

## PLEASURE BOAT ANCHORING PRESSURE IN A PROVENCE COVE

N. Frachon<sup>1</sup>, P. Bonhomme<sup>1\*</sup>, C. F. Boudouresque<sup>2</sup>, D. Bonhomme<sup>1</sup>, D. Nerini<sup>2</sup>, L. Le Mire Pecheux<sup>3</sup>, P. Astruch<sup>1</sup>, E. Rouanet<sup>1</sup>, A. Accornero-Picon<sup>3</sup> and M. Harmelin-Vivien<sup>2</sup>

<sup>1</sup> GIS Posidonie, Groupement d'Intérêt Scientifique pour l'Etude de l'Environnement Marin, Aix-Marseille University, Campus Universitaire de Luminy, Case 901, 13288 Marseille Cedex 09, France - patrick.bonhomme@univ-amu.fr

<sup>2</sup> Aix-Marseille University, Mediterranean Institute of Océanography (MIO), Université du Sud Toulon-Var, CNRS/INSU, IRD, UM 110, Campus Universitaire de Luminy, Case 901, 13288 Marseille Cedex 09, France

<sup>3</sup> Parc national des Calanques, Bât A4 Parc Valad, Impasse Paradou, 13009 Marseille, France

### Abstract

Anchoring pressure was precisely evaluated with the AP-AP system in Sormiou Cove (Provence, France, NW Mediterranean Sea). The image analysis (30 000 pictures) under GIS allowed to georeference anchored boat position and determinate the anchoring density per hectare and per day, during an annual cycle.

**Keywords:** *Posidonia*, North-Western Mediterranean, Monitoring, Mapping, Marine parks

### Introduction

Ecological importance of *Posidonia oceanica* meadows makes their decline particularly worrying [1]. The regression of *P. oceanica* meadows in the NW Mediterranean is therefore an issue of growing concern. A variety of human activities threaten *P. oceanica* meadows, e.g. pollution, water turbidity, trawling, invasive species and anchoring. Beyond a given level of anchoring pressure (number per hectare, frequency), the rhizome growth cannot compensate for shoot and rhizome losses. Breaks then develop within the mat. The anchoring pressure was assessed by the AP-AP system (Anchoring Pressure by Automatic Photography) developed during the research program 'Liteau III FHUVEL' [2]. The goal was to compare spatialized maps of the anchoring pressure and of the status of the *P. oceanica* meadow.

### Material and methods

The study site was Sormiou Cove, a popular site for leisure boating and anchoring, mostly covered by *P. oceanica* [3], close to the city of Marseilles. Sormiou Cove is included within the recently established 'Parc national des Calanques'. 30 000 pictures taken by the AP-AP system (May 2010 through April 2011) were georeferenced under GIS.

### Results and discussion

During the one-year study period, 5 920 boats anchored over the 25.5-ha surface area where anchoring is authorized. Anchoring occurred mostly (95%) during the high season (May through September). The highest recorded daily frequentation was 255 boats (July 11th) while the highest recorded simultaneous frequentation was 101 boats (August 22nd, 15:14). Sailing boats constituted the dominant category (44%), followed by motor boats less than 10 m long (30%), with conspicuous fluctuations according to the day of the week, the month and the wind strength (Figure 1).

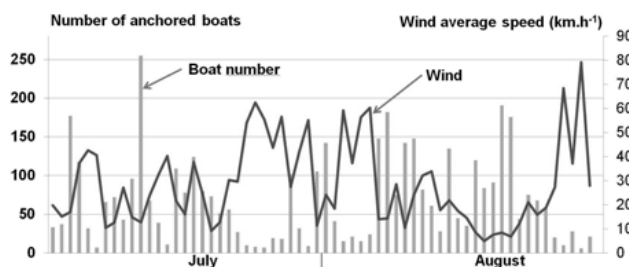


Fig. 1. Number of anchored boats per day according to wind strength (July and August 2010).

The anchoring process began at 9:00 and peaked from 12:00 to 14:00. The mean duration of the stay at anchor was 6 h 18 min, the record being 9 days. The sailing boats were concentrated in the centre of the cove, close to the line of marker buoys delimiting the area of unauthorized anchoring. The highest local density of anchored boats was observed in the centre of the cove, 6 boats/ha/d (annual average) and 22 boats/ha/d (August average) (Figure 2).

The thresholds of maximum sustainable anchoring pressure on *P. oceanica* meadows are 2 boats/ha/d (annual average) and 10 boats/ha/d (at peak periods) [4]. Though the validity of these recommendations requires confirmation, it is worth noting that the Sormiou Cove anchoring pressure locally exceeds the above mentioned thresholds (upon 2 ha of meadow). The monitoring of the *P. oceanica* meadow will allow to confirm, to invalidate or to adjust the thresholds proposed by the authors above mentioned.

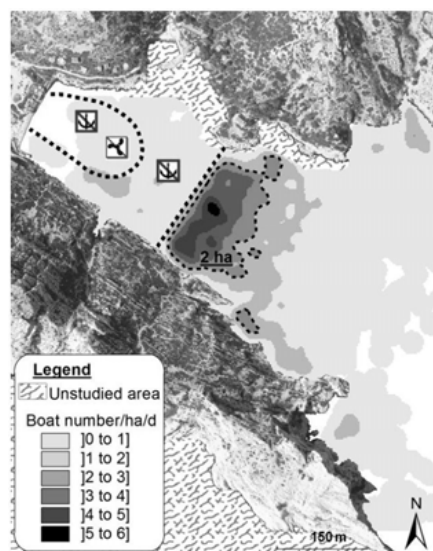


Fig. 2. Anchoring pressure (boat number/ha/d)(May 2010 through April 2011).

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