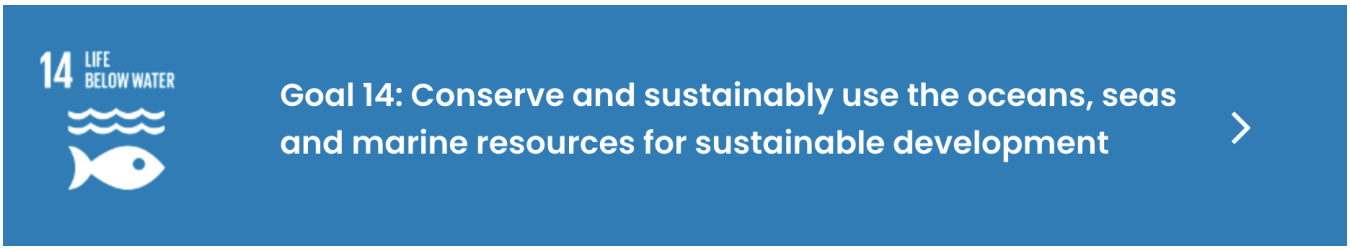
# 14 – Life below Water




**EO Product/Service supporting the SDGs**

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## Goal: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

EO data offer an invaluable opportunity for better-informing development policies and quantifying various targets. How can EO be used to help countries achieve specific targets? *Source:* ***ESA compendium of EO contributions to the SDG Targets and Indicators***

**Target 14.1: By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land- based activities, including marine debris and nutrient pollution.**

*This target addresses the need to reduce marine pollution by recognising the land-based sources that emit pollutants such as nutrients and plastic debris. It is therefore an interconnected target that seeks to join land and sea based approaches to pollution reduction and prevention. In setting a deadline for achievement of this target by 2025, the community must act quickly towards global pollution reduction. EO is useful in relation to this target because it has both land, sea and coastal coverage thereby enabling integrated monitoring, e.g. of land based debris which accumulates on shorelines before being transported seaward. Equally, EO can monitor the location and extent of inland waterways, including their water quality as mentioned in relation to SDG 6, enabling the transport of land based, water-dissolved pollutants such as excessive nutrients to be monitored. At sea, the detection of surface, coarse marine debris is an experimental area for EO but with increasing sophistication this technique could yield results in being able to map large debris fields and plot their movement for subsequent intervention and clean up. Evaluation of coastal eutrophication status, anomalies and trends is a challenging but evolving application of EO and contributes to the land-based pollution reduction aspect of this target.*

*(eo services based on Integrate data & monitoring for marine pollution. Indicator 14.1.1: Coastal marine pollution)*

**Target 14.3: Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels.**

*As the ocean's biology and biochemistry is largely under sampled, this target presents a significant challenge for countries hence the stated need to enhance scientific cooperation at all levels. Nevertheless, this enhanced scientific cooperation should involve the remote sensing community, at least at the target level. For instance, EO can support countries in planning for and setting targets on minimising ocean acidification, as part of a wider climate change monitoring/management strategy. EO could help countries with significant marine areas to identify areas at risk from acidification and estimate their extent, e.g. of waters with aragonite close to its saturation level, below which organisms find it more difficult to form and retain their shells. EO can also be used as a diagnostic tool, e.g. to map the impacts of ocean acidification on coral reefs. The utility of the satellite measurements comes in obtaining a synoptic view where few or no in situ measurements of the carbonate system exist. Although EO is limited to the ocean surface layer, these observations are important because the change in carbonate chemistry due to atmospheric CO2 occurs in the ocean surface first.*

*(eo services based on Planning for setting targets for ocean acidification. Indicator 14.3.1: Ocean acidification)*

**Target 14.4:** **By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics**

*This target is aimed at regulation through consistent reporting of overfishing as well as restoration of already depleted fish stocks. The most conservative estimates suggest that illegal, unreported and unregulated (IUU) fishing on the high seas, affecting species such as tunas and sharks, is worth US$1.25 billion annually (Global Ocean Commission, 2014). Current measures taken for implementing, monitoring and enforcing plans for fish stock conservation at the national level are mostly inadequate.*

*Satellite remote sensing has the potential to improve plans for monitoring and management of fisheries in a number of ways (Stuart et al. 2011a). For example satellite data on ocean parameters such as temperature, salinity, phytoplankton and chlorophyll- a concentrations can help identify ocean areas where fish tend to aggregate (e.g. thermal fronts) and to estimate primary production. Studies have shown that satellite remote sensing of primary production in the ocean could be used to support fish stock assessments, for example, using ocean colour images to infer primary production and estimate global fish biomass. This would be particularly useful for this target given that the fish stock assessments demand high levels of technically capacity and data, which is currently lacking at country level. However, the uptake of satellite remote sensing in fisheries management has so far been limited. This is due to a number of reasons, including the spatial and temporal inadequacy of available ocean colour data for fisheries management purposes, lack of technical capacity to analyse remote sensing data sets, and the limited accuracy of ocean colour algorithms for coastal areas, where most fishing activities take place (Stuart et al. 2011b, Wilson 2011).*

*(eo services based on Support fish stocks assessments)*

**Relevant Success Stories**

- The GOS4M Knowledge Hub designed for end-users to assess the effectiveness of measures undertaken under the Minamata Convention on Mercury.
- Detect and monitor oil slicks
- Ocean Model Circulation Operational Validation
- Operational risk in ice-prone waters
- Satellite based oil spill detection and impact assessment – The chronology of the Deepwater Horizon Accident
- GIO water and wetlands
- Satellite-based oil spill detection
- Satellite based oceanography
- Satellite based detection of oil spills