

## AI-Driven Surveillance of Boat Mooring & Marine Habitats in the Lerins Archipelago



### Context:

The Iles de Lerins face a notable environmental challenge, with vast numbers of boats choosing to moor in areas rich with *Posidonia Oceanica*, a renowned and protected species endemic to the Mediterranean Sea. Current regulations and the presence of an eco-mooring park have not effectively alleviated the pressure on these critical habitats. Spearheading the initiative to rectify this are dedicated professionals from the marine protected area, Natura 2000, supervised by the city of Antibes. Their mission is to devise and implement strategic measures that enhance the mooring regulations, ensuring the conservation of the *Posidonia Oceanica*.

### Objectives:

At the heart of this initiative is the aim to alleviate the mooring pressure on *Posidonia oceanica* within the Marine Protected Area (MPA), especially around the Lerins Island due to its heightened vulnerability. **The immediate task for this specific proposal is to delineate a clear baseline, capturing both the current marine habitat coverage, which includes the *Posidonia Oceanica*, and an exhaustive understanding of the boat mooring patterns (timing, location, frequency, boat dimensions, etc.).** From this initial work, MARRES students will be architecting an array of potential solutions, that will be presented to key decision-makers. A core component of these solutions will be the conceptualization of a novel eco-mooring project, meticulously crafted considering technical, environmental, and financial dimensions.

### Methods:

The roadmap to address these challenges is multifaceted. Initially, there will be an intensive phase of research and data accumulation, focused on capturing the current dynamics of *Posidonia Oceanica* presence and the boat mooring behaviors within the region. From September 14-17, the MARRES students will be on-site, gathering data pertinent to marine biodiversity and human influence around Iles de Lérins. They aim to meticulously document 1) The *Posidonia* coverage landscape and 2) The boat mooring patterns within the region. To achieve this, innovative methods like drone-based mapping will be employed, offering frequent updates over the four-day span. Post this intensive phase, a designated technician will continue this data collection, ranging from weekly to monthly intervals. **The vast data reservoir generated, i.e. drone pictures, encompassing both boat activities and possible marine habitat variation, will need you to be analyzed, including through image processing and artificial intelligence.** Ensuring seamless project progression, the data science students will maintain regular communication with the MARRES team, aligning their objectives and methodologies for maximum efficiency.