

An aerial photograph of a port area with a city skyline in the background. A large cargo ship is docked at a pier, and a smaller tugboat is nearby. The water is blue, and the city buildings are visible on the right side of the image.

# Ports and Environmental Sustainability

Panel Discussion:

Sarah Pautzke

Derek Chow

Conchita Taitano

Jeannie Beckett

February 2023

# DREDGING

- USACE deals with commercial dredging in ports
  - USACE has re-use authority in Section 204 that states it will do the studies in the receiving areas to determine site suitability, as well as performs designs and implementation
  - USACE will assume cost share
  - They can sponsor a Section 204 Beach Nourishment if there is a beneficial use of dredge material
- USDOT loves the concept, but paying for it is difficult



# DREDGING

USACE Section 204 authorities provides for:

- Use of sediment in construction, repair, rehabilitation, or modification of water resources to protect/restore/create habitats, mitigate storm damage, and stream stabilization and shoreline enhancement
- In carrying out a federal project, with consent of the non-Federal sponsor, the Secretary may select a disposal method that is not the least cost option if the incremental costs of the disposal method are reasonable in relation to the flood and storm damage mitigation benefits



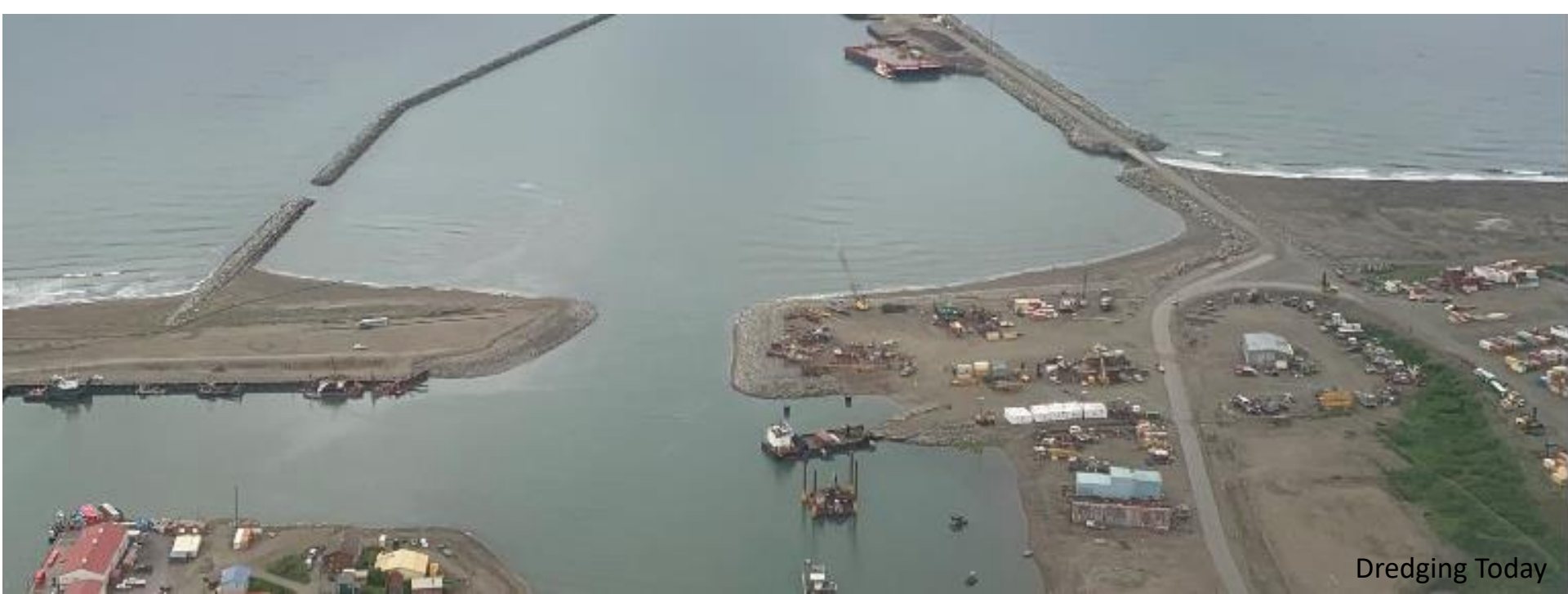
# DREDGING

- San Diego: Beneficial re-use of dredge spoils is a priority
  - Sediment must be clean per EPA requirements
  - Typically used for beach replenishment
  - Other uses: wetlands support, eelgrass creation
- Honolulu: dredge to re-create Waikiki Beach and ensure Ala Wai Canal function



# DREDGING

- CNMI: Dredging is dumped at sea because the dredge material is not useful for building due to its composition
- Alaska:
  - Used as a landfill cap
  - Fill on land to fill holes left by the military (Shemya)
  - Beach nourishment (Nome)



# DREDGING: The Realities

- Almost every time, in-water placement is cheaper
  - Extra cost associated with dewatering (could be millions)
  - Need to sort the dredge spoils – what do you do with those that don't work?
- If it's cheaper, then the USACE must go with it
- However, if there is a local sponsor that can provide cost sharing, and they are willing to pay the difference, they can take the material
- Must have a purpose
- Many times, the dredge material is contaminated



# HARBOR ADAPTATION STRATEGIES



# **HARBOR ADAPTATIONS TO SEA LEVEL RISE**

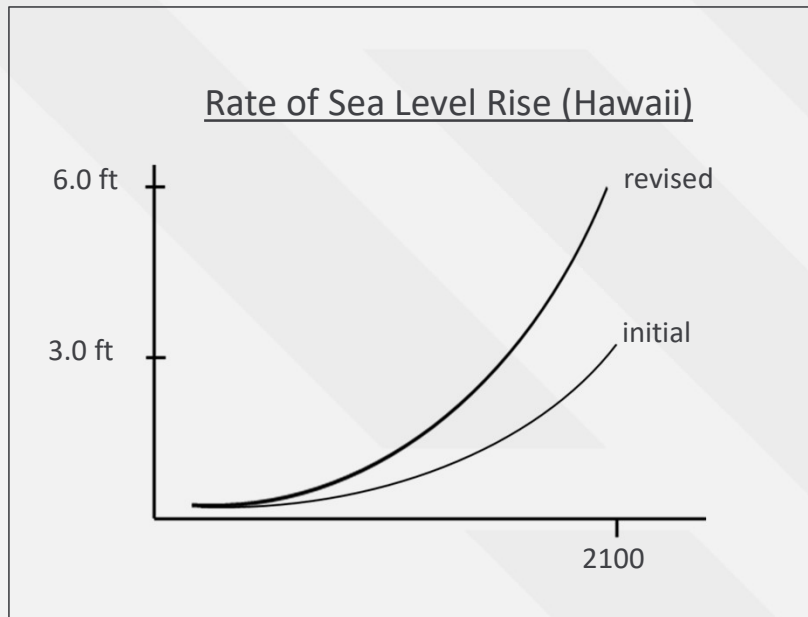
APP WINTER CONFERENCE  
FEBRUARY 10, 2023



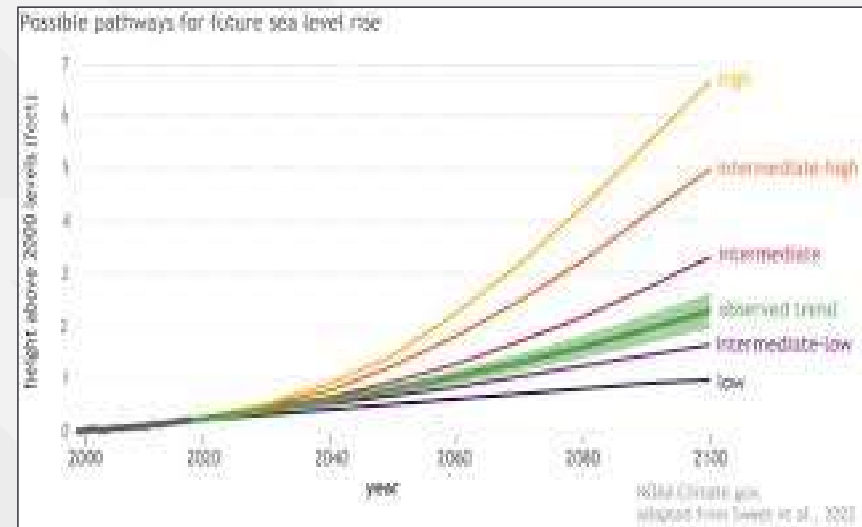


# Rate of Sea Level Rise

- ▶ Adopt sea level rise rate
- ▶ Sea level rise predictions are estimates, not exact science
- ▶ Take a low, intermediate, and high sea level rise approach



Hawaii Sea Level Rise Vulnerability and Adaptation Report, 2017

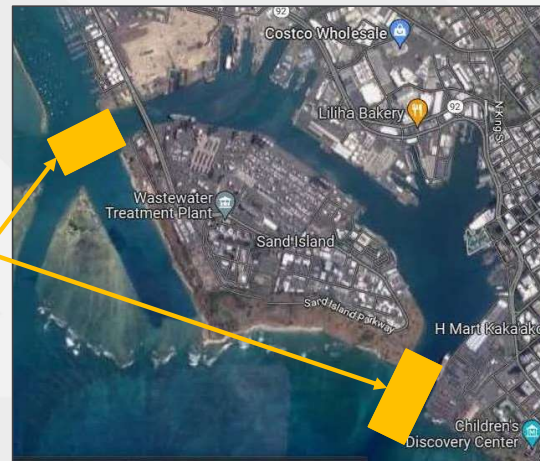
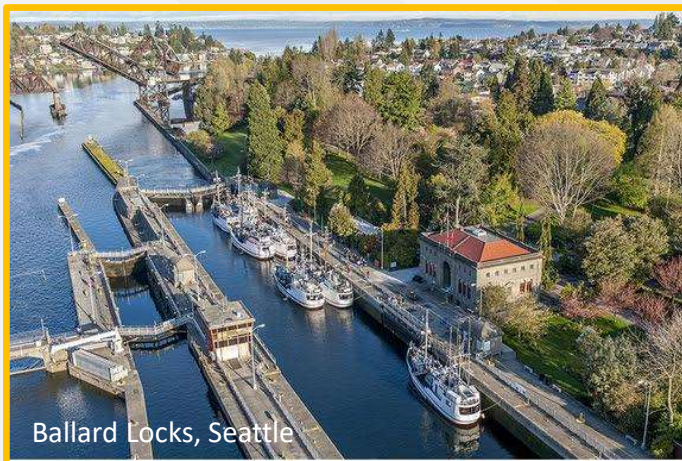
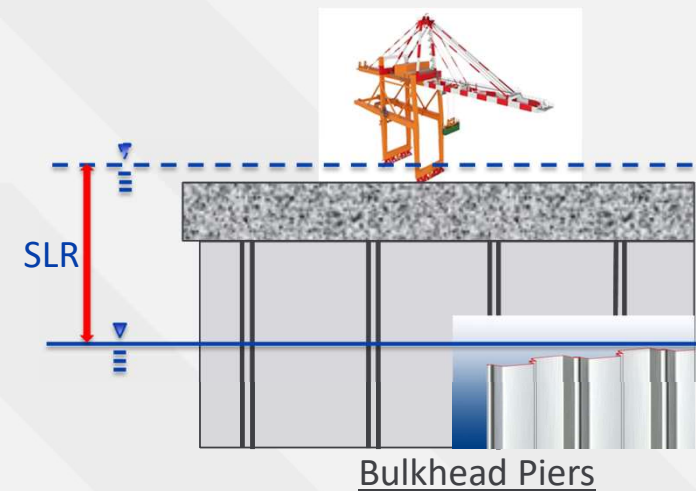
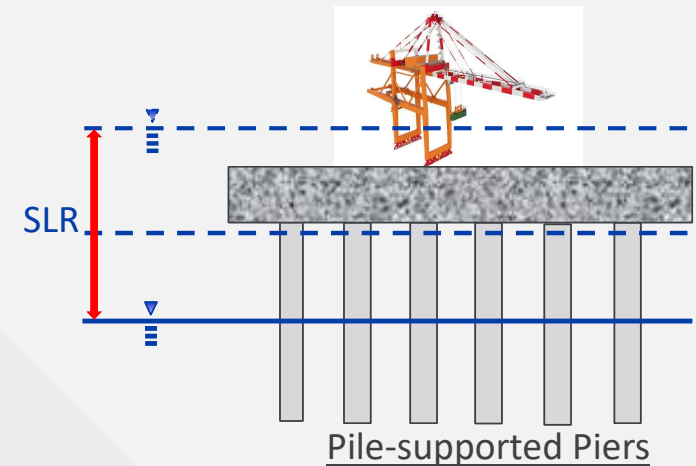


Low, intermediate, high levels of sea level rise

ER 1100-2-8162, Incorporating Sea Level Change in Civil Works Programs

# Adaptation Strategies

- ▶ Incremental modifications to piers and operational areas
- ▶ Full modifications to piers and operational areas
- ▶ Water control structures that allows fewer changes
- ▶ Disruptions to operations
- ▶ Cost of modifications and disruptions
- ▶ Period of operability
- ▶ Risk vs. cost
- ▶ Changes to vessels, barges and land side equipment



Locks and dams

**THANK YOU!**



# Guam's Port Sustainability





# Port Authority of Guam

## Our Road Towards Port Sustainability & Resilience



Association of Pacific Ports – February 2023



# SUSTAINABILITY

Source: <https://www.onthemosway.eu/18306-2/?cn-reloaded=1>



# Protecting Our Environment

## Rehabilitation of H-Wharf

- Environmental Assessment - Finding of No Significant Impact (**FONSI**) with the implementation of BMPs stipulated by various federal agencies and adherence to the *PAG's Compensatory Mitigation Plan*.
- The *PAG's Compensatory Mitigation Plan*
  - ✓ **Relocation of 258 coral colonies** with monitoring over a 36 month period.
  - ✓ Construction **debris removal**.
  - ✓ Storm water management - **Additional** storm water outfalls.
  - ✓ Sea turtle **conservation**
  - ✓ **Silt & sediment control** - Turbidity curtain



# The Road to Net Zero

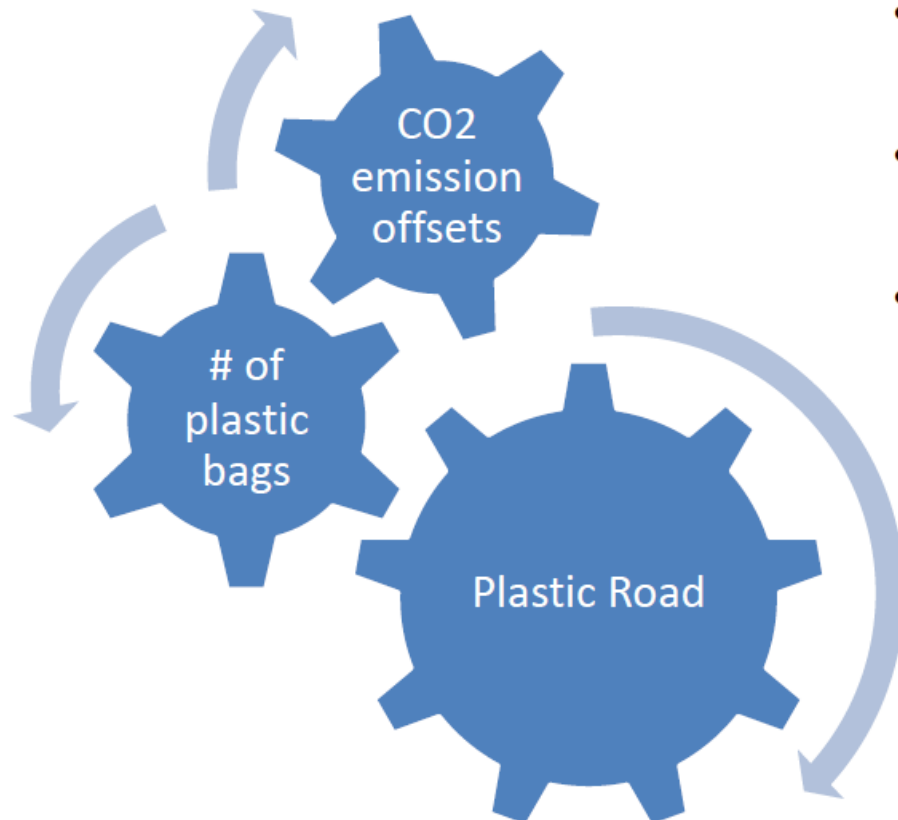
- The Diesel Emissions Reduction Act Program (**DERA**) was created under the Energy Policy Act of 2005.
  - The PAG was awarded a total of \$376,609.00
    - Replacement of four (4) Tier-3 ULSD terminal tractors with **15 Tier-4 ULSD terminal tractors.**
- **Next Step:** Identify GHG reduction opportunities - GHG Emission Inventory



# The Road to Net Zero

- Office of Local Defense Community Coordination (OLDCC) (**formerly OEA**)
  - **Draft *Solar Power Feasibility Study*** completed
  - Review from Guam Power Authority (GPA)
  - **Next Step:**
    - Identification of strategic Port site locations
    - Coordination with key Divisions to develop SOW
    - Collaboration with GPA on implementation of net metering plan

# From Plastics to Pavement on Guam



- Bench scale testing underway
- **Demo project location** identified
- 2-inch plastic asphalt overlay of ~16 ft wide x 5280 ft long road (TBD)
- Anticipate **>100,000 single-use plastic** bags will be used
- Also an opportunity to use **RAP in the aggregate mix**
- Anticipated additional benefits: **reduction in GHG emissions**, enhanced asphalt performance



# RECYCLING ENTERPRISE ZONE

- Public Law 25-127
  - Material Reuse & Processing
  - Cottage Industry Opportunities

## Next Steps:

- Siting & Feasibility Assessment
  - Characterize baseline conditions for Port facilities, operations, and infrastructure to assess sustainability potential.



# RESILIENCE

Source: <https://www.onthemosway.eu/18306-2/?cn-reloaded=1>




# Sea Level Rise Mitigation

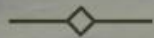
## Wharves Service Life Extension – F1 to F6

- The 2021 Rebuilding American Infrastructure with Sustainability and Equity (RAISE) USDOT Grant.
  - ✓ \$17.9 million in grant funding
  - ✓ NEPA review process
- **Next Step:** Mitigation: **Assessment on sea level rise**





# ***OPPORTUNITIES TO ACCELERATE NATURE-BASED SOLUTIONS***



White House Council on Environmental  
Quality: Co-Chair, Lydia Olander

White House Office of Domestic Climate  
Policy: Co-Chair, Krystal Laymon

White House Office of Science and  
Technology Policy: Co-Chair, Heather Tallis

# Investing in Nature to Solve Today's Challenges



A healthy and thriving natural world **leads to** healthy and thriving communities.



Nature-based solutions, like protecting forests or restoring coastal marshes, are a **fundamental pillar** of fighting the climate crisis.



Nature-based solutions **are innovative**, and that they are **highly complementary** to necessary technological solutions.

## ***Nature-Based Solutions: Shoreline Erosion; Tidal Flooding; Storm Surge***



### ***•Protecting or Restoring Coastal Habitats—***

**mangroves, coral reefs**, oyster reefs, beaches, rock reefs, coastal dunes, freshwater marshes, and salt marshes all **help reduce coastal erosion** and, depending on their extent, can reduce flooding from storms and high tides.

***•Living Shorelines—*** native coastal habitats (oyster reefs, salt marsh, **mangroves, seagrass beds**) alone or in combination with sills and berms, reduce storm surge and coastal erosion and **stabilize the shoreline.**



# Natural Solutions - Mangroves

- *Wetland A* – Approximately 17,700-sq. ft
- *Wetland B* – Approximately 1,123-sq. ft
- *Wetland C* – Approximately 11,355-sq. ft.



# SI YU'US MA'ÅSE' – THANK YOU



## **Port Authority of Guam**

Jose D. Leon Guerrero Commercial Port

### **Conchita S.N. Taitano, MSEM**

*Member, Board of Directors*

1026 Cabras Highway, Suite 201

Piti, Guam 96915

Phone: (671) 477-5931 Ext. 302

Fax: (671) 477-4445

Email: [conchitagu@me.com](mailto:conchitagu@me.com)

[www.portofguam.com](http://www.portofguam.com)



# FUNDING FOR SUSTAINABILITY



**NFWF**

**NATIONAL COASTAL RESILIENCE FUND**  
INCREASING THE NATION'S NATURAL DEFENSES

## ANNOUNCEMENT OF FEDERAL FUNDING OPPORTUNITY EXECUTIVE SUMMARY

Federal Agency Name(s): Oceanic and Atmospheric Research (OAR), National Oceanic and Atmospheric Administration (NOAA), Department of Commerce

Funding Opportunity Title: Climate Program Office for FY 2012

Announcement Type: Initial

Funding Opportunity Number: NOAA-OAR-CPO-2012-2003041



# Where to look for Grants to support Environmental Projects

APP Winter Meeting - February 2023

Jeannie Beckett  
The Beckett Group  
253-905-8904  
[jbeckett@thebeckettgroup.org](mailto:jbeckett@thebeckettgroup.org)



# USDOT has added new resources

## [www.transportation.gov/bipartisan-infrastructure-law](https://www.transportation.gov/bipartisan-infrastructure-law)

Bipartisan Infrastructure Law | US

https://www.transportation.gov/bipartisan-infrastructure-law

Register.com | My... Employer Registrati... COVID-19 vaccine i... National Economic... word Apple Capital Loop EJ Analysis Neighborhoods at... Grant County Climate change Applicant Toolkit fo... EPA Technical Resources... Other favorite

U.S. Department of Transportation

ABOUT DOT PRIORITIES CONNECT

f t i l M

Bipartisan Infrastructure Law

The President's Bipartisan Infrastructure Law makes historic investments in the transportation sector: improving public safety and climate resilience, creating jobs across the country, and delivering a more equitable future.

f t i l +

FUNDING OPPORTUNITIES

Discover what funding opportunities are coming next.

View Upcoming NOFOs

GRANT LIST

View all of DOT's grant programs for the Bipartisan Infrastructure Law.

View All Grant Programs

DOT NAVIGATOR

View technical assistance resources for DOT grant programs.

Visit the DOT Navigator

ADDITIONAL RESOURCES

Get your questions about the BIL answered.

View Additional Resources

# Where else should we look?

- ▶ USDOT Grant Programs
  - ▶ Each of the Funding Programs require a responses to Resiliency, Sustainability, Emission Merit Criteria - Start there and include your environmental projects within a larger Transportation Infrastructure Project
- ▶ Example:
- ▶ The [Rebuilding American Infrastructure with Sustainability and Equity](#) (RAISE, formerly known as BUILD and TIGER) discretionary grant program provides an opportunity for USDOT to invest in road, rail, transit, and port projects that achieve national objectives.
- ▶ The eligibility requirements of RAISE allow project sponsors at the State and local levels to obtain funding for multimodal, multi-jurisdictional projects that are more difficult to support through traditional USDOT programs.
- ▶ For FY21, RAISE increased program focus on zero-emission vehicle infrastructure, including EV charging.
- **Eligible EV activities:** LDV charging, infrastructure planning, commercial charging, public transportation charging



# Where else should we look?

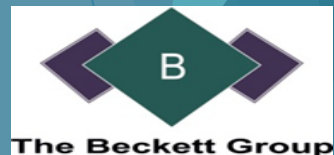
PIDP FY23 Due April 28, 2023

- ▶ (IV) environmental and emissions mitigation measures, including projects for—
  - ▶ (a) port electrification or electrification master planning;
  - ▶ (b) harbor craft or equipment replacements or retrofits;
  - ▶ (c) development of port or terminal microgrids;
  - ▶ (d) provision of idling reduction infrastructure;
  - ▶ (e) purchase of cargo handling equipment and related infrastructure;
  - ▶ (f) worker training to support electrification technology;
  - ▶ (g) installation of port bunkering facilities from ocean-going vessels for fuels;
  - ▶ (h) electric vehicle charging or hydrogen refueling infrastructure for drayage and medium or heavy-duty trucks and locomotives that service the port and related grid upgrades; or
  - ▶ (i) other related port activities, including charging infrastructure, electric rubber-tired gantry cranes, and anti-idling technologies.



# Other Agency Funding Ideas

- ▶ Restoration and sustainability grants from NOAA
- ▶ **NOAA's Transformational Habitat Restoration and Coastal Resilience Grants (Under the IIJA) -**
  - ▶ Objective: To support transformational projects that restore marine, estuarine, coastal, or Great Lakes ecosystems, using approaches that enhance community and ecosystem resilience to climate hazards.
- ▶ Funding will **prioritize habitat restoration actions** that: demonstrate significant impacts; ...promote climate-resilient ecosystems, especially in tribal or underserved communities; and improve economic vitality, including local employment.







# Other Agency Funding Ideas

- ▶ Restoration and sustainability grants from NOAA (in the past):
- ▶ **NOAA Marine Debris Program 2022 Grant solicitation:** objective of this funding opportunity is to make tangible, beneficial impacts to coastal and marine habitats and communities across a broad geographic scale, through a variety of marine debris removal methods.
- ▶ **PRIORITY 1: the development of large scale and high-value marine debris removal programs** (hereafter “partnerships”) that can be responsive to local and regional marine debris removal needs, with a focus on large marine debris.
- ▶ For the purposes of this funding opportunity, “large debris” is defined as abandoned and derelict vessels (ADV), derelict fishing gear (DFG), and other debris that is generally unable to be collected by hand.
- ▶ Note: there was also a marine debris program solicitation for removal of smaller debris (i.e., not boats)

# Other Agency Funding Ideas

- ▶ Restoration and sustainability grants from NOAA (in the past):
- ▶ **FY21 Effects of Sea Level Rise:** This solicitation is to improve adaptation and planning in response to regional and local effects of sea level rise and coastal inundation through targeted research on key technologies, natural and nature-based infrastructure, physical and biological processes, and model evaluation.
- ▶ Solicitation goal changes annually, in 2022 it was less applicable to ports than 2021. Let's see what 2023 includes



# Other Agency Funding Ideas

## ► National Fish and Wildlife Foundation:

- 1) **Emergency Coastal Resilience Fund** - supports projects that build resilience for coastal communities impacted by natural disasters.
- The first round of funding was directed toward communities that received a federal disaster declaration in **2018** as a result of the impacts of hurricanes Michael and Florence, **Typhoon Yutu (CNMI, Guam)**, and catastrophic wildfires.
- The fund provides needed funding for projects that protect community assets and restore critical habitats for fish and wildlife.



# Other Agency Funding Ideas

## ► National Fish and Wildlife Foundation:

► 2) **National Coastal Resilience Fund** - restores, increases and strengthens natural infrastructure to protect coastal communities while also enhancing habitats for fish and wildlife.

The National Coastal Resilience Fund supports the implementation of nature-based solutions to enhance the resilience of coastal communities and ecosystems to these threats.

“We strategically invest in projects that construct or restore coastal habitats that increase the capacity of communities and habitats to withstand and recover from disruptions and adapt to changing environmental conditions.”

Nature-based solutions include natural and hybrid (“green-gray”) solutions, such as restoring coastal marshes, reconnecting floodplains, rebuilding dunes or other natural buffers, and installing living shorelines





# Other Agency Funding Ideas

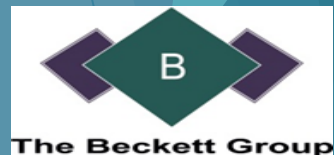


## The Corps of Engineers

► The Corps is not a “granting” agency but does cost share in efforts. In fact, to utilize Corps authorities, the Corps has to perform the studies, designs, and implementation.

► The Corps of Engineers has **authorities to help with beneficial use of dredged materials**. Section 204(a) of the 1992 Water Resources Development Act allows the Corps to cost share placement of dredged material to provide shoreline protection and other purposes.

More information can be found in Section 204“Regional Sediment Management”.



# Other Agency Funding Ideas

## The Corps of Engineers



► Section 206, 1996 Water Resources Development Act (PL 104-303), Aquatic Ecosystem Restoration, and Section 1135, WRDA 1986 (PL 99-662), Environmental Restoration can also be used for restoration purposes, but 204 is more direct in the beneficial use of dredged materials.



EP\_1105-2-58 Continuing Authorities Program.pdf  
.pdf File



WRDA1992-Section204.pdf  
.pdf File



STATUTE-106-Pg4797.pdf  
.pdf File

- ▶ Best Tip - Silicate ideas from your Engineering and Environmental Staff and your Environmental Consultants.
- ▶ They are the experts use their expertise.



# GREEN INFRASTRUCTURE

- Marine & Civil Maintenance
  - Goal – ensuring minimal environmental impact from operations to the community and ecosystem
  - Implement anode cathodic protection systems and concrete repairs
- EConcrete
  - Goal – bringing concrete to life
  - Shoreline protection, waterfront infrastructure, offshore applications
  - Use solution that works in synergy to decrease the ecological footprint and enables growth of marine life on concrete infrastructure



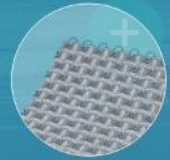
# Waterfront Infrastructure

Ports, Marinas, Urban Waterfronts

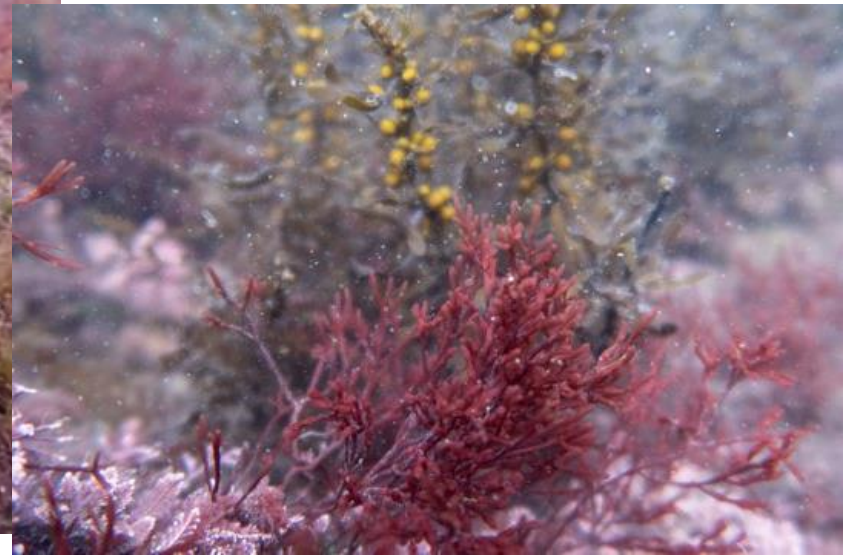
+

## Articulated Concrete Block Mattress

Stabilize shorelines and control erosion, armor cables, and protect from scour.







*"COASTALOCK is the trifecta we love: carbon sequestration, smaller footprint, while at the same time, providing resilience."*

John Jason Giffen, VP  
Port of San Diego

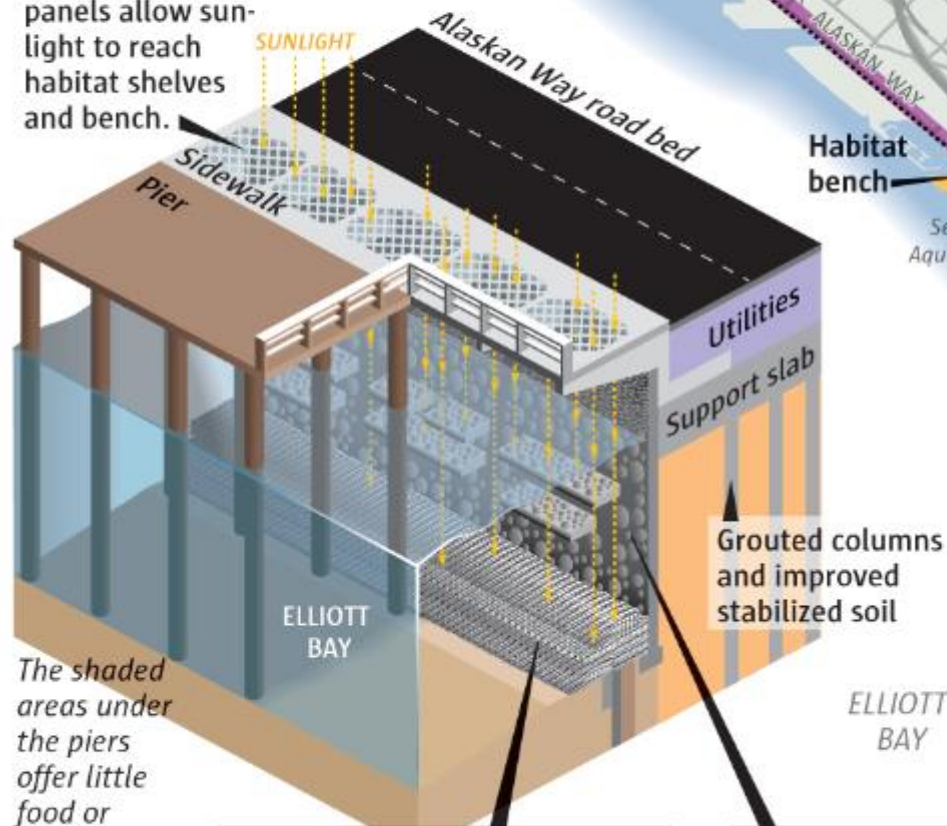


## As seawall work progresses, a new habitat is emerging

As Seattle builds a new seawall, workers are creating a “habitat bench” for marine life running the length of the downtown waterfront.

### New seawall:

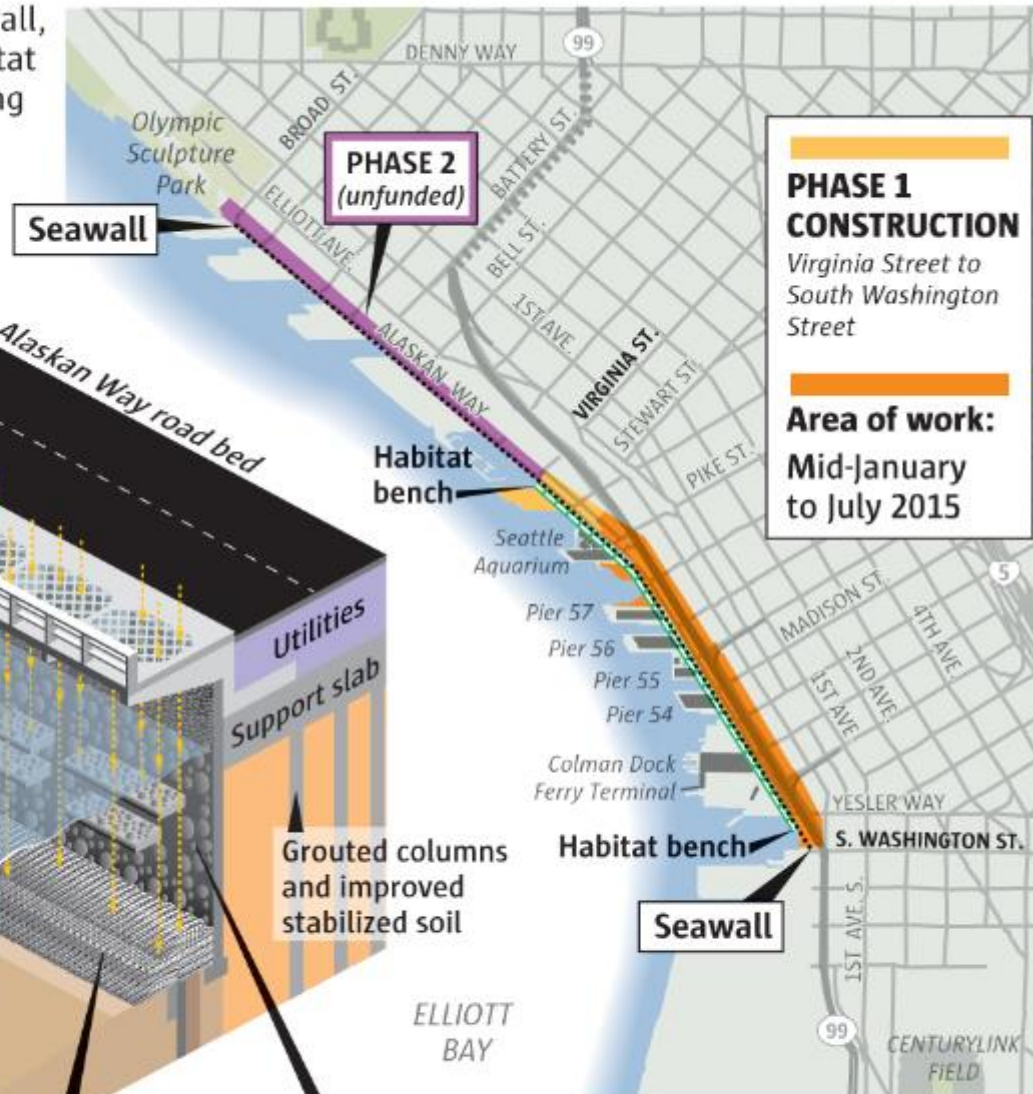
- Translucent sidewalk panels allow sunlight to reach habitat shelves and bench.



The shaded areas under the piers offer little food or habitat for young salmon.

- Habitat bench made from marine mattresses for marine organisms and migrating salmon.

- Seawall face with textured panels and shelves to provide habitat for algae and other marine organisms to attach, providing food for migrating salmon.



### PHASE 1 CONSTRUCTION

Virginia Street to South Washington Street

### Area of work:

Mid-January to July 2015

## Seattle Seawall







THANK YOU!

