



ACCESS BASS Programme Line

USE CASES DESCRIPTION

“Responsible Fishing”

THEMATIC CALL FOR PROPOSALS

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Introduction

This document lists the use cases to be used as part of the “Responsible Fishing” thematic call for proposals. The use cases presented result from the cooperation between the European Space Agency (ESA) and stakeholders from the fishery sector. It aims at developing sustainable services leveraging space assets and technology in consort to address key challenges and opportunities to develop operational solutions. These use cases are also relevant for small scale coastal fisheries (SSCF) who lack the capital for integrating significant innovations. Dedicated technologies addressing the challenges described in the use cases for small-scale fisheries are key to ensure a fair and sustainable transition while ensuring small operators are not left behind.

When writing the initial proposal, the applicant will make clear which use case(s) their solution will address, if chosen from those listed here.

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Organizations involved in the definition of the use cases

Marine Stewardship Council (MSC)

The Marine Stewardship Council (MSC) is an international non-profit organization that sets globally recognized standards for sustainable fishing and for the seafood supply chain. Its certification and eco-labelling program help ensure that seafood comes from well-managed, environmentally responsible fisheries.

European Association of Fish Producers Organisations (EAPO)



The European Association of Fish Producers Organisations (EAPO) was founded in 1980 and is unifying around 30 Producers Organisations (POs) among 12 EU Member states. As an association of European recognised Producers Organisations, their key role is to assist their members, and the people onboard the 4.000 fishing vessels they represent in achieving the objectives of the Common Fishery Policy (CFP) and the Common Market Organisation (CMO) for fishery and aquaculture products.

EAPO aims to strengthen the cooperation between European POs by looking for common grounds in addressing the challenges for European fisheries, such as securing sustainable food production through socio-economic viability, with respect for the environment, cultural heritage and livelihoods. As Producers Organisations, EAPO members play a primary role in the implementation of the Common Fisheries Policy and in promoting the viable and sustainable fishing activities of their members.

International Seafood Sustainability Foundation (ISSF)

ISSF is a non-governmental organization (NGO) created in 2009 that focuses on the sustainability of tuna fisheries. ISSF promotes science-based fishing practices, supports stronger management through Regional Fisheries Management Organizations (RFMOs), and advances measures to reduce bycatch and protect marine ecosystems. It also operates tools such as the ProActive Vessel Register (PVR) and Vessel in Other Sustainability Initiatives (VOSI) to increase transparency and encourage responsible fishing across the tuna supply chain.

The use cases

1. Use case: Illegal, Unregulated and Unreported fishing (IUU).

1.1.1.1 Problem statement

IUU fishing undermines sustainable fisheries management, threatens fish stocks, contributes to the depletion of marine resources, harms legitimate fishers, can involve forced labour and costs the global economy billions annually. The EU imports 70% of its seafood, making it essential, as highlighted by EAPO, to ensure a level playing field with third countries by requiring equal sustainability standards and combating illegal, unreported and unregulated (IUU) fishing. The Marine Stewardship Council (MSC) addresses these risks by requiring strong enforcement systems within certified fisheries, and banning certification for vessels on IUU blacklists or for seafood transported by them. However, many small-scale fisheries lack the resources and data needed to prove compliance, underscoring the need for solutions that strengthen local monitoring and surveillance to support effective and sustainable fishery management.

1.1.1.2 Role of Space

Currently, satellite-based vessel tracking (using AIS and GNSS) enabling real-time monitoring of fishing fleets is already in place. Nevertheless, there is still place for improvement. A



combination of AI and SatEO could help locate and forecast IUU hotspots. AI could cross-check satellite/AIS data with blockchain to ensure traceability verifying legality and origin, closing a major loophole in IUU enforcement.

2. Use case: Stock management

1.1.1.3 Problem statement

Overfishing depletes fish stocks, threatens marine biodiversity, and endangers both food and economic security for communities relying on fisheries. It also disrupts ecosystems by altering fish size, reproduction, and food-web dynamics, while climate change and pollution from land-based activities, such as plastics, agricultural runoff, and persistent organic pollutants, further damage marine life and pose risks to human consumers. Although European waters are managed under a framework built around the Maximum Sustainable Yield (MSY), implementation remains partial and largely reactive. As climate-driven shifts in species distribution might make previously sustainable practices inadequate, effective fisheries management increasingly depends on accurate data collection and monitoring tools. RFMOs and ICES (for EU fisheries) provide guidelines to ensure fisheries monitoring and sustainability. Additionally, MSC-certified fisheries must collect a range of information, at sufficient quality, to ensure they minimize environmental impacts and operate sustainably. Monitoring solutions such as electronic observation, satellite-based tools, and low-cost systems for data-poor regions are essential to support resilient, adaptive, and sustainable fishing practices.

1.1.1.4 Role of Space

Remote sensing data can monitor oceanographic conditions (e.g., sea surface temperature, chlorophyll) to assess fish stock health and distribution, supporting science-based quotas and ecosystem-based management in real-life conditions. Combining SatEO and self-reported catch through smartphone apps can help fishery managers monitor recreational fishing to improve stock assessments and sustainable catch allocations. In combination with AI, SatEO (Satellite Earth Observation) can enforce quota compliance in real-time through alerts for authorities. Satellite navigation helps enforce fishing limits by confirming vessel locations and effort relative to quota-managed zones.

The synergy of SatEO, navigation (SatNav), and satellite communication (SatCom) brings comprehensive, real-time, and actionable insights into managing land-based ocean pollution. SatEO detect changes in water quality, trace sediment and nutrient runoff, identify oil spills, and observe coastal and watershed conditions. SatNav enable precise geolocation of pollution events and support tracking and movement modeling of plumes or runoff. SatCom facilitate real-time transmission and sharing of EO data, ensuring timely alerts, broad dissemination to authorities, and responsive management strategies.

3. Use case: Habitat destruction and bycatch

1.1.1.5 Problem statement

Non-selective fishing harms sensitive habitats and leads to high bycatch, including endangered species, making sustainable ecosystem management more challenging. Restoration efforts must balance environmental goals with the socio-economic realities of the fishing sector, reconsidering blanket fishing bans in Marine Protected Areas when certain methods are compatible with conservation aims. Collaboration among ocean stakeholders is essential to manage habitat impacts and unwanted catch under international management frameworks (e.g. Regional Fisheries Management Organisations), and MSC-certified fisheries must demonstrate that they minimise bycatch, avoid serious harm to seafloor habitats, and operate sustainably. To support this, improved tools, especially for data-poor regions, are needed to map and monitor habitat impacts and bycatch risks, with satellite-based monitoring offering promising real-time insights that can support adaptive, transparent, and environmentally responsible fisheries management.

Role of Space

Ecosystem restoration can be supported by space assets in many ways. SatEO can be leveraged to monitor habitat recovery (e.g., coral reefs, seagrass beds) and human impact over time. When multiple stakeholders in different areas are involved in a restoration project, they can communicate using SatCom. This is especially relevant when located in remote areas where terrestrial communication is lacking. SatNav can guide restoration vessels and equipment to precise deployment sites, or guide other vessels to avoid sensitive and vulnerable areas.

4. Use case: Product traceability and enabling certification

Problem statement

Ensuring traceability is essential for proving sustainable fishing practices and gaining market access, yet it remains challenging for small-scale fisheries. Satellite-based tracking systems can help create digital records of vessel movements and catches, improving transparency across supply chains. The MSC recognizes the importance of accurate labelling. Its Chain of Custody certification requires businesses prove certified seafood is purchased from an MSC-certified supplier, record where it is sold to, and clearly distinguish certified from non-certified products to prevent fraud and assure consumers of sustainable sourcing. With the seafood industry rapidly adopting digital traceability to combat illegal, unreported, and unregulated fishing, there is a growing need for interoperable, standardised solutions aligned with global best practices such as the Global Dialogue on Seafood Traceability (GDST).

Role of Space

Tracking systems relying on SatNav can create digital records of vessel movements and catches supporting transparent supply chains. A combination of SatNav and SatEO data can be integrated into record keeping platforms to ensure the product's origin.

5. Use case: Ghost gears and marine pollution

Problem statement

Fishing gear can cause major harm to marine biodiversity, especially when it becomes lost or abandoned as “ghost gear,” which continues trapping wildlife and contributing to pollution and microplastics. Fisheries must minimise gear loss and understand its ecological impacts. This can involve avoiding deploying gear in high-risk areas, and implementing monitoring, marking, and retrieval programmes. However, locating lost gear and identifying accumulation hotspots remains difficult, especially in remote regions. Satellite-based detection and modelling could contribute to tracking gear movement, improving ghost gear recovery efforts, and supporting global RFMO, international (e.g. MARPOL) and MSC requirements to minimize ecosystem harm due to lost gear. Low-cost, practical solutions are still needed to help fisheries better monitor, track, and retrieve lost gear and predict ghost gear hotspots for more effective prevention.

Role of Space

SatEO can help detect accumulations of floating debris and ghost gear, enabling targeted clean-up and prevention efforts. Additionally, SatEO can support rapid responses to pollution incidents, reducing their long-term impacts.

6. Use case: Monitoring of Harmful Algae Blooms (HABs)

Problem statement

HABs are a major threat to fisheries, causing fish kills, shellfish toxicity, economic losses, and ecosystem damage.

Role of Space

SatEO can help detect and monitor the algae and predict shifts in blooming. By detecting changes in watercolor, chlorophyll-a, and other indicators of algae blooms through SatEO, it is possible to create early warning systems for zones under pressure. This allows fisheries to relocate or move fishing stocks on time. Combining EO with in-situ measurements helps detect the toxicity of the algae.

7. Use case: Worker safety in fisheries

Problem statement

The seafood industry is vital to the livelihoods of millions, including providing a major source of employment. However, labour issues in the seafood industry are a significant challenge. As well as being a high-risk occupation from exposure to dangerous weather and equipment, the use of forced and child labour is a global issue. The MSC standard focuses on the environmental challenge of overfishing and does not have social claims associated with the ecolabel, however MSC supports efforts to improve worker safety within the seafood sector and address the absolutely unacceptable presence of forced and child labour. Solutions are needed to help workers confidentially communicate labour issues to relevant authorities on shore, and monitoring solutions are needed to help detect labour issues on vessels. A particular challenge is implementing these tools in fisheries operating in remote areas for long stretches of time.

Role of Space

SatEO enables weather monitoring to help crews avoid severe weather conditions such as storms and high waves, or can be used to help detect and locate fishers lost at sea. In combination with SatNav, it allows to calculate the optimal route to avoid dangerous areas. SatCom can be leveraged for emergency alerts in cases of injuries or vessel damage, or to help workers confidentially communicate labour issues to authorities.

8. Use case: Controlled access to fishing grounds and Marine Protected Areas (MPAs)

1.1.1.6 Problem statement

Effective enforcement and evaluation of MPAs remains a challenge in many regions, particularly where resources for at-sea monitoring are limited. Satellite-based solutions could strengthen visibility of fishing activity in or near protected zones and track ecosystem changes over time, helping to assess the ecological effectiveness of MPA measures. Such developments would provide valuable complementary data to existing compliance and biodiversity monitoring frameworks, supporting fisheries operating near MPAs in demonstrating alignment with conservation objectives.

Fisheries are regulated by a complex patchwork of international, EU, and national rules that vary by fishing zone, species, gear type, and season. At sea, boundaries between fishing grounds are invisible and can change with shifting stocks or temporary closures, making it difficult for fishers to know precisely which zone they are operating in at any given moment. As a result, fishers often struggle to determine which specific regulations apply, increasing the risk of unintentional non-compliance. For instance, Brexit has been one of the major factors of change in recent years and has fundamentally reshaped the regulatory framework for European fisheries, introducing significant challenges related to access to traditional fishing grounds.

Moreover, in this tense geopolitical context, the fisheries fleet, navigating in the European and global seas represent the EU in many areas where their strategic importance could prove decisive.

1.1.1.7 Role of Space

This can be supported by SatEO. It ensures compliance by detecting unauthorized fishing within protected zones. On top of this, SatEO maps and monitors maritime boundaries and fishing activity hotspots. SatCom enables secure communication between vessels and authorities for access verification. On another hand, SatNav allows Geofence fishing zones to alert vessels when entering restricted or foreign waters. SatCom can help in maintaining secure communications for EU fleet operations in strategic zones. SatNav can be leveraged to monitor fleet positioning and route optimization for strategic presence. SatEO allows to observe geopolitical hotspots and maritime traffic patterns.