



March 30th, 2022
Identifying Models for Institutional Arrangements for
the Compilation of Ocean Accounts



A Global Ocean Accounts Secretariat (GOAP) Technical report

Authors

Prepared by the GOAP Secretariat: Laura Treub, Teerapong Praphotjanaporn, Jordan Gacutan

Recommended citation

This publication (and any material sourced from it) should be attributed as:
GOAP (2022) *Identifying models for institutional arrangements for the compilation of Ocean Accounts*. Global Ocean Accounts Partnership, Sydney, Australia.

<https://www.oceanaccounts.org/identifying-models-for-institutional-arrangements-for-the-compilation-of-ocean-accounts/>

Email contact: info@oceanaccounts.org

Website: www.oceanaccounts.org



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.
- The multidisciplinary approach of Ocean Accounts integrates a variety of data that allows to measure changes in ecosystem health and its effects on the economy and society

There are several institutional arrangements to implementing Ocean Accounts, reflecting different policy needs and country contexts. Government-led initiatives could consider implementing accounts through:

- Inter-ministerial oversight, steering implementation through a policy or technical committee (or both),
- A single, lead ministry / department, with the power to delegate to other ministries and institutions,
- Inception at the sub-national government level, to build capacity and form a community of practice, and
- Pilot projects by one ministry or department as a proof-of-concept.

Ocean Accounts may also be conducted external to government processes, where governments may delegate pilots to external institutions or inception begins as a completely external process:

- to research institutions with expertise across multiple areas required for natural capital accounting (e.g., GIS, economics, ecology etc.)
- to domestic-international partnerships, to develop capacity.

The following report provides a background to Ocean Accounts and expands on each approach and identifies institutional models for the inception of accounts. It does not provide a critique of the models, nor an assessment of their efficacy, but rather provides an overview of the options of implementing Ocean Accounts in early stages.

Keywords: Governance models, System of Environmental-Economic Accounting



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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. These 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 currently 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., SDGs, Paris Agreement, CBD, etc.

Alignment with international policy commitments and strategic planning

Increased human activity in coastal areas pressures the capacity and health of the ocean's ecosystems. The sustainable management of these ecosystems therefore requires a



comprehensive understanding of the multiple pressures posed on them. *Strategic development plans for the ocean economy* such as the “Blue Economy”, “Ocean Economy” and “Blue Growth” strategy have established development objectives and targets aligned with diverse guiding principles to address this problem. Some regionally representative examples include the European Union’s Blue Growth Strategy, South Africa’s Operation Phakisa Oceans Economy strategy or Fiji’s National Ocean Policy. Ocean Accounts is an emerging framework, that offers relevant support structures for countries to work towards achieving these targets. Collecting data from a range of disciplines, they provide a basis for analysing the economic relevance of ocean’s environmental assets, the impacts of ocean-based economic activity, and other relationships that impact the achievement of ocean sustainable development. The continuous analysis of such trends supports the identification and evaluation of policy response options towards important targets.

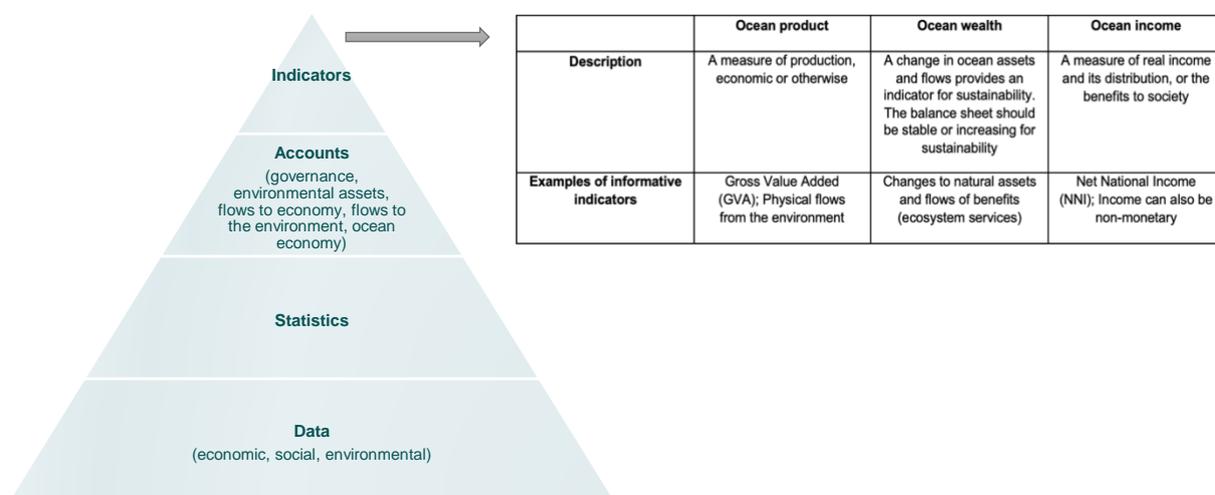


Figure 1: Data Foundation for Ocean Accounts



Ocean Accounts framework structure

Ocean Accounts provide a means to combine a variety of data sources. The framework includes five table groups: (1) Environmental assets, (2) Flows to economy (ecosystem services), (3) Flows to the environment (5) Ocean economy and (5) Governance. Together they collect a range of different information/data which then inform policy relevant indicators to support government decisions. Ocean Accounts are aimed at centralising, standardising and integrating information on the oceans, enabling governments to process ocean data in a coherent way. The spatially - explicit and consistent information allows to be compared and integrated across borders and encourages knowledge collaboration and exchange between countries. This is critical as the nature of ocean's systems is transboundary.

The way governments manage ocean environments influences the development of the ocean economy and the health of ocean ecosystems. Therefore, it is essential to consistently monitor ocean environments and re-evaluate predetermined policy objectives. This requires consistent monitoring and evaluation of ocean data. However, data sources can be scarce and are often fragmented across different stakeholders (governments, ministries, universities etc.) and disciplines, providing weak data foundations for plans and decisions. There is a general lack of a means to evaluate progress and linkages between different objectives and indicators. The interdisciplinary approach of Ocean Accounts addresses these problems by offering to integrate data and statistics across different disciplines. The framework provides an opportunity for increased collaboration across government ministries and stakeholders towards a more integrated and holistic planning of the oceans' futures.

Specifically, OA allow countries to monitor and report on three critical trends: Changes in ocean wealth (e.g., ports, mangroves, reefs), ocean related welfare and income for different groups of people and ocean based economic production. Recording these trends provides governments with a common and solid information infrastructure for ocean policies, reporting and reduces the reliance on ad hoc, unintegrated data for critical decision making. Critical information to gain from OA includes tracking the size and changes of the ocean economy and the conditions of the marine environment or identifying jobs/industries which rely on specific ocean ecosystems. OA also increase authorities' ability to identify relevant knowledge gaps, providing valuable information on how to increase future capacity.

Opportunities for implementing Ocean Accounts

A full set of Ocean Accounts provide an integrated and standardised understanding of the ocean system, supporting several processes within strategic planning decisions making. Many international commitments and domestic policies support the compilation of accounts, as a 'data foundation' to inform actions and evaluate progress towards targets.



Policy alignment and evaluating progress

As explored in Section 1.3, States may have policies prioritising the growth of ocean-related economic sectors and conservation of ocean ecosystems, both of which are commonly embedded within strategic plans. For example, South Africa's Operation Phakisa Oceans Economy strategy, Fiji's National Ocean Policy, and Chapter 41 of China's 13th Five-Year Plan for Economic and Social Development all contain elements of 'blue' economic development, alongside the need to conserve ecosystems and their functioning. These plans, therefore, require a means to evaluate the impact of policies and management, which is provided by ocean accounts. Table 1 identifies the table groups that may support specific policy targets and therefore support the compilation of such accounts. Oceans accounts further provide statistics and indicators that support national (e.g., State of environment) and international reporting on commitments (e.g., progress on Sustainable Development Goals).

Table 1. Policies and the table groups within Ocean Accounts that support them.

Policy focus	Table groups	Examples
Ocean-related economic growth	Ocean economy, governance	<ul style="list-style-type: none"> • Measure production and employment within developing sectors (e.g., aquaculture, marine tourism). • Determine impacts of spatial planning on economic performance.
Environmental impact monitoring	Flows to the environment	<ul style="list-style-type: none"> • Link pollutants to their impacts to ecosystems (e.g., solid wastes, plastics). • Identify compliance with environmental standards by economic sectors.
Natural resource management and conservation	Environmental assets, flows to economy	<ul style="list-style-type: none"> • Determine impacts on 'ocean wealth' (i.e., stocks of ecosystems and natural resources). • Identify contributions to society and the economy through ecosystem goods and services.

Assessing the benefits of conservation

The increase in the number and intensity of activities has produced multiple impacts on the ocean. There is a growing realisation, however, that many of these sectors are reliant on ecosystem health and the services they provide, reflected in commitments towards the conservation of ecosystems. Several countries have policies and plans that require



'ecosystem-based' or 'integrated' management of their ocean space, in better representing ocean ecosystems within cost-benefit analyses. This aligns with commitments to conserve certain percentages of a country's sovereign waters (e.g., Convention on Biodiversity, 30x30 initiative). Whilst exclusion from conservation of areas may impact specific economic sectors, protected areas have been shown to contribute to society and the economy through means other than economic growth.

The OA framework allows countries to move 'Beyond GDP' in the analysis of ocean economies, by further providing indicators on ocean wealth (i.e., ecosystem and natural resource stocks) and how ecosystems may contribute non-market or non-material benefits to society and the economy, through the compilation of tables such as '*flows to the economy*'. These tables capture non-use and non-market services, such as the protection mangroves provide to infrastructure and housing, in reducing wave energy from storms. The benefits are only realised once they are removed, and damage has occurred. Thus, countries can better understand the importance of health ecosystems, avoiding the unforeseen costs associated with their removal and providing incentives for conservation.

Challenges for implementing Ocean Accounts

Undertaking ocean accounting efforts requires a range of highly specialised expertise and manipulation of datasets that rivals, if not eclipses, the effort required to compile measures of GDP. Further, as a novel framework, much remains that requires testing to develop methods for the numerous stocks and flows within ocean systems. The below describe the challenges identified within existing pilots, that influence the ways countries have commenced the implementation of accounts.

Capacity and technical difficulty in implementing OA

A common challenge in OA is assembling teams of transdisciplinary experts required to produce the accounts. For example, ecosystem accounts (i.e., environmental assets, flows to the economy) require the knowledge of ecologists and physical scientists, whilst the compilation of accounts on the Ocean Economy relies on national accountants and economists (See Section 2). The diverse range of expertise required often lies outside a single government ministry or department, and therefore requires collaboration and coordination across multiple institutions. Within many countries, natural capital accounting is a novel field, where pilots and testing require external engagement to build capacity on relevant frameworks, methods, and workplans.

Even with relevant expertise, the compilation of the accounts remains a challenge due to the difficulties in working with ocean knowledge and data. For example, oceans are 3 dimensional, posing a technical challenge to any accounting framework. Further, data limitations require the use of proxies for the extent and condition of ecosystems, and numerous assumptions on estimating the nature of the ocean economy. Finally, the



valuation of ecosystem services poses a challenge, especially those that are non-market (i.e., non-use) or non-material in nature (e.g., coastal protection, cultural services).

Difficulties with coordination

The need for multiple fields of expertise across multiple institutions poses a challenge to coordination, where departments may have different mandates and jurisdictions. Further, knowledge and data relevant to OA is often fragmented across departments, stakeholders, and research institutions, requiring groundwork to establish data sharing agreements and overcoming other administrative and bureaucratic barriers. As a novel process, countries may not have previous experience or the capacity to assemble and coordinate such partnerships and a significant challenge may be assigning a lead agency to oversee the process.

Incompatible data and accounting areas

Most countries have existing processes that capture data on ocean related sectors and resources (e.g., fisheries stock). These processes, however, may not align with the classifications, definitions and methods used by OA. A common challenge is the varying classifications at different scales (e.g., nation vs. sub-national), which poses difficulties in collating and aggregating statistical data on oceans. Further, the accounting or reporting areas used by different institutions may also vary, where the census areas used by national statistical offices may not align with reporting areas for environmental departments. Other challenges include varying institutional jurisdictions, where coastal and marine habitats are treated separately.



Institutional arrangements led by government

Ocean Accounts, in aligning with national accounting processes, is ultimately a government exercise to assist in decision making. Therefore, accounts should be maintained by national statistical offices (or their equivalent), to ensure compatibility with existing processes (e.g., strategic planning and management). The expertise required to compile accounts, however, spans across multiple ministries or departments (see Section 2), leading to multiple approaches in the inception of OA. In general, the institutional arrangements for the initial implementation of Ocean Accounts are either government-led or delegated to other institutions, for later endorsement and assimilation into a government department. The below describes the various modes of government-led institutional arrangements, led by either (i) a cross-departmental / ministerial group, (ii) a single lead ministry/department, or (iii) the compilation of OA at the sub-national level.

The key considerations affecting the modality employed will include:

- the existing legal framework, competencies of the selected ministry/ies to perform various duties and whether those should be expanded to encompass OA,
- suitable lead experts within each ministry and the stakeholders that may influence the implementation process.
- Ability to coordinate and communicate within and between ministries.

Multi-departmental

Due to the expertise required, OA implementation may be coordinated across multiple government institutions, through the establishment of a cross-departmental committee that may focus on either coordination, technical aspects, or both. Depending on the focus, the committee could have:

- Lead experts from each ministry on the technical aspects of accounts,
- Executives (or equivalent) to ensure coordination and compatibility of deliverables,
- A mixture of both to ensure alignment with policy goals, whilst maintaining coherence with international standards.

Each ministry may have its own focus and mandate, aligned with its functions and expertise, working separately to compile accounts, in line with policy demand. For example, the Ministry of Economy may focus on accounts of the Ocean Economy in parallel with a Ministry of Environment compiling ecosystem accounts. Ensuring compatibility between the resulting outputs, however, relies on a strong inter-ministerial committee, that maintains dialogue and lines of communication. The different end-users and stakeholders of each ministry's process may influence accounts and cause incompatibilities in the long-term.



Lead department / ministry

A top-down government mandate, led by a specific ministry can provide the necessary legitimacy, authority, and financial incentives to plan the implementation of OA. The ministry will most likely have the power to delegate certain tasks to other ministries, to utilise complementary expertise. The most likely ministry depends on the initial accounts compiled, where a focus on:

- Ocean Economy – may be led by a Ministry of Finance / Economy or National Statistical Office.
- Ocean Ecosystems - may be led by a Ministry of Environment (or similar),
- Supporting existing accounting processes – may be led by a National Statistical Office.

The ocean policy of several countries is implemented through the focal department or ministry of the president / prime minister (e.g., Department of Prime Minister and Cabinet, Cabinet Office, Executive Office of the President, or similar), that has the authority to delegate across ministries and ensure coordination with activities. This would ensure that the activities align with central policies and provides a platform for dialogue between departments. The responsible lead ministry will also need the institutional infrastructure (e.g., data sharing agreements) to access and compile the relevant data and outcomes.

Sub-national government initiative.

Federal or central government may delegate the initial implementation of OA to sub-national governments due to:

- limited capacity and resources for implementation at the national scale,
- testing the framework at smaller scales, to provide a business case for scaling,
- the jurisdiction of the sub-national government, which may extend across coastal areas, encompassing priority accounting areas (subsidiary principle).

Delegation sub-nationally allows the central government to assess the utility of accounts and could later adopt and assimilate the process at a national scale. It further allows capacity building and engagement with multiple sub-national governments to be involved in the implementation process, also reduces the risk of future incompatibility and inadequate funding from the centre. A key risk, however, is later compatibility with the national process and coherence between future processes of adjacent states/provinces/territories. Continued dialogue between central and sub-national governments is of high importance.



Institutional arrangements led externally

Countries may choose to delegate the OA process externally to government-affiliated institutes (i.e., government-affiliated science institutes) and research institutions (i.e., universities), who develop and test OA through pilot studies. Such institutional arrangements vary in government oversight and may involve either multiple domestic institutions or external consultancy through local-external partnerships, depending on resourcing and available domestic expertise. Investment into OA domestically may also require proof-of-concept or business cases to demonstrate their utility and return on investment, which may lead to later adoption of outcomes according to policy alignment.

Delegation to domestic institutes

Governments may choose to delegate the compilation of accounts to one or more domestic research institutes, to compile accounts. Delegating of pilot studies to external institutions allows governments to scope the expertise and resources needed to successfully implement the framework at various scales. The type of institutes engaged (e.g., NGOs, economic think tanks, universities) is dependent upon the policy drivers and focus of the accounts. Universities are commonly employed, due to their breadth of expertise (across economic, environmental, and social sciences) and existing infrastructure (e.g., GIS, remote sensing, computing capacity) and data from existing programs to compile pilot OA. As environmental expertise (physical and biological) is strongly represented within universities and experts have access to relevant data, they have often been engaged in the compilation of ecosystem accounts.

Local-external partnership

Countries may have capacity within government and research institutions to produce accounts, although currently lack knowledge of the OA framework or a community of practice is still developing. In other cases, there capacity development and resourcing is required, which may be sourced from partnerships with external institutions.

Several early pilots of OA arose from partnerships between domestic and external institutions, where external institutions provided resourcing, capacity building and expertise towards the compilation of accounts. For example, UN Economic Social Commission for Asia and the Pacific (UN-ESCAP) partnered with government and local institutions to deliver several pilots within South-east Asia and Oceania, concerning ocean ecosystems and flows to the environment from economic sectors (specifically wastes). Further, the GOAP continues to support more than 15 countries with capacity building events and expertise in the development of accounts. As a novel framework, expertise globally is limited, where experiences and lessons learnt continue to be compiled and shared through the Global Ocean Accounts Partnership.



Conclusions

As a relatively novel framework, there are several opportunities and barriers to the inception of ocean accounts, where the operationalisation of the framework will depend on the existing policies mandates, expertise, capacity, and resourcing within each country context. The early experiences of several countries show that there are several modes of governance that could be used to commence ocean accounts, led by either government ministries (at the National or Sub-national level) or be conducted as an external process conducted by research institutions.

For government-led processes, works could commence with the Central government, led by either a single focal ministry, or inter-ministerial steering group. Sub-national ministries could also be the driving institution, to provide a proof-of-concept, or business case to assess the utility of accounts before further investment. Processes external to the government could be conducted by local (i.e., domestic) institutes or be performed with external partners, that provide resourcing and expertise. The pros and cons of each approach should be aligned with the policy needs of each country.



Further reading

- Goap 2021a. Ocean Accounting for Sustainable Development, Detailed Technical Guidance for account compilers, data providers, and end-users (v0.9, global consultation). *In: BORDT MICHAEL, MILLIGAN, B. & PRAPHOTJANAPORN, T. (eds.) Ocean Accounting for Sustainable Development.* Global Ocean Accounts Partnership.
- Goap 2021b. Ocean Accounting for Sustainable Development, Global Progress Assessment. *In: BORDT MICHAEL, MILLIGAN, B. & PRAPHOTJANAPORN, T. (eds.) Ocean Accounting for Sustainable Development.* Global Ocean Accounts Partnership.