

Assessment of carbon sequestered within the *matte* of the *Posidonia oceanica* meadow at the NATURA 2000 site “Grand Herbier de la Plaine Orientale”

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The coastal vegetation, and in particular the seagrasses, plays a major role in the fixation of carbon. *Posidonia oceanica*, a species endemic to the Mediterranean, is of particular interest because of the constitution of a particular structure, the *matte*, which enables the sequestration of carbon over long periods of time.

An initial assessment of the stocks of carbon sequestered within the *matte* has been undertaken in two sectors of the NATURA 2000 site “Grand Herbier de la Plaine Orientale”, Biguglia in the north and Aléria in the south.

The surface area of the meadow has been measured by means of the combined use of aerial remote sensing (shallow zone) and side-scan sonar (deep zone). The thickness of the *matte* has been assessed by means of seismic reflection using a 2.5 KHz sediment probe and a sparker. The calibration of the seismic data was performed by scuba diving at the level of *intermatte* cliffs, clearly visible on the seismic profiles.

The seagrass meadow at the NATURA 2000 site extends from 3 to 41 m depth and covers an estimated total area of 22 667 ha, or 52.4% of the bottom between 0 and 50 m depth. The speed of propagation within the *matte* (celerity), estimated by comparison of the field data (*intermatte*) and the seismic profiles, ranges from 1 600 to 1 700 m.s⁻¹. The thickness of the *matte*, estimated on the basis of the mean celerity, is on average 2.7 m for the Biguglia zone where it may locally exceed 8 m; it is on average 3.2 m for the Aléria zone where it may exceed 13 m, in particular off the mouth of the coastal river Tavignano. The presence of *matte* beneath the sediment should also be noted in patches of sand within the meadow and also beyond the lower limit. The quantity of carbon sequestered at this NATURA 2000 site may exceed 60 million tons. However, it would be necessary to carry out coring within the *matte*, in several representative sectors, in order to assess more accurately the amounts of carbon sequestered at this site.