

Combined Presentations

Creates combined presentations that integrate physical, monetary, and qualitative accounts for ocean accounting, drawing on asset accounts (TG-3.1).

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OUTCOME

After completing this Circular, readers will be able to create combined presentations that integrate physical, monetary, and qualitative accounts for ocean accounting, drawing on asset accounts ([TG-3.1](#)), flow accounts ([TG-3.2](#), [TG-3.4](#)), economic activity accounts ([TG-3.3](#)), social accounts ([TG-3.5](#)), and governance accounts ([TG-3.7](#)). Combined presentations are an analytical layer, not new accounts; they enable decision-makers to understand connections between ecosystem condition, economic activity, and human wellbeing. Key use cases include ocean management dashboards, parliament reporting on ocean wealth, SDG 14 progress tracking, and marine spatial planning. Section 3.1 covers combination principles; Sections 3.2–3.3 address physical-monetary and social-governance integration; Sections 3.4–3.5 cover compilation and communication; Sections 3.6–3.11 address extended balance sheets, the dashboard specification, cross-domain integration, sub-national presentations, and a worked example.

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ABOUT THIS CIRCULAR

RECOMMENDED CITATION

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DRAFT

1. Outcome

¶1 After completing this Circular, readers will be able to create combined presentations that integrate physical, monetary, and qualitative accounts for ocean accounting, drawing on asset accounts (**TG-3.1**), flow accounts (**TG-3.2**, **TG-3.4**), economic activity accounts (**TG-3.3**), social accounts (**TG-3.5**), and governance accounts (**TG-3.7**). Combined presentations are an analytical layer, not new accounts; they enable decision-makers to understand connections between ecosystem condition, economic activity, and human wellbeing. Key use cases include ocean management dashboards, parliament reporting on ocean wealth, SDG 14 progress tracking, and marine spatial planning. Section 3.1 covers combination principles; Sections 3.2–3.3 address physical-monetary and social-governance integration; Sections 3.4–3.5 cover compilation and communication; Sections 3.6–3.11 address extended balance sheets, the dashboard specification, cross-domain integration, sub-national presentations, and a worked example¹.

2. Requirements

¶1 Essential prerequisites:

- ¶2 **TG-0.1 General Introduction to Ocean Accounts**: conceptual framework and key components of Ocean Accounts
- ¶3 **TG-3.1 Asset Accounts**: methodology of physical and monetary asset accounts

¶4 Helpful background:

- ¶5 **TG-0.2 Overview of Relevant Statistical Standards**: classification frameworks and international statistical standards
- ¶6 **TG-3.2 Flows Environment to Economy**: physical flow accounting of natural resource extraction and ecosystem service use
- ¶7 **TG-3.3 Economic Activity Relevant to the Ocean**: ocean economy thematic and extended accounting framework
- ¶8 **TG-3.4 Flows Economy to Environment**: residual flow accounts documenting pressures on the marine environment

¶9 ⓘ Framework Position

¶10 This Circular addresses the integration of all component accounts into coherent presentations. Combined presentations draw on all eleven accounting relationships (E1–E11) identified in the Ocean Accounts Framework, assembling data from asset accounts, flow accounts, social accounts, and governance accounts into thematic views that support decision-making. In the Ocean Accounts Framework (TG-0.1 Figure 0.1.2):

Edge	Direction	Description
Scope. TG-3.8 owns the combined presentation: how accounts already compiled elsewhere are assembled into one coherent view, the consistency conditions that assembly requires, and the dashboard and integrated-table formats. It compiles no account of its own, and it cross-refers to the circular that owns each component account rather than restating its method.		
¶11 E1 FG1 → SG3 Pollution/residuals from economy to environment E2 FG2 → SG3 Pollution/residuals from society to environment E3 FG1 ↔ SG1 Monetary flows between assets and economic sectors E4 FG2 ↔ SG1 Social activities interacting with SNA assets E5 FG1 → SG2 Economic contributions to social conditions E6 FG2 → SG2 Social activities to social conditions E7 SG2 → FG1 Social assets enabling economic flows E8 SG2 → FG2 Social assets enabling social activities E9 SG3 → FG1 Ecosystem services to economy E10 SG3 → FG2 Ecosystem services to society E11 FG3 ↔ SG3 Intermediate ecosystem services		

3. Guidance Material

¶1 The SEEA Ecosystem Accounting framework recognises that policy and analysis related to the environment and human connection to it can be framed in many ways, often requiring consideration of specific environmental themes such as biodiversity, climate change, oceans, and urban areas². The ocean accounts framework responds to this need by integrating data from the SEEA Central Framework, SEEA Ecosystem Accounting, and the System of National Accounts into a coherent information set that supports decision-making for ocean governance.

¶2 Combined presentations enable decision-makers to monitor several trends: changes in ocean ecosystem extent and condition; changes in ocean wealth including produced and non-produced assets; ocean-related income and welfare for different groups of people; ocean-based economic production; and changes in how oceans are governed and managed³. These feed a range of ocean governance processes including marine spatial planning, integrated coastal zone management, development planning for ocean sectors, and collaborative resource management.

¶3 The Global Ocean Accounts Partnership (GOAP) develops and promotes the ocean accounts framework internationally. The SEEA EA recognises the existence of an “ocean accounting community of practice” whose objective is to ensure that data common to multiple communities—including those for marine spatial planning, disaster risk, and climate change—are standardised and shared⁴. The GOAP has supported pilot studies in several countries (see Section 3.2) and continues to advance methodological guidance for implementing combined presentations.

¶4 The general ecosystem accounting framework illustrated in Figure 3.8.1⁵ provides the conceptual foundation for combined presentations. It shows how ecosystem assets are measured through extent, condition, and other characteristics, how they supply ecosystem services, and how those services flow to the economy, generating benefits for society.

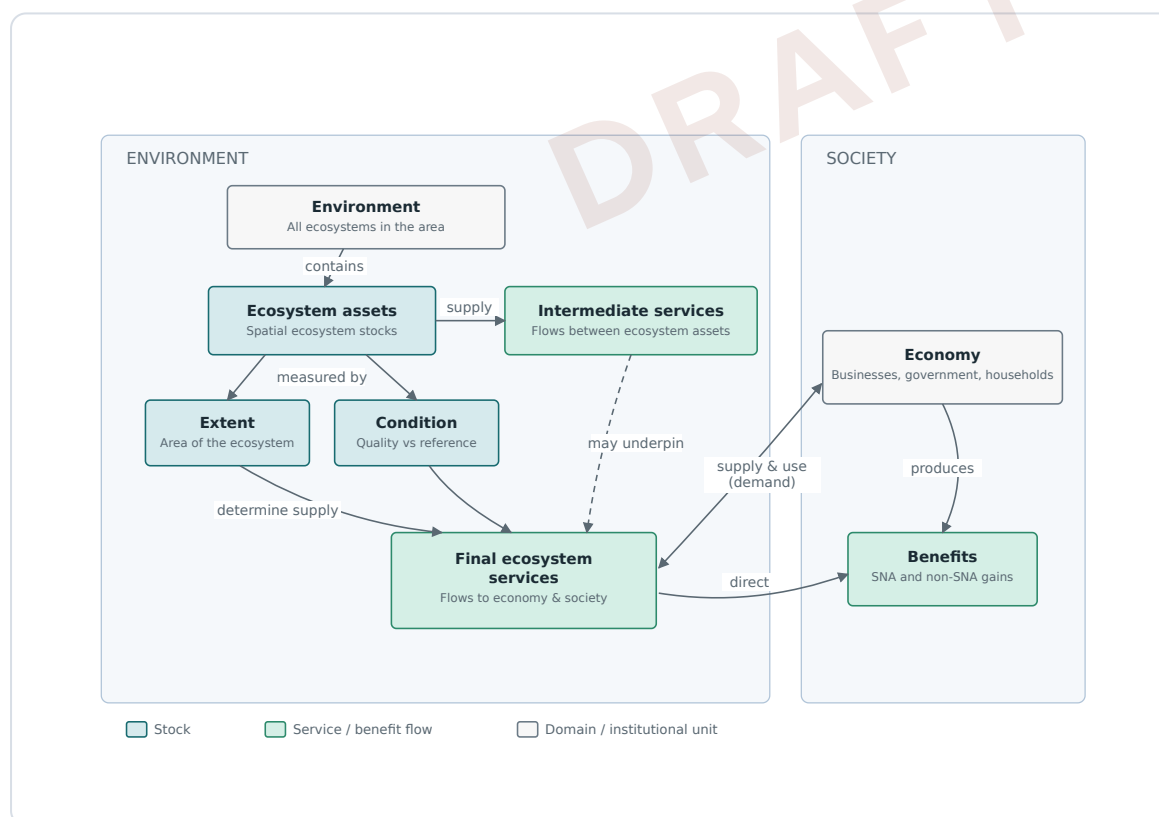


Figure 3.8.1 Ecosystem assets measured by extent and condition supply final ecosystem services to the economy and society. Intermediate services stay within the Environment. Nodes coloured by stock, flow, or institutional domain; economy nested within society.

3.1 Integrated Ocean Account Framework

Structure and components

¶1 The ocean accounts framework builds on SEEA EA ecosystem extent, ecosystem condition, and ecosystem services flow accounts, adding accounts for natural resources and physical flows from the SEEA Central Framework and accounts for the ocean economy, governance, management, and technology⁶. Figure 3.8.2 illustrates the coverage of this integrated framework.

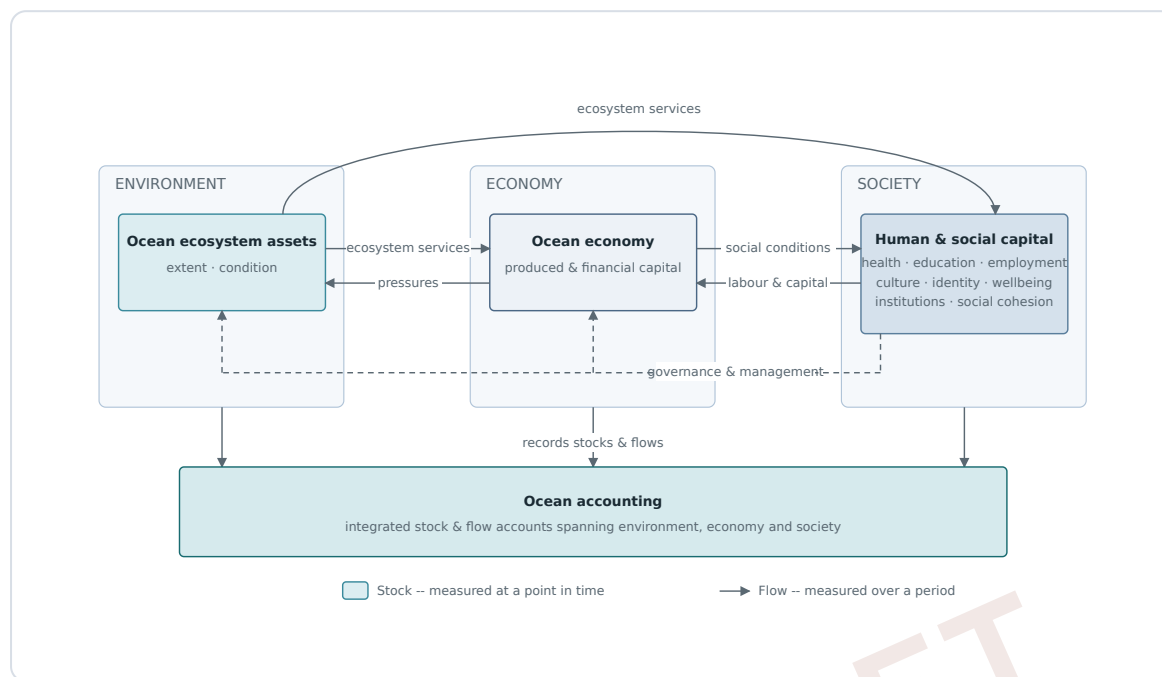


Figure 3.8.2 Ocean accounting integrates environment, economy, and society pillars as linked capital stocks and flows. Flows include ecosystem services, labour and capital, pressures returning to the environment, and governance responses.

¶2 The core components of an integrated ocean account framework are:

¶3 **Environmental accounts** comprise the physical and monetary measurement of ocean-related environmental assets and flows:

- ¶4 Extent accounts for coastal and marine ecosystem types (see [TG-3.1 Asset Accounts](#))
- ¶5 Condition accounts recording ecosystem health indicators (see [TG-2.1 Aggregate Biophysical Indicators of Environmental State](#))
- ¶6 Ecosystem services flow accounts in physical and monetary terms (see [TG-2.4 Ecosystem Goods and Services](#))
- ¶7 Individual environmental asset accounts for fish stocks, minerals, and energy resources
- ¶8 Physical flow accounts for pressures including emissions and waste (see [TG-3.4 Flows Economy to Environment](#))

¶9 **Economic accounts** document the contribution of the ocean to economic activity:

- ¶10 Ocean economy thematic and extended accounts measuring industry contributions to GDP (see [TG-3.3 Economic Activity Relevant to the Ocean](#))
- ¶11 Supply and use tables for ocean-characteristic products
- ¶12 Employment accounts for ocean-related industries
- ¶13 Investment accounts for ocean infrastructure (see [TG-2.6 Ocean Investment](#))

¶14 **Social accounts** record human dimensions of ocean-society relationships:

- ¶15 Wellbeing indicators for ocean-dependent communities (see **TG-3.5 Social Accounts**)
- ¶16 Equity measures showing distribution of benefits and burdens
- ¶17 Vulnerability and resilience indicators
- ¶18 Traditional knowledge and cultural connections (see **TG-3.6 Traditional Knowledge**)

¶19 **Governance accounts** document institutional arrangements:

- ¶20 Marine spatial planning coverage and zoning
- ¶21 Regulatory frameworks and compliance
- ¶22 Management effectiveness indicators (see **TG-3.7 Governance Accounts**)

Principles for combining accounts

¶1 The SEEA EA identifies three key principles that enable accounts for different themes to be combined into coherent presentations⁷:

¶2 **First**, there must be a clearly agreed geographical area. For ocean accounting, this is the ocean accounting area, which typically aligns with a country's Exclusive Economic Zone (EEZ) plus territorial waters and coastal zones. For thematic presentations, a focus on more targeted areas (e.g., specific catchments, marine protected areas, or ecosystem types) may be appropriate. The delineation of geographical areas should follow the guidance in **TG-0.1 General Introduction to Ocean Accounts** regarding the ocean accounting area.

¶3 **Second**, there must be a set of entities that are the focus of accounting. In ecosystem accounting, the focus is on ecosystems; in the SNA, the focus is on economic units; in the Central Framework, the focus is on individual stocks and flows. Combined presentations integrate multiple entity types, requiring consistent classifications that allow linkages across domains. The classification frameworks described in **TG-0.2 Overview of Relevant Statistical Standards** provide the basis for this consistency.

¶4 **Third**, multiple accounts are required to organise relevant information for a single theme. The SEEA and SNA frameworks demonstrate that no single account captures all relevant information. The same applies to combined presentations: a coherent narrative for ocean sustainability requires extent accounts, condition accounts, service flow accounts, economic accounts, and potentially social and governance accounts.

¶5 Links between accounts are possible because of consistent application of a delineated geographical boundary and consistent classifications for agreed entities⁸. This allows combined presentations to convey a coherent narrative, support derivation of consistent indicators, and enable integration of data into models and analytical tools.

¶6 Accounting principles are equally applicable across different spatial scales and entities⁹. Combined presentations can therefore operate at national, regional, or local scales depending on the policy question being addressed. The SEEA EA notes that choices of geographical area, entity types, and classifications "should be made with a focus on the use of the accounts, including the potential to compare results over time and in different locations"⁹. For ocean accounting, this means that combined presentations for marine spatial planning may operate at local scales (individual bays, reefs, or marine management areas), whilst those supporting national development planning may aggregate to the full EEZ. Compilers should align the spatial scope of combined presentations with existing administrative boundaries and decision-making processes, following the broader guidance in SEEA EA para. 13.9 on linking geographical scope to existing data and governance arrangements.

¶7 The connections between the core ecosystem accounts that underpin combined presentations are illustrated in Figure 3.8.3¹⁰. Ecosystem extent and condition accounts are mutually informing; condition data feeds into physical ecosystem service flow accounts; physical and monetary service

flow accounts are linked through valuation; and monetary service flows provide the basis for monetary ecosystem asset valuation.

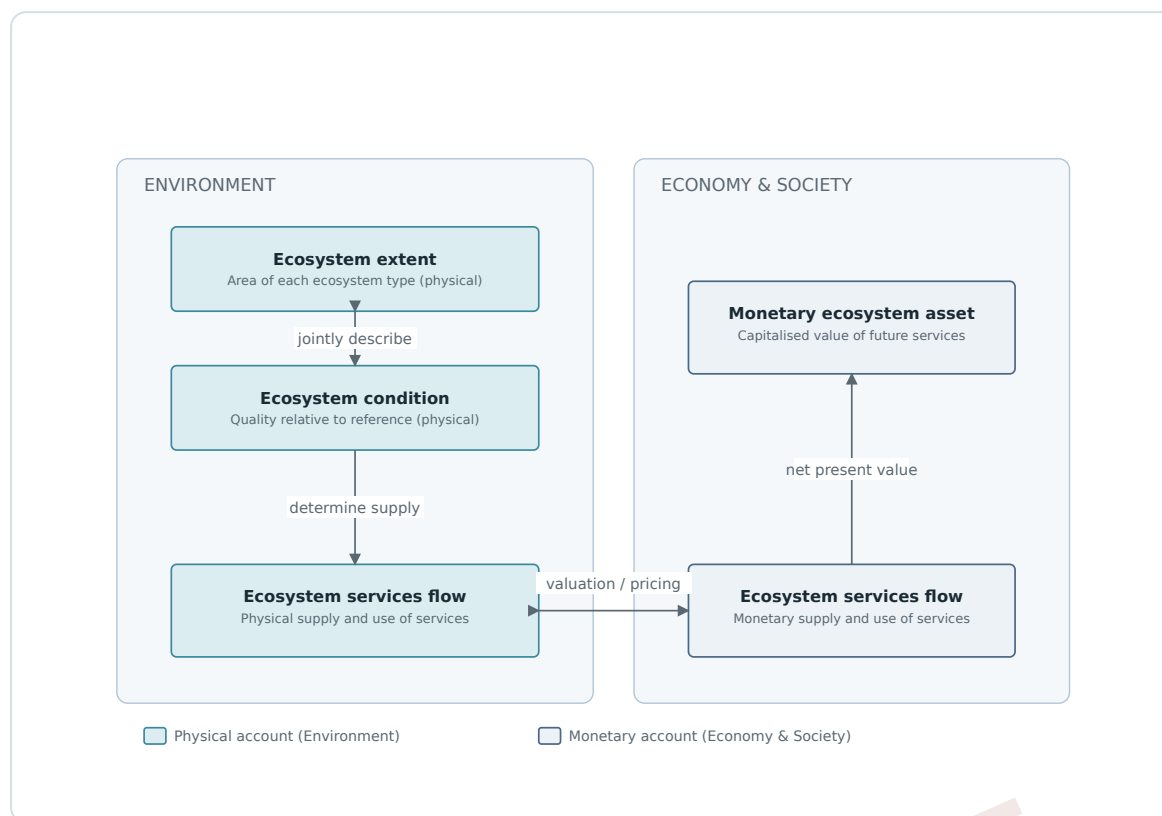


Figure 3.8.3 Five SEEA EA ecosystem accounts connect: extent and condition determine physical service flows that value into monetary accounts. Physical flows link by valuation to monetary service flows, which accumulate as NPV into the monetary asset account.

3.2 Physical-Monetary Integration

¶1 A distinctive feature of combined presentations is the integration of physical and monetary data to provide complementary perspectives on ocean resources. Physical accounts record stocks and flows in tonnes, hectares, cubic metres, or number of individuals; monetary accounts translate these into currency values that can be aggregated and compared with economic aggregates¹¹.

Approaches to integration

¶1 Three approaches to physical-monetary integration are relevant for ocean accounting:

¶2 **Parallel presentation** displays physical and monetary accounts side by side, allowing users to examine both dimensions. This approach is particularly useful when physical quantities and monetary values diverge—for example, when the monetary value of a fish stock increases due to rising prices even as physical biomass declines. Parallel presentation preserves information in both dimensions without implying that one takes precedence. The asset account structure in **TG-3.1 Asset Accounts** provides the foundation for parallel presentation of physical and monetary data.

¶3 **Hybrid accounts** integrate physical and monetary data within a single table structure. The SEEA Central Framework describes hybrid accounts for environmental protection expenditure that show both monetary expenditure and associated physical outcomes (e.g., tonnes of pollutants removed)¹². For ocean accounting, hybrid accounts might show investment in coastal protection infrastructure alongside physical measures of coastal erosion or protection.

¶4 **Extended supply and use tables** incorporate physical flows alongside monetary transactions. The SEEA EA describes how physical supply and use tables for ecosystem services can be linked to

monetary supply and use tables, enabling analysis of the physical basis of economic activity¹³. For the ocean economy, this approach reveals the material throughput underlying economic output. The supply and use framework in **TG-3.3 Economic Activity Relevant to the Ocean** provides the basis for this integration.

Linking ecosystem services to economic activity

¶1 Linking ecosystem services from marine ecosystems to economic activity is a central integration task. The SEEA EA framework provides the conceptual basis: ecosystem services represent the contributions of ecosystems to benefits, with ecosystem services flow accounts recording the supply by ecosystem types and the use by economic units and households¹⁴.

¶2 For combined presentations, the linkage can be illustrated by tracing provisioning services through to economic output, as summarised in Table 3.2.1 below.

Step	Account and contribution
1. Ecosystem extent and condition accounts	(see TG-3.1 Asset Accounts) record the area and health of fish-supporting ecosystems.
2. Ecosystem services accounts	(see TG-2.4 Ecosystem Goods and Services) record the biomass provisioning service – fish available for harvest.
3. Individual asset accounts	(see TG-3.1 Asset Accounts , Section 3.3) record fish stock levels and sustainable yield.
4. Physical flow accounts	(see TG-3.2 Flows Environment to Economy) record the harvest (extraction from the environment).
5. Economic activity accounts	(see TG-3.3 Economic Activity Relevant to the Ocean) record the value added by the fishing industry.
6. Social accounts	(see TG-3.5 Social Accounts) record employment, income, and wellbeing for fishing-dependent communities.

¶3 This sequence illustrates how combined presentations trace the pathway from ecosystem assets through ecosystem services to economic activity and social outcomes.

Pilot implementation experience

¶1 The ocean accounts framework has supported pilot studies across several countries, each answering policy-relevant questions through combined presentations¹⁵. The pilot studies in Samoa, Thailand, and Viet Nam centred on sustainable tourism, linking tourism income, natural resource use, land-based pollution, and ecosystem impacts. China's pilot developed harmonised mangrove maps and improved understanding of environmental assets in Beihai Bay. Malaysia examined food security risk concerning fish stocks along the Straits of Malacca under expected future climate variability. All pilots depended on available data that were often limited, but one function of the ocean accounts framework was to guide the search for and integration of data¹⁵.

¶2 These experiences demonstrate that combined presentations can be compiled even with partial data coverage. Compilers should begin with available accounts and progressively expand coverage as data systems mature, following the incremental implementation approach described in **TG-0.1**

General Introduction to Ocean Accounts.

Physical-monetary discrepancies

¶1 Combined presentations should explicitly address discrepancies between physical and monetary trends, as these often reveal important information for policy. Common discrepancies include:

- ¶2 **Declining physical stocks with stable or increasing values:** Rising scarcity can increase unit prices faster than stocks decline, masking physical depletion in monetary terms. This is particularly relevant for fisheries where declining catch per unit effort (CPUE) may coincide with increasing fish prices¹⁶.
- ¶3 **Increasing physical stocks with declining values:** Abundance can reduce unit prices, potentially reducing incentives for sustainable management
- ¶4 **Unvalued ecosystem services:** Many regulating and cultural services from marine ecosystems are not captured in monetary accounts, creating gaps between fuller physical measures and partial monetary values. The treatment of ecosystem services valuation in **TG-1.9 Safe Usage of Monetary Valuation** addresses these measurement challenges.

¶5 The SEEA EA notes that “monetary values may be a poor guide to physical sustainability” and recommends that combined presentations include both physical and monetary information¹⁷.

3.3 Including Social and Governance Dimensions

¶1 Combined presentations for ocean accounting extend beyond environmental and economic data to incorporate social and governance dimensions, following the full scope of the ocean accounts framework.

Social dimensions

¶1 The 2025 SNA recognises that national accounts contribute to measuring wellbeing and sustainability beyond GDP, including through extended accounts for labour, human capital, and household distributional analysis¹⁸. For ocean accounting, social dimensions include:

¶2 **Distributional analysis** examines how the benefits and costs of ocean use are distributed across population groups. Combined presentations can show, for example:

- ¶3 How ocean economy employment is distributed by region, gender, and age group (see **TG-3.5 Social Accounts**, Section 3.6.2)
- ¶4 How coastal ecosystem degradation disproportionately affects vulnerable communities (see **TG-3.5 Social Accounts**, Section 3.3)
- ¶5 How access to marine recreation varies across income groups

¶6 **Wellbeing indicators** complement monetary measures with broader dimensions of quality of life. The social accounts guidance in **TG-3.5 Social Accounts** identifies relevant domains including employment quality, food security, health, and cultural connections to the ocean.

¶7 **Vulnerability and resilience** measures document the susceptibility of communities to ocean-related shocks and their capacity to adapt. Combined presentations can integrate data on:

- ¶8 Economic dependence on ocean sectors
- ¶9 Exposure to environmental pressures and pollution (see **TG-2.7 Pollution and Other Flows to Environment**)
- ¶10 Adaptive capacity indicators

Governance dimensions

¶1 Governance accounts document the institutional arrangements that shape ocean use and management (see **TG-3.7 Governance Accounts**). For combined presentations, governance data provides context for interpreting environmental and economic trends:

¶2 **Marine spatial planning** accounts show the allocation of ocean space across different uses, enabling analysis of how spatial planning decisions relate to ecosystem condition and economic outcomes.

¶3 **Protected area coverage** accounts document the extent of marine protected areas and other area-based conservation measures, which can be related to ecosystem condition and

ecosystem service flows. SDG indicator 14.5.1 measures “Coverage of protected areas in relation to marine areas”¹⁹.

¶4 **Management effectiveness** indicators assess whether governance arrangements are achieving their objectives, providing context for understanding why environmental or economic outcomes are improving or declining.

¶5 The SEEA EA describes governance accounts as including “explicit consideration of institutional and legal frameworks such as zoning, rules and decision-making institutions, social circumstances of affected populations, and measures of ocean-related risks and resilience to them”²⁰.

3.4 Compilation Procedure for Combined Presentations

¶1 This procedure assumes that the underlying component accounts have already been compiled following the guidance in the relevant circulars (TG-3.1 through TG-3.7). The steps below address the additional work needed to combine those accounts into an integrated presentation.

Step 1: Define the policy question and presentation scope

¶1 The compilation process begins with defining the policy question the combined presentation will address. This determines which accounts to include, the geographical scope, and the temporal frame. SEEA CF para. 6.56 emphasises that “the structures of combined presentations of monetary and physical data are dependent on the availability of data and the question under investigation”²¹.

¶2 For ocean accounting, typical policy questions include:

- ¶3 Is the ocean economy growing sustainably? (requires asset accounts, economic accounts, and depletion measures)
- ¶4 How do coastal protection benefits from ecosystems compare to infrastructure costs? (requires ecosystem service accounts, ecosystem extent/condition accounts, and public expenditure accounts)
- ¶5 Are fishing communities benefiting from improved fish stock management? (requires fish stock asset accounts, economic accounts for fisheries, and social accounts for fishing-dependent communities)

¶6 Once the policy question is defined, compilers should document:

- ¶7 The specific policy decision or analytical purpose the presentation will serve
- ¶8 The primary users (cabinet, parliament, planning ministry, coastal management agency)
- ¶9 The geographical scope (national EEZ, specific coastal zone, marine protected area)
- ¶10 The time period and frequency (annual snapshots, multi-year trends)
- ¶11 Which accounts are essential versus desirable for answering the question

Step 2: Identify and assemble component accounts

¶1 Based on the defined scope, compilers identify the component accounts required and assess their availability and quality. Component accounts may include:

¶2 **Core accounts** (always required):

- ¶3 Ecosystem extent accounts for relevant marine/coastal ecosystem types
- ¶4 Economic accounts showing ocean economy GVA and employment
- ¶5 At least one flow account (either environment-to-economy or economy-to-environment)

¶6 **Supporting accounts** (included as available):

- ¶7 Ecosystem condition accounts
- ¶8 Ecosystem services flow accounts (physical and monetary)
- ¶9 Fish stock or other individual environmental asset accounts
- ¶10 Social accounts (employment, distributional measures)

- ¶11 Governance accounts (protected areas, zoning)
- ¶12 Public expenditure accounts for ocean-related functions

¶13 For each identified account, compilers should verify:

- ¶14 Reference period (does it match the presentation timeframe?)
- ¶15 Geographical coverage (does it align with the defined accounting area?)
- ¶16 Classification systems (are they consistent with other accounts?)
- ¶17 Data quality ratings and limitations
- ¶18 Update frequency and publication lag

Step 3: Reconcile classifications and boundaries

¶1 Before combining accounts, compilers must ensure consistent classifications and boundary definitions. The SEEA CF notes that “any differences in classification need to be resolved before physical and monetary data are combined” (para. 6.88)²².

¶2 Key reconciliation tasks include:

¶3 **Geographical boundaries:** Verify that all accounts refer to the same ocean accounting area. Where accounts use different spatial units (e.g., administrative regions versus ecosystem spatial units), establish concordance tables or spatial overlays to enable consistent aggregation.

¶4 **Time periods:** Align all accounts to a common reference period. The SEEA CF emphasises that “it is important to ensure that the source data underpinning the physical and the monetary data relate to the same accounting period” (para. 6.71)²³. Where accounts use different reference dates (e.g., fiscal year versus calendar year, or biological stock assessment periods versus accounting years), document the adjustments made.

¶5 **Product and industry classifications:** Ensure that ocean economy accounts, supply-use tables, and physical flow accounts use consistent classifications. Map national classifications to ISIC (industries) and CPC (products) as described in **TG-0.2 Overview of Relevant Statistical Standards**.

¶6 **Ecosystem type classifications:** Confirm that extent accounts, condition accounts, and ecosystem service accounts use the same ecosystem type classification, typically based on the IUCN Global Ecosystem Typology for marine biomes.

¶7 **Measurement units:** Standardise physical units across accounts. For example, ensure fish biomass is consistently measured in tonnes (live weight), ecosystem extent in square kilometres, and carbon flows in tonnes CO₂-equivalent.

Step 4: Structure the presentation format

¶1 With component accounts identified and classifications reconciled, compilers design the presentation format. The SEEA CF describes a general structure (Table 6.4) that can be adapted for ocean themes, comprising four sections²⁴:

¶2 Section A: Monetary flows

- ¶3 Supply and use of ocean-characteristic products (by industry and product)
- ¶4 Gross value added by ocean-related industries
- ¶5 Depletion-adjusted value added
- ¶6 Environmental taxes, subsidies, and transfers

¶7 Section B: Physical flows

- ¶8 Natural resource inputs (fish harvest, mineral extraction, water abstraction)
- ¶9 Ecosystem service flows (provisioning, regulating, cultural services by ecosystem type)
- ¶10 Residual flows (emissions, waste to marine environment)

¶11 Section C: Stocks and asset flows

- ¶12 Closing stocks of environmental assets (fish stocks, ecosystem extent, mineral reserves) in physical and monetary terms
- ¶13 Depletion and degradation
- ¶14 Closing stocks of fixed assets (vessels, offshore infrastructure, port facilities)
- ¶15 Gross fixed capital formation

¶16 **Section D: Related indicators**

- ¶17 Employment by ocean industry
- ¶18 Population in coastal zones
- ¶19 Productivity indicators (GVA per employee, resource productivity)
- ¶20 Intensity indicators (emissions per unit output, extraction per unit stock)

¶21 The column structure should remain consistent across all four sections to facilitate comparison. Typical column headings include:

- ¶22 Industries (by ISIC division or aggregation)
- ¶23 Households
- ¶24 Government
- ¶25 Capital accumulation
- ¶26 Rest of world
- ¶27 Total

Step 5: Populate the presentation and check accounting identities

¶1 With the structure defined, compilers populate the combined presentation by extracting relevant entries from component accounts. The SEEA CF stresses that accounting identities must be maintained: “it is important to ensure that the implicit relationships between quantities and prices are meaningful and reasonable” (para. 6.91)²⁵.

¶2 Key accounting identities to verify:

- ¶3 **Supply equals use:** For each product in monetary terms and each physical flow, total supply must equal total use
- ¶4 **Stock-flow consistency:** Changes in asset stocks (closing stock minus opening stock) must equal net additions (total additions minus total reductions)
- ¶5 **Physical-monetary consistency:** For marketed flows, the ratio of monetary value to physical quantity must yield plausible unit prices
- ¶6 **GVA aggregation:** Sum of GVA across ocean industries must equal ocean economy GVA reported in economic accounts

¶7 Where discrepancies arise, compilers should investigate whether they result from:

- ¶8 Differences in scope between accounts (e.g., residence versus territory recording)
- ¶9 Timing mismatches (e.g., production versus consumption timing)
- ¶10 Genuine data errors requiring correction in source accounts
- ¶11 Conceptual differences requiring explanatory notes

Step 6: Add contextual information and interpretation

¶1 The final step is adding contextual information that helps users interpret the combined presentation. The SEEA CF notes that combined presentations “have the potential to serve as a bridge between” scientists and economists (para. 6.59)²⁶, requiring clear communication for diverse audiences.

¶2 Essential contextual elements include:

- ¶3 **Introduction:** Brief statement of the policy question addressed and how the presentation supports decision-making
 - ¶4 **Methodological notes:** Description of scope, classifications, valuation methods, data sources, and quality limitations
 - ¶5 **Interpretation guidance:** Explanation of key patterns, trends, and discrepancies visible in the data
 - ¶6 **Policy implications:** Summary of what the integrated data reveal about sustainability, distribution, or governance effectiveness
 - ¶7 **References and links:** Citations to underlying accounts and related circulars
- ¶8 For multi-period presentations showing trends, additional contextual information should cover:
- ¶9 Changes in methodology or coverage affecting time-series comparability
 - ¶10 Revisions made to earlier periods
 - ¶11 Factors explaining observed trends (policy changes, external shocks, data improvements)

3.5 Visualization and Communication

Dashboard approaches

¶1 Dashboards provide a compact format for presenting key indicators drawn from combined accounts. The SEEA Central Framework describes combined presentations that bring together information from various accounts to support decision-making²⁷. For ocean accounting, effective dashboards typically include:

¶2 **Headline indicators** that summarise overall status:

- ¶3 Total extent of marine and coastal ecosystems (from extent accounts)
- ¶4 Aggregate ecosystem condition index (see **TG-2.1 Aggregate Biophysical Indicators of Environmental State**)
- ¶5 Ocean economy contribution to GDP (see **TG-3.3 Economic Activity Relevant to the Ocean**)
- ¶6 Ocean-dependent employment (see **TG-3.5 Social Accounts**)

¶7 **Trend indicators** that show change over time:

- ¶8 Change in ecosystem extent by type
- ¶9 Change in condition for key ecosystem types
- ¶10 Change in sustainable yield versus actual harvest (see **TG-2.11 Resource Efficiency Indicators**)
- ¶11 Change in ocean economy employment

¶12 **Distributional indicators** that reveal how benefits and impacts are distributed:

- ¶13 Ecosystem services by beneficiary type (see **TG-2.4 Ecosystem Goods and Services**)
- ¶14 Economic benefits by region and community type
- ¶15 Vulnerability indicators by population group

¶16 **Pressure and response indicators** that show drivers and policy actions:

- ¶17 Pollution loads by source (see **TG-3.4 Flows Economy to Environment**)
- ¶18 Climate change impacts
- ¶19 Protected area coverage
- ¶20 Environmental expenditure

¶21 Table 1 provides an illustrative indicator template organised by account domain, drawing on indicator categories derived from ocean accounts²⁸. Compilers should adapt this template to national circumstances and priority policy questions.

¶22 **Table 1: Illustrative Ocean Accounts Dashboard Indicator Template**

Domain	Indicator	Account Source	SDG Linkage
Ecosystem extent	Total area of marine and coastal ecosystems (km ²)	Extent account	14.2.1
Ecosystem condition	Aggregate condition index by ecosystem type	Condition account	14.1.1
Ecosystem services	Value of provisioning services (fisheries, aquaculture)	Ecosystem services flow account	14.7.1
Ocean economy	Ocean economy GVA as share of national GDP	Thematic economic account	14.7.1
Employment	Ocean-dependent employment by sector and gender	Economic activity account	8.5.2
Pressures	Nutrient and pollution loads to marine waters (tonnes)	Residual flow account	14.1.1
Governance	Proportion of EEZ under marine spatial planning	Governance account	14.5.1
Ocean wealth	Change in total ocean natural capital (monetary)	Extended balance sheet	–

Indicator derivation

¶1 Combined presentations support derivation of indicators that span multiple account types. Examples relevant to ocean accounting include:

¶2 **Efficiency indicators** that relate economic output to environmental inputs:

- ¶3 Gross value added per tonne of fish harvested
- ¶4 Employment per hectare of aquaculture
- ¶5 Carbon emissions per unit of maritime transport output (see **TG-2.11 Resource Efficiency**)

¶6 **Sustainability indicators** that relate extraction to regeneration:

- ¶7 Harvest as a percentage of sustainable yield (see **TG-2.11 Resource Efficiency Indicators**)
- ¶8 Ecosystem degradation as a share of ecosystem service value
- ¶9 Depletion as a share of ocean economy value added

¶10 **Intensity indicators** that express environmental impacts relative to economic scale:

- ¶11 Pollution intensity of ocean industries
- ¶12 Land/ocean use intensity of coastal tourism
- ¶13 Resource intensity of aquaculture production

¶14 The SEEA EA notes that “there is the potential for data from the accounts to support climate change modelling focused on implications of projected climate change scenarios on economic activity”²⁹. Combined presentations provide the integrated ‘data foundation’ for such analytical applications. In the ocean context, indicators derivable from ocean accounts include specific measures for ocean conditions such as acidification and concentrations of marine debris, as well as indicators for ocean-related beneficiaries such as income of small-scale fishers²⁸.

Communication for decision-making

¶1 Effective communication of combined presentations requires attention to audience needs. Key considerations include:

¶2 **Policy relevance:** Combined presentations should be organised around policy questions, not accounting structures. For example, a presentation addressing coastal resilience might draw on ex-

tent accounts (mangrove coverage), condition accounts (ecosystem health), economic accounts (coastal protection infrastructure), and social accounts (vulnerable populations).

¶3 **Accessibility:** Technical accounting detail should be supported by summary visualisations and plain-language interpretation. The SEEA EA notes that combined presentations “can be a useful tool for mainstreaming discussion” of environmental themes in broader policy discourse³⁰.

¶4 **Transparency:** Combined presentations should document data sources, methods, and limitations, enabling users to assess confidence in the information presented. Quality assurance considerations from **TG-0.7 Quality Assurance Principles** apply to combined presentations.

3.6 Extended Balance Sheets

¶1 Extended balance sheets are a specific type of combined presentation that integrates natural capital with conventional national balance sheets, supporting whole-of-ocean wealth accounting.

Conceptual framework

¶1 The 2025 SNA describes how balance sheets record the value of assets and liabilities at the beginning and end of accounting periods, with the balancing item being net worth³¹. For whole-of-economy wealth accounting, the scope of assets can be extended to include natural assets not traditionally recorded in national balance sheets.

¶2 For ocean accounting, extended balance sheets incorporate:

¶3 **Produced assets** including vessels, ports, aquaculture infrastructure, and offshore energy installations. These are recorded in conventional national balance sheets and can be allocated to ocean-related sectors. The SEEA EA notes that ocean wealth includes “produced assets (e.g. ports)”³².

¶4 **Non-produced natural assets** including:

- ¶5 Marine fish stocks and other aquatic resources (see **TG-3.1 Asset Accounts**, Section 3.3)
- ¶6 Seabed mineral and energy resources (see **TG-3.10 Offshore Energy Accounts**)
- ¶7 Coastal land resources

¶8 **Ecosystem assets** representing the monetary value of marine and coastal ecosystems. The SEEA EA provides guidance on valuing ecosystem assets using net present value of expected ecosystem service flows³³. Valuation follows the methods described in **TG-1.9 Safe Usage of Monetary Valuation**.

Ocean wealth indicators

¶1 Extended balance sheets support derivation of ocean wealth indicators that complement flow-based measures like ocean economy GDP:

¶2 **Total ocean wealth:** The aggregate value of all ocean-related assets, including produced assets, natural resources, and ecosystem assets.

¶3 **Ocean wealth per capita:** Total ocean wealth divided by population, providing a measure of the asset base supporting each person’s potential ocean-derived wellbeing.

¶4 **Ocean wealth change:** The change in total ocean wealth between accounting periods, decomposed into:

- ¶5 Capital formation (investment in produced assets)
- ¶6 Natural growth (regeneration of renewable resources)
- ¶7 Depletion (extraction exceeding sustainable yield)
- ¶8 Degradation (decline in ecosystem asset values)
- ¶9 Revaluation (price changes)

¶10 **Ocean wealth sustainability:** The relationship between ocean wealth change and ocean economy output. Sustainable development implies that wealth is at least maintained over time; depletion of ocean wealth to support current consumption represents unsustainable use. This indicator connects to the sustainability indicators in **TG-2.11 Resource Efficiency Indicators**.

Limitations and caveats

¶1 Extended balance sheets for ocean wealth face several limitations that should be communicated in combined presentations:

¶2 **Valuation challenges:** Monetary valuation of ecosystem assets remains methodologically challenging, with the SEEA EA valuation chapters adopted as recommendations rather than full international standards³⁴. Extended balance sheets should present valuations with appropriate uncertainty characterisation.

¶3 **Boundary issues:** Ecosystem assets may provide services beyond national economic territory, creating challenges for allocating values to national balance sheets. This is particularly relevant for migratory fish stocks and ecosystem services with transboundary effects. The SEEA EA notes the opportunity to compile global ocean accounts for areas beyond national jurisdiction, where much data are already collected by international agencies³⁵.

¶4 **Non-substitutability:** Monetary aggregation of produced and natural assets may suggest substitutability that does not exist ecologically. Extended balance sheets should be accompanied by physical accounts that reveal whether natural asset decline is being offset by produced capital or represents genuine wealth loss.

¶5 The SEEA EA observes that “a comprehensive set of ocean accounts enables decision makers to monitor several critical trends” including “changes in ocean wealth, including produced assets (e.g. ports) and non-produced assets (e.g. mangroves, coral reefs)”³⁶. Extended balance sheets provide the framework for this monitoring.

3.7 Integrated Ocean Dashboard Specification

¶1 Combined presentations carry the most policy weight when assembled into integrated ocean dashboards that present headline indicators across all four accounting domains (environmental, economic, social, and governance) in a single view. This section specifies the structure, indicator selection criteria, and layout for an ocean dashboard that can serve as the primary communication product of an ocean accounting programme. The dashboard design draws on the indicator categories identified in Table 1 (Section 3.5) and extends them into a fuller specification suitable for both printed reports and interactive web-based platforms.

Headline indicators by domain

¶1 An effective ocean dashboard presents a small number of headline indicators that together convey the overall status of the ocean-society relationship. The selection of headline indicators should satisfy three criteria: policy relevance (the indicator addresses a question that decision-makers actively consider), data availability (the indicator can be compiled from existing or planned accounts), and communicability (the indicator can be understood by non-specialist audiences). The following table specifies the recommended headline indicator set, organised by the four domains of the ocean accounts framework.

¶2 *Table 3.7.1: Integrated ocean dashboard headline indicators*

Domain	Headline Indicator	Unit	Account Source	Update Frequency
Environmental	Total marine and coastal ecosystem extent	km ²	Ecosystem extent account (TG-3.1)	Annual

Domain	Headline Indicator	Unit	Account Source	Update Frequency
Environmental	Aggregate ecosystem condition index	Index (0-1)	Ecosystem condition account (TG-2.1)	Annual
Environmental	Fish stock status (proportion within biological limits)	%	Individual asset accounts (TG-3.1)	Annual
Environmental	Blue carbon stock (mangroves, seagrass, salt marsh)	Tonnes C	Ecosystem extent + condition accounts	Annual
Economic	Ocean economy GVA	Currency units	Thematic economic account (TG-3.3)	Annual
Economic	Depletion-adjusted ocean economy GVA	Currency units	Extended economic account (TG-3.3)	Annual
Economic	Ocean economy share of national GDP	%	Thematic economic account	Annual
Economic	Resource rent from ocean natural assets	Currency units	Asset accounts (TG-3.1) + valuation (TG-1.9)	Annual
Social	Ocean-dependent employment	Persons	Economic activity account (TG-3.5)	Annual
Social	Coastal community well-being index	Index	Social accounts (TG-3.5)	Biennial
Social	Income equity ratio (coastal vs national median)	Ratio	Distributional accounts (TG-3.5)	Annual
Social	Food security from marine sources (protein supply per capita)	kg/capita/yr	Flow accounts (TG-3.2) + social accounts	Annual
Governance	Marine protected area coverage	% of EEZ	Governance accounts (TG-3.7)	Annual
Governance	Ocean area under spatial planning	% of EEZ	Governance accounts (TG-3.7)	Annual
Governance	Management effectiveness score	Index	Governance accounts (TG-3.7)	Biennial
Governance	Environmental expenditure for ocean management	Currency units	Public expenditure accounts	Annual

¶3 Countries should adapt this indicator set to national circumstances, adding or replacing indicators to reflect priority policy questions. However, maintaining a consistent core set enables international comparison and benchmarking through the GOAP community of practice.

Dashboard layout template

¶1 The dashboard should follow a two-tier layout: a single-page summary providing the overall picture at a glance, and a set of drill-down pages providing detailed analysis for each domain. This structure allows the dashboard to serve multiple audiences: ministers and executives who need a rapid overview, and technical analysts who require detailed breakdowns.

¶2 The **single-page summary** should present the sixteen headline indicators in a quadrant layout (environmental top-left, economic top-right, social bottom-left, governance bottom-right), with each indicator showing the current value, the trend direction (improving, stable, or declining), and the percentage change from the previous period. A central panel should display one to three cross-domain integration indicators such as depletion-adjusted GVA per capita or the ratio of ecosystem service value to ocean economy output. Colour coding (green for improving, amber for stable, red for declining) provides immediate visual assessment, though the dashboard should remain interpretable in greyscale for printed reports and accessibility.

¶3 Each **drill-down page** should present the full indicator set for one domain, accompanied by time-series charts showing trends over a minimum of five years (where data permit), spatial maps showing geographic variation across the accounting area, and explanatory text highlighting key patterns and policy implications. The drill-down pages should cross-reference related indicators in other domains; for example, the environmental drill-down should note the economic value of ecosystem services, and the economic drill-down should flag depletion and degradation adjustments. Data tables supporting each drill-down page should be published as downloadable datasets in machine-readable formats, following the interoperability standards described in **TG-4.6 Data Harmonisation and Interoperability**.

¶4 *Table 3.7.2: Dashboard layout specification*

Component	Content	Format	Audience
Single-page summary	16 headline indicators in quadrant layout; trend arrows; cross-domain integration indicators	One page (A4/Letter); printable and web	Ministers, executives, media
Environmental drill-down	Extent trends by ecosystem type; condition indices; ecosystem service flows; pressure indicators	2-4 pages with charts and maps	Planners, environmental managers
Economic drill-down	GVA by industry; employment trends; trade balance; investment; depletion adjustments	2-4 pages with charts and tables	Finance ministry, planning commission
Social drill-down	Employment quality; income distribution; food security; vulnerability; cultural indicators	2-4 pages with charts and maps	Social policy, community development
Governance drill-down	Protected area trends; spatial planning coverage; management effectiveness; expenditure	2-4 pages with charts and maps	Governance agencies, oversight bodies
Data annex	Full indicator tables; metadata; quality notes; concordance documentation	Machine-readable download (CSV/SDMX)	Analysts, researchers

¶5 The dashboard should be updated annually in alignment with the national accounts publication cycle, with a target release date within twelve months of the reference period end. Interim updates for high-priority indicators (such as fish stock status or protected area coverage) may be published on a more frequent basis where data systems permit.

3.8 Cross-Domain Integration Protocol

¶1 Integrating data across environmental, economic, and social domains is the central difficulty of combined presentations. Whilst the compilation procedure in Section 3.4 describes the general workflow, this section provides a step-by-step protocol for linking specific account types across domain boundaries. The protocol addresses four integration pathways frequently encountered in ocean accounting: linking land accounts to coastal zone accounts, connecting water accounts to marine quality indicators, integrating blue carbon into national greenhouse gas inventories, and reconciling plastics flows with waste accounts.

Land accounts to coastal zone

¶1 Terrestrial land accounts compiled under the SEEA Central Framework and SEEA Ecosystem Accounting record land use and land cover for national territory, typically stopping at the coastline. Ocean accounts record marine and coastal ecosystem extent from the coastline seaward. The integration protocol bridges these two domains to provide a continuous picture of the land-sea interface, supporting analysis of how land-based activities affect coastal and marine ecosystems.

¶2 The protocol proceeds in four steps. First, establish a common spatial framework that encompasses both the terrestrial coastal strip (typically defined as the area within a specified distance of the mean high-water line, such as 5 km or 10 km) and the nearshore marine zone (extending to the limit of the coastal ecosystem types such as mangroves, seagrass, and nearshore reefs). The spatial framework guidance in **TG-2.12 Spatial Data Frameworks** provides the basis for this delineation. Second, reconcile the ecosystem type classification used in land accounts (often based on national land cover classifications mapped to the IUCN GET terrestrial and transitional realms) with the marine ecosystem type classification used in ocean accounts (based on GET marine realm). The concordance should explicitly address transitional ecosystems (mangroves, salt marshes, estuaries) that may appear in both land and ocean accounts, ensuring they are counted once and allocated consistently. Third, compile a linked extent account that shows land use change in the coastal strip alongside marine ecosystem extent change in the nearshore zone, enabling analysis of how coastal development drives marine habitat loss. Fourth, verify consistency by checking that land-based pollution loads recorded in the residual flow accounts (**TG-3.4**) are physically plausible given the land use composition of the coastal strip.

¶3 *Table 3.8.1: Land-coastal zone integration checklist*

Step	Action	Quality Check
1. Spatial framework	Define coastal strip and nearshore zone boundaries	Boundaries contiguous; no gaps or overlaps at coastline
2. Classification concordance	Map land cover classes to marine ecosystem types for transitional zone	Each transitional ecosystem allocated to exactly one domain
3. Linked extent account	Compile land use change and marine extent change in single table	Total area equals sum of terrestrial strip plus nearshore zone
4. Pollution flow consistency	Compare land-based pollution loads to coastal water quality	Nutrient loads from land accounts plausible given receiving water volumes

Water accounts to marine quality

¶1 Water accounts compiled under the SEEA Central Framework (Chapter 3) record water abstraction, use, and return flows within the hydrological cycle. Marine quality monitoring programmes measure concentrations of nutrients, sediments, and pollutants in coastal and marine waters. The integration protocol links these two information systems to enable analysis of how freshwater management decisions affect marine environmental quality.

¶2 The protocol requires, first, identifying the river basins and coastal catchments that discharge into the ocean accounting area. Water accounts for these catchments provide data on return flows (treated and untreated wastewater discharges) and diffuse pollution loads (agricultural runoff, urban stormwater). Second, the return flow data from water accounts should be expressed in terms of pollutant loads (tonnes of nitrogen, phosphorus, suspended sediments, and biochemical oxygen demand) rather than water volumes alone. This requires combining water volume data with concentration measurements, which may come from water quality monitoring stations operated by environmental agencies. Third, the pollutant loads should be linked to the residual flow accounts in **TG-3.4 Flows Economy to Environment**, which record emissions from economic activities to the marine environment. Fourth, the resulting pollutant load estimates should be reconciled with marine water quality observations from coastal monitoring programmes, checking that the estimated

loads are consistent with observed concentrations given the dilution and assimilative capacity of receiving waters. Discrepancies may indicate unaccounted pollution sources (such as atmospheric deposition or groundwater discharge) or errors in load estimation.

¶3 *Table 3.8.2: Water-marine quality integration protocol*

Data Source	Variables	Transformation	Ocean Account Destination
Water accounts (SEEA CF)	Return flow volumes by catchment	Multiply by pollutant concentrations	Residual flow accounts (TG-3.4)
Water quality monitoring	Pollutant concentrations at discharge points	Convert to load estimates (concentration x flow)	Residual flow accounts
Marine monitoring	Coastal water quality indices	Compare with estimated loads for consistency	Ecosystem condition accounts (TG-3.1 Section 3.5.2)
Agricultural statistics	Fertiliser application rates by crop and region	Apply runoff coefficients for diffuse load estimates	Residual flow accounts

Blue carbon to GHG inventories

¶1 Blue carbon integration links carbon stock data from ocean extent and condition accounts to national GHG inventories, ensuring consistent treatment of mangrove, seagrass, salt marsh, and kelp carbon flows under IPCC wetlands guidance. For the full blue carbon integration protocol, including the stock decomposition method, IPCC category mapping, and reconciliation checklist, see **TG-6.2 Mangrove and Coastal Wetland Accounting**.

Plastics to waste accounts

¶1 Marine plastic pollution is a priority policy concern that requires integration of data from waste accounts (recording plastic waste generation, collection, and disposal), residual flow accounts (recording plastic leakage to the marine environment), and marine debris monitoring (recording plastic concentrations in coastal and marine waters). The integration protocol links these data streams to provide a complete material flow account for plastics from production through to marine accumulation.

¶2 The protocol begins with the waste accounts compiled under the SEEA Central Framework, which record waste generation by economic activity and waste management (collection, recycling, disposal) by waste type. Compilers should extract plastic waste flows from the waste accounts, using the relevant waste classification categories. Second, plastic leakage to the marine environment should be estimated using a combination of waste management data (uncollected waste, landfill leakage) and pathway analysis (riverine transport, coastal littering, maritime sources). The pollution flow accounts in **TG-2.7 Pollution and Other Flows** provide guidance on estimating residual flows. Third, marine debris monitoring data (beach surveys, trawl surveys, remote sensing) should be compiled as condition indicators for the relevant marine ecosystem types, following the condition accounting guidance in **TG-2.1 Aggregate Biophysical Indicators of Environmental State**. Fourth, the complete material flow should be reconciled: total plastic production minus recycling minus managed disposal minus exports should equal domestic accumulation (in landfills and the environment) plus marine leakage, within estimation tolerances. Discrepancies should be investigated and documented.

¶3 *Table 3.8.4: Plastics material flow reconciliation*

Flow Component	Data Source	Unit	Quality Check
Plastic production + imports	Industry statistics, trade data	Tonnes/yr	Cross-check with customs data
Plastic exports	Trade data	Tonnes/yr	Verify with partner country import data
Managed disposal (landfill, incineration)	Waste management records	Tonnes/yr	Sum of disposal routes equals collected waste
Recycling	Waste management records	Tonnes/yr	Recycling rate within plausible range for country
Uncollected waste	Estimated from collection coverage	Tonnes/yr	Consistent with population and collection infrastructure
Marine leakage	Pathway analysis + monitoring	Tonnes/yr	Plausible given uncollected waste and proximity to coast
Balance check	Production + imports - exports = disposal + recycling + accumulation + leakage	Tonnes/yr	Residual within 10% tolerance

3.9 Sub-National Combined Presentations

¶1 Many ocean governance decisions are made at sub-national scales: by provincial governments, municipal authorities, port authorities, and local marine management bodies. This section provides guidance on adapting the combined presentation format for sub-national application, recognising that sub-national compilers typically face more constrained data environments and require simplified indicator sets that can be compiled with available resources.

Adapting the framework for provinces and municipalities

¶1 The ocean accounts framework and the combined presentation structure described in Sections 3.1 through 3.8 are designed primarily for national-level application, but the SEEA EA explicitly notes that accounting principles are applicable across different spatial scales. Sub-national combined presentations follow the same general structure (environmental, economic, social, and governance domains) but require adaptation in three areas: spatial scope, data sources, and indicator selection.

¶2 For **spatial scope**, sub-national combined presentations should define the accounting area with reference to existing administrative boundaries (province, district, municipality) and the adjacent marine area over which the sub-national authority exercises jurisdiction or management responsibility. Where the sub-national authority does not have formal marine jurisdiction, the accounting area may be defined as the coastal zone within its terrestrial boundary plus a seaward extension agreed with the national ocean accounting programme. The spatial unit guidance in **TG-2.12 Spatial Data Frameworks** applies, with the additional requirement that the sub-national accounting area should nest within the national accounting area to enable aggregation.

¶3 For **data sources**, sub-national compilers will often lack the detailed economic statistics available at national level (such as supply-use tables or detailed industry GVA by sub-national region). Available data may include regional employment statistics, local government revenue data, fisheries landing records from local ports, and environmental monitoring from sub-national agencies. Remote sensing data (**TG-4.1 Remote Sensing and Geospatial Data**) and citizen science data (**TG-4.4 Citizen Science**) can supplement official statistics at the sub-national level.

¶4 For **indicator selection**, sub-national presentations should use a simplified indicator set that can be compiled with available data whilst still covering the four domains. The following table provides a recommended minimum indicator set for sub-national combined presentations.

¶5 *Table 3.9.1: Simplified indicator set for sub-national combined presentations*

Domain	Indicator	Minimum Data Requirement	Compilation Difficulty
Environmental	Coastal and marine ecosystem extent	Satellite imagery + national land cover map	Low
Environmental	Key ecosystem condition indicator (e.g., water quality index)	Local monitoring station data	Medium
Environmental	Fish stock indicator (e.g., CPUE from local fleet)	Local fisheries landing records	Medium
Economic	Local ocean economy employment	Regional labour force survey or census	Low
Economic	Fisheries landing value	Port landing records	Low
Economic	Tourism visitor numbers and expenditure	Local tourism statistics	Low-Medium
Social	Coastal community population and demographics	Census data	Low
Social	Households dependent on ocean livelihoods	Household survey or census	Medium
Social	Access to marine-related services (e.g., sanitation near coast)	Administrative records	Low
Governance	Local MPA or managed area coverage	Protected area registry	Low
Governance	Compliance and enforcement indicators	Local management authority records	Medium
Governance	Local government ocean-related expenditure	Budget records	Low

¶6 This simplified set of twelve indicators represents the minimum viable combined presentation for a sub-national area. As data systems mature, additional indicators from the full national dashboard specification (Section 3.7) can be incorporated.

Aggregation and consistency with national accounts

¶1 Sub-national combined presentations must be designed for aggregation to the national level. This requires that sub-national accounting areas are exhaustive (every part of the national accounting area belongs to exactly one sub-national unit) and mutually exclusive (no overlaps). Classification systems used at the sub-national level must be consistent with national classifications, or concordance tables must be maintained to enable consistent aggregation. Where sub-national data are compiled independently by multiple agencies, a coordination mechanism is needed to ensure consistent boundary definitions, classification application, and temporal reference periods. The data harmonisation guidance in **TG-4.6 Data Harmonisation and Interoperability** provides the technical framework for this coordination.

¶2 The relationship between sub-national and national combined presentations should be documented in metadata, specifying: the nesting hierarchy of spatial units, any allocation methods used to distribute national data to sub-national areas (such as pro-rata allocation of national GVA based on employment shares), and any sub-national data that are compiled independently and aggregated upward to the national total. Where discrepancies arise between the sum of sub-national accounts and independently compiled national accounts, these should be treated as statistical discrepancies and documented transparently, following the quality assurance guidance in **TG-0.7 Quality Assurance Principles**.

Link to TG-3.11

¶1 Sub-national combined presentations are a key input to the compilation of ocean sustainability reports at local and regional scales. **TG-3.11 Sub-National Ocean Accounts** provides guidance on linking sub-national accounts to local planning processes and on dashboards for local decision-makers (its Sections 3.5 and 3.6). While combined presentations maintain the formal accounting structure (tables, indicators, and methodological documentation), sustainability reports translate these into accessible narratives with policy recommendations. Sub-national authorities preparing sustainability reports should compile the simplified combined presentation described in this section as the data foundation, then apply the local-planning and dashboard guidance in TG-3.11 to produce the final report. The feedback loop between reporting requirements and data compilation priorities should inform progressive improvements in sub-national data collection, with the most policy-relevant indicators receiving priority investment in data quality and timeliness.

3.10 Worked Example: Integrated Coastal Zone Combined Presentation

¶1 This section presents a worked example demonstrating how to compile a combined presentation for a hypothetical coastal zone. The example uses synthetic data to illustrate the compilation procedure described in Section 3.4, showing how component accounts are assembled into an integrated presentation that answers a specific policy question.

Scenario and policy question

¶1 **Policy question:** Is coastal development in the Northshore Zone proceeding sustainably, balancing economic growth with conservation of marine ecosystems and coastal protection services?

¶2 **Accounting area:** Northshore Coastal Zone, encompassing 50 km of coastline, extending 12 nautical miles offshore, with total area of approximately 1,200 km² (at start of period: 152 km² of mangroves, 82 km² of seagrass meadows, 605 km² of coral reef ecosystems, and 370 km² of continental shelf waters).

¶3 **Reference period:** Calendar year 2025.

¶4 **Primary users:** Regional development authority, national planning ministry, coastal zone management agency.

Step 1: Component accounts assembled

¶1 The following accounts were available for the reference period:

¶2 Environmental accounts:

- ¶3 Ecosystem extent account (from satellite analysis and field surveys)
- ¶4 Ecosystem condition account (from monitoring stations)
- ¶5 Fish stock asset account (from stock assessment)
- ¶6 Ecosystem services flow account (physical measures only; partial monetary valuation)

¶7 Economic accounts:

- ¶8 Ocean economy thematic account for Northshore Zone (GVA by industry)
- ¶9 Employment account (by industry and demographic group)
- ¶10 Tourism expenditure account

¶11 Social accounts:

- ¶12 Household distributional account (income by coastal/inland residence)
- ¶13 Employment by gender and age group

¶14 Governance accounts:

- ¶15 Protected area coverage (marine protected area extent and status)

¶1.6 **Data limitations:** Monetary valuation of regulating services (coastal protection, carbon sequestration) incomplete; governance effectiveness indicators not quantified; full supply-use tables not available.

Step 2: Combined presentation structure

¶1 Based on the policy question, the presentation is structured into four integrated sections:

¶2 **Section A: Environmental status and trends** (extent, condition, services) **Section B: Economic activity and benefits** (GVA, employment, income) **Section C: Sustainability indicators** (depletion, degradation, pressure-state relationships) **Section D: Governance and management response** (protected areas, expenditure)

Section A: Environmental Status and Trends

¶1 **Table 2: Ecosystem Extent and Condition (2025)**

Ecosystem Type	Opening Extent (km ²)	Closing Extent (km ²)	Net Change (km ²)	Aggregate Condition Index (0-1)	Change in Condition
Mangroves	152	150	-2	0.68	-0.03
Seagrass meadows	82	80	-2	0.71	-0.05
Coral reefs	605	600	-5	0.58	-0.07
Continental shelf	370	370	0	0.64	-0.02
Total	1,209	1,200	-9	0.62 (area-weighted)	-0.04

¶2 **Interpretation:** The coastal zone experienced net loss of 9 km² of ecosystem extent during 2025, driven by conversion of mangroves and seagrass to coastal development and degradation of coral reef systems. Condition indices declined across all ecosystem types, with coral reefs showing the most significant decline (0.07 reduction in condition index). The aggregate condition index (area-weighted average) for the zone fell from 0.67 to 0.62, indicating widespread ecosystem stress.

¶3 **Table 3: Physical Ecosystem Service Flows (2025)**

Ecosystem service	Unit	Mangrove	Seagrass	Coral reef	Total supply	Primary users
Fish provisioning	tonnes/yr	450	280	1,120	1,850	Commercial fisheries (1,620 t), Subsistence fishing (230 t)
Coastal protection	km protected	27	6	17	50	Coastal properties, infrastructure
Carbon sequestration	tonnes C/yr	1,800	640	120	2,560	Global community (climate regulation)
Recreation	visitor-days/yr	8,000	12,000	95,000	115,000	Tourism operators, households

¶4 **Interpretation:** Coral reefs provide the majority of fish provisioning services (1,120 of 1,850 tonnes), whilst mangroves contribute the most to carbon sequestration (1,800 of 2,560 tonnes carbon per year) and coastal protection (27 of 50 km protected, after the 15 km of coastline protected by more than one type is allocated in proportion to each type's share so that no stretch is counted twice). Recreation services are heavily concentrated in coral reef areas (95,000 of 115,000 visitor-days).

¶5 **Table 4: Fish Stock Asset Account (2025)**

Entry	Value (tonnes)
Opening stock (1 Jan 2025)	18,500
Additions	
Natural growth	3,200
Reductions	
Commercial catch	1,620
Subsistence catch	230
Natural mortality	2,150
Closing stock (31 Dec 2025)	17,700
Sustainability measures	
Sustainable yield (MSY estimate)	1,500
Actual catch	1,850
Depletion	350

¶6 **Interpretation:** Fish stock declined by 800 tonnes (4.3%) during 2025. Actual catch (1,850 tonnes) exceeded sustainable yield (1,500 tonnes) by 350 tonnes, indicating overfishing and resource depletion. At current extraction rates, fish stocks will continue to decline unless catch is reduced.

Section B: Economic Activity and Benefits

¶1 **Table 5: Ocean Economy Contribution (2025, million USD)**

Industry	GVA	Employment (persons)	Share of Zone GVA (%)
Marine fishing	12.5	620	8.2
Aquaculture	3.8	180	2.5
Coastal tourism	45.2	1,350	29.6
Maritime transport (port services)	8.6	240	5.6
Coastal construction	15.3	890	10.0
Other ocean-related	4.1	320	2.7
Total ocean economy	89.5	3,600	58.6
Non-ocean economy	63.2	2,800	41.4
Total zone economy	152.7	6,400	100.0

¶2 **Interpretation:** Ocean-related industries account for 58.6% of the zone's gross value added and 56% of employment. Coastal tourism is the dominant sector (29.6% of GVA, 1,350 employees), followed by coastal construction (10.0% of GVA) and marine fishing (8.2% of GVA). The zone's economy is heavily dependent on ocean resources and marine ecosystem health.

¶3 **Table 6: Income Distribution (2025, households by location)**

Indicator	Coastal Households	Inland Households	Zone Average
Median annual income (USD)	18,400	22,600	20,200
Share employed in ocean economy (%)	64	28	48
Households below poverty line (%)	22	14	18

¶4 **Interpretation:** Coastal households earn 18% less than inland households on average and have higher poverty rates (22% versus 14%), despite higher dependence on ocean economy employment

(64% versus 28%). This suggests that ocean economy jobs, particularly in fishing and aquaculture, provide lower incomes than inland employment, and that coastal communities are economically vulnerable to changes in marine resource availability.

Section C: Sustainability Indicators

¶1 **Table 7: Integrated Sustainability Indicators (2025)**

Indicator	Value	Interpretation
Resource efficiency		
GVA per tonne of fish caught (USD/tonne)	6,757	Fisheries generate USD 6,757 of value added per tonne of catch
Tourism GVA per km ² of coral reef (USD thousand/km ²)	75.3	Each km ² of coral reef supports USD 75,300 of tourism GVA
Sustainability		
Catch as % of sustainable yield	123%	Overfishing: catch exceeds sustainable yield by 23%
Depletion as % of fisheries GVA	2.8%	Depletion valued at resource rent of USD 1,000/tonne (350 tonnes x USD 1,000 = USD 350,000), representing 2.8% of fisheries GVA (USD 12.5M)
Ecosystem extent change (%)	-0.7%	Ecosystem extent declined by 0.7% during the year
Pressure intensity		
Nutrient loads per unit coastal development (tonnes N/km ²)	3.2	Each km ² of development generates 3.2 tonnes of nutrient pollution
Tourist visitors per km ² of reef	158	Coral reef areas receive 158 visitor-days per km ² per year

¶2 **Interpretation:** The zone shows clear signs of unsustainable use. Fish catch exceeds sustainable levels by 23%, leading to stock depletion that reduces the net income from fisheries by 2.8%. Ecosystem extent is declining, and condition indices are falling across all ecosystem types. Nutrient pollution from coastal development and visitor pressure on coral reefs are contributing to ecosystem stress.

Section D: Governance and Management Response

¶1 **Table 8: Governance and Management Indicators (2025)**

Indicator	Value	Target	Gap
Marine protected area coverage (km ²)	180	300	-120
MPA coverage as % of zone area	15.0%	25.0%	-10.0%
Government expenditure on coastal management (million USD)	2.4	–	–
Coastal management expenditure per km ² (USD thousand/km ²)	2.0	–	–
Enforcement patrol days	120	180	-60

¶2 **Interpretation:** Marine protected area coverage (15%) falls short of the national target (25%), with 120 km² additional area requiring designation to meet the target. Government expenditure on coastal management (USD 2.4 million, or USD 2,000 per km²) may be insufficient given the level of ecosystem stress observed. Enforcement capacity (120 patrol days) is below the planned level (180 days), suggesting monitoring and compliance challenges.

Section E: Balance Sheet and Adjusted Aggregates

¶1 The four sections above present accounts side by side. This one brings them onto a single line. Two presentations do that: the ocean balance sheet, which states what the zone owns at a point in time, and the adjusted aggregates derivation, which states what it earned after the cost of running its natural capital down.

¶2 **The ocean balance sheet.** Assembled from the closing stocks of the asset accounts, produced and non-produced together. It is the presentation **TG-3.1** Section 3.2 Step 6 names as the integration point for asset accounts, and the only one in which produced and environmental capital appear on comparable terms.

¶3 **Table 9: Ocean balance sheet – structural template**

	Opening	Closing	Change
Non-financial assets			
Produced assets – vessels, aquaculture, energy, port, coastal protection	[value]	[value]	[+/-]
Non-produced natural resources – aquatic, mineral and energy, water	[value]	[value]	[+/-]
Ecosystem assets	[value]	[value]	[+/-]
Financial assets	[value]	[value]	[+/-]
Less: liabilities (incl. decommissioning provisions)	[-value]	[-value]	[+/-]
Net worth	[value]	[value]	[+/-]

¶4 *Table 9: Structural template of an ocean balance sheet. Produced asset values come from the TG-3.1 Table 10 template, natural resources from Table 1b, ecosystem assets from Table 4. Decommissioning provisions are a liability, not a negative asset.*

¶5 **Adjusted aggregates.** Gross value added measures production without charging for the natural capital consumed in producing it. The adjustment deducts consumption of fixed capital, as the SNA already does for produced assets, and then deducts depletion and degradation, which the SNA does not. The 2025 SNA treats depletion of natural resources as a cost of production analogous to depreciation, so the deduction is not an alternative accounting – it is the completion of the existing one.

¶6 **All three deductions must be at constant prices.** Holding gains are not income. TG-3.1 Section 3.7 shows an ecosystem account closing above its opening value in a year when extent, condition and biomass all fell, purely on revaluation; an adjusted aggregate that netted revaluation into the deduction would inherit that error.

¶7 **Table 10: Adjusted ocean aggregates – derivation**

Line	Source	Value (million USD)
Ocean economy gross value added	Table 5	89.50
less consumption of fixed capital	Produced asset account	(7.20)
Net ocean value added		82.30
less depletion of natural resources, at constant prices	Table 4 depletion x resource rent (350 t x USD 1,000/t)	(0.35)
less ecosystem degradation, at constant prices	Condition index decline x opening ecosystem asset value	(2.85)
Environmentally adjusted net ocean value added		79.10
Memorandum: adjustment as a share of GVA		3.6%
Memorandum: revaluation excluded from the above	Asset accounts	4.10

¶8 *Table 10: Derivation of environmentally adjusted net ocean value added for the Northshore Coastal Zone, 2025. Every line traces to an account compiled above or to the produced asset account in TG-3.1 Section 3.6.*

¶9 **Reading the derivation.** The zone's ocean economy reports USD 89.5 million of gross value added. USD 7.2 million of that is the using-up of vessels, ponds and port structures, and a further USD 3.2 million is the using-up of fish stocks and ecosystem condition. Net of both, the zone earned USD 79.1 million – 11.6 per cent less than the headline, and 3.6 per cent less than a conventional net measure that stops at produced capital.

¶10 The memorandum line is the one to watch over a run of years. USD 4.1 million of holding gains sat in the asset accounts this period, more than the entire natural capital deduction. A presentation that reported change in net worth without separating that line would show the zone's ocean wealth broadly flat while its fish stocks fell 4.3 per cent, its reefs lost 5 km² and every condition index declined.

¶11 **A caution on completeness.** This derivation charges only for what has been measured. Degradation here covers the ecosystem types with condition accounts; services without a defensible valuation contribute nothing to the deduction, which biases the adjusted figure upwards. State what the deduction covers whenever the number is published, or it will be read as comprehensive.

Step 3: Integration and policy implications

¶1 *The tables above together show declining condition alongside rising GVA; the gap between sustainable yield and actual harvest signals resource depletion; and distributional data reveal that coastal households bear a disproportionate share of ecosystem stress. Together these warrant the policy adjustments described in the scenario narrative.*

3.11 Condition-to-Services Data-Flow Integration

¶1 Combined presentations that span condition and services require a structured linkage from condition account outputs to ecosystem service account inputs. The three-step pattern (inventory condition outputs, map them to service inputs, then assemble an integrated extent-condition-service table) operationalises the SEEA EA articulation of these accounts as a connected sequence³⁷. Compilers should apply the service-specific methods and indicator guidance in **Section 3.2** and the linked TG-2.x circulars when selecting indicators and conversion factors.

4. Summary

¶1 Combined presentations integrate data from multiple account types to support analysis and decision-making for ocean governance. Key principles include:

1. ¶2

Consistency: Combined presentations draw on underlying accounts compiled using consistent geographical boundaries, entity definitions, and classifications.

2. ¶3

Complementarity: Physical, monetary, social, and governance data provide complementary perspectives that together support fuller analysis.

3. ¶4

Policy orientation: Effective combined presentations are organised around policy questions, not accounting structures, with visualisations designed for decision-making audiences.

4. ¶5

Transparency: Methods, data sources, and limitations should be clearly documented to support informed interpretation.

¶6 Combined presentations are the analytical endpoint of the ocean accounts framework, enabling the derivation of integrated indicators and supporting the mainstreaming of ocean sustainability into national policy and decision-making.

Implementation Considerations

¶1 For minimum institutional capacity, data infrastructure, and human skills requirements for compiling these accounts, see [TG-0.8 Implementation Readiness Assessment](#). For guidance on adapting these methods to sub-national scales, see [TG-3.11 Sub-National Ocean Accounts](#).

5. Acknowledgements

¶1 **Authors:** [To be confirmed]

¶2 **Reviewers:** [To be confirmed]

6. References

1. ¶1 SEEA EA (2021), para. 13.1. "The framing provided by ecosystem accounting is systematic and comprehensive with respect to ecosystem extent, ecosystem condition and ecosystem services and offers one perspective on monetary values of ecosystem services and ecosystem assets."
2. ¶2 SEEA EA (2021), para. 13.1. "Policy and analysis related to the environment and human connection to it can be framed in many ways. Often, it requires consideration of specific environmental themes, such as biodiversity, climate change, oceans and urban areas, among many others."
3. ¶3 SEEA EA (2021), para. 13.81. "A comprehensive set of ocean accounts enables decision makers to monitor several critical trends: (a) changes in ocean ecosystem extent and condition and in associated flows of ecosystem services; (b) changes in ocean wealth, including produced assets (e.g. ports) and non-produced assets (e.g. mangroves, coral reefs); (c) ocean-related income and welfare for different groups of people (e.g. income from fisheries for local communities); (d) ocean-based economic production (e.g. GDP from sectors deemed to be ocean-related); (e) changes in how oceans are governed and managed."
4. ¶4 SEEA EA (2021), para. 13.90. "Much of the information required to compile ocean accounts is common to other communities of practice including those for marine spatial planning, disaster risk and climate change. One objective of the ocean accounting community of practice is to ensure that these common data are standardized and shared."
5. ¶5 SEEA EA (2021), Figure 2.1 "General ecosystem accounting framework."
6. ¶6 SEEA EA (2021), para. 13.83. See Figure 13.2 "Coverage of the ocean accounts framework."
7. ¶7 SEEA EA (2021), paras. 13.5-13.7. "First, there needs to be a clearly agreed geographical area... Second, it is necessary to have a set of entities that are the focus of accounting... Third, in accounting for a single theme, multiple accounts are required."
8. ¶8 SEEA EA (2021), para. 13.8. "Links between the various accounts for a theme are possible because of the use of a clearly delineated and consistently applied geographical boundary and consistent application of classifications for agreed entities. This allows the accounts for one theme to convey a coherent narrative."
9. ¶9 SEEA EA (2021), paras. 13.9-13.10. "For any given thematic accounting exercise, there is no a priori restriction on the geographical area, type of entity or classification that must be applied." and "Accounting principles are themselves equally applicable across different spatial scales and entities and are unaffected by the choice of classification. These choices should therefore be made with a focus on the use of the accounts, including the potential to compare results over time and in different locations."
10. ¶10 SEEA EA (2021), Figure 2.2 "Connections between ecosystem accounts."
11. ¶11 SEEA CF (2012), para. 5.1. Asset accounts "record the stock of environmental assets at the beginning and end of each accounting period and the changes in the stock during the accounting period."
12. ¶12 SEEA CF (2012), Chapter IV describes environmental activity accounts including hybrid formats integrating physical and monetary data.
13. ¶13 SEEA EA (2021), Chapter 7 describes physical supply and use tables for ecosystem services.
14. ¶14 SEEA EA (2021), para. 7.1. "Ecosystem services flow accounts record the supply of ecosystem services by ecosystem assets and the use of those services by economic units."
15. ¶15 SEEA EA (2021), para. 13.92. "The ocean accounts framework has proved effective in supporting several pilot studies, each of which has aimed towards answering policy-relevant questions." Pilots in Samoa, Thailand, Viet Nam, China, and Malaysia are described.
16. ¶16 SEEA CF (2012), para. 5.457. "A commonly used indicator that is closely associated with the stock of aquatic resources, and in particular with fish, is the catch per unit of effort (CPUE)."
17. ¶17 SEEA EA (2021), para. 12.4. The chapter on integrated and extended presentations discusses relationships between physical and monetary data.
18. ¶18 2025 SNA, Chapter 34 (Measuring Well-being) and Chapter 35 (Measuring the Sustainability of Well-being). "A unique feature of the 2025 SNA is the broadening of the national accounts framework to better account for elements affecting wellbeing and sustainability."
19. ¶19 United Nations SDG Indicator 14.5.1. See also SEEA EA para. 13.94 on ocean account indicators.

0. ¶20 SEEA EA (2021), para. 13.89. “The objective of the ocean governance accounts is to provide spatially explicit location-based information so that decision makers and planners can make the most effective decisions with respect to ensuring the sustainable use of the ocean.”
1. ¶21 SEEA CF (2012), para. 6.56. “Different forms of combined physical and monetary presentations are possible and, indeed, there is no standard form for these presentations or accounts... Ultimately, the structures of combined presentations of monetary and physical data are dependent on the availability of data and the question under investigation.”
2. ¶22 SEEA CF (2012), para. 6.88. “The monetary accounts and tables are compiled using a consistent set of classifications of products and industries as used in the SNA. For physical data, different classifications are often used for different topics and themes that are specifically developed for analysis of those topics... Any differences in classification need to be resolved before physical and monetary data are combined.”
3. ¶23 SEEA CF (2012), para. 6.71. “It is important to ensure that the source data underpinning the physical and the monetary data relate to the same accounting period.”
4. ¶24 SEEA CF (2012), Table 6.4 and para. 6.122. “Table 6.4 sets out a possible structure and some typical content for the presentation of combined physical and monetary data. It has four sections, covering monetary flows, physical flows, stocks and flows of environmental and fixed assets, and relevant indicators.”
5. ¶25 SEEA CF (2012), para. 6.91. “It is therefore important, when combining monetary and physical data, to confirm that the implicit relationships between quantities and prices are meaningful and reasonable.”
6. ¶26 SEEA CF (2012), para. 6.59. “Because these presentations combine physical data that may be of more immediate relevance to scientists, with monetary data familiar to economists, they also have the potential to serve as a bridge between both types of specialists in the context of their analysis of the environment.”
7. ¶27 SEEA CF (2012), Chapter VI describes applications and combined presentations.
8. ¶28 SEEA EA (2021), paras. 13.93-13.96 and Appendix A13.3. “In the context of ecosystems, the ocean may be viewed as a set of marine, coastal and transitional ecosystem types and any indicators derivable from SEEA EA can also be derived from the ocean accounts.”
9. ¶29 SEEA EA (2021), para. 13.74. “There is also the potential for data from the accounts to support climate change modelling focused on implications of projected climate change scenarios on economic activity.”
0. ¶30 SEEA EA (2021), para. 13.46. Combined presentations “can be a useful tool for mainstreaming discussion of biodiversity.”
1. ¶31 2025 SNA, Chapter 13 describes balance sheets.
2. ¶32 SEEA EA (2021), para. 13.81.
3. ¶33 SEEA EA (2021), Chapter 10 describes principles of valuation for ecosystem assets.
4. ¶34 SEEA EA (2021), the monetary valuation chapters (Chapters 8-11, covering monetary ecosystem service accounts and monetary ecosystem asset accounts) were adopted by the UN Statistical Commission as recommendations rather than full international standards, pending further methodological development.
5. ¶35 SEEA EA (2021), para. 13.91. “The ocean is mostly an area beyond national jurisdiction (ABNJ). This introduces the opportunity to compile global ocean accounts, where much of the data are already collected by international agencies.”
6. ¶36 SEEA EA (2021), para. 13.81.
7. ¶37 SEEA EA (2021), Chapter 2 and Figure 2.2 describe the connected sequence of ecosystem extent, condition, and service accounts, with condition variables informing the supply of ecosystem services.