

**Title: Lessons learnt from existing Essential Variables and the way forward for Ecosystem Services.**

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**Abstract:**

Proposed for the first time in the 1990s by the Global Climate Observing System, the concept of “Essential Variable” (EV) led to calls for systematic observation of a selected set of critical variables. Since then, the international scientific community has proposed a set of essential thematic variables for climate (ECV), biodiversity (EBV), the ocean (EOV), and many more, intended to improve the monitoring of nature’s elements and to help detect on time extreme incidents. Entering the Anthropocene era, the need for considering the human element has emerged and hence, the need to generate EVs for Ecosystem Services (EESVs).

To support this initiative, we did an analytical study on “lessons learnt” from the existing EVs, we considered how ecosystem services are different from the other EV thematics and sought to suggest basic principles to be considered when proposing EESVs.

For this purpose, we reviewed the scientific (peer-reviewed and grey) literature on EVs in order to identify: the context under which different types of existing EVs have been created; their basic characteristics; the political and scientific context under which each has been defined as “essential”; and their current or potential use. From each publication we extracted information on: applied conceptual frameworks, criteria of selection, scalability of EVs, units of measurement, end-users (if applicable). In most cases, there was no explicitly defined framework applied. We then used the existing knowledge on EVs and Ecosystem Services (ES) to provide guidance for proposing Essential Variables for Ecosystem Services. We used the “lessons learnt” from our review and our knowledge on the ES concept to propose criteria to be considered for defining Essential Ecosystem Services Variables (EESVs).