Sediment for Survival
A Strategy for Bayland Resilience

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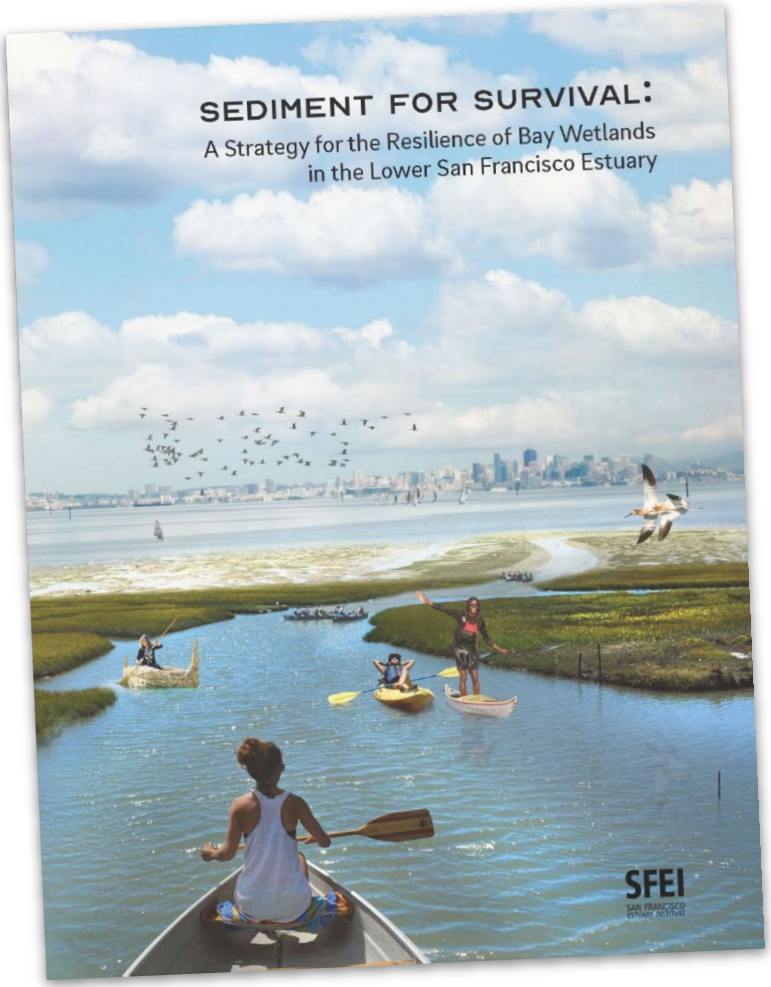
Senior Scientist & Lead Geomorphologist

Resilient Landscapes Program

14 October 2021
Bay RMP Annual Meeting

SFEI AQUATIC SCIENCE CENTER



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Acknowledgements

Technical Advisory Committee (TAC)

- Josh Collins (SFEI)
- Maureen Downing-Kunz (ESA)
- Lorraine Flint (USGS, ret)
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- Jeremy Lowe (SFEI)
- Lester McKee (SFEI)
- Michelle Orr (ESA)
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- Karen Thorne (USGS)

Management Advisory Committee (MAC)

- Luisa Valiela (EPA)
- Darcie Luce (SFEP)
- Donna Ball (SBSPRP and SFEI)
- Jessica Davenport (SCC)
- Setenay Frucht (SF Bay RWQCB)
- Brenda Goeden (BCDC)
- Dave Halsing (SBSPRP)
- Roger Leventhal (Marin DPW)
- Brett Milligan (UC Davis)
- Heidi Nutters (SFEP)
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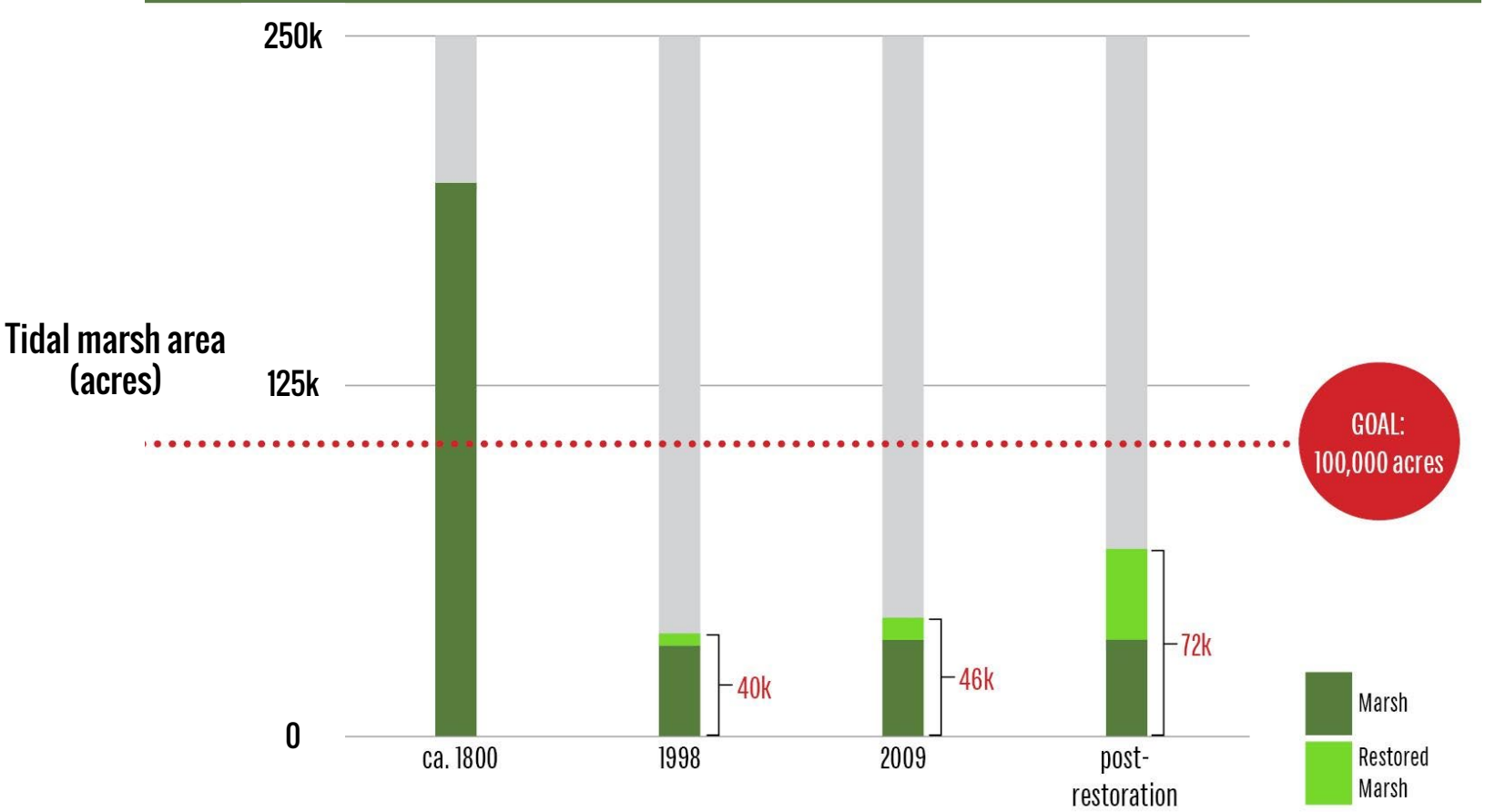
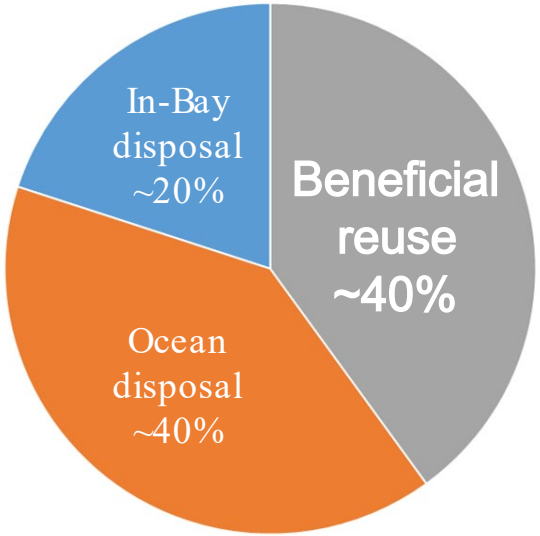
TIDAL MARSH *restoration*



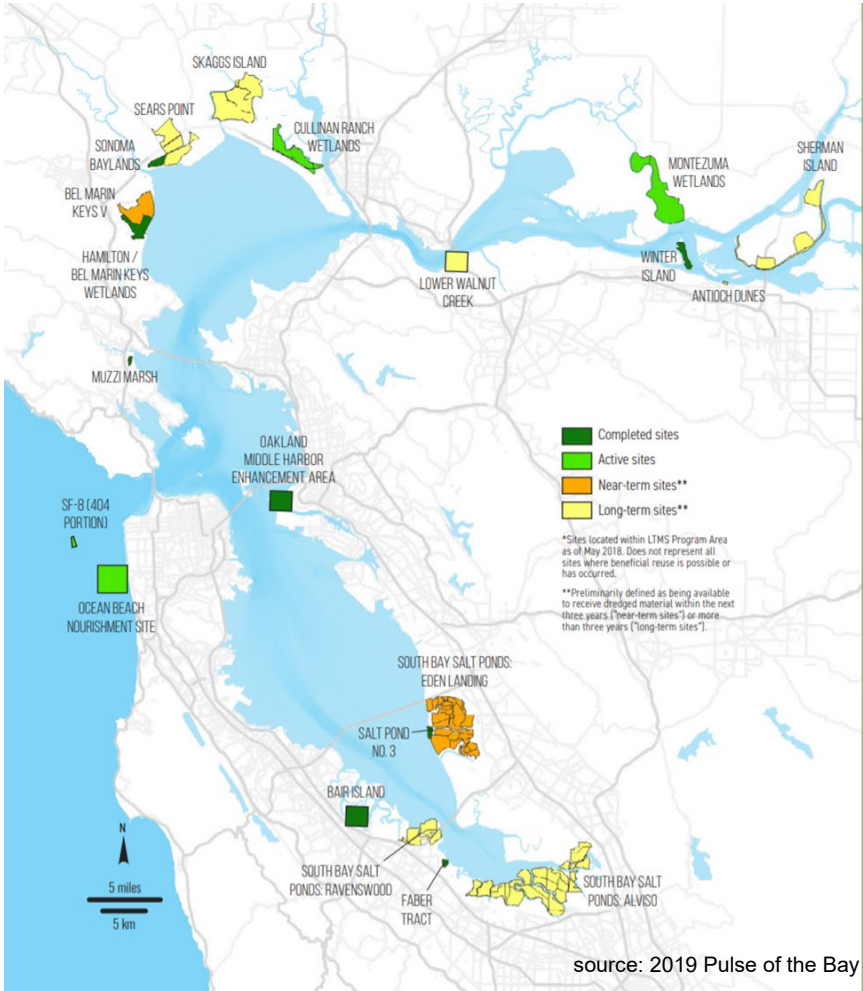
LTMS Program

Long-term goal for dredged sediment



To date, ~25 million cubic yards of dredged sediment have been used to restore over 7,500 acres of wetlands

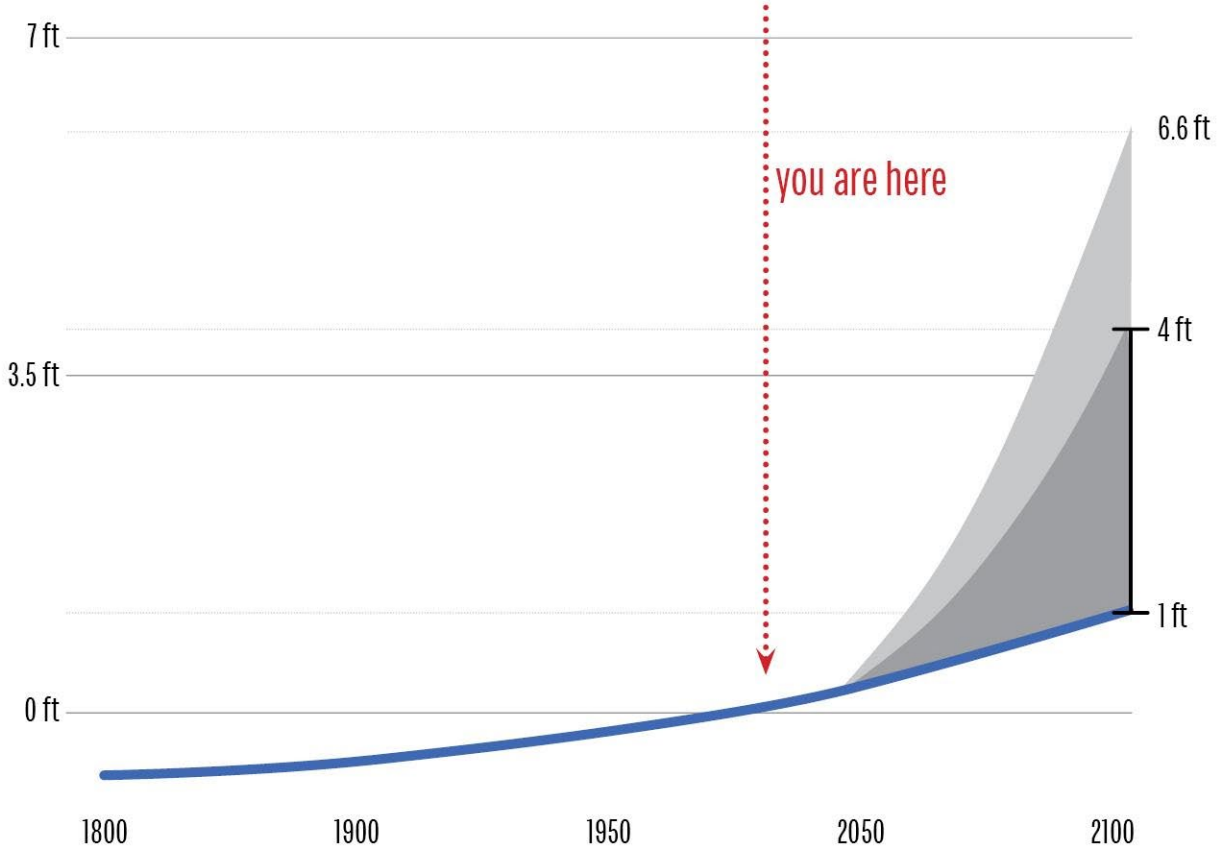
LTMS Beneficial Reuse Placement Sites in SF Bay



source: 2019 Pulse of the Bay

GLOBAL SEA LEVEL *change* SINCE 1800

Courtesy 3rd National Climate Assessment, 2014



Key Sediment Questions

How much sediment is needed?

How much sediment is available?

How can we get more?

Scenarios Considered

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Future bayland habitats

- **Existing baylands**(ca. 2009)
- **Existing baylands + 24k acres restoration**

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SLR projections

- **1.9 ft SLR**(2010-2050)
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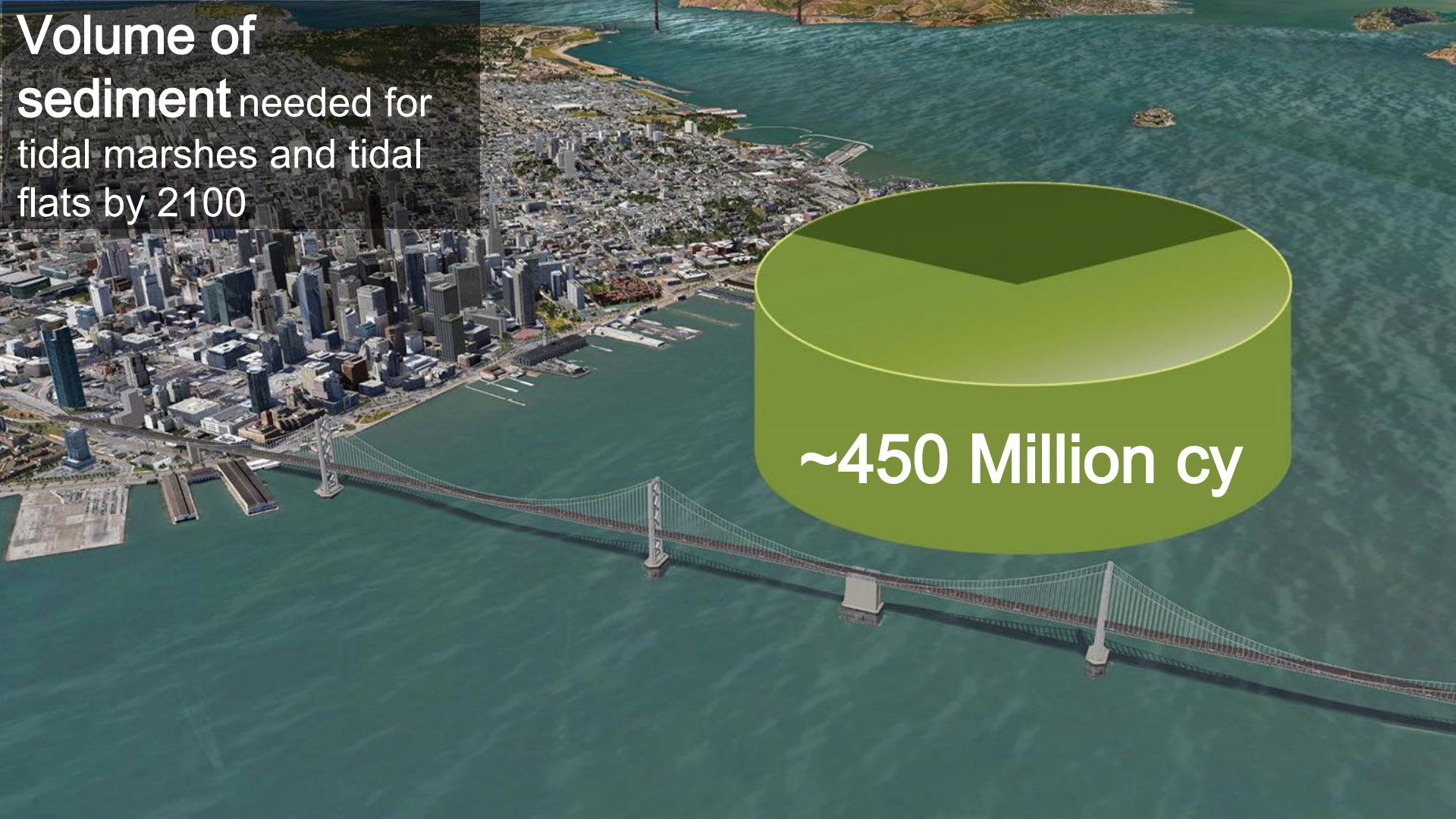
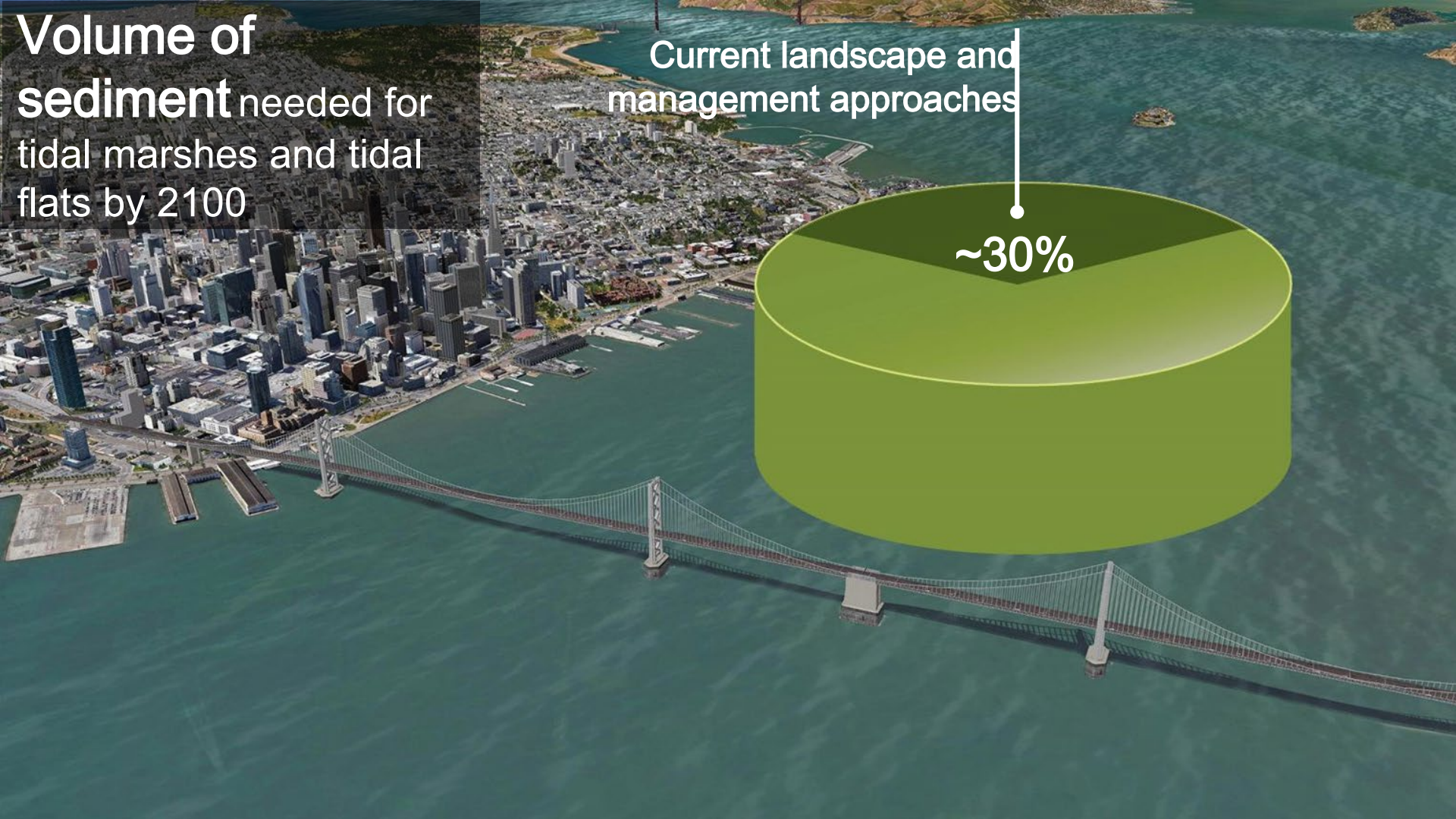
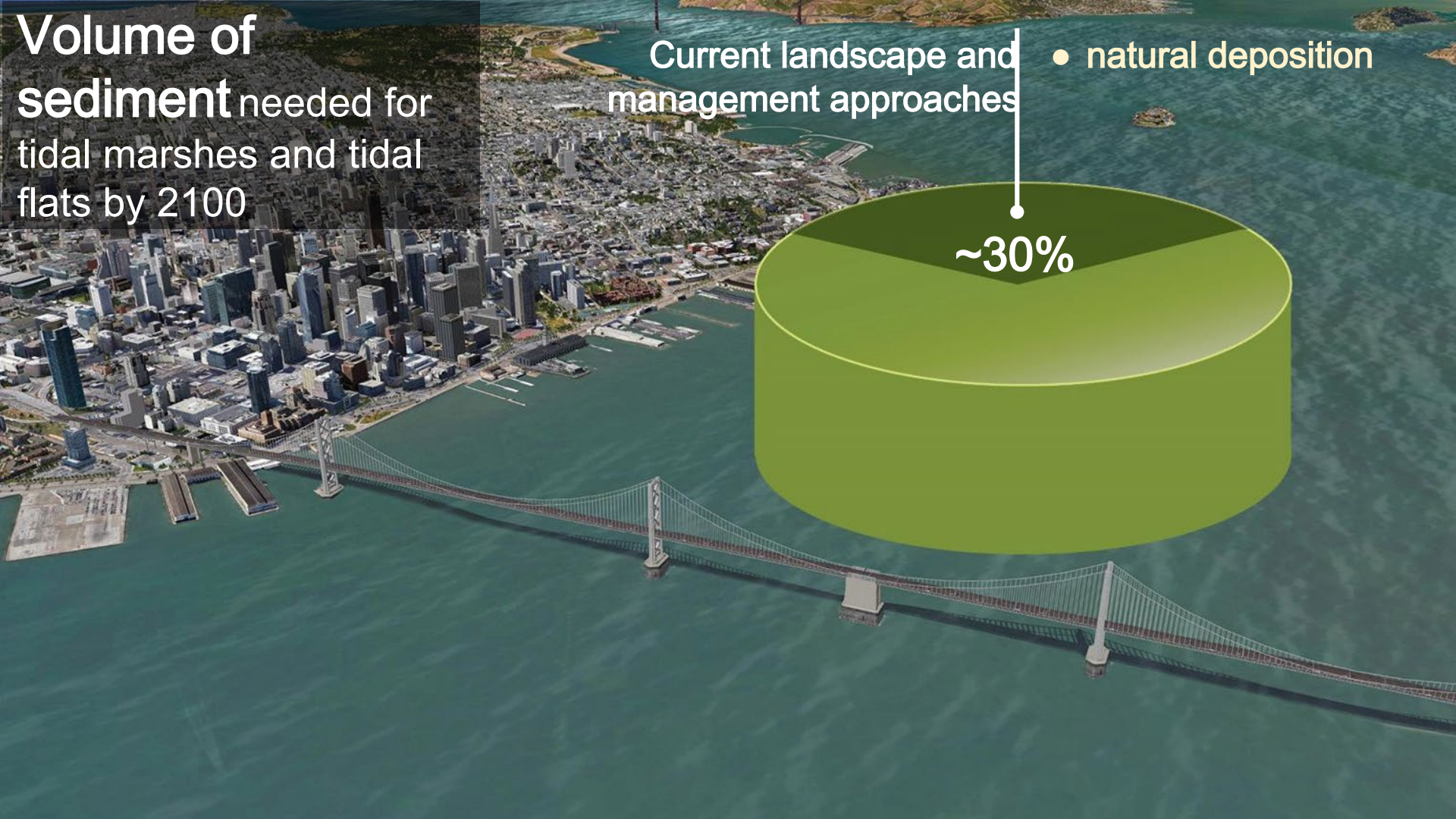
Future precipitation/runoff

- **Slightly wetter future**
- **Slightly drier future**


Volume of sediment needed for tidal marshes and tidal flats by 2100
~450 Million cy


Volume of sediment needed for tidal marshes and tidal flats by 2100
Current landscape and management approaches
~30%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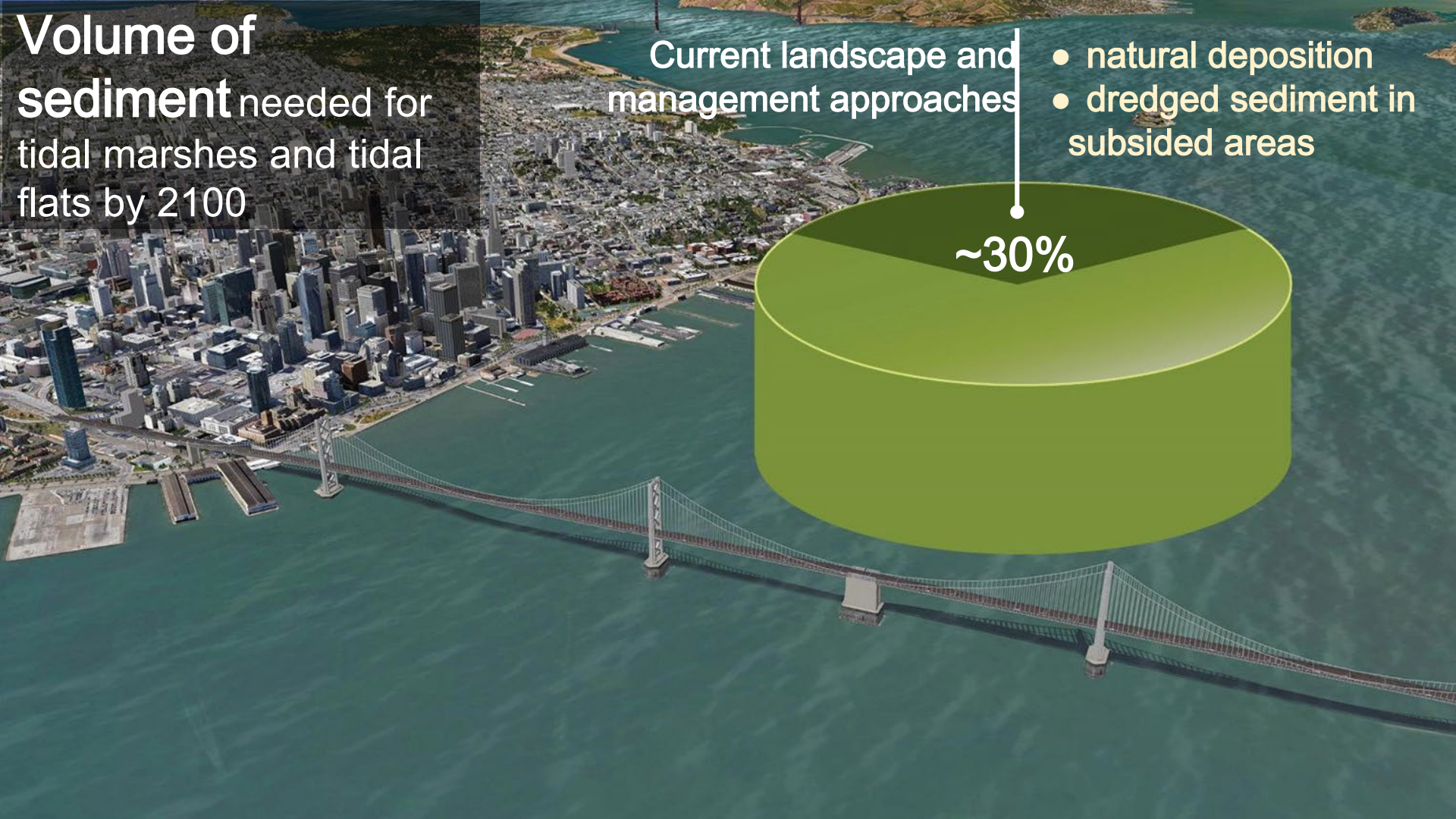
Volume of sediment needed for tidal marshes and tidal flats by 2100
Current landscape and management approaches
• natural deposition
• dredged sediment in subsided areas
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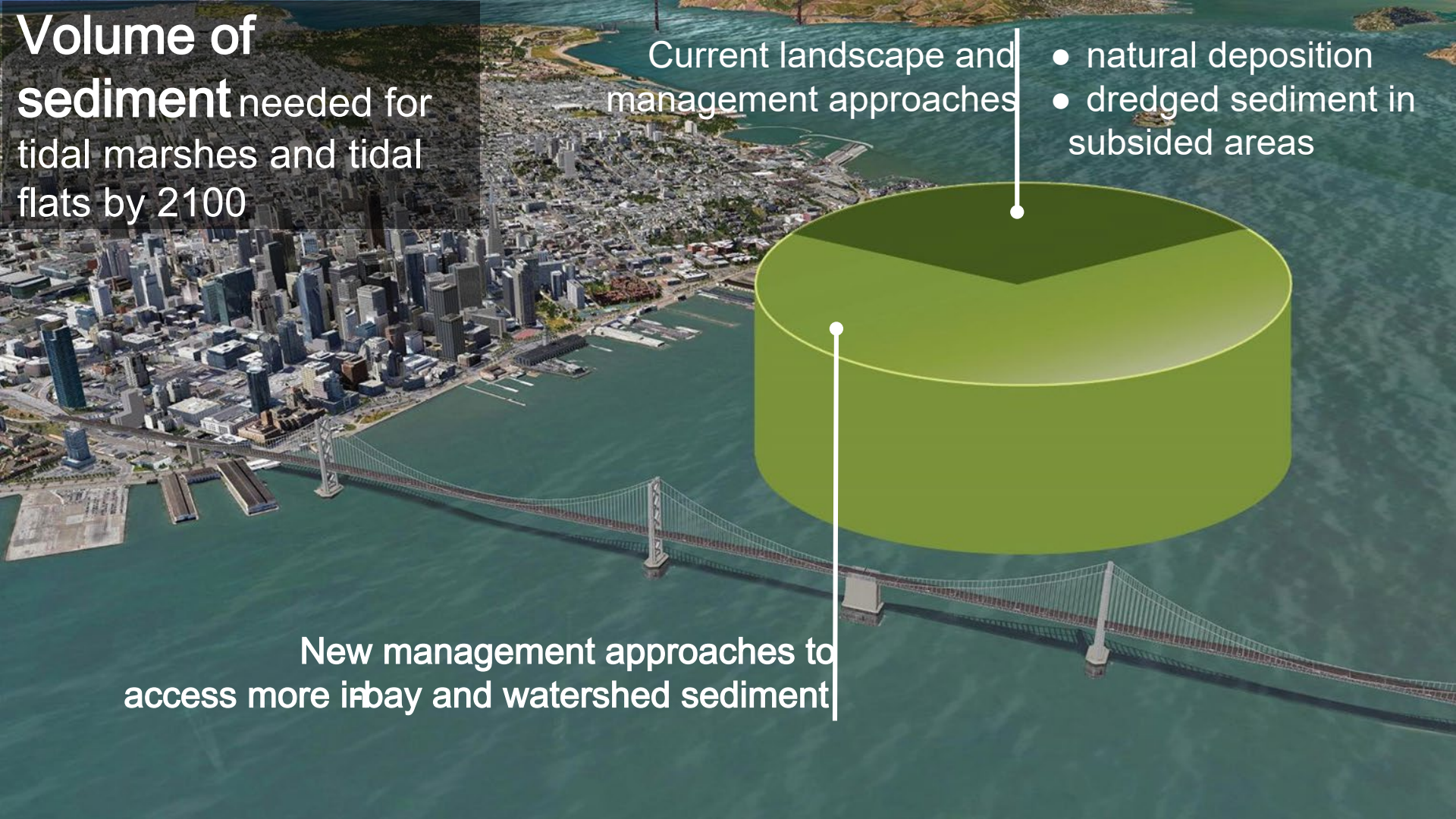
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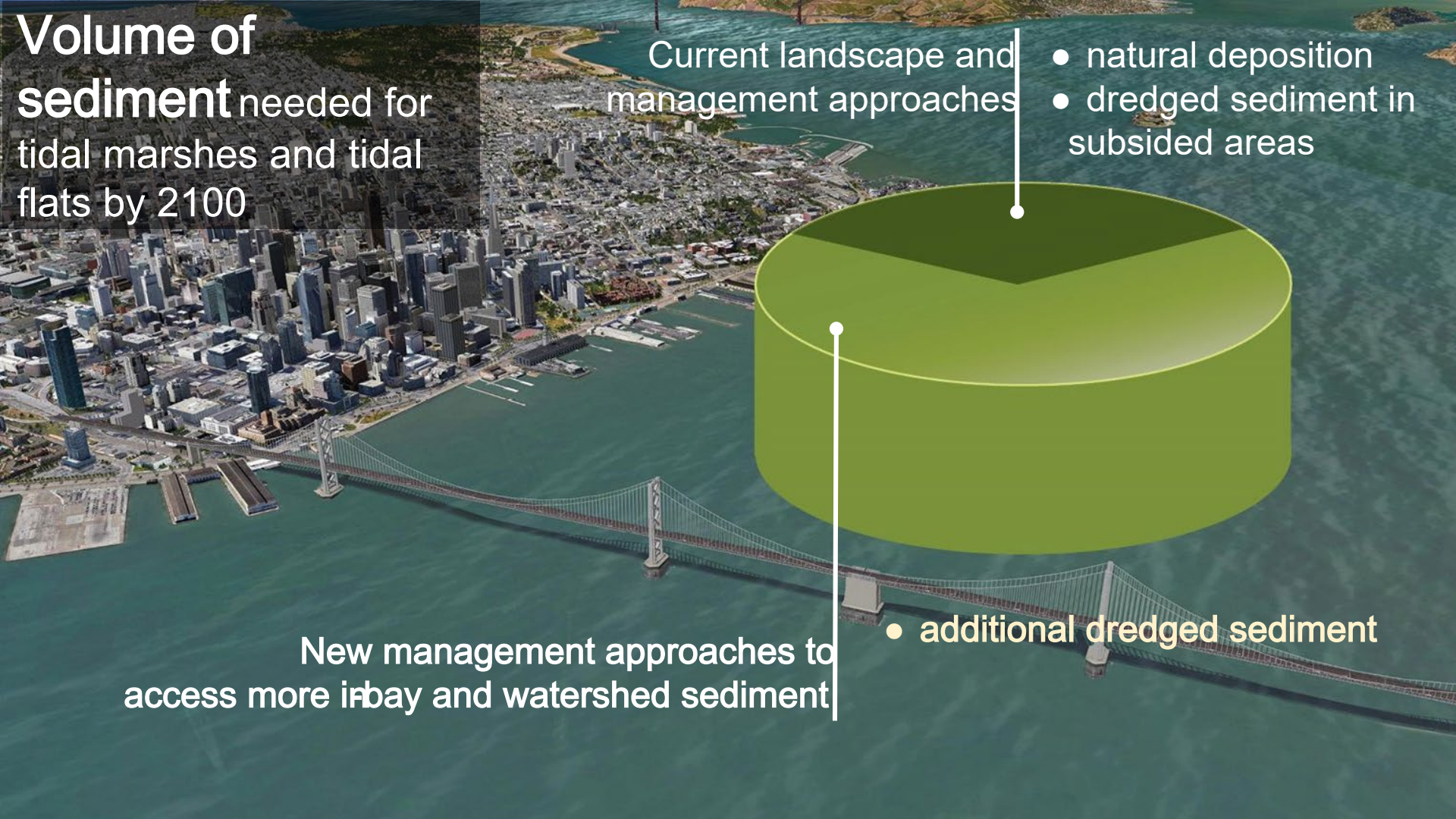
New management approaches to access more in-bay and watershed sediment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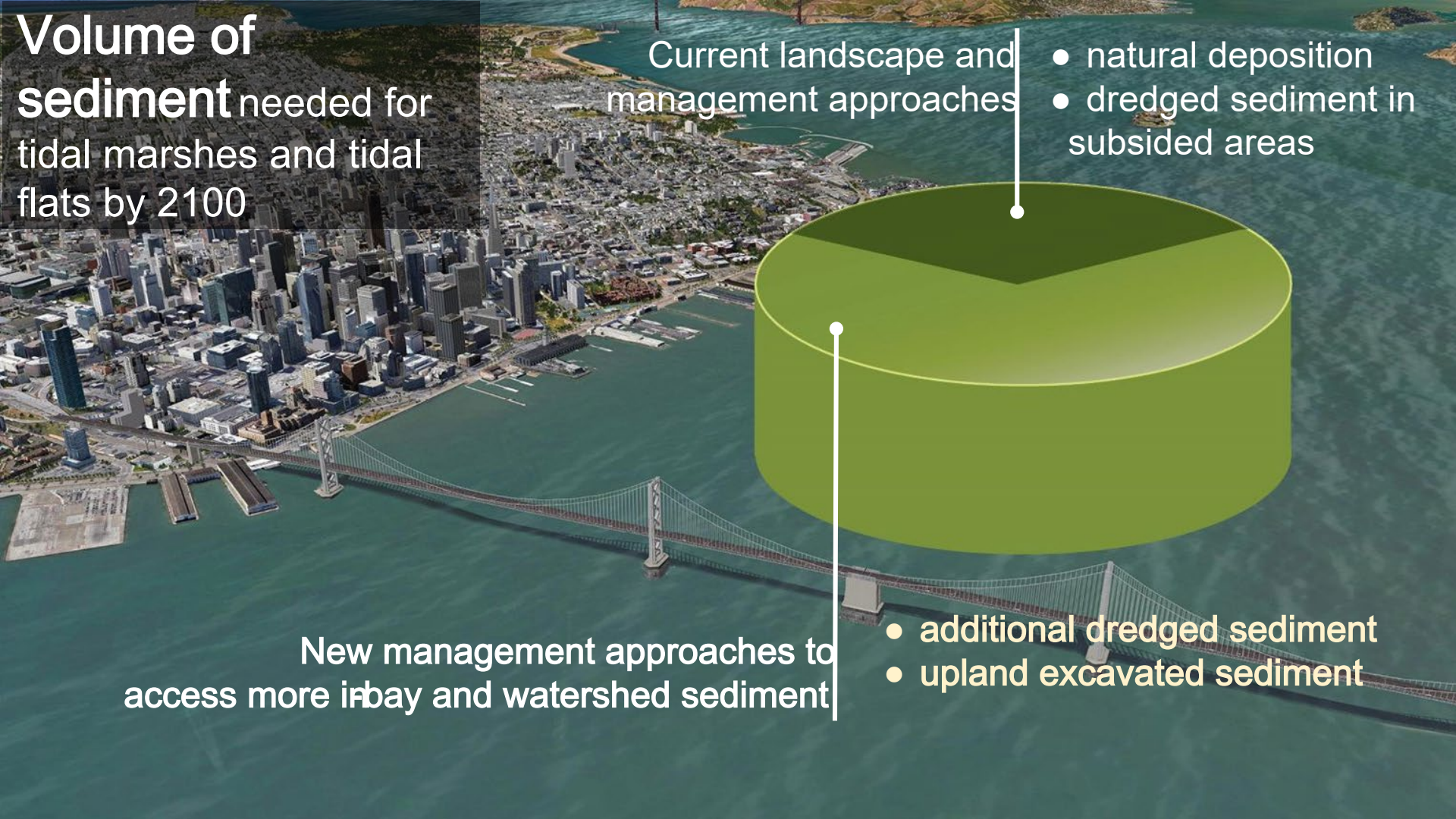
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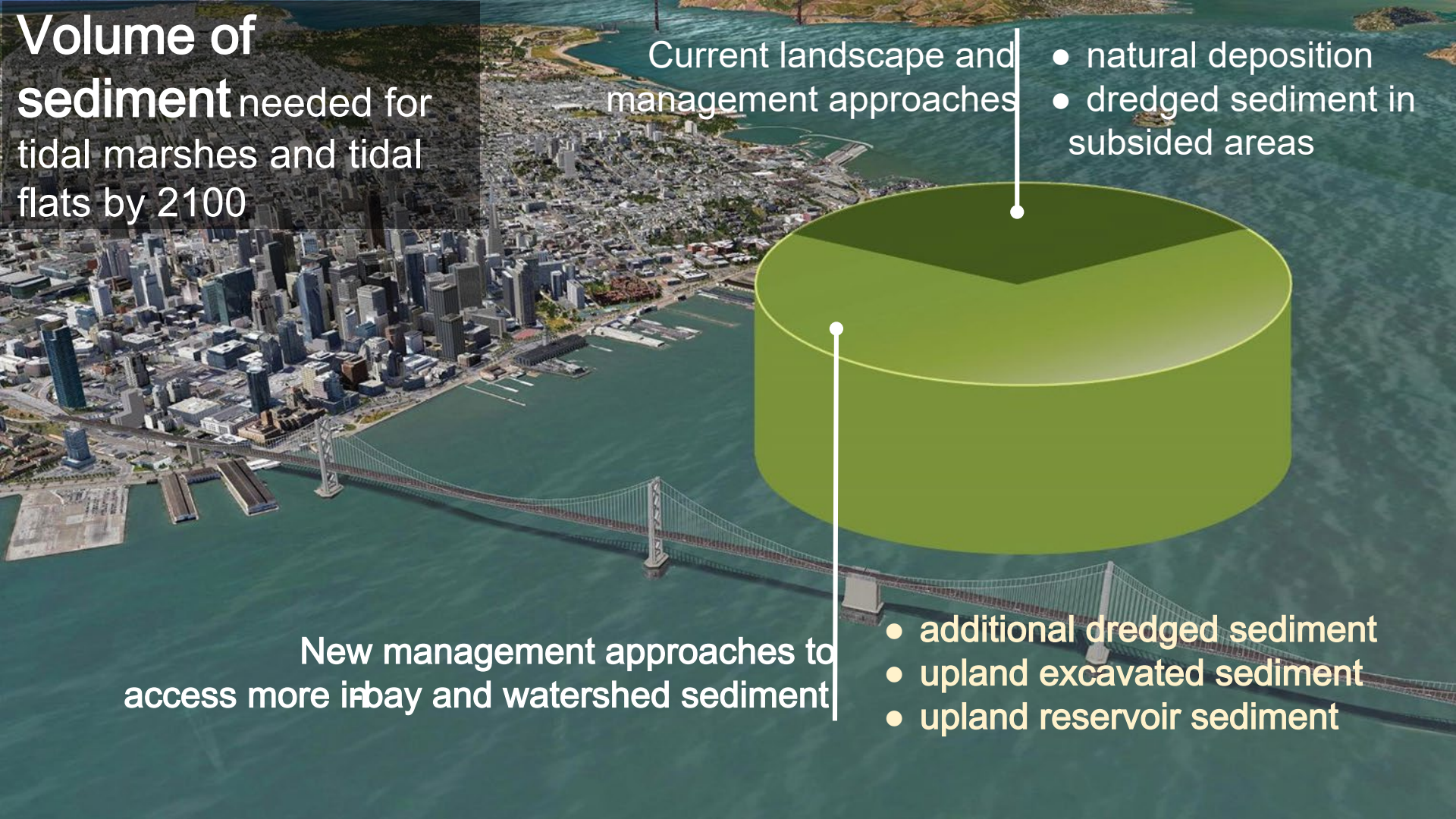
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• upland reservoir sediment

Result

Management Actions

Result

Management Actions

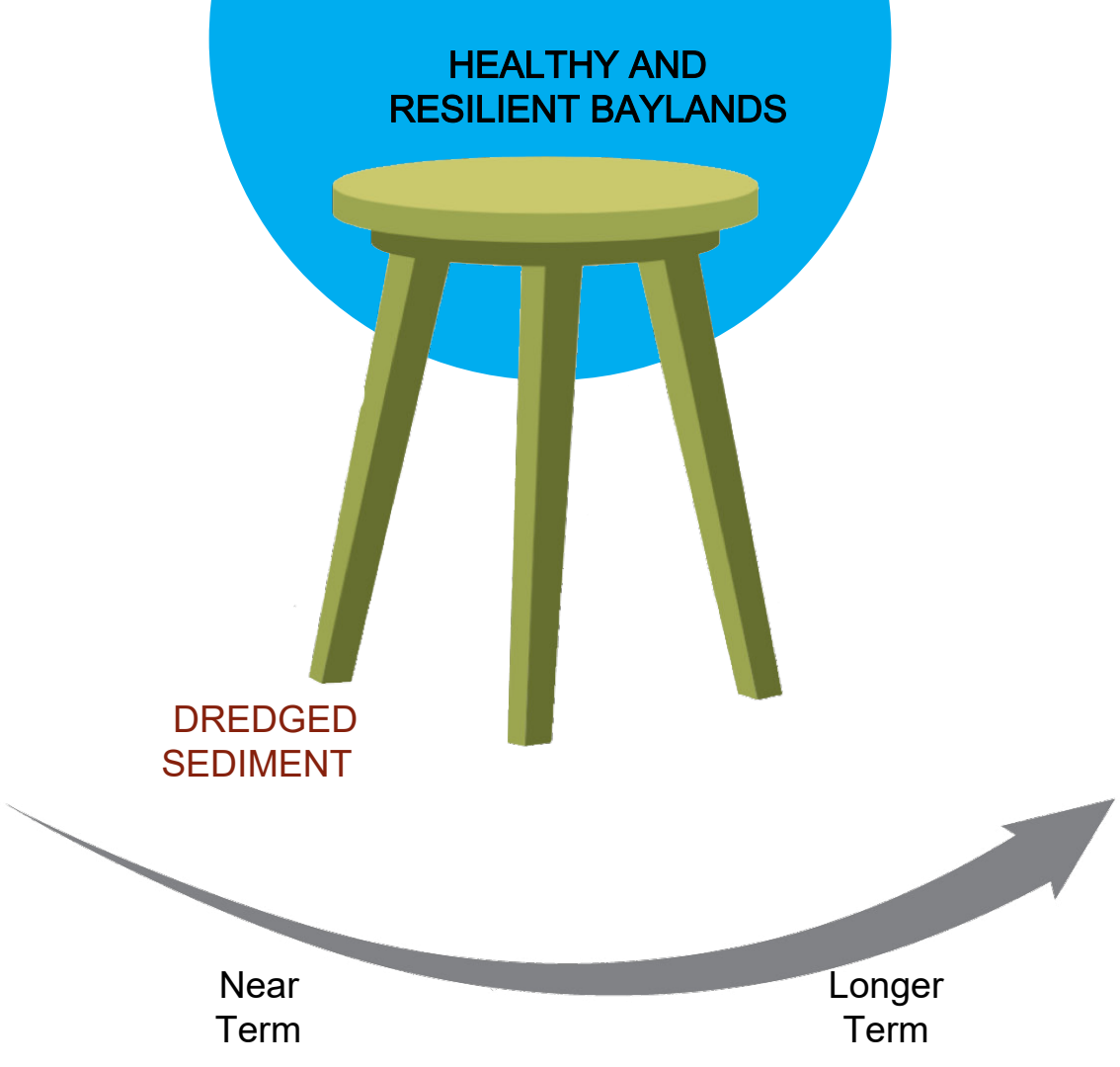
Timing

Near
Term

Result

Management Actions

Timing



Result

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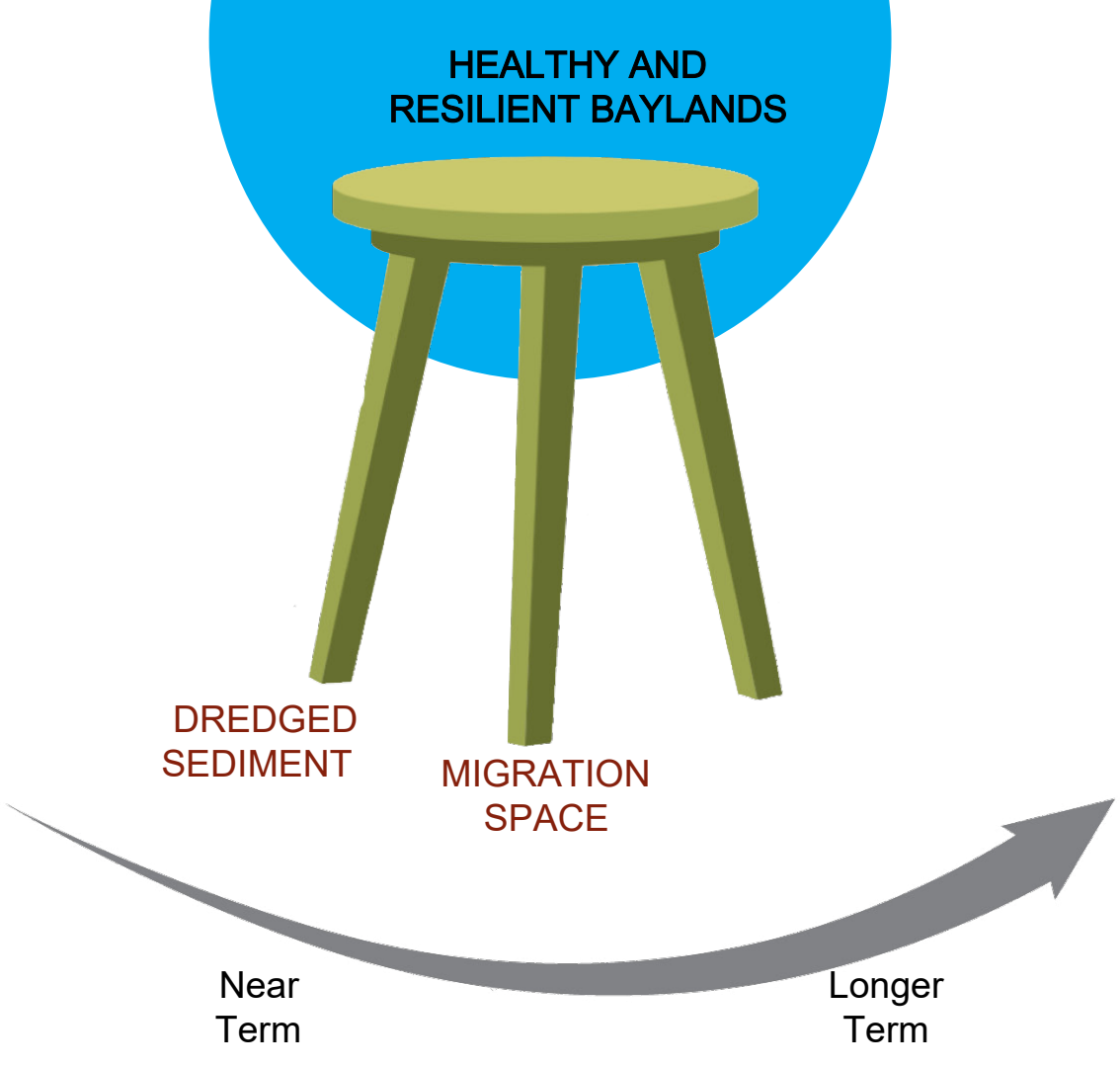
Timing



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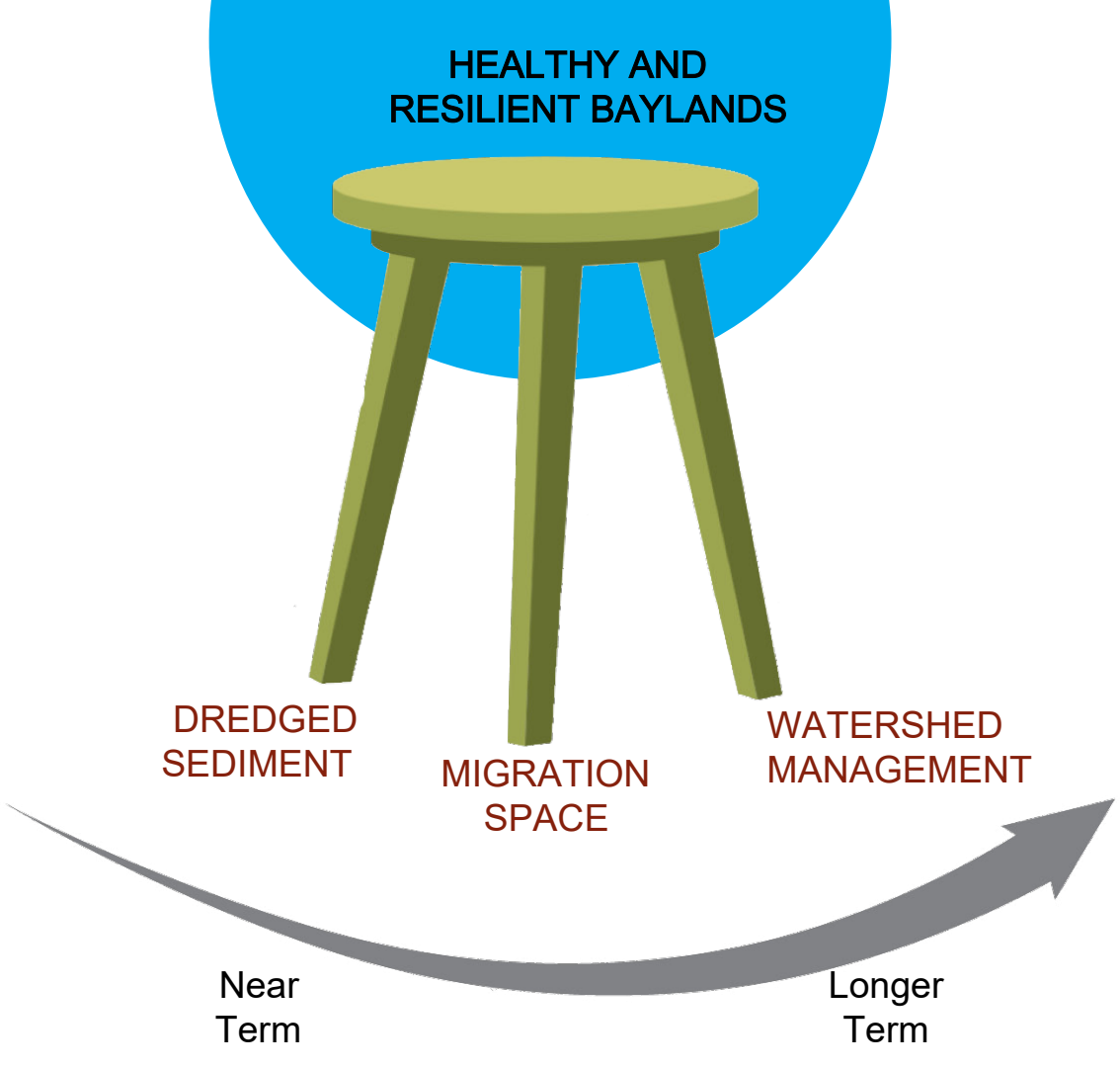
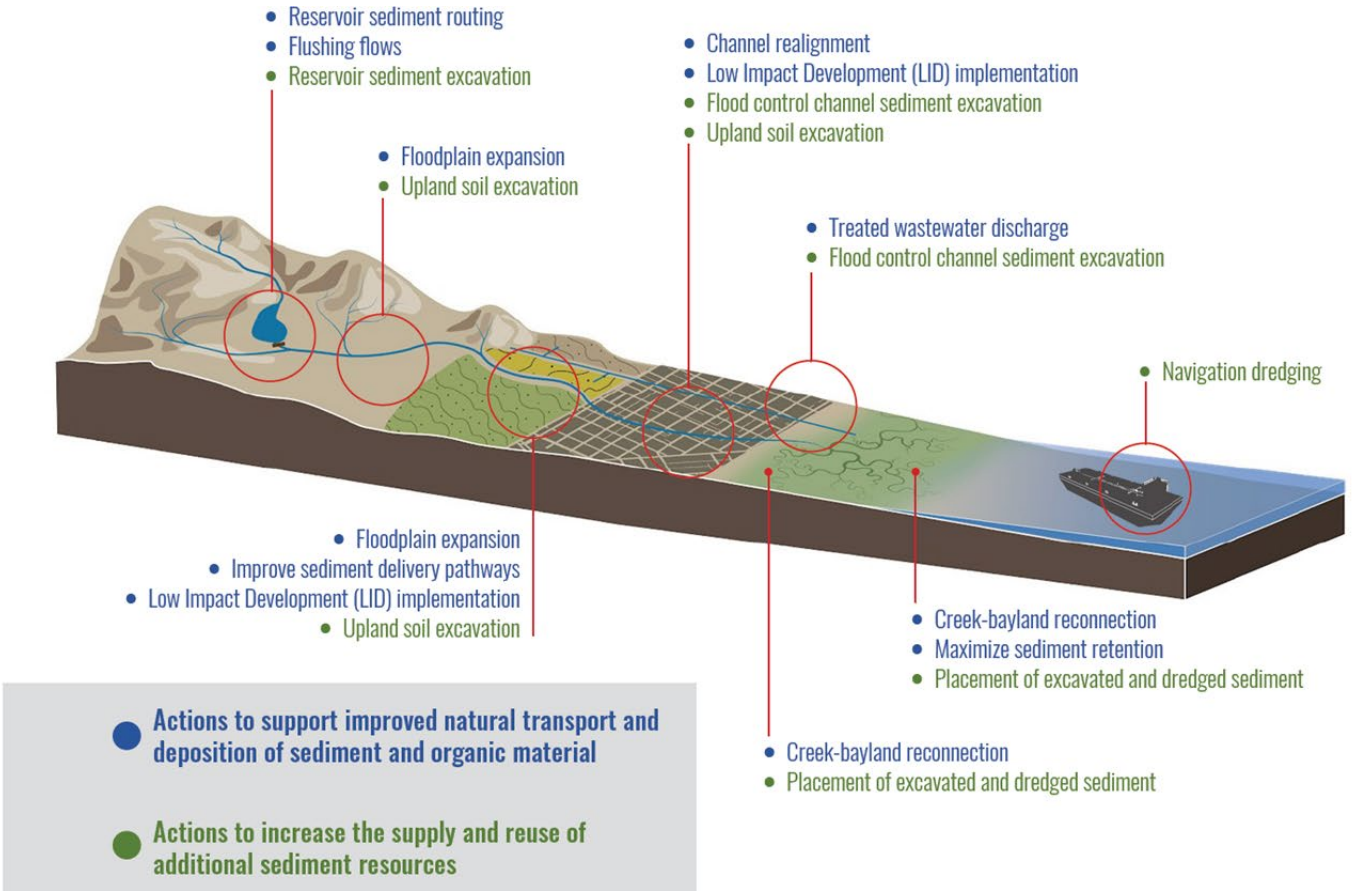


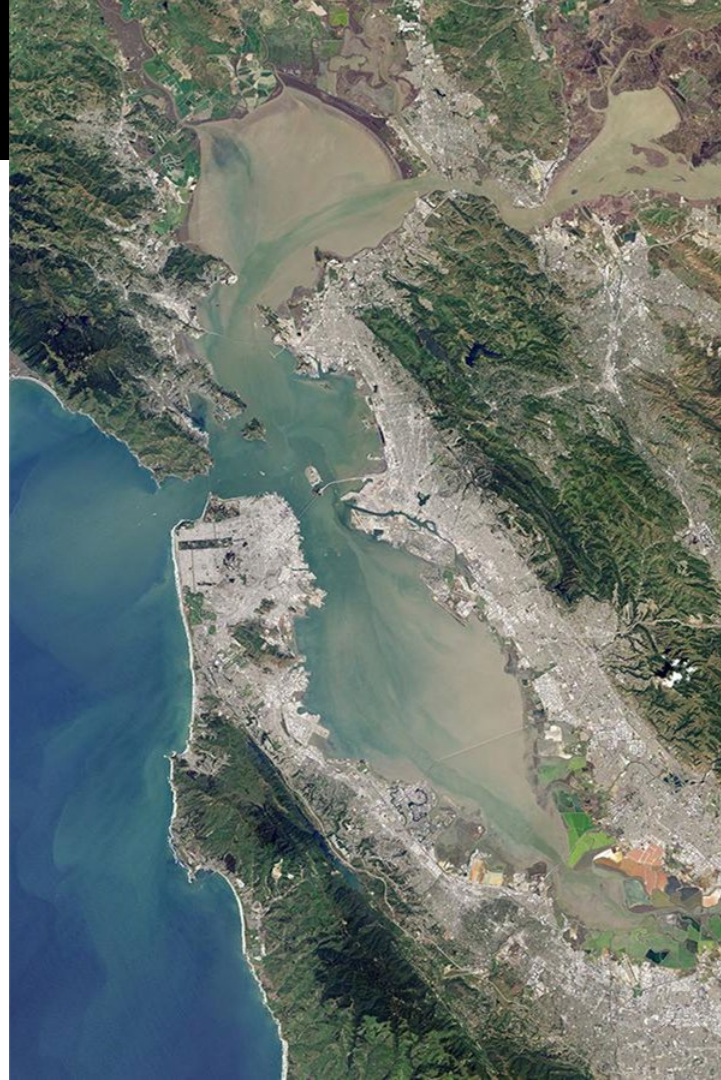
Integrated Watershed-Baylands Management



Sediment Workgroup Contribution

Some Recent & Ongoing Efforts

- Sediment bioaccumulation guidance
- Monitoring and modeling of sediment flux between subembayments and at the Golden Gate
- Monitoring and modeling sediment flux onto marshes
- Bay sediment conceptual model



Questions?

www.sfei.org/projects/sediment-for-survival

www.sfei.org/programs/sf-bay-regional-monitoring-program