

The ICySEASe project

PPR Océan Climat

Réunion axe polaire IUEM 12/01/2022

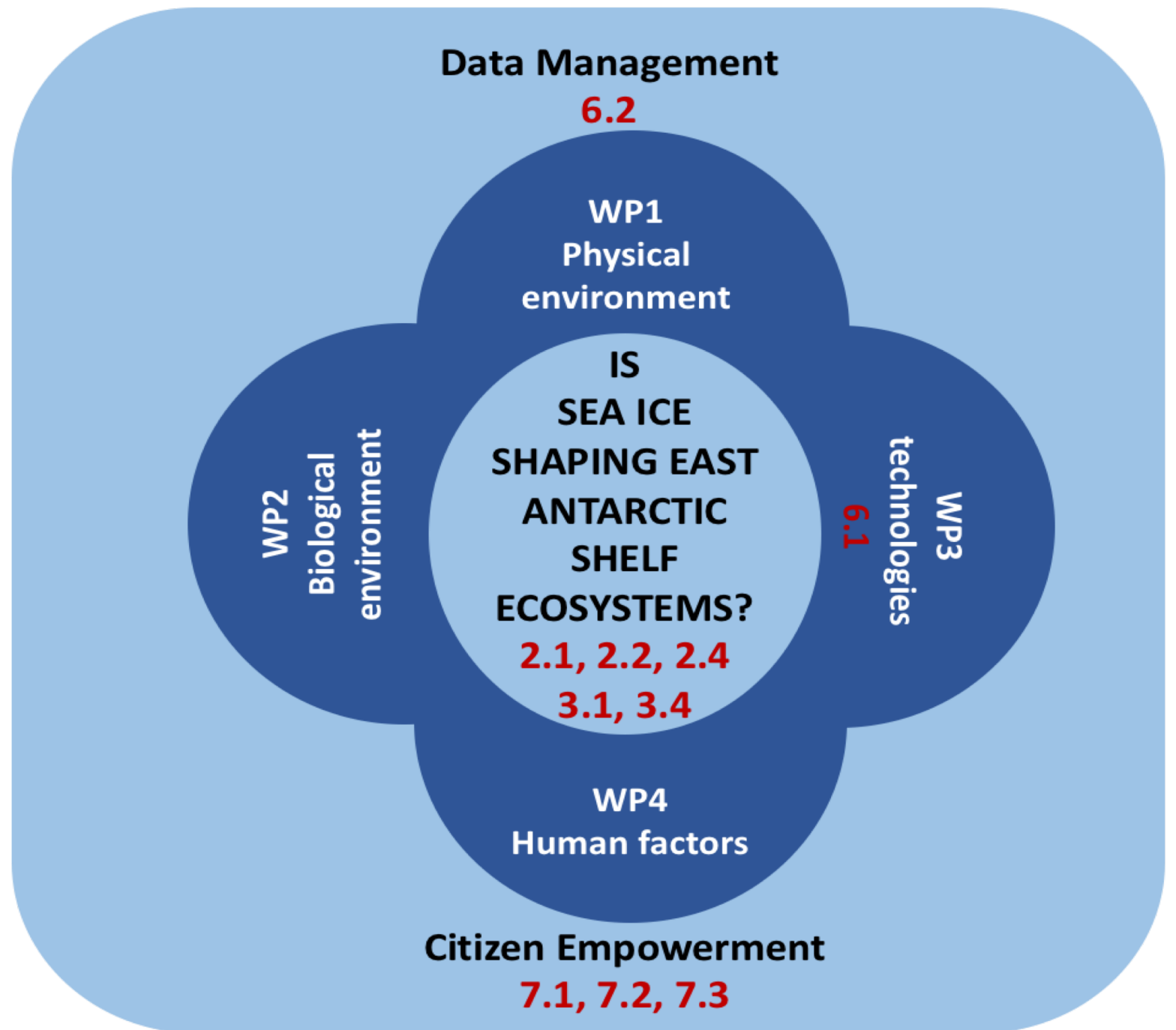
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In a nutshell...

- hypothesis: **Sea Ice dynamics is a central control of polar icy environments**
- The project will use a **multidisciplinary approach** to understand the role of sea ice and its multiple forms for ecosystem functioning
- We will use the Dumont d'Urville sea and the **DDU station** as a model region of icy marine environment
- Strong **technological developments** to observe above and under sea ice (including gliders, sensors and drones)
- Results will provide the scientific basis to establish a long term polar observatory to understand rapid environmental and ecological changes
- The project output will support the creation of a polar coastal MPA
- General Coordination by **Guillaume Massé** (CNRS) and **Marc Eléaume** (MNHN)

Project Structure



WP1: Marine ice and ocean physics as primary actors of the Antarctic shelf environment

- *Establish multi-scale maps of the **marine icescape*** (Multisensor approach: satellite, passive and active seismic)
- *Analysis of the **icescape variability** from seasonal to centuries and millennial time scales* (Sedimentary paleoenvironment)
- *Current functioning of the **physical marine environment** in the DTAD region* (Modelisation of water column 3D transport)

WP2: The State of East Antarctic Shelf Ecosystems. Structure, functioning and ocean forcings

- *Detailed view of **primary production** on the in the DTAD Shelf and its evolution on daily, seasonal, annual and interannual scales in relation to surface ocean conditions (Animal sensors, satellite and glider)*
- *Analyze the structure and cyclicity of the **micro to nanoplankton community** at the individual, metabolic and genome levels to understand the biotic and abiotic controls on the "Antarctic" microbial loop (In situ sampler, Metagenomics, bioinformatics)*
- *Describe **pelagic and benthic fauna communities** in the DTAD area in terms of composition, distribution, and functioning and establish relationships with surface ocean.*

WP3: Lifting technological latches for a leadership in polar science and conservation

- *Improving existing **biologging technology***
- *Developing a **lab-on-chip** integrated on a platform including data transmission and energy (harvesting and storage) facilities*
- *A ground-breaking **sensor for measuring Chl_a** in sea ice covered environments (carried by A. Penguins)*
- *DDU-Glider : a **coastal glider** underwater vehicle with multiple sensing capacities for operation in marginally icy environments*

WP4 : Science, diplomacy and civil society in the face of conservation challenges

- *Science and diplomacy interactions: how **conservation policies** are constructed in international organizations*
- *Science and civil society interactions: what is the general **public perception of conservation**?*
- *How ICySEASe's public commitment is shaping **citizenship attitudes towards conservation in Antarctica***

Contribution IUEM

- WP2 co-coordination (L. Maignien)
- WP2 Biogéochimie silicate (A. Leynaert)
- WP2 Partition Silicate benthique Pelagique (A. Leynaert)
- WP2 Observatoire génomique Plancton (L. Maignien)
- WP2 Modélisation dynamique des gènes et génomes (E. Faure)
- WP2 NCP et Fixation de l'azote (N. Cassar)
- WP2 Faune Benthique et sclérochronologie (J. Thebault)
- WP1 Imagerie satellite (F. Ardhuin)
- WP2 Acoustique (L. Chauvaud)