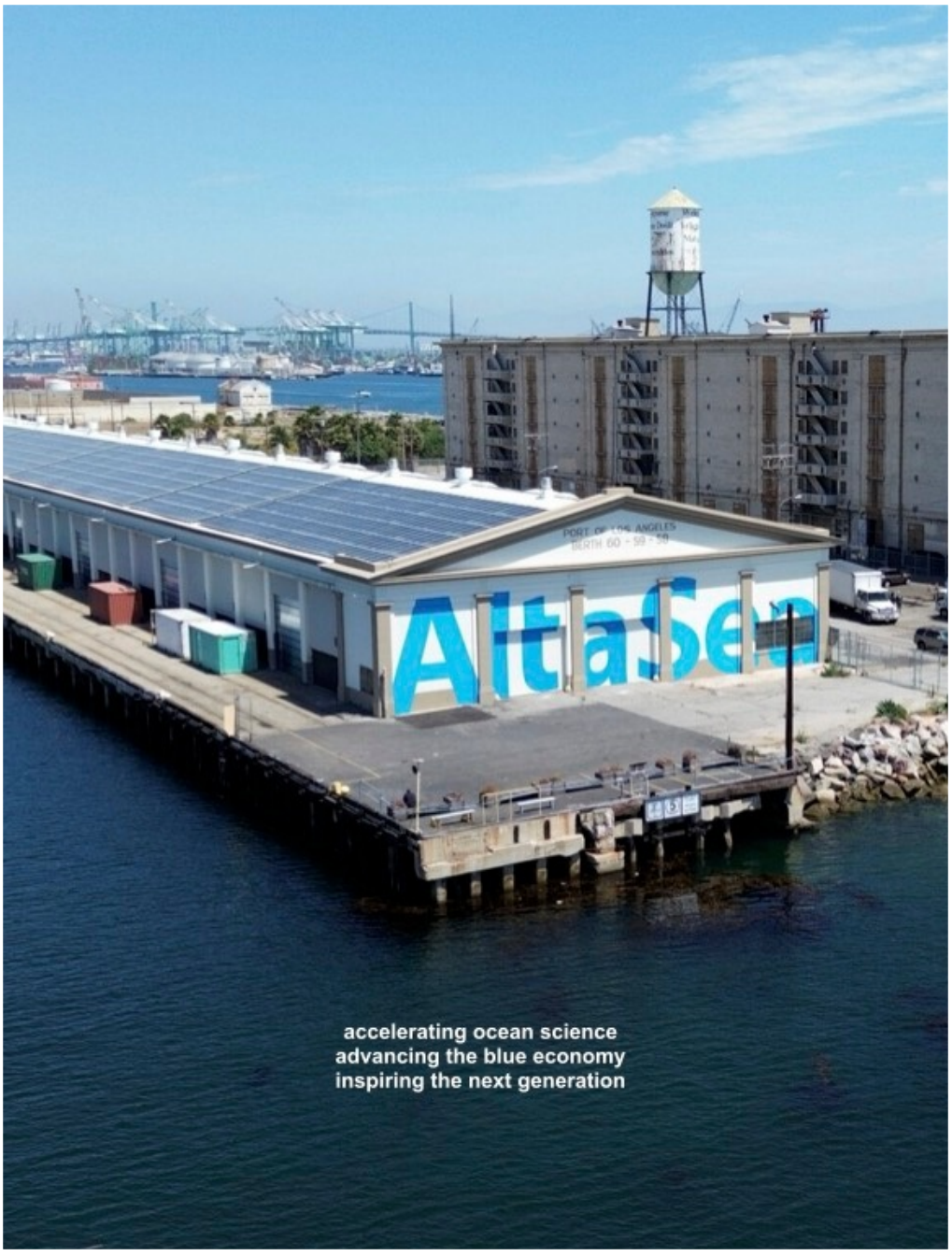
THE BLUE BOOK

2025

AltaSea
AT THE PORT OF LOS ANGELES


AltaSea
accelerating ocean science
advancing the blue economy
inspiring the next generation

2025 DASHBOARD
AltaSea Campus Overview

LETTER FROM OUR CEO
A Beacon in the Storm

LETTER FROM OUR FOUNDER
AltaSea Goes Global

BLUE ECONOMY REPORT
Thriving Marine Sector in LA

EDUCATION
Summer Interns

WORKFORCE DEVELOPMENT
Internship to Employment

SUSTAINABLE AQUACULTURE
A Blue Foods Future

BLUE CLIMATE ACTION
Portside Wave Energy

OCEAN STARTUP PROFILE
Tini Scientific

TENANT SPOTLIGHT
OceanWell

AltaSea at the Port of Los Angeles is dedicated to accelerating scientific collaboration, advancing an emerging Blue Economy through business innovation and job creation, and inspiring the next generation, all for a more sustainable, just, and equitable world.


Welcome to
America's Port
THE PORT OF LOS ANGELES

2025 DASHBOARD

35	3	87
Acre Campus	Floating Labs	% Leased

180,000	5,000
ft² Renovated Space	Students Served

CAMPUS FEATURES

CENTER FOR INNOVATION

180,000 ft² blue economy hub for marine business & research

OCEAN RESEARCH BARGE

Floating classroom featuring aquaculture & underwater robotics

DOCK SPACE

Housing exploration vessels & the Los Angeles Police Dept. Dive Unit

FLEX LAB

Multi-purpose marine lab, accessible as a co-working space

ALTASEA CAMPUS OVERVIEW

RESEARCH

Marine Carbon Dioxide Removal
USC, UCLA, CalTech

Sustainable Kelp Aquaculture
USC Nuzhdin Lab, Kelp Ark

BUSINESS R&D

Wave Energy
Eco Wave Power

3D Concrete Printing
Sperra

Green Hydrogen
Equatic

EDUCATION

In-Class Programming
Semester-long courses in underwater robotics, ocean-based renewable energy, and regenerative aquaculture

AltaSea Campus Programming
High school mentorships, paid college internships, and technical trades training courses

College-Level Certificates
Aquaculture Certificate Program at Santa Monica College with more career certificates in development at partner community colleges

LETTER FROM OUR CEO

A BEACON IN THE STORM

AltaSea has become a bulwark for ocean-based climate solutions at a critical moment. But planet-saving action is facing more headwinds than ever before. Despite this, at AltaSea the sustainable blue economy and ocean-based climate solutions just had their most successful year yet.

On the AltaSea campus, ocean entrepreneurs are championing wave-generated renewable energy and regenerative aquaculture. Kelp researchers are helping species recover from the after-effects of LA's devastating wildfires. And pioneers in ocean-based carbon capture technology are developing innovative ways to roll back the clock on some of the carbon pollution already in our seas and atmosphere.

2025 was also the most successful year yet for AltaSea's educational programming. A record number of students visited the AltaSea campus on field trips, where they had the chance to navigate underwater robots. And several dozen high school and college students participated in internships and training programs in the technical trades.

This collection of articles showcases stories from the AltaSea campus, and highlights some of our successes from the past year. All that we have accomplished to date would not be possible without the generous support of our partners and donors. Thank you for your continued commitment to our oceans, our community, and our planet.

Sincerely,

Terry Tamminen
CEO
AltaSea at the Port of Los Angeles

Above: Jenny Krusoe, Executive VP/COO and a Founder of AltaSea (Allen J. Schaben / Los Angeles Times)
Below: EcoWave Power's wave energy demonstration at AltaSea (Arturo Garcia-Ayala)

LETTER FROM OUR FOUNDER

ALTASEA GOES GLOBAL

At New York Climate Week 2025, AltaSea's President and CEO Terry Tamminen and I announced AltaSea's Deep Blue Decade Initiative. The goal of the Deep Blue Decade is to implement the AltaSea model in ports around the globe, in order to scale the blue economy within the timeframe necessary to effectively address the climate crisis.

The initiative has already generated new partnerships in Jordan, Indonesia, Tanzania, and Tonga. AltaSea is working closely with advisors and place-based partners to establish locally-attuned blue economy centers in coastal communities in these countries.

Knowledge-sharing is also an important part of this initiative. This past summer, at the United Nations Oceans Conference in France and the Blue Economy and Finance Forum in Monaco, I shared AltaSea's expertise as the world's largest blue economy center.

As we enter the second year of the Deep Blue Decade Initiative, AltaSea will continue to expand global partnerships while also remaining firmly dedicated to our campus in the Port of Los Angeles and all of the benefits the blue economy brings to the Los Angeles region.

Our work in Los Angeles and our Deep Blue Decade Initiative are both rooted in the same belief: the blue economy is for everyone. We thank you for your support of AltaSea's work so far, and look forward to sharing this exciting new chapter with you. Our future is blue!

Sincerely,

Jenny Krusoe
Founder and COO
AltaSea at the Port of Los Angeles


CALIFORNIA UNITED TERMINALS
CALIFORNIA UNITED TERMINALS
ZPMC

THRIVING MARINE SECTOR IN LA

Los Angeles County's marine sector produced a record-high $15.7 billion in GDP in 2021 and recovered jobs to almost pre-pandemic levels—employing over 105,000 people. While sustainable blue economy industries currently constitute only a small portion of the region's marine sector, a 2025 report emphasizes that LA's blue economy continues to grow and is poised for expansion in the coming decades.

The report, which analyzed data from NOAA, argues that several unique advantages prime LA for a thriving blue economy. The greatest of those advantages, according to the report, is that the city is home to both the nation's busiest port and AltaSea's 35-acre campus dedicated to cultivating the blue economy.

Throughout the report, produced by the Los Angeles Economic Development Corporation, AltaSea is highlighted as a catalyst for the region's blue economy. AltaSea's tenant organizations are also touted as leaders in ocean-based climate change solutions, including marine carbon dioxide removal, green hydrogen technology, and wave-powered renewable energy.

In addition to providing a status update on the blue economy in LA, the report also analyzed trends in the region's traditional marine sectors. Maritime shipping consistently remains LA County's leader in ocean-based employment and revenue. The maritime industry is also a significant contributor to climate change, accounting for three percent of humanity's annual greenhouse gas emissions.

As the shipping industry moves towards becoming emissions free by 2050, new job opportunities requiring technical skills and STEM knowledge will open up alongside existing roles. Workforce development programs are needed in order to meet the evolving needs of traditional ocean industries as well as prepare young people for careers in emerging blue economy industries.

In LA, California Community Colleges' Blue Economy and Climate Action Pathways initiative is the leading blue economy workforce development program. This education-to-career pathways program—a collaboration between Santa Monica College, the Los Angeles Economic Development Corporation, and

ALTASEA IS A CATALYST FOR THE SUSTAINABLE BLUE ECONOMY IN LOS ANGELES

AltaSea—plans to reach fifteen community colleges throughout LA County.

The program combines climate STEM curriculum, post-secondary certificates and degrees, internships, and job placements. The program's flagship certificate in Sustainable Aquaculture launched its first cohort at Santa Monica College in 2024, and soon-to-launch certificate programs include Green Hydrogen at LA Harbor College, Underwater Robotics at El Camino College, and Nature-Based Solutions at West LA College.

The coming decades are critical for fighting climate change. The ocean holds many solutions, and the blue economy is the key to unlocking them. AltaSea is dedicated to providing the education and career pathway programs that LA's blue economy needs. There has never been a more important time to support ocean-friendly, climate change-fighting, well-paid jobs.

EDUCATION

SUMMER INTERNS

During her speech at AltaSea's August 2025 open house, California State Senator Laura Richardson took a moment to recognize the cohort of college students who had just completed their summer internships at AltaSea.

"We can have great young people who have an interest in working to preserve our climate," she said in her speech, "I'm so excited to see what you're going to do."

The senator said she views AltaSea's internship program as an example of "paying it forward" by investing in the future of both the planet and the local community.

For Takuji Yamazaki, who studies aquaculture at Santa Monica College, working as an Entry-Level Hatchery Technician Intern at Holdfast Aquaculture helped him transition from education to career. During his internship, Takuji learned how to maintain tanks and equipment, feed the oyster larvae, and count microalgae using a hemocytometer.

"The hands-on work gave me a real sense of what the aquaculture industry is like," he said. "I had the opportunity to drain twenty million oyster larvae during a water change, which was a big responsibility. That moment taught me how to stay calm under pressure and take ownership in real-life situations."

California State Maritime Academy graduate Skyler Williams and CSU Long Beach student Kalani Ono interned with EcoByRy, upcycling shredded plastic into surfboard fins. They also were trained in the highly technical process of layering epoxy and fiberglass, and used their new skills to glass autonomous sailboat parts.

CSU Northridge graduate Lorie Van Ligten focused on outreach and marketing during her internship with Kelp Ark. And CalPoly Pomona student Natalie Garcia conducted community outreach with the Marine Protected Areas Collaborative Network. Others applied their creative skills to environmental communications.

"I designed visuals for social media and other communications, which gave me a lot more confidence in my design skills," said University of Texas student Sophie Harmon, who interned for AltaSea's communications team.

USC film student Arian Tomar also completed a creative internship, directing a promotional short film for Holdfast Aquaculture.

“When I heard that there was an opportunity to work with Holdfast through AltaSea, I jumped at the opportunity to continue deepening my experience in sustainability, science, and research storytelling,” Arian said.

Arian traveled to Morro Bay to conduct interviews and collect footage of Holdfast’s oyster farm. While there, he was able to photograph wild sea otters—a highlight for him as a visual storyteller.

A common sentiment amongst the interns is that the skills they learned at AltaSea will be beneficial no matter where their careers lead. Lorie wants to continue searching for career opportunities that combine her communications skills and interest in lab work. Natalie plans to pursue a PhD in Marine Chemistry, focusing on ocean acidification. And Arian plans to use his storytelling skills to benefit his home state of Minnesota.

“I’m hoping to combine my interests in storytelling and sustainability with my passion for education,” he said.

Sophie is determined to “continue making a positive impact on the ocean and the communities connected to it.”

“While I don’t have a specific career path mapped out yet, I know that the knowledge and experiences I’ve gained here will guide me in finding opportunities where I can contribute meaningfully to ocean conservation and education,” she said.

Kalani, who is studying marine biology, said that her internship at EcoByRy helped refine her career goals. “I’ve realized that I'll have the most rewarding work experiences when I have to be doing things with my hands, as opposed to being solely at a desk,” she said.

Takuji is clear on his future path—becoming a leader in sustainable aquaculture.

“My long-term goal is to open a community-based fish market in Santa Monica that connects local aquaculture producers directly with customers. I’d like to make fresh, sustainable seafood more accessible,” he said.

“This internship helped me understand the industry better and gave me the confidence to keep moving forward.”

WORKFORCE DEVELOPMENT

INTERNSHIP TO EMPLOYMENT

In December 2025, two of the students participating in AltaSea's most recent internship cohort have accepted job offers from the AltaSea tenant business at which they were interning, bringing this year's total number of students whose Altasea internships have led directly to employment to four.

Janet Parga, AltaSea's workforce development manager, confirmed that both students interned for, and have now been hired by, Holdfast Aquaculture—one of AltaSea's flagship sustainable aquaculture tenants. Earlier this year, Equatic—an AltaSea tenant deploying marine carbon dioxide removal technology—also hired two interns.

Both of the students hired by Holdfast came to AltaSea through Santa Monica College's Aquaculture Certificate Program, the flagship offering of California Community Colleges' Blue Economy and Climate Action Pathways (BECAP) initiative, the education-to-career pathways program pioneered by Santa Monica College, AltaSea, and the Los Angeles Economic Development Corporation. With plans to reach fifteen community colleges in LA County, BECAP is trailblazing blue economy workforce development in Los Angeles.

"I think it's really inspiring to see our interns hired [by] their host, because it's proof that the BECAP program works," Parga said.

"[The students] learned about aquaculture and husbandry in class, and were able to apply it in their internship. It's easier to hire someone who has demonstrated capabilities to perform the job and dedication to the mission."

Parga also came to AltaSea through a work-experience-to-career pathways program, California's College Corps Fellows, which allows low-income students to complete year-long paid job placements at community-based organizations.

AltaSea offered Parga a fulltime job after her fellowship ended. Since she started overseeing AltaSea's internships in June 2024, AltaSea and its tenants have hosted 76 paid internships, with 2025 being the most successful year yet for AltaSea's internship program.

A BLUE FOODS FUTURE

Sustainable blue foods sourced from Earth's waters have the potential to address both food scarcity and ocean degradation—two of the world's most pressing problems.

The world's food systems are at an impasse. The status quo of food production hurts our planet—the oceans are overfished and animal agriculture is just as responsible for climate change as fossil fuels. And the combination of climate change and population growth likely means global food insecurity will be unavoidable in the coming decades. But sustainably harvested blue foods offer an alternative.

"Blue foods deserve a seat at the table in every conversation about the future of food," says Jennifer Bushman, executive director of the sustainable blue foods advocacy firm Fed by Blue, "Blue foods are a central part of a resilient, climate-smart food system."

Blue foods are already a primary source of nutrition for three billion people. And, if harvested sustainably, blue foods can help heal the planet while also circumventing the pitfalls land-based agriculture faces in a world altered by climate change. That's because blue foods require no soil or fresh water, and some forms of sustainable aquaculture—especially shellfish and kelp—are even able to clean the ocean, create habitats, and absorb carbon as they grow.

Achieving a sustainable blue foods future—a future where the world is fed and the oceans thrive—will require the seafood industry to substitute outdated, environmentally damaging fishing and aquaculture practices. Bushman explains, "Responsibly produced blue food means improved wild fisheries management and fishing practices. It [also] means innovation, cleaner practices, and using less resources."

Advocating for sustainably-sourced seafood is the focus of Andrew Zimmern, celebrity chef and special advisor to the AltaSea Deep Blue Decade, in his Emmy nominated docuseries *Hope in the Water*. Bushman, who served as the series' executive producer of impact, met a wide variety of blue foods farmers over the course of filming the show—including Paul Damhoff and Barbara Frank, who turned a third-generation dairy barn into a sustainable shrimp farm, and Dune Lankard, a member of the Eyak tribe in Alaska

who is turning ocean conservation and kelp cultivation into economic opportunity for indigenous Alaskans.

"[Lankard] is blending traditional knowledge with modern regenerative aquaculture in a way that heals both ecosystems and communities," Bushman says. "Watching him bring people back to the water, helping them build local food sovereignty and economic independence through kelp farming, was profoundly moving."

The people featured in *Hope in the Water* showcase the power of blue foods to positively impact food security, ocean restoration, and local economies. These economic opportunities are especially fruitful for historically marginalized populations and the frontline communities that are hit the hardest by climate change and food insecurity. That's why sustainable aquaculture is a central focus of AltaSea. One of AltaSea's blue foods success stories is former tenant business Holdfast Aquaculture, a team of scientists-turned-aquafarmers that has spent the past several years cultivating shellfish—one of the most sustainable and environmentally regenerative sources of protein available.

Now, Holdfast's operations have outgrown AltaSea and expanded to a commercial scale ocean farm in Morro Bay. In a full-circle moment, one of Holdfast's most recent culinary venues was the blue economy hub where they got their start—the AltaSea campus. At AltaSea's 2025 Blue Hour Gala, Holdfast's shellfish-based cuisine was a hit amongst guests and master chefs alike.

Holdfast and other sustainable aquafarmers in the U.S. face a wide array of challenges, including complex permitting processes, lack of investment, an import heavy seafood market, and a lack of consumer awareness about diverse blue foods.

"[This lack of awareness] limits market demand for regenerative, lower-trophic species like mussels, oysters, or seaweed," Bushman says. "Add to that competition from cheap imports, and domestic producers often struggle to scale while maintaining high sustainability standards."

To increase people's knowledge about blue foods, Chef Zimmern co-wrote and published a cookbook in 2025, *The Blue Food Cookbook: Delicious Recipes for a Sustainable Future.* Created in collaboration with co-writer Barton Seaver and Bushman's Fed by Blue, the book contains almost 150 recipes and functions as a sustainable blue foods almanac that helps readers incorporate lesser known blue foods into a wide range of delectable dishes.

Bushman's favorite recipe from the new book is the Kelp and Berry Cobbler. "It perfectly captures what this book is all about—reimagining how we use blue foods in everyday cooking," she says.

Encouraging people, especially people in developed Western nations, to use sustainably harvested blue foods in their daily meals is necessary in order to change humanity's relationship with the ocean for the better. In a blue foods future, humanity has stopped climate change, stabilized and restored both ocean and terrestrial ecosystems, and ensured that people worldwide are well-fed and thriving.

Such a vision may seem utopian, but the means to make it happen already exist—we just need to support and accelerate sustainable solutions at scale. This means not giving up when faced with political actors chained to retrograde ways of thinking. The current political state has proven to be hostile to the future of our planet—treating people, oceans, and climate as expendable for the

"WHEN WE CARE FOR THE WATERS THAT FEED US, THEY WILL CONTINUE TO FEED US FOR GENERATIONS TO COME."

JENNIFER BUSHMAN, FED BY BLUE

sake of the profits of an elite few. These truths cannot be ignored when discussing sustainable solutions. If we want a livable future for our planet, the support of public citizens and private funders is more vital now than ever before.

“We have to invest in the people and organizations driving education, innovation, and communication,” Bushman says. “Groups like AltaSea and Fed by Blue are doing the essential work of connecting science, storytelling, and public engagement, helping communities understand how protecting and producing from our waters can go hand in hand. But we can’t do it without robust funding support.”

If the sustainable blue economy can be realized at scale, Bushman envisions, “a world where marine protected areas thrive, fisheries are well-managed, and aquaculture regenerates ecosystems, proving that when we care for the waters that feed us, they will continue to feed us for generations to come.”

In the spirit of accelerating a blue foods—and blue economy—future, Blue Hour 2026, scheduled for October 10, will be centered around blue foods. Chef Zimmern will be returning to AltaSea’s cornerstone annual event as a featured chef, championing his core message—blue foods can change the world.

From Left to Right: AltaSea Founder and COO Jenny Krusoe, ocean conservationist Ashlan Cousteau, Chef Andrew Zimmern, and AltaSea CEO Terry Tamminen at Blue Hour 2025.

BLUE CLIMATE ACTION

PORTSIDE WAVE ENERGY

By 2050, ocean-based solutions could deliver up to 35 percent of the annual greenhouse gas emissions reductions needed to limit global warming to 1.5 degrees Celsius. There are seven key blue economy climate solutions that are primed for widespread implementation, and scaling marine renewable energy sources tops the list.

Offshore wind and solar often dominate discussions about ocean-based renewable energy, but the nascent industries of wave and tidal energy also offer promising possibilities. The Energy Information Administration has estimated that, if fully harnessed, the waves off America's shores could generate the equivalent of 63 percent of the electricity the U.S. produced in 2019.

One of the main advantages that wave and tidal energy have over other renewable energy sources is consistency. Weather conditions—like overcast skies or lack of wind—can affect the generation of wind and solar. But tides—and the waves they produce—are produced daily by the gravitational pull of the moon. Because they are independent from Earth's weather systems, they are also resilient against global warming-induced changes in weather patterns.

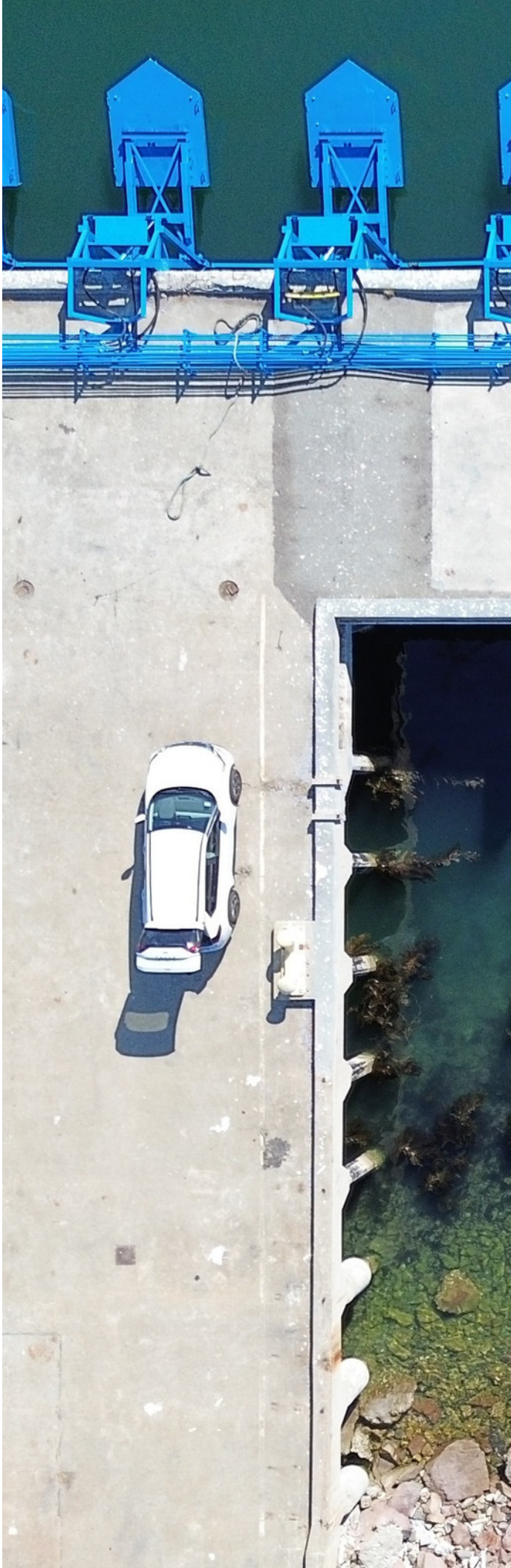
Despite these advantages, wave and tidal energy have yet to be utilized at scale. Tidal energy has significant drawbacks that have hindered its widespread adaptation, including high construction costs and the environmental impact of tidal facilities' underwater turbines. Wave power has its own set of challenges, as exemplified by the nation's first offshore wave energy testing facility in Oregon, which struggled to move forward amidst a decade-long regulatory process, engineering difficulties, and a construction sticker price of $80 million.

However, onshore wave power facilities are proving to be capable of circumventing the financial barriers and construction challenges that have hindered both offshore wave energy and tidal energy. This year, Eco Wave Power went from obtaining final permitting approval from the Port of Los Angeles to debuting America's first onshore wave power project within a six-month time frame, attaching power-generating floaters to an existing concrete wharf on the AltaSea campus.

By installing a wave power demonstration onto existing port infrastructure and working with a mix of public and private funding partners, Eco Wave avoided many of the aforementioned challenges. And Eco Wave's utilization of preexisting structures in an industrial port means no new habitat degradation and no obstruction of California's iconic coastline.

In addition to the climate benefits, portside wave energy could also have important public safety implications. Access to an energy supply that isn't affected by fire or earthquakes could make the Port of Los Angeles an optimal emergency shelter and evacuation zone for natural disaster-prone Southern California.

If Eco Wave's proof-of-concept project at AltaSea is successful, the plan is to expand wave generation across the Port of Los Angeles' breakwater. Such a fullscale installation could generate enough energy to power over 60,000 homes. This pioneering project could become a model for other ports to follow, harkening in an era of portside wave energy.



OCEAN STARTUP PROFILE

TINI SCIENTIFIC

Tini Scientific has a vision for improving ocean information—crowdsourcing highly localized data from smart watch sensors to tell people exactly how the water conditions are at their favorite beaches.

Tini Scientific's two-woman team of Kim Martini and Virginia Schutte, who have backgrounds in ocean sensors and scientific communications, are building an app that can translate sensor data from smart watches into information about wave height, wave period, and currents.

Tini Scientific's co-founders hope their app will give ocean recreationalists information that is as accurate as possible—allowing them to enter the water safely. Currently, popular wave and ocean condition apps rely on various weather models and buoy sensors to create forecasts. This can result in variable forecasting accuracy, because each beach has its own unique characteristics that can impact wave conditions. Inaccurate forecasts can mean anything from disappointment for surfers who made the drive to a certain beach, to unexpectedly hazardous conditions for fishers and swimmers. Tini Scientific envisions itself as a piece of the ocean data puzzle that could help solve this problem—filling current data gaps with hyperlocal, real-time data.

The app has already received interest from open water swimmers, and is currently being tested by a cohort of swimmers and divers. But, as it grows, Tini Scientific could potentially be utilized for applications beyond recreation—for markets including local governing bodies and Naval intelligence officers.

This past summer, Tini Scientific participated in Ignite22, a blue tech showcase at the AltaSea campus. The event, hosted by AltaSea tenant Braid Theory, enabled over a hundred blue economy startups and entrepreneurs to exhibit their technology while networking with investors and industry leaders.

Tini Scientific plans to spend most of 2026 working with tester data and officially launch the app in 2027. If you are interested in becoming a beta tester for the app, you can contact Tini Scientific via their website.

TENANT SPOTLIGHT

OCEANWELL

OceanWell—an innovative blue technology company that produces fresh water from the ocean—became the newest addition to the AltaSea campus in summer 2025.

As climate change continues to affect the water cycle, adequate amounts of fresh water will become increasingly difficult to find. By 2050, five billion people will be impacted by climate-related water shortages. Arid nations in the Middle East have long relied on desalination in order to maintain freshwater supplies, but traditional coastal desalination plants are energy intensive and negatively impact coastal ecosystems by discharging highly salty brine.

OceanWell set out to redesign desalination and avoid these negative impacts. Their technology harnesses the pressure of the deep sea to generate fresh water via reverse osmosis. Each of OceanWell's 'water pods' produces up to one million gallons of fresh water a day, and then transfers the water to

shore via subsea pipelines. According to OceanWell, a ‘large’ water farm could meet the water needs of an entire city.

Because it uses the hydrostatic pressure of the deep sea to drive the reverse osmosis process, OceanWell says its technology uses 40 percent less energy than coastal desalination plants. The technology also has a built-in mechanism for dispersing extracted salt via deep sea currents. OceanWell claims that this allows the salt to rapidly diffuse back to ‘ambient level’ salinity.

OceanWell has made the AltaSea campus its base as it executes its pilot project—the world’s first water farm. In partnership with Las Virgenes Municipal Water District, OceanWell will anchor 20 to 25 pods to the seabed off the coast of Malibu. The plan is to eventually add enough pods to supply water to 250,000 people.

"[OceanWell’s technology] can potentially provide us Californians with a reliable water supply that doesn't create toxic brine that impacts marine life," Mark Gold, the Natural Resources Defense Council’s director of water scarcity said in an interview with the Los Angeles Times.

"If this technology is proven to be viable, scalable and cost-effective, it would greatly enhance our climate resilience."

Feeling blue about the future of our planet?

Look to the oceans for inspiration. The oceans don't stop, and neither do we.

AltaSea is committed to science-based solutions to climate change; solutions that both protect the oceans and benefit local communities. But we can't do it without your support.

Contact us about ways to give.

raube@altasea.org

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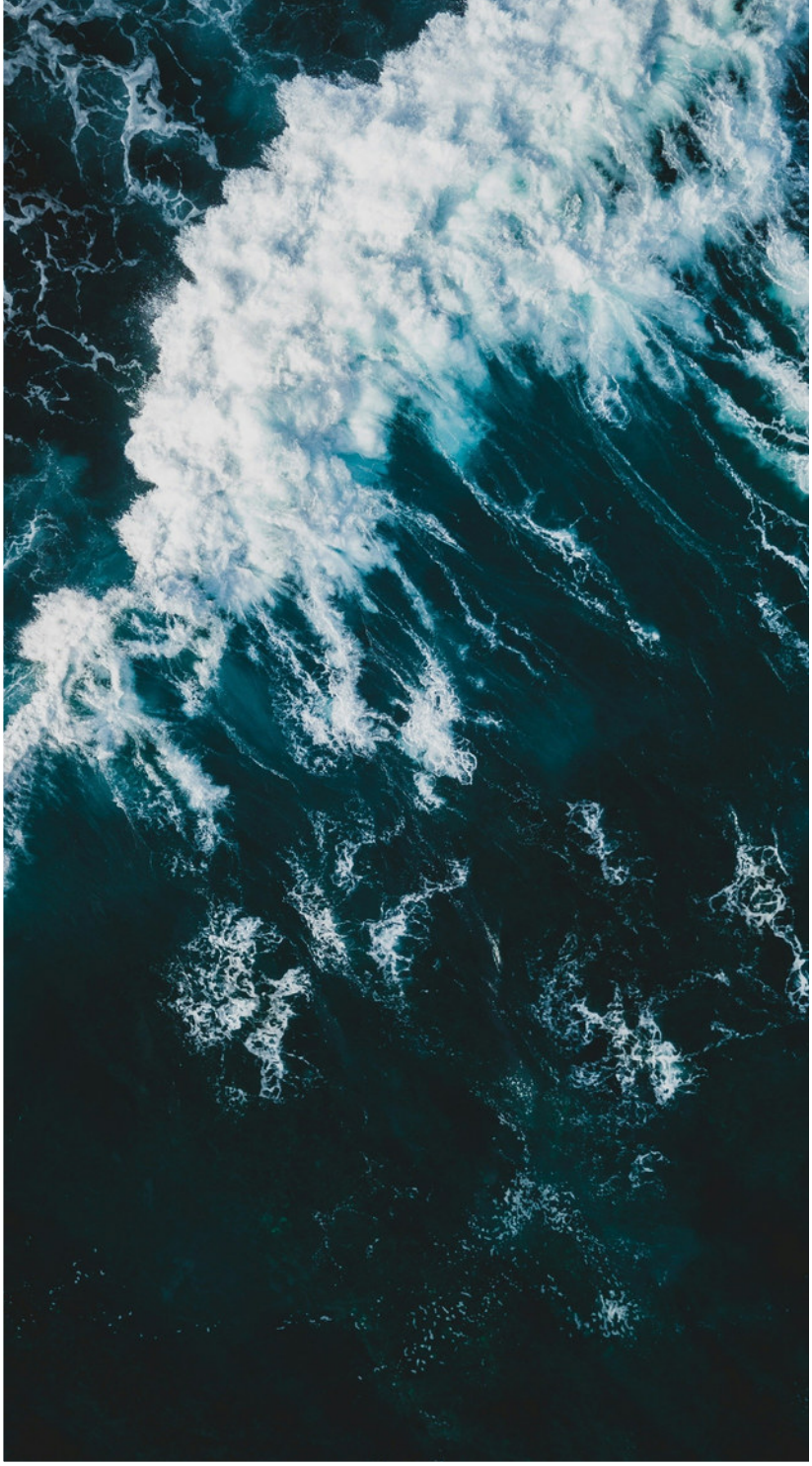

AltaSea

AT THE PORT OF LOS ANGELES