DONIA: the mobile application for more respectful anchoring



ANDROMEDE OCEANOLOGIE

L'OEil d'Andromede

RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

agence de l'eau
RHÔNE MÉDITERRANÉE CORSE

NAOS

ANDROMEDE
OCEANOLOGIE

- A scientific Expeditions division,

to **Explore and Magnify**

The Gombessa explorations take on three challenges : a scientific enigma, extreme dives and never-before-seen images.
The film 'Gombessa V: Mediterranean Planet' has been seen by 51 million people.
Laurent Ballesta is Wildlife photographer of the year 2021.



- An R&D division, to

Research and understand

- 'Research Tax Credit' accreditation since 2014
- Joint laboratory with the University of Montpellier,
- Reconised by the Agence Nationale de la Recherche since 2017.
- Responsible for implementing the following networks Water quality monitoring for the Mediterranean Sea.



- An Engineering Division, to

Protect and Restore

We provide support for coastal and offshore projects With high environmental ambitions.

- Upstream, studying the impact.
- During the works : assisting the project owner and implementing measures to limit the impact.
- Deploy ecological measures.



ANDROMEDE OCEANOLOGIE *présente* DONIA ENJOY & PROTECT THE SEA TOGETHER



Founded in 2008, **Andromède Océanologie** is an SME of around fifteen people, driven by a dual culture**: a passion for the sea, and scientific innovation to study and protect it**.
As field researchers, we spend more than six months a year at sea, and we translate our R&D into tangible action.
Passionate and daring, we know how to mobilise significant resources to build innovative solutions.

Posidonia (*Posidonia oceanica*) is an underwater plant that lives exclusively in the Mediterranean, at depths of up to 40 metres.
Its vast **meadows play essential ecological and economic roles**. Posidonia is a protected species.
Yet it is being **destroyed** at a dramatic rate by the **anchoring of boats**.

Fortunately, there are solutions: **Inform, and provide ways to anchor out of the seagrass** (the DONIA app) or moor to buoys (DONIA Mooring).

POSIDONIE

Identity card

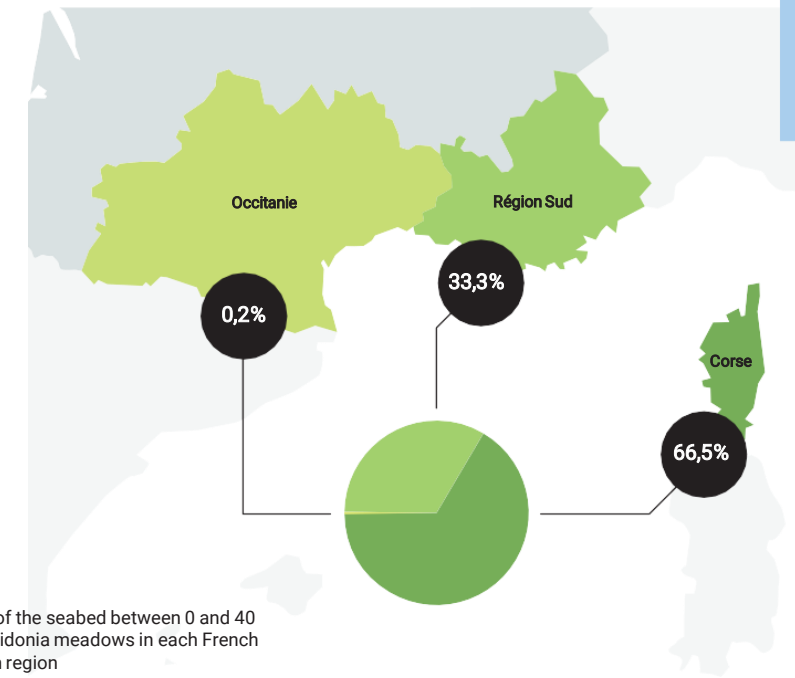
Name : *Posidonia oceanica*

Habitat : mediterranean coastline only

Depth : forms vast **underwater meadows** between 0 and -40 meters

Constitution : bundles of leaves, rhizomes and roots

The tangle of rhizomes, roots, scales and sediment trapped in the infractuosities make up the **matte**.



Coverage (%) of the seabed between 0 and 40 metres by Posidonia meadows in each French Mediterranean region

Posidonia meadows currently cover a surface area of **78,934 ha in the French Mediterranean.**

- Some areas of Occitanie have lost more than 90% of their Posidonia surface area over the lastlast 50 years
- Many areas with Posidonia are still degraded by the impact of anchoring
- Around a hundred small areas are showing a recovery of Posidonia



Trois fruits dans l'herbier



La fleur de *Posidonia oceanica*. Certaines années, des fleurs sont produites entre août et novembre.



Fruit et graine de posidonie

© Laurent Ballesta

Multi-service protected species

Posidonia is not just another species.

Scientists attribute 25 ecological roles to it.

- It **produces so much oxygen** that it has been dubbed the 'lung of the Mediterranean'.
- It **stores carbon**, which is then 'removed' from the atmosphere
- It **purifies water** by filtration
- It provides a **habitat for thousands of species**
- It **contributes to the nutrient cycle**
- It **stabilises the seabed**
- It **slows coastal** erosion**...**

Posidonia consists of leaves and rhizomes (creeping stems). and roots. This tangle, known as 'matte', traps sediment.

The carbon captured sustainably by coastal marine ecosystems (mangroves, salt marshes and seagrass beds) is known as **'blue carbon'.**

This is as much carbon less in our atmosphere, which slows down climate change.In this role, Posidonia oceanica is the most effective of the sixty-four species of seagrass beds*.

* Source : Monnier *et al.*, 2020

The economic value of seagrass beds is considerable. According to a study by Costanza et al (1997), it is :

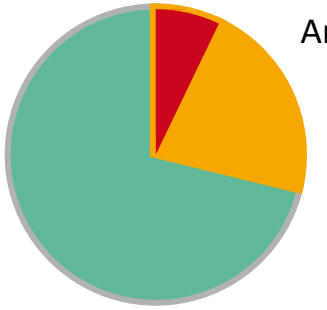
- **3 times greater than that of coral reefs,**
- **10 times that of tropical forests.**



POSIDONIE

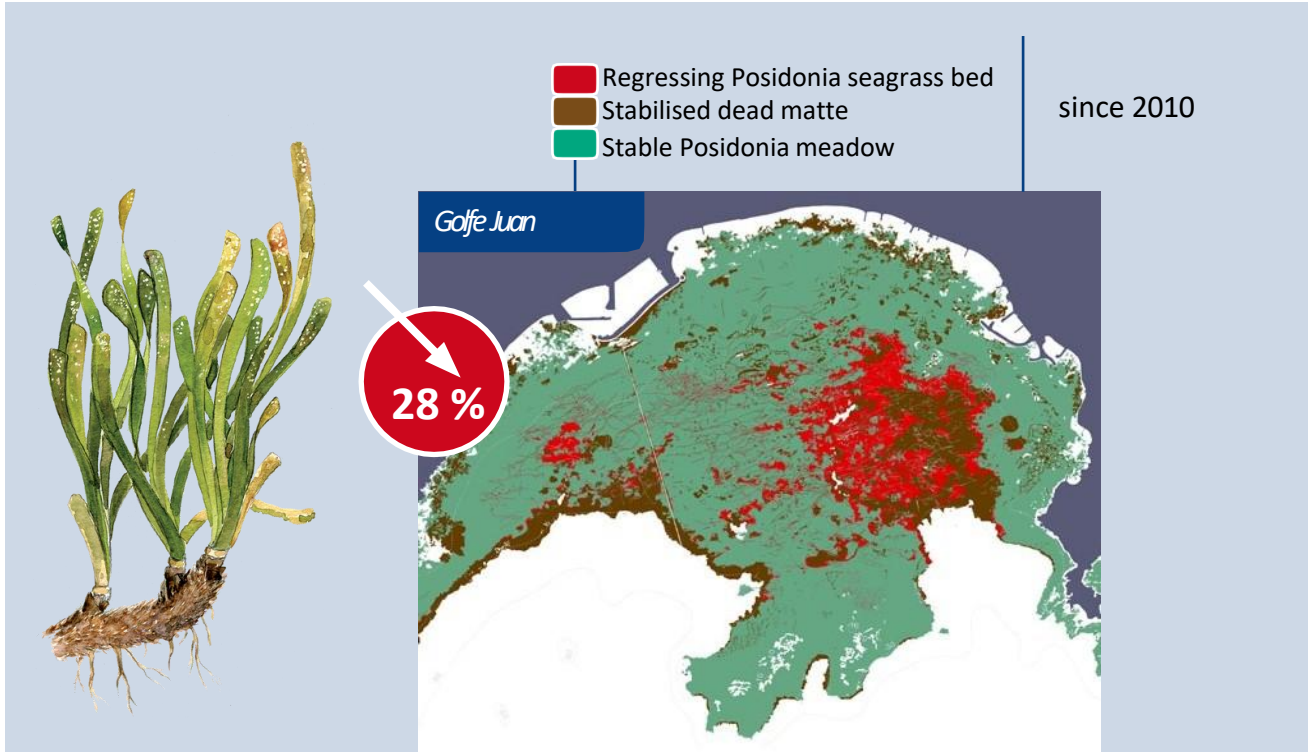
The impact of anchoring on posidonia

10 % **of Posidonia meadows have disappeared**
in the Mediterranean in 100 years,
And up to



more than 30 % in certain sectors **in just a few years.**

In the Gulf of Saint-Tropez, more than 145 hectares have disappeared since 2010.
In Golfe Juan, more than 225 hectares have been lost since 2006.





Source : cahier de surveillance Medtrix n°6

The damage is exponential as recreational boating continues to increase.

+ 449 % **anchorages each year**
for vessels between 24 and 60 meteres

+ 12 000 **Additional boats**
registered each year

24 % anchorages are made on the Posidonia, most of them by 40 to 60 m long boats.

30 % of coastal habitats are under threat.

POSIDONIE

The impact of anchoring on posidonia

Posidonia is torn or crushed by boat anchors and chains when the anchor is dropped and raised. This is also the case throughout the anchoring period, as the chain on the seabed rotates with the boat every time the wind changes.

In France, some sectors of the southern region have lost up to **30 %** In few years







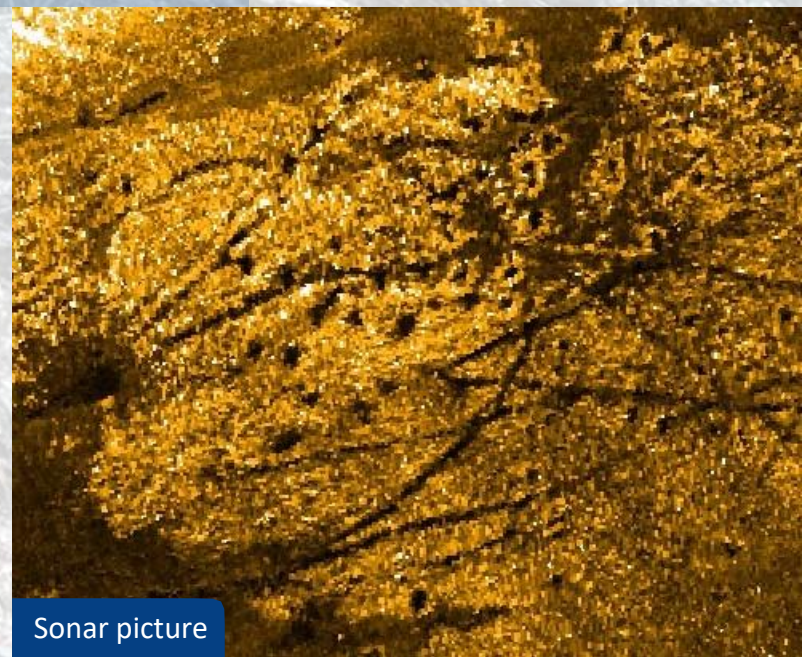
With their chains, these anchors weigh up to two tonnes and scrape the seabed for several hundred metres.
(for boats between 40 and 60 metres long, the most numerous to drop anchor in the Posidonia).

Posidonia is torn **out in blocks, with its roots:** regrowth is almost impossible.
What remains grows back **very slowly.**



The scars remain visible for **several decades.**

In the Mediterranean basinPosidonia meadows have already lost 10% of theirof their surface area over the last 100 years



Sonar picture

© Laurent Ballesta

DONIA

The free application that guides anchors out of seagrass beds

While it is true that ships' anchors **have caused significant damage to the seabed** and in particular to the Posidonia meadow in the Mediterranean, it is possible to **limit this impact with appropriate regulations and mooring aids** that are accessible to all.

Pour cela, il faut faire évoluer les comportements, en sensibilisant et en fournissant des moyens d'éviter l'ancrage dans la posidonie.

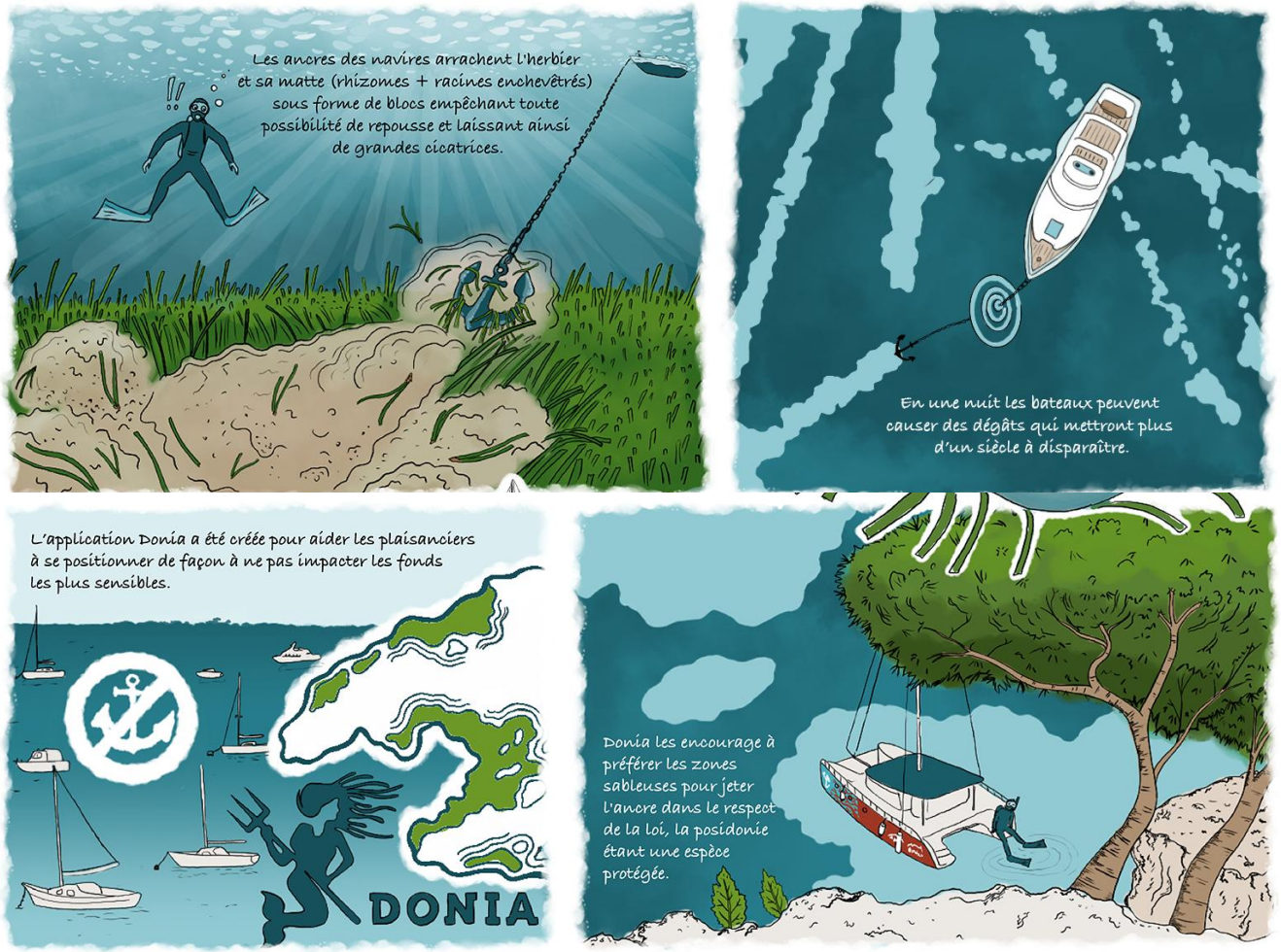
More than one in four yachtsmen drop anchor in Posidonia meadowsalong the coasts of the Alpes-Maritimes and Var. With DONIA, users can help preserve this sensitive habitat.



DONIA, an app for all vessels, whatever their size



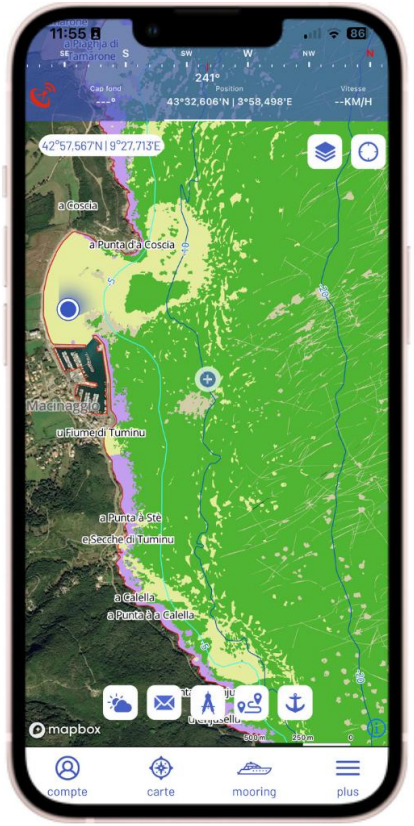
The application can be downloaded free of charge



DONIA: an application that guides boat anchoring to protect seagrass beds (© Aline Faure).

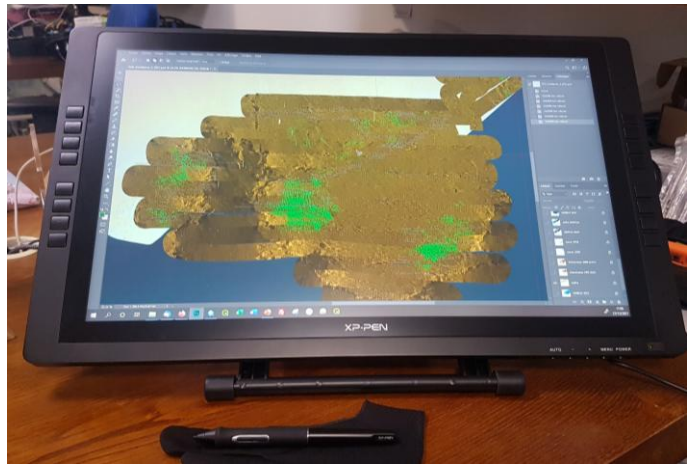
Cartography: the heart of the application

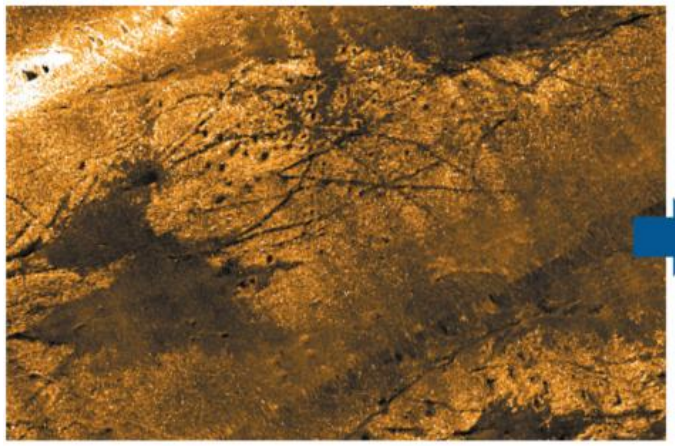
DONIA's essential function is **to guide users** (yachtsmen, fishermen, divers, etc.) away from fragile ecosystems (including Posidonia and coralligenous reefs).



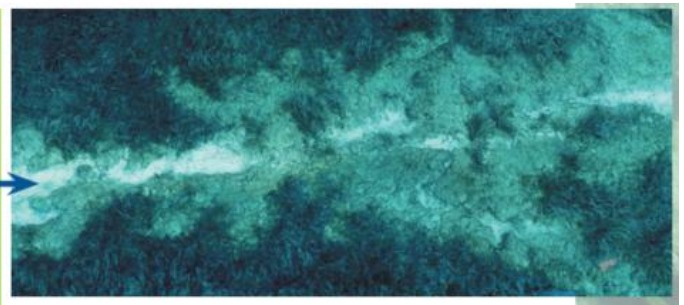
To do this, the application **relies on cartography**. This is done upstream using **side-scan sonar** towed behind the boat, then downstream by processing the data manually by a cartographer.







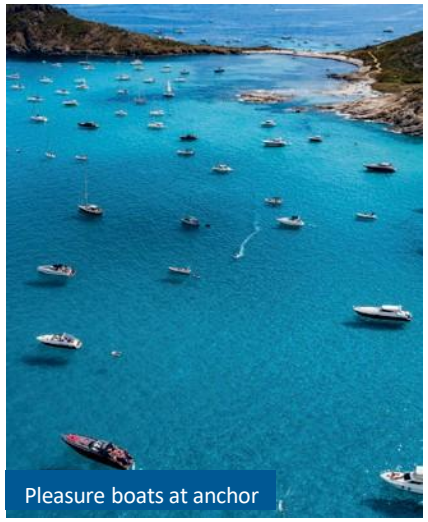




Damages caused by anchoring is mapped used sonar data.
Diving confirms anchorages impacts in living seageass meadow.

Cartography: the heart of the application

To avoid conflicts of use and make it easier to manage the impact of ships mooring, it is essential **to locate, quantify and monitor** the areas subject to this pressure.

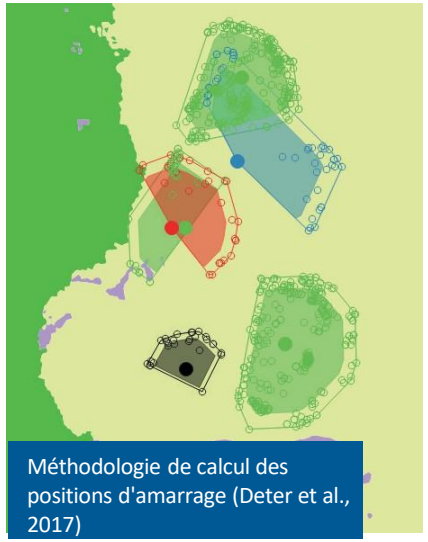


Pleasure boats at anchor

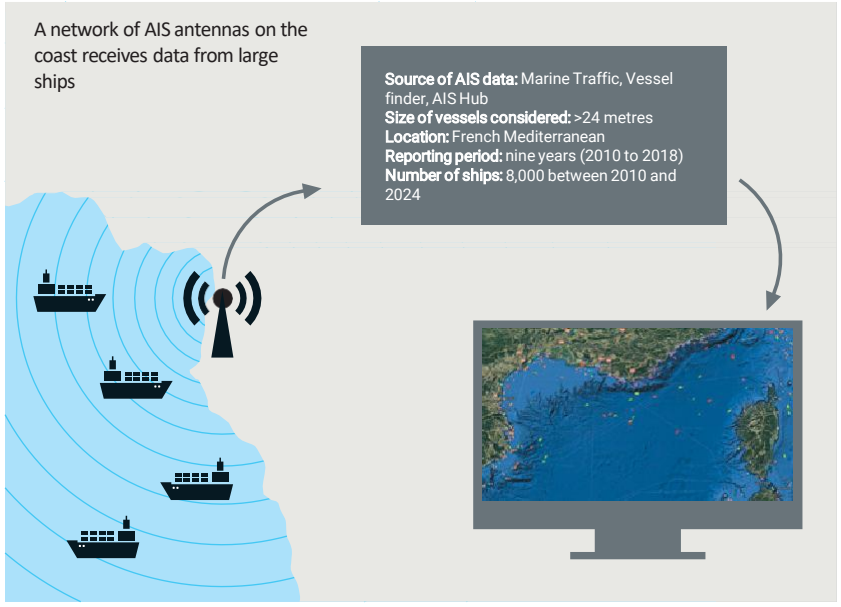
How can anchoring pressure be quantified and mapped?

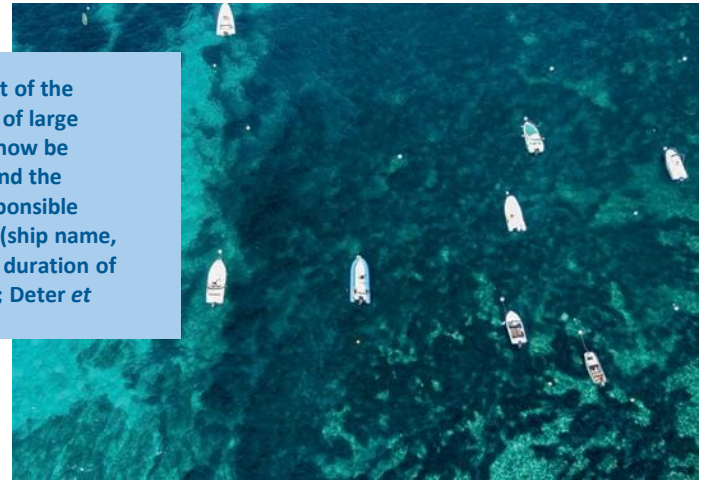
Since the end of 2004, AIS (**Automatic Identification System**) data has been a mandatory navigation safety tool on board ships of more than 300 tonnes in international waters, ships of more than 500 tonnes not in international waters and all commercial passenger ships, regardless of size, for safety reasons (International Marine Organization (IMO), 2016).

AIS data can be used to locate ships' anchorages.



Méthodologie de calcul des positions d'amarrage (Deter et al., 2017)

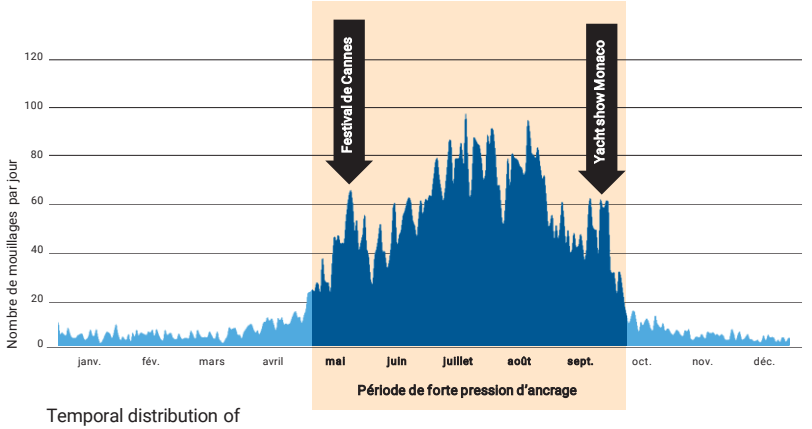




The impact of the anchoring of large ships can now be mapped and the vessel responsible identified (ship name, size, date, duration of anchoring; Deter *et al.*, 2017).

Anchoring pressure :when is it strongest?

From May to the end of September
Local eventsWeekend (Friday to Sunday)
Meal times (12pm and 8pm)



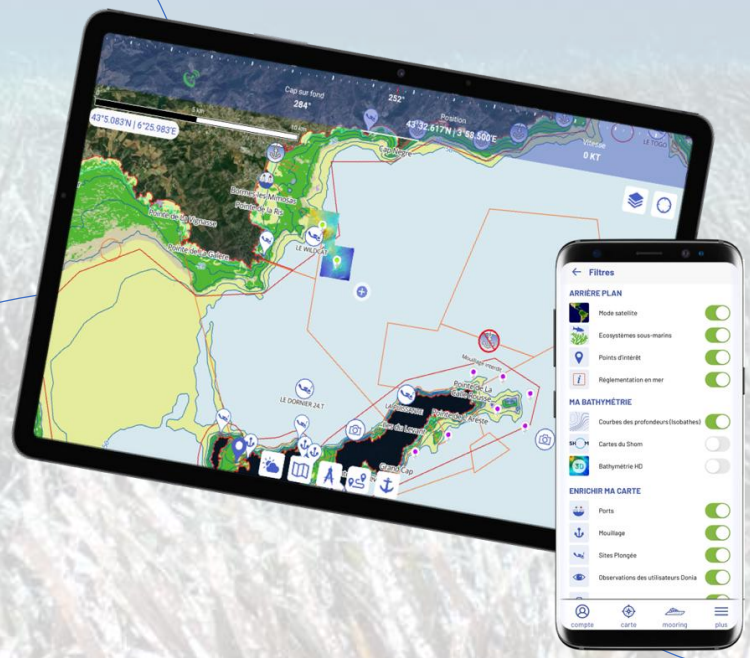
Temporal distribution of anchoring pressure

Integrated functions

Sailing and nautical activities

- Information on ports, sites of interest, mooring buoys, biocenosis, isobaths, etc.
- Tools for measuring, recording routes, etc.





Security

- Danger warning
- Anti-collision, l'ancre skid and chain entanglement alarms.
- Real-time display of the EASIS.



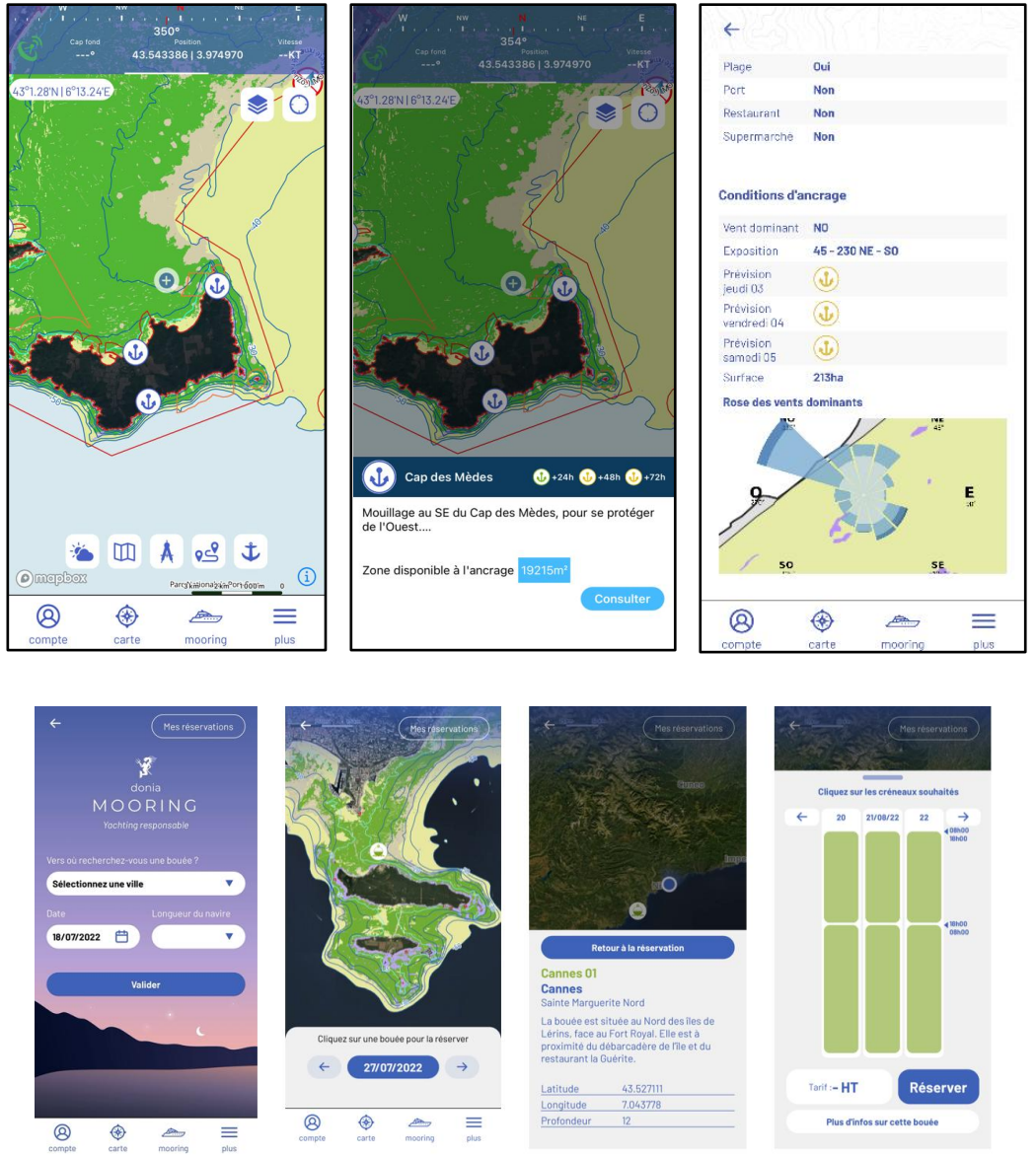
A community of users

- **Addition of 'spots'** based on observations (diving or fishing sites, anchorages, hazards, biodiversity, etc.).
- **Real time display** of connected boats.
- Discussion via **DONIA messaging system**.
- Gallery of **georeferenced underwater photographs** by the famous photographer Laurent Ballesta.



Sailing and nautical activities

DONIA incorporates **navigation-related functions** such as measurement and route recording tools.
It is also possible to access **SHOM charts and numerous bathymetric charts** (DONIA Premium).
DONIA offers a simple and **complete display of port information**, as well as numerous dive sites, anchorages, etc.
A module for **reserving DONIA Mooring buoys** has been integrated into the application, giving boats from 24 to 70 m access to secure, connected structures for mooring as close as possible to sites of interest.



Security

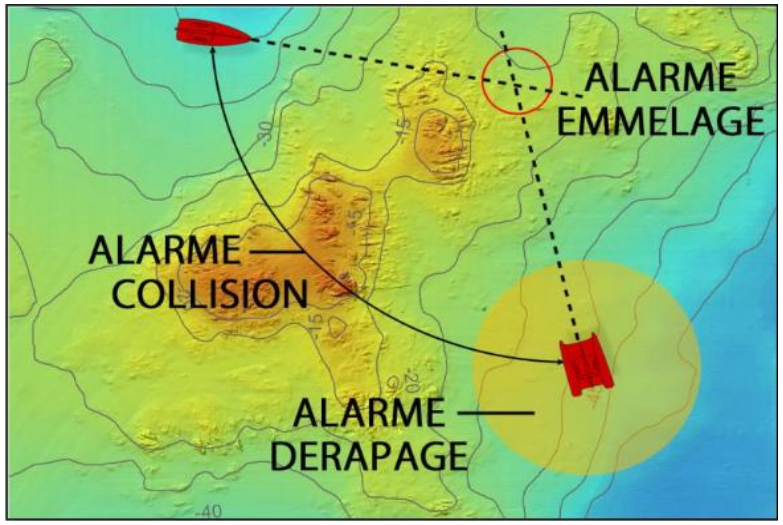
DONIA's main function is to **provide a safe, ecological anchoring aid**.

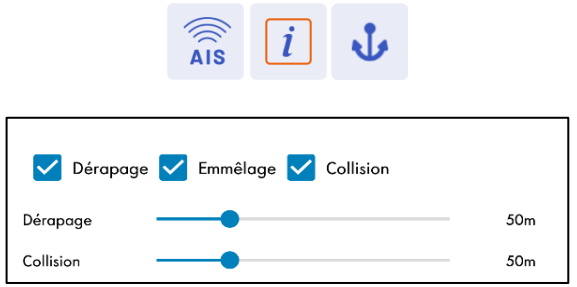
In addition to the map of biocenoses, **tools are available to ensure safe anchoring**: weather forecasts associated with safe anchoring sites, skid, collision and entanglement alerts.

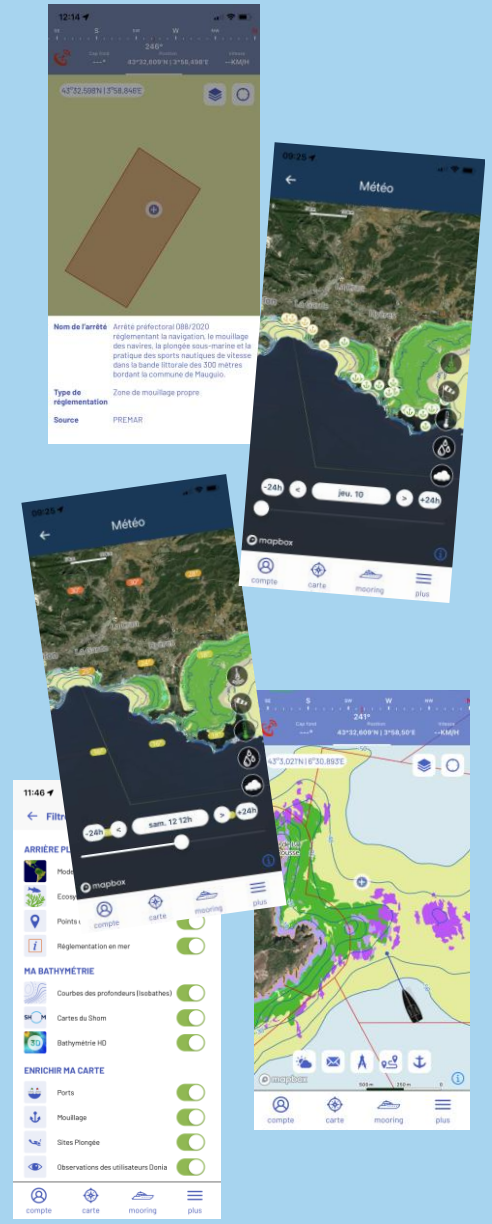
SOS alerts can also be launched and notified in DONIA.

The **regulations are displayed** according to the size of the user's boat. **They are updated regularly.**









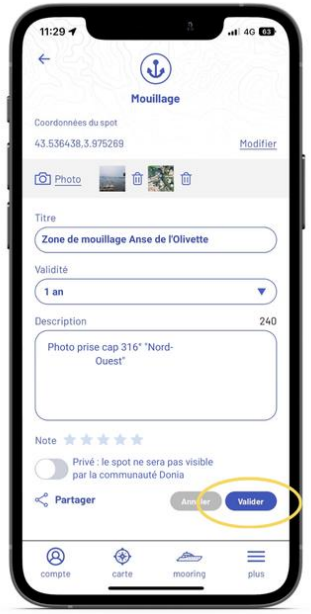
Integrated functions

A community of users

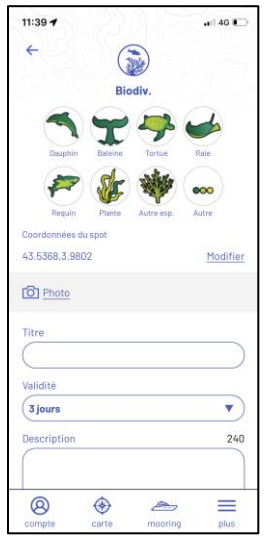
As a **community application**, DONIA aims to enable users to experience the famous maritime solidarity.

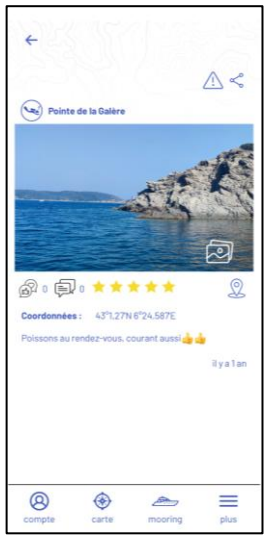
- To do this, it has a **messaging system**, a **directory** of contacts and friends, and a comment and rate system.
- It is also possible to view the position of **AIS boat** and others **DONIA users**.
- DONIA has a system for **adding observations**. You can **add information** in real time, such as pollution, species observed, interesting anchorages, dangers, etc.

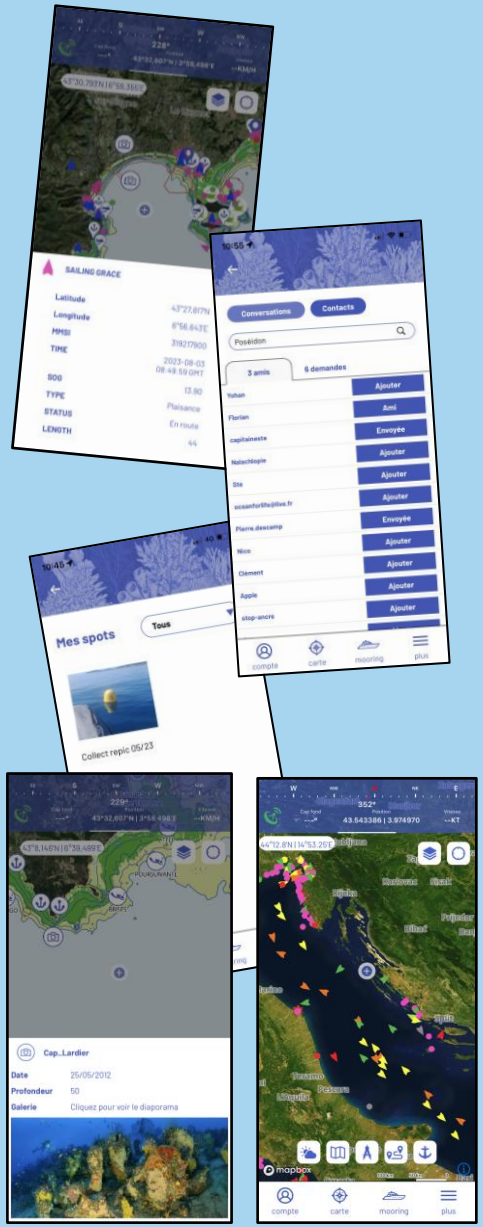












DONIA

A tool with concrete results



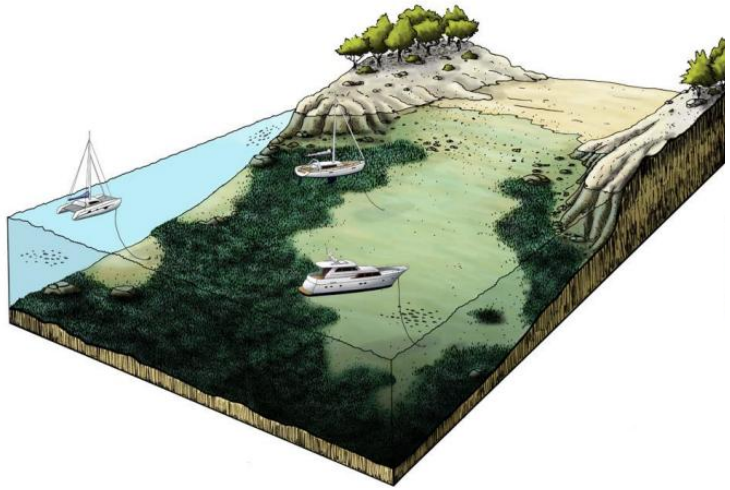
- To preserve the Posidonia meadows by helping all boats to **anchor outside this sensitive ecosystem**, in compliance with the law.
- To have a **precise map** of the Posidonia meadows and monitor their evolution
- **Enforce regulations** by sharing knowledge
- **Raise awareness** of more sustainable behaviour at sea

It's quantified:

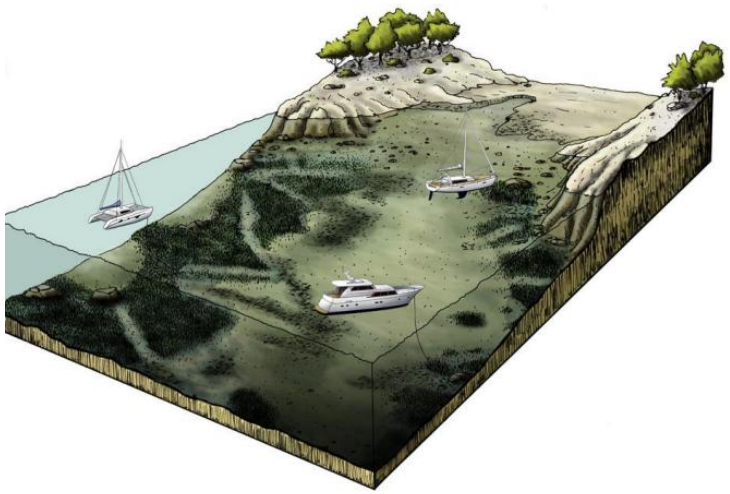
364 hectares

Of posidonia have been preserved between 2020 and 2025 thanks to this change in behaviour

With DONIA, seagrass beds are protected from anchoring



Without DONIA, anchoring is uncertain and Posidonia meadows are destroyed



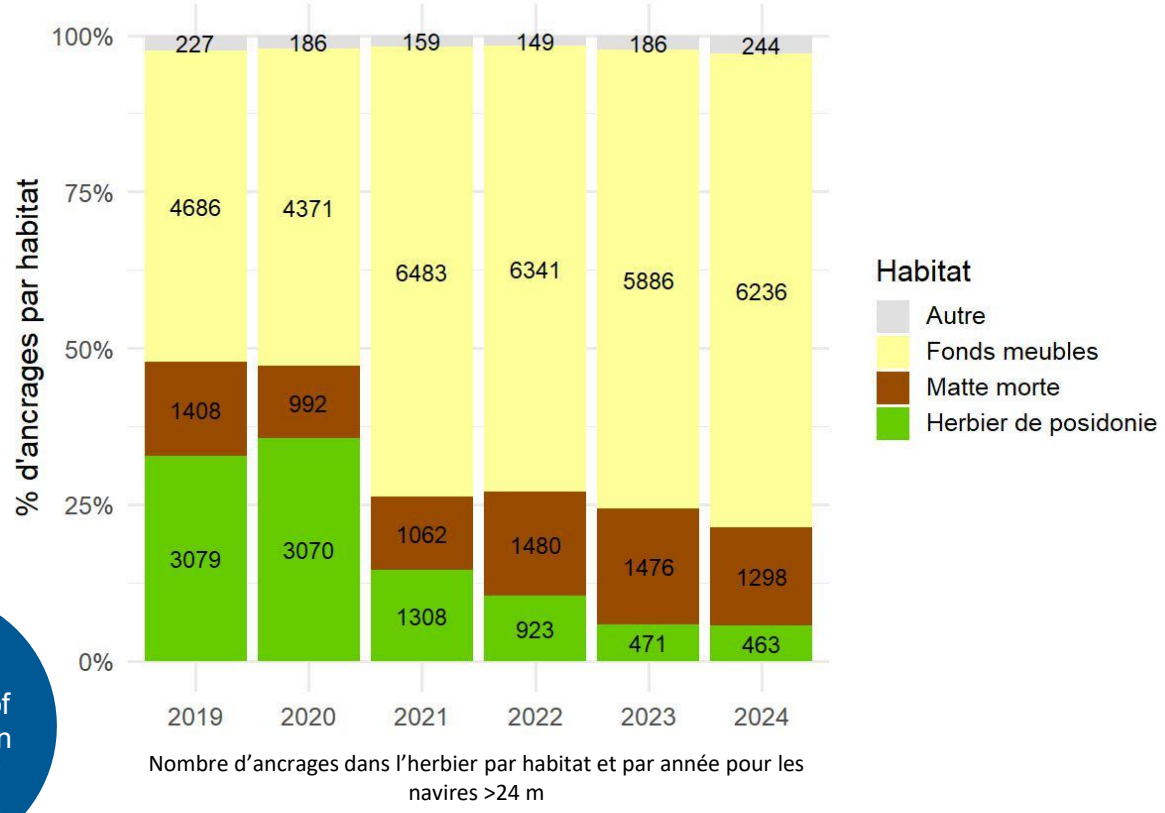
A tool with concrete results

Thanks to prefectoral decree no. 123/2019, supported by the data collected via DONIA, and the change in behaviour generated by the application, **and the change in behaviour generated by the application,**



Boats with DONIA

Boats without DONIA (AIS location)



Nombre d'ancrages dans l'herbier par habitat et par année pour les navires >24 m

-20%
the number of anchorages in the meadow (since 2021)

The **difference in behaviour** between DONIA users and non-users is visible and encourages boaters to promote this tool.

POSIDONIE

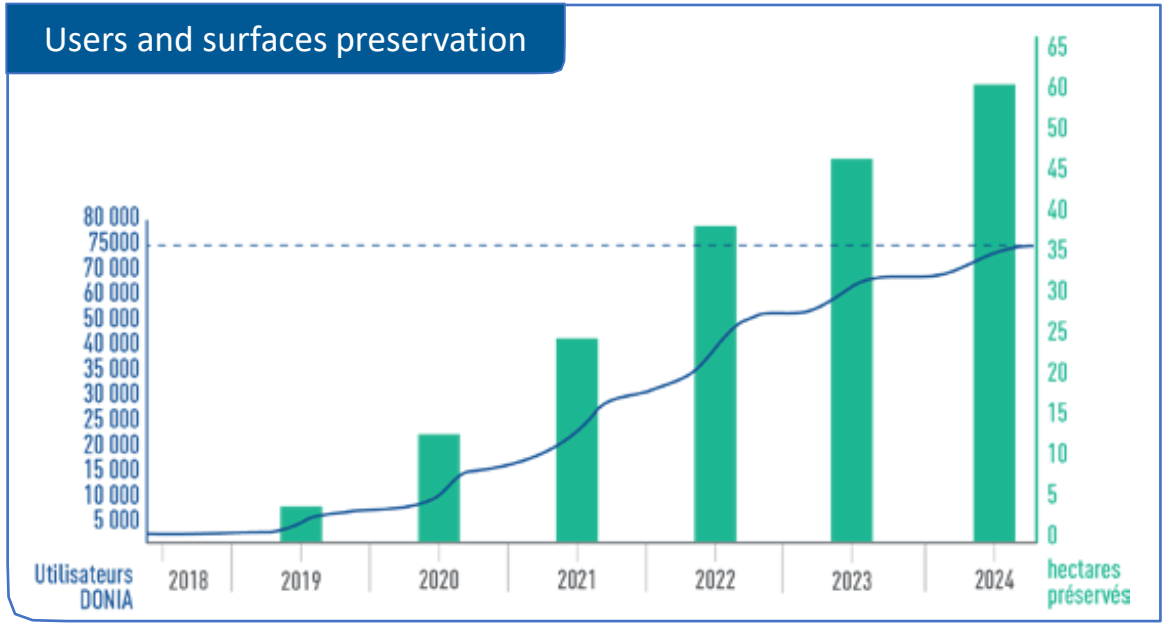
A tool with concrete results

In 2025, the DONIA community means
over 100,000 users!

DONIA is now a **recognised solution** for **preserving posidonia.**

Widely **publicised in the media** and at symposia and conferences, it is an **accessible tool with concrete results**.

Users and surfaces preservation





Les ancres des gros navires causent de véritables saignées dans Océanologie

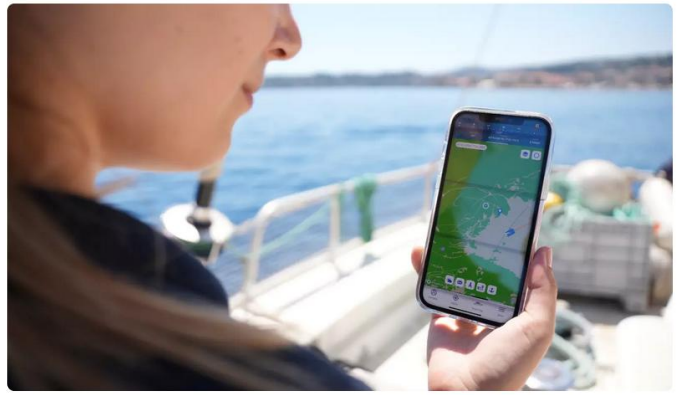
POSIDONIE

A tool with concrete results

Donia: l'application gratuite qui sauve la posidonie en guidant l'ancrage des bateaux au large de la Méditerranée

Plus d'un plaisancier sur 4 jette son ancre dans les herbiers de posidonie le long des côtes des Alpes-Maritimes et du Var. Pour éviter de dévaster ces forêts sous-marines, il suffit de télécharger l'application Donia. Elle affiche des cartes où la localisation des herbiers est indiquée. Pratique pour ancrer dans le sable et préserver la posidonie.

Sophie Casals • Publié le 18/07/2024 à 10:10, mis à jour le 18/07/2024 à 10:10



L'application cartographie les fonds et permet ainsi aux plaisanciers de ne pas s'ancrer dans les herbiers de posidonie. **Photo Franck Fernandes**

◎ LE DIRECT

12:45 Taylor Swift "complètement choquée" par l'attaque au couteau en Angleterre, qui a visé..

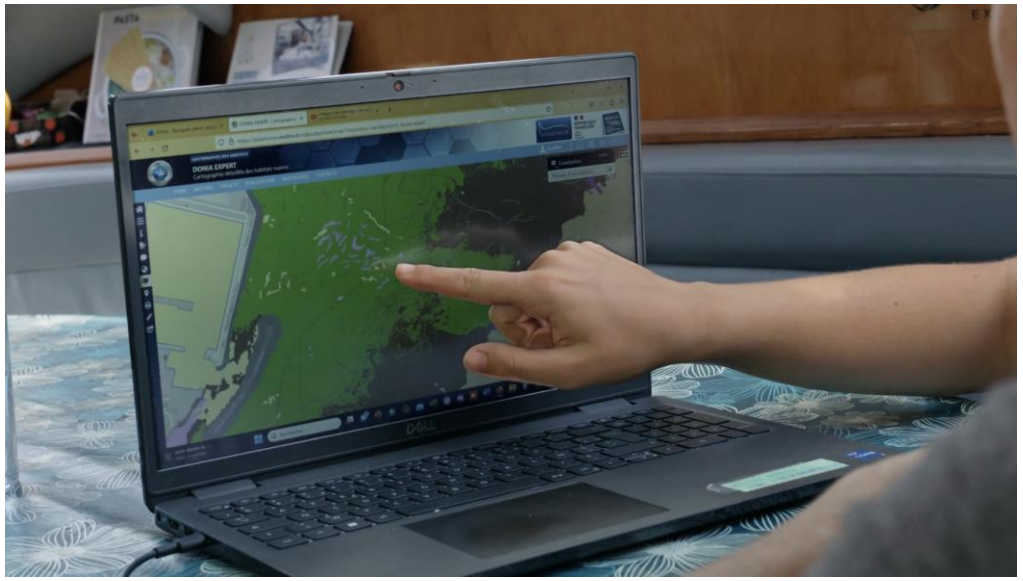
12:40 Le Premier ministre espagnol Pedro Sánchez devant le juge dans l'enquête visant son..

12:33 ALERTE La police municipale porte secours à un chien qui suffoquait dans une voiture à..

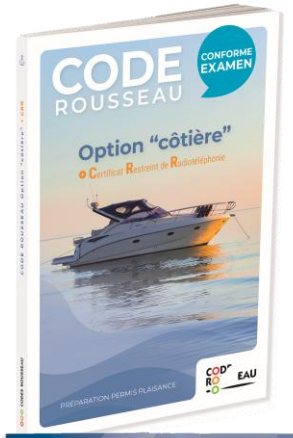
12:30 Et si, cet été, vous visitiez Saorge, l'un des plus beaux villages de France?

12:20 Le point sur l'épidémie de coqueluche, qui se poursuit en France

12:00 A Hyères, cette association propose des











Méditerranée : Donia, une appli pour mouiller propre







Andromède Océanologie réalise sa propre cartographie des herbiers grâce à des sonars haute définition. © DR

Des applications pour respecter l'herbier

Cette décision de justice inédite devrait vraisemblablement contribuer à l'efficacité de la politique de protection des herbiers de posidonie portée depuis plusieurs années par les services de l'État, les collectivités engagées et les acteurs privés associés.

Que l'on possède une embarcation longue de dizaines de mètres ou un modeste semi-rigide, les zones interdites au mouillage sont, évidemment, à respecter.

Et puisque nul n'est censé ignorer la loi, rappelons ici l'existence de l'application Donia, dont nous avons déjà souligné la pertinence en Méditerranée dans un précédent article publié sur Subaqua.fr, ainsi que pour de l'appli Mes Calanques dédiée au parc national des Calanques (Marseille).



L'application DONIA offre notamment un rendu cartographique enrichi en intégrant la nature des fonds, la bathymétrie et la réglementation en mer. © DONIA



DONIA

ENJOY & PROTECT THE SEA TOGETHER

ANDROMEDE OCEANOLOGIE

L'OEil d'Andromede

RÉPUBLIQUE FRANÇAISE
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agence de l'eau RHÔNE MÉDITERRANÉE CORSE

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