Space and Blue Economy

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SDG 14: Life below water

“Conserve and sustainably use the oceans, seas and marine resources for sustainable development”

• Supports the conservation and protection of oceans and their resources;

• Considers the sustainable use of submarine resources and their respective habitats, as well as the increase of economic benefits to Small Island developing States and least developed countries from such use;

• Champions the promotion of scientific knowledge and the adoption of new technologies to deliver results towards the achievement of the global agendas.
Marine Environment and the SDGs

• The most relevant SDG to the marine environment is SDG 14: Life Below Water
• However, the marine environment is linked to a very wide range of SDGs, with most prominent:

SDG 1: No Poverty

SDG 2: Zero Hunger

SDG 13: Climate Action

SDG 17: Partnerships for the Goals
Space technologies for marine monitoring

Global Navigation Satellite Systems (GNSS) are commonly used to monitor marine traffic and prevent accidents at sea, particularly ship collisions.

In case of an accident, the use of images generated by Earth Observation satellites can be critical in search and rescue operations and containing damages, especially pollution.

Earth Observation satellite data are often used to monitor changes in the marine environment.

One such change that is easily detectable through EO is algal blooms, commonly known as red tides.

Identification of harmful algal blooms can assist communities in protecting local coastal ecosystems.

Red tide at UAE. Photo @ C-wams project, Planetek Hellas/ESA retrieved from the ESA photo repository
EO for monitoring of oil spills

Earth Observation data, particularly radar data, can be used to create maps to monitor the spread of oil spills and to provide data in near-real time to authorities involved in clean-up efforts.

One such example is the explosion of the Deepwater Horizon rig in April 2010, which threatened the spawning grounds of the Atlantic bluefin tuna.

Radar data from European and international satellites were transformed into weekly maps showing the location, shape and size of the spill.

By overlaying the oil spill extent maps and the ‘spawning habitat index’, it was possible to see where and how often the oil spill overlapped with spawning grounds. Fortunately, the spawning hotspot in the west was apparently unaffected by the pollution, as observed from satellite images.
Satellite data for illegal fisheries monitoring

Global Navigation Satellite Systems technology is commonly used in monitoring commercial fishing vessels. The vessel monitoring system (VMS) employed universally within the European Union keeps track of vessels longer than 15m.

The vessels are required to emit a signal in regular intervals for authorities to track their operating locations.

If GNSS is coupled also with Earth Observation data (images), it is also possible for authorities to acquire instant proof of illegal activity during the non-emitting intervals and increase enforcement levels.

Vessel Monitoring System graph @ ec.europa.eu
Satellite data has long been utilised for monitoring of endangered species populations, including cetaceans.

GNSS trackers are commonly used to track marine migration routes and allow for monitoring of registered pods.

Earth Observation images also allow for monitoring of populations, including their nesting and feeding areas.

Monitoring population distribution however still remains a challenge.

Citizen science, coupled with online social platforms with geotagging, can prove the solution to data acquisition, as it allows for real-time reporting of sightings.

Dolphin. Photo retrieved from the NASA photo repository
United Nations Office for Outer Space Affairs

VISION

Bringing the benefits of space to humankind

MISSION STATEMENT

The core business of the Office is to promote international cooperation in the use of outer space to achieve development goals
Unique Roles of UNOOSA

CAPACITY-BUILDER: UNOOSA brings the benefits of space to humankind by building space capacity of non-space-faring countries.

GLOBAL FACILITATOR: UNOOSA plays a leading and facilitating role in the promotion of the peaceful uses of outer space.

GATEWAY TO SPACE: UNOOSA is the main UN agency on space matters and facilitates the coordination of UN activities using space technology to improve lives around the world.
Actions that countries can take to contribute to the promotion of space-based technologies within the context of the SDGs

- Awareness raising about the use of space technologies for environmental monitoring
- Integration of space technologies in monitoring and enforcement of regulation
- Provision of access to citizen science platforms
- Development of international partnerships for integrated adoption of space technologies
The importance of synergies

- The combination of the two (Copernicus and EGNSS) will allow both the monitoring and the achievement of some of the targets that are associated with the Goals:
  - **Monitoring** – enhancing the quality of data collected to help monitor the status of SDGs implementation;
  - **Achievement**, which envisages direct support from EGNSS and Copernicus in achieving specific SDGs.

UNOOSA and the European GNSS Agency *(ST/SPACE/71)*:

**European Global Navigation Satellite Systems and Copernicus: Supporting the Sustainable Development Goals**

EGNSS and Copernicus supporting SDG 14

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**Level of contribution in monitoring/achieving part of a target/indicator**

- ![Symbol](#) ![Symbol](#): Limited contribution
- ![Symbol](#) ![Symbol](#): Significant contribution

*United Nations publication: ST/SPACE/71*
UNOOSA supports the Committee on the Peaceful Uses of Outer Space (COPUOS), its Scientific and Technical Subcommittee, Legal Subcommittee, and related working groups.

COPUOS was established by the General Assembly in 1959 with 24 members. Since then, the Committee's membership has continued to expand (currently 92 members), though the Office serves all 193 Member States of the UN).
STSC and LSC

The Legal Subcommittee (LSC) discuss legal matters related to the exploration and use of outer space. Topics include the status and application of the **five United Nations treaties on outer space**, the definition and delimitation of outer space, national space legislation, legal mechanisms relating to **space debris mitigation**, and **international mechanisms for cooperation** in the peaceful exploration and use of outer space.

The Scientific and Technical Subcommittee (STSC) discuss matters related to the scientific and technical aspects of space activities. Topics for discussion include **space weather**, **near-Earth objects**, the use of **space technology for socioeconomic development**, or for **disaster management support**, **global navigation satellite systems**, and the **long-term sustainability** of outer space activities.
International Committee on GNSS (ICG)

- UNOOSA serves as the executive secretariat of ICG
- The ICG promotes voluntary cooperation related to civil satellite-based positioning, navigation, timing, and value added services
- Encourages coordination among GNSS providers
- Promotes the introduction and utilization of GNSS services in developing countries
- Assists GNSS users with their development plans and applications
- Contributes to the sustainable development of the world
- Assure GNSS interoperability and compatibility among providers and users globally for enhanced services and applications
ICG: Programme on GNSS applications

❖ United Nations Regional Workshops/training courses on the use and applications of GNSS
  ▪ Building the capacity of developing countries in using GNSS technology for sustainable development

❖ Reference frames and timing (WGD)
  ▪ To benefit operational geodesists or surveyors involved in positioning and measurement and potentially dealing with sea level changes. It is open to government, private sector, academic or graduate students in surveying or a related discipline (IAG, FIG, IGS)

❖ Space Weather and GNSS (WGC)
  ▪ Promotes the use of GNSS for scientific applications and space weather in developing countries
  ▪ Increased number of students and young scientists studying and using GNSS, including increasing participation by women, and many opportunities for research (improved imaging of the ionosphere over the equatorial region, ionospheric effects on augmentation systems...)
International Committee on Global Navigation Satellite Systems (ICG)

MISSION STATEMENT
The International Committee on Global Navigation Satellite Systems (ICG), established in 2000 under the umbrella of the United Nations, promotes voluntary cooperation on matters of mutual interest related to civil satellite-based positioning, navigation, timing, and value-added services. The ICG contributes to the sustainable development of the world. Among the core missions of the ICG are to encourage coordination among providers of global navigation satellite systems (GNSS), regional systems, and augmentations in order to ensure greater compatibility, interoperability, and transparency, and to promote the introduction and use of these services and their future enhancements, including in developing countries, through assistance, if necessary, with the integration into their infrastructures. The ICG also serves to assist GNSS users with their development plans and applications, by encouraging coordination and serving as a focal point for information exchange.

VISION STATEMENT
The International Committee on Global Navigation Satellite Systems (ICG) strives to encourage and facilitate compatibility, interoperability and transparency between all the satellite navigation systems, to promote and protect the use of their open service applications and thereby benefit the global community. Our vision is to ensure the broad satellite-based positioning, navigation and timing for peaceful uses for everybody, anywhere, anytime.

At the "United Nations International Meeting for the Establishment of the International Committee on Global Navigation Satellite Systems (ICG)" held on 1-2 December 2000 in Vienna, Austria, the ICG was established on a voluntary basis as an informal body for the purpose of promoting cooperation, as appropriate, on matters of mutual interest related to civil satellite-based positioning, navigation, timing, and value-added services, as well as compatibility and interoperability among the GNSS systems, while increasing their use to support sustainable development, particularly in the developing countries. The participants in the meeting agreed on an establishment of the ICG information portal, to be hosted by UNOOSA, as a portal for users of GNSS services.
THANK YOU