



BRIEF #3

Out of sight,  
out of mind:  
Marine ecosystem



## ABSTRACT

How can we imagine ocean vulnerability? Oceans cover more than 70% of the globe and they provide global ecosystem services that are vital for our planet stability. The [Copernicus state of the Global Ocean](#) report shows that the world's oceans are undergoing rapid and worrying changes. Ocean warming has doubled in rate over the past two decades for many regions, with global sea surface temperatures rising by about **0.13 ± 0.01 °C per decade** over 1982–2023, and upper ocean heat content increasing significantly. Sea levels are also rising more quickly: estimates show increases of ~4.3 mm/year in recent years versus ~2.1 mm/year in the 1990s.. Biodiversity is under stress: coral bleaching has reached unprecedented levels, with some **84% of global coral reefs** affected in the 2023-2025 global bleaching event (ICRI, 2025). Altogether, these multifaceted changes — warming, acidification, rising seas, loss of oxygen, and habitat destruction — point to an ocean that is being pushed toward tipping points, with serious consequences for marine life, climate regulation, and human societies.

Action is being taken at international level, between states. The recent United Nations Ocean Conference (UNOC 3 hosted in Nice) highlighted the need to bring countries from around the world together to reach common agreements, whether on plastic pollution or deep-sea mining. Many companies are beginning to engage in protecting the oceans through strategies such as reducing plastic pollution (for example by eliminating single-use plastics), improving supply chain transparency (especially in fisheries and seafood), adopting sustainable shipping and aquaculture practices, investing in research, and aligning with frameworks or pledges like the [UN Global Compact's Sustainable Ocean Principles](#). However, only a relatively small number of companies make strong, measurable commitments for ocean conservation: they often consider that making operations ocean-friendly requires larger investments while regulations remain silent or uncertain.

Naturetech startups can help remove barriers and scale up solutions to reduce and mitigate environmental impacts — yet they won't stop or sufficiently mitigate those dramatic changes. The scale at which those changes are operating is far greater than the actual investments in the blue economy: all together, we estimate that ocean related Naturetech startups raised 583 million dollars for the past ten years. It represents 0,5% of what AI startups raised in 2024 alone (approximately \$101 billion according to [TechCrunch](#)). Whether autonomous agents are vital or not, such differences in investing clearly reflect the lack of interest from investors into the blue economy.

## WHO WE ARE

We combine data, economic analysis and environmental expertise to explore the NatureTECH emerging ecosystem.

- **Database:** by using the Motherbase database, we collect and sort over 1000 start-ups developing different technologies in line with the Global Biodiversity framework of Kunming-Montreal.
- **Analysis:** thanks to the data appendix, we analyse economic trends and draft micro and macro analysis by sector and technologies.
- **Community:** because defending nature is a collective affair, we are a catalyst for businesses committed to stop and reverse the biodiversity loss.

# Tech as an enabler of the Blue economy

## Growing human pressures and their consequences

Late September 2025, a seventh planetary boundary concerning ocean acidification has been crossed, as confirmed by the Planetary Health Check. This development has direct consequences for marine biodiversity as 28% of marine living organisms are directly threatened ([Back to Blue, 2023](#)), highlighting the urgent need to minimize the impact of climate change and ocean acidification, a goal set out in Target 8 of the Global Biodiversity Framework.

The resulting loss of biodiversity has systemic consequences: it disrupts food chains, weakens climate and coastal protection, and jeopardizes key economic sectors like fishing and tourism. The combined effect of these pressures, along with population growth, is pushing the oceans beyond their capacity to recover. The table below details the five main pressures identified by the IPBES, presenting the human activities that cause them and their impacts on marine ecosystems:

	5 IPBES PRESSURES	IMPACTS ON MARINE ECOSYSTEMS	KEY FIGURES
	<b>Changes in sea use and the resulting loss of habitats</b>	Human activities are causing the physical alteration and destruction of marine environments. Activities such as coastal infrastructure development, trawling, metal mining, and ship anchoring directly lead to the degradation and destruction of habitats. This damages vital ecosystems like corals, mangroves, and seagrass meadows, which in turn accelerates coastal erosion and threatens global food security. The ongoing degradation of the seabed puts key economic sectors like fishing and tourism at increasing risk.	If global warming is limited to 1.5 °C above pre-industrial levels, 70-90% of warm-water coral reefs could be lost; at 2 °C warming, over 99% of reefs are projected to decline, threatening biodiversity, food security and resilience. ( <a href="#">IPCC, 2018</a> )
	<b>Overexploitation of resources</b>	The overexploitation of marine resources, primarily through overfishing, involves harvesting species faster than they can replenish. This unsustainable practice can lead to the collapse of global fish stocks and even the potential extinction of species. The resulting loss of biodiversity disrupts marine food chains and reduces the resilience of coastal communities that depend on the sea for their livelihoods.	35.5% of fishery stocks are classified as overfished ( <a href="#">FAO, 2025</a> )
	<b>Climate change</b>	The release of greenhouse gas emissions into the atmosphere is altering the physical and chemical balance of the oceans. This process causes ocean warming and acidification, which severely damages marine ecosystems. The planetary boundary for ocean acidification has now been crossed, which has direct consequences for marine biodiversity.	If greenhouse gas levels remain high, the decline of critical ecosystems like coral reefs could result in global fisheries losses estimated between \$49 and \$69 billion (Speers et al., 2016).
	<b>Pollution</b>	Various forms of pollution are harming the marine environment. Plastic but also other pollutants from oil spills, heavy metals, wastewater, and chemical runoff poison marine life, contaminate food resources, and cause a decline in water quality. Furthermore, shipping contributes noise and light pollution, which disrupts the migration, communication, hunting, and reproduction patterns of marine animals.	Between 4.8 and 12.7 million tons of plastic enter the oceans each year (Jambek and al., 2015). If this trend continues, there could be more plastic than fish in the ocean by 2050 (Ellen Macarthur foundation, 2021).
	<b>Invasive alien species</b>	The introduction of non-native species by human activities poses a significant threat to marine ecosystems. These species are often transported through shipping, the aquarium trade, and aquaculture. Once established, invasive alien species can disrupt local food chains, spread diseases, decline water quality and lead to the extinction of native fauna and flora.	30% of endangered species in French overseas territories are affected by invasive alien species ( <a href="#">IUCN, 2025</a> )

## Marine ecosystem services

Oceans cover more than 70% of our planet's surface and are essential to life, the economy, and global climate stability. Marine and coastal systems provide a wide range of services, which can be grouped into four categories: provisioning services, regulating services, cultural services and supporting services (see figure 1). These ecosystem services not only preserve biodiversity and human well-being, but they also provide essential support for economic activities. The ocean therefore plays a central role in the global economy. According to the OECD, the global ocean economy represents \$ 2.6 trillion in gross value added and over 100 million jobs depend on the ocean economy (OECD, 2025).

### PROVISSIONNING

- Products obtained from ecosystems
- Food provision (fisheries and aquaculture)
- Fresh water
- Fuel wood
- Fibre
- Biochemicals
- Genetic ressources

### REGULATING

- Benefits obtained from the regulation of ecosystem processes
- Climate regulation
- Disease regulation
- Water regulation
- Air quality regulation
- Biological regulation
- Weather regulation
- Erosion control
- Human disease control
- Flood/storm protection
- Ocean nourishment

### CULTURAL

- Nonmaterial benefits obtained from ecosystems
- Recreation and ecotourism
- Aesthetic
- Inspirational
- Educational
- Sense of place
- Cultural heritage

### SUPPORTING

Services necessary for the production of all other ecosystem services

- Photosynthesis
- Primary production
- Nutrient cycling
- Resilience and resistance
- Biologically mediated habitat

Figure 1 - Pressures and impacts of human activities on marine biodiversity  
(Source: Carbon 4, Speers et al, Jambek and al., Ellen Macarthur foundation, IUCN, FAO)

## Marine vs terrestrial environments

The ocean covers over 70% of the Earth's surface, and yet scientific knowledge and conservation efforts remain disproportionately concentrated on terrestrial ecosystems. Despite widespread recognition of this paradox, marine science continues to struggle with bridging the gap. The underlying reasons are multiple: the ocean's sheer scale, the high financial and technical costs of its study, and the fact that it remains comparatively under-documented in both historical and scientific terms.

- **Historical perspective and state of knowledge:** A first major distinction between terrestrial and marine ecosystems lies in the depth of accumulated knowledge. Terrestrial environments have been systematically studied for centuries, with extensive sampling, cataloguing, and monitoring of flora and fauna. Accordingly, the historical record for terrestrial ecosystems is relatively continuous and robust, providing reliable baseline references. By contrast, marine ecosystems, particularly in the deep ocean, have received far less systematic attention. Their historical record is fragmented, offering weaker baselines and complicating the assessment of long-term ecological change (Raffaelli and al, 2005).
- **Accessibility:** A second axis of difference concerns accessibility, which directly influences sampling capacity. Terrestrial ecosystems, even remote ones, can generally be accessed with relatively modest logistical resources. The ocean, however, presents significant constraints: depth, distance from shore, and reliance on costly infrastructure such as research vessels, submersibles, and advanced sensors. These constraints result in stronger sampling biases in marine research, with shallow coastal regions disproportionately represented relative to vast and ecologically critical deep-sea zones.
- **Governance, policy, and protection:** A third difference lies in governance and conservation policy. Terrestrial ecosystems benefit from a longer tradition of protected area designation, stronger legal frameworks, and more consistent institutional enforcement. By contrast, marine protection remains limited: only 8.4% of the ocean is formally protected, compared with 17.5% of terrestrial areas, and effective enforcement reduces the figure to only 2.8% ([IUCN, 2024](#); [Bloomberg Philanthropies, 2024](#)). Several factors explain this gap: the relative invisibility of marine degradation, which delays political response (Lubchenco et al., 2016); the complexity of governing areas beyond national jurisdiction, where nearly two-thirds of the ocean lies (UNEP, 2021); and the high economic stakes of marine resource exploitation (e.g., fisheries, seabed mining, shipping), which often outweigh conservation priorities (OECD, 2020). These combined challenges make marine conservation harder to implement and enforce compared with terrestrial systems.

Although marine and terrestrial ecosystems are often treated separately in conservation research and policy, their health is inextricably linked. This systemic interdependence is demonstrated by the fact that 80% of plastic waste comes from land, which is then drained into oceans through rivers and canals, showing that solutions to marine degradation necessarily require effective management of terrestrial systems.

## The rise of blue economy: a platform for Naturetech startups ?

Unfortunately, environmental challenges do not immediately create a market in which start-ups and new technologies can be funded directly. The economic significance of the oceans is undeniable, with the global ocean economy doubling in value from approximately \$1.3 trillion to \$2.6 trillion between 1995 and 2020, mainly due to cargo transportation. Despite this, financial flows dedicated to the sustainable management of marine ecosystems remain marginal.

However, over the past decade, the concept of the 'blue economy' has become widely used in international political discourse and serves as a platform for many innovative business models. The World Wide Fund for Nature (WWF) defines sustainable blue economy, as a sea-based economy that provides social and economic benefits to current and future generations, restores and maintains the diversity and resilience of marine ecosystems, and relies on clean technologies, renewable energy, and circular material flows. Recent developments signal a positive shift in momentum. The third UN Ocean Conference (UNOC3) marked a significant acceleration of the international ocean agenda, gathering 175 Member States and generating substantial commitments.

The UNOC3 gathered 175 Member States, 63 Heads of State and Government, 174 delegations, 12,000 participants, including NGOs, scientists, and civil society actors. The conference marked a significant acceleration of the international ocean agenda, structured around key areas for Naturetech startups (UNOC, 2025):

- **Ocean science and technology:** UNOC3 reaffirmed the critical role of science in decision-making. Over 2,000 scientists participated in the One Ocean Science Congress, presenting policy recommendations. Key initiatives include Mission Neptune, an ambitious ocean exploration program, and the Mercator International Center for the Ocean, tasked with creating a digital twin of the ocean. The Space4Ocean Alliance will enhance satellite-based ocean monitoring. A new annual Starfish Ocean Barometer will measure ocean health and human impact.
- **Scaling up ocean finance and a fair blue economy:** A total of €8.7 billion was pledged for the sustainable blue economy, half of it from private investors and foundations. A new coalition of development banks was formed, and a sustainable maritime tourism pact was launched. Countries also reaffirmed their commitment to decarbonize maritime transport by 2050, backed by a carbon pricing agreement under the IMO. Nevertheless, the final declaration failed to mention fossil fuels, drawing criticism. During the UNOC3 week, Swen Capital raised 160 million euros for its second ocean preservation fund, with a final target of 300 million euros in subscriptions. This fund aims to finance startups working to support the regeneration of ocean biodiversity.
- **Ocean pollution:** 96 countries backed the Nice Call for a global plastics treaty, and underwater noise pollution was acknowledged as a global concern for the first time. 37 countries joined a coalition for a quieter ocean. Yet most commitments remain non-binding. The plastic treaty is still under negotiation (next session: August 2025 in Geneva), and the legal framework to tackle marine pollution is still vague.

# Blue financing: a drop in the ocean of fundraising

A deep-seated and chronic lack of financing remains one of the most significant barriers for startups trying to enter the blue economy. Oceans are underinvested - the SDG 14, "Life below water," consistently ranks as the least funded of all the Sustainable Development Goals. \$175 billion per year is needed to achieve SDG 14 by 2030, yet between 2015 and 2019, just under \$10 billion was invested (WEF, 2022).

The financial landscape for the blue economy is also structurally imbalanced, relying heavily on public funds while failing to attract sufficient private capital. An analysis of financial flows reveals that public funding constitutes the vast majority, accounting for 82% of the total. In contrast, private financial flows contribute only 18%, a figure that includes philanthropic contributions (5%) and a strikingly small amount from impact investments, which represent a mere 2% of total funding (UNEP, 2022). Marine and coastal ecosystems receive only 9% of the total global investment directed toward nature-based solutions. This leaves little room for investment in naturetech startups, while public actors also favor other sources of innovation, such as universities and scientific groups.

When viewed through the lens of global venture capital, the financial flows directed towards the blue economy appear as a mere grain of sand in the ocean of fundraising: the entire ecosystem of NatureTech startups focused on the blue economy and ocean restoration has collectively raised just \$583 million in venture capital and equity funding. This figure represents a mere 6.5% of the total funding raised by all NatureTech startups and is dwarfed by the estimated annual financing gap of \$14.6 billion needed just to achieve the 30x30 ocean protection target. This stark disparity highlights a profound disconnect between investment priorities and evident global utility. The oceans provide essential services critical to life on Earth, regulating the climate, ensuring food security, and generating considerable economic value annually. While the societal benefits of protecting these vital ecosystems are clear and universally acknowledged, in reality blue economy investments do not attract as much as it needs to.

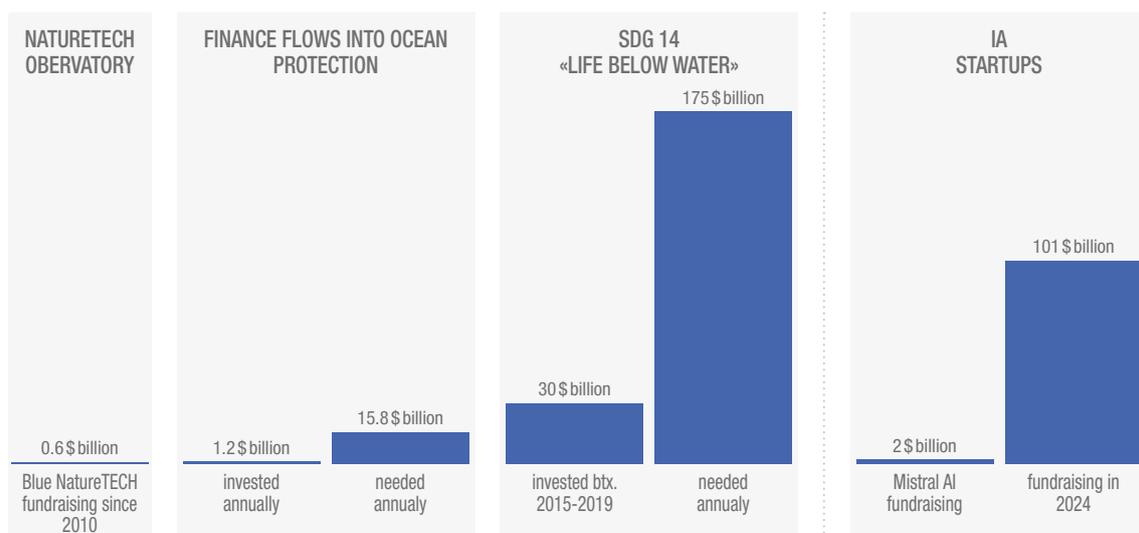


Figure 2 - What we need and what we have for a sustainable blue economy (sources: NatureTECH Observatory, Motherbase, WEF 2022, Techcrunch)

In a report Promoting Sustainable Ocean Economies, the OECD explains that the global financing landscape of sustainable ocean economy is fragmented and lacks coherence (OECD, 2025). This is because a sustainable ocean economy encompasses numerous sectors, such as shipping and fisheries, and involves a multitude of financial actors. A significant challenge is the absence of a common understanding or definition of a sustainable ocean economy, which leads to the risk of diverging objectives and standards among funders. While interest in ocean finance is growing, the creation of new funds and mechanisms could worsen the existing fragmentation in the global development finance architecture. To counter this, enhancing transparency is a critical first step according to the OECD. This involves clearly mapping all the specific multilateral, private, bilateral, and philanthropic actors operating in this space. Such clarity would help in designing mechanisms to improve coordination, for example through voluntary coalitions like the one for Public Development Banks. The ultimate goal is to reduce fragmentation, transaction costs, and incoherence across the ocean finance landscape.

## Blue economy and investment funds

For innovative startups, specialized private equity and venture capital funds are the most direct and significant source of financing. The number of funds targeting SDG 14 has almost doubled in the past 5 years (Phenix Capital, 2025). Yet only five investment funds dedicated exclusively to SDG 14, while most target multiple goals, including SDG 14, even though almost “all of the SDGs are impacted by blue economy focused investing” as highlighted by Phenix Capital. Among them, 35 focus on more than ten SDGs. Around 37% of the funds linked to the blue economy also address six to nine other SDGs, which tends to dilute their specific impact on oceans. For instance, [Swen Capital partners](#) launched its first fund dedicated to blue economy “SWEN Blue Ocean” at the World Conservation of the IUCN in 2021 and launched a second one at the UN Ocean Conference in June 2025. Those two funds helped to mobilize over €300 million to invest in early-stage, innovative startups for the ocean.



## The challenge of fragmented governance in the face of the ocean crisis

A significant challenge for the sustainable blue economy is its fragmented regulatory and governance landscape ([OECD, 2025](#)). This fragmentation stems from several factors, most notably jurisdictional complexity. A vast portion of the ocean, nearly two-thirds, lies beyond national jurisdiction, creating a legal void that complicates conservation efforts ([UNEP, 2021](#)). While the recent Biodiversity Beyond National Jurisdiction (BBNJ) treaty aims to provide a legal framework for these areas, it is a recent development intended to address what has long been a major gap in global governance.

This jurisdictional division is compounded by a fragmentation of priorities and policies even within national waters. There is often a “tangle of public policies” with diverse and sometimes conflicting objectives, such as economic development, strategic independence, and security, which tend to dilute or overshadow environmental protection goals ([Ministère des armées, 2025](#)). This clash of interests creates a situation where regulatory frameworks lack global harmonization and are often insufficiently enforced, with economic considerations frequently taking precedence over environmental ones.

The consequences of this fragmented governance are profound. It directly contributes to a fragmented and incoherent financial landscape for the sustainable ocean economy, as there is no common understanding or definition to guide funders, leading to diverging objectives and standards ([OECD, 2025](#)). This lack of coordination hinders effective action on global issues, as seen in the heated debates within the International Seabed Authority over a mining code for the deep sea, which pits nations advocating for a moratorium against those pushing to accelerate industrial development. Ultimately, this governance gap results in weaker marine protection compared to terrestrial ecosystems; for instance, only 8.4% of the ocean is formally protected, and effective enforcement reduces this figure to roughly 3% ([IUCN, 2024](#); [Bloomberg Philanthropies, 2024](#)). The invisibility of marine degradation further exacerbates the problem by delaying the necessary political response.

## Tech as an enabler

Specific startups demonstrate the practical application of these technologies across the crisis spectrum. [The Ocean Cleanup](#) has removed millions of kilograms of plastic using autonomous collection systems deployed in oceanic garbage patches and river mouths, while [Arc Marine](#) develops artificial reef technologies that accelerate coral restoration at scale—critical given that coral reefs support 25% of marine species despite covering less than 1% of the ocean floor ([Causeartist, 2025](#)). [Stream Ocean](#) employs AI-powered maritime surveillance for real-time ecosystem monitoring ([Dealroom, 2025](#)), and [PlanetCare](#) has developed washing machine filters that capture 98% of microplastic fibers before they enter waterways—addressing the estimated 700,000 microscopic plastic particles released from every 6 kg of laundry. [SafetyNet Technologies](#) uses proprietary LED technology in fishing nets to allow juvenile fish and non-target species to escape, reducing bycatch by up to 90% in pilot programs. [Matter](#) captures microplastics at source, while [Ocean Rainforest](#) operates sustainable seaweed farming in the Faroe Islands. These examples illustrate how ocean tech spans monitoring, restoration, pollution prevention, and sustainable resource extraction.

The ocean technology sector has experienced remarkable growth in recent years, driven by the convergence of environmental urgency and technological innovation. However, understanding this growth requires careful attention to how “blue economy” and “ocean tech” are defined, as figures vary significantly depending on scope. The broadest definitions encompass maritime decarbonization, offshore renewable energy, and sustainable shipping—sectors that often dominate investment totals. For instance, European blue economy investments reached [€13 billion between 2018 and 2023](#) ([European Commission, 2024](#)), but this includes energy transition projects like offshore wind farms and maritime transport electrification. When focusing specifically on ocean-climate technology startups—those directly addressing marine ecosystem health—the numbers are more modest: the narrower blue tech sector attracted [\\$1.9 billion globally in 2024](#) ([Dealroom, 2025](#)). This distinction matters: technologies addressing plastic pollution, biodiversity loss, overfishing, and ocean acidification—the core environmental crises threatening marine ecosystems worth an estimated \$2.8 trillion annually ([OECD, 2024](#))—represent only a subset of the broader blue economy investment landscape.

However, significant challenges temper this optimism, particularly when examining technologies specifically targeting ocean environmental health rather than broader maritime industries. The carbon capture sector—critical for addressing ocean acidification—has attracted only 2% of total ocean-climate technology investment since 2014 ([JPMorgan Chase, 2024](#)), with most marine carbon dioxide removal (mCDR) startups still in pilot phases struggling to demonstrate viability at scale. Early-stage funding remains critically low: while 270 blue economy deals close annually in the EU ([European Commission, 2024](#)), many support energy transition projects rather than ecosystem restoration. Geographic concentration persists, with the U.S. and Europe accounting for approximately 80% of 2024 investments, leaving regions most vulnerable to ocean degradation—particularly in Southeast Asia and West Africa—underserved. Even within ocean-focused investment, maritime decarbonization (ships, ports) captures significantly more capital than biodiversity protection or pollution remediation. Technology adoption faces additional hurdles: many innovations remain too costly for developing coastal communities most affected by ocean degradation, and standardized impact measurement frameworks are still evolving. As Katapult Ocean’s 2024 report notes, only 70.8% of their portfolio companies submitted impact reports ([Katapult Ocean, 2024](#)), highlighting ongoing challenges in accountability and verification. Success will ultimately depend not just on technological sophistication, but on creating inclusive business models that empower local stakeholders, establishing transparent verification systems that build investor confidence, and mobilizing capital at the scale required to match the magnitude of ocean restoration challenges ahead—while ensuring that “blue economy” growth translates into genuine environmental outcomes rather than merely maritime industrial development.

Overall number of NatureTECH startups referenced by the NatureTECH Observatory with relationships with blue economy and ocean restoration:

150

representing 14% of total NatureTECH startups registered in our database. The creation of these startups has progressively accelerated over the past ten years.

#### **VC AND EQUITY FUNDINGS**

Startups operating in the “blue economy and restoration” sector have collectively raised \$583,557,495.00 in venture capital and equity funding. This amount remains relatively low, representing only 6.5% of the total funding raised by all NatureTECH startups.

#### **CORE ECOSYSTEM**

startups focused on blue economy and ocean restoration and strongly linked to biodiversity accounted for 15% of the total investment raised (\$86 million).

#### **FUNDRAISING DISTRIBUTION**

Fundraising is mainly directed toward startups focused on data collection and analysis (53%), followed by waste collection (22%) and ocean restoration (14%).

#### **GEOGRAPHY**

In terms of nationality, 20% of these startups are based in the United States, 15% in France, and 14% in the United Kingdom.

#### **MATURITY**

In the last 5 years, 44% of all NatureTECH startups have been created.

# Deepdive into ocean-focused NatureTECHs



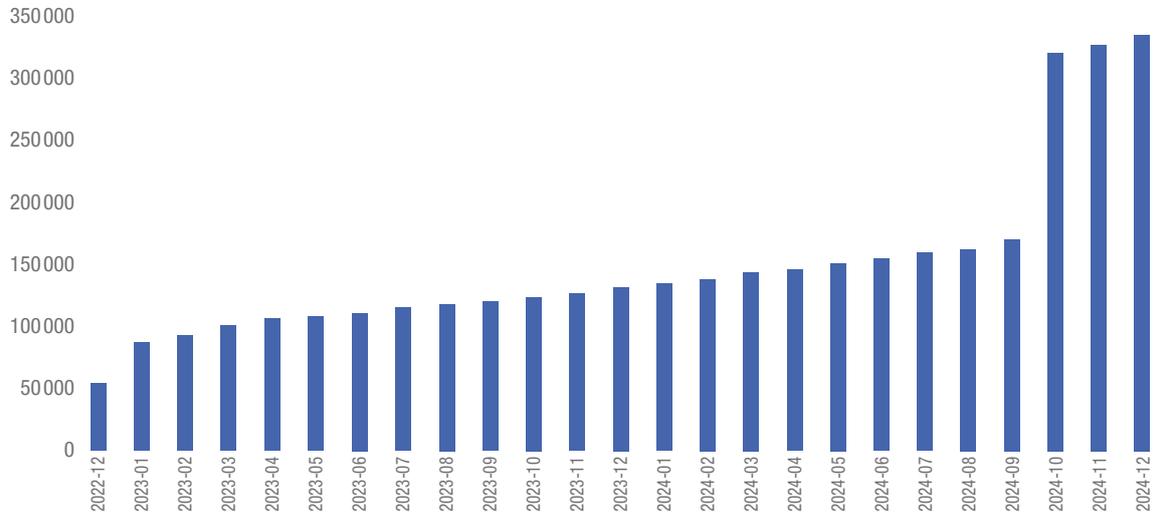


Figure 3 - LinkedIn followers evolution since 2022 for blue economy and ocean restoration startups (NatureTECH Observatory, Motherbase)

## NatureTECH startups navigating ocean data

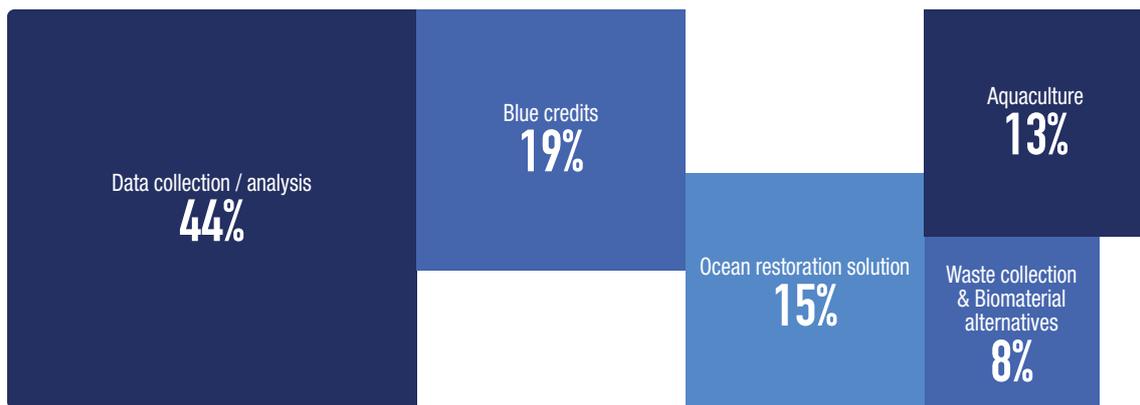


Figure 4 - Areas of innovation for NatureTECH startup ecosystem focusing on marine ecosystem by number (Sources: NatureTECH Observatory, Motherbase)



Figure 5 - Fundraising distribution according to areas of innovation for NatureTECH startup (Sources: NatureTECH Observatory, Motherbase)

Within the NatureTECH startup ecosystem focusing on marine ecosystem, several distinct areas of innovation have emerged. The first and largest category, which represents about 44% of startups in this segment, revolves around data collection and analysis. These companies develop technologies to monitor, analyze, and interpret information about marine ecosystems. Such solutions are particularly useful in reducing the existing knowledge gap between terrestrial and marine environments, as scientific research on land has historically been much more extensive than at sea. Improved data collection not only enhances our understanding of marine biodiversity and ecosystem functioning but also supports compliance with regulatory frameworks such as the Corporate Sustainability Reporting Directive (CSRD) or the Taskforce on Nature-related Financial Disclosures (TNFD). By providing robust, real-time insights, these technologies can inform reporting, guide policy, and issue early alerts about the health and degradation of marine ecosystems.

A second important category consists of startups engaged in the development of “blue credits,” which account for around 19% of the market segment. This represents 28 startups, 20 created since 2020 and 6 between 2023 and 2024. Those startups have raised \$25,744,192, accounting for only 4% of the total fundraising of the NatureTECH blue economy market. These credits operate in a similar way to carbon credits but are linked to ocean-based mechanisms for carbon capture and biodiversity enhancement. Many initiatives focus on seaweed cultivation, as seaweed grows quickly, sequesters significant amounts of carbon, and provides habitat for marine life. The idea of biodiversity credits is also emerging in this space, aiming to quantify and reward actions that protect or restore marine ecosystems beyond carbon accounting. This approach has the potential to create new financial incentives for ocean conservation.

Closely connected to this are startups focused on the restoration of marine ecosystems, making up 16% of the sector. This represents 23 start-ups and \$80,775,512.00 in funds raised, or 14% of the total funds raised for start-ups in NatureTECH's Blue Economy and Ocean Restoration category. Innovation in coral reef restoration is particularly dynamic, with a wave of new biotechnologies, artificial reef structures, and other approaches being tested and deployed. Among them, [Reefgen](#) stands out with its robotics-based approach: the company develops underwater robots that can autonomously plant corals and seagrasses, significantly reducing the cost and time normally required for restoration. By automating the delicate process of transplantation, Reefgen tries to scale up interventions in degraded ecosystems that would otherwise take years to recover. Another promising initiative is [rreefs](#), which designs modular 3D-printed reef structures made of clay. These hollow "reef bricks" are engineered to mimic natural reef complexity, offering surfaces ideal for coral larvae settlement and refuges for small marine species. Over time, the structures integrate into the marine environment and could foster natural regrowth and biodiversity recovery. Those technologies might help to achieve gains in specific situations, as a wide range of startups are exploring other strategies, from coral nurseries and biomimetic substrates to community-based programs and large-scale artificial reef systems. Together, they illustrate possible solutions for coral restoration and offering new hope for protecting fragile marine ecosystems.

Another significant domain is aquaculture, which represents about 13% of startups in the Naturetech marine sector. Those startups have raised over the last decade over 38 million dollars, which accounts for 7% of the total funds raised for startups in NatureTECH's Blue economy and Ocean restoration category. Seaweed production is once again central here, not only because of its potential for carbon credits but also due to its applications in producing sustainable alternatives to plastics, textiles, and even animal feed. This sector highlights the potential of marine biomass to reduce our dependence on fossil-based products while supporting a circular economy.

Finally, 8% of the startups are working on plastic pollution solutions. Their approaches include the development of new technologies for capturing plastic waste directly from rivers and oceans, advanced recycling systems, and bio-based alternatives to conventional plastics. Notable initiatives include [Ichthion](#) and [The Ocean Cleanup](#), both of which focus on large-scale interception of plastic waste before it accumulates in marine ecosystems. These startups not only address one of the most visible threats to marine life but also help create new value chains around recycled and biodegradable materials.

Taken together, these categories illustrate the diversity and growing sophistication of the marine naturetech startup ecosystem. From data and reporting tools to financial innovation, ecosystem restoration, sustainable aquaculture, and pollution mitigation, these companies are shaping a future in which ocean conservation and economic activity can be more closely aligned.

## How to make the invisible visible

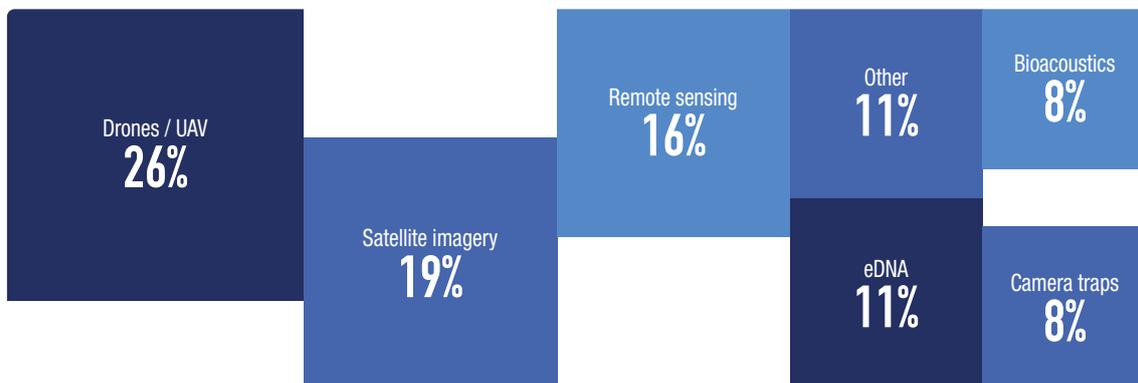


Figure 6 - Different technologies used to collect environmental data on marine ecosystems (Sources: NatureTECH Observatory, Motherbase)

In the NatureTech ecosystem, different technologies are being harnessed to collect environmental data. Drones and UAVs, used by 26% of startups in the field, enable high-resolution mapping and flexible monitoring of ecosystems, even in hard-to-reach areas. They are particularly useful for forest inventories, erosion tracking, or vegetation analysis. A good example is Deep Forestry, a Swedish startup that develops autonomous drones with advanced computer vision to measure tree biomass and forest growth with precision, helping both researchers and land managers better understand carbon storage and forest health.

Satellite imagery, representing 19% of usage, allows for consistent and large-scale observation of environmental changes, from deforestation to coastal erosion. Complementing this, remote sensing technologies such as LiDAR or multispectral sensors (17%) can capture details like canopy height, soil moisture, or water quality that are invisible to the human eye, offering a more complete ecological picture.

Another breakthrough is eDNA (environmental DNA), used by 11% of startups. By analyzing genetic traces left in water, soil, or sediments, it is possible to detect species presence without physically observing them, which is particularly valuable for rare, elusive, or underwater species. NatureMetrics is a leader in this field, providing large-scale biodiversity assessments that support governments, NGOs, and corporations in monitoring and protecting ecosystems.

On the ground, camera traps (8%) offer discreet ways to capture wildlife activity, while bioacoustics (8%) opens up new perspectives by recording animal sounds—from birds and amphibians to whales—revealing not only presence but also behavioral patterns. Startups in this space, such as those deploying underwater acoustic sensors, are beginning to revolutionize how we track marine mammals or measure ecosystem health through soundscapes.

## Ocean exploration not ocean exploitation

Emerging technologies such as drones, satellite imagery and autonomous underwater vehicles are transforming how we monitor marine ecosystems. These tools allow for collection of high-resolution spatial and temporal data on coral health, biodiversity, water quality, and environmental impacts. For instance, drone-based systems are being used to detect oil spills more rapidly and estimate their thickness, enabling faster response and mitigation. In coastal zones, aerial and underwater drones have also proved efficient for surveying marine litter and mapping shallow benthic environments, revealing patterns of pollution that were previously poorly understood. However, not all data collection is necessarily benign in its effects or use. There is an increasing literature that cautions about how such technologies may be used for purposes other than conservation or, when misused, even to the detriment of ecosystems. For example, drones may disturb wildlife (animals may change behavior, avoid certain areas, or suffer physiological stress) when flown too low or too close (Lukas Schad and Julia Fischer, 2022). Also, data captured might be repurposed for commercial exploitation (e.g. locating high-value species, fishing hotspots, or for coastline development). The dual-use nature of many of these tools implies that we need strong ethical, legal, and governance frameworks around what data can be collected, who owns it, who can access it, and for what purposes.

## Startups sinking and the aftermath for ocean restoration

One of the biggest challenges in marine restoration innovation is the long-term sustainability of the organizations deploying restoration structures, coral nurseries, or artificial reef modules. Many startups succeed in proving technical feasibility or pilot projects, but struggle to survive commercially, to maintain infrastructure, or to secure long-term funding and institutional support. According to the OECD, more than half of new businesses startups created in OECD countries disappear from the market within five years of their foundation (OECD, 2024). In the specific case of ocean startups, when such a startup fails or ceases operations without adequate transition or maintenance plans, the physical structures or restoration installations may be left unmanaged, deteriorate, or even become environmental liabilities (e.g. dislodged artificial reefs, invasive substrate, or habitats poorly adapted to changed conditions).

For example, in a recent study of 764 restoration projects worldwide, while the average success rate was about 64%, failure was often associated with poor maintenance and methodology or due to environmental conditions and extreme events such as hurricanes (Danovaro et al., 2025). Thus, for restoration technologies to have real, enduring impact, the business models of startups must include strategies for long-term infrastructure upkeep, community or governmental partnerships, and resilience in finances, not just innovation in design. In other terms, nature tech innovations are best effective in

a secured and well governed environment with multiple local stakeholders. Ocean governance should also play a role to regulate these initiatives and ensure that the sea does not become a dumping ground for failed experiments.

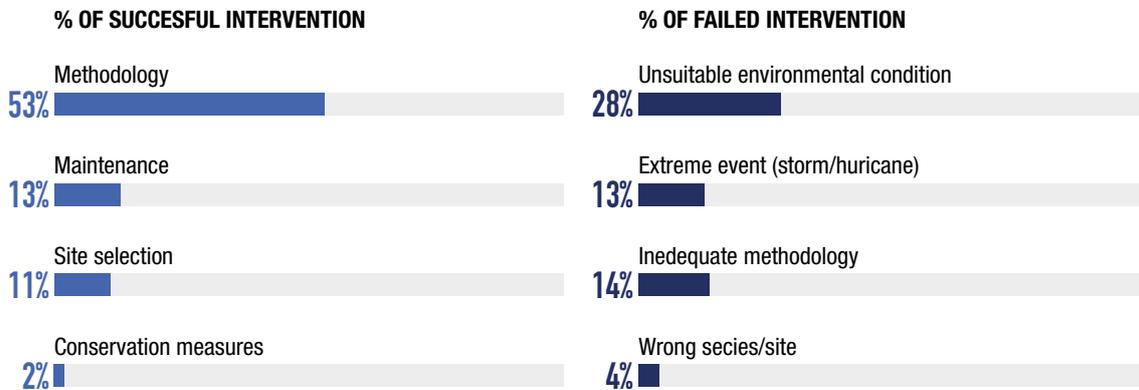


Figure 7 - Main drivers of success and failure in marine ecological restoration (Danovaro et al., 2025)

## Focus projet restauration

The NatureTECH start-ups with a focus on ocean restoartion showcase four major innovation focuses driving marine ecosystem restoration :

- First, several companies specialize in **coral reef and marine habitat restoration**, using advanced technologies such as **3D printing, robotics, and bio-engineered materials** to recreate natural habitats and restore biodiversity.
- Second, others focus on **ecological engineering and biomimetic solutions**, designing artificial habitats and coastal defense systems inspired by nature to enhance marine resilience.
- A third group addresses **coastal protection and blue carbon restoration**, developing nature-based methods to combat erosion, regenerate wetlands, and rebuild seaweed forests.
- Finally, some start-ups drive **scientific research and social innovation**, integrating citizen science, education, and data monitoring to scale up restoration impact.

Within this diverse ecosystem, [Korai](#) is a French start-up founded in 2022 that aims to regenerate marine ecosystems of coastal Africa. The company enables businesses to engage concretely in the restoration of marine ecosystems, such as coral reefs and mangroves, as part of their CSR and biodiversity strategies. One of its restoration site is located on the island of Nosy Tanga, Madagascar, where the objective is to repopulate a degraded reef with over 30,000 corals across a 6,000 m<sup>2</sup> area. In 2024, Korai began attaching coral fragments to restoration structures and placing them directly on the damaged reef. To assess the project's effectiveness, the start-up conducts annual ecological monitoring, including surveys of fish and invertebrate populations and measurements of benthic coverage. Korai's clients include Decathlon, Orange, and Société Générale, which rely on Korai to fulfill the environmental dimension of their sustainability reporting.



# TARGETS SDG 14



## INCREASE SCIENTIFIC KNOWLEDGE, RESEARCH AND TECHNOLOGY FOR OCEAN HEALTH

### OBJECTIVES

Mapping marine ecosystems

Collecting ocean data

# 5

## NATURETECH STARTUPS



Less than 1% of the seafloor has been mapped in detail. By combining hyperspectral and RGB imaging with geo-referencing and advanced Artificial Intelligence, Planblue provide highly detailed seafloor maps that visualize seafloor health, biodiversity, pollution levels, carbon capture potential, and much more.

FUNDRAISING: \$1 250 000

COUNTRY: GERMANY



Using satellite imagery and machine learning, Ocean Ledger's models analyze shoreline changes, underwater topography, and natural defenses like mangroves and corals. The company aims to provide more precise and localized risk assessments than conventional tools.

FUNDRAISING: \$900 000

COUNTRY: UNITED-KINGDOM



## REDUCE MARINE POLLUTION



## BUSINESSES ASSESS, DISCLOSE AND REDUCE BIODIVERSITY-RELATED RISKS AND NEGATIVE IMPACTS

Catching pollution before it hits the sea

Reducing underwater noise pollution

Restoring coral reefs

**Pollustock**<sup>®</sup>

Since 80% of marine waste originates on land, it is sufficient to block it upstream. Pollustock, a company that develops anti-pollution and anti-waste solutions such as floating booms and nets that collect waste and pollutants, offers solutions that make this possible.

FUNDRAISING: \$1 340 000

COUNTRY: FRANCE

**Quiet oceans**

Quiet-Oceans maps the underwater sound footprint of human activities, then advises NGOs, companies, and government agencies on how to limit their impact.

COUNTRY: FRANCE

**CORAL VITA**

Coral Vita's innovative coral reef restoration grows diverse, resilient corals up to 50x faster to protect marine biodiversity and support communities dependent on healthy reefs.

FUNDRAISING: \$10 000 000

COUNTRY: BAHAMAS





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# NATURETECH OBSERVATORY

We combine data, economic analysis and environmental expertise to explore the NatureTECH emerging ecosystem.

**Database:** by using the Motherbase database, we collect and sort over 1000 start-ups developing different technologies in line with the Global Biodiversity framework of Kunming-Montreal.

**Analysis:** thanks to the data appendix, we analyse economic trends and draft micro and macro analysis by sector and technologies.

**Community:** because defending nature is a collective affair, we are a catalyst for businesses committed to stop and reverse the biodiversity loss.



MOTHERBASE™

Motherbase is an AI-powered SaaS solution for identifying, evaluating, and qualifying ecosystems and innovation entities. As of April 2025, Motherbase tracks and updates 190,000 innovation entities worldwide on a monthly basis.

**CDC** BIODIVERSITÉ

