

Towards a better understanding of our marine environment: of habitats, maps and engineering

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Our oceans cover ~70% of our planet and represent the biggest ecosystem on Earth. Still, we have better maps of Mars and the Moon than of the global seafloor, and it is estimated that less than ~25% of marine species have been described to date. At the same time, human activities are rapidly moving into deeper waters, as we look at the oceans for the provision of vital functions and for solutions to onshore problems. Some of our industrial activities have a direct impact on the marine environment (e.g. Oil & Gas installations, fisheries, deep-sea mining), while others are more indirect (e.g. ocean acidification, the global occurrence of marine plastics). As indicated by UN Sustainable Development Goal 14, limiting and managing our impacts on the ocean is one of the biggest challenges of this century. For this, we urgently require a better understanding of the marine environment.

This need can only be answered through integrated, collaborative research that looks at the oceans as a complete system. So many places are still completely unexplored, hence the research often starts with seafloor and habitat mapping. Inherently multidisciplinary, combining sonar, sampling, imagery and taxonomic approaches, habitat mapping aims to provide marine scientists, managers and users with a synthesis of the seabed characteristics, both in terms of environment and faunal community. Over the past 20 years, the field has developed quickly, particularly as the result of the increased use of new technologies. Marine robotic systems such as Remotely Operated Vehicles (ROVs), Autonomous Underwater Vehicles (AUVs) and gliders have provided unseen opportunities. We can now reach locations that previously were too challenging to explore because of their extreme depth or complex terrain, and can acquire, simultaneously, a multitude of high-resolution datasets that describe the entirety of an environment (seabed, watercolumn and faunal community).

This presentation will provide examples of habitat mapping work in key ecosystems such as submarine canyons, cold-water coral reefs, seamounts and hydrothermal vents. It will illustrate how the use of new technologies played a crucial role in the new discoveries, and what the next challenges and opportunities may be. With an initial qualification as 'Bio-engineer in Land- and Forest Management', a career in marine research was maybe not immediately obvious for me, but having a background that crosses several disciplines enabled me to transfer typical terrestrial solutions to the marine problems, and allowed me to look at our seafloor with from a different angle.