MAIA
Mapping and Assessment for Integrated ecosystem Accounting

The MAIA country fact sheets summarize the state of affairs on natural capital accounting (NCA) in the countries connected to the MAIA project. They serve as an accessible overview and entry point for collaboration. The factsheets describe the needs from policy, society, science and business for the use of NCA, give an overview of the ongoing and published research -including knowledge gaps- in the country, include contact details and an overview of national partners and stakeholders involved in the accounts. Information in this document is based on MAIA Deliverables and exchanges, and the content is reviewed, co-authored and updated by MAIA-liaison persons in the participating country. This version was updated on 15 December 2020.

Country fact sheet:
France (FR)

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Summary

In France there is much interest in both biophysical and economic accounts. Their potential is acknowledged by the government institutions. More specifically they would be used for: spatial planning, facilitate budget allocation on natural amenities, follow the state of ecosystems, as an aid to set new wealth indicators, to help inform decision makers for different impactful activities, to include ecological debts and credits in national accounts and to set ecological taxation.

A methodological framework has been developed for the creation of the Marine ecosystem extent, condition and monetary asset account. The accounts are expected in the following years. A forest ecosystem monetary asset account has been developed on a national scale and a cultural ES supply and use account in monetary terms has also been developed on a local scale. Moreover, a theoretical framework is under construction to calculate the unpaid ecological cost for an ecosystem, this is a complementary approach to valuation according to the SEEA EEA framework.

Data gaps in France mainly involve marine and coastal habitats and the overseas territories. The first suffers from infrequent and inconsistent data affecting both extent and condition accounts, while the second lacks data overall except for coral reefs. The account for unpaid ecological cost still needs conceptual and technical refinements to become operational.

In France, no capacity building needs have been identified at this stage. Stakeholders have emphasized the need to create accounts that are useful for public policies, since setting up accounts is costly. There are problems that still need to be overcome for the unpaid ecological cost and extent account. A committee or working group, including various public administrations and researchers, on the means to improve and integrate ecosystem accounts, should be put in place in order to facilitate the construction and use of the ecosystem accounts. Informal discussions are already taking place on a regular basis.

Country policy priorities for developing natural capital accounts

Based on MAIA D5.1 (Annex 5 section 3)

In France there is much interest in both biophysical and economic accounts. Their potential is acknowledged by the government institutions. More specifically they would be used for: spatial planning, facilitate budget allocation on natural amenities, follow the state of ecosystems, as an aid to set new wealth indicators, to help inform decision makers for different impactful activities, to include ecological debts and credits in national accounts and to set ecological taxation.

There are no Natural Capital Accounts from within the MAIA project in France yet. However, their value is acknowledged by French policymakers and a number of priorities have been identified.

Both biophysical and economic accounts could be used to help with policymaking by producing reliable indicators in a framework that enables the formulation of strategic questions, and by producing spatialized data useful to inform coastal and marine planning. They could potentially be used as new environmental-economic information to facilitate discussions around budget allocation on natural amenities. The biophysical accounts could be used to follow the state of ecosystems degradation through time and space. There is a demand for the biophysical accounts from the Data and Statistical Office of the Ministry for an Ecological and Solidary Transition.

The economic accounts could complement the set of new indicators of wealth proposed by the Sen Stiglitz Fitoussi Commission (2009). They could be used to compare with other wealth indicators like assets accounts produced by national statistics to communicate more comprehensive information. Economic accounts could also be used to inform on the environmental costs of human activities to better inform decisions on authorization regimes for different impactful activities. They could also be used to inform ecological debts or credits in national accounts to modify current wealth indicators. This information could be related to the impact of different sectors and firms on the environment and be used to set ecological taxation. There is a demand for the economic accounts from the DML and CGDD of the Ministry in charge of the environment (MTE), as well as from the ONB of the French biodiversity office (OFB).
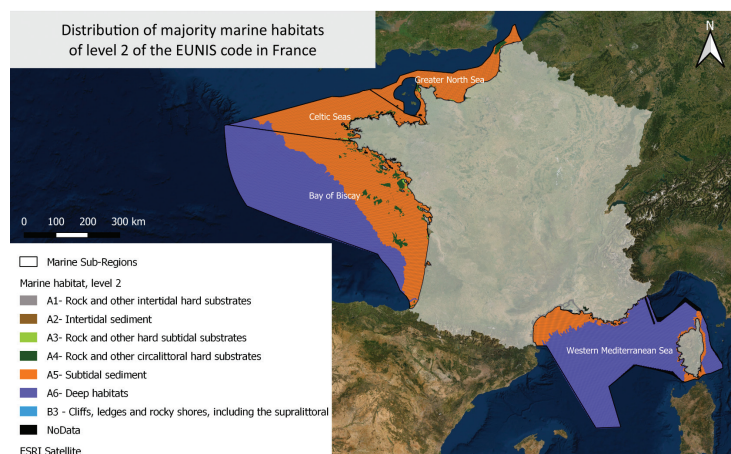
Pilot accounts under development
Summary table of accounts

Account		Ecosystem Types / Ecosystem Services	Link to research
Accounts for ecosystem assets	Ecosystem extent account	**Marine ecosystems***	Comte et al., 2020
	Ecosystem condition account	**Marine ecosystems***	Comte et al., 2020
	Ecosystem monetary asset account	**Marine ecosystems***	Comte et al., 2020
		Forest ecosystems*	CGDD, 2018
Accounts for ecosystem services	Ecosystem services supply and use table - physical terms		
	Ecosystem services supply and use table - monetary terms	Cultural ES	Martin et al., 2018
Thematic accounts			

Scale	State of development
National	Finished
Regional	Ongoing
Local	None ongoing or published
*Highlighted in the fact sheet	

Distribution of majority marine habitats of level 2 of the EUNIS code in France

Marine Sub-Regions
Marine habitat, level 2
- A1- Rock and other intertidal hard substrates
- A2- Intertidal sediment
- A3- Rock and other hard subtidal substrates
- A4- Rock and other circalittoral hard substrates
- A5- Subtidal sediment
- A6- Deep habitats
- B3 - Cliffs, ledges and rocky shores, including the supralittoral
- NoData

ESRI Satellite

Summary overview of highlight accounting projects

Extent account for marine ecosystems in France

Scale
The French metropolitan Exclusive Economic Zone as a whole and divided by sub-regions;

Involved and funding partners
Research funded by MAIA, involving AgroParisTech and CIRED, with collaborations from the French Biodiversity Office (OFB) and the French ministry for an ecological transition (MTE);

(Policy) Goal of the study
The development of this account will help with the assessment of marine ecosystems that can feed the reporting of integrated maritime policies, including the Marine Strategy Framework Directive, and marine spatial planning;

Ecosystems under study
Marine ecosystems;

Methods and data used for the study (if relevant indicators used)
The extent account is produced based on the surface aggregation of marine habitats at two precision levels (EUNIS level 2 describing 7 habitats, and EUNIS level 4 describing 84 habitats) using data from the CarpeDiem project (Quemmerais et al., 2020). The spatialized data is projected on a one-minute arc grid, in which a single habitat is associated with a single cell. This account can then be used to extract information of particular habitats, including habitats of community interests for European directives;

Research used in the methodology
Quemmerais-Amice, F., Barrere, J., La Rivière, M., Contin, G., Bailly, D., 2020. A Methodology and Tool for Mapping the Risk of Cumulative Effects on Benthic Habitats. Frontiers in Marine Science 7. https://doi.org/10.3389/fmars.2020.569205;

Link to research/Reference
Comte, A., Kervinio, Y., Levrel, H., 2020. Ecosystem accounting in support of the transition to sustainable societies – the case for a parsimonious and inclusive measurement of ecosystem condition. CIRED Working Paper.

Extent account		Marine habitats, EUNIS level 2									
		A1	A2	A3	A4	A5	A6	B1	B2	B3	Unit
Marine Sub-Regions	Greater North Sea	49.43	195.56	253.38	997.78	27379.61		0.08	0.01	0.27	km²
	Celtic Sea	24.43	158.55	599.04	868.23	39603.80	2995.87	0.10		1.02	
	Bay of Biscay	72.80	188.50	730.02	5099.93	77176.94	105020.02	0.17	0.01	0.47	
	Western Mediterran Sea	0.42	7.83	99.39	119.81	17845.41	94894.66	0.49	0.26	0.01	
Exclusive Economic Zone		147.09	550.44	1681.83	7085.74	162005.76	202910.55	0.84	0.27	1.77	

Condition account for marine ecosystems in France

Scale
The French metropolitan Exclusive Economic Zone as a whole and divided by sub-regions;

Involved and funding partners
Research funded by MAIA, involving AgroParisTech and CIRED, with collaborations from the French Biodiversity Office (OFB) and the French ministry for an ecological transition (MTE);

(Policy) Goal of the study
The development of this account will help with the assessment of marine ecosystems that can feed the reporting of integrated maritime policies, including the Marine Strategy Framework Directive, and marine spatial planning;

Ecosystems under study
Marine ecosystems;

Methods and data used for the study (if relevant indicators used)

Marine environment	Categories of condition	Condition indicators related to descriptors (D) of the MSFD
Benthic	Heritage	D1: Marine protected areas (various status)
	Functionality	D6: Sensitivity of habitats to pressure / Risk of cumulative effects
		D10: Waste on the seabed
Pelagic	Heritage	D1: Number of species groups / Abundance Density / IUCN Classification / Marine protected areas / Stranding of marine mammals
	Capacity	D3: Fish Stocks
	Functionality	D5: Eutrophication (Nitrate, Phosphate / Turbidity/ Dioxygen / Chlorophyll-A)
		D10: Floating waste

This account proposes to measure ecosystem condition through a set of biophysical indicators organized in three categories reflecting the distinct values underlying ecosystem management, including heritage, functionality, and capacity (Comte et al., 2020). Various datasets are used from different sources: French research projects, monitoring of the marine environment for the reporting of the Marine Strategy Framework Directive (MSFD), and international sources, available below.

Research used in the methodology
ICES, n.d. Stock assessment of fishery resources [WWW Document]. Stock Assessment Graphs. URL https://stand-ardgraphs.ices.dk/stockList.aspx (accessed 12.1.20)

Ifremer, n.d. Sextant [WWW Document]. Sextant. URL https://sextant.ifremer.fr/ (accessed 12.1.20)

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Quemmerais-Amice, F., Barrere, J., La Rivière, M., Contin, G., Bailly, D., 2020. A Methodology and Tool for Mapping the Risk of Cumulative Effects on Benthic Habitats. Frontiers in Marine Science 7. https://doi.org/10.3389/fmars.2020.569205;

Link to research/Reference
Comte, A., Kervinio, Y., Levrel, H., 2020. Ecosystem accounting in support of the transition to sustainable societies – the case for a parsimonious and inclusive measurement of ecosystem condition. CIRED Working Paper;

Approximate date of final results
First semester of 2021.
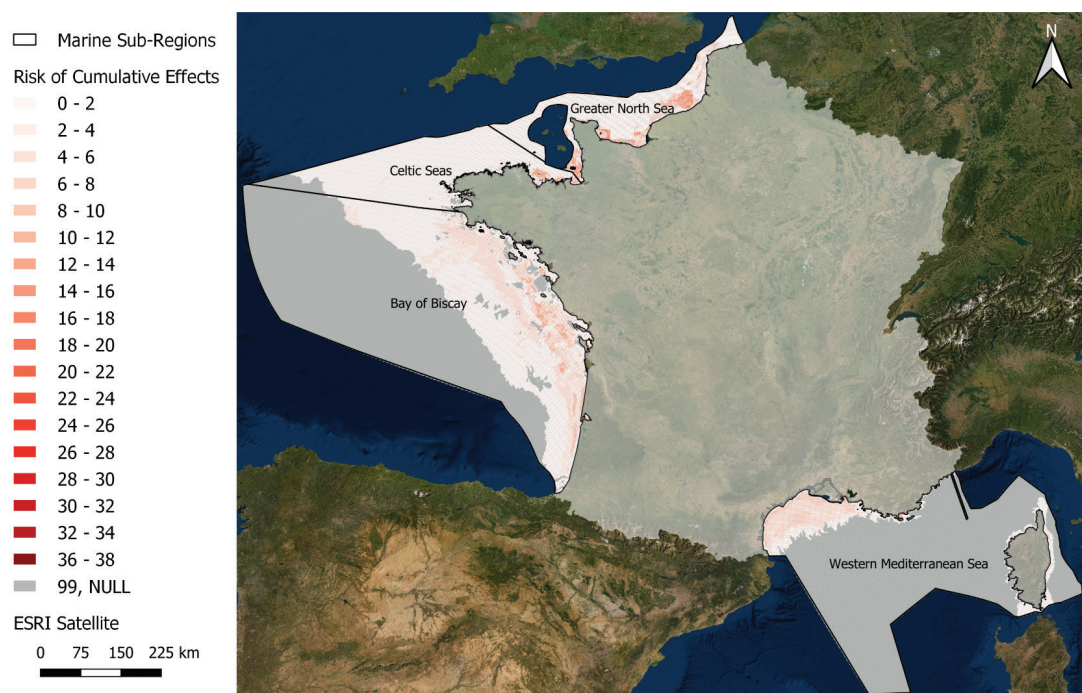
Figure
Distribution of the Risk of Cumulative Effects according to the majority marine habitat of level 4 of the EUNIS Code in France

Ecosystem asset account in monetary terms using Unpaid ecological costs, applied to the marine ecosystems in France

🐟 Scale

The French metropolitan Exclusive Economic Zone as a whole and divided by sub-regions;

🐟 Involved and funding partners

Research funded by MAIA, involving AgroParisTech and CIRED, with collaborations from the French Biodiversity Office (OFB) and the French ministry for an ecological transition (MTE);

🐟 (Policy) Goal of the study

The development of this account will help with the assessment of an ecological debt, which can be used as an indicator of sustainability, to measure the cost of degradation, or to correct macro-aggregate figures (Vanoli, 2015);

🐟 Ecosystems under study

Marine ecosystems;

🐟 Methods and data used for the study (if relevant indicators used)

Unpaid ecological costs are "the cost of the damage to natural assets resulting from economic activities which could not be avoided or repaired by the internalized costs borne by the economy" (Vanoli, 2015, p. 84). This approach relies on setting standards or reference conditions of a good ecological status to be reached. Methods to estimate unpaid ecological costs include Habitat Equivalency Analysis, abatement costs, and restoration costs;

### 🐟 Research used in the methodology

Levrel, H., Jacob, C., Bailly, D., Charles, M., Guyader, O., Aoubid, S., Bas, A., Cujus, A., Frésard, M., Girard, S., Hay, J., Laurans, Y., Paillet, J., Pérez Agúndez, J.A., Mongruel, R.,

2014. The maintenance costs of marine natural capital: A case study from the initial assessment of the Marine Strategy Framework Directive in France. Marine Policy 49, 37–47. https://doi.org/10.1016/j.marpol.2014.03.028

Vanoli, A., 2015. National accounting and consideration of the Natural heritage, in: Nature and the Wealth of Nations – La Revue Du CGDD. pp. 75–84;

🐟 Link to research/Reference

Comte, A., Kervinio, Y., Levrel, H., 2020. Ecosystem accounting in support of the transition to sustainable societies – the case for a parsimonious and inclusive measurement of ecosystem condition. CIRED Working Paper;
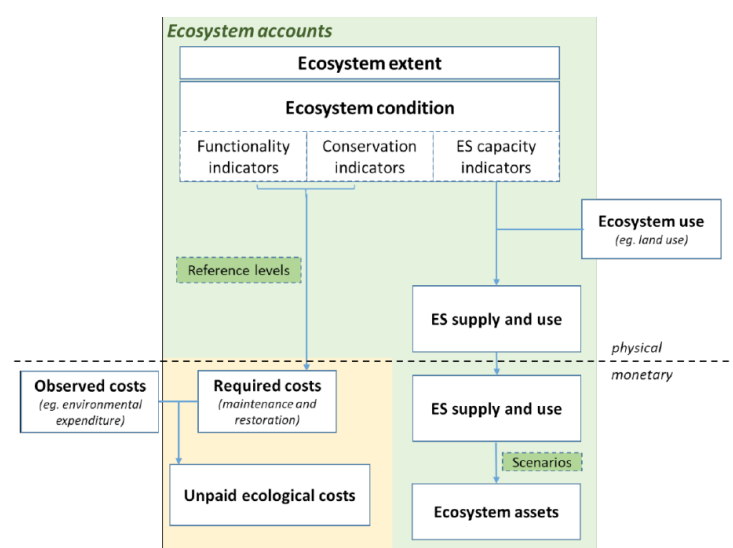
Figure

Structure of ecosystem accounts proposed in Comte et al. (2020)

Knowledge gaps and difficulties for developing natural capital accounts

Based on MAIA D3.2 (Annex 5 section 5); D5.1 (Annex 5 section 5e and 6d)

Data gaps in France mainly involve marine and coastal habitats and the overseas territories. The first suffers from infrequent and inconsistent data affecting both extent and condition accounts, while the second lacks data overall, except for coral reefs. The account for unpaid ecological cost still needs conceptual and technical refinements to become operational.

For the extent account, the frequency of mapping of the marine and coastal habitats is very low and requires different tools depending on the depth of the seafloor. This leads to the creation of habitat maps that are composed of different data sources, using different tools, over a long period of time. It will therefore be impossible to define an accounting period at this stage.

For the condition account, many different indicators exist on the condition of the marine environment. The difficulty will be to choose the most important ones, that are spatially-explicit, as some indicators are measured in specific stations and not over large areas. However, these accounts will allow a recurrent reporting of habitat condition trends, probably with an accounting period of 6 years.

The development of the marine and coastal habitats accounts is challenging. However, the amount of work going into the implementation of the Marine Strategy Framework Directive, which takes an ecosystem approach, is very valuable as a basis to construct the accounts.

For the unpaid ecological cost account most of the data regarding funding needs and cost-effectiveness of marine conservation programs are missing in France. This means hypotheses on the perimeters of costs and the economic tools to evaluate the different categories of maintenance and restoration costs have to be determined. Moreover, using the unpaid ecological cost as an indicator of the cost of degradation has not been widely used and needs many conceptual and technical refinements to become operational.

Overall, data is lacking for the French overseas territories. Contacts in one oversea territory, New-Caledonia, shows that there is not sufficient data to produce spatially-explicit ecosystem accounts. Datasets are only available for one ecosystem type, coral reefs, and for one kind of activity related to the condition and ecosystem service of marine ecosystems, fisheries.

Support needs for developing natural capital accounts

Based on MAIA D3.2 (Annex 5 section 6 and 7); D5.1 (Annex 5 section 6e, 7 and 8)

In France, no capacity building needs have been identified at this stage. Stakeholders have emphasized the need to create accounts that are useful for public policies, since setting up accounts is costly. There are problems that still need to be overcome for the unpaid ecological cost and extent account. A committee or working group, including various public administrations and researchers, on the means to improve and integrate ecosystem accounts, should be put in place in order to facilitate the construction and use of the ecosystem accounts.

There is no need for external capacity building at this stage. A seminar will be organized after the first year of the project on the development of ecosystem accounts and unpaid ecological cost, to build the capacity of the various stakeholders involved in France, notably the MTE. Informal discussions on ecosystem accounts are taking place regularly.

The stakeholders have emphasized the need to create accounts that are useful for public policies, since setting up accounts is costly. Therefore, the process of engaging with stakeholders to refine the accounts to be developed is a key step in the project.

A system to monitor the state of marine ecosystems in France can build on the work produced every six years in the context of the Marine Strategy Framework Directive, especially for condition and current expenses accounts. However, there is currently still an account missing for the maintenance and restoration cost/unpaid ecological cost accounts. In addition, the extent account cannot be monitored every 6 years since few additional data regarding the changes of habitat surfaces will be added. In this context the best way to fill in the extent account is to use an indicator regarding the condition account (a normalized index can lead to consider a habitat as still present but without any biological community in it for example).

A committee or working group, including various public administrations and researchers, on the means to improve and integrate ecosystem accounts, should be put in place in order to facilitate the construction and use of the ecosystem accounts. This issue will be raised to the different national stakeholders involved in the project, though MAIA will not be responsible to establish such a committee. To this aim, it could be pertinent to target the « commission des comptes et de l'économie de l'environnement ». Involving key resource persons in the different administrations is important to ensure the continuation of the account production and refinements over time.

Involved partners and stakeholders

Based on D5.1 (Annex 5 section 2); European NCA stakeholder day

Government	Research	Private sector or NGO
Sustainable Development Commission (CGDD)	AgroParisTech-CIRED	
Coast and See Directorate (DML)	Ifremer (French research institute of the sea)	
Data and Statistical Survey Services (SDES)	Université de Bretagne Occidentale (UBO)	
Ministry for an Ecological Transition (MTE)		
French Biodiversity Office (OFB)		
National Observatory on Biodiversity (ONB)		

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Levrel, H., Jacob, C., Bailly, D., Charles, M., Guyader, O., Aoubid, S., Bas, A., Cujus, A., Frésard, M., Girard, S., Hay, J., Laurans, Y., Paillet, J., Pérez Agúndez, J.A., Mongruel, R., 2014. The maintenance costs of marine natural capital: A case study from the initial assessment of the Marine Strategy Framework Directive in France. Marine Policy 49, 37–47. https://doi.org/10.1016/j.marpol.2014.03.028

Martin, J.-C., Mongruel, R., Levrel, H., 2018. Integrating Cultural Ecosystem Services in an Ecosystem Satellite Account: A Case Study in the Gulf of Saint-Malo (France). Ecological Economics 143, 141–152. https://doi.org/10.1016/j.ecolecon.2017.07.005

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Vanoli, A., 2015. National accounting and consideration of the Natural heritage, in: Nature and the Wealth of Nations – La Revue Du CGDD. pp. 75–84