This project is funded by the European Union
(Grant agreement No. 641762)

ESSENTIAL Variables for Ecosystems: the ECOPOTENTIAL Contribution

Essential Variables are a minimal set of variables that describe a system's condition and trends by providing reliable, traceable, observation-based evidence for addressing **specific questions** and applications, including **monitoring**

ESSENTIAL **CLIMATE** VARIABLES (**ECVs**)	ESSENTIAL **OCEAN** VARIABLES (**EOVs**)	ESSENTIAL **BIODIVERSITY** VARIABLES (**EBVs**)
Atmospheric Temperature	Phytoplankton biomass	Species distribution
Atmospheric Precipitation	Chlorophyll-a	Ecosystem extent
(…)	(…)	(…)

Objective: Develop and implement a sound process to identify, select, calculate and validate the Essential Variables

7 VARIABLES USED ACROSS STUDIES AND SCALES IN **ECOPOTENTIAL**

- Ecosystem structure
- Ecosystem extent
- Ecosystem function
- Species populations
- Species distribution
- Atmospheric air temperature
- Atmospheric precipitation

Locally relevant
(identified and used at PAs)

Globally consistent
(used across scales)

ECOPOTENTIAL's framework has contributed to the conceptual framework on the identification of Essential Biodiversity Variables in GEOBON.
This project has made then a direct and long-term contribution to the GEO BON Implementation plan 2017-2020.
One of GEOBON's major tasks is now the identification of Essential Biodiversity Variables.

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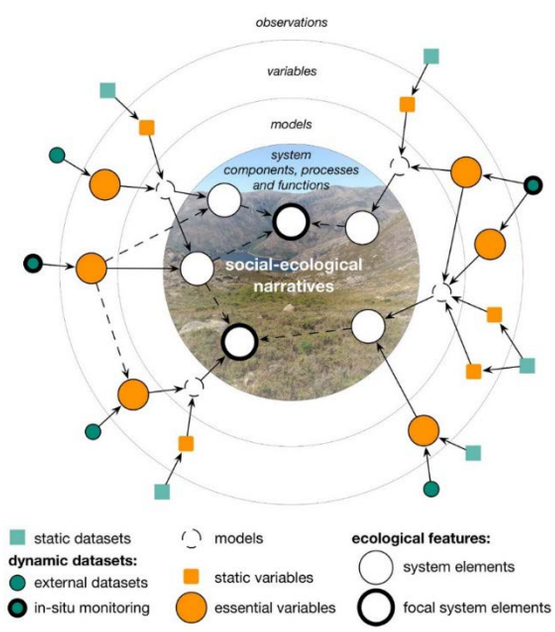
A bottom-up approach for the identification of Essential Variables

In ECOPOTENTIAL we have suggested a system approach, where conservation managers draw on system-level knowledge and causal diagrams to identify locally important variables that meet local or sub-global needs for monitoring data.

Four steps:

- Step 1. Develop narratives to describe and identify the major system components, functions and processes, and the underlying causal relationships that affect them.
- Step 2. Develop models to quantitatively address these system elements and their changes through time using static or dynamic variables.
- Step 3. Identify the set of variables that summarize observations to operationalize the models and create the foundation for the design and implementation of monitoring systems.
- Step 4. Prioritize which observations must be collected, considering both in-situ and remote monitoring activities and the practitioners' own needs



The arrows in the Figure differentiate between direct data dependencies (full lines) and the expected causal relations between system components and essential variables (dashed lines)

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