

10 Challenges to SLR Implementation in 10 Minutes - View from Local Flood Control*

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**One flood engineers
mini-rant...*

#1 – Simplistic Adaptation

“Cartoons” Minimize Complexity

- “Cartoon” representations of adaptation can ignore complexity (*i.e. massive redevelopment*)
- Avoids discussion of factors such as private property rights, CEQA, costs and permitting
- Openly discuss trade-offs (lose-lose)



bjarke ingels group unveils floating city concept made up of hexagonal islands

#2 – Singular Focus on Green “Solutions”

- Wetlands are very important but not always sufficient for flood protection
- Most agency/NGO presentations are only this...
- Higher SLR values may wash out these “solutions”

WETLANDS CAN HELP SAN FRANCISCO COMBAT LEVEL RISE

By Catherine A. Cardno, Ph.D.

A report authored by 100 scientists and 21 management agencies recommends wetlands to mitigate the effects of sea level rise in the bays in the San Francisco area.

November 10, 2015—Rising global temperatures, melting arctic ice, and rising sea levels are creating multiple issues that coastal communities must address if they hope to become resilient in the face of natural disasters. Within the United States, planning on the East and Gulf coasts must include the effects of hurricanes and their associated storm surges, among other issues. On the West Coast, much of the attention is given to earthquakes, but rising sea levels there must also be addressed if its coastal areas—the low-lying San Francisco Bay area, for example—hope to adjust without losing the valuable infrastructure that often extends along the coastlines.

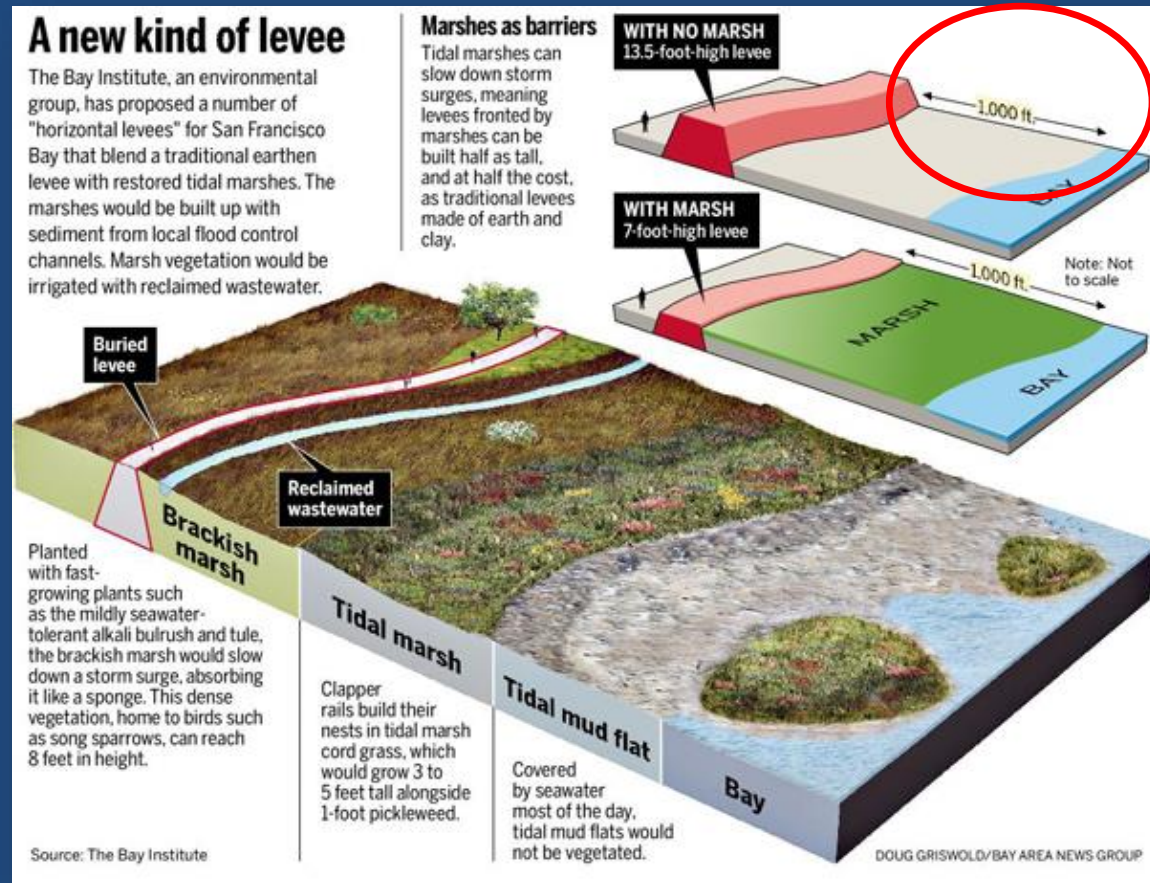
A new report, *The Baylands and Climate Change: What We Can Do*, released last month and authored by 100 scientists and 21 management agencies, recommends mitigating the effects of sea level rise in the San Francisco Bay Area by using wetlands. The report focuses on the steps necessary to maintain a resilient ecosystem in the Bay area through 2100, and is an update of the 1999 report *Baylands Ecosystem Habitat Goals*, which calls for the establishment and maintenance of 100,000 acres of habitable tidal marsh.



The creation and maintenance of wetlands can help the San Francisco Bay area remain resilient against sea level increases without the need for construction projects, a new report reveals. NPS

#3 – Difficulties in Moving Large Volumes of Fill

- Earthwork is highly complex
- Not only sourcing large quantities, but physically moving it (*trucking, dredging, loading, GHG emissions*)



Trucks, trucks, trucks



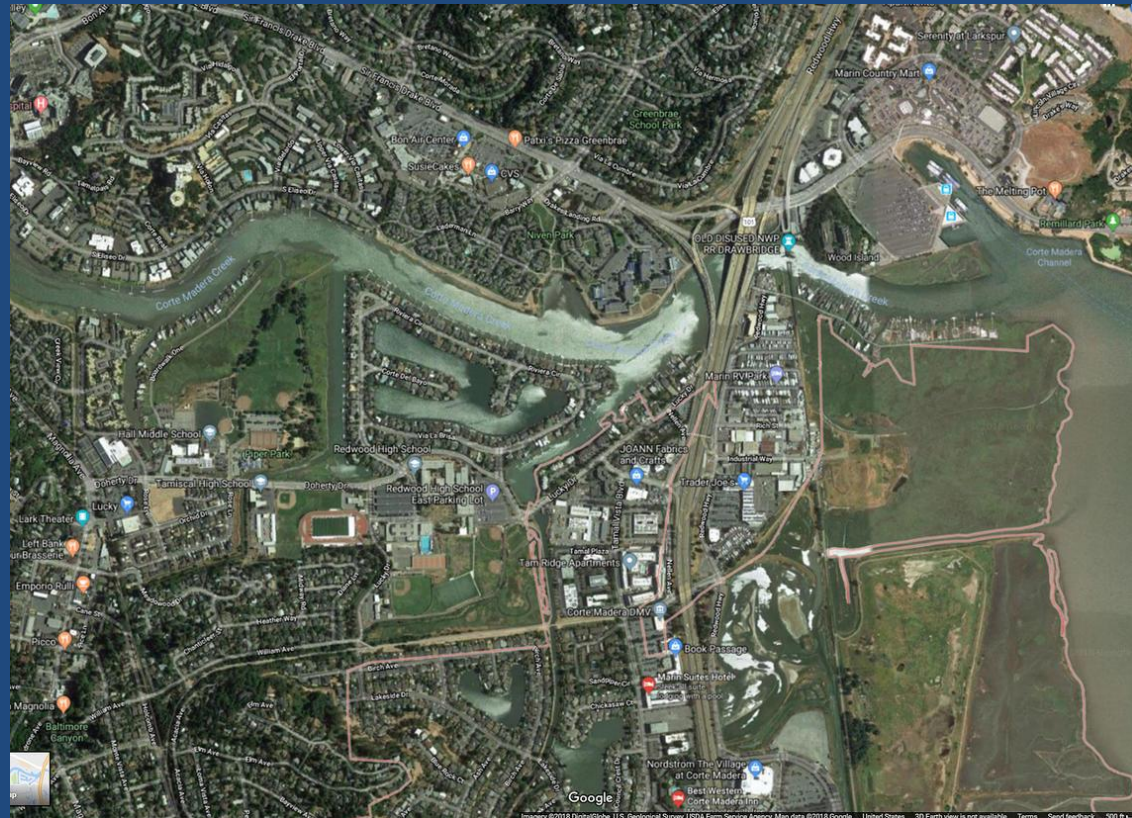
#4 – Lack of Knowledge on Cost-Effective Implementation

- Need more focus on engineering pilots to reduce costs for adaptation
- Some ecotone levee projects showing erosion issues



#5 - Primary Source of Urban Flooding Up Creeks and Rivers Has No “Natural Solution”

- Major areas of existing development in these areas (*redevelop?*)
- Need to look closely at tidal barriers flood gates on some creeks



#6 – CEQA/NEPA Limits Adaptation

- CEQA actually only looks at a project's impact on the environment, not the environment's impact on the project (i.e. SLR impacts)
- First in time, first in protection (i.e. utilities)
- What is “baseline” in a changing environment?
- Easy to “kill” projects

#7 - State and Local Permits

- Permitting can be difficult and expensive (BRRIT may be one solution)
- Focus on single species at expense of habitats or protecting people
- Ecosystems are always changing – why is bay edge circa 1900 the goal
- Permits require expensive monitoring and analysis
- Costs are out of scale. Some projects are abandoned or never even started

#8 – Funding of So-Called “Tool Boxes”

- “Tools” that aren’t tools to flood agencies
- “Tool boxes” should be checked and scored for citations and used for a year or two afterwards
- The “Tools” are mostly GIS based models
- Need different tool boxes for different users

#9 – How Grant Funding is Decided

- Restrictions on dredging, hard infrastructure
- No funding for maintenance
- No more GIS flood maps needed....(USGS maps circa 2009)
- Need larger pool of deciders...

#10 – Lack of Focus on Need for Both Hard and Soft Engineering (green/gray)

- Ecotone levees will typically need traditional pump stations being them
- Can't do green without some gray and effectively do flood protection
- Post flooding, push will be for hard engineering so we will need to do both

#11 – Hard to Find Real Funding/Tech Support for Flood Protection

- No real funding for flood protection projects – difficult to obtain FEMA and Corps funding
- FEMA and USACE not really interested in certifying levees – how will they address ecotone levee?
- Could USACE be technically involved in vetting ecotone/horizontal levee design and construction? Other technical issues

Final Thoughts

- At least 10 to 20 years into Focused Bay SLR response – what have we accomplished? Is it enough? Money spent
- What are our goals? Habitat protection or people protection? What about conflicts?
- Much confusion and disconnect at the local level - where the flood agencies live
- Is the money really there? And for what and whom?
- Is governance really changing? Nature of bureaucracy
- Dealing with real people is eye opening