Alameda County have performed a weak-link analysis for the Alameda County shoreline as the first phase of ART project. Similar study is currently in progress for the rest of the bay. Once completed threshold of jurisdictional action in different areas needs to be established.
 - § Water levels and timeline to react is one of the Adaptation Strategy Group tasks to establish.

- § Need to understand **how local projects will affect the region**. For example, Salt Pond Restoration projects are needed for coastal flood protection, but need to analyze those for impacts caused by SLR. Similarly, how will construction of levees and seawalls impact regional water levels?
- § For regional adaptation strategies subgroup: In order to develop a strong foundation for SLR adaptation strategies, we first need to define and develop the scope of studies that we must conduct. Adaptation strategies sub group members are tasked to develop an outline for the required studies.
- Water quality has not yet been assessed. Potential for third-party class action suits based on mercury contamination in floodplains. Bayshore industrial contaminants may be exacerbated by rising waters.
 - Strongly consider using **risk-based analysis**. May be a better approach for SLR impacts than FEMA mapping in some areas (e.g. San Mateo). USACE has a decision tree that is useful in considering coincidence of tide & river frequency.
 - CHARG should consider determining the boundary that **EO 13690** dictates, to share with CHARG Funding group, who are looking beyond federal for funding. For example, “Refocus” company used creative strategies to leverage catastrophic/private risk companies for financing resilient infrastructure post-Sandy.
 - **SFO discussion**: Currently planning sea walls where none exist. State has no clear guidance on wall heights (for SLR). City [of SF] is currently developing guidance for wall height requirements, currently requires them to “consider” the higher SLR projections. FAA is maxed out on land based on wall elevations; opportunity to advocate for funding (currently more focused on air traffic control safety).
 - State guidance includes regulatory actions that will be imposed to consider SLR. NRC based on previous CNET3 (AR4) projections. Projections will constantly be updated as science improves (e.g. ice sheet dynamics). Next update is 2017. State water board is also doing a study for sediment out of bay.
 - Next major earthquake is imminent; there is potential to guide rebuilding effort **away from** “quick fix” (return to existing conditions) and **toward** an SLR approach. CHARG needs to develop a weighting/rating system for adaptation strategies (e.g. strategic removal/deposition of storm debris) post-disaster.
 - Combination of coastal and fluvial effects should be considered.