



# DEEP REST



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Conservation and restoration of marine ecosystems in the context of deep-sea mining

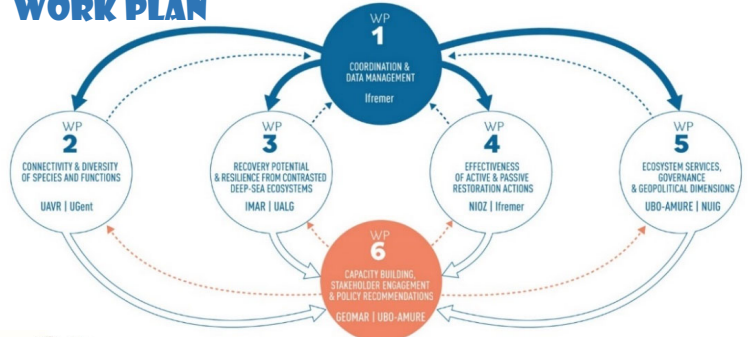
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## CONTEXT

Increasing demand for mineral resources worldwide for the car & nuclear industries, new technologies and also for renewable energies.

- Strategic mineral resources are found in deep-sea ecosystems including manganese crusts, **polymetallic nodules** and **seafloor massive sulfides**.
- Lack of **fundamental knowledge** about the biodiversity associated with these ecosystems, their functioning and the services they provide.
- Clock is ticking** : The International Seabed Authority (ISA) is currently drafting the mining code that will regulate mining operations in the Area and is working on the development of Regional Environmental Management Plans.
- Information on **how to mitigate the impacts** of future mining activities in deep-sea environments are of utmost importance.

## WORK PLAN



## OBJECTIVES

Develop a **novel approach** to improve our **conservation/restoration capacities** in two deep-ocean ecosystems threatened by mining : **nodules** and **hydrothermal vents**. Specific objectives are to:

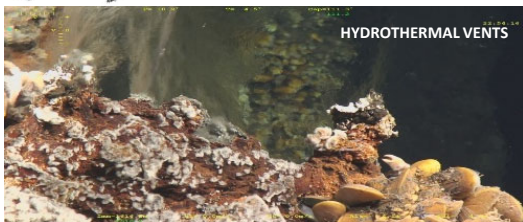
- Investigate and compare the **biodiversity, functioning & connectivity** of biological communities within and across ecosystems, linking to environmental conditions (WP2);
- Evaluate the **recovery potential** and **resilience** of deep-sea communities at different degrees of disturbance, identify indicators of change and characterize tipping points (WP3);
- Test, through experimentation, the **effectiveness of different restoration actions** on the recovery of communities (WP4);
- Evaluate **conservation/restoration outcomes** in terms of **ecosystem services** and identify the **governance arrangements** needed for efficient actions in concertation with stakeholders (WP5);
- Provide **scientific guidance to stakeholders and policy-makers** and **recommendations to support deep-sea governance**, ensuring a sustainable management of resources and conservation of ecosystems (WP5);
- Communicate with **stakeholders** and the **general public** on **issues linked to the exploitation** of deep mineral resources (WP6).



## EXPECTED IMPACTS

- Acquisition & integration of **fundamental knowledge** on biodiversity, functioning & connectivity in link with environmental conditions in nodules and vent ecosystems;
- Evaluation of socio-economic dimensions **in concertation with stakeholders** including identification of ecosystem services + potential costs & benefits of exploitation;
- Assessment of **conservation and restoration scenarios** to integrate **knowledge and concerns** from **scientists and stakeholders (industries, NGO's, international authorities)**;
- Development of **improved management strategies + identification of areas** to set aside for **conservation + as reference areas. Recommendations** for the design of "marine protected areas".
- Policy briefs** that will feed into the public debate. **Actions/interactions** with the general public + with students/classrooms.

## STUDY AREAS



## ACKNOWLEDGMENTS

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