

General Introduction to Ocean Accounts

Explains what ocean accounts are and how they work, in terms that make sense to economists, ecologists, and policymakers alike.

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OUTCOME

After reading this Circular, you will be able to explain what ocean accounts are and how they work, in terms that make sense to economists, ecologists, and policymakers alike. You will understand the core framework that organises ocean-society-economy interactions, recognise how ocean accounts connect to established international standards – the System of National Accounts (SNA) and the System of Environmental-Economic Accounting (SEEA), both defined in the [TG-0.6 Glossary of Key Terms](#) – and identify practical starting points for implementation.

CONTENTS

1. Outcome	3
2. Requirements	3
3. Guidance Material	3
3.1 Sustainable development of the ocean	3
3.2 Information requirements for sustainable development decision-making	3
3.3 Definition and scope of ocean accounts	4
3.4 Functional components of ocean accounts	4
3.5 Conceptual components of the Ocean Accounts Framework	6
3.6 Relationship to other standards and approaches	10
3.7 Data quality and uncertainty	11
3.8 Implementation approaches and starting points	11
4. Acknowledgements	12
5. References	12

ABOUT THIS CIRCULAR

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1. Outcome

¶1 After reading this Circular, you will be able to explain what ocean accounts are and how they work, in terms that make sense to economists, ecologists, and policymakers alike. You will understand the core framework that organises ocean-society-economy interactions, recognise how ocean accounts connect to established international standards – the System of National Accounts (SNA) and the System of Environmental-Economic Accounting (SEEA), both defined in the [TG-0.6 Glossary of Key Terms](#) – and identify practical starting points for implementation.

2. Requirements

¶1 None: this Circular introduces the Technical Guidance on Ocean Accounts for Sustainable Ocean Development as a whole.

¶2 New to ocean accounting?

¶3 If you find the material challenging, consider starting with TG-0.5 Navigating the Technical Guidance to find a reading pathway matched to your role, or consult the [TG-0.6 Glossary of Key Terms](#) for unfamiliar terms.

3. Guidance Material

3.1 Sustainable development of the ocean

¶1 Sustainable development requires maintaining or enhancing the assets that future generations will need¹. These include produced and financial capital, and also natural capital, which the 2025 SNA defines as the combination of natural resources (such as mineral and energy resources, biological resources, and water resources) and ecosystem assets (spatially defined areas of ecosystems, measured through SEEA Ecosystem Accounting)^{2, 3, 4}. The 2025 SNA formally locates natural capital within a broader multiple-capitals framework alongside produced capital, human capital, and social capital (Chapters 2, 34 and 35)⁴.

¶2 The ocean contains and supports a wide range of these natural capital assets: individual environmental assets located in the ocean (such as aquatic resources and seabed mineral and energy resources, as defined in the SEEA Central Framework), marine and coastal ecosystem assets (as defined in SEEA Ecosystem Accounting), and produced assets supporting ocean economic activity (as defined in the SNA)^{5, 6}. The ocean water body itself is not treated as an environmental asset in the SEEA framework, because the stock of water is too large to be meaningful for analytical purposes (SEEA CF para 2.102)⁵. This exclusion does not limit the measurement of individual assets within the ocean, such as fish stocks and seabed minerals.

¶3 Sustainable ocean development entails three interconnected objectives: (1) advancing ocean-based economic activities that provide sustainable livelihoods, (2) ensuring equitable distribution of benefits across society, and (3) conserving and enhancing marine ecosystems and their ecological processes⁷. These objectives are inseparable: a fishery that collapses undermines both economic output and coastal community wellbeing.

3.2 Information requirements for sustainable development decision-making

¶1 Traditional economic indicators such as GDP cannot answer the key questions facing ocean managers: GDP does not capture environmental depletion, equity considerations, or values not traded in markets^{8, 9}. International commitments now require better measurement: CBD Decisions 15/24 (2022) and 16/1 (2024) call on countries to integrate biodiversity and ecosystem values into national accounting frameworks, including through ocean accounts.

¶2 The information requirements for sustainable ocean development reduce to three questions¹⁰:

1. ¶3 **What is the current economic output from ocean-related activities?** This establishes the scale and composition of the ocean economy.
2. ¶4 **What benefits (and disbenefits) do people and communities derive from the ocean, and how are these distributed?** This identifies who gains, who loses, and whether ocean development is equitable.
3. ¶5 **Is ocean development sustainable over time?** This question turns on whether the asset base (natural, produced, human, and social capital) is being maintained or depleted.

¶6 Answering these questions requires indicators spanning ocean production, ocean income (including physical measures of ecosystem services and monetary measures disaggregated across population segments), and changes in ocean balance sheets as sustainability indicators.

3.3 Definition and scope of ocean accounts

¶1 Ocean accounts give countries a common, structured way to measure the ocean, its importance to people, and what people are doing to change it¹¹. They bring together environmental, economic, and social data into a single coherent framework, so that a fisheries scientist, a national accountant, and a coastal community planner can all work from the same evidence base.

¶2 Three characteristics distinguish ocean accounts from other ocean-related information compilations:

1. ¶3 **They follow the Ocean Accounts Framework presented in this Technical Guidance (introduced in Section 3.5).** Data from different agencies and domains are organised consistently, enabling comparison across sectors, regions, and time periods.
2. ¶4 **They are compatible with international statistical standards, in particular the SNA and SEEA.** Ocean accounts speak the same language as national economic accounts, so ocean data can be directly compared with GDP figures and other official statistics.
3. ¶5 **They adhere to the principles of official statistics.** The information meets quality standards required for policy decision-making: transparent, reproducible, and independently verifiable^{12, 13}.

¶6 The framework covers marine and coastal areas within national jurisdictions (territorial waters, exclusive economic zones, continental shelves) and can be applied to particular areas within these zones (e.g., bays, protected areas). It is also applicable to activities functionally connected with but spatially separate from the ocean (e.g. nutrient pollution from inland agriculture), and to areas beyond national jurisdiction though with added conceptual challenges.

¶7 Whilst ocean accounts can include economic valuation of some ocean assets and services, they do not aim to determine a single 'total value' of the ocean, which would be both conceptually problematic and practically impossible¹⁴.

3.4 Functional components of ocean accounts

¶1 Ocean accounts function as an information pipeline: diverse data sources feed into a validation layer where statistical standards are applied to produce standardised accounts, from which indicators and reports are derived for decision-makers.

¶2 Figure 0.1.1 below sets out the four stages of this pipeline. Reading from bottom to top:

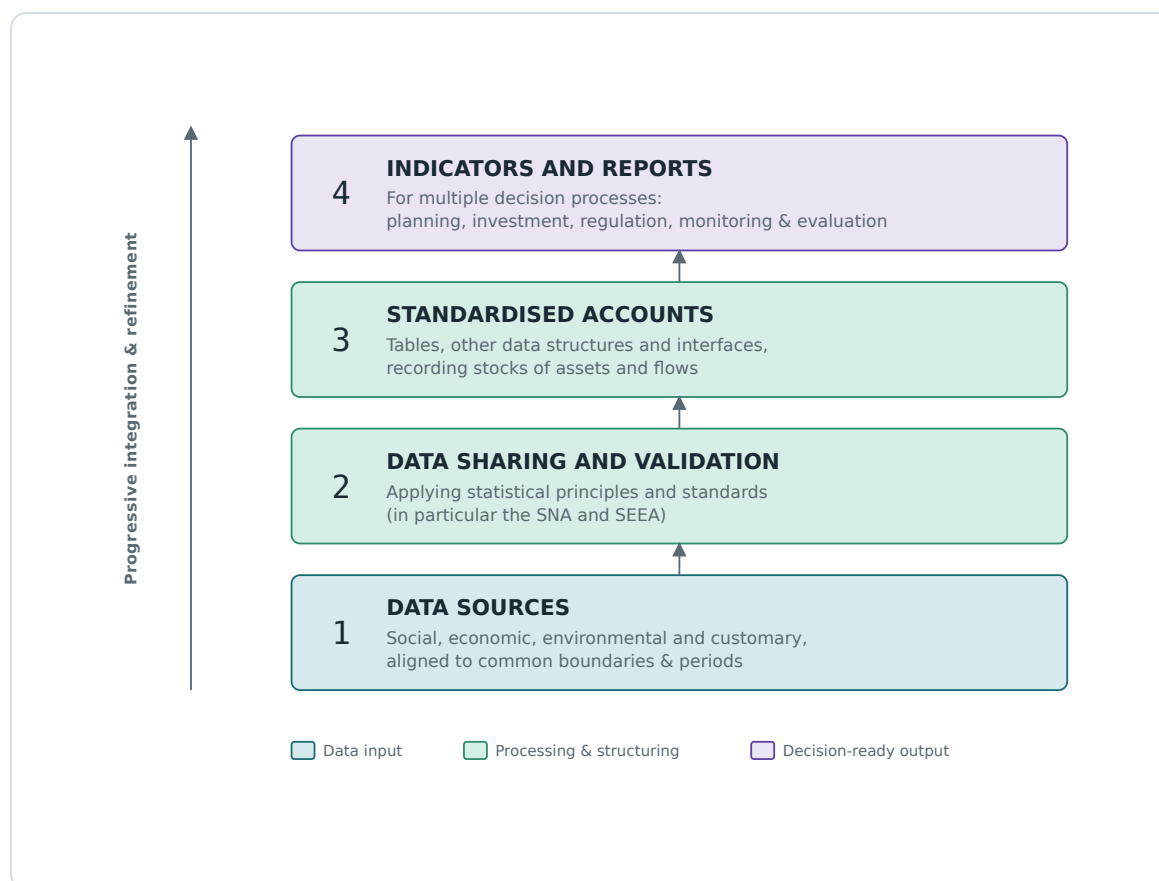


Figure 0.1.1 Four stacked stages show progressive integration from raw data sources to decision-ready indicators and reports. Read bottom to top; each stage adds integration relative to the one below.

Source: TG-0.1 §3.4 (functional components of ocean accounts).

Adapted from: Global Ocean Accounts Partnership, Technical Guidance on Ocean Accounting (2021), functional structure of ocean accounts.

¶3 The construction of ocean accounts begins with data collection and compilation from numerous sources: government agencies, research institutions, industry bodies, citizen science programmes, and indigenous knowledge systems. These data span environmental monitoring, economic statistics, social surveys, governance information, geospatial observations, customary knowledge, and many others¹⁵. A necessary step is aligning these heterogeneous datasets to common spatial boundaries, classifications, and accounting periods, through data sharing and validation processes that apply the relevant international statistical principles and standards (in particular the SNA and SEEA).

¶4 Raw data are then organised into standardised accounting tables or other data structures (e.g. non-relational JSON objects) in accordance with the Ocean Accounts Framework. These structures distinguish between:

- ¶5 **Stocks of assets:** levels measured or valued at a point in time (for example fish biomass, coral reefs, or coastal infrastructure).
- ¶6 **Flows of goods, (dis)services or activities:** physical or monetary transfers, measured or valued over an accounting period, between assets and/or social or economic sectors (for example fish harvest, coastal protection from mangrove forests, pollution of the environment by economic activity).

¶7 From these tables, analysts or automated systems derive indicators and visualisations that condense complex information into decision-relevant metrics for planning, investment, regulation, monitoring and evaluation, and reporting¹⁶.

3.5 Conceptual components of the Ocean Accounts Framework

¶1 The Ocean Accounts Framework starts from a central premise: the economy is embedded within the environment rather than sitting alongside it¹⁷. A fishing industry employs people in coastal communities (the economy is embedded within society), and those communities depend on healthy fish stocks (society is embedded within the environment). Damage to one layer propagates inward to the layers it contains, and improvements to one layer carry through to the others.

¶2 The Framework calls this arrangement a nested superset structure. The three domains (Economy, Society, and Environment) are concentric layers. The Framework distinguishes between flows (measurements of supply, use, activity or interaction) and stocks (measurements of asset status, extent and/or condition), each organised into three nested domain groups (Figure 0.1.2)¹⁸.

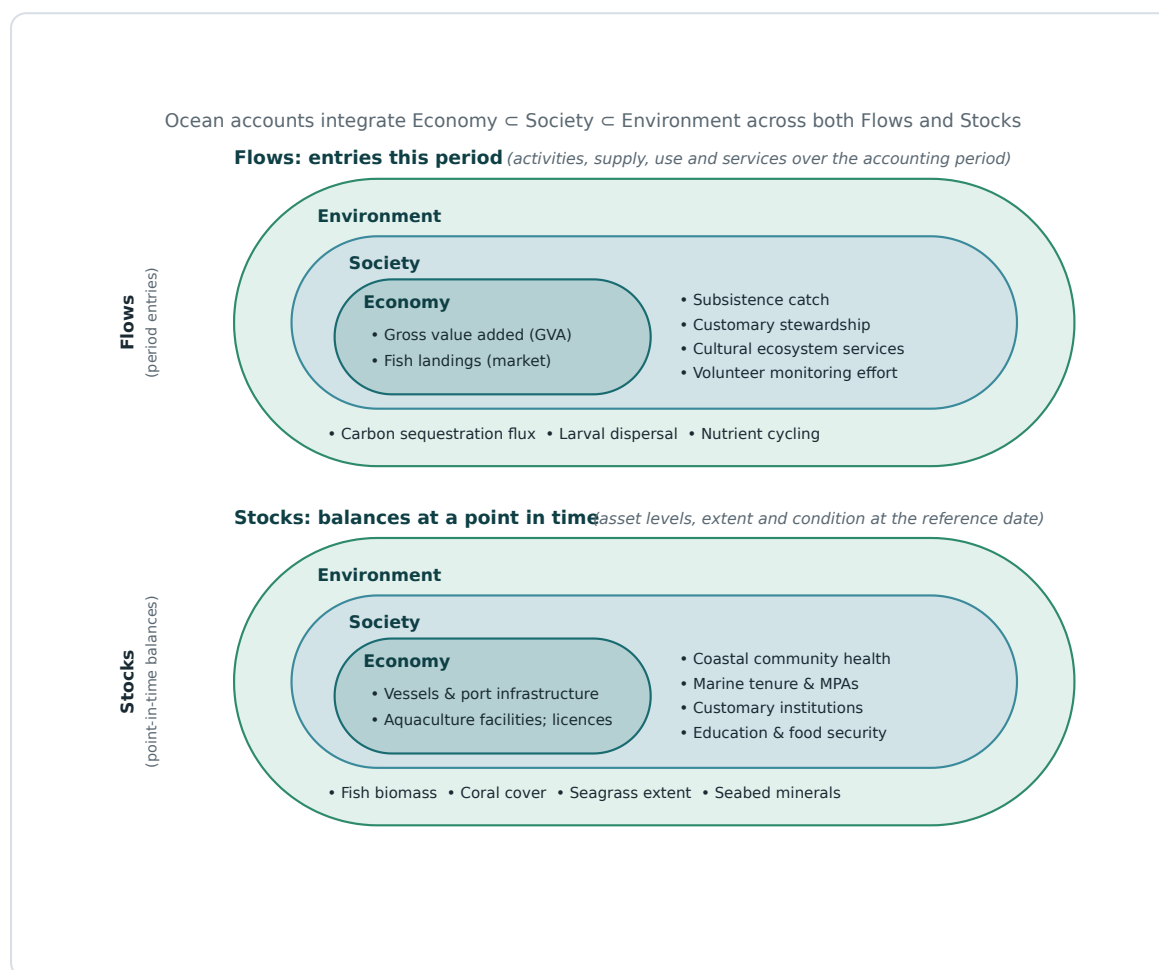


Figure 0.1.2 Economy sits nested within Society within Environment, shown separately for flows over the period and stocks at a point in time. Example entries illustrate the kinds of measurement each ring contributes.

Source: SEEA EA 2024 §2.21-2.24 (SNA/SEEA boundary, ecosystem-economy interactions); 2025 SNA §34.1 (multiple-capitals framework and the SNA production boundary).

Adapted from: GOAP Diagnostic Tool (2023); SEEA EA 2024 §2.21-2.24; 2025 SNA Chapter 34.

¶3 This nested conception aligns with the multiple-capitals framework adopted by the 2025 SNA, which identifies produced capital, human capital, social capital, and natural capital as the four pillars of sustainable wellbeing (Chapters 2, 34 and 35)⁴. The Framework also supports integrated accounting for qualitative and quantitative data drawn from multiple knowledge systems. In many countries, traditional knowledge systems do not make clear distinctions between people and nature.

¶4 The **accounting relationships** between domain groups define the subject matter of the Technical Guidance Circulars. Figure 0.1.3 below illustrates the principal categories of accounting

relationship between flow groups and stock groups.

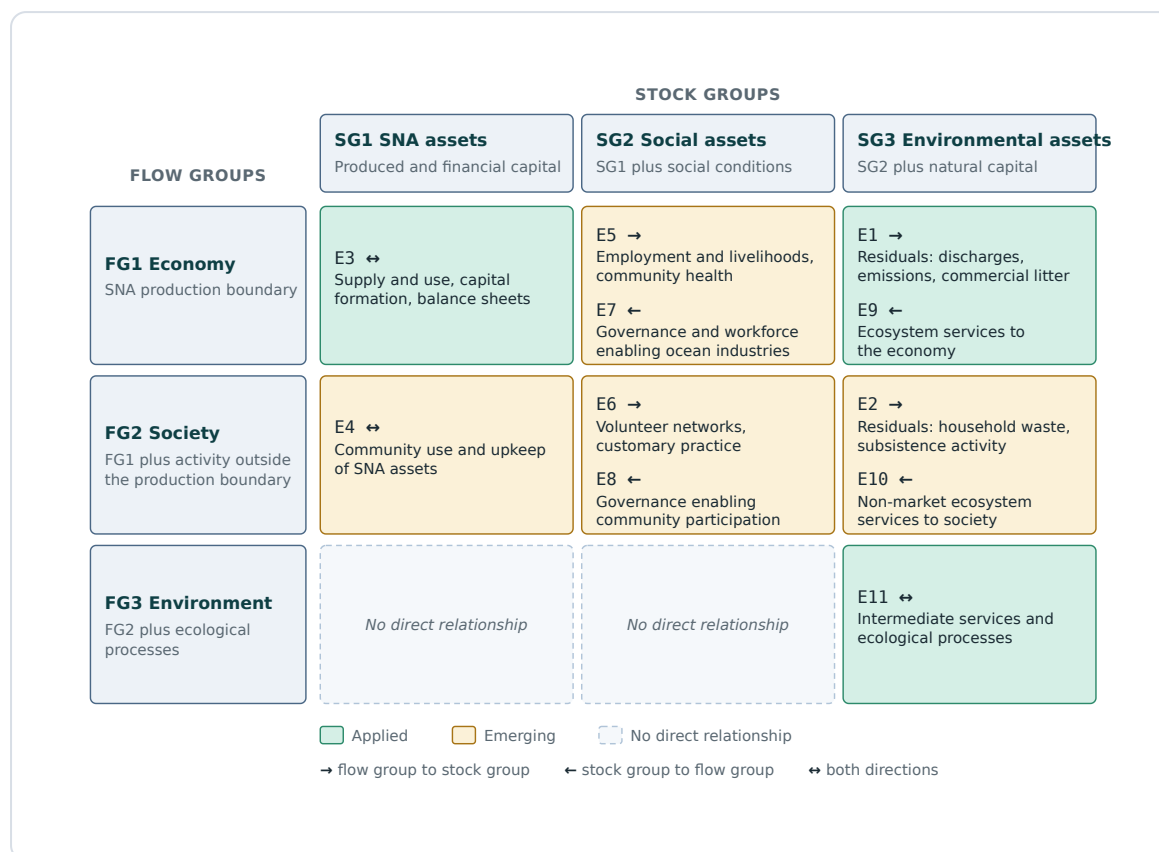


Figure 0.1.3 The eleven accounting relationships (E1-E11) between the flow groups (rows) and the stock groups (columns), shaded by badge. The table below describes each relationship and names its primary circulars.

¶5 The Framework identifies three nested domain groups for flows (FG1-FG3) and three for stocks (SG1-SG3). Figure 0.1.3 illustrates the principal categories of accounting relationship between them; the table below enumerates the eleven specific accounting relationships (E1-E11) addressed by the Technical Guidance.

Domain groups for flows

¶1 The three flow groups are nested like concentric rings:

- ¶2
FG1 – Economy (SNA production boundary): Flows that national accountants already measure: production, income, supply and use, capital formation and financial transactions, and household distributional accounts. For ocean accounts, this encompasses all monetary flows related to ocean industries (fishing, shipping, offshore energy, tourism) as well as physical flows of natural resource inputs and residuals structured through Physical Supply and Use Tables (PSUTs) as defined in SEEA CF Chapters 3 and 4⁵. The 2025 SNA also provides for extended labour accounts, distributional income and consumption accounts, and measures of unpaid household service work (Chapter 16, para 7.31)^{4, 19}, representing the boundary between FG1 and FG2.
- ¶3
FG2 – Society ⊃ FG1: Everything in FG1, plus activities outside the SNA production boundary that are significant for sustainable ocean development: subsistence fishing, volunteer beach clean-ups, community-based marine monitoring, customary marine stewardship practices, and governance activities. The 2025 SNA acknowledges the importance of measuring these extended activities for wellbeing assessment (Chapters 16, 34)^{4, 19}.
- ¶4

FG3 – Environment $\supset$ **FG2**: Everything in FG2, plus ecological processes and interactions within the environment that maintain ecosystem functioning but are not directly used by people. These include intermediate ecosystem services (nutrient cycling, seed dispersal between ecosystems), biogeochemical cycles (carbon, nitrogen, phosphorus), energy flows through food webs, species migrations, and larval dispersal⁶.

Domain groups for stocks

¶1 The stock domain groups follow the same nested structure, mapping directly to the 2025 SNA's multiple-capitals framework (Chapters 34–35)⁴:

• ¶2

SG1 – SNA assets (produced capital): Balance sheets, physical asset inventories, and financial positions within the SNA framework. For ocean accounts, this includes produced assets such as vessels, port infrastructure, aquaculture facilities, and offshore platforms; and financial assets such as fishing licences (where treated as assets) and ocean-related investments.

• ¶3

SG2 – Social assets $\supset$ **SG1**: Everything in SG1, plus community conditions (health, education, food security in coastal populations), governance arrangements (legal frameworks, customary tenure, marine protected area designations), and institutional capacities, corresponding to 'human capital' and 'social capital' in the SNA 2025 framework. Measurement approaches draw on the SEEA EA treatment of cultural services (Chapter 6) and TG-3.7 Governance Accounts⁶.

• ¶4

SG3 – Environmental assets $\supset$ **SG2**: Everything in SG2, plus natural capital: individual environmental assets as defined in the SEEA Central Framework (fish stocks, seabed minerals, water resources) and ecosystem assets as defined in SEEA Ecosystem Accounting (coral reefs, mangroves, seagrass meadows, pelagic ecosystems), measured through extent and condition accounts^{5, 6, 20}.

¶5 Individual environmental assets in the ocean domain can be classified according to the 2025 SNA's five categories of natural resources (para A2.37)^{3, 4}: (1) land, including coastal land and the seabed; (2) mineral and energy resources, including seabed minerals, offshore hydrocarbons, and renewable energy resources such as offshore wind and tidal energy (AN322); (3) biological resources, including aquatic resources such as fish stocks; (4) water resources; and (5) other natural resources. Ecosystem condition is measured using the SEEA EA Ecosystem Condition Typology (ECT), which organises condition variables into three groups and six classes: abiotic characteristics (physical and chemical characteristics), biotic characteristics (compositional state, structural state, and functional state), and landscape/seascape characteristics^{6, 21}. Condition is measured relative to a reference condition reflecting the natural or undegraded state of the ecosystem (SEEA EA para 5.69)⁶.

¶6 An important distinction applies to aquatic biological resources. **Aquaculture production** (cultivated biological resources) falls within the SNA production boundary: the growth of organisms in aquaculture facilities is treated as a process of production, and these resources are classified as produced assets. In contrast, **wild-capture fisheries** target natural biological resources that are outside the production boundary until harvest, and are subject to depletion accounting. This distinction, elaborated in SEEA CF Section 5.9⁵, bears directly on how these resources are recorded in ocean accounts, including whether changes in stock are treated as changes in produced capital or as depletion of natural resources. In practice, changes in aquaculture biomass are recorded as changes in produced assets (gross fixed capital formation or changes in inventories, depending on the holding period), whilst changes in wild fish stocks are recorded as depletion of natural resources in SEEA-aligned supplementary accounts, with direct implications for adjusted measures of net income such as net domestic product (NDP).

Accounting relationships between domain groups

¶1 The eleven accounting relationships in the table below define the connections between flow groups and stock groups. Each relationship represents a distinct category of interaction that is the subject of one or more Technical Guidance Circulars. The “Primary Circular(s)” column identifies where detailed guidance on each relationship can be found.

Edge	Direction	Description	Primary Circular(s)	Badge
E1	FG1 → SG3	Pollution and residuals from economic activity to the environment – industrial discharges, shipping emissions, oil spills, marine litter from commercial sources	TG-3.4	Applied
E2	FG2 → SG3	Pollution and residuals from broader social activity to the environment – household waste, subsistence activity residuals, community-generated marine litter	TG-3.4 , TG-3.5	Emerging
E3	FG1 ↔ SG1	Monetary and physical flows between economic sectors and SNA assets – supply/use tables, capital formation, depreciation, balance sheet changes (bidirectional: monetary flows between SNA sectors and assets run in both directions)	TG-3.1 , TG-3.3	Applied
E4	FG2 ↔ SG1	Social activities affecting or drawing upon SNA assets – community use of public infrastructure, volunteer maintenance of coastal assets	TG-3.5	Emerging
E5	FG1 → SG2	Economic activities contributing to social conditions – employment generating livelihoods, industries affecting community health, economic growth supporting education	TG-3.3 , TG-3.5	Emerging
E6	FG2 → SG2	Social activities contributing to social conditions – volunteer networks building community resilience, customary practices maintaining cultural knowledge	TG-3.5 , TG-3.7	Emerging
E7	SG2 → FG1	Social assets enabling economic flows – governance frameworks that create conditions for investment, educated workforce supporting ocean industries, institutional trust enabling market transactions	TG-3.7 , TG-3.3	Emerging
E8	SG2 → FG2	Social assets enabling social activities – governance arrangements enabling community participation, cultural institutions supporting customary practices	TG-3.5 , TG-3.7	Emerging
E9	SG3 → FG1	Ecosystem services flowing to the economy – fish provisioning, coastal protection enabling economic activity, water purification for industry, seabed minerals extraction	TG-3.2	Applied
E10	SG3 → FG2	Ecosystem services flowing to society beyond the economy – cultural and spiritual values of marine environments, non-market recreational benefits, subsistence provisioning, climate regulation benefits to communities	TG-3.2 , TG-3.5	Emerging

Edge	Direction	Description	Primary Circular(s)	Badge
E11	FG3 ↔ SG3	Intermediate ecosystem services and ecological processes – nutrient cycling maintaining water quality, larval dispersal sustaining fish populations, carbon sequestration maintaining climate regulation capacity (bidirectional: intermediate ecosystem services involve mutual exchanges between ecosystems)	TG-3.2	Applied

¶2 The distinction between E1 and E2 (economic vs. social residuals to the environment) and between E9 and E10 (ecosystem services to the economy vs. to society) reflects a reality that matters for policy: human–environment interactions extend well beyond market transactions. E2 captures residuals from activities outside the SNA production boundary (e.g., household plastic waste, subsistence fishing bycatch), whilst E10 captures ecosystem contributions to wellbeing that are not mediated through market transactions (e.g., cultural values of coral reefs, spiritual significance of marine environments). The social edges E4–E8 represent the least standardised relationships between social capital and both economic and environmental outcomes, drawing on the 2025 SNA's expanded treatment of wellbeing and sustainability measurement ⁴.

Spatial data framework

¶1 The Framework employs a spatially explicit approach with Basic Spatial Units (BSUs) as the foundation. These units may be differentiated into terrestrial, coastal, and marine BSUs, establishing connections between terrestrial activities that impact the ocean, coastal transition zones, and marine environments. Depth layers within BSUs enable a three-dimensional perspective that accommodates the complex spatial nature of ocean systems.

3.6 Relationship to other standards and approaches

¶1 Ocean accounts build on established international standards. Full treatment of the SNA and SEEA concepts relevant to ocean accounts is in [TG-0.2 Overview of Relevant Statistical Standards](#).

System of National Accounts (SNA)

¶1 The **System of National Accounts (SNA)** ³ provides the foundational structure for measuring economic activity. The 2025 SNA formally defines natural capital, treats the depletion of natural resources as a cost of production, and explicitly identifies ocean accounting as an application of its thematic accounting framework (para 35.63) ⁴. It also gives more emphasis to net income measures such as Net Domestic Product (NDP) as the conceptually preferred measure of economic growth (Annex 4, para A4.10) ⁴.

System of Environmental-Economic Accounting (SEEA)

¶1 The **System of Environmental-Economic Accounting (SEEA)** includes two complementary standards: the SEEA Central Framework (SEEA-CF) ⁵ and SEEA Ecosystem Accounting (SEEA-EA) ⁶. Ocean accounts adapt these approaches specifically for the marine domain, addressing challenges such as three-dimensional ecosystem delineation and fluid boundaries ²².

Ocean Economy Satellite Accounts

¶1 **Ocean Economy Satellite Accounts** are specialised economic accounts that disaggregate and measure ocean-related economic activities, providing greater detail on maritime sectors often hidden within broader national account classifications ²³.

Natural Capital Accounting (NCA)

¶1 **Natural Capital Accounting (NCA)** broadly refers to approaches that measure natural assets and their contributions to the economy. Ocean accounts represent a specific application of NCA principles to the marine domain²⁴.

Corporate disclosure frameworks

¶1 **Corporate disclosure frameworks** such as those for climate-related and nature-related financial disclosures focus on enterprise-level reporting. Whilst ocean accounts primarily support public policy, the data can inform corporate reporting on ocean dependencies and impacts²⁵.

Marine Spatial Planning (MSP)

¶1 **Marine Spatial Planning (MSP)** frameworks organise the spatial allocation of ocean activities. Because both MSP and ocean accounts use spatial units, the two approaches are natural complements: MSP defines where activities can happen, and ocean accounts measure what actually happens and what changes as a result²⁶.

3.7 Data quality and uncertainty

¶1 All data have limitations, and acknowledging uncertainty is a mark of rigorous accounting. The SEEA EA identifies six dimensions of data quality relevant to environmental-economic accounting: relevance, timeliness, accuracy, coherence, interpretability, and accessibility, together with the quality of the institutional environment in which the data are compiled (SEEA EA para 2.86)⁶.

¶2 Four categories of uncertainty are particularly pertinent to ocean accounts:

1. ¶3 Uncertainty related to physical measurement of ecosystem services and ecosystem assets
2. ¶4 Uncertainty in the valuation of ecosystem services and ecosystem assets
3. ¶5 Uncertainty related to the dynamics of ecosystems and changes in flows
4. ¶6 Uncertainty regarding future prices and values (SEEA EA para 2.90)⁶

¶7 All accounting work should document the scope of measurement, the definitions applied, the methods used, and the assumptions made (SEEA EA para 2.95). The quality dimensions, uncertainty categories, documentation requirements and quality flags that apply to every account are set out in [TG-0.7 Quality Assurance Principles](#).

3.8 Implementation approaches and starting points

¶1 Countries typically adopt modular approaches, building accounts progressively rather than attempting full implementation from the outset. Common entry points include:

- ¶2 **Thematic focus:** Start with a pressing policy question: marine protected area management, sustainable fisheries, coastal tourism, marine pollution reduction, climate change adaptation, or blue economy strategy monitoring²⁷.
- ¶3 **Geographic scope:** Start with the area that matters most: the national level (whole exclusive economic zone), subnational regions, specific ecosystems (coral reefs, mangroves), marine protected areas, or areas of high economic significance or environmental vulnerability.
- ¶4 **Existing data availability:** Start with what you already have: national statistical compilations, environmental monitoring programmes, economic surveys, marine spatial data infrastructures, research programmes, and administrative datasets²⁸.
- ¶5 **Institutional arrangements:** Start with the institutions ready to collaborate: national statistics office-led, environment agency-led, multi-agency collaborative, or research institution partnerships.

¶6 Initial pilot studies often focus on feasibility assessment and capability development before scaling to wider implementation. Countries with limited resources may begin with rapid assessments using global datasets before developing more detailed national accounts²⁹.

4. Acknowledgements

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¶2 **Reviewers:** [To be confirmed]

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