



P1.60 - Optimal tool selection for EBM approaches supporting GES assessments: How sensitive is the guidance from the SEAS4GES decision support tool?

Steve Barnard^{1,2,*}, Anita Franco¹, Eva Amorim¹, Nadia Papadopoulou³, Christopher J. Smith³, Michael Elliott¹

¹ International Estuarine & Coastal Specialists (IECS) Ltd., Leven, United Kingdom, UK; ² Wolds Environmental Consulting Ltd, Beverley, UK
³ Institute of Marine Biological Resources and Inland Waters, HCMR, Heraklion, Greece; * corresponding author: steve.barnard@iecs.ltd

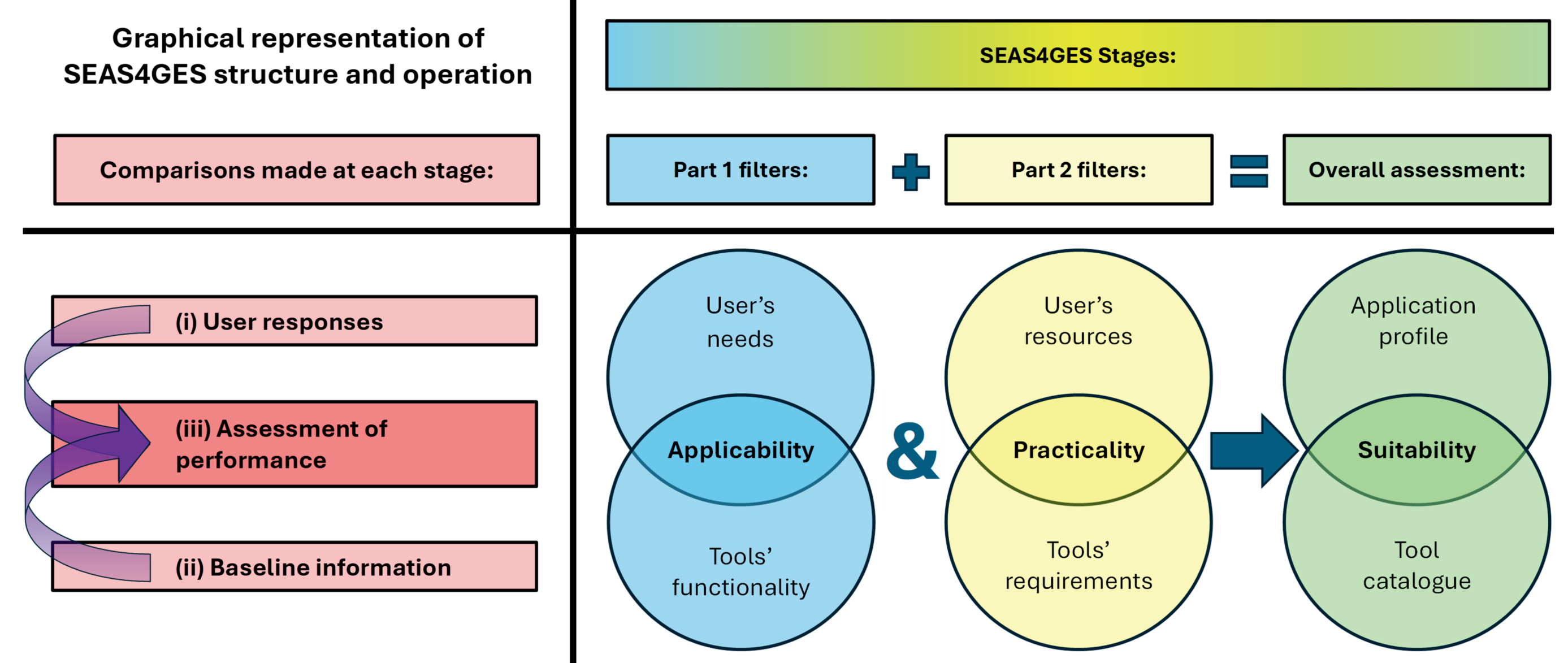


1. Introduction: Many different tools and approaches can be used to implement EBM as part of GES assessments, and that each comes with its own strengths and weaknesses (e.g. Berg et al., 2015), but what has the GES4SEAS project told us about the application of Ecosystem-Based Management (EBM) tools to GES determinations under the MSFD?

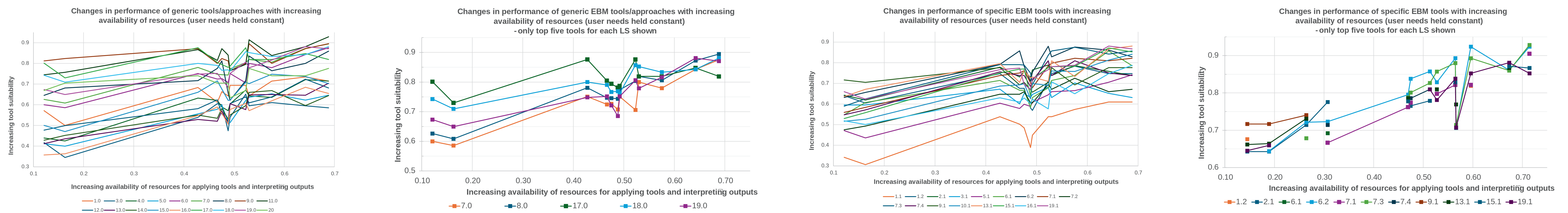
- We know that **EBM tools that support ecosystem-based management principles in marine spatial planning processes are important** – e.g. Galparsoro, et al. 2025;
- We know that **there is no ‘one size fits all’ approach**, and that **different situations call for different tools** – Papadopoulou et al., 2025; and
- We have **developed a decision support tool capable of identifying optimal EBM tools for specific scenarios** (Selection of Ecosystem-based Approaches 4 GES, SEAS4GES) – e.g., Barnard et al., 2026; and see related poster, P1.59).
- The **SEAS4GES tool assesses the overall suitability of EBM tools as a function of their applicability** (will the tool deliver what the user wants?) and **practicality** (can the user provide the resources required to apply the tool?). It considers both **generic EBM approaches** (e.g. simple assessment indices such as M-AMBI), and **prominent examples of specific EBM tools** (e.g. overarching assessment tools such as NEAT).

2. Sensitivity of the SEAS4GES tool: It is evident that optimal tool choice is related to the specific circumstances of each application, a combination of **user-needs** and **resource availability** (i.e. the **type and quality of input data**, and the **skills and experience of staff**).

- **In practice**, when looking to apply EBM tools or approaches to address either statutory reporting obligations or operational (management) needs relating to the EU MSFD, **users are likely to have only limited freedom of choice over their range of needs** (e.g., over the particular element, or application, of EBM that they need to address, or over which GES Descriptors they are concerned about).
- **Conversely, there is potentially much more variation in the user’s options around resourcing, and so in meeting the needs of particular tools.** For example, additional user-specific expertise may be co-opted onto a project, and access to ancillary data might be improved through increased cooperation with other agencies or research groups.
- The investigation reported here **examines how sensitive the SEAS4GES tool is in its responses to the estimation of overall suitability scores** for a suite of 35 EBM tools or approaches, **given changes in the level of resource availability**, as reported across the MARBEFES Project’s 13 Learning Sites (LS).



3. Performance & sensitivity (user needs held constant, resource availability varied by site):



- **For all assessments, the responses to the first set of filters (user needs) were kept constant**, based on responses provided by GES4SEAS colleagues from AZTI, **reflecting a standardised application scenario developed to provide feedback on the useability of the SEAS4GES tool from across the project’s 13 LS** - specifically, the responses were intended to represent a situation where the respondent assumed the role of a decision-maker, working in the national competent authority, and implementing the MSFD with a particular focus on using EBM tools to support single MSFD Descriptors/single issues (e.g., eutrophication, NIS, HABs) as well as wider GES assessments.
- **Responses to the second set of filters (user resource availability) were provided by other members of the wider GES4SEAS project team across the 13 LS** during the early development and testing of the SEAS4GES tool. These responses provided a wide variation in the users’ reported resource availability which reflected ‘real world’ situations.
- An **overall index of the level of resource availability** (based on the overall number of resource elements that the LS was able to provide) **was calculated for each LS**.
- For each plot, **estimates of tool suitability for each LS were plotted against the index of the LS resource availability** (derived from their responses to the second set of filters).
- The **outputs from these assessments from across all 13 LS are reproduced above** - for all generic EBM tools/approaches (plot 1), and for specific EBM tools (plot 3); and also for just the five top performing EBM tools/approaches, or specific EBM tools, at each LS (plots 2 & 4).
- Overall **each of the 35 EBM approaches and tools show a general increase in suitability as resource availability increases**. This was expected given the structure of the SEAS4GES assessment algorithms.
- The outputs also suggest that **the unique requirements of each tool generates non-linear ‘noise’ around the general increasing trend**, meaning that **changes seen in tool suitability will not be steadily incremental**. This arises from treating all aspects of the tools’ requirements as being equally important, whereas **the absence of a key resource for one EBM tool may be ‘critical’ whilst for another it may be considerably less important**.
- There is also a **considerable amount of variation in the make-up of the top five tools for each LS**. Across three of the assessments (plots 1, 3 & 4) between 10 and 12 tools appear within the top five identified across the 13 LS. In contrast, the assessments for generic tools/approaches based on Scenario S0.1 (plot 2) has the same set of tools appear in the top five across all of the LS. This firmly **underlines the concept of there being ‘no single best EBM tool’** (Papadopoulou et al. 2025), and **clearly demonstrates how different tools become more, or less, suitable with changes to the scope of the user’s application parameters** (i.e. changes either to their needs or, as in this study, resources).
- Overall, these results **show the SEAS4GES tool to be sufficiently sensitive as to discriminate between changes in tool suitability given relatively small changes in assessment inputs**, and that **it provides a consistent means of assessing how EBM tools vary in their suitability when presented with differing levels of user needs and resource availability**.

4. References cited:

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