

## Patch types in *Posidonia oceanica* meadows around Corsica. How can we use them in seascape ecology?

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The meadows formed by the Mediterranean seagrass *Posidonia oceanica* are subjected to various natural (e.g., water movement, light availability, sedimentation) and anthropogenic (e.g., anchoring, trawling, fish farms, explosives) phenomena that erode them and create diverse types of patches. The assemblage of the *P. oceanica* matrix and these patches creates particular seascapes. On the basis of this assessment, we aimed to investigate the importance of the patch type in structuring *P. oceanica* seascapes and to offer new prospects in the large scale studies of seagrass meadows.

Five sites encompassing large *P. oceanica* meadows ranging from 1.86 km<sup>2</sup> to 4.42 km<sup>2</sup> along the Corsican coast (France) were considered. Eleven patch types with different sizes, shapes and origins were identified using side scan sonar images (sonograms). Five were recognized as natural and five as anthropogenic. One can be of both origins. The resolution of the sonograms allowed to detect patches of various sizes ranging from 1 m<sup>2</sup> to 111 829 m<sup>2</sup>. The relation between structural characteristics of patches and the whole seascape aspect was explored using seven landscape metrics relevant for the study of meadows patchiness (patch area, mean radius of gyration, area-weighted radius of gyration, coefficient of variation of the Euclidean nearest-neighbor distance, area-weighted perimeter-area ratio, landscape division index, number of patches). Only a small number of patch types appears to play the strongest role in the characterization of the *P. oceanica* seascapes.

Furthermore, the use of seascape structures seems to be suitable for the development of new tools like indices for the assessment of human impacts on *P. oceanica* meadows. In this perspective we propose a new and simple index, the Patchiness Source Index (PaSI), to estimate the origin of the patchiness (natural or anthropogenic) for a given area. A landscape approach, as well as information on patch dynamic, should be integrated in the new indices that aim to assess the state of conservation of the whole *P. oceanica* ecosystem.