



Understanding and Managing Marine Socioecological Systems : Challenges and Prospects from the French MPA Agency standpoint

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Agence des aires marines protégées / French MPA Agency







Ecosystem

**Human
dimension**

Assess

Manage

YES



	Ecosystem	Human dimension
Assess		
Manage	Very few	YES



	Ecosystem	Human dimension
Assess	YES	
Manage	Very few	YES



	Ecosystem	Human dimension
Assess	YES	A little bit
Manage	Very few	YES



Agence des aires marines protégées French Agency for Marine Protected Areas

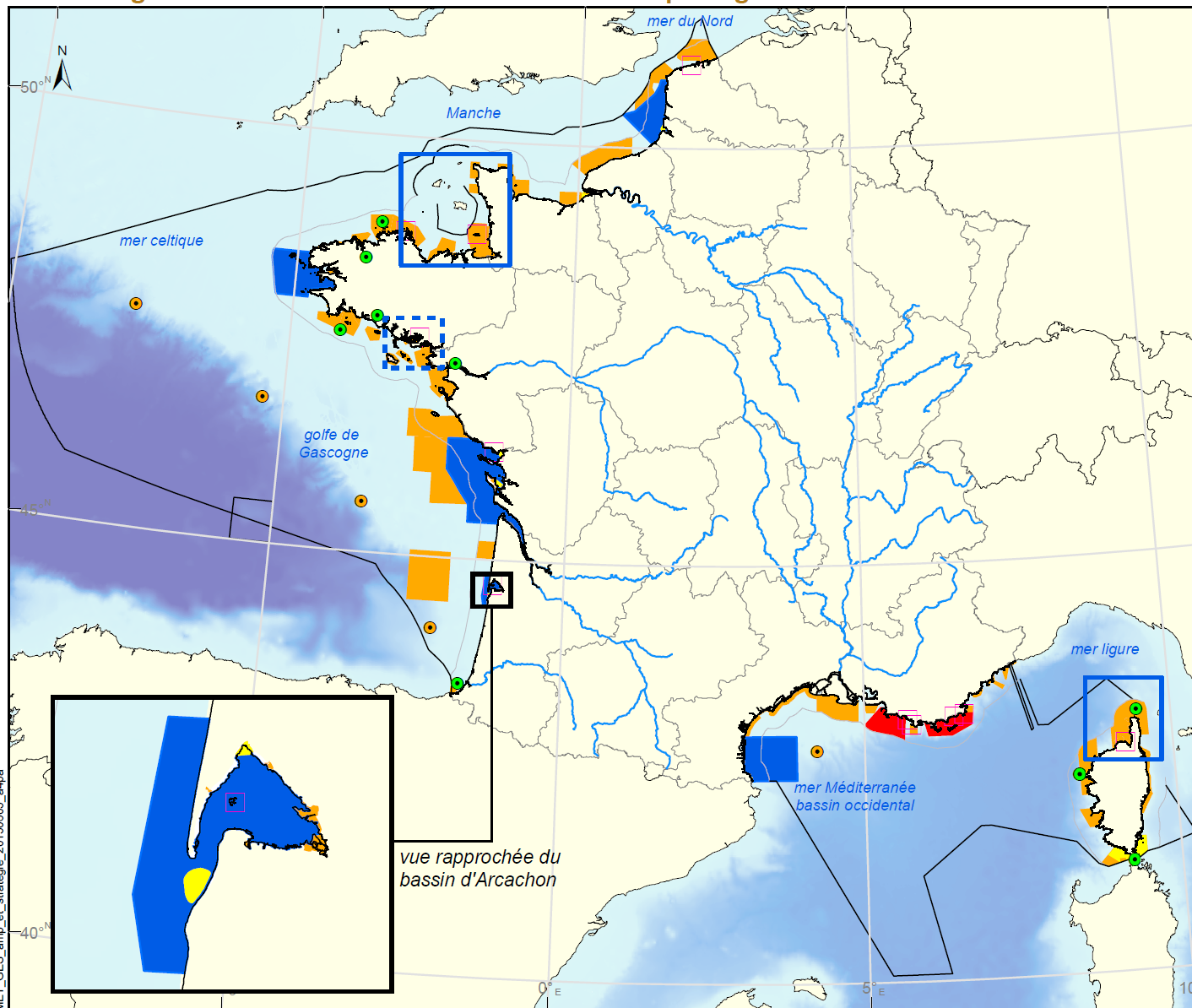


French MPA Agency

A management organisation (not a research institute)

In charge of (inter alia) :

- Creating and managing **10 marine nature parks**
- Supporting the development and the management of the whole French MPA network (mainland and overseas)
Data collection / technical studies / raising awareness
- Supporting the protection of marine biodiversity (including the implementation of EU Marine Strategy Framework Directive)



parc naturel marin (PNM)

- PNM existant
- secteur de mission d'étude
- proposition de mise à l'étude

autres catégories d'aires marines protégées (non exhaustif)

- parc national
- réserve naturelle
- site Natura 2000
- domaine public maritime relevant du Conservatoire du littoral
- outil de protection renforcée à créer (extension, création)
- projets de nouveaux sites Natura 2000 (localisation indicative)

Délimitations maritimes françaises *

- Limite de la mer territoriale
- Limite des eaux sous juridiction



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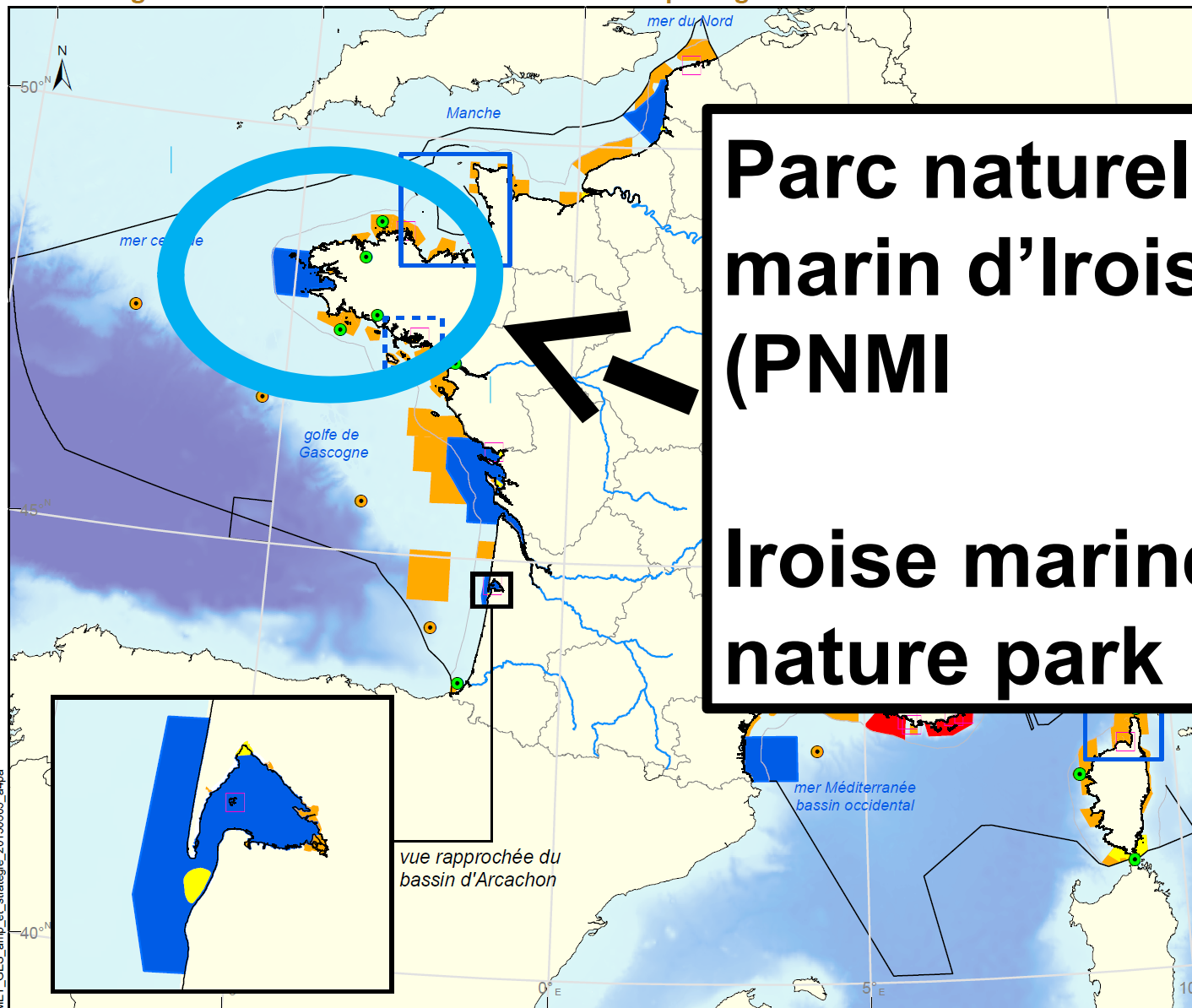
Système de coordonnées : Lambert 93 / RGF93 / IAG GRS 1980



En cas de superposition spatiale entre catégories d'aires marines protégées et dans le cas d'un parc national ou d'un parc naturel marin, seules les réserves naturelles et les aires de protection de biotope ne sont représentées sur cette carte.



**Diving into the PNMI
Iroise marine nature park**



parc naturel marin (PNM)

PNM existant

secteur de mission d'étude

**Parc naturel
marin d'Iroise
(PNMI
Iroise marine
nature park**

à l'étude

exhaustif

littoral relevant

renforcée
création)

sites
indication indicative)

ses *

ale
ridiction

0 50 100 kilomètres



0 50 100 milles nautiques



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vue rapprochée du bassin d'Arcachon

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What is a « Marine Nature Park »?

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- One of the 6 main French MPA categories (created by the law in 2006)
- 3 overall objectives : knowledge, protection, sustainable development (IUCN category 6)
- Defined by :
 - ⇒ A perimeter
 - ⇒ A governance body
 - ⇒ A set of long term objectives (“management orientations”)



10 management orientations in the Iroise park

1. **Knowledge** of the marine ecosystem
2. Good **conservation status** of protected habitats and species
3. Reduction of land-based and marine **pollutions**
4. Control of material **extraction activities**
5. Sustainable harvesting of **fisheries resource**
6. Support to professional **coastal fisheries**
7. Sustainable harvesting of **kelp**
8. Support to marine **activities in the Islands** in order to maintain a permanent population
9. Conservation and promotion of landscape, architectural, maritime and archeological **heritage**, including submarine, and of local knowledge
10. Reasoned development of **touristic activities** compatible with the protection of marine ecosystems



10 management orientations in the Iroise park

Not an exclusive focus on conservation :

1. Knowledge
2. Good co
3. Reductio
4. Control
5. Sustaina
6. Support
7. Sustaina
8. Support
9. Conserv
10. Reason

protection or marine ecosystems



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protection or marine ecosystems

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Not an exclusive focus on conservation :

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- resource management

- sustainable development (fisheries, tourism, new activities...)

- knowledge, education

- cultural heritage

protection of marine ecosystems



Marine Nature Parks : a bet on the long term

- When the park is created, no specific regulations are set – only long term objectives



Marine Nature Parks : a bet on the long term

- When the park is created, no specific regulations are set – only long term objectives
- Regulations and other management actions are taken progressively, during the lifetime of the Park, based on long term objectives and a responsible vision endorsed by the governance body



Marine Nature Parks : how does it work ?

- Governance body : the “management council”
- Management plan
- Spatial planning
- Assessment (“dashboard”)



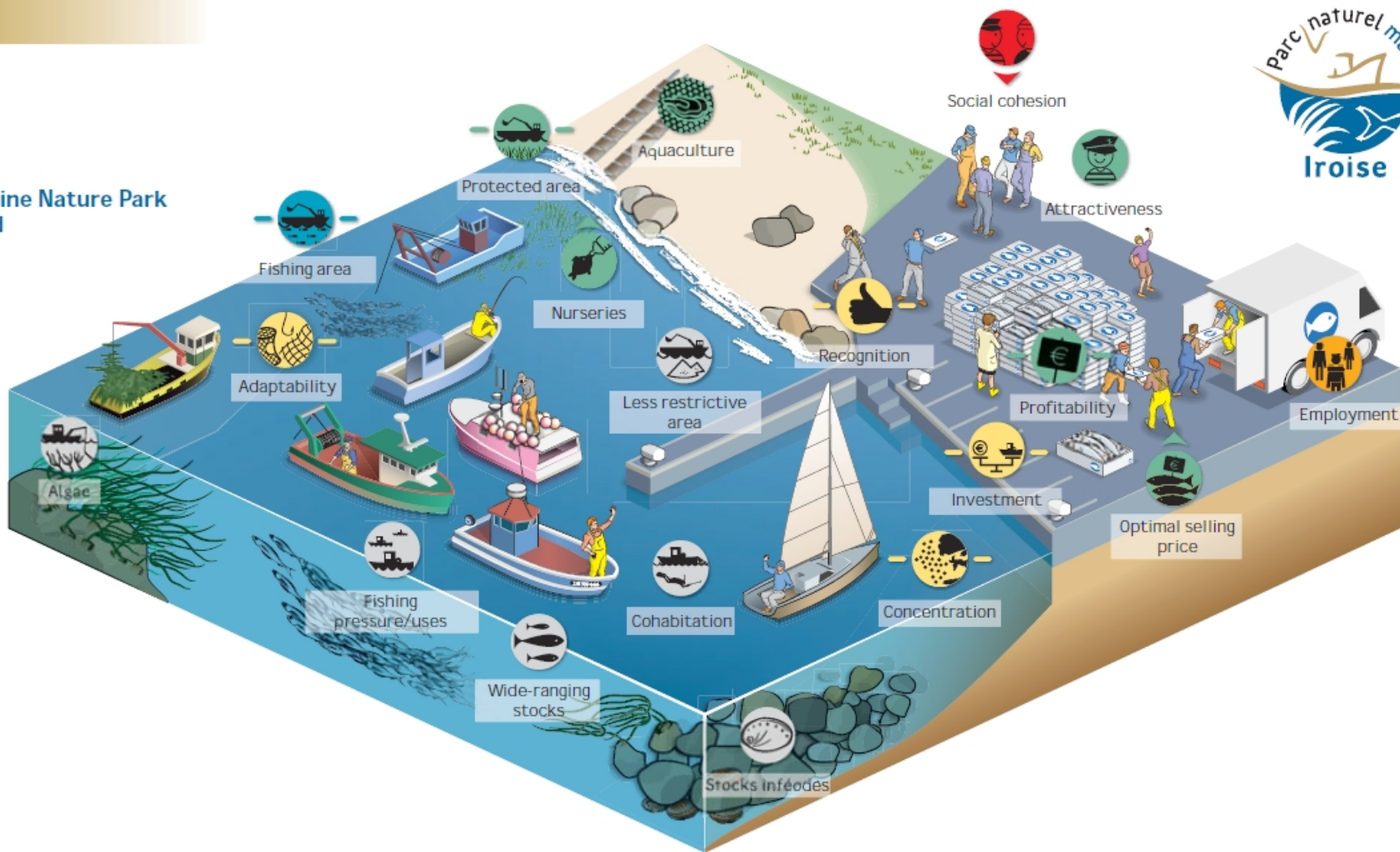
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The Iroise « dashboard »

Iroise Marine Nature Park dashboard



Indicator status



Assessment in a marine nature park : the dashboard



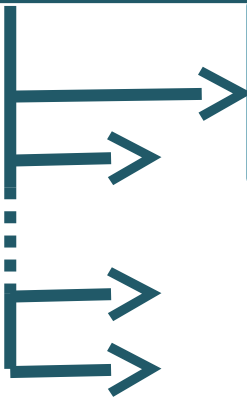
**Management
orientations**

Assessment in a marine nature park : the dashboard



**Management
orientations**

**Long term
goals**



Assessment in a marine nature park : the dashboard

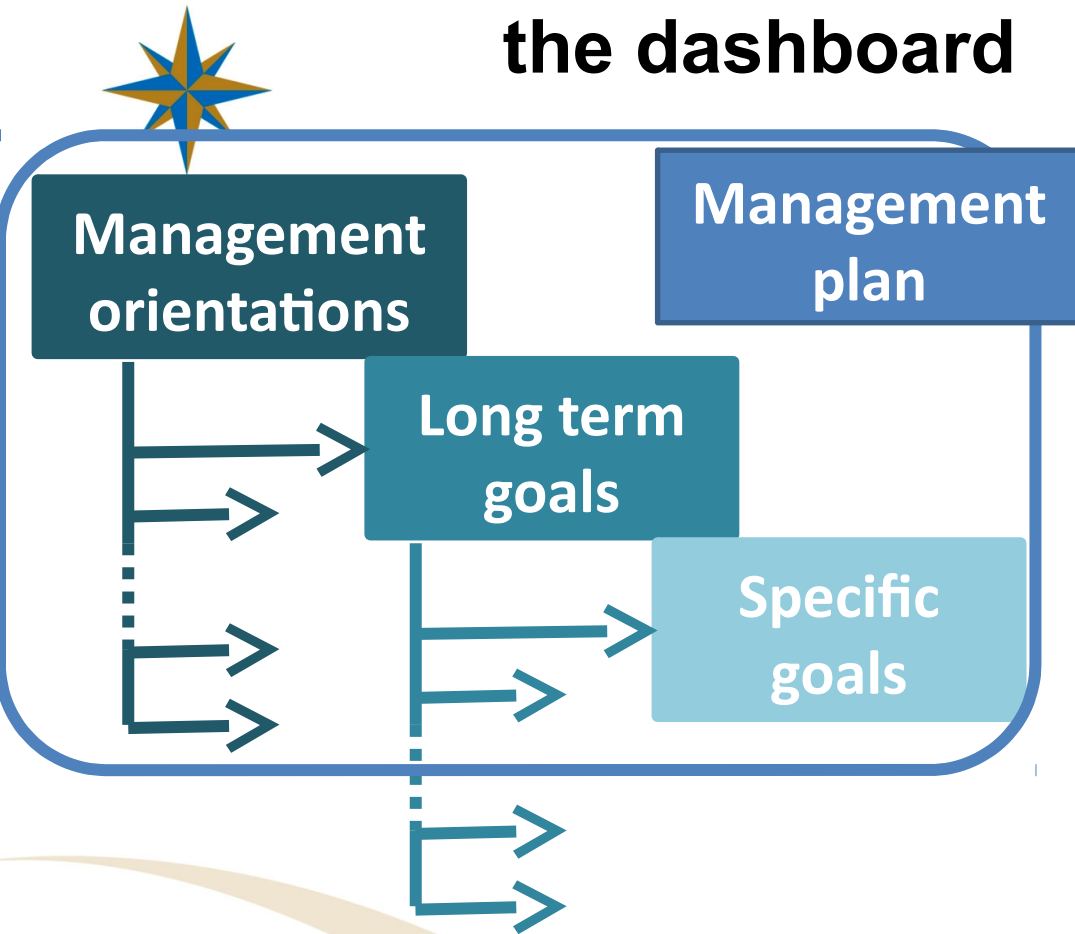


**Management
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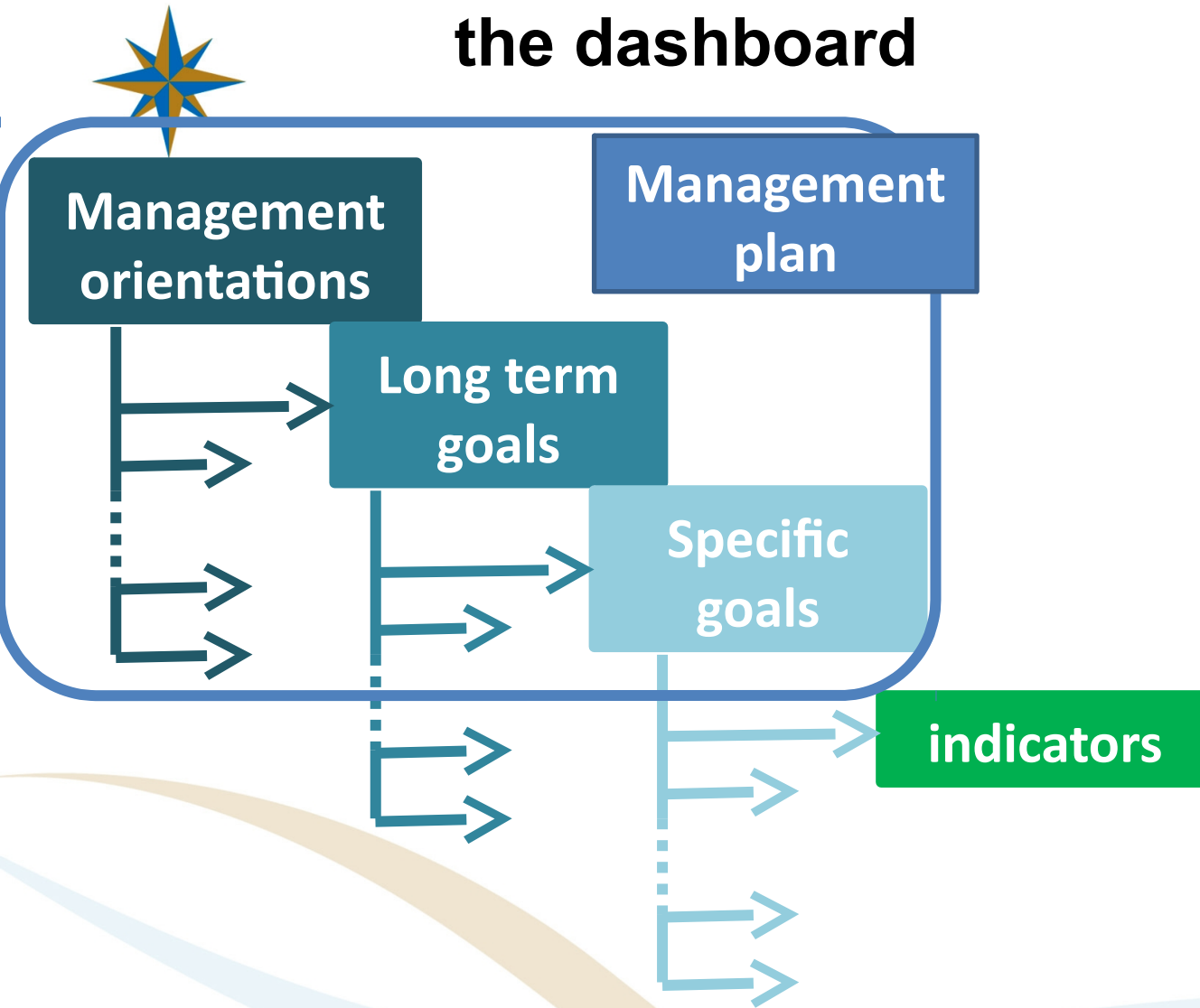
**Long term
goals**

**Specific
goals**

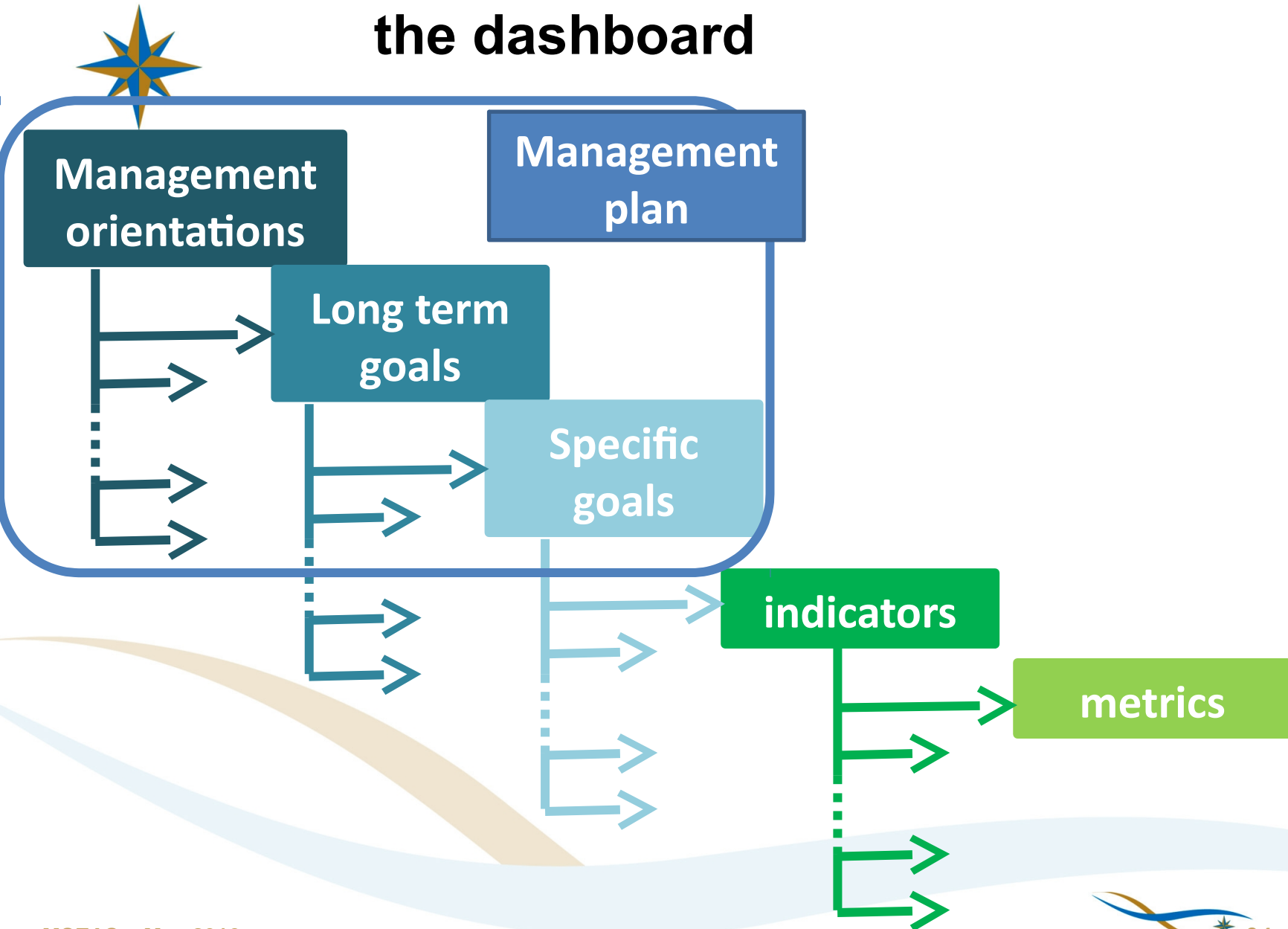
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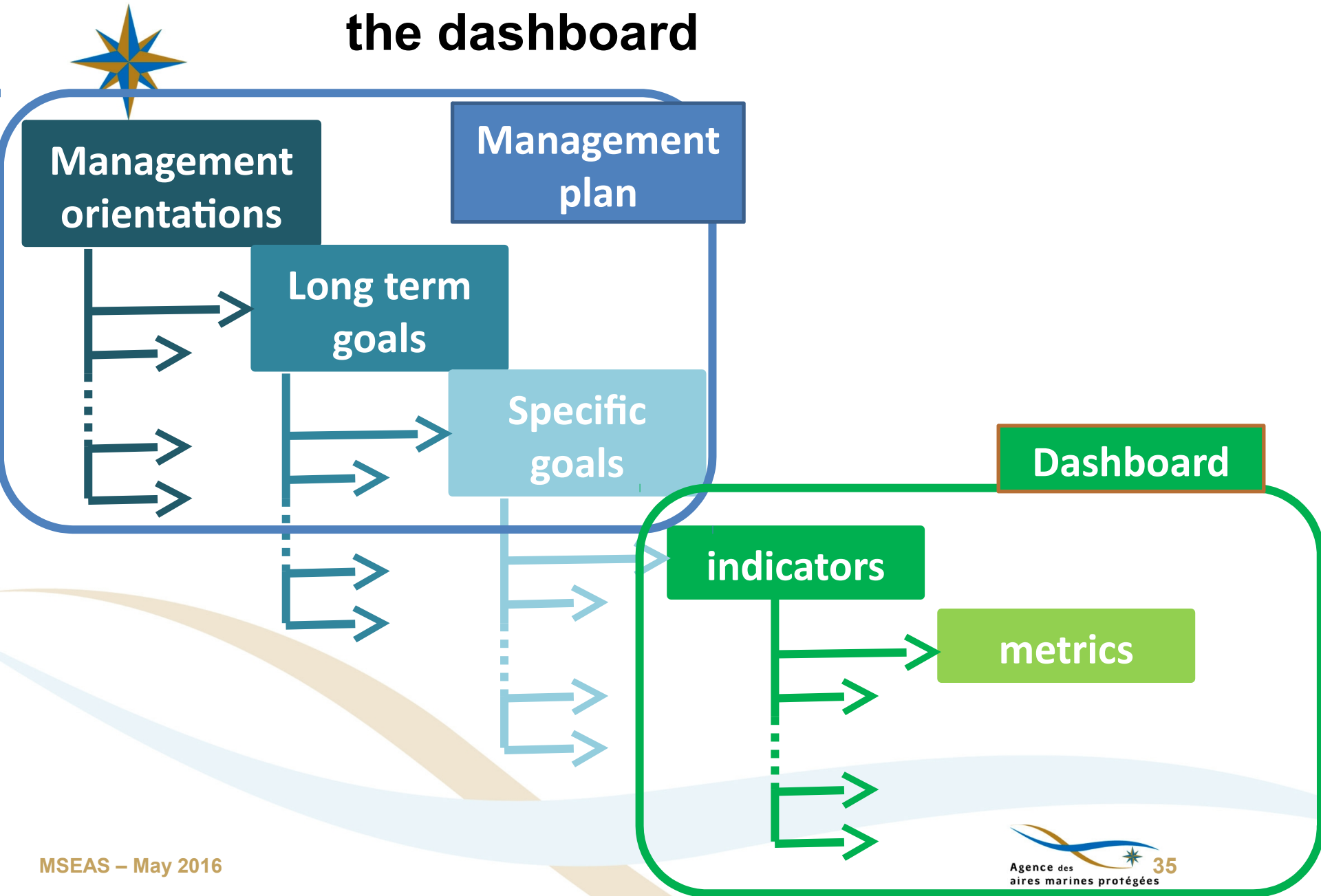
Assessment in a marine nature park : the dashboard



Assessment in a marine nature park : the dashboard



Assessment in a marine nature park : the dashboard



Management orientations	10
Long term goals	21
Specific goals	60
Indicators	79
Metrics	217

...77% of indicators are computed



More than 200 metrics... do we take into account the human dimension ?

- **A lot of indicators about “ecosystem health”, “good ecological state”, “water quality”, “sustainability of fishing”...**

- **But also**
 - ⇒ **Indicators concerning pressures & impacts**
 - ⇒ **Socio-economic indicators**
 - ⇒ **Indicators concerning cohesion, education, governance...**

**Management
orientation**

Support to coastal fisheries

Management orientation	Support to coastal fisheries
Long term goal	Maintain a balanced local socio-economic context

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Specific goal	Enhance socio-economic adaptability in fishing fleets
Indicator	Adaptability
Metric 1	Vessels versatility
Metric 2	Catch composition (in €)
Metric 3	Importance of diversification activities

Management orientation	Support to coastal fisheries, Support to marine activities on Islands
Long term goal	Contribute to creating a common identity among Iroise fishermen
Specific goal	Reinforce social cohesion of Iroise fishing communities
Indicator	Social cohesion
Metric 1	Sense of belonging to the community

Management orientation	Deepening and diffusion of knowledge on marine ecosystems
Long term goal	Diversification of audience that benefit from education to marine environment
Specific goal	The general public discovers marine environment in Iroise
Indicator	The general public having access to tools for discovery of marine environment in Iroise
Metric 1	% of resident public having acces to...
Metric 2	% of non resident public having acces to...



Other examples : governance

- “Good functioning of the management council”
- “Implementation of decisions and recommendations”
- “Compliance with regulations”
- “Social acceptance”
- “Territorial integration”

Each of them expressed by several metrics



Are we happy with this dashboard ? (1)

- Marine nature parks are still very young ! We need to wait for the end of the management plan (2022)

Are we happy with this dashboard ?



(1)

- Marine nature parks are still very young ! We need to wait for the end of the management plan (2022)
- A real attempt to implement the ecosystem approach : very simplistic but holistic ; understood and accepted by the governance body

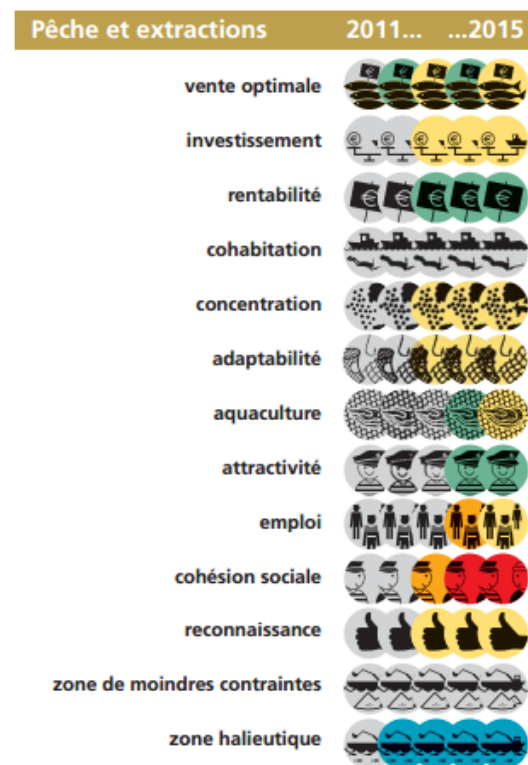
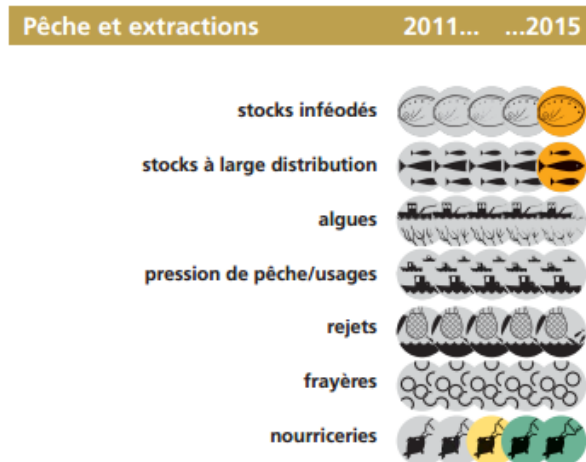
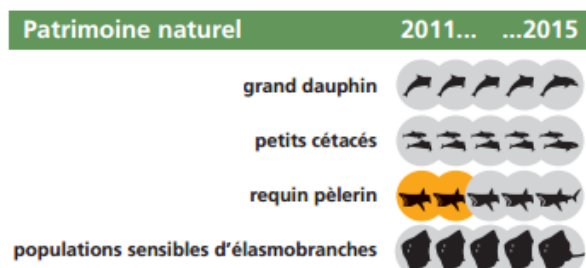
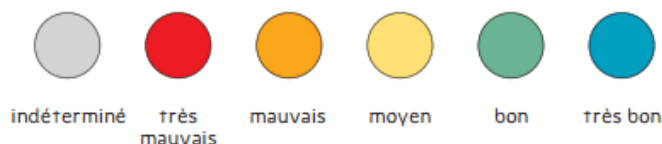
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(1)

- Marine nature parks are still very young ! We need to wait for the end of the management plan (2022)
- A real attempt to implement the ecosystem approach : very simplistic but holistic ; understood and accepted by the governance body
- A tool for dialogue and ownership by the governance body

Évolution des indicateurs entre 2011 et 2015





Are we happy with this dashboard ? (2)

- Economic indicators :
 - ⇒ Problems of scale (ex. What is an “Iroise fishing vessel”?)
 - ⇒ Metrics : lack of ownership by fishermen



Are we happy with this dashboard ? (2)

- Economic indicators :
 - ⇒ Problems of scale (ex. What is an “Iroise fishing vessel”?)
 - ⇒ Metrics : lack of ownership by fishermen
- “social sciences” indicators : oversimplistic – but a lack of science and a lack of “ready made” indicators
 - ⇒ raises a lot of scientific questions
 - ⇒ a need to facilitate the dialogue between social sciences and MPA managers



Are we happy with this dashboard ? (3)

More globally

- Lack of statistical dimension



Are we happy with this dashboard ? (3)

More globally

- Lack of statistical dimension
- Lack of underlying models



Are we happy with this dashboard ? (3)

More globally

- Lack of statistical dimension
- Lack of underlying models
- Not appropriate to predict or feed back “crises”



A model-based approach in Iroise : the kelp socio-ecosystem model developed by the VALMER project

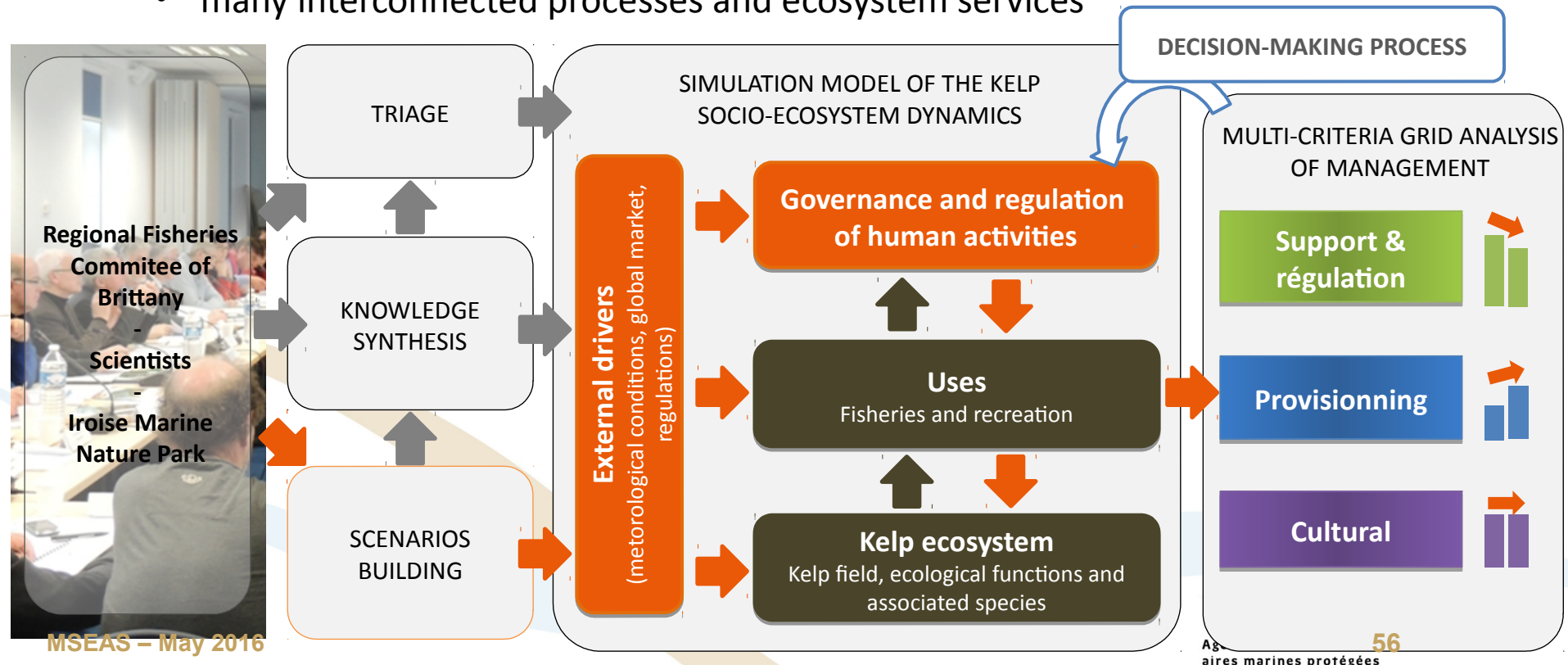
Vanhoutte-Brunier A., Laurans M., Mongruel R., Guyader O., Davout D., Marzin A., Vaschalde D., Charles M., Le Niliot P., 2016. Évaluation des services écosystémiques du champ de laminaires de l'archipel de Molène. Retour d'expérience du site du Parc naturel marin d'Iroise. Rapport des projets VALMER Interreg IV A Manche et IDEALG ANR Investissements d'avenir. 119 pages.



→ A multicriteria assessment framework based on indicators computation and model variables simulation

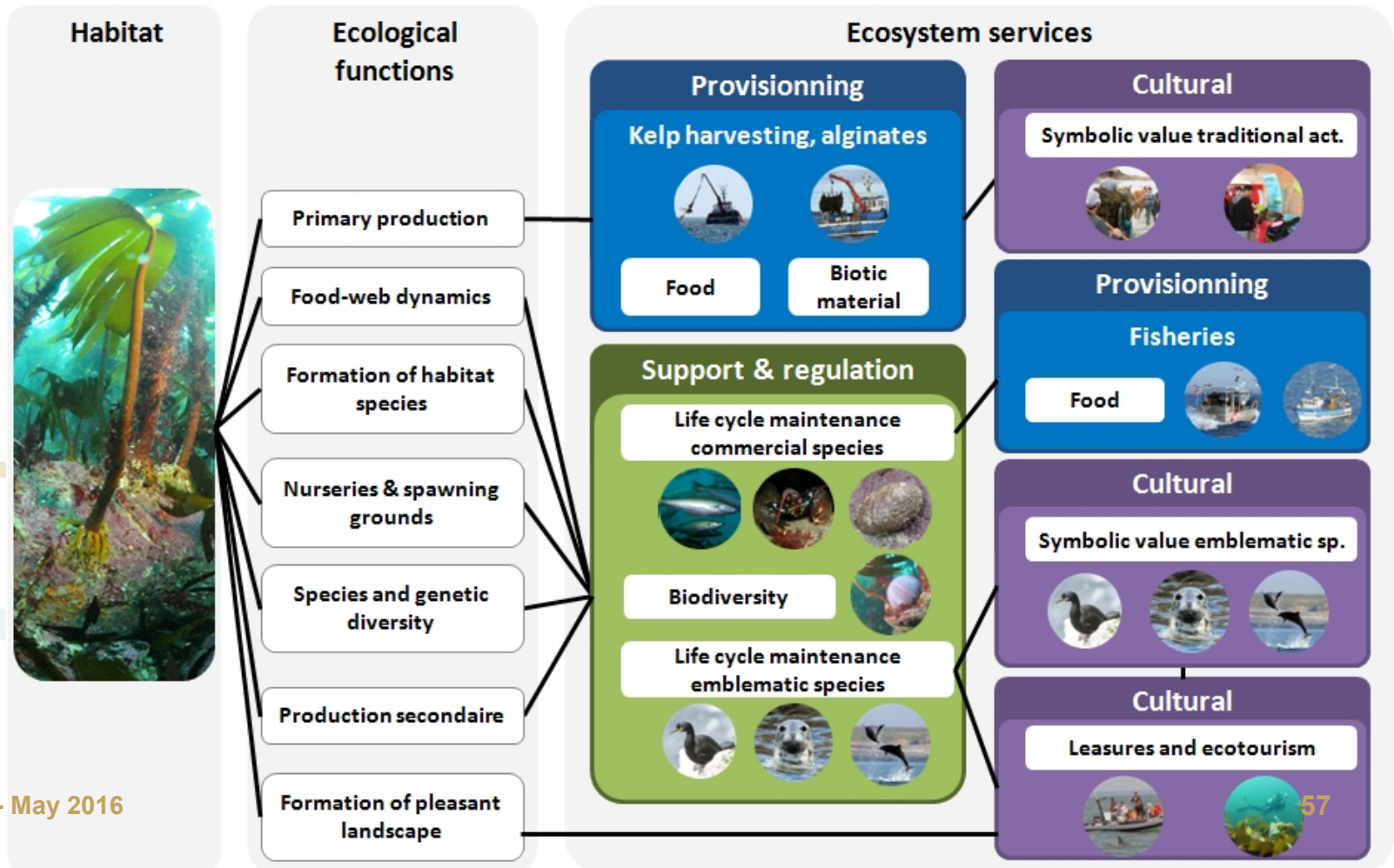
- numerous factors of change
- comparing management options
- many interconnected processes and ecosystem services

→ participatory dynamic modelling



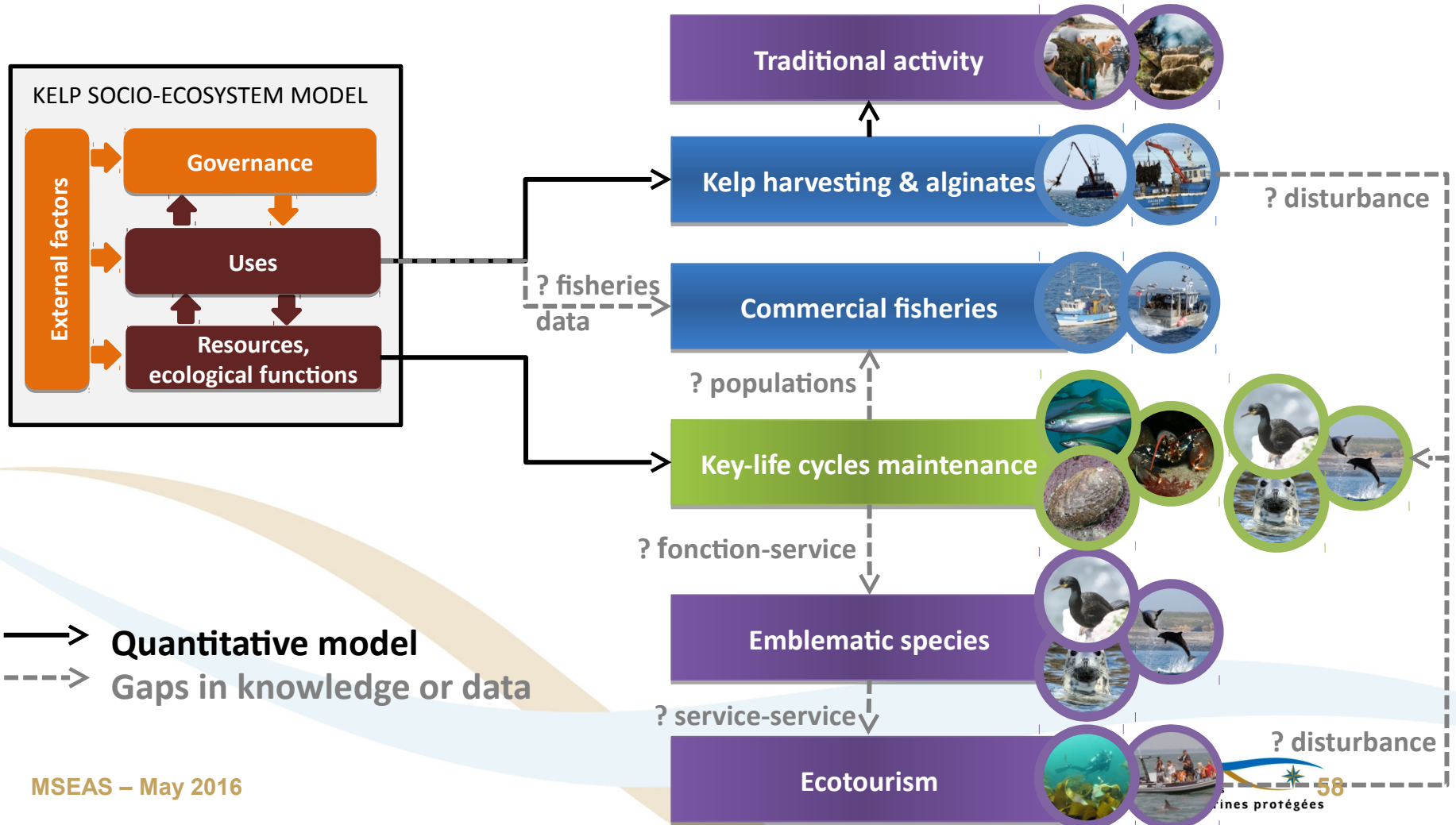


→ ES concept appropriation and common vision on the kelp socio-ecosystem functioning





➔ Dynamic quantitative assessment: data & knowledge requirements



Practical outputs...

A contribution to :

- A shared vision, in the governance body, of multiple functions and services given by the kelp forest

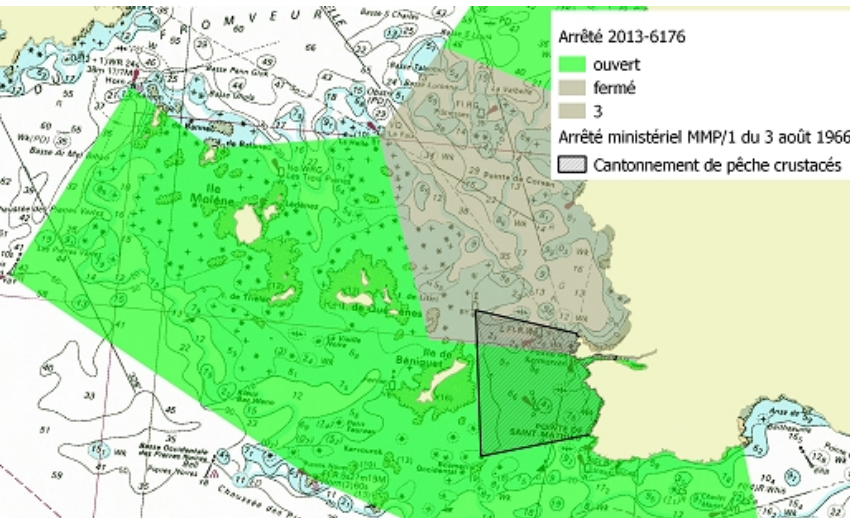
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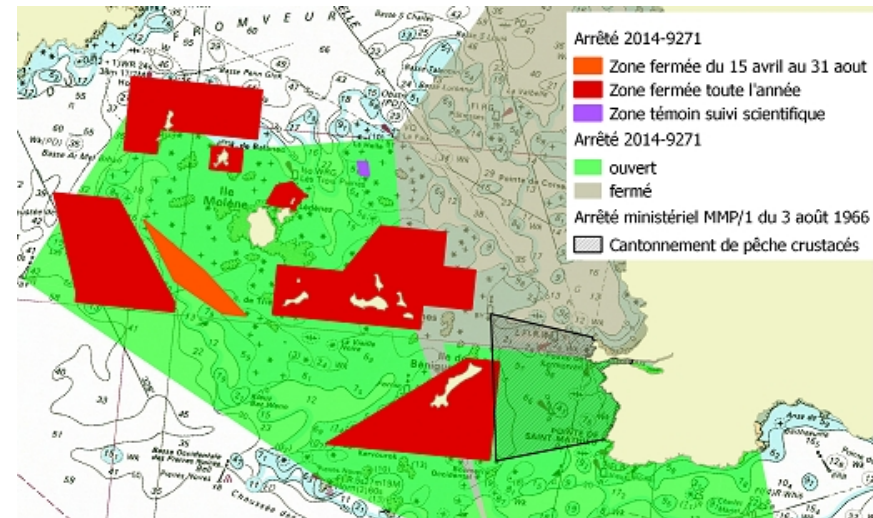
- A shared vision, in the governance body, of multiple functions and services given by the kelp forest
- A practical contribution to changes in management, driven by :
 - ⇒ resource management
 - ⇒ other considerations



2013



2014





Models...

... Other approaches ?

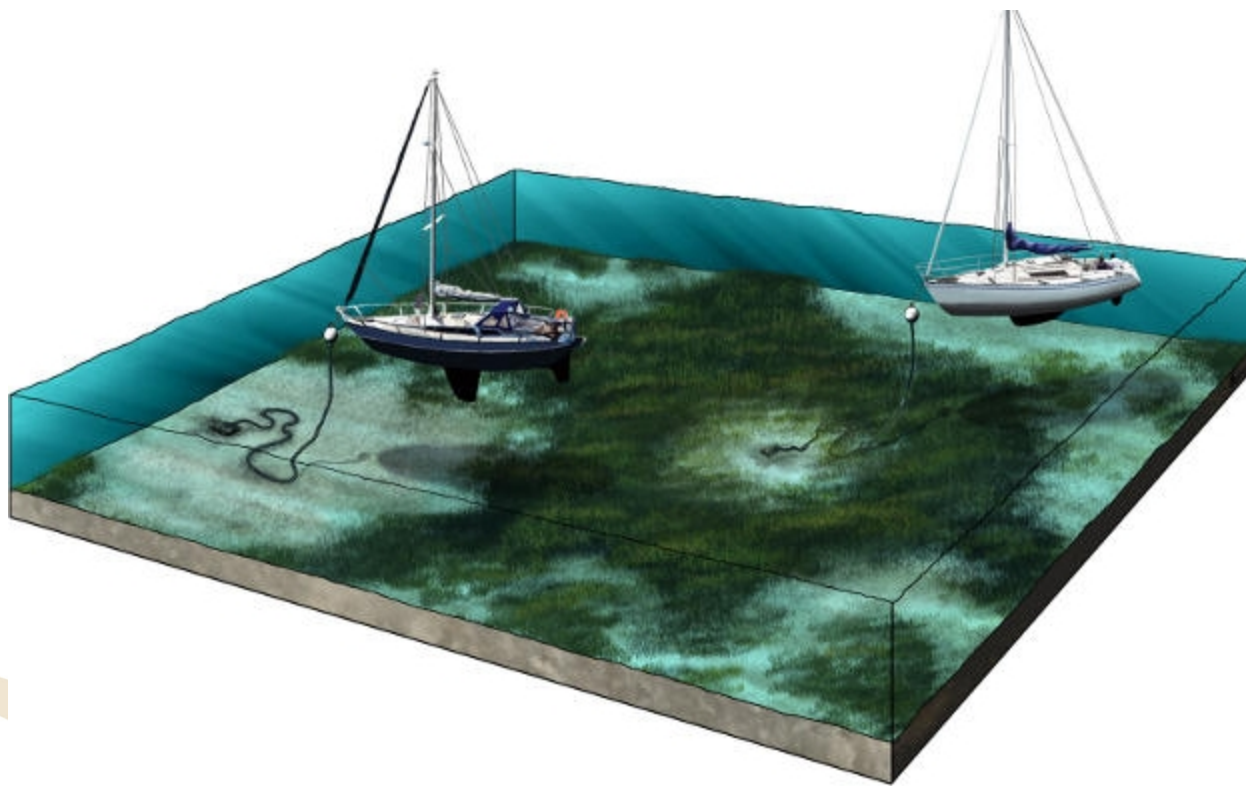


Marine landscapes

Sources :

- parc naturel marin d'Iroise,
- Maxime Aubinet, paysagiste DPLG











- Make it visible : a better ownership and understanding of marine conservation issues



- Make it visible : a better ownership and understanding of marine conservation issues
- Contribution to a convergence of multiple representations of the marine environment



- Make it visible : a better ownership and understanding of marine conservation issues
- Contribution to a convergence of multiple representations of the marine environment
- A contribution to a better management of mooring on zostera beds



Cultural heritage



Memories of fishermen

*Je m'appelle Louis DIVERES.
Je suis né le 21 mai 1943 à
Plouarzel.*

*Moi, mon père, mon grand-père, mon arrière-
grand-père, on est toute une génération de
pêcheurs. J'ai embarqué à 16 ans, pendant l'été
avec mon grand-père mais mon père ne voulait
pas que je fasse la pêche.*

*Jean-Marie LEBRIS, né le 14
juin 1982 à Bogota.*

*Jean-Luc QUEMENEUR, né à Brest le 29 juillet
1963.*

*Depuis 15 ans maintenant, je fais ça en
saison : je récolte des algues alimentaires,
toutes sortes d'algues alimentaires, 7 ou 8
sortes.*

*On sent que ça à l'air de vouloir revenir
parce qu'on pêche plus de petites lottes, en
fin des petites, c'est des lottes de 5 kg
quand même, donc ce n'est pas vraiment
petits.*

*Sur mes espèces cibles, la ressource est au
rendez-vous et je ne la sens pas en danger.
Non, parce qu'avec notre façon de travailler, on
laisse quand même un temps de repos, même
s'il est forcé, il y a quand même un temps de*

*Je remarque une chose : il y a beaucoup moins
de repos.
d'algues qui viennent à la côte aujourd'hui. Il y
a cinquante ans, c'était incroyable de voir la
quantité qu'il y avait. Maintenant, je vois que
plus ça va et moins il y en a.*



- An objective of the park in itself



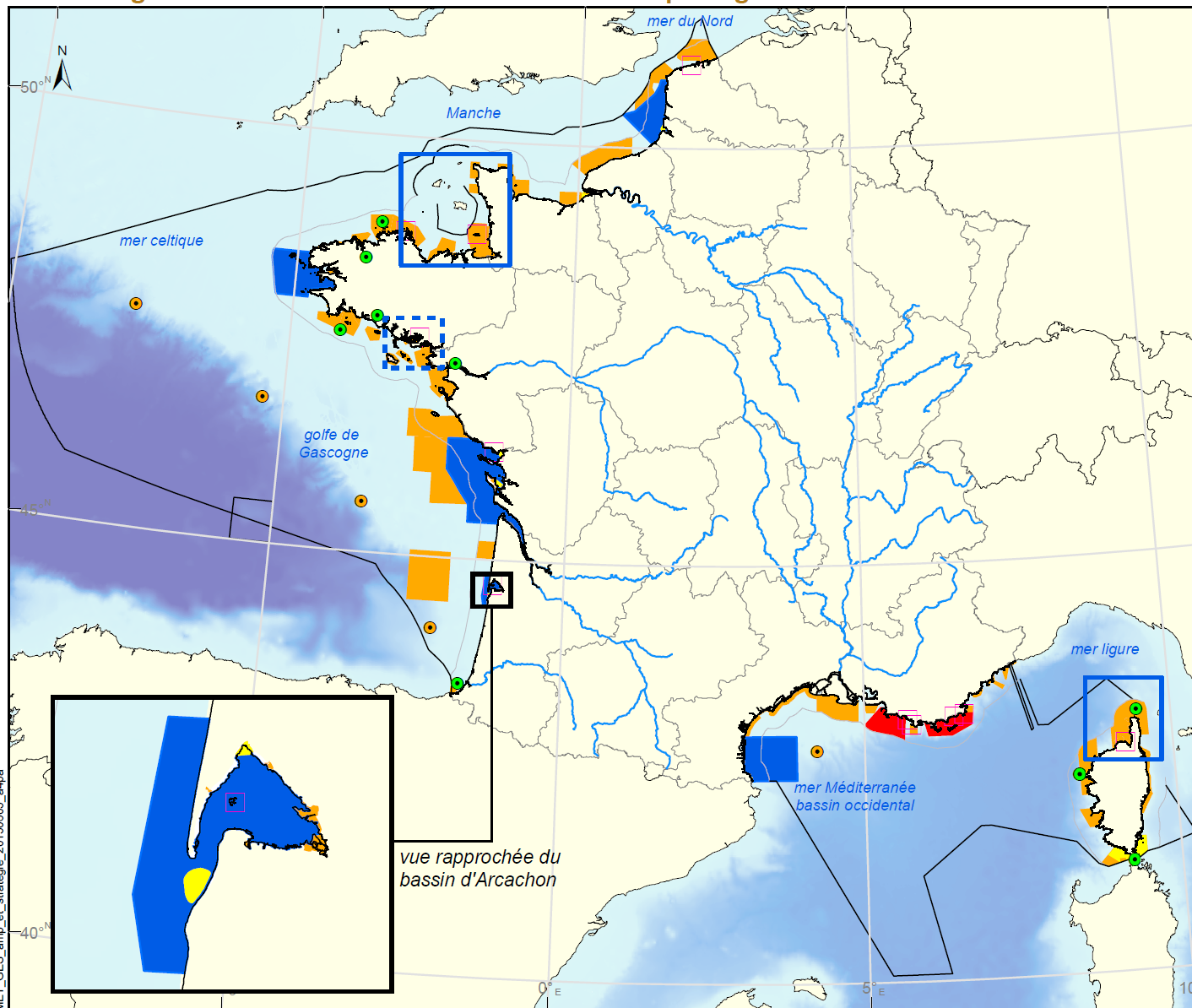
- An objective of the park in itself
- Facilitation of management
 - Contribution to a cohesive community
 - Recognition of local knowledges



- An objective of the park in itself
- Facilitation of management
 - Contribution to a cohesive community
 - Recognition of local knowledges
- Questions for research
 - Which relationship between nature and culture
 - To whom belongs knowledge ?
 - Can we use memories to characterize past states of ecosystems ?



Cooperating to Foster Dialogue on the Human Dimension



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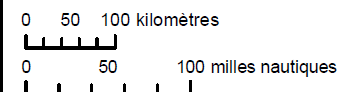
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An Example on Perceptions/Representations



SENSIBILISATION DES PRATIQUANTS DE SPORTS ET LOISIRS DE NATURE AU DERANGEMENT DE LA FAUNE SAUVAGE

Les apports de la psychologie environnementale

Rapport (septembre 2015)



Sensibilisation des pratiquants de sports de nature dans les AMP de la région Bretagne:

Apports de la psychologie environnementale

Cosquer A.* ; Le Corre N.*; Michel-Guillou E.** ; Daviau N. *** ; Dérogis P.**** ; Gicquel C.***** ; Tachoures S.*****

*Laboratoire LETG-Géomer (UMR 6554 CNRS)

**Centre de Recherche en Psychologie, Cognition et Communication (EA 1285)

***Communauté de commune de la baie du Kernic

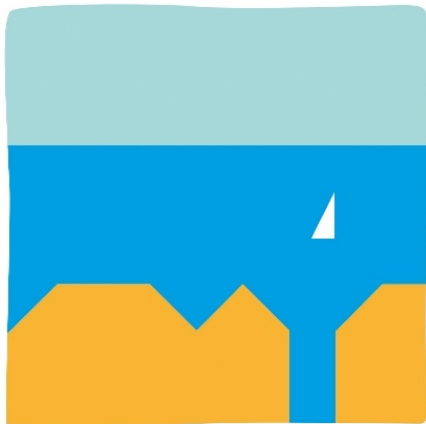
**** Pôle ressources national des sports de nature

***** Agence des aires marines protégées





Connecting Management and Research Needs



HomMer

Groupement d'Intérêt Scientifique

<http://www.gis-hommer.org/fr>

136 researchers and MPA managers
To better understand issues concerning
the human dimension in MPAs

Geography
Economy
Anthropology
History
Law



Some priority areas for research

« how to characterise, monitor, assess... »

- Intensity of uses, flow of visitors, carrying capacity...
- Pressures-impact relationships
- Ecosystem Services
- Governance Processes



Merci de votre attention !

Thank you for your attention !