



March 30th, 2022

Linking Ocean Accounting to Marine Spatial
Planning



A Global Ocean Accounts Secretariat (GOAP) Technical report

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Recommended citation

This publication (and any material sourced from it) should be attributed as:

GOAP (2022) Linking Ocean Accounting to Marine Spatial Planning. Global Ocean Accounts Partnership, Sydney, Australia. <https://www.oceanaccounts.org/linking-ocean-accounting-to-marine-spatial-planning/>

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Highlights

Ocean accounts:

- Organise ocean data (social, environmental, economic) into a common framework using the same structure as national accounts maintained by National Statistical Offices or Finance Ministries.
- Provide countries with the means to go beyond Gross Domestic Product (GDP) alone to measure progress towards growth and sustainability of the ocean economy.
- Provide a common information infrastructure for ocean policy, strategic planning (including marine spatial planning) and reporting.

Ocean Accounts could assist Marine Spatial Planning by:

- Providing data needed by MSP to analyse and allocate spatial activities, according to multiple criteria (beyond economic measures only),
- Providing a standardised 'data foundation' for plan formulation and scenario analyses, including cost-benefit and trade-off analyses,
- Reducing duplication in data-gathering exercises and supporting maintained time-series of policy and planning relevant data,
- Providing a framework to monitor and evaluate plans towards pre-defined objectives.

Marine Spatial Planning could further the compilation of Ocean Accounts by:

- Providing a foundation for compiling accounts through inventories of economic, social, and environmental data,
- Identifying the priority data gaps that could be addressed through accounts,
- Identifying the layers of governance defining an ocean space and priority.

Keywords: ecosystem-based management, System of Environmental-Economic Accounting, socio-economic activities, blue economy



Table of Contents

Highlights.....	3
Ocean Accounts for Sustainable Development.....	5
What are ocean accounts?.....	5
Why are ocean accounts useful?.....	5
Strategic development planning.....	5
Components of Ocean Accounts	6
Conceptual links between Ocean Accounting and Marine Spatial Planning.....	7
What is Marine Spatial Planning (MSP)?.....	7
Why link OA and MSP?.....	7
Operational links between OA and MSP.....	8
Using MSP as a foundation for OA	8
Using OA as a foundation for MSP	9
Linking components of the Ocean Accounting framework	9
References.....	12



Ocean Accounts for Sustainable Development

What are ocean accounts?

National accounts influence public policy — All countries maintain systems of national accounts, which inform and justify economic decision-making. The accounts are generally maintained by National Statistical Offices or Finance Ministries, based on the international standard System of National Accounts 2008 (SNA). They regularly produce and report the headline indicator of Gross Domestic Product (GDP).

Ocean accounts organise ocean data in a common framework, integrated with existing national accounts — Ocean accounts (OA) are integrated records of sectoral economic activity (e.g., sale of fish) or social conditions (e.g., coastal employment, inclusivity and poverty), and spatial environmental conditions (e.g. extent / condition of mangroves) that are compiled on a regular basis and are compatible with existing statistical standards. They are based on the SNA, and System for Environmental Economic Accounting (SEEA), which is now used by at least 80 countries to account for policy-relevant environment-economy relationships on land. At least 15 countries are actively developing ocean accounts.

Why are ocean accounts useful?

Reporting of progress of the ocean economy towards growth, well-being and sustainability — A comprehensive sequence of ocean accounts enables countries to monitor three critical trends: (1) changes in ocean wealth, including produced assets (e.g., ports) and non-produced assets—e.g., mangroves, coral reefs; (2) ocean-related income and welfare for different groups of people—e.g. income from fisheries for local communities; (3) ocean-based economic production—e.g. GDP from ocean-related sectors.

Providing a common information infrastructure for ocean policy and reporting — Many ocean policy shortcomings arise from isolated information. Ocean accounts provide a common reference point for diverse policy questions, related to: (1) Ocean development—e.g., GDP in the shipping sector and associated GHG emissions; value-added in fisheries exports versus stock health and employment; (2) Marine spatial planning and area-based protection—e.g. changes in biodiversity or flows of ecosystem services like carbon storage or flood risk regulation; (3) International reporting—e.g. Sustainable Development Goals (SDGs), Paris Agreement, CBD, etc (see Figure 1 and Table 1 for OA framework structure).

Strategic development planning

Strategic development plans for the ocean economy, including national “Blue Economy”, “Ocean Economy” and “Blue Growth” plans that establish development objectives and targets aligned with diverse guiding principles. A regionally representative list of examples includes the European Union’s Blue Growth Strategy, South Africa’s Operation Phakisa Oceans Economy



strategy, Fiji's National Ocean Policy, or Chapter 41 of China's 13th Five-Year Plan for Economic and Social Development. Ocean Accounts perform several support functions for strategic and planning decisions that justify the investment in compiling them. By virtue of their holistic and integrated structure, Ocean Accounts provide a basis for analysing the economic relevance of the ocean's environmental assets, the impacts of ocean-based economic activity, and other relationships that impact the achievement of ocean sustainable development. This analysis supports the identification and evaluation of policy response options, in terms of their impacts on assets (environmental, social, economic) that underpin development, and on the flows of services and benefits from these assets.

Components of Ocean Accounts

Ocean Accounts are aligned with the following standards:

- UN System of National Accounts (SNA, 2008), in the treatment and measurement of economic sectors, activity and production,
- UN System of Environmental-Economic Accounting – Central Framework (SEEA-CF, 2012), in the consideration of thematic flows from the environment to the economy (e.g., water, energy) and conversely, flows to the environment (e.g., waste, air emissions),
- UN SEEA – Ecosystem Accounting (SEEA-EA, 2021), in the consideration and treatment of ecosystems, their extent, condition and services.

Ocean accounts draw from these international accounting standards through several table groups (Figure 1), which seeks to identify and relate components of an ocean system. Several components of OA are spatial, contextualising flows between environment, society, and economy. For example, in aligning with SEEA-EA, the supply of ecosystem services (i.e., flows to economy, Figure 1) are dependent on the location of ecosystems and their intersection with economic sectors, government and households. The importance of specific ecosystem services, such as coastal protection, are contextualised by the presence (or absence) of assets which benefit from such protection.

Another key table group is the Ocean Economy, based on ocean economy satellite accounting, in disaggregating to ocean-related economic activities (REF). Linking ocean economic activities to ecosystems identifies their dependency on ecosystem goods and services.



Conceptual links between Ocean Accounting and Marine Spatial Planning

What is Marine Spatial Planning (MSP)?

The ocean is seen as a significant vehicle for economic growth in the coming decades, where the growing intensity and diversity of human activities has driven (or will contribute to) conflicts for space and ocean resources, either between activities (user-user) or degrading shared ocean ecosystems and their resources (user-environment). To mitigate present and future conflict, ocean management has transitioned from sectoral to integrated management, to overcome information and governance siloes and make progress towards strategic objectives.

Within the marine domain, Marine Spatial Planning (MSP) has been used to allocate human activities spatially, usually through participatory processes, to reconcile differing values and priorities between diverse stakeholders. The framework is endorsed by IOC-UNESCO, and has been embedded into regional legislation (e.g., European Union¹) and international MSP initiatives (e.g., MARISMA project²). Approximately 75 of 150 countries with marine waters have implemented or are in the process of developing some form of MSP.

Why link OA and MSP?

The two frameworks possess several synergies that further effective and evidence-based ocean governance (see Gacutan et al., 2022 for full exploration). Essentially, OA can provide a structured and integrated 'data foundation' that shapes policy through providing a range of comparable statistics and indicators. These policies, in addition to legislation and other layers of governance, define the objectives of MSP, where OA may provide data to assist in the formation of plans, and further evaluate progress towards policy targets.

Aside from policy motivators, there are clear conceptual links between OA and MSP, where marine spatial plans are increasingly required to advance an 'integrated' or 'ecosystem-based' approach, framing the environment and its contributions as 'natural capital' and 'ecosystem services'. The organisation of ecosystem 'stocks' and 'flows' lends naturally to an accounting framework, and OA provides guidance to organise and structure the ocean system in a manner compatible with existing international accounting standards. This facilitates comparability in the statistics and indicators produced within and between countries.

¹ Maritime Spatial Planning Directive (2014/89/EU)

² MARISMA Project (www.benguelacc.org/index.php/en/marisma)



While there is currently limited intersection of OA and MSP, a growing number of countries are investing in both activities, increasing *the risk of incompatibility and duplication within shared functions*. MSP is a data-intensive exercise, where integrated plans require an understanding of relationships between environment, economy, and relevant stakeholders within society. Data-gathering for MSP may also be highly specialised, varying in spatial or temporal scale. This limits the use of the data in other contexts, including Ocean Accounting. As Ocean Accounting may be performed by other departments (e.g., National Statistical Offices, Ministries of Finance), the frameworks should be linked to reduce the risk of duplication.

Operational links between OA and MSP

Linking both frameworks operationally can begin through multiple entry points, depending on the needs of OA or MSP practitioners and the progress for either framework. Table 1 provides scoping questions to determine the progress of OA and MSP activities and options to link activities of either process (see also Figure 2).

Using MSP as a foundation for OA

MSP can be considered the ‘implementation’ of relevant ocean policies, legislation, and other layers of governance (see Gacutan *et al.*, 2022). Several countries have existing mandates to complete plans, where MSP is generally more developed and implemented globally, relative to OA. It may be the case that OA practitioners are seeking to draw from existing MSP processes to streamline account compilation.

If MSP has an established legal basis, although in pre-planning stages, OA practitioners should identify and align OA activities with the policies, legislation and other layers of governance driving the MSP process. This ensures that the compiled accounts will be directly linked to relevant policies and inform strategic ocean planning. This could involve the selection of appropriate table groups from the OA framework. For example:

- MSP focusing on ocean-related economic growth should prompt OA practitioners to compile ocean economy satellite accounts.
- MSP embedding natural capital and ecosystem services concepts should prompt OA practitioners to consider compiling ecosystem accounts for relevant habitats.

This reduces the risk of duplication in data gathering and processing and ensures compatibility with accounting processes. Existing data inventories from MSP could form the basis for scoping OA feasibility. In conducting trade-off and cost-benefit analyses of different scenarios, MSP processes identify priority data gaps, often lacking data at relevant spatial and temporal (i.e., time-series). In collaborating with marine spatial planners, OA practitioners could align data gathering activities and ensure collection and transformation is account compliant. Again, this reduces duplication and mitigates future incompatibility.



If marine spatial plans are completed, OA practitioners should prioritise the production of accounts and indicators that support the evaluation of plans and their progress towards predefined objectives. This ensures direct relevance of OA to existing planning and reporting processes and justifies the resources in compiling them.

Using OA as a foundation for MSP

As a 'data foundation', there are clear steps in which OA may support the development of MSP. As a starting point, MSP practitioners should scope the types of accounts that have been compiled (e.g., ecosystem accounts, ocean economy) and their alignment with the objectives of the MSP process. For example, MSP prioritising ocean-related economic activity would benefit from ocean economy satellite accounts that disaggregate ocean economic production and employment. A full list has been compiled in Table 1. Further, access to OA data inventories would allow MSP practitioners to identify gaps, such as accounting areas that differ with the planning area. Gaps in the overlap between the two may require further data gathering. Data sharing agreements should be prepared as soon as possible with the relevant department / ministry to facilitate access.

Linking components of the Ocean Accounting framework

The following describes the structure of the OA framework (Figure 1) and identifies links per component to MSP. Accounts could be compiled in any order, relevant to policy demand. A full range of accounts, however, better measures the contribution of oceans to society and the economy. Table 3 identifies relevance to MSP processes.

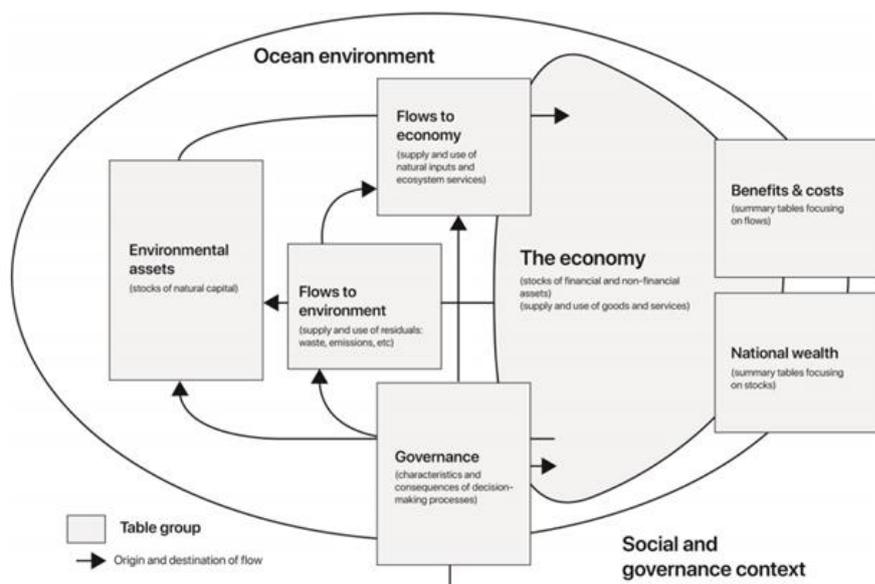


Figure 1. General structure of the Ocean Accounts Framework adapted from the Technical Guidance on Ocean Accounting (GOAP, 2021).



Table 1. Summary of links per response to scoping questions by theme, modified from “*Best practice in Marine Spatial Planning*”, (Ehler and Douvere, 2009). OA = Ocean Accounts, MSP = Marine Spatial Planning.

Theme	Question	Actions to further links between OA and MSP
Establishing authority and pre-planning	Are there existing commitments to produce OA or MSP? If yes, have the scope / policy targets of either framework been defined?	<ul style="list-style-type: none"> • If ‘yes’ for MSP, determine the policies driving implementation and their alignment with OA. For example, determine whether novel ocean-related economic sectors or environmental conservation will be prioritised, guiding which table groups will be most appropriate to support MSP, as an existing policy process. • If ‘yes’ for OA, determine which table groups will be prioritised and identify those most aligned with strategic planning. Prioritise the development of governance accounts, to assist in identifying stakeholders and relevant layers of governance, crucial for initial steps of MSP formulation.
Data needs	Have data inventories been compiled for MSP or OA?	<ul style="list-style-type: none"> • If ‘yes’ for MSP, identify the datasets relevant to OA (scoped through quality, accessibility and spatio-temporal resolution). For data collection processes that are not aligned with OA, determine if collection methods could be modified to emphasise appropriate spatial scale and regular time-series. • If ‘yes’ for OA, prepare data sharing agreements to support and streamline the MSP process.
Formulating OA / MSP	Has MSP plan formulation or OA account compilation begun?	<ul style="list-style-type: none"> • If ‘yes’ for MSP, identify priority data gaps noted during cost-benefit, trade-off or scenario analysis. Identify opportunities for gathering account-compliant data. • If ‘yes’ for OA, identify and prioritise production of the statistics and indicators which would directly inform the MSP process.
Implementation, evaluation, and adaptation	Are MSP plans or OA completed?	<ul style="list-style-type: none"> • If ‘yes’ for MSP, identify how OA may support the evaluation and adaptation of plans. Determine which indicators could be used to evaluate MSP progress towards objectives. • If ‘yes’ for OA, identify the datasets and indicators that could be used to support plans through each stage of the MSP process.



Table 2. Description of Ocean Accounting table groups and links to Marine Spatial Planning. SEEA-CF = SEEA Central Framework, SEEA-EA = SEEA Ecosystem Accounting.

Table group	Description	Links to MSP
Environmental assets	Relates to the 'stock' of biological and physical assets. Accounts could revolve around specific natural resources (e.g., SEEA-CF) or take an ecosystem-based approach, to consider the extent and condition of ecosystems (i.e., SEEA-EA).	Provides the spatial extent of ecosystems and their resources, relevant to policies and legislation defining MSP. For example, identifying protected habitats or areas most suitable for conservation or distribution of priority space / natural resources.
Flows to economy	The supply and use of natural inputs (e.g., goods) and ecosystem services, disaggregated by economic sector, government, and households.	Several MSP processes are required to consider ecosystem services, assisting in identifying non-use and non-market aspects of ecosystems in cost-benefit analyses. Services may be of importance to the functioning of multiple economic sectors. MSP may identify the impacts of activities on ecosystems and their services.
Ocean economy	Measures of economic production and employment for ocean-related sectors.	As a framework to analyse and allocate economic and other human activities spatially, MSP requires an understanding of activities, their dependence on natural inputs and importance to the overall economy.
Flows to environment	Measures the outputs / pressures of economic sector activities to the environment, including pollutants (e.g., chemical, and physical wastes, plastics, noise), air, and water emissions.	The table group could be used to identify and measure pressures posed by economic and human activities on ecosystems. These measures could be used in cost-benefit analyses.
Governance	Provides a spatial understanding of layers of ocean governance (legislation, regulatory instruments, national standards, policy etc.), sectoral contacts and data/knowledge holders.	Identifies relevant stakeholders and potentially the relationship between them. It also identifies the layers of ocean governance relevant to MSP.

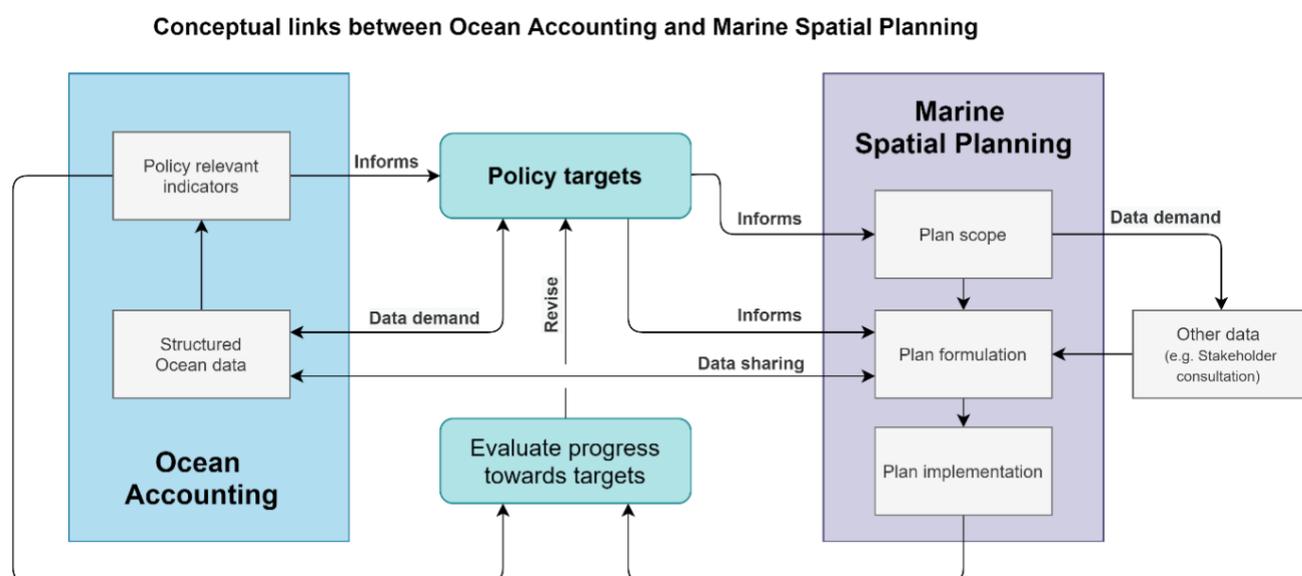


Figure 2. Overview of the links and relationships between the two frameworks.

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