



Oregon Kelp Alliance

Updates on Science, Restoration and Mariculture

Sara Hamilton, PhD and Carl Hendrickson

OPAC meeting

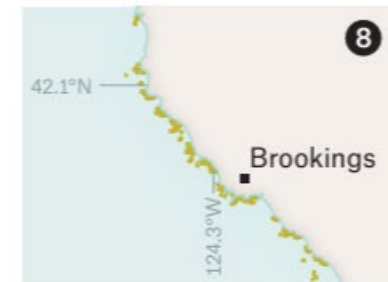
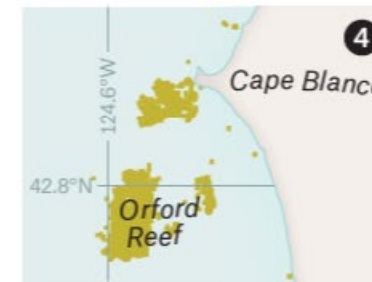
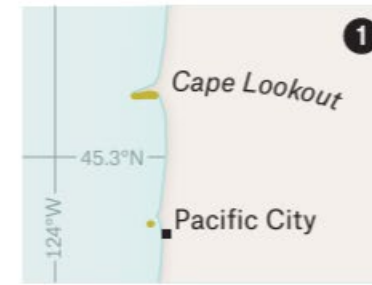
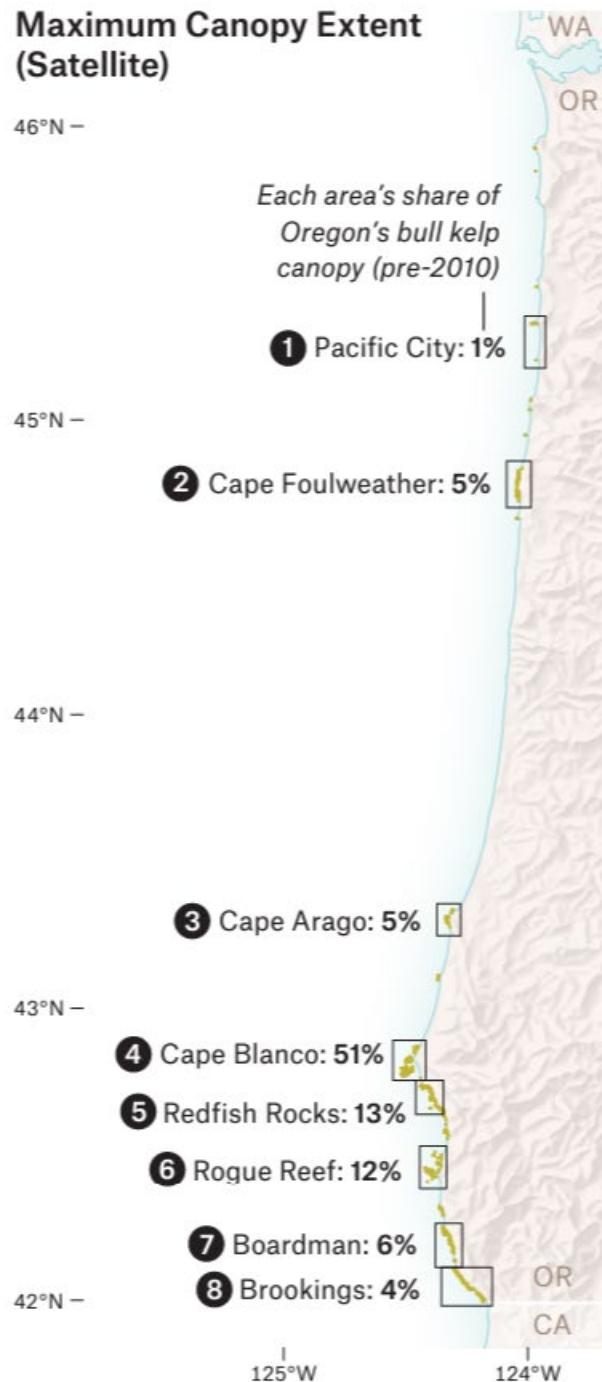
May 7, 2025

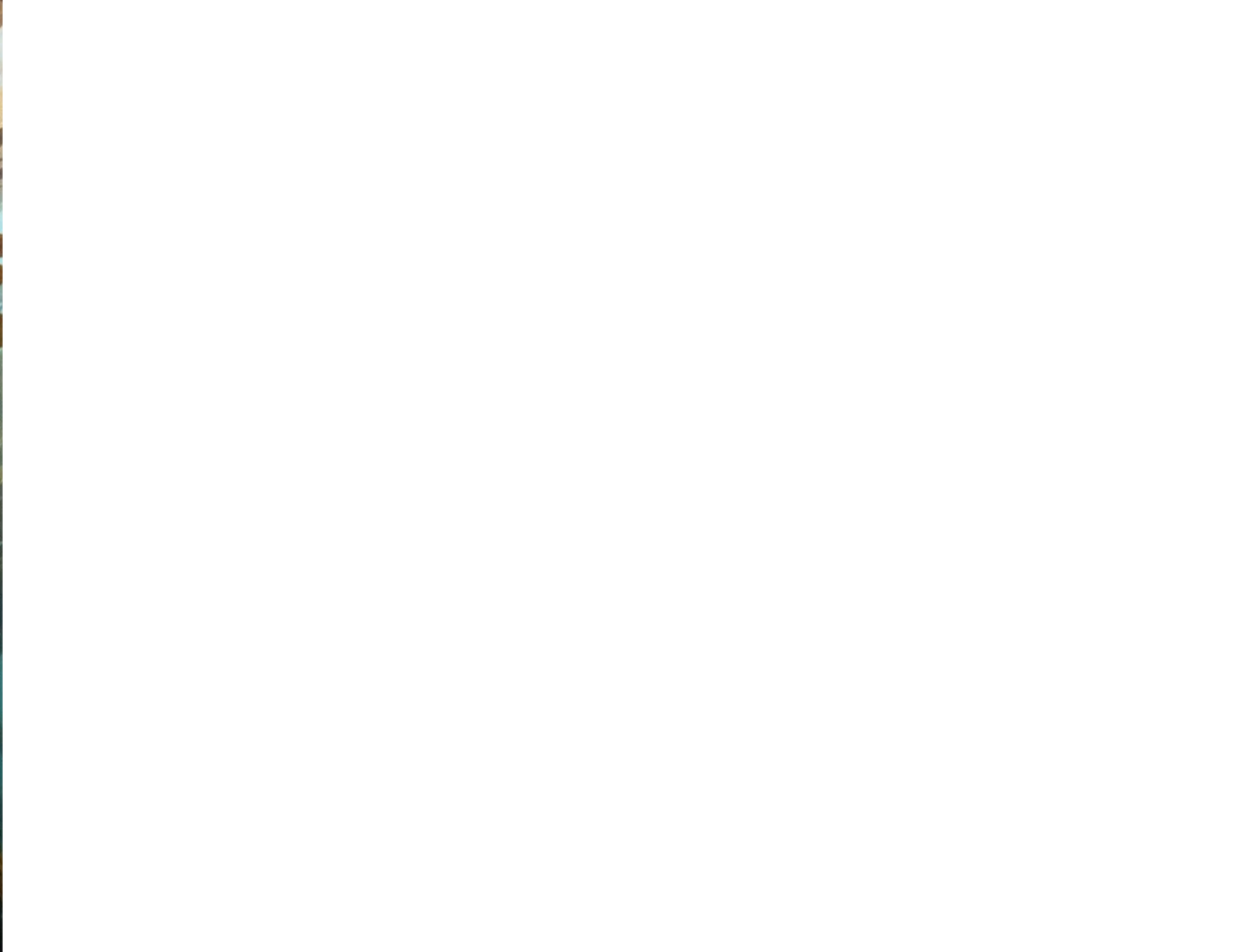
Oregon's Kelp Forests

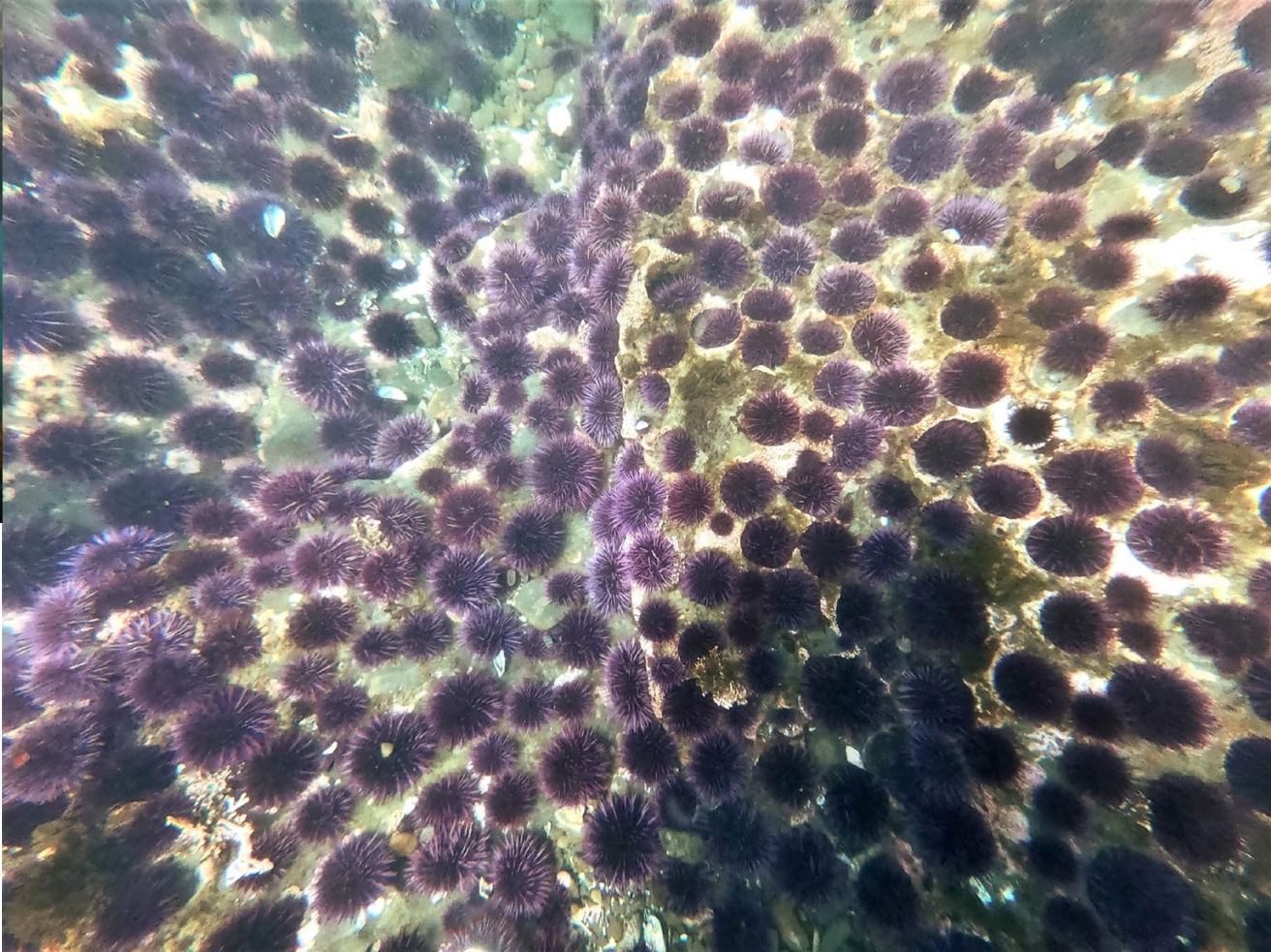
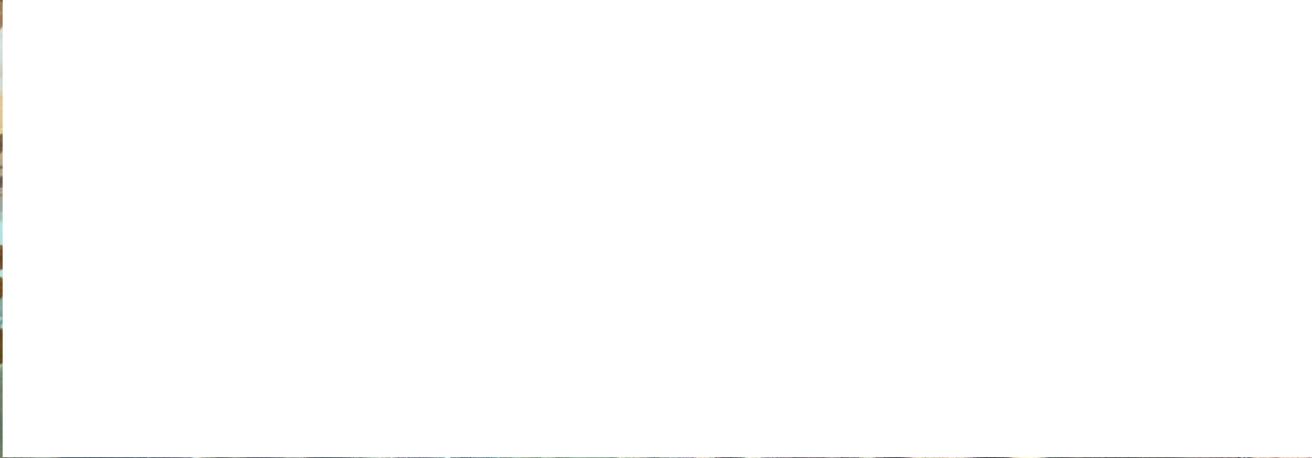


Oregon's Kelp Forests

- Bull kelp canopy with understory spp.
- Can only grow on rocky substrate
- Extensive forests lining the south coast from Cape Arago to Brookings









A REPORT OF THE OREGON KELP ALLIANCE

2024 Oregon Kelp Forest

STATUS REPORT

Sara Hamilton¹, Tom Calvanese^{1,2}, Sarah Gravem^{2,3}, Aaron Galloway⁴,
Delaney Chabot^{2,3}, Emily Vidusic⁴ and Natalee Webster²

1. The Oregon Kelp Alliance, Port Orford, OR

2. Oregon State University, Corvallis, OR

3. Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO)

4. Oregon Institute of Marine Biology, The University of Oregon, Charleston, OR

PHOTOGRAPH BY BRANDON COLE

First Task: Document the Problem

With support of Sen. Merkley and
Sen. Wyden, ORKA received NOAA
funds to assess the Status of
Oregon's Kelp Forests

A Group Effort

- **Co-authors:** Tom Calvanese, Sarah Gravem, Aaron Galloway, Delaney Chabot, Emily Vidusic, Natalee Webster
- **Contributors and Collaborators:** Dan Abbott, Diana Hollingshead, Jim Burke, Doug Batson, Anne Mefford, Aubrey Taradash, Lindsay Aylesworth, Kevin Buch, Stephanie Fields, Scott Marion, Steve Rumrill, Moritz Schmid, Kendall Smith, Leigh Torres, Miles Rough, Ryan Grant, Eli Cronin, Brendan Feely, Faith Townsend, Caroline Rice, Tate Scarpaci, Justin Myers and Patrick Barber



How did we assess status?

GOAL: 1) Assess current conditions of Oregon's kelp forests and 2) compare to past conditions to understand changes

- Historical and ongoing time series from ODFW and Reef Check
- Diving: ~170 SCUBA surveys
- Drones: 21 drone surveys

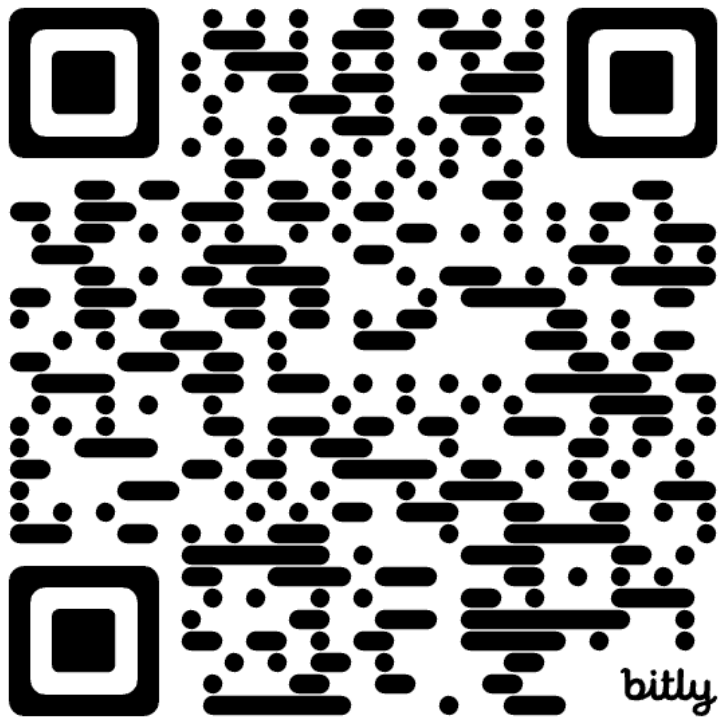
Left: Divers take a surface interval on South Coast Tour's The Black Pearl in between survey dives. Right: Sara conducts a drone-based kelp forest survey at Sister's Rock State Park





2024 Oregon Kelp Forest

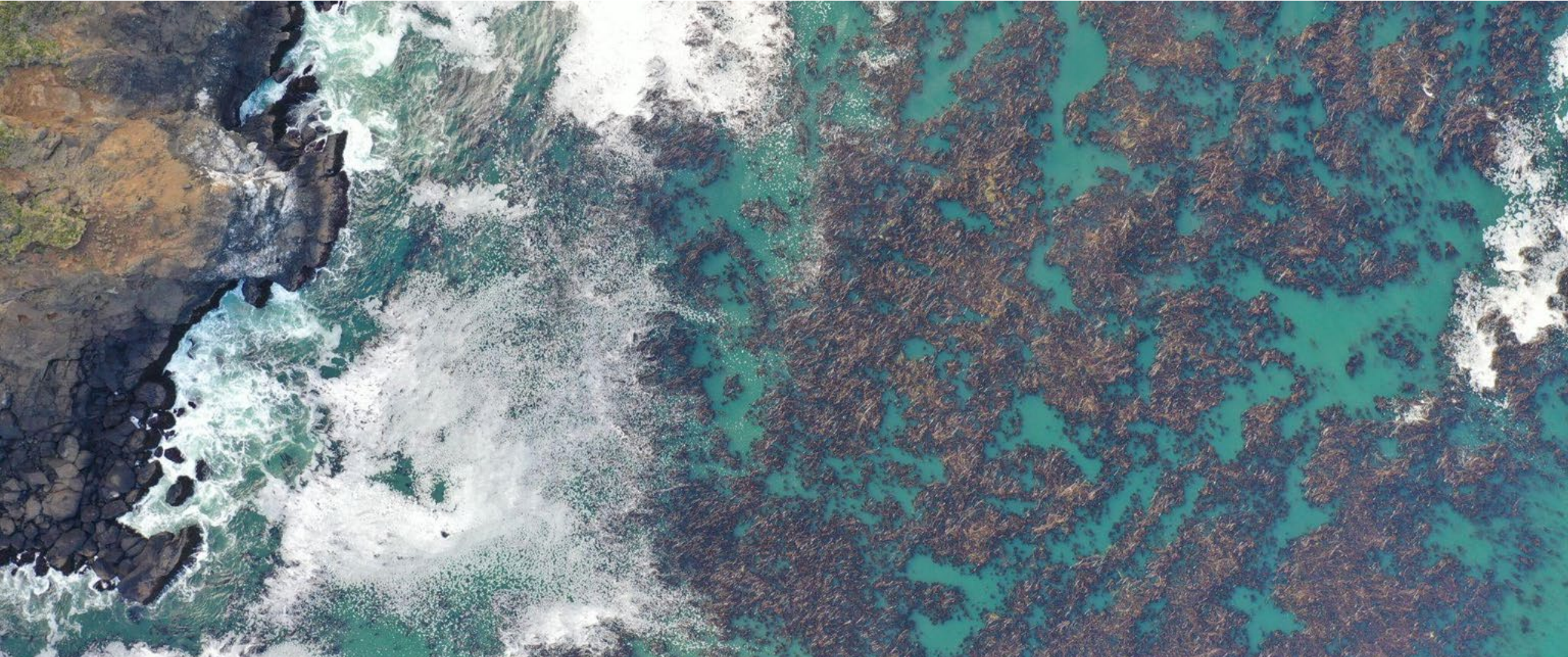
STATUS REPORT



Status Report Takeaways

1. ~70% less bull kelp in 2022 than 2010
2. Large swaths of historic kelp forest habitat supported little to no kelp
3. Increasing purple urchin densities a key driver
4. Exciting signs of resilience

The Oregon Kelp Forest Stewardship Initiative



The Oregon Kelp Forest Stewardship Initiative

- New grant from NOAA NMFS Office of Habitat Conservation to support restoration and protection work
- Sen. Jeff Merkley, Sen. Ron Wyden, and Rep. Val Hoyle provided support
- Will fund 2 years of work at 6 sites across the coast
- May 2025 - June 2027



**Major Funding Secured: \$2.521M
Boost for Oregon Kelp Forest
Protection and Restoration Initiative**

Oregon Kelp Alliance Awarded \$2.521 Million Grant to Launch Kelp Forest Protection and Restoration Initiative

Where?

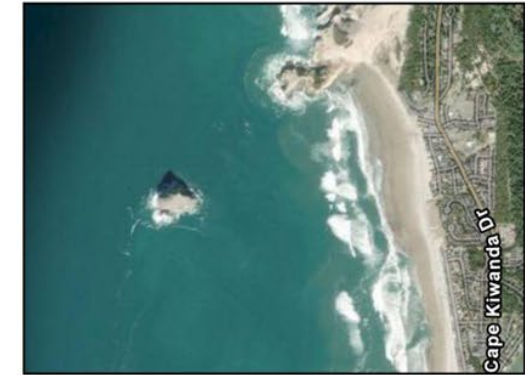
6 sites across the coast that community members helped us identify as priorities



Cape Lookout



Kiwanda Rock



Cape Foulweather



South Cove



Nellies Cove



Macklyn Cove



Where?

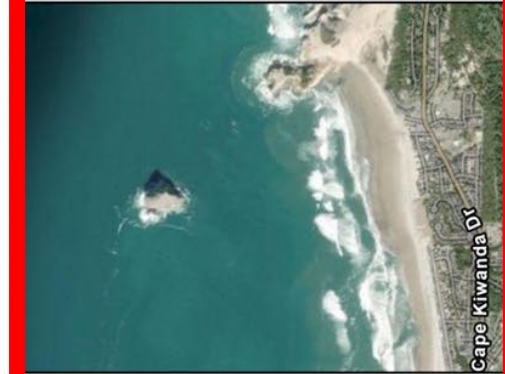
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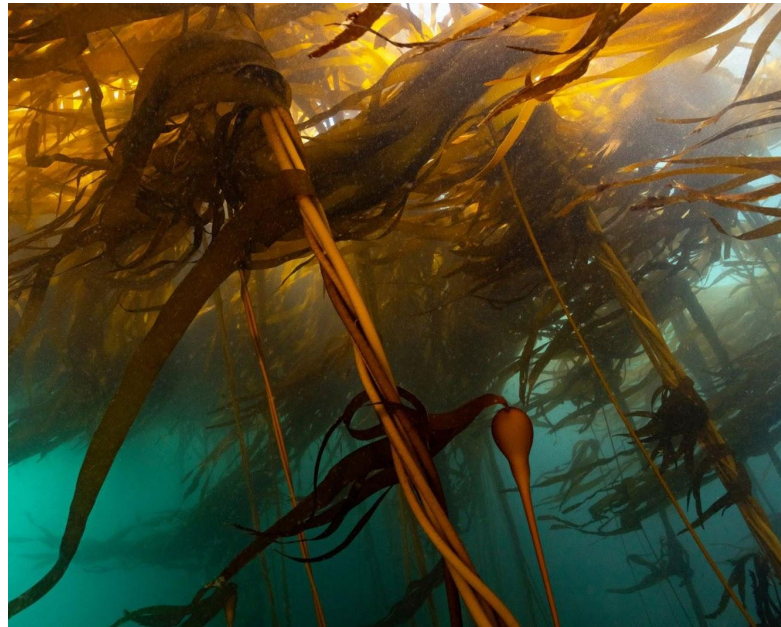
How?

Active Kelp Forest Restoration and Protection



Grazer Control

Harvest and cull purple urchins from sites of interest



Kelp Seeding

Outplant bull kelp and boosting spore supply

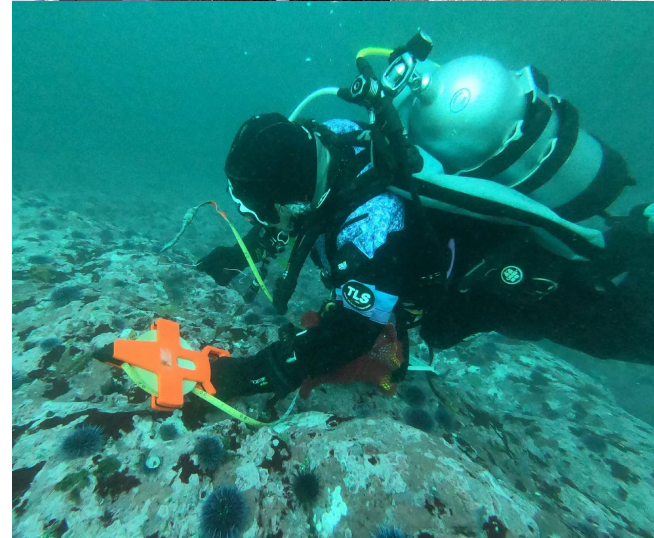
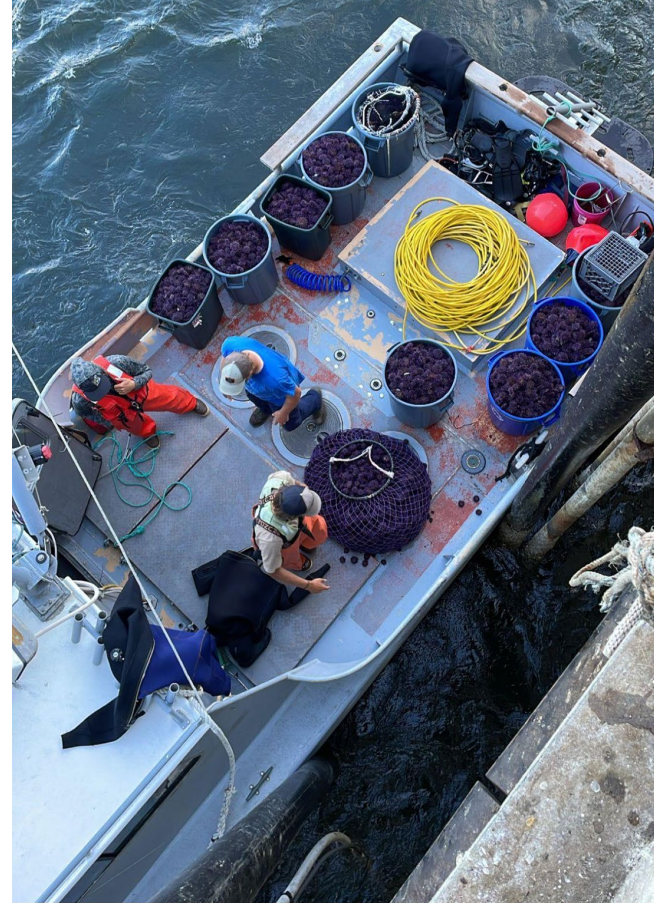


Sea Star Recovery

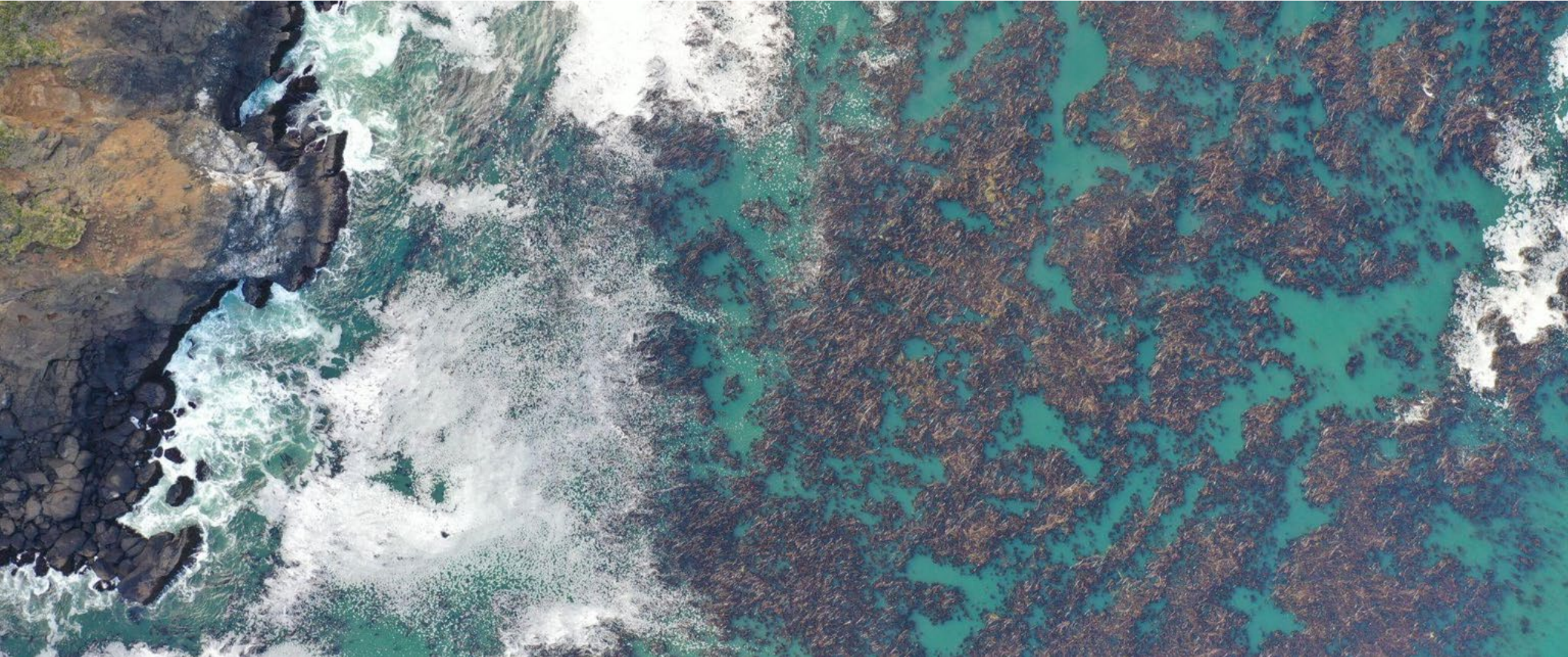
Promote sunflower sea star recovery at kelp restoration sites

Who?

- Commercial urchin divers
- Reef Check
- Community science divers
- Tribal members
- ORKA Mariculture Team
- University of Oregon and Oregon State University scientists and students



Oregon Restorative Kelp Mariculture Project



- Commercial kelp cultivation & ecosystem restoration through market-based solutions
- Partnerships with local fishermen for economic diversification
- Multiple value streams (livestock feed, soil amendments, fertilizer, food, reproductive spores)



Oregon Restorative Kelp Mariculture





Tom Calvanese, Director, Oregon Kelp Alliance



Aaron Ashdown, F/V Misty, Port Orford

Overview

The Oregon Restorative Kelp Mariculture Project is a pioneering initiative launched in Port Orford, Oregon that uniquely combines commercial kelp cultivation with ecosystem restoration objectives. The project focuses on bull kelp (*Nereocystis luetkeana*) forests, which have experienced significant decline along the Oregon coast, and the development of market-based solutions.

Community-Based Collaboration

The three-year initiative (2024-2026) represents a partnership between local fishermen and marine scientists, focusing on developing best practices for local bull kelp cultivation, harvest, processing, and marketing. This collaborative approach directly engages Port Orford fishermen in carrying out the pilot project, under the leadership of Captain Aaron Ashdown (F/V Misty) and Tom Calvanese, Director of the Oregon Kelp Alliance.



Tate Scarpaci, Port Orford Mariculture Field Crew



Sara Hamilton, ORKA Science Coordinator



Carl Hendrickson, ORKA Program Coordinator



Kelp mooring sites were chosen in collaboration with local commercial crabbers and fishermen to minimize interference with existing commercial uses. Temporary moorings are deployed seasonally and designed for flexibility and ease of relocation. Sites are registered with Oregon Department of State Lands (DSL).

Innovations

Vertical point moorings to minimize navigational and entanglement hazards.
Natural materials to reduce plastic use in mariculture operations.



Kelp mooring: Manila rope mooring with "myco-buoy" grown from mushrooms and coated with organic sealant, anchored with steel anchors. No plastic!

Economic Diversification

A key goal is demonstrating how this model can provide economic diversification for fishing communities while supporting kelp forest restoration efforts. By developing opportunities to participate in this restorative mariculture enterprise, fishermen will have the chance to include this economic opportunity in their fisheries portfolio.

Multiple Value Streams

This pilot project emphasizes sustainable production of multiple value streams, including livestock feed, soil amendments, food products (kelp pickles), and kelp spores for restoration activities. This diversified approach creates economic opportunities while supporting ecological goals.









Future Directions

This pilot is exploring experimental cultivation methods, expected environmental impacts, and the development of a replicable business model for community-based kelp mariculture in Oregon. It represents a significant step toward establishing economically viable, environmentally responsible seaweed cultivation practices that can be adapted for use in other rural coastal communities.

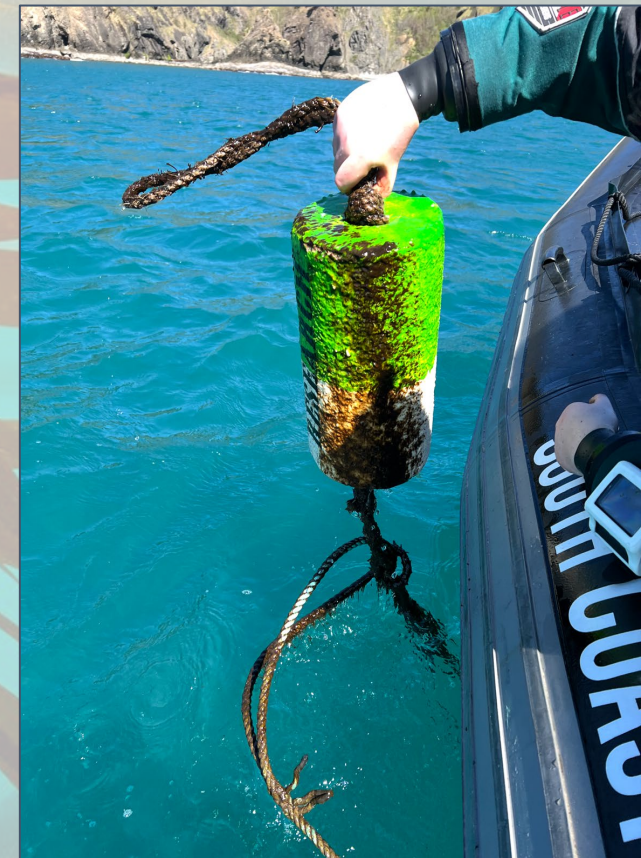
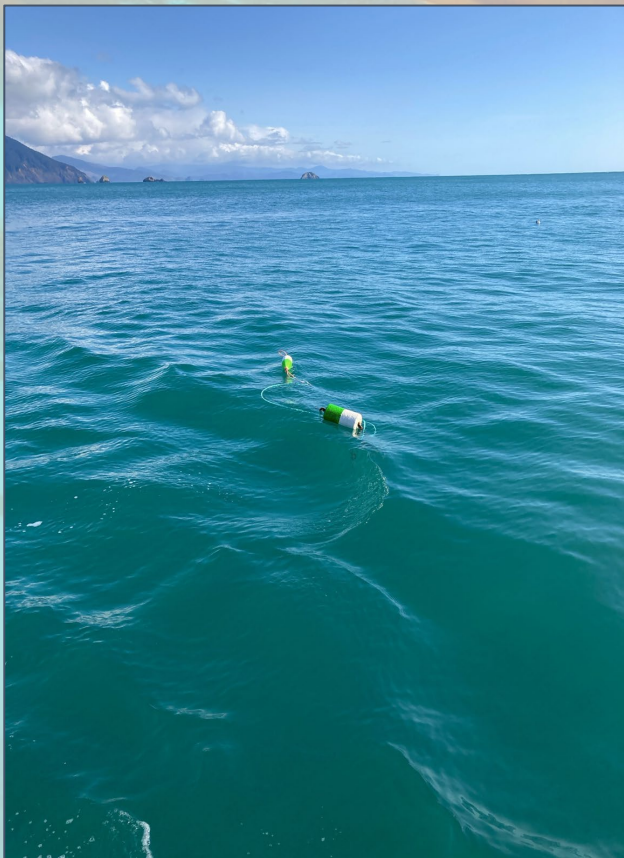


In partnership with the Oregon Coastal Mariculture Collaborative

oregonkelp.com for more information

Made possible with support from the Builder's Initiative







Barnacle Sea Foods



Seagrove Kelp Co

Looking to the future!

- \$4.5 million ask to NOAA for restoration
- Pledge to the global Kelp Forest Challenge
- Captive breeding program for sunflower sea stars
- Local stewardship cohorts
- Deepening Tribal engagement



Oregon State University
Port Orford Field Station




THANK YOU!


Questions?

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Change in Kelp Canopy Cover from 2010 to 2022

 Measured by satellite

 Measured by plane

 Cape Lookout: 92% loss*

 Cape Foulweather: 44% loss*

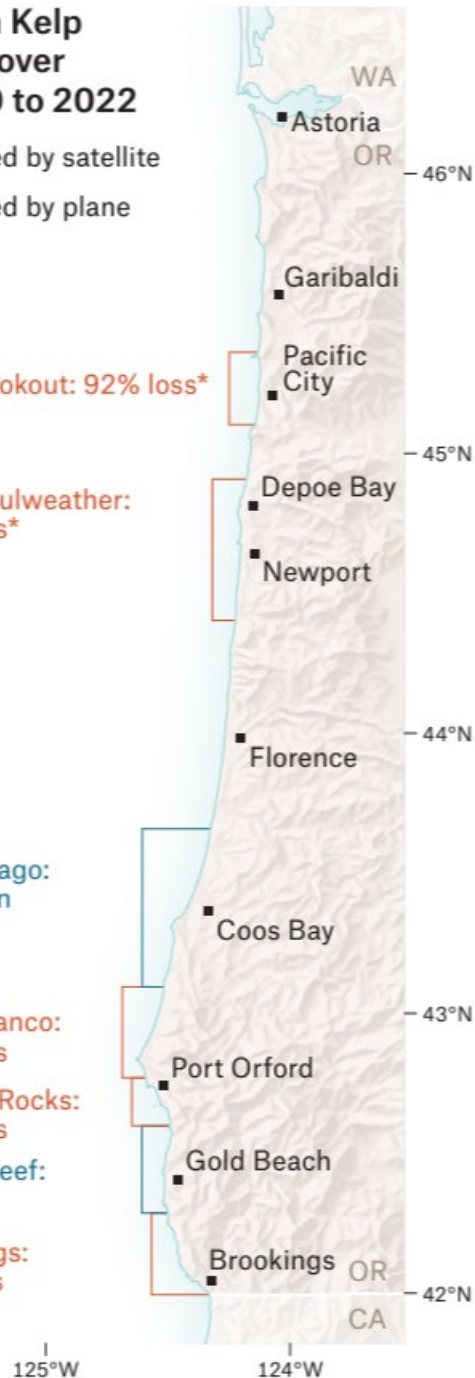
 Cape Arago: 23% gain

 Cape Blanco: 95% loss

 Redfish Rocks: 26% loss

 Rogue Reef: 1% gain

 Brookings: 74% loss

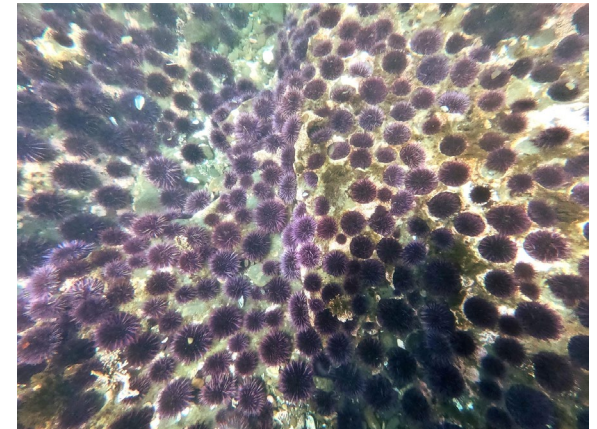
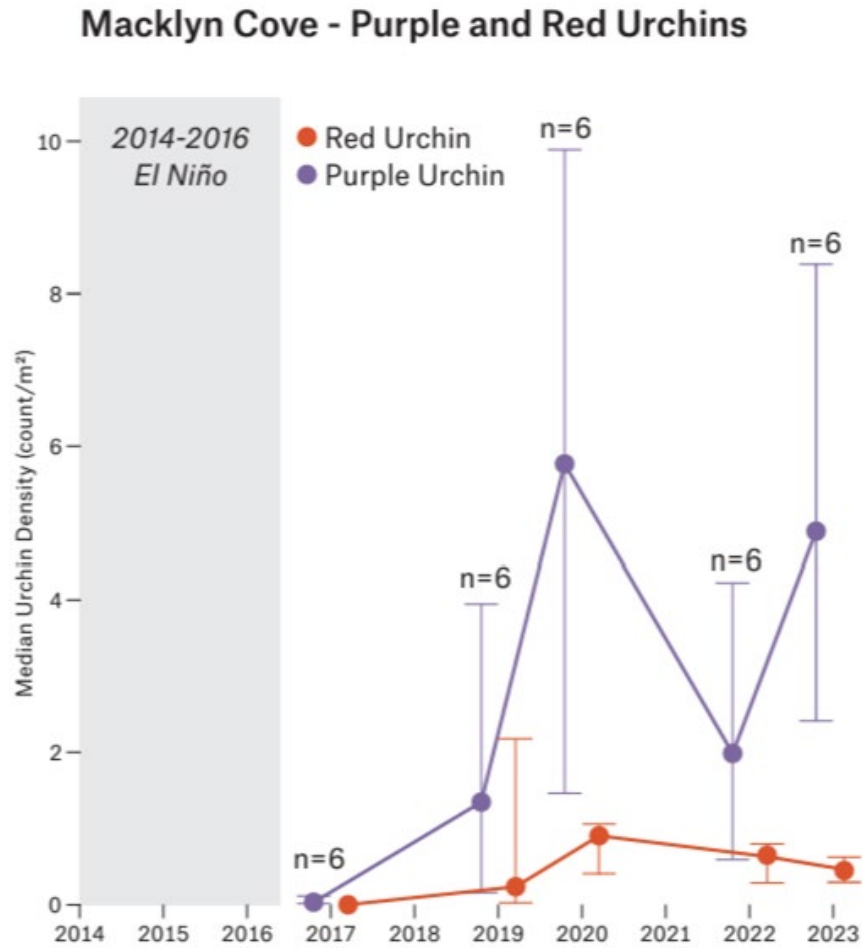


~70% less bull kelp in 2022

2022 vs. 2010 – 67-73% decline in bull kelp area. That's about **900 acres**.

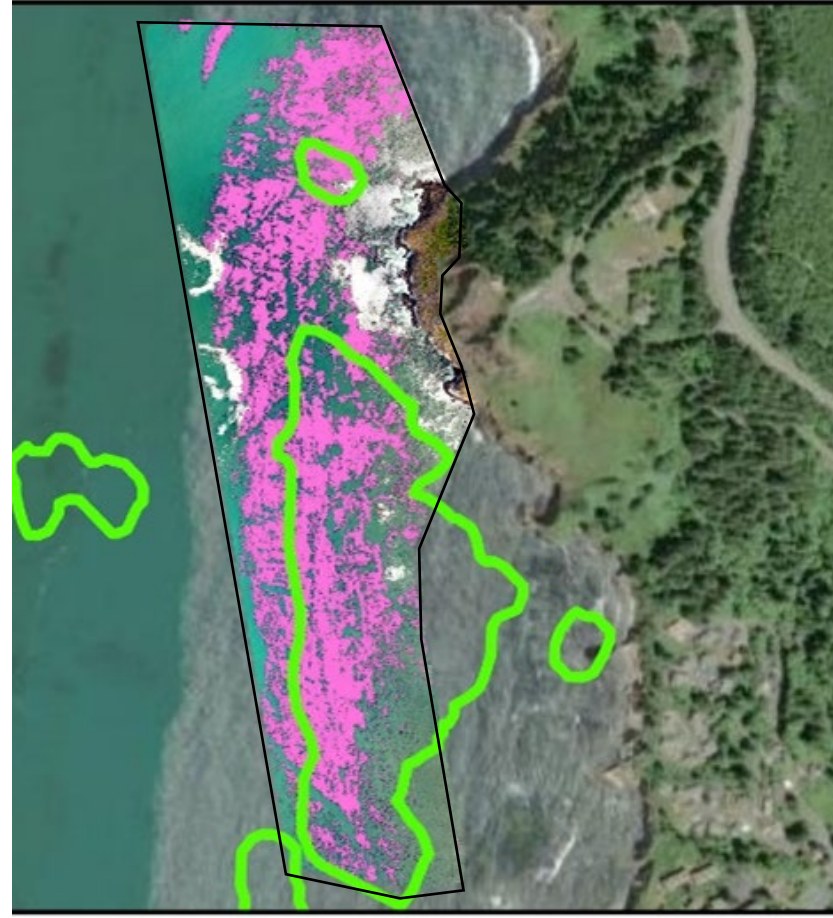
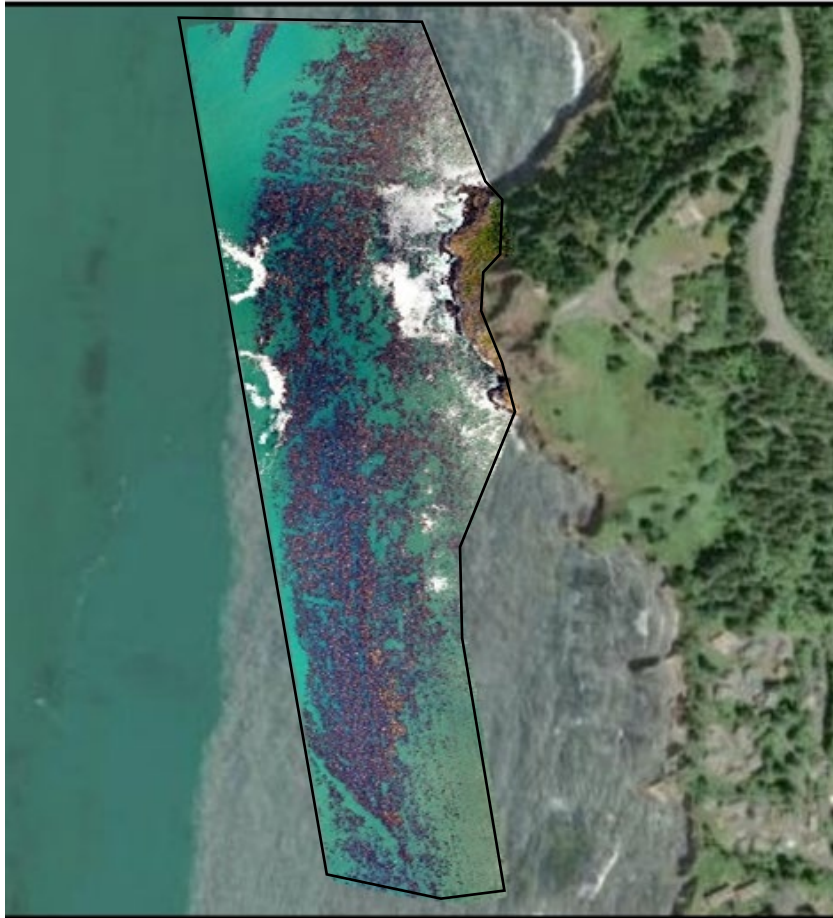
Losses not spread evenly across the coast. Some places display near total loss. Some show small gains.

Purple urchins as a key driver







Signs of Life



2023 was a historically good year for bull kelp around Cape Foulweather

2023 Otter Crest

Legend

-  1990 ODFW Aerial Kelp Canopy Extent
-  2023 ORKA Drone Kelp Canopy Extent

Signs of Life

Sightings of Sunflower Sea Stars Documented on community science sites iNaturalist.org and SeaStarWasting.org

- Astoria to Netarts
- Netarts to Depoe Bay
- Depoe Bay to Reedsport
- Reedsport to Cape Blanco
- Cape Blanco to Brookings

