

Sustainability  
Report 2022

# Cuna del Mar

Cuna del Mar  
Portfolio  
Companies

This report describes the sustainability efforts of Cuna del Mar portfolio companies: Innovasea, the Center for Aquaculture Technologies, Blue Ocean Mariculture, Earth Ocean Farms, Open Blue and Sol Azul.



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## Reporting Notice

Aligning our efforts on the journey to sustainability

The Report is intended as a key platform for Cuna del Mar under iAlumbra to reflect the progress we are making on our goals and highlight areas that require additional focus for our company portfolio in the future.

iAlumbra is a collective of organizations that deploys resources across the capital spectrum to advance its mission and make progress in four interrelated impact themes: Sense of Place, Ocean Vitality, Land and Water Stewardship, and Flourishing Baja Sur. The vision of iAlumbra is to create a world in which community environment and economy function as an integrated system for well-being.

iAlumbra partners value a whole systems approach with a long-term commitment with the tolerance for risk, teaching and continuous learning.

Cuna del Mar shares the Ocean Vitality theme with iAlumbra. The iAlumbra Ocean Vitality theme is realized through understanding that the sea, land, and people share a singular ecosystem. Striking a balance between the three is critical to the health of the entire system. The livelihood of communities whose economic prosperity is based upon ocean vitality requires the soundness of each part of the whole.



## Letter from Robert Orr

**Bringing forward our vision for 2023 and reflecting on the year past, it is evident that the world has learned many collaborative lessons because of the pandemic. Speaking on behalf of Cuna del Mar and supported by our colleagues' efforts across iAlumbra, I see a renewed vigor and commitment to ensuring a healthy and safe food supply for our many diverse customers.**

CDM is focused on goals for the upcoming three to five years, nested under the United Nations Sustainable Development Goals (SDG). These goals provide a shared blueprint for peace and prosperity for people and the planet, now and into the future.

Cuna del Mar understands that supporting the sustainability initiatives within our portfolio companies gives them an important competitive advantage. The OCEANS FIRST seal is Cuna del Mar's commitment to guaranteed quality for more sustainable seafood while protecting the oceans. The range of products, produced by the farming portfolio companies includes: Sol Azul Oysters, Blue Ocean's Hawaiian Kanpachi, Open Blue Cobia and Earth Ocean Farms Pacific Snapper and Totoaba, are naturally high in protein, rich in Omega 3, and a good source of Vitamin D, critical for human health. With an OCEANS FIRST approach, CDM is backed by first-class research and technology advances with meticulous stewardship from hatchery to maturity, including stringent multistage inspections.

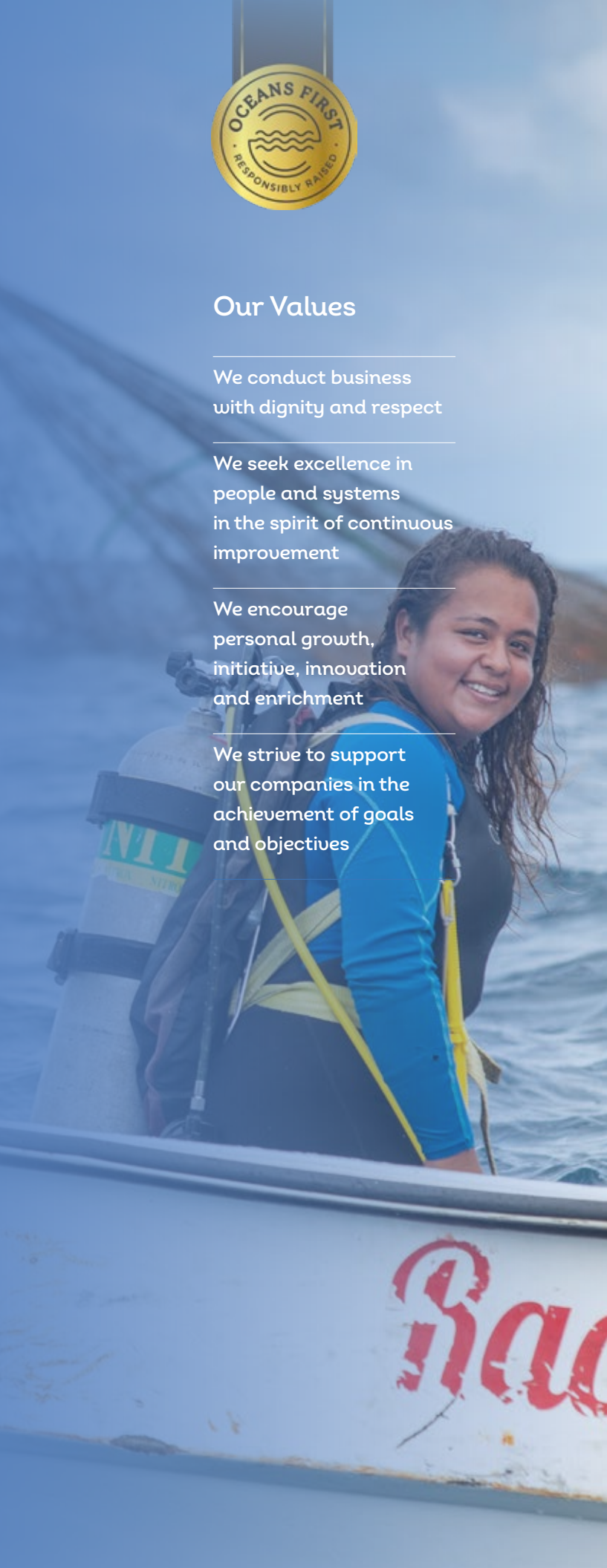
### Our Values

We conduct business with dignity and respect

We seek excellence in people and systems in the spirit of continuous improvement

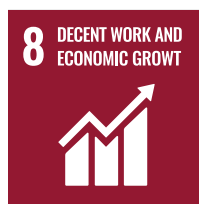
We encourage personal growth, initiative, innovation and enrichment

We strive to support our companies in the achievement of goals and objectives





# SUSTAINABLE DEVELOPMENT GOALS



## Our 2023-2024 goals

CDM's goals for 2023-2024 and beyond are aligned with the United Nations Sustainable Development Goals: Good work and well-being, Decent work and economic growth, Climate action, and Life below water.

In 2022 Cuna del Mar wants to:

- Reflect the progress we are making on our previously stated goals
- Continue support of sustainability advances through portfolio companies
- Refine reporting across companies to introduce specific data points to align measurements for sustainability efforts, and
- Highlight areas that require additional focus for our company portfolio in the future.
- Measure diversity in the workforce and set targets across the portfolio companies
- Collect baseline data on fuel usage to add to baseline data collected on key climate parameters

## Building a diverse workforce

One of the aspirations for 2022 is to bring the conversation on diversity, equity and inclusion forward (DEI). As described in last year's report, diversity has been an area of emerging focus for our portfolio companies. At Cuna del Mar, we believe that diversity is crucial to our success. We recognize that diversity includes, but is not limited to, differences in race, ethnicity, gender, sexual orientation, age, religion, ability, and culture. We value diversity because it brings a range of perspectives, experiences, and ideas to the table, which helps us make better decisions and drive innovation. Additionally, we believe that fostering a culture of respect, belonging, and possibility for all of our employees, regardless of their background, is not only the right thing to do but is also good for business.

## Climate change

In 2015 the Paris climate agreement was signed by 175 parties who agreed to work together to limit global temperature rise this century to less than 2 degrees C with further reductions to 1.5 C. A 2019 report from the Intergovernmental Panel on Climate Change (IPCC) estimated that between 21 to 37% or one-third of global emissions are derived from food production and transport. Our initial data collection done in 2022 shows minimal direct control carbon emissions from farming operations, but the majority of emissions are coming from feed shipments to our farms and end product shipment to our customers.

Our portfolio company Sol Azul is providing leadership in this area. As oyster producers, they are early indicators of climate challenges, as oceans absorb more carbon dioxide and become more acidic this can shift the delicate balance that supports oyster life. The continued tracking of climate indicators such as temperature and oxygen will build on the data collected in 2022 and expanding this data collection to track across all the Cuna del Mar portfolio will inform next steps needed.

## Regenerative Aquaculture

The oceans play a crucial role in maintaining the balance of the earth providing food security, medical treatments and supporting trade and tourism. However, limited protection of marine areas from fishing impacts leave the oceans vulnerable. Deep water/open ocean aquaculture can be part of the solution to protect marine environments. A recent paper (Linked to CDM here) shows the farm portfolio combined protects 11,272 hectares or 27,856 acres from commercial fishing. Utilizing deep water aquaculture to protect marine environments is a potentially promising approach in achieving the United Nations sustainable development goals related to ocean protection.

Accurate and reliable data collection is key to managing aquaculture companies sustainably as it helps to ensure that the health of the fish and the environment are properly monitored and optimized. Our portfolio company Innovasea's technology provides remote oversight and the ability to gather data on various environmental indicators which are crucial in maintaining healthy living conditions for the fish and promoting sustainability in aquaculture operations. By using wireless sensors Innovasea's technology serves as the central nervous system for aquaculture intelligence and enables informed decision-making, providing the Cuna del Mar companies and other aquaculture operations with the tools to track the impact of climate change and improve operational efficiency leading to better management of the industry.

Utilizing the latest research and technologies in aquaculture, health, nutrition and genetics, can improve the efficiency and productivity of operations, reducing waste and increasing yields. Working with our teams at the Center for Aquaculture Technology (CAT) gives us a unique advantage in accessing solutions with a focus on health, nutrition and feeds, and genetics including genomics, genotyping, genome editing, and breeding to help create a more sustainable and successful aquaculture operation.

We are committed to working under the leadership of our founder Christy Walton and iAlumbra to enhance and protect our oceans and the people who work diligently to provide seafood solutions for the world. I wish you every success for the coming year.

Sincerely,  
Robert Orr, Managing Director,  
Cuna del Mar



## CAT THE CENTER FOR AQUACULTURE TECHNOLOGIES

**The Center for Aquaculture Technologies (CAT) is a Research and Development organization focused on the application of biotechnologies to improve productivity, efficiency and sustainability in aquaculture and related industries.**

CAT is a joint US - Canada operation that combines aquaculture expertise with cellular and molecular technologies as well as in vivo testing. The company has facilities in San Diego, CA and Victoria and Souris, PEI, Canada.

Utilizing the latest research and technologies in aquaculture, health, nutrition and genetics, can improve the efficiency and productivity of operations, reducing waste and increasing yields. This can also lead to improved animal health reducing the need for antibiotics and other treatments and promoting sustainable practices. Working with CAT provides access to a team of experts and a unique advantage in delivering research-based solutions. With a focus on health, nutrition and feeds, and genetics including genomics, genotyping, genome editing, and breeding utilizing CAT's services can help create a more sustainable and successful aquaculture operation.

Climate change is having a significant impact on the world's aquatic ecosystems and farmed fish are no exception. Changes in water temperature, acidity, and salinity can all have negative effects on the health and survival of farmed fish. Many diseases in fish are the result of environmental stress such as poor water quality or high temperatures. Genetic improvements can create fish that are better adapted to environmental stress reducing the risk of disease and improving overall health.

Genetic improvements can be used to build more diverse strains of fish that are better adapted to changing climate conditions. For example, gene editing can be used to create fish that are more resistant to changes in water temperature allowing them to thrive in warmer water, more tolerant of changes in water acidity and salinity and are better able to cope with other environmental stressors such as increased levels of pollutants.

Genetic improvements can also be used to create vaccine like effects in fish providing protection against specific diseases.

Reducing escapes is another important consideration for farmers. Farmed fish can escape from net pens when they are stimulated to migrate by environmental cues, such as changes in water temperature or light conditions. Gene editing can be used to alter the migration behavior of farmed fish making them less likely to respond to migration stimuli and potentially less likely to escape from net pens. Sterile fish are often used in aquaculture to reduce the concern about escaped fish. Conventional methods for inducing sterility such as chemical or heat treatments could have negative impacts on the health and growth of the fish. Genetic improvements have the potential to create sterile fish without these potential negative impacts.

Ocean farming can generate waste which can impact water quality and sensitive aquatic environments. Genetic improvements can be used to create strains of fish that are better adapted to high density aquaculture conditions reducing waste production and improving water quality.

**“Knowledge of the complete health of farmed fish and shellfish is critical for sustainability and business profitability. Using the revolutionary potential of genome editing, CAT can provide international farm producers with dramatic improvement in genetic performance in less time than traditional conventional breeding programs.”**

*Dr. John Buchanan,  
CAT President and CEO*





Producers of aquatic species, like their colleagues in terrestrial farming have recognized the value of genetic improvement through selective breeding programs. It is recognized that aquatic animals are easier to work with than terrestrial food animals because of their high fertility rates and shorter life cycles (1). However, selective breeding programs take time as they are limited by the heritability of the desired traits and the generation interval of species as well as the need to target multiple traits in the breeding process.

Genome editing has the potential to speed up sustainable genetic improvement in aquaculture. The CRISPR tool, invented in 2009 makes DNA edits easier, quicker and can solve challenges like disease resistance and high omega 3 content in fish. Through trusted relationships with industry clients and CAT's highly skilled team of expert scientists, there is enormous potential for the application of this expertise across the industry.

CAT is also focused on the development of an effective breeding business working with their clients which includes cost efficiency and real time capacity monitoring systems. They develop and manage selective breeding programs for aquatic species by identifying the key characteristics of the current population, selecting the right tools and designing customized breeding strategies to achieve quantifiable genetic gains. In addition, CAT provides support to third-parties for the evaluation of fish health products and functional feeds, custom pathogen and disease challenge model development and evaluation of environmental and handling stressors on animal health.

In 2022 CAT experienced significant market growth resulting in enhanced reputation, increased revenue and expanded market share.

- GE agreements were signed with leading influential aquaculture companies
- Intellectual property breakthroughs continue

- Engagement with regulators with collaborative clients in key markets to ensure responsible and trustworthy oversight, including clarification of regulatory pathways in five key countries for GE sterility technology, registration of species
- Retention of all breeding clients and added new breeding programs which resulted in scientists hiring and new tools added

## 2023 and beyond

- Become thought leader in commercial breakthroughs for advanced genetic and genomic technologies
- Leverage cross functional expertise to continue the creation of innovative genetic products and services
- Advance finfish and shrimp genetic innovation outlook
- Find innovative ways to accelerate leader position strategy by strengthening relationships with key partners
- Drive commercial expansion and maximize efficiencies
- Continued development of GE tools and maximize new facilities to accelerate GE research priorities
- Implement formal quality control programs and training and onboarding plans
- Continue engagement with regulators with collaborative clients and NGOs in key markets to ensure responsible and trustworthy oversight for sterility edits
- Continue active engagement with Biocom, the PEI BioAlliance, the Aquaculture Association of Canada, California Aquaculture Association, certifying bodies, the Canadian Food Inspection Agency, the Canadian Council for Animal Care, and the California Natural Resources Agency.

# Innovasea

**Fueled by leading-edge technology and a passion for research and development, Innovasea is revolutionizing aquaculture and advancing the science of fish tracking to make our oceans and freshwater ecosystems sustainable for future generations.**

With more than 275 employees worldwide, Innovasea provides full end-to-end solutions for fish farming and aquatic species research – including quality equipment that's efficient and built to last, expert consulting services, and innovative platforms and products that deliver unrivalled data, information and insights.

## Our four business areas

- Open Ocean Aquaculture
- Land-Based Aquaculture
- Aquaculture Intelligence
- Fish Tracking

### Open Ocean Aquaculture

Innovasea is a pioneer in deep water open ocean systems in response to challenges faced by aquaculture operations located near-shore and has developed a fully integrated system that's helping revolutionize open ocean aquaculture.

### Land-Based Aquaculture

Innovasea has been designing and building energy-efficient, sustainable water treatment systems for more than 25 years, providing commercial fish farms, government hatcheries, universities, research institutions, zoos and aquariums with ideal growing conditions year-round regardless of location. The company

has unrivaled experience with freshwater and saltwater recirculating aquaculture systems (RAS).

Innovasea's technology provides remote oversight of the fish from the shore to observe and optimize fish health and manage environmental considerations. Technologies include feed management systems that allow for shore-based remote operations, submerged arterial feed delivery to improve the biological performance of the crop and ongoing benthic monitoring. Wireless aquaMeasure sensors serve as the central nervous system for aquaculture intelligence solutions. These submersible sensors track water temperature and depth along with a host of environmental indicators.

### Fish Tracking

An industry trailblazer for four decades, Innovasea's groundbreaking fish-tracking technology is helping push the boundaries of science, facilitating cutting-edge research that leads to novel insights into aquatic animal behavior and survival. It optimizes its advanced acoustic telemetry tools and consulting services to shorten the paths from data collection to conclusion, observation to discovery, and detection to protection.

### Continuing Innovation

In 2022 Innovasea continued to scale its aquaculture business through the completion of multiple projects and by honing its technologies and developing new solutions for aquaculture and fish tracking. This work provides the Cuna del Mar companies and other aquaculture operations with the tools to track the impact of climate change and improve operational efficiency.



“Innovasea remains committed to sustainable aquaculture as a key part of a healthy food system. We believe science and technology are the enablers to sustainably producing large quantities of quality protein. Our technology, products and systems need to: produce measurable improvements in financial and environmental performance for our clients; be user friendly for farm personnel; and support the growth of the animal across its lifecycle.”

*David Kelly, CEO, CTO Innovasea*

## Support of CDM clients in 2022

### Earth Ocean Farms

- Continued training and support for SeaVolution Pens
- Replacement of one pen
- Expansion of grid level feeding to grids 1 and 2
- Wave sensor validation testing

### Blue Ocean Mariculture

- Grid level feeding and remote feeding control through FeedIQ
- Installation of mortality traps
- Development of a new nursery grid

### Open Blue

- Upgrades to feed vessel
- Installation of mortality traps
- Inspections of SeaStations along with planning for upgrades

Aquaculture Intelligence grew its market position in environmental monitoring expanding the number of farms utilizing its real-time environmental monitoring solution and delivering prototype oxygenation/aeration automation solutions.

Land-based aquaculture expanded its portfolio of design projects with multiple clients progressing toward the build phase. The RAS Automation capability is being revamped with a focus on common designs and solutions.

Fish Tracking conducted successful field trials of a tagless fish detection capability for the hydropower market.

Innovasea is also a proven thought leader, with its executives and subject matter experts often sought out for commentary by industry media and invited to present at key trade shows and conferences. Innovasea continues to enable sustainable aquaculture in the United States and beyond through active membership of Stronger America Through Seafood, the National Fisheries Institute and the National Aquaculture Association.

## Key metrics for 2022

- 537 farms worldwide using real-time monitoring solutions
- 10.1 million daily measurements
- 1,912 total users

## 2023 Sustainability targets

- Continue to grow the open ocean market to increase positive industry impact and expand product adoption into warm water regions
- Continue commercialization of aquaControl products
- Increase delivery of RAS market solutions by developing customizable core product offering and expanding education opportunities
- Demonstrate tagless fish detection products to expand market uptake



## Blue Ocean Mariculture

**Blue Ocean Mariculture prides itself on contributing to a new conversation about responsible aquaculture that leads to food security, local jobs and the health of those in the communities they serve.**

Blue Ocean Mariculture, founded in 2009, is a unique company dedicated to working responsibly and with a commitment to future generations. The operations of Blue Ocean Mariculture include a hatchery and a newly acquired specialty processing plant, at the Hawaii Ocean Science and Technology Park as well as sea pens located offshore using Innovasea submersible technology.

The acquisition of Kona Cold Lobster in May 2022 marked a significant expansion for Blue Ocean Mariculture, broadening the company's product offerings to include oysters, crabs, clams, and mussels in addition to their locally grown Hawaiian Kanpachi, a species native to Hawaii. By diversifying its product offerings, Blue Ocean can reduce freight costs and minimize its environmental impact.

They also offer other farmed product from NELHA Host Park, which supports local businesses and brings their product availability to the community.

As CEO of Blue Ocean Mariculture, Dick Jones has a crucial role to fulfill the company's commitments, one of which is investing in the Aquaculture Stewardship Council (ASC) certification. Blue Ocean Mariculture is the first finfish farm to gain ASC certification in the U.S. According to Jones, this recognition reflects the hard work the com-

pany has already put in place and is a significant milestone for Hawaii, the US aquaculture industry, its workers, and customers. The company, like all CDM portfolio companies supports diversity and inclusion. With a team of 70 individuals, 30% of whom are women, the company is leading the way in gender diversity within the fisheries and aquaculture industry, which currently employ only 8.4 million women out of its 60 million workforce or 14%. Dick believes in hiring team members based on experience and knowledge, rather than gender, and this philosophy is evident in his leadership of the company. "It never occurred to me throughout my years of working in this industry, that a person was hired over another, based on their gender," says Jones, "I believed that experience and knowledge mattered most. That's how I hire my team today. What matters is what they can bring to the team and how well they can do their job". Blue Ocean Mariculture has two female offshore workers who have quickly moved into leadership positions. "Hopefully we can add to this growing group of experts and foster continued growth as the industry grows," says Jones. "Blue Ocean Mariculture not only needs gender diversity, but diversity and inclusion more generally. We honor local and diverse additions to our company culture, especially because we are based in Hawaii." Creating opportunities for younger workers is an important priority for Blue Ocean. They use their unique opportunity in Hawaii by promoting aquaculture to community schools and recruiting interns from Hawaii-based universities.

## 2022 Highlights

- Improved accounting and financial transparency through benchmarking and auditing
- Emphasis on leadership growth and development
- Utilization of ASC certification for species and farm awareness
- Improved knowledge of larval nutrition
- Acquisition of sustainable boat "Lōkahi" with HDPE hull for reduced carbon footprint
- Use of solar-powered Innovasea Communications Buoy for data collection
- Featured on KHON2 News "Empowered Hawaii"
- Hosted tours to raise awareness about aquaculture and responsible farming in Hawaii.
- Strong developments in feed formulations and nutritional development based on results from research and development
- Negotiated with a local company to remove fish waste, compost it and donate the compost to the community
- Conducted research with two other CDM companies to understand impact of fed aquaculture systems on environment
- Participated in a monitoring project to increase understanding of interactions between ESA listed species and aquaculture net pens
- Demonstrated the benefits of co-culture of macroalgae and marine fish in tropical offshore environments Goals for 2023
- improve water quality testing program
- Increase the annual harvest to meet market demand
- Install automated feeding and nursery to reduce fingerling cost
- Continue outreach with chefs, universities and interested community stakeholders



**"As the leading open-ocean mariculture farm in the United States, we take pride in our commitment to sustainable and responsible ocean farming practices. Our roots in commercial fishing gives us a unique perspective on the necessity and inevitability of ocean farming. However, we firmly believe that it must be carried out in an eco-friendly and respectful manner towards the ocean."**

*Dick Jones, CEO,  
Blue Ocean Mariculture*



## Earth Ocean Farms

**Earth Ocean Farms started in La Paz, Mexico in 2008, and since that time they have created an innovative and sustainable operation that considered all aspects of their enterprise: growing endemic fish in an environmentally sensitive way, while integrating the hatchery, farm and processing plant into the economy of this remote part of Mexico.**

Earth Ocean Farms is a sustainable aquaculture operation based in La Paz, Mexico. It raises Pacific Red Snapper and Totoaba in the Sea of Cortez in a manner that minimizes impact on the surrounding ecosystem and integrates the hatchery, farm, and processing plant into the local economy.

The farm was sited through a careful process which ensures minimal impact to the surrounding ecosystem and the seafloor beneath, and minimizes any visual impacts, which aligns well with the tourism businesses in the area. The company's farming system, developed by sister company Innovasea, is designed to withstand high winds and strong currents found during certain times of the year in the Sea of Cortez.

Earth Ocean Farms raises two different species of fish, Pacific Red Snapper and Totoaba (Totoaba macdonaldi). Totoaba is native to Mexico and was once abundant. The species has been overfished for years and was placed on the Mexican Endangered Species List. Earth Ocean Farms (EOF) not only makes a positive contribution to the restoration of the Totoaba fish species, but in 2021, the Standing Committee of the Convention on International Trade in Endangered Species (CITES) also granted permission for EOF to sell their farmed Totoaba fish globally.

The second species raised by Earth Ocean Farms is Pacific Red Snapper, (*Lutjanus peru*) a healthy and tasty fish known in Mexico as Huachinango. Since most species of snappers generally grow slowly and have moderately long lifespans, they are vulnerable to overfishing and the populations have declined as demand climbs. Once again, responsible aquaculture provides a solution to this dilemma, by meeting the need for healthy tasty fish products for a large group of consumers.

Reporting on goals for 2022 and plans for 2023 and beyond:

EOF reports that 2022 was a successful year for the company. Highlights include:

- Buildout of farm infrastructure capacity to 3 grids including EVO Pens.
- Pens operated to support proper buoyancy control, reduce biomass risk during storm weather events
- Solidified its reporting and oversight management by the achievement of three star Best Aquaculture Practices certification for plant, farm and feed
- Obtained the CITES registration to permit exports of farmed Totoaba
- Increased social media presence and positive community events including totoaba restocking event and food events
- Increased stocking to build capacity for 2023 and 2024
- Strong control of operating costs

## 2023 Goals

Earth Ocean Farms ambitious goal over the next five years is to become the most profitable finfish aquaculture business in Mexico, without diminishing any of the sustainability commitments in place. Key to achieving this goal is the development of a talent strategy in order to build a high performance team focused on excellence at every level of the organization. This work will be done in partnership with iAlumbra and the Innovation Center.

- Farm infrastructure capacity work continues
  - Installation of new feeding systems for submerged pens enabling simultaneous feeding, biomass and feed camera systems
- Continued supply of top quality snapper juveniles for production increase
  - Continuation of family breeding program Phase 2. The genetic program, working with world-leading genetic scientists from the sister company, the Center for Aquaculture Technologies, is developing a customized breeding program to boost productivity and promote faster growth.
  - Shorten the growout cycle, support the fish to resist disease and ensure that production is increasingly sustainable.
- Market development for entry of Totoaba into marketplace
  - Work on a branding strategy for both species will celebrate the efforts of the EOF team to grow sustainably produced, healthy fish
- Continued work with CDM to understand how fed aquaculture systems impact the environment.
- Baseline data collection on key climate parameters continues
- New production and fiscal compliance software installed, full implementation Q4
- Begin hatchery certification underway to achieve the 4 star BAP



**“At Earth Ocean Farms, our unwavering mission is to lead the way as the most sustainable and profitable finfish aquaculture business in Mexico. To achieve this, we are dedicated to creating a talent strategy that will foster a team of high-performing individuals, focused on driving excellence and innovation in every aspect of our organization. We are committed to this goal and are proud to be partnering with iAlumbra and the Innovation Center to ensure our success. We call on each and every member of our team to join us in this mission and to be a part of shaping our future as a business. Let’s work together to create a positive impact and to reach our goal of being the best in the industry.”**

*Pablo Konietzko, Director General, Earth Ocean Farms*



## Open Blue

**Open Blue is a leading global company in sustainable aquaculture, with a focus on environmental care, governance, accountability, and social responsibility. The company produces cobia, a delicious, healthy white fish grown 12 kilometers off the Caribbean coast of Panama, using advanced Innovasea technology which consists of strongly anchored submersible pens that can be lowered 10 meters below the surface.**

The Open Blue sustainability approach holds three pillars:

### 1. Environmental Care

*Grow our fish in harmony with the ocean*

### 2. Accountability

*Measure, monitor and manage progress*

### 3. Social Responsibility

*Care for our people, customers and communities*

Open Blue is audited annually by trusted independent third-party auditors under the most stringent aquaculture standards worldwide which includes full ASC Chain of Custody certification since 2017 and four-star BAP certification since 2016 covering the hatchery, farm, and processing plant. They also require BAP certification from their feed suppliers.

Open Blue has made significant progress in sustainable feed formulation, using processing plant by-products to replace traditional fish meal and oil, and reducing the use of antibiotics using natural immunostimulants, vaccines and improved feed formulation.

Fish-In-Fish-Out (FIFO) / Forage Fish Dependency Ratio (FFDR) is used by the aquaculture industry as a measure of sustainability. It establishes a farm's dependency on wild fishery products to produce farmed fish and other aquatic organisms. The sustainability of aquaculture production is measured on a sustained reduction on the dependency of any wild-origin raw materials (specifically Fish Meal and Fish Oil originating from wild-capture fisheries). Open Blue is on track to reduce its FFDR/FIFO score below 4.0 by December 2023 and below 3.0 by December 2024, from an original standard of 6.0.

In June 2022 Open Blue Inaugurated its rendering plant in the Pacific port of Vacamonte. Open Blue is now able to reconvert their offcuts and fresh mortality into high value/high-quality trimmings' FM/FO that re-enters the production cycle at various points, allowing them to eliminate waste, create a new revenue stream, help other species to limit their dependency on pelagic FM/FO, and reduce landfill waste. Along the way, they have been reaching out to other fish processors to open the rendering operation to third-party offcuts that were previously being disposed of in landfills.

Open Blue is proud to be able to reduce its impact and help others follow suit in making our industries better aligned with global sustainability targets, becoming more efficient resource users, reusing valuable biomass, and keeping our oceans clean. Open Blue will continue its focus on sustainability and research by testing the use of algae oil as a replacement for fish oil and developing low Fish In Fish Out diets.

The impacts of climate change, including record storms and increased water currents, continue to present challenges in the offshore location.

Open Blue has been monitoring current levels since 2014. The data shows that current tracking reached a high of 1.39 knots in 2022, causing damage to some of the pens. To mitigate potential harm, Open Blue is continuously assessing the specific conditions and equipment involved to manage the offshore location in the face of sustained high-water currents.

The company is also committed to social responsibility, with education, freshwater for human consumption, and waste reduction as its top community priorities for 2023. The scholarship program serving the families in the communities in Costa Arriba continues at the same level of commitment in 2022. Two additional drilled wells are planned in 2023 to serve the drinking water needs of local communities. The International Oceans Day event returns to Panama and Open Blue is a long-standing participant and supporter of this event designed to increase local awareness about the importance of the oceans on earth.

Open Blue is in a collaborative project with two other farm companies and Cuna del Mar to better understand the impact of fed aquaculture systems on the environment. The company is also collecting baseline data on key climate parameters to expand its measurement of fuel usage and carbon use.



**“We made an amazing step forward in 2022 by opening our new rendering plant to reconvert our offcuts and mortalities to high-quality trimmings. We’ve invited our colleagues in neighbouring farm facilities to benefit from this sustainable option which helps limit their landfill waste and we can help other species to use the ingredients reducing the need for wild fish ingredients”**

*Dario Marchetti, CEO, Open Blue*



## Sol Azul

**With a strategic vision to be the world's leading sustainable oyster operation with a zero carbon footprint, Sol Azul is Mexico's largest controlled producer and exporter of the Pacific oyster (*Crassostrea gigas*) and the Kumamoto (*Crassostrea sikamea*) variety.**

The Sol Azul facilities are located on the Pacific coast in the El Vizcaino Biosphere Reserve. This important conservation wildlife refuge is at the center of the Baja peninsula between the Pacific Ocean and the Sea of Cortez or the Gulf of California. Declared a national biosphere in 1988, El Vizcaino has a landmass of over 2.5 million hectares (143,600 square km). It is the largest wildlife refuge in all Latin America and the most diverse. Sol Azul is actively engaged in managing the natural environment on their farms and in the biosphere and is a member of the technical management committee for the Biosphere Reserve.

Sol Azul oysters are marketed under the Sanctuary brand [sanctuaryoysters.com](http://sanctuaryoysters.com). The oysters are celebrated for their superb quality, freshness, and impeccable clean taste. Sol Azul organic oysters surpass the most demanding international norms and standards. They are certified organic under the European Community Standards, also with the Monterey Bay Aquarium Seafood Watch, Fish Choice and Fish Wise validation. Aquaculture Stewardship Council certifications provide annual independent audits of the facilities and other recognitions from Sea Choice, the Blue Ocean Institute and New England Aquarium, which round out their endorsements.

Founded in 1994, Sol Azul is led by Philippe Danigo, founder of Sol Azul. Philippe was born in Bretagne, France, where his family has been culturing oysters for four generations. Under his leadership, Sol Azul has had many successes over the past several years. With Philippe's forward-looking approach, the company weathered the covid challenges. In 2022 the company achieved 100% energy self-sufficiency with the newly installed solar power system. The desalinization plant is now providing 100% of the company's freshwater needs.

Historic sales with higher value achieved for every oyster grown in 2022 have made possible these strategic investments. It has also meant that the construction of the most innovative hatchery in Mexico and Latin America was funded through cash flow, an impressive accomplishment for this well-run company. The new hatchery was fully launched in 2022 with trials, start-up of the new equipment and new protocols promising production of seeds for 2023 growth cycles. Working with sister company Center for Aquaculture Technologies has led to genetic improvements over the past several years.

Mother Nature challenged the company due to the effects of Hurricane Kay with the loss of seeds due to water quality issues as a result of the storm, but the company persevered and has now recovered from that challenge.

Ensuring market supply is also a critical business growth strategy with associated grow-out farms, achieving the same diligent grow-out and quality requirements, an important part of the next phase of growth for Sol Azul. This requires an investment in highly communicative trust-building business relationships led by Danigo and actioned across the company. They continue to provide equal opportunities across the business for their qualified workforce with an almost equal distribution of jobs between men and women (44 females and 66 males). Providing childcare to these working families is an important part of what makes this successful. Sol Azul continues their active involvement in the community supporting mangrove planting in the area and serving as a member of the Technical Committee for El Vizcaino Biosphere Reserve with a group of dedicated people to preserve the thoughtful management of this important area. "We are committed to leaving every interaction, relationship and situation better than we found it." Says Danigo. It's a team approach at Sol Azul with team members responsible for making good business decisions leading to higher efficiencies across the farm and processing operations.



**"I am grateful and very proud of all of the team efforts over the past year. Successfully regaining our markets and now entering into this sustainable growth period, I will continue to work with and celebrate the forward progress we are making, to farm our oysters in a fully sustainable and responsible way, to show leadership to our colleagues across the business and to demonstrate that our business can achieve success."**

*Philippe Danigo, Founder, Sol Azul*



Sustainability  
Report 2022

# Cuna del Mar

The 2022 Sustainability and Environmental, Social and Governance (ESG) Report for Cuna del Mar and its portfolio companies: Innovasea, Center for Aquaculture Technologies, Blue Ocean Mariculture, Earth Ocean Farms, Open Blue and Sol Azul has been built using the widely accepted Global Reporting Initiative reporting principles and standard disclosures.

Cuna del Mar is a unique business enterprise designed to support the development of open ocean and land-based aquaculture that is economically, socially and environmentally responsible.

We welcome your comments at [info@cunadelmar.com](mailto:info@cunadelmar.com)