

Resource Management for Sea Level Rise Adaptation

Nate Kauffman & Doug Wallace
SFBRA Meeting, 2/12/21



Doug Wallace

Consultant and Activist

For 25 years, Doug was the chief environmental advocate at the East Bay Municipal Utility District (EBMUD). During that time, he advanced numerous initiatives in environmental policy and sustainability, most often involving complex stakeholder interactions. He is currently a climate change consultant, and serves as the North Bay representative on the Restoration Authority's Independent Citizens' Oversight Committee.



Nate Kauffman

PhD Candidate, UC Berkeley; Adaptation Planner

Nate's scholarship and research concern strategic planning for climate adaptation. He studies the industrial ecology and system dynamics involved in physically constructing landscapes and urban shorelines that are sustainable, ecologically rich and equitable. An award-winning landscape architect with experience as a project director, consultant and educator, Nate founded LEAP, the Live Edge Adaptation Project, to envision a more vibrant and just future.

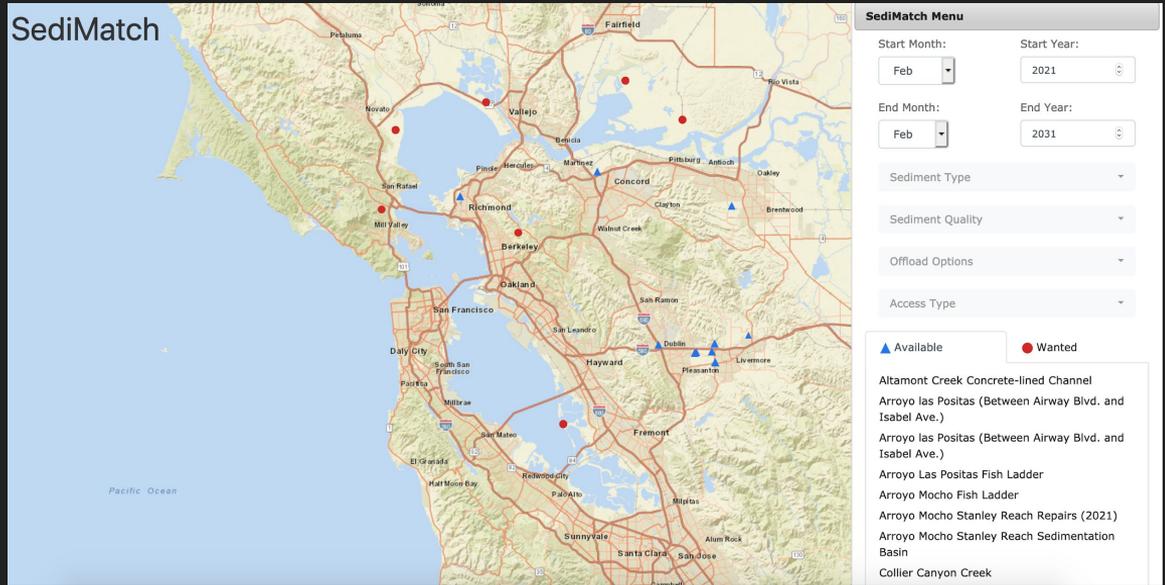
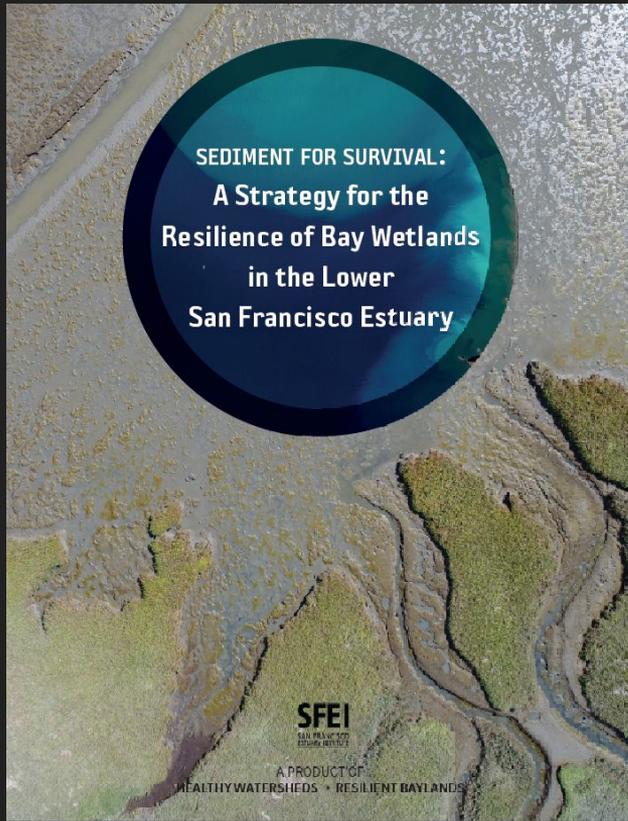
“ The natural processes and physical materials of the Bay are not going to sculpt the landscape we need for 21st century resilience and sustainability. ”

- Andy Gunther

Enormous volumes of diverse materials will be needed to nourish wetlands, fill subsided ponds/polders, realign or raise barriers, and remediate and construct future inundation/transition zones.

Main Points

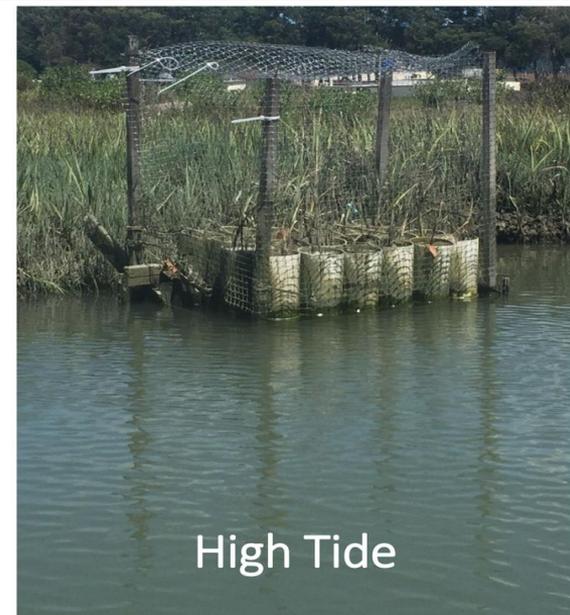
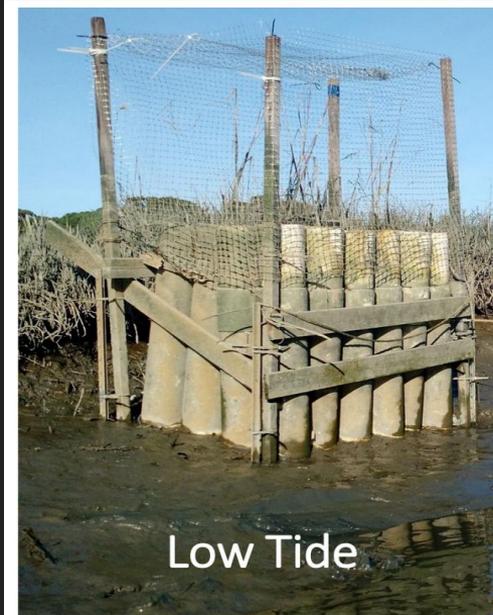
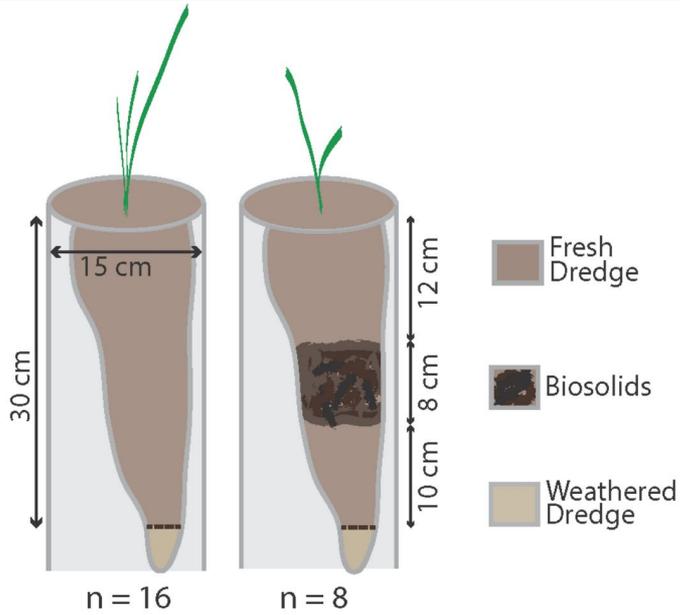
1. Overlooked and undervalued resources in the region may be crucial tools for adapting to SLR.
2. Leadership is critical to support and facilitate studying, analyzing and modeling these resources.
3. Achieving regional adaptation goals will require public/private sector collaboration to optimize materials management.



Important projects to mention on this topic: SFEI's Sediment Strategy (forthcoming) and the Sedi-Match Tool

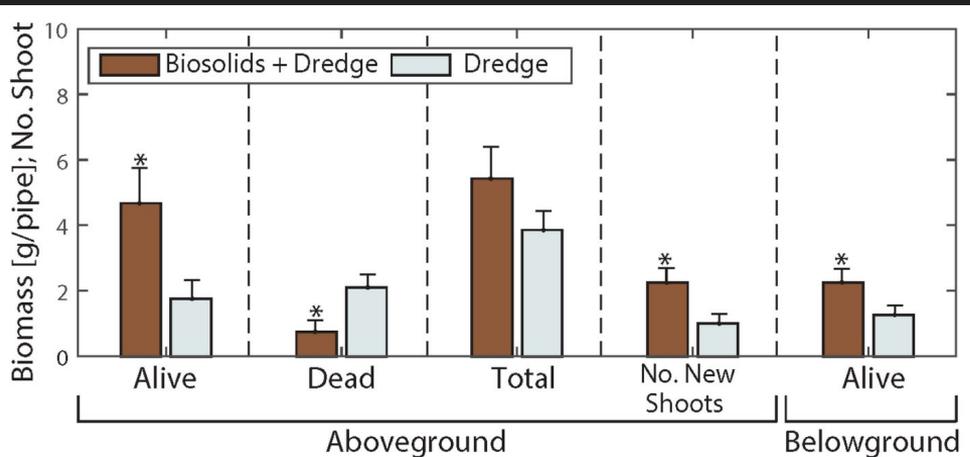
Local Experimentation with biosolids as soil amendment.

Courtesy of *Foster-Martinez & Variano (2018)*



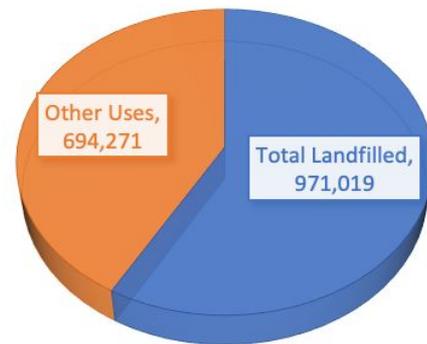
Foster-Martinez & Variano (2018)

Biosolids as a Marsh Restoration Amendment, *Ecological Engineering* 117; 165-173



Foster-Martinez and Variano (2018)

REGIONAL BIOSOLIDS DISPOSAL, US TONS: 2009-2018



Critical Considerations and Concerns :

- 1 ECOLOGICAL : Various active biochemical compounds and pollutants of concern.
- 2 GEOTECHNICAL : Aspects relating to use as a building material.
- 3 SOCIAL : Aesthetic impacts and those affecting public use and access of Baylands.
- 4 PERMITTING : Numerous technical permits relating to clean water and a healthy watershed.
- 5 CONSTRUCTION : Impacts and issues associated with management, reuse and application.

Pond E6 : Planned Ecotone @ Upland Levee Edge = 300' wide x 2500' long



Before 2025



After 2025

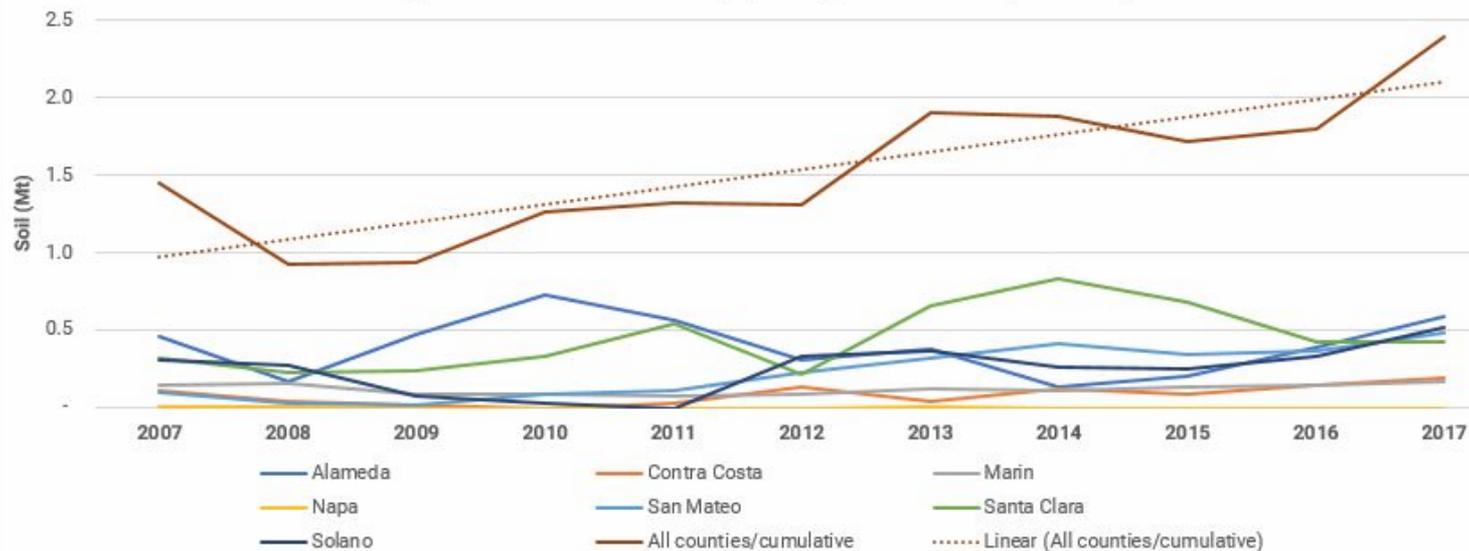


NOT FOR DISTRIBUTION

Population rise + urban density = excavation of soils.

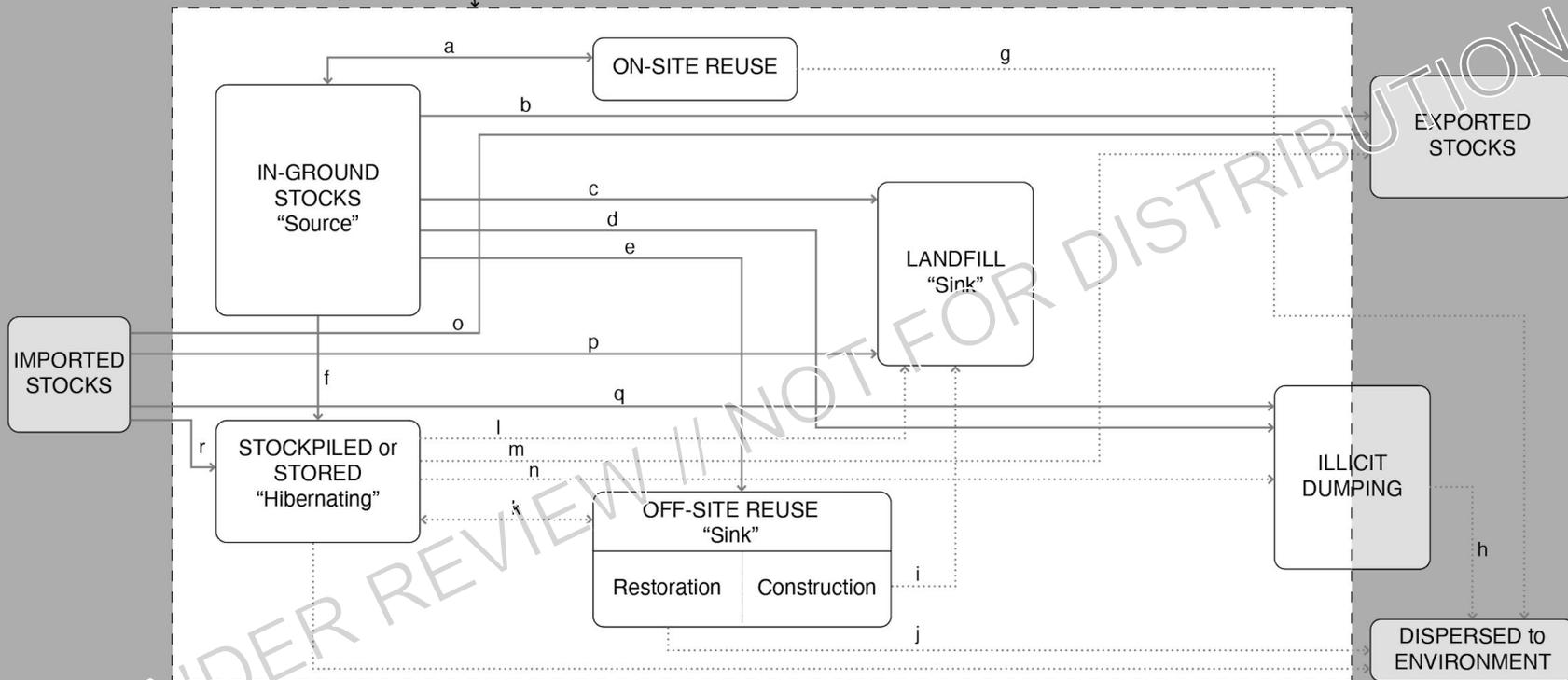


Regional Soil Volumes to Landfills, by County and Cumulative (2007-2017)



Material Flow Analysis: Excavated Soils

SYSTEM BOUNDARY:
9-County SF Bay Area



a. On-site Reuse*

b. In-Ground Stock Exported from System

c. In-Ground Stock to Landfill

d. In-Ground Stock to Illicit Dumping

e. In-Ground Stock to Off-site Reuse

f. In-Ground Stock to Stockpile

g. On-site Reuse to Environment

h. Illicit Dump to Environment

i. Off-site Reuse to Landfill

j. Off-site Reuse to Environment

k. Stockpile to Off-site Reuse*

l. Stockpile to Landfill

m. Stockpile Exported from System

n. Stockpile to Illicit Dumping

o. Transported through System

p. Imported to Landfill

q. Imported to Illicit Dumping

r. Imported to Stockpile

What's Needed

1. Leadership - to drive a deeper evaluation of overlooked materials for restoration and adaptation.
2. Cross-sector collaboration - to optimize materials management and achieve regional adaptation goals.
3. A fresh look - at legacy regulations that impede the novel enterprise of SLR adaptation, and fail to recognize newly emerging risks to the human and natural environment.

Water Board's Perspective on Using Biosolids for Wetland Restoration

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Regulatory Challenges

- Statewide General Order
 - Prohibits runoff from site
 - Excludes Suisun Marsh and BCDC jurisdiction
- Many other agencies involved in permitting biosolid reuse in wetlands



Technical Considerations

- Metals
- Nutrients (agronomic rate)
- Emerging Contaminants
- Others?



Priority Sediment Sources for Marsh Restoration

- Navigational Dredging
- Excavated Upland Soils
- Flood Control Channels



Thank You!

