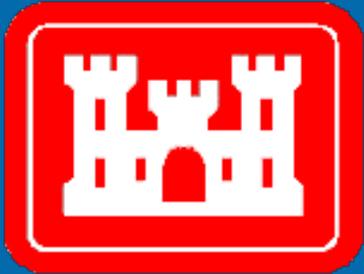


Reducing Risk with Nature & Insurance



**US Army Corps
of Engineers®**



UC SANTA CRUZ | **Center for Coastal
Climate Resilience**

Michael W. Beck
Director & AXA Chair
in Coastal Resilience

Megan Kelso
Postdoctoral Fellow



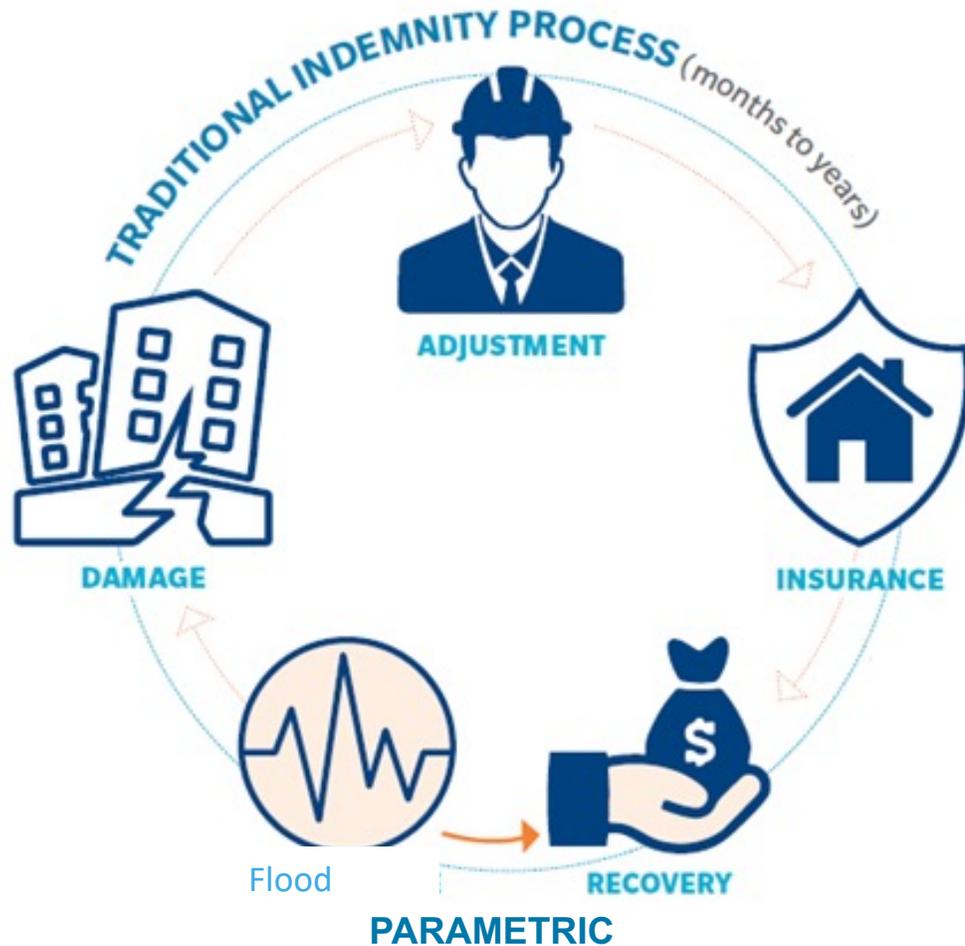
**CALIFORNIA
OCEAN SCIENCE TRUST**

Symposium Goals

- **USACE** – Finalizing report on *Integrating Nature into Risk Science & Insurance*
- **CDI** – Identifying CA coastal project opportunities
- **Center for Coastal Climate Resilience**- Inform Priorities
- **Finding:** Not yet at tipping point where nature is well integrated in risk management & insurance
- **Goal:** To speed integration of nature in insurance & risk management
- **Connect, Collaborate, Enjoy**



Sidebar: Parametric Vs Traditional Indemnity Insurance



Parametric Offers...

- ✓ **Speed:** Payments are fast as there is no claims adjusting process
- ✓ **Transparency:** Payments established in the contract based on publicly measured triggers
- ✓ **Versatility:** Freedom to use proceeds as needed with no or very relaxed exclusions and specifications
- ✓ **Customization:** Cover can be designed to guarantee certain levels of payment for desired scenarios

Indemnity Offers...

- ✓ **Precision:** The claims adjustment process ensure recoveries approximate experienced losses

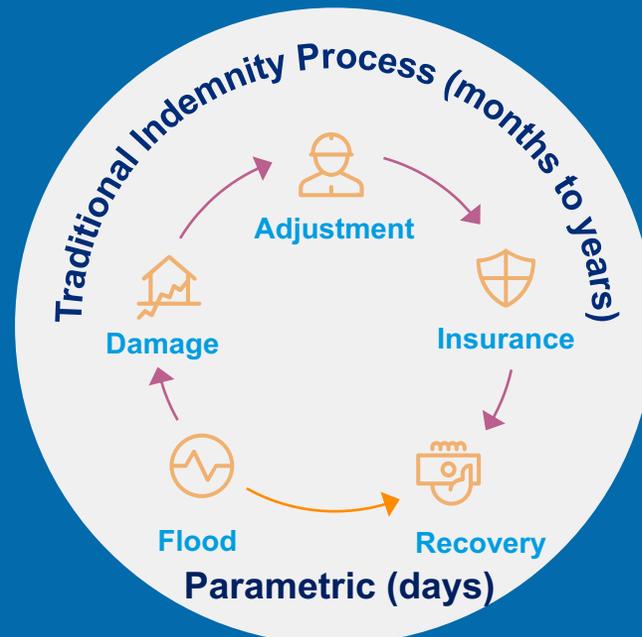
Sidebar: Parametric Vs Traditional Indemnity Insurance

? What Are Parametric Solutions?

Parametric solutions pay a pre-established amount based on the occurrence of a physical event with certain characteristics.

They can be structured as insurance, reinsurance, derivatives, catastrophe bonds, and other financial vehicles, depending on the regulatory environment.

- Pre-defined limits, pay-out based on pre-defined event characteristics
- Pay-out terms defined by specific trigger mechanisms
- Triggers are directly related to buyer's peril of concern, e.g.
 - **Earthquake:** magnitude, location
 - **Hurricane:** Wind speed, track
 - **Wildfire:** Coordinates / area of burn
- Contract only pays when triggers are met



Parametric Benefits

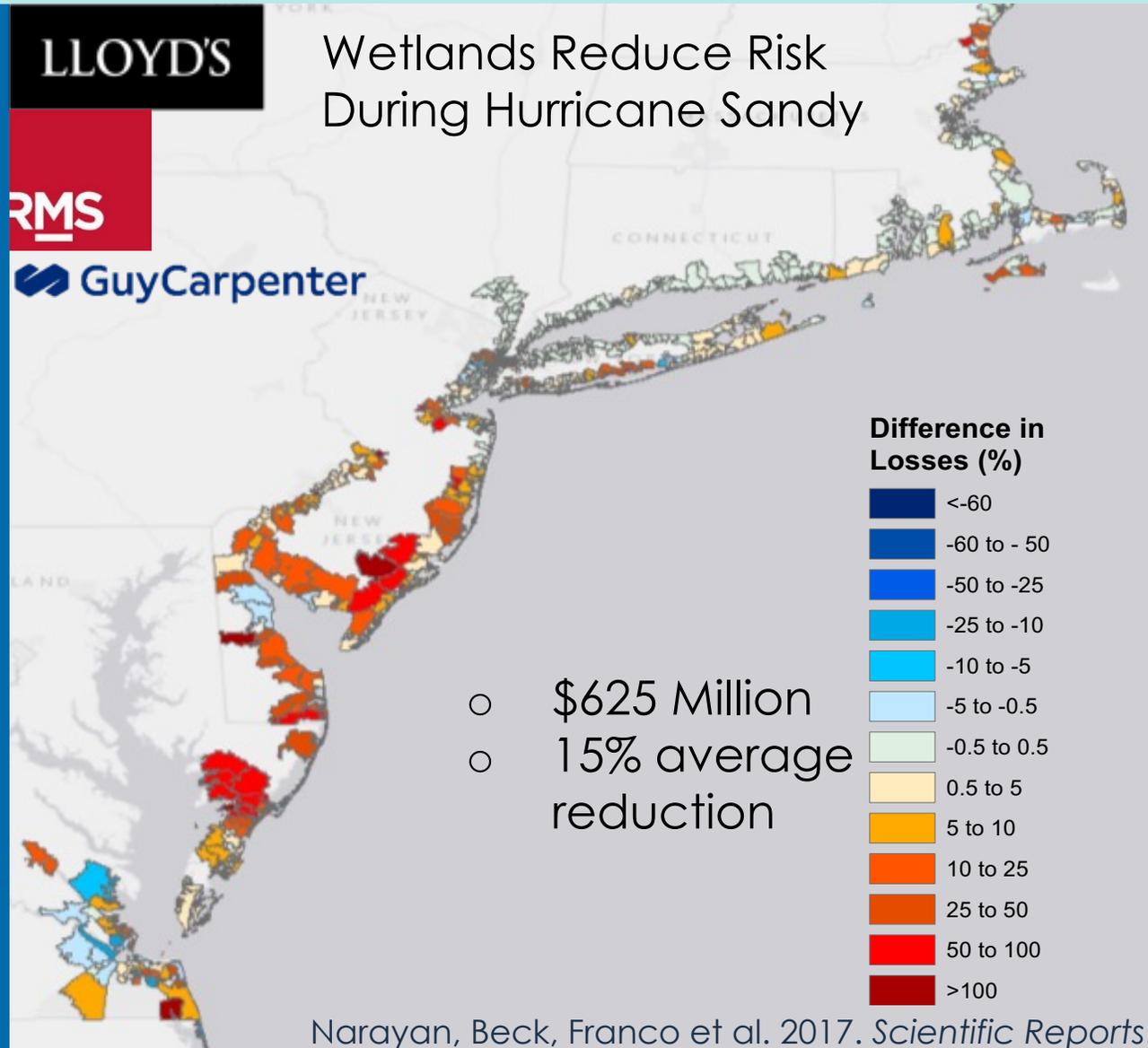
Parametric solutions vs traditional indemnity:

1. **Speed of Payment:** Typically days to weeks.
2. **Transparency:** Conditions for payment detailed in the contract and based on publicly reported measures.
3. **Customization:** Cover can be designed to guarantee certain levels of payment for desired scenarios
4. **Versatility:** Payouts can be used freely to cover direct physical damages or business interruption or contingent damages, or any other source of financial disruption.

Parametric Considerations

1. **Damages can occur without payment** if trigger not met (Precision issue).
2. **Post event** - entities must decide what to do with funds.

Assessing Nature in Risk Industry Models



Recommendations from USACE Report

- Aim: Identify opportunities where risk science and insurance can support nature for risk reduction
- 15 recommendations
- 4 categories:
 - Risk models
 - Insurance coverages
 - Public-private partnerships
 - Financing opportunities

Integrating Nature into Risk Science & Insurance

M. Kelso, A. Stovall & M. Beck



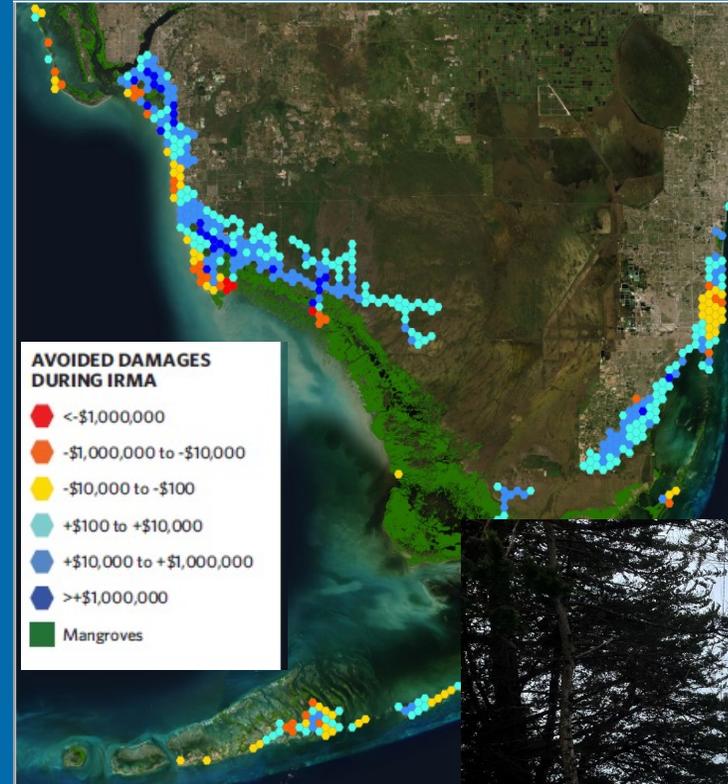
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A Report from the Coastal Resilience Lab at
the University of California Santa Cruz
Draft Version December 2022

Improving Risk Models

- Improve how ecosystems, waves, and climate change are modeled
- Agency & industry models



Innovative Insurance Coverages

- Insurance for ecosystem damage
 - Parametric
 - e.g. Mesoamerican Reef insurance; Hawaiian reef insurance



A Race Against Time to Rescue a Reef From Climate Change

In an unusual experiment, a coral reef in Mexico is now insured against hurricanes. A team of locals known as “the Brigade” rushed to repair the devastated corals, piece by piece.

Driving Corporate Investments in Nature

- Corporate interest motivated by ESG, TCFD, SEC, TNFD
- Adaptation marketplace would facilitate investments in NBS adaptation projects



Developing an Adaptation Market

WHAT ARE CLIMATE CREDITS?



ADAPTATION CREDITS

Adaptation credits support projects such as wetland restoration that reduce risks from present storms and sea level rise.



Present

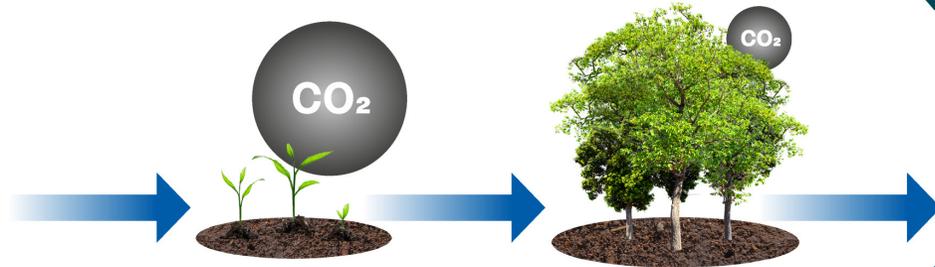


2025

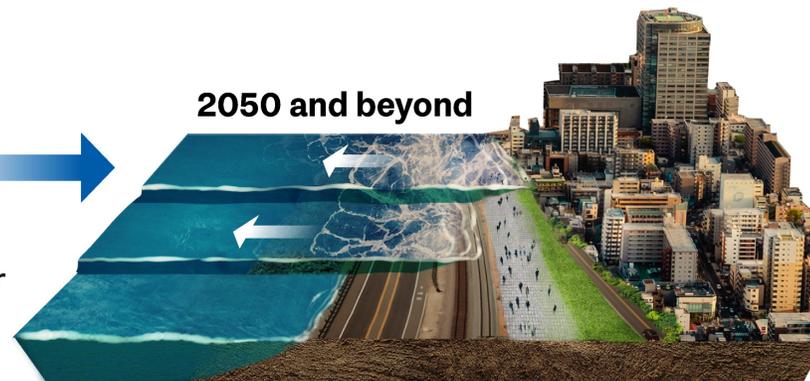


MITIGATION CREDIT

Mitigation credits support projects such as reforestation that sequester carbon and reduce risks from future storms and sea level rise.



2050 and beyond



Investing in Reef Restoration for Risk Reduction



Coral Reef Restoration for Risk Reduction (CR4): A Guide to Project and Proposal Development

CENTRAL OFFICE FOR RECOVERY, RECONSTRUCTION AND RESILIENCY
COR3



FEMA

News Release

FEMA Allocates Millions to Restore Coral Reefs in the Coast of San Juan

This is the first allocation of the federal agency for this type of project



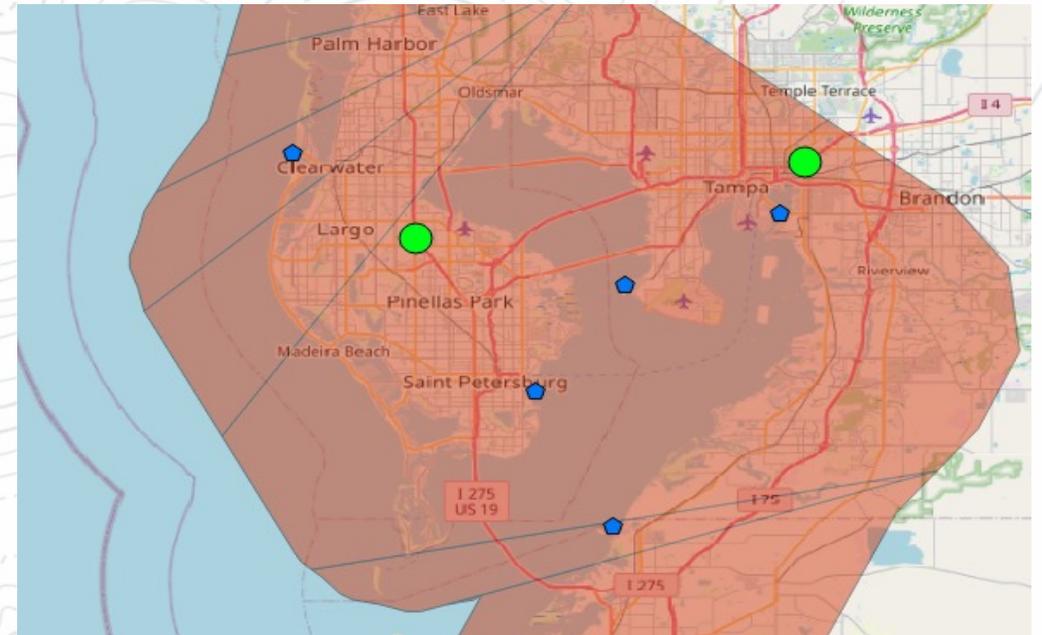
San Juan, PUERTO RICO (May 23, 2023) – The project to restore coral reefs in San Juan Bay seeks to reduce flooding and will benefit the communities of Escambrón, Condado, Ocean Park and Puntas Las Marías. The initiative approved by FEMA consists of two phases: nearly \$3 million for phase 1 and \$35.6 million for phase 2, for a total of approximately \$38.6 million. Photo FEMA/Eduardo Martínez



Premium Pricing Nature

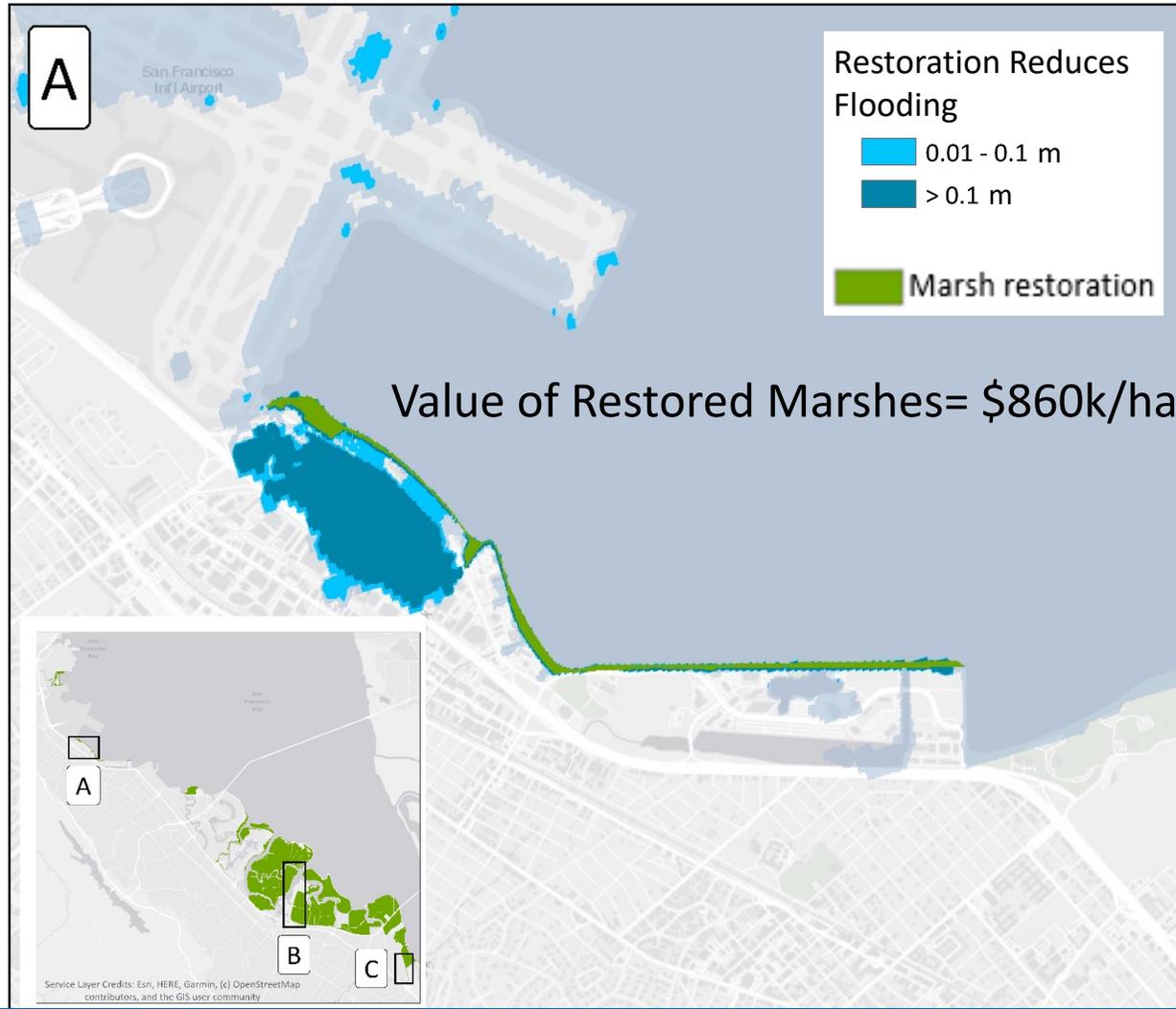


- Exposure **Pinellas County** ~ \$263 Billion
- AAL(current model) = \$292 Million
- AAL(without mangroves) = \$563 Million
- => Economic value of mangroves per year = \$272 Million**

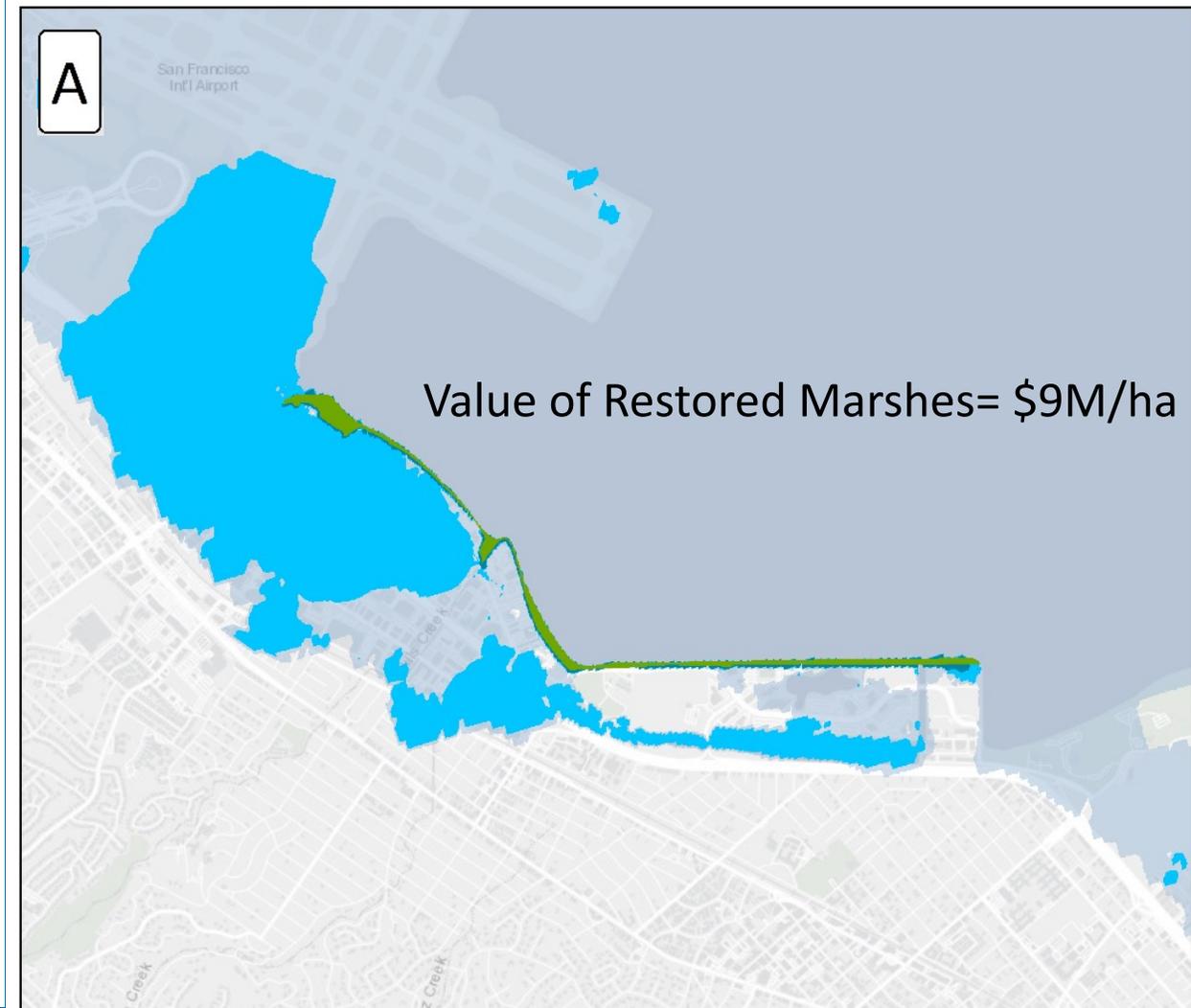


San Francisco Bay: Future Flood Risk & Benefits of Marsh Restoration

0 m SLR & 100-Year Storm



0.5 m SLR & 100-Year Storm



Coastal Walk & Strategy Brainstorm



CA Leadership On Climate Adaptation

- The impacts of climate change are here
- CA has led on Climate Mitigation – Must now lead on adaptation
- Lead with innovation & market-based solutions
- Restore & enhance nearshore rocky reefs
- Develop Adaptation Markets

A18 SUNDAY, JANUARY 22, 2023 * Los Angeles Times
OP-ED



One big climate fight our state is losing

Reducing carbon emissions is not enough at this point. We need to minimize harm from the fires and floods that can no longer be prevented.

By Michael W. Beck

Vision: To advance innovative solutions for building coastal resilience that engage partners, foster leaders and address the challenges from climate change in California and beyond.

Activities

- Assess Climate Risks & Nature's Benefits to identify Equitable Solutions
- Develop a CA Adaptation Market
- Industry/Government Visiting Fellowships
- Professional Development Course(s)
- Support Communities to Access Hazard Mitigation & Adaptation Funds