

Insufficient ocean knowledge

- ▶ The dearth of knowledge on the ocean stems from a variety of factors that broadly fall into two categories. The first has to do with ocean characteristics and physicochemical parameters, while the second set (1) is inherent to the specificity of ocean sciences, which are considered "mega science".
- ▶ With respect to the first category, it is important to emphasize the following:
 - ❖ Great depths are a hindrance to human exploration as a result of rising pressure, cold and obscurity.
 - ❖ Ocean depths cannot be mapped by radar as for the moon or Mars because sea water interferes with satellite radio waves.
 - ❖ The ocean's immense expanse would require 200 to 600 years to be mapped.
 - ❖ Acoustic data acquisition is made difficult if not impossible by rough seas and strong currents, which can displace sounder trajectories and even rupture cables connecting these to vessels (2).
 - ❖ Acoustic data quality is subject to spatial and temporal variations in water temperature and salinity (3), as well as changes in towed sounder positioning.
 - ❖ The materials and electronic components of devices deployed at sea cannot withstand the corrosive action of salt water and hydrostatic pressure (4).
 - ❖ Frequent and sudden variations in seabed topography and geological risks (earthquakes, subduction, volcanism, ...) render exploration difficult and dangerous.
- ▶ With respect to the second category of factors, the specificity of ocean sciences as a "mega science", multidisciplinary investigations are complicated by insufficient specialized human resources and extremely costly and sophisticated equipment requirements.

References

- UNESCO, 2017. *Global Ocean Science Report :The current status of ocean science around the world*. Paris : Editions UNESCO [[online](#)].

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End note

1. These are among the main conclusions of the UNESCO/IOC World Ocean Science Report.
2. Ocean spaces with strong currents, such as the Strait of Gibraltar, are genuine graveyards of scientific equipment and devices lost in oceanography campaigns.
3. Spatial or temporal variations in water temperature and salinity alter acoustic signal propagation. In fact, the acoustic wave is subject to refraction as seawater density changes.
4. Pressure rises with depth by one atmosphere for every 10 m, at 10 m it is 2 kg per cm² and at 10,000 m it is one ton per cm².

