



Blue Economy Innovation at the Port of San Diego

Association of Pacific Ports 112th Annual Conference, August 6, 2026



Port of San Diego Granted Lands

34

miles of waterfront

11,977

acres of Submerged
Tidelands

2,404

acres of Port Tidelands





Port Commissioners



Chair



Vice Chair



Secretary



Commissioners





Port of San Diego



Operate on behalf of the people of the State of California



Manage San Diego Bay and the Waterfront 'Tidelands'



Promote commerce, navigation, fisheries, recreation, and environmental stewardship



We collect no taxes; generate our own revenue; and we are an Economic Engine supporting \$13.8 Billion in Economic Impact and 71,360 jobs (2023)



Plans, Policies, and Programs



Overall Emissions

2024 Maritime Air Emissions Inventory

percent change since 2019

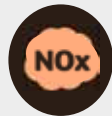
Diesel
Particulate
Matter (DPM)

-46%



Nitrogen
Oxides
(NO_x)

-32%



Carbon
Dioxide
Equivalent
(CO₂e)

-10%





Port of Firsts

The Port and our Partners are Advancing Zero Emissions Technologies





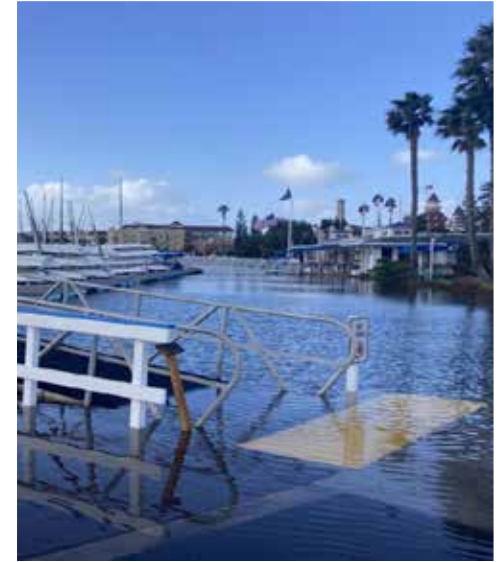
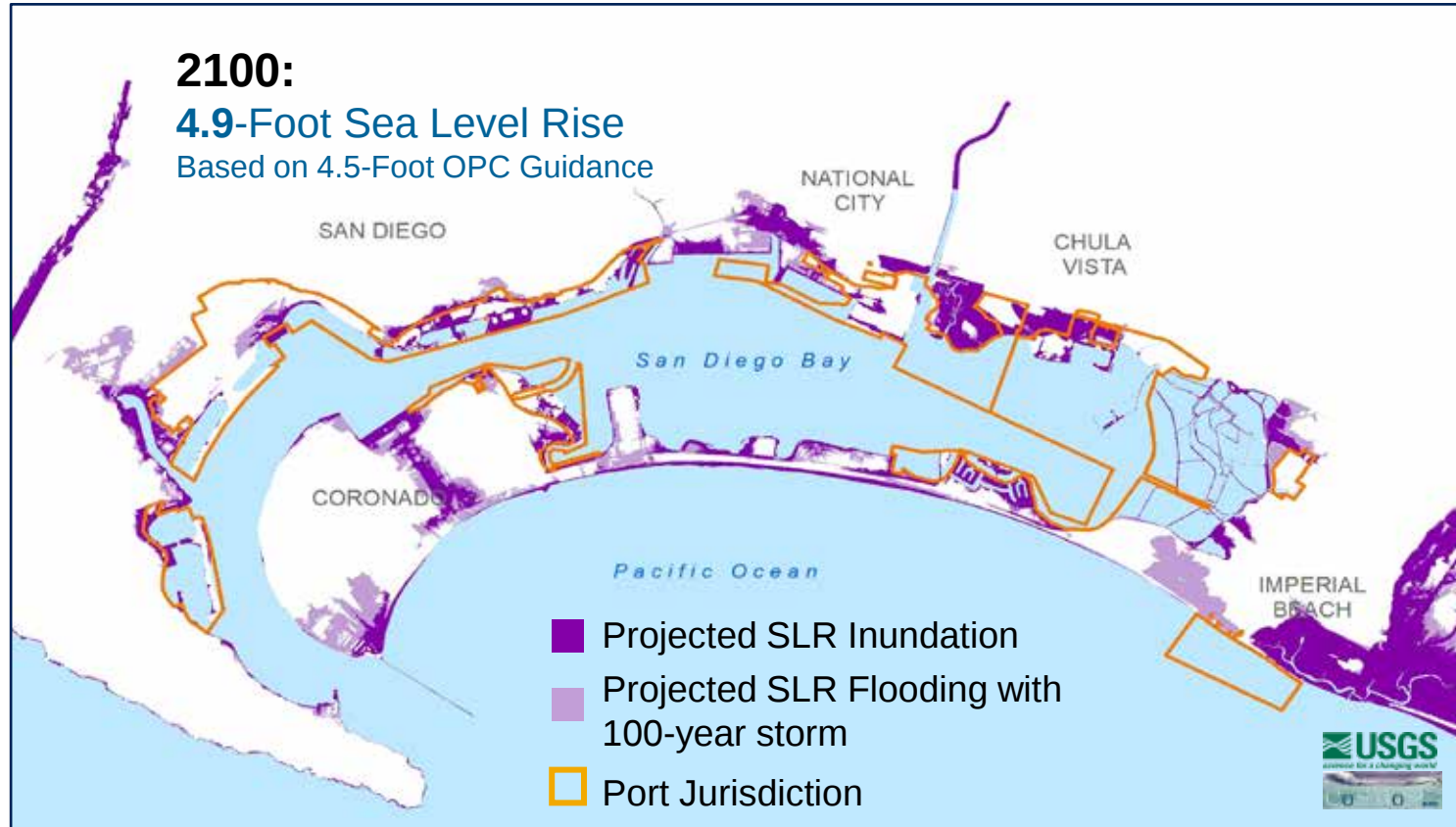
San Diego Bay Shorelines





Sea Level Rise

Tomorrow's flood on today's landscape



Preparing the Port of San Diego for Resilience



Continued scientific modeling and leadership



Recognition of the unique setting for ports, harbors, and working waterfronts



Streamlined permitting for nature-based solutions

Building a Portfolio of Nature-Based Solutions



Blue Carbon



Native Oyster Living Shoreline Project



Sustainable Shorelines



Restoration & Mitigation Banking



Established Industries

Cargo/Cruise



Coastal Development



Shipbuilding/Boatyards



Commercial Fishing
Recreation/Tourism



Nature-Based Solutions



Environmental Protection &
Remediation



Coastal Resiliency



Maritime Decarbonization



Shellfish & Seaweed
Aquaculture



Ocean Data, Monitoring,
Sensing, & Security



Port's Blue Economy

Emerging Industries



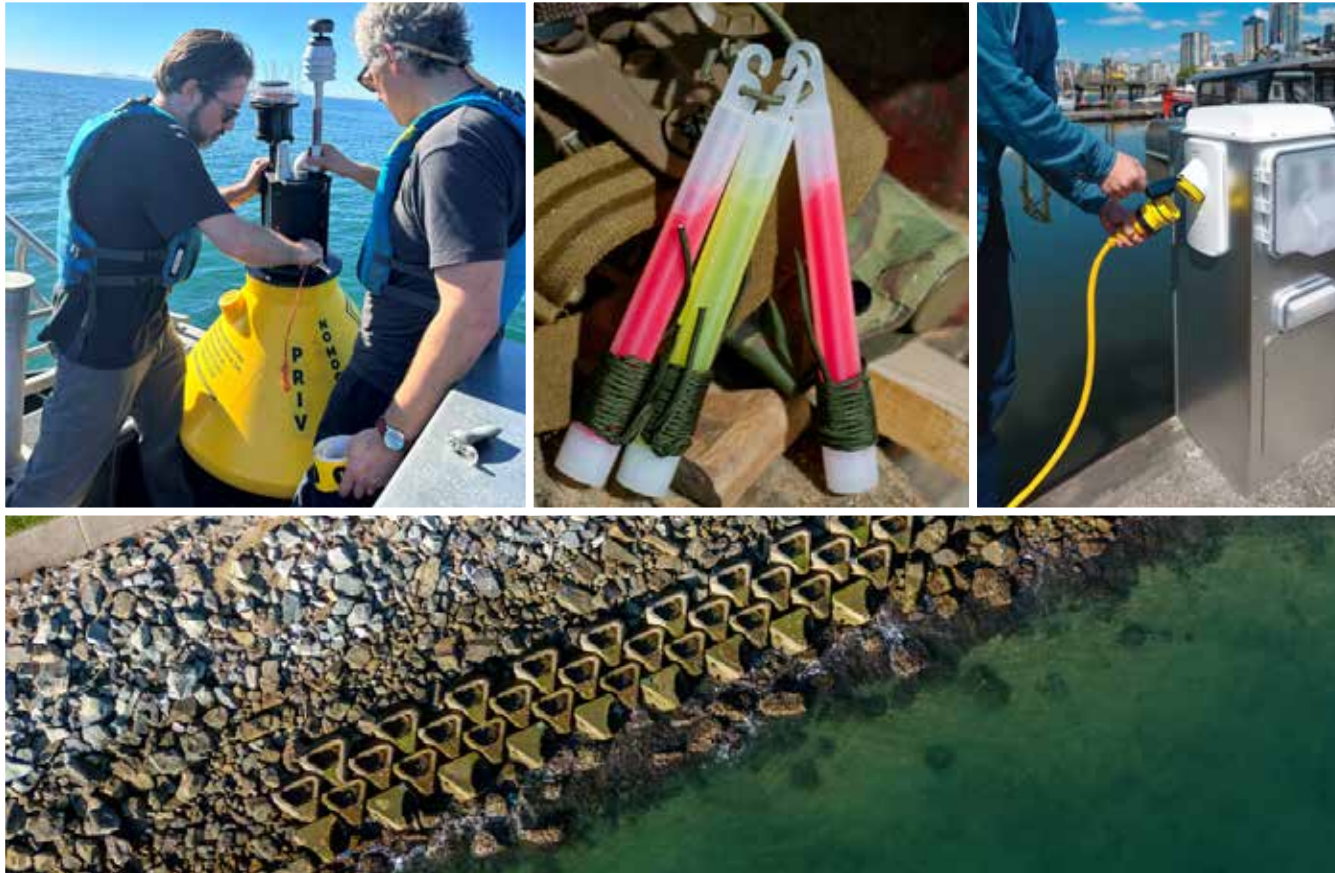
Port of San Diego: Leader for Ocean Innovation

- Expertise in permitting and entitlement
- Role as landlord, operator, regulator, and environmental steward.
- Champion of the Blue Economy
- Supporting Public-Private/Public Partnerships

Blue Economy Incubator Launched in 2016

4

BLUE ECONOMY INCUBATOR HIGHLIGHTS REPORT



Blue Economy Incubator Value Proposition

Pilot Project Facilitation

- Port investment
- Port-based pilot sites
- Permitting and technical assistance
- Subject matter expertise
- Access to global network of partners
- Public Relations and media visibility
- Access to grant funding and investment



Our Impact in Numbers



14

PILOT PROJECTS

launched through a port-wide collaboration process, with more in the pipeline

\$3.3

MILLION

IN FUNDING

to support the launch of sustainable ocean-positive pilot projects

\$9.1

MILLION

ADDITIONAL EXTERNAL RESEARCH/GRANT FUNDING

leveraged by BEI Companies

MORE THAN

429

INQUIRIES RECEIVED

from organizations seeking partnership and pilot project opportunities



Blue Economy Incubator Active Projects



Sunken Seaweed
Seaweed Aquaculture



ECONcrete
Eco-engineered
Solution for Shoreline
Protection



HyperKelp
Sensor Agnostic
Smart Buoys



MarineLabs
Coastal Intelligence
Data System



VoltSafe
Smart Marina Shore
Power Solution

Lux Bio
Natural Bioluminescent
Enzymes



PortXchange
Emissions Inventory Platform

Case Study - EConcrete

Eco-engineered Solution for Shoreline Protection

Permitting Assistance: A Pathway to Scale

Two-year pilot to demonstrate bio-enhancing concrete solution for marine infrastructure

- **2019** - \$200,000 in funding awarded for a two-year pilot to demonstrate the COASTALOCK shoreline protection infrastructure
- **2021** - Port of San Diego assisted with California's complex permitting process, resulting in 160 linear feet of COASTALOCK units installed across two sites replacing riprap along the San Diego Bay shoreline





Case Study - EConcrete

Eco-engineered Solution for Shoreline Protection



Permitting Assistance: A Pathway to Scale

- **2026** – approved by Port of San Diego for an additional 1060 linear feet expansion at two locations
- With more than **50 different projects in over a dozen countries**, EConcrete has been able to successfully scale across the globe



Case Study – VoltSafe

Smart Marina Shore Power Solution

- > Contacts are safe to touch
- > Current leakage detection
- > Waterproof
- > Over-voltage protection
- > Over-current detection
- > No arcing
- > Adaptable contact design
- > UV resistant
- > Aerospace-level safety
- > No moving parts



The Power of Media Coverage

One-year pilot to validate its marina shore power solution and smart marina manager software

Hardware + Software

- Minimizes opportunity for electrical accidents while delivering faster charging speeds.
- Hardware Integrates with software applications.
- Marina Manager and Boat Owner app is an all-in-one CRM, energy manager, and system diagnostic tool.



Case Study - VoltSafe

Smart Marina Shore Power Solution

The Power of Media Coverage



Successful media placements have resulted in increased exposure and brand recognition nationally and worldwide.

In the last 12 months BEI projects have generated...

562+

MEDIA MENTIONS

617+

IMPRESSIONS

\$5.7M

IN EARNED MEDIA
COVERAGE

across local, national, and international media outlets





Case Study – Lux Bio

Natural Bioluminescent Enzymes

Versatility = Success

- **Patented bioluminescent enzymes generate clean, visible light** through a biological catalytic reaction rather than toxic chemical oxidation.
- **Replaces traditional chemiluminescence (glow sticks)** with non-hazardous, enzyme-driven light production housed in ocean-biodegradable materials.
- **Engineered enzymes deliver extended illumination (48+ hours)**, providing a long-duration, non-toxic, plastic-free alternative to conventional glow-stick technology.





Case Study – Lux Bio

Natural Bioluminescent Enzymes



Versatility = Success

18-month pilot validates Lux Bio's bioluminescent signaling tools in **3 distinct real-world environments** to optimize for environmental durability, usability, and operational performance.

- **Parks & Rec Events** enabling interaction with the product
- **Pfleger Institute of Environmental Research (PIER)** depth and pressure testing for deep sea fisheries
- **Security & Defense** tests for search and rescue and other defense operations

Case Study - MarineLabs

Coastal Intelligence Data System



Sensor Technology

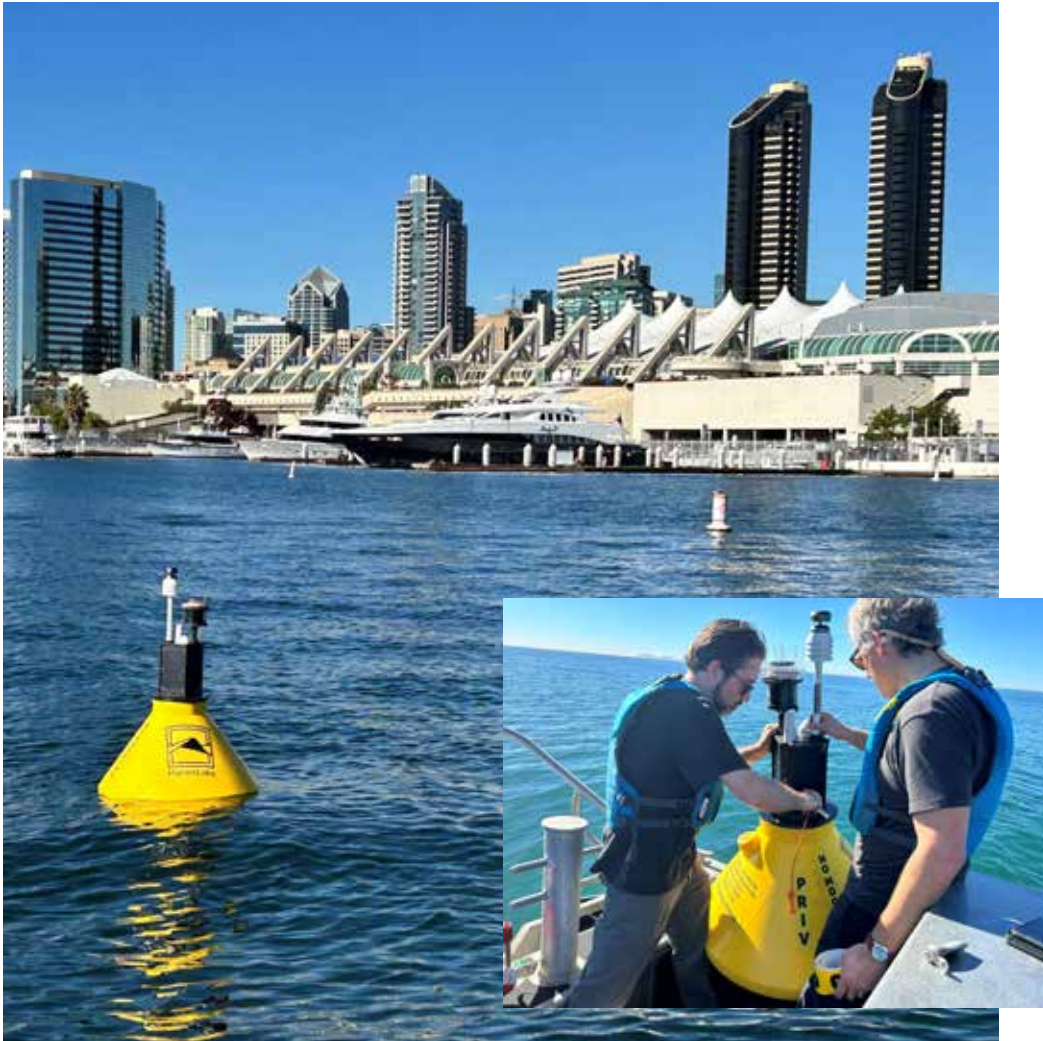
Real-world Test Environment

Two-year pilot to validate coastal intelligence data system for port environmental and security applications

- **Sensors collect wind, wave, and vessel wake data** used for climate hazard assessments, aiding the design and upgrade of port infrastructure, making projects more cost efficient and climate resilient.
- **Browser based access of real-time and predictive data**, machine learning-enabled weather insights and forecasting to validate critical decisions and improve safety

Case Study - MarineLabs

Coastal Intelligence Data System



Real-world Test Environment

- **5 buoys currently installed** throughout San Diego Bay, collecting wind, wave, and wake data
- **5 additional sensors to be installed** on Coast Guard Aids to Navigation (ATON) buoys
- **Testing tech in practical environments** creates more precise and mutually beneficial data, leading to more informed decision making
- **Partnerships/connections with local, national, and international organizations and agencies** allows the Port to support companies with real-world test environments

Sunken Seaweed

Seaweed Aquaculture



Funding pathways allow for scaling

One-year pilot to demonstrate sustainable seaweed aquaculture in an urban environment

- **2018** – Agreement approved for \$137,000 to fund a ¼ acre pilot farm in San Diego Bay
- **2019** – Pilot farm installed at Grape St Pier, hatchery established at San Diego State University, successfully tested ecosystem services, bioremediation research, commercial opportunities for several species of seaweeds
- **2021** – used published results from pilot project to obtain additional grant funding and extend pilot additional 4 years.



Sunken Seaweed

Seaweed Aquaculture



Funding pathways allow for scaling

- **2022** – Port of San Diego reinvested \$100,000, allowing Sunken Seaweed to expand and scale its land-based seaweed aquaculture operations at a new location in Humboldt Bay, CA
- **Today** – Selling seaweed products commercially in restaurants, grocery stores, and farmers markets; expanding processing capabilities; continuing research; producing 18,000lbs of seaweed per year at full capacity.



Collaborators Across the Pacific



O! OCEAN
IMPACT
ORGANISATION

htdc

blue MARITIME

AltaSea
AT THE PORT OF LOS ANGELES



TMA
BlueTech

StartBlue
Ocean Enterprise Accelerator

moananui
CAWTHRON

PRINCE RUPERT
Port Authority
CANADA'S LEADING EDGE

COAST

BLUE ACTION
CANADA

MarineLabs
DATA SYSTEMS

VOLTSAFE

LUX BIO

**ASSOCIATION OF
PACIFIC PORTS**



Upcoming Pacific Engagement

AUGUST 2026



**HAWAII
TECH WEEK**



Association of
Pacific Ports 112th
Annual Gathering



Hawai'i Tech Week

SEPTEMBER 2026



Pacific Coast Shellfish
Growers Association
Annual Conference



One Impact Week
1000 Ocean Startups
Annual Meeting

NOVEMBER 2026



TMA BlueTech
Blue Tech Month



Blue Economy Incubator Highlights Report



BLUE ECONOMY INCUBATOR HIGHLIGHTS REPORT 3

A Cruise ships, terminals, and port infrastructure highlight the active maritime industries that power the region's waterfront.

PORT OF SAN DIEGO'S BLUE ECONOMY

Driving ocean-positive innovation in and around San Diego Bay

The blue economy encompasses ocean and water dependent industries that sustainably use marine resources to drive economic growth, create jobs, and support healthy ecosystems. With its natural deep-water harbor, robust infrastructure, and thriving science and tech sectors, San Diego is solidifying its reputation as Blue Tech Bay. The Port of San Diego plays a central role in uniting government, businesses, conservation, and academia to drive innovative solutions that support economic growth and environmental stewardship. As the state-legislated trustee of 34 miles of waterfront and submerged waters in and around San Diego Bay, the Port is a leader of the region's blue economy – fostering entrepreneurship, collaborating on research, innovation, investment, and building pathways for ocean innovation to scale.

Thank you



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**PORT of
SAN DIEGO**
Waterfront of Opportunity