
Is there a link between *Posidonia oceanica* spatial configuration and coastal anthropogenic pressures?

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Abstract

Since the 70's, the landscape is considered as the most powerful integration scale for ecological processes and environmental relations, and is thus largely used for the study of continental systems. Yet, this scale is poorly used in marine ecology because of the lack of precise spatial data sets concerning seabed. Since 2014, a fine-scale cartography (1: 10 000) of marine habitats is available for the French Mediterranean coast (Andromède Océanologie 2014). This map was used to spatially study the impact of 10 anthropogenic pressures on marine habitats, and particularly on *Posidonia oceanica* meadows, which are indicators of the coastal water quality. The aim of this study is to test the effects of coastal anthropogenic pressures on *Posidonia oceanica* seascapes. Several seascape metrics are extracted from 100x100m grid cells, along 1800 kilometers of the Mediterranean French coast between 0 and 10 meters depth using the "SDMTools" package (VanDerWal et al. 2014) in R (R Core Team 2015). A first data set exploration using multivariate analysis (package FactoMineR, Husson et al. 2016) shows an important link between local pressures (aquaculture and anchorage) and the decline of *P. oceanica*, the mean patch area, the landscape proportion covered by *P. Oceanica* and the landscape division. A "randomForest" approach is also used to explain the seascape metrics by the available pressures (Holon et al. 2015). Ongoing analyses should link spatial seagrass configuration with pressure intensity. This work could make pressure impact and seagrass bed status monitoring easier by using aerial photography.

Keywords: Seascape, Anthropogenic pressures, *Posidonia oceanica*, Seagrass

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