



How space-based Smart IoT helps power the New Blue Economy

From aquaculture to defense needs, ocean-based energy projects and environmental observation, E-Space Smart-IoT solutions have the power to help ensure the sustainability and productivity of the blue economy. Adding artificial intelligence (AI) capabilities provides a major boost to data collection and analysis efforts to create a complete picture from the field — no matter how remote.



Smart-IoT use cases — Blue economy



Ocean monitoring: Connected buoys can collect data on ocean conditions, such as temperature, salinity and pH levels.

- Connected devices can be attached to near-surface animals to track their movements, behavior and health.
- Monitor shipping traffic - Connected devices can be used to track the movements of ships and identify potential hazards, such as oil spills or collisions.



Defense and coastal monitoring:

Connecting remotely operated vehicles (ROVs) and autonomous underwater vehicles (AUVs) open new tools for maritime situational awareness and surveillance. Ubiquitous connectivity extends mission range and longevity.



Ocean observation/research: IoT sensors provide powerful tools for monitoring the marine environment for pollution, climate change effects and other human impacts.



Fish farming: Monitoring water quality, fish health, controlled feeding and escape prevention are just a few examples of how IoT aids in aquaculture enterprises.



New Blue Economy

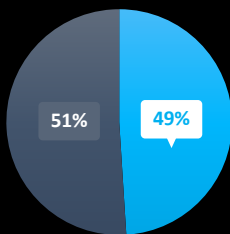


Key Challenges & Opportunities

- **Limited or no connectivity:** Availability of these powerful tools is limited by connectivity and affordability. By definition, coverage of the world's oceans and waterways is suited only to satellite connections that can go anywhere.
- **Basic sensors:** Many in use today are of the "beep IoT" variety, with inadequate data rates to meet the demand for artificial intelligence and machine learning at the edge.
- **Expensive:** Traditional satellite is prohibitively expensive for all but the largest operations.

Aquaculture rise

In 2020, aquaculture accounted for 49% of global fish production, compared to 51% for capture fisheries



Source: FAO

Costly diseases

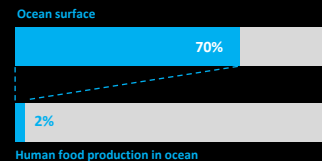
\$6 billion

The annual economic loss associated with aquaculture diseases worldwide was estimated to be more than US\$6 billion per year

Source: World Bank

Oceans' food gap

Although oceans cover 70 percent of the Earth, they account for less than 2 percent of human food production



Source: NOAA Fisheries



Solution: Affordable, Smart-IoT from E-Space

To achieve this scale and the benefits which can be derived, a new communication technology to connect the Smart-IoT device to the data center is needed with improvements in three areas:



Coverage must be ubiquitous, no gaps.



Connection speed must be high enough to allow for AI/ML interactions in the connected data center.



Easy install is required for massive deployments - as it is usually the largest contribution to the total cost of ownership (TCO).

A new approach

E-Space will provide a new class of ubiquitous, low-cost Smart-IoT services offering a large-scale solution to deliver vast amounts of data from hundreds of thousands of small, affordable devices. Those who thought this technology was out of reach or unavailable will be able to take advantage of cutting-edge solutions to optimize their operations.

Service anywhere

Connected smart devices will work with sensors and apps connected to a low Earth orbit satellite constellation for service anywhere on the planet. With high data rates, enhanced security and resilience, and actionable intelligence via AI and machine learning (ML), the system provides cost-effective deployment beyond today's IoT.