

National Data Coordination Architectures

Helps practitioners design and establish national data coordination architectures for ocean accounting, including the data-sharing arrangements.

Version 0.6.2

Status Draft

Stability Applied

Last updated September 2026 **Responsible officer** Dr Jordan Gacutan

Drafting AI-assisted drafting from GOAP Secretariat source materials; source list to be published at the close of consultation.

OUTCOME

After completing this Circular, practitioners will be able to design and establish national data coordination architectures for ocean accounting, including the data-sharing arrangements, technical working groups, and coordination mechanisms required to bring together diverse ocean data streams into coherent accounting frameworks. It addresses how national statistical offices (NSOs) and ocean-related agencies can collaborate effectively through formal data sharing agreements, joint technical committees, and shared data platforms to produce and maintain ocean accounts.

The scope of this Circular is deliberately focused on data-specific coordination: the memoranda of understanding (MOUs) that govern data exchange between agencies, the technical working groups that resolve methodological questions about data integration, and the platform architectures that enable shared access to accounting data. Broader questions of governance design are addressed elsewhere: how ocean accounts are embedded within national planning frameworks in [TG-1.10 OA and National Planning Integration](#), and inter-ministerial coordination models and strategies for building domestic champions in [TG-0.8 Implementation Readiness Assessment](#) Section 3.5.

Ocean accounting is inherently multi-institutional. As the SEEA Ecosystem Accounting framework recognises, “given the high degree to which ecosystem accounting is cross-cutting and spatial in nature, implementation necessitates a highly collaborative approach and the active participation of representatives of many different agencies and disciplines”. The data coordination architectures described in this Circular provide the institutional infrastructure through which this collaboration is realised at the operational level.

This Circular complements [TG-0.8 Implementation Readiness Assessment](#), which provides the broader context for evaluating a country’s institutional, data, and human capacity prerequisites for ocean accounting. Where TG-0.8 helps countries assess their readiness across all dimensions of implementation, the present Circular provides detailed operational guidance on establishing and managing the data coordination mechanisms that readiness assessment identifies as necessary. The data harmonisation standards and interoperability protocols described in [TG-4.6 Data Harmonisation and Interoperability](#) provide the technical foundation on which the coordination architectures in this Circular are built. Whilst TG-4.6 addresses what standards and formats to use, TG-4.7 addresses how agencies organise themselves to apply those standards collaboratively.

CONTENTS

1. Outcome	3
2. Requirements	3
3. Guidance Material	4
3.1 National Data Coordination Committee Models and Mandates	5
3.2 NSO–Ocean Agency Data Sharing Agreements	7
3.3 Trust Frameworks for Data Sharing	8
3.4 Integrated Platform Architectures	10
3.5 Modular Implementation Strategies	11
3.6 Time–Series Data Investment Planning	13
4. Summary	14
Implementation Considerations	15
5. Acknowledgements	15
6. References	15

ABOUT THIS CIRCULAR

RECOMMENDED CITATION

National Data Coordination Architectures (2026) (GOAP Technical Guidance on Ocean Accounting, TG–4.7, v0.6.2). GOAP Secretariat.
<https://guidance.oceanaccounts.org/circulars/section-4/4-7-data-coordination/>

© 2026 Global Ocean Accounts Partnership. Licensed under CC BY-NC 4.0.

DRAFT

1. Outcome

¶1 After completing this Circular, practitioners will be able to design and establish national data co-ordination architectures for ocean accounting, including the data-sharing arrangements, technical working groups, and coordination mechanisms required to bring together diverse ocean data streams into coherent accounting frameworks. It addresses how national statistical offices (NSOs) and ocean-related agencies can collaborate effectively through formal data sharing agreements, joint technical committees, and shared data platforms to produce and maintain ocean accounts.

¶2 The scope of this Circular is deliberately focused on data-specific coordination: the memoranda of understanding (MOUs) that govern data exchange between agencies, the technical working groups that resolve methodological questions about data integration, and the platform architectures that enable shared access to accounting data. Broader questions of governance design are addressed elsewhere: how ocean accounts are embedded within national planning frameworks in **TG-1.10 OA and National Planning Integration**, and inter-ministerial coordination models and strategies for building domestic champions in **TG-0.8 Implementation Readiness Assessment** Section 3.5.

¶3 Ocean accounting is inherently multi-institutional. As the SEEA Ecosystem Accounting framework recognises, “given the high degree to which ecosystem accounting is cross-cutting and spatial in nature, implementation necessitates a highly collaborative approach and the active participation of representatives of many different agencies and disciplines”¹. The data coordination architectures described in this Circular provide the institutional infrastructure through which this collaboration is realised at the operational level.

¶4 This Circular complements **TG-0.8 Implementation Readiness Assessment**, which provides the broader context for evaluating a country’s institutional, data, and human capacity prerequisites for ocean accounting. Where TG-0.8 helps countries assess their readiness across all dimensions of implementation, the present Circular provides detailed operational guidance on establishing and managing the data coordination mechanisms that readiness assessment identifies as necessary.

¶5 The data harmonisation standards and interoperability protocols described in **TG-4.6 Data Harmonisation and Interoperability** provide the technical foundation on which the coordination architectures in this Circular are built. Whilst TG-4.6 addresses what standards and formats to use, TG-4.7 addresses how agencies organise themselves to apply those standards collaboratively.

2. Requirements

¶1 **Essential prerequisites:**

- ¶2 **TG-0.1 General Introduction to Ocean Accounts** – for the conceptual framework and key components of Ocean Accounts, including the relationship between environmental and economic accounting frameworks that data coordination must bridge.
- ¶3 **TG-4.6 Data Harmonisation and Interoperability** – for the data standards, exchange formats, and interoperability protocols that coordination architectures operationalise.

¶4 **Helpful background:**

- ¶5 **TG-0.7 Quality Assurance Principles** – for the quality dimensions and assessment frameworks that data coordination arrangements must uphold, particularly the institutional environment dimension.

¶6 ⓘ Framework Position

¶7 This Circular addresses the institutional infrastructure for data coordination across all ocean accounting domains. Data coordination arrangements support every edge in the Ocean Accounts Framework (TG-0.1 Figure 0.1.2), as each connection between accounting components requires data flows from multiple custodian agencies. The coordination mechanisms described here are prerequisites for the data harmonisation workflows described in **TG-4.6**.

3. Guidance Material

¶1 Ocean accounts draw on data from national statistical offices (economic statistics, national accounts), environmental agencies (ecosystem monitoring, biodiversity surveys), hydrographic organisations (bathymetry, tides, currents), fisheries management authorities (catch data, stock assessments), maritime administrations (vessel tracking, port statistics), and research institutions (earth observation, oceanographic surveys). Each of these agencies operates within its own legislative framework, with distinct mandates, data collection cycles, confidentiality requirements, and institutional cultures. The fundamental challenge for data coordination is to establish durable institutional mechanisms that enable these agencies to share data systematically while respecting their individual mandates and constraints.

¶2 The GSGF identifies five key elements that support implementation of its principles: governance and institutional capacity, policy and legal, human resources and capability, data and interoperability, and technology and infrastructure². These elements provide an analytical lens for ocean accounting data coordination, recognising that effective data sharing requires not only technical standards but also institutional arrangements, legal frameworks, and skilled personnel.

¶3 This section examines six dimensions of national data coordination architecture: committee models and mandates; data sharing agreements; trust frameworks; integrated platform design; modular implementation strategies; and time-series data investment planning. Together, these elements form the institutional infrastructure for sustained ocean accounting data production. Figure 4.7.1 illustrates how they connect through a worked coastal-wetland example, in which multiple source agencies formalise their contributions through data-sharing agreements feeding a technical working group that governs a shared data platform.

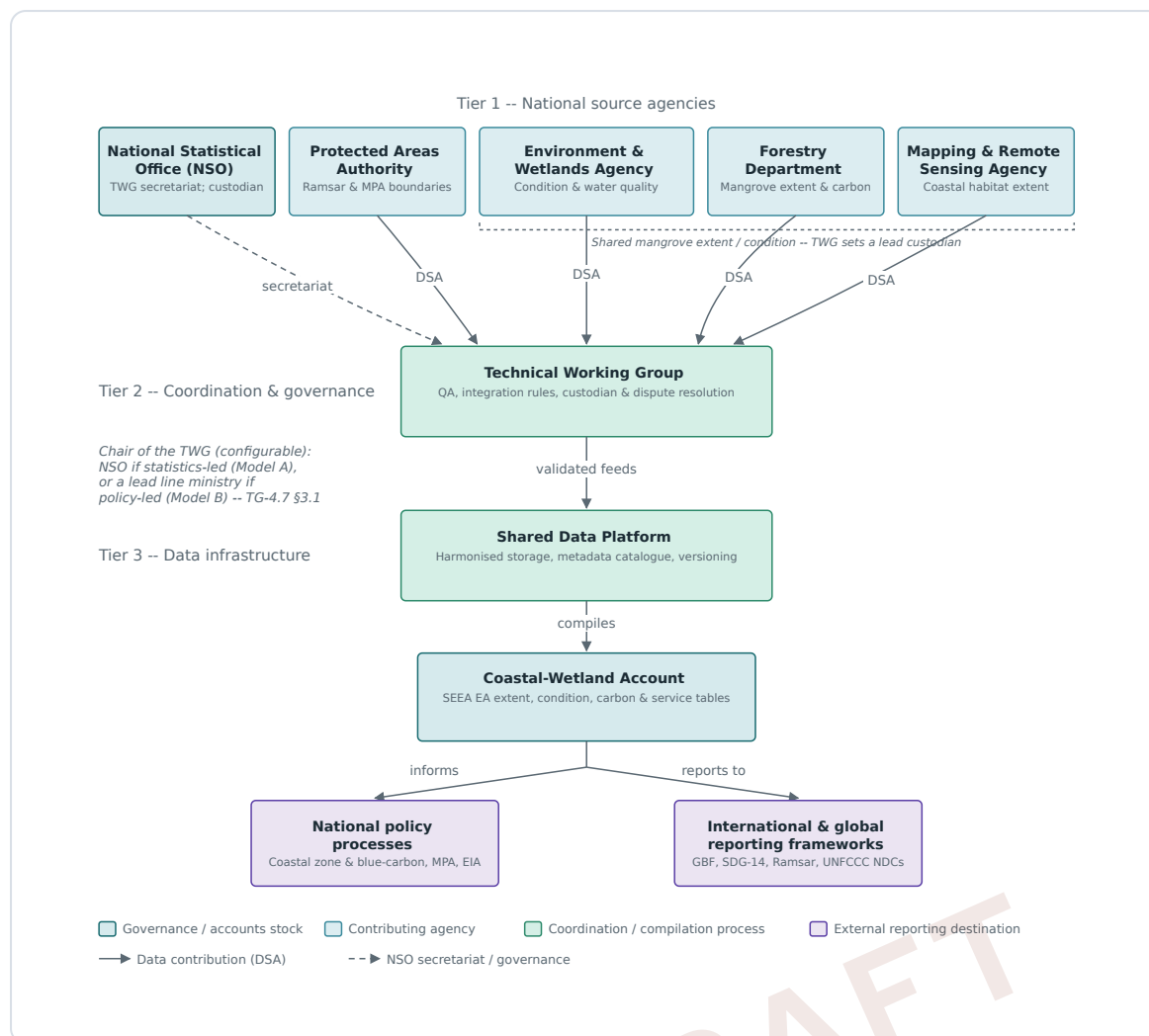


Figure 4.7.1 Five agencies share coastal-wetland data under an MOU into a TWG and shared platform that compiles the Ocean Account. NSO always provides TWG secretariat; chair is NSO (Model A) or ministry (Model B).

Source: TG-4.7, §3.1 (committee models and dispute resolution), §3.2 (data-sharing agreement requirements), §3.4 (shared platform design), and §3.5 Phase 1 (NSO + environmental-monitoring-agency anchor partnership).

3.1 National Data Coordination Committee Models and Mandates

¶1 The establishment of a dedicated data coordination committee is the foundational institutional step for ocean accounting. This committee provides the governance structure through which agencies negotiate data sharing arrangements, resolve methodological disagreements, and coordinate production schedules. The committee's design should reflect the country's existing institutional landscape and statistical system architecture, building on rather than duplicating existing coordination mechanisms.

¶2 The SEEA EA emphasises that "work is needed to fulfil a key objective, namely, the appropriate institutionalization of the processes (including data sharing), roles and responsibilities underpinning the compilation of ecosystem accounts"³. For ocean accounting specifically, this institutionalisation requires a committee structure that brings together data custodians from across the statistical, environmental, and marine science domains.

¶3 The choice of coordination arrangement – where the mandate sits, and what instrument carries it – is set out in **TG-0.8 Implementation Readiness Assessment** Section 3.5.1, which is normative for the publication. This section covers the operational design of the resulting committee: its mandate content, membership, and relationship to existing coordination bodies.

¶4 For reference, the three configurations most often met in data-coordination practice map onto that typology as follows:

¶5 **Model A: NSO-led steering committee.** The national statistical office establishes and chairs the committee, drawing authority from its statistical legislation mandate. This model draws on the NSO's institutional independence and established relationships with government agencies. The NSO's role as data steward – as described in SEEA EA, where NSOs have shifted “from functioning solely as statistics producers to acting also as service providers, which entails both facilitating a collaborative approach to data and statistics across different data and statistics communities and providing oversight and governance”⁴ – provides a natural basis for convening data-sharing discussions. *Country example: Australia's Australian Bureau of Statistics (ABS) leads environmental-economic account compilation under its national statistics mandate, coordinating data inputs from the Department of Climate Change, Energy, the Environment and Water and other custodian agencies as part of an integrated accounts programme.*

¶6 **Model B: Multi-agency technical committee.** A joint committee is established with rotating or co-chair arrangements between the NSO and a lead ocean/environmental agency. This model distributes authority more evenly and may generate stronger buy-in from agencies that see themselves as equal partners alongside the statistical office, rather than as data suppliers to it. The model requires clear terms of reference to avoid ambiguity about decision-making authority, particularly when methodological disagreements arise. *Country example: Canada's joint environmental accounts programme pairs Statistics Canada with Environment and Climate Change Canada (ECCC) under a co-led technical arrangement, combining statistical expertise and environmental domain knowledge.*

¶7 **Model C: Nested committee structure.** An overarching ocean data coordination committee establishes domain-specific sub-committees for distinct data streams (e.g., fisheries data, ecosystem condition data, marine economic data). Each sub-committee handles the technical details of data sharing within its domain, whilst the overarching committee ensures cross-domain consistency and resolves inter-domain conflicts. This model scales well to large national statistical systems with many data custodians but introduces coordination overhead. *Country example: Interministerial technical working group (TWG) structures of the kind used in ASEAN GOAP pilot countries such as the Philippines and Indonesia illustrate this nested approach, with sector-specific sub-groups feeding a central coordination body.*

¶8 *Table 3.1.1: Indicative fit of the three configurations, by data-coordination factors (see TG-0.8 Section 3.5.1 for the full typology)*

Factor	Model A (NSO-led)	Model B (Multi-agency)	Model C (Nested)
Number of data custodian agencies	Few (3–5)	Moderate (6–8)	Many (9+)
NSO capacity for environmental data	Strong	Moderate	Variable
Existing inter-agency mechanisms	Weak or none	Moderate	Strong
Legislative backing	Statistical Act	MOU or executive order	Framework legislation
Decision-making speed	Faster	Moderate	Slower
Agency buy-in	Lower for non-NSO agencies	Higher	Highest
Coordination overhead	Low	Moderate	High

Note: The agency-count ranges are indicative. Countries whose situation falls near a boundary

should weight the qualitative factors in this matrix more heavily than the numeric threshold alone.

¶9 Regardless of model, the committee mandate should specify at minimum: the scope of data coordination (which data streams and account types are covered); the authority to request data from member agencies; the decision-making process for resolving methodological disputes; the production schedule and reporting obligations; and the review cycle for data sharing arrangements. The mandate should also clarify the committee's relationship to any existing national statistics coordination bodies to avoid duplication.

¶10 Committee membership should include representatives with both subject-matter expertise and institutional authority to commit their agencies to data sharing arrangements. A common failure mode is to populate committees with technical staff who lack authority to agree to data release, or conversely with senior officials who lack the technical knowledge to resolve data integration questions. Effective committees typically include both levels, with a senior sponsoring official from each agency and a designated technical focal point.

¶11 The GSGF recommends that countries "scope the data sharing landscape in place at country level to support discussions and establish the needs for new arrangements"⁵. Before establishing new committee structures, countries should inventory existing data coordination mechanisms – such as inter-agency statistics committees, environmental data networks, or marine science consortia – and assess whether ocean accounting coordination can be accommodated within or alongside these existing structures. Creating entirely new coordination bodies when existing mechanisms can be adapted risks institutional fatigue and competition for senior attention.

3.2 NSO-Ocean Agency Data Sharing Agreements

¶1 Formal data sharing agreements provide the legal and operational foundation for regular, systematic exchange of data between agencies. Unlike ad hoc data requests – which depend on personal relationships, are vulnerable to staff turnover, and typically deliver data in inconsistent formats – formal agreements establish ongoing obligations, standard formats, and quality expectations that support sustained accounting production.

¶2 The GSGF notes that "establishing strong communication and institutional collaboration mechanisms between NSOs and NGIAs is essential" and that "this can be facilitated by, for example, country-level laws and policies, Memorandum of Understandings (MoUs), data sharing agreements, and other communities of practice"⁶. The UN Expert Group on the Integration of Statistical and Geospatial Information has developed a template MOU for joint work between NSOs and national geospatial information authorities that provides a useful starting point for ocean accounting data sharing agreements⁷.

¶3 Data sharing agreements for ocean accounting should address the following elements:

¶4 **Scope and content.** The agreement should specify precisely which data variables are to be shared, at what level of disaggregation, and covering which geographic areas and time periods. For ocean accounting, this typically involves specifying the statistical unit (e.g., individual vessel, fishing zone, port, ecosystem asset), the variables (e.g., catch weight, landing value, ecosystem condition indicator), and the classification system to be applied (e.g., the current ISIC revision – Rev.4 or Rev.5 as nationally implemented – for economic activities⁸; FAO ASFIS codes for species; IUCN Global Ecosystem Typology (GET) for ecosystem types⁹). Reference to the data harmonisation standards in **TG-4.6 Data Harmonisation and Interoperability** should be included to establish shared expectations about exchange formats.

¶5 **Frequency and timeliness.** The agreement should specify the data delivery schedule aligned with the ocean accounting production calendar. This includes the reference period (e.g., calendar year), the expected delivery date, and any interim or provisional data releases. Timeliness benchmarks should be aligned with the national statistical release calendar – typical environmental-eco-

economic accounting cycles produce preliminary data within 6–12 months and final data within 12–24 months of the reference period close¹⁰. Actual schedules will depend on the production cycles of each contributing agency; differences in agency production cycles are one of the most persistent operational challenges in environmental-economic accounting. Aligning delivery schedules across multiple agencies requires explicit negotiation in every data sharing agreement.

¶6 **Quality standards.** The agreement should reference the quality assurance framework in **TG-0.7 Quality Assurance Principles** and specify the quality documentation expected to accompany each data delivery. At minimum, this should include metadata describing data sources, coverage, estimation methods, and known limitations. Where data are subject to revision, the agreement should specify revision policies and notification procedures.

¶7 **Confidentiality and access controls.** Ocean data sources may contain information governed by three distinct legal regimes, each with different release rules:

- ¶8 *Statistical confidentiality* (governed by national statistics acts and the UN Fundamental Principles of Official Statistics) applies to data collected under statistical mandate and prohibits release in identifiable form. Aggregated tables derived from confidential collections may be released, but unit-record data require secure-access protocols.
- ¶9 *Commercial sensitivity* applies to firm-level data shared under non-disclosure terms – for example, vessel-level economic data shared by a fisheries authority. Compilers should document the permitted uses and aggregation obligations under any such arrangement.
- ¶10 *Personal data protection* (governed by national data-protection legislation and, in many jurisdictions, GDPR-equivalent frameworks) applies to data relating to natural persons. Vessel-level data often engage this regime where vessel operators can be identified.

¶11 The agreement must clearly identify which regime applies to each data element, specify access controls and aggregation rules accordingly, and note where multiple regimes apply simultaneously. Where data cannot be provided at unit-record level, the implications for the achievable level of account detail should be documented.

¶12 **Format and transmission.** The agreement should specify the exchange format (referencing SDMX, GeoJSON, or other standards as appropriate from **TG-4.6**), the transmission method (secure file transfer, API access, shared platform), and the metadata standards to be applied (ISO 19115 for geospatial metadata, SDMX structural metadata for statistical data).

¶13 **Dispute resolution and review.** The agreement should include procedures for resolving disagreements about data quality, timeliness, or interpretation, and should specify a review cycle (typically every two to three years) to ensure the agreement remains fit for purpose as accounting requirements evolve.

¶14 The six elements above – scope, frequency, quality standards, confidentiality, format, and dispute resolution – constitute the minimum checklist for any ocean accounting data sharing agreement; the paragraphs above provide the operational detail for each.

¶15 Countries at early stages of ocean accounting may find it pragmatic to begin with lightweight data sharing arrangements – such as a letter of intent or an annex to an existing inter-agency agreement – rather than negotiating full MOUs from the outset. Initial arrangements can be formalised as the accounting programme matures and data requirements become better defined. The key requirement is that arrangements be documented and institutional rather than dependent on individual relationships.

3.3 Trust Frameworks for Data Sharing

¶1 Trust is the precondition for sustained data sharing between agencies. Even where formal agreements exist, effective data sharing requires that data custodians trust that their data will be used appropriately, that their contributions will be acknowledged, that quality concerns will be ad-

dressed constructively, and that shared data will not be used in ways that undermine their agency's mandate or reputation. Trust frameworks formalise these expectations and provide mechanisms for building and maintaining inter-agency confidence over time.

¶12 The GSGF identifies four dimensions of interoperability derived from the European Interoperability Framework, of which organisational and legal interoperability are directly relevant to trust¹¹. Organisational interoperability concerns the alignment of business processes and responsibilities between agencies, whilst legal interoperability ensures that agencies operating under different legislative frameworks can share data lawfully.

¶13 Trust frameworks for ocean accounting data sharing should address four dimensions:

¶14 **Data provenance and attribution.** Agencies are more willing to share data when they are confident that their role as data custodians will be acknowledged in published accounts. Trust frameworks should specify how source agencies are credited in published ocean accounts, including acknowledgement in methodology documentation, inclusion in data provenance metadata, and recognition in public communications. The SEEA EA notes the importance of NSOs providing "oversight and governance through provision of an independent and expert opinion on data"¹², and trust frameworks should clarify how this oversight role interacts with the custodian role of contributing agencies.

¶15 **Quality feedback loops.** Data sharing generates opportunities for quality improvement when receiving agencies identify anomalies, inconsistencies, or gaps in source data. Trust frameworks should establish constructive feedback channels through which the compiling agency can communicate quality concerns to source agencies without undermining confidence or creating adversarial dynamics. Framing quality feedback as a mutual benefit – where integration reveals patterns invisible to individual agencies – rather than as criticism encourages continued participation. Technical working groups (see §3.1) provide a natural forum for these discussions.

¶16 **Graduated access models.** Not all data need to be shared at the same level of detail or with the same access conditions. Trust frameworks can establish graduated access tiers that allow agencies to share aggregated data broadly while restricting access to unit-record data to authorised compilers under specific conditions. This approach allows data sharing to proceed where full disclosure of microdata is not feasible, while preserving the option for deeper integration as trust develops over time. Graduated access may be structured as follows:

¶17 *Table 3.3.1: Graduated data access tiers*

Tier	Access Level	Typical Content	Governance
Public	Open access	Published aggregates, indicators	Standard open data licence
Statistical	Designated compilers and accredited researchers under secure-access conditions	Confidential microdata, unit-record survey data	MOU with statistical confidentiality protocols; secure data environment
Released disaggregated	Broad authorised users	Disaggregated published tables, subnational breakdowns	Data sharing agreement or open data licence with attribution
Restricted	Designated compilers only	Commercially sensitive firm-level or vessel-level data	MOU with non-disclosure and access-control protocols
Embargoed	Compiling agency only	Pre-release data, provisional estimates	Time-limited embargo clause

¶18 **Mutual benefit demonstration.** Trust is sustained when all participating agencies derive benefit from the data coordination arrangement. Trust frameworks should identify and communicate the specific benefits that each agency receives from participation – whether improved data quality

through cross-source validation, access to integrated datasets that support their own analytical needs, or enhanced visibility through association with a high-profile national accounting programme. Countries that have successfully sustained inter-agency data sharing for environmental-economic accounting often point to reciprocal data flows as a critical success factor: the NSO provides economic context data to environmental agencies, whilst environmental agencies provide ecosystem monitoring data to the NSO.

¶9 Building trust takes time and requires sustained investment in relationship management. The SEEA EA acknowledges that “traditionally, NSOs have less experience working with those types of environmental data” and that “collaboration with environmental policy and associated technical research agencies in the development of ecosystem accounts should be expected”¹³. Countries should anticipate that trust-building typically requires one to several years in practice, depending on prior working relationships between agencies and the frequency of joint working group meetings. Where inter-agency collaboration traditions are strong, sufficient trust for operational data sharing may develop within a year or two; in systems with limited prior coordination experience, the process may extend considerably longer.

3.4 Integrated Platform Architectures

¶1 Integrated data platforms provide the technical infrastructure through which agencies share, access, and manage ocean accounting data. Platform design choices carry consequences for the sustainability, scalability, and accessibility of ocean accounting data coordination. The platform architecture should align with the interoperability standards described in **TG-4.6 Data Harmonisation and Interoperability** and the quality assurance requirements in **TG-0.7 Quality Assurance Principles**.

¶2 The GSGF recommends that organisations “host appropriate technical infrastructures which support the use of the relevant standards where systems and services are linked through standard interfaces, services, and data formats”¹⁴. For ocean accounting, this translates to three broad platform architecture options:

¶3 **Centralised repository.** A single platform, typically hosted by the NSO or a designated data management agency, receives, stores, and manages all ocean accounting data. Contributing agencies upload data to the repository according to agreed schedules and formats. The compiling team accesses all data through the central platform. This architecture simplifies data management, ensures version control, and provides a single point of access for compilation. However, it requires substantial hosting infrastructure, places the maintenance burden on a single agency, and may raise concerns about data ownership among contributing agencies.

¶4 **Federated data network.** Each agency maintains its own data systems and exposes relevant datasets through standardised APIs (such as SDMX REST services or OGC web services). The ocean accounting compilation system queries these distributed data sources and integrates responses into accounting tables. This architecture respects agency autonomy over their data systems, distributes the infrastructure burden, and ensures that agencies always provide the most current version of their data. However, it requires that all participating agencies maintain API endpoints conforming to common standards, introduces dependency on multiple agencies’ system availability, and may complicate version management. The SDMX Registry Specification (Section 5 of the SDMX technical standards) defines subscription and notification services that enable automated processing of registry updates in federated data environments¹⁵.

¶5 **Hybrid approach.** The most common architecture in practice combines elements of both models. Core accounting data are maintained in a central repository, while large or frequently updated datasets (e.g., satellite imagery, real-time environmental monitoring) are accessed through federated services. This approach balances the governance benefits of centralisation with the flexibility and scalability of federation. The hybrid model allows agencies to contribute data through which-

ever channel best suits their capacity: agencies with mature API infrastructure expose data through web services, while agencies with limited IT capacity upload data files to the central repository.

¶6 *Table 3.4.1: Platform architecture comparison*

Criterion	Centralised	Federated	Hybrid
Data governance	Single point of control	Distributed governance	Mixed
Infrastructure cost	Concentrated in one agency	Distributed across agencies	Distributed with central core
Technical prerequisite	Central repository + upload mechanisms	API endpoints at each agency	Central repository + selective APIs
Version control	Straightforward	Requires coordination	Moderate complexity
Data currency	Depends on upload frequency	Always current at source	Mixed
Scalability	Limited by central capacity	Scales with network	Scales selectively
Best suited to	Small–medium programmes	Mature IT environments	Most national contexts

¶7 Regardless of architecture, the platform should support the functional requirements summarised in Table 3.4.2 below.

Requirement	Description
Metadata management	Storage and retrieval of data provenance, quality documentation, and structural metadata conforming to SDMX and ISO 19115 standards.
Version control	Tracking of data revisions with timestamped snapshots enabling reproduction of previously published accounts.
Access control	Role-based access consistent with the graduated access tiers described in §3.3.
Data validation	Automated quality checks at data ingestion, implementing the validation procedures described in TG-0.7 Quality Assurance Principles .
Audit trail	Logging of data access, modifications, and exports for accountability.
Service-level expectations (federated architectures)	Documented uptime targets, maintenance window notification procedures, and fallback arrangements for API unavailability during compilation cycles; cross-reference TG-4.6 Data Harmonisation and Interoperability for technical interoperability protocols governing API service obligations.

¶8 Platform investment should be proportionate to the scale of the ocean accounting programme. Countries at early stages may begin with a shared file system or spreadsheet-based workflow, progressing to database-backed platforms and API integration as the programme matures and data volumes grow. The critical requirement is not technological sophistication but rather that data management procedures are documented, reproducible, and not dependent on a single individual's knowledge.

3.5 Modular Implementation Strategies

¶1 Given the institutional complexity of multi-agency data coordination, a modular implementation strategy allows countries to establish coordination mechanisms incrementally, building on initial successes rather than attempting full coordination from the outset. Modular implementation recognises that different data streams present different coordination challenges and that agencies vary in their readiness to participate in formal data sharing arrangements.

¶2 The SEEA EA describes a spectrum of compilation approaches, noting that “in practice, the approach to compilation of ecosystem accounts lies between these two ends of the spectrum, with

implementation being dependent on (a) policy focus; (b) availability of source data; and (c) re-sources available for compilation”¹⁶. This same pragmatism should guide data coordination. Begin with the data streams that are most readily available and where coordination relationships are strongest, then extend to more challenging domains as institutional capacity develops.

¶3 A modular strategy typically proceeds through three phases:

¶4 **Phase 1: Anchor partnership.** Establish a data sharing arrangement between two agencies for a single, well-defined data stream. The most productive anchor partnerships typically involve the NSO and a fisheries management authority (where catch and economic data are relatively well-structured) or the NSO and an environmental monitoring agency (where ecosystem extent data from remote sensing are readily available). The anchor partnership serves as a proof of concept, demonstrating the feasibility and value of formal data coordination and providing a template for subsequent agreements. During this phase, the coordination mechanism may be informal – a working-level agreement between technical staff – with formal MOU development deferred until the collaboration has demonstrated its value.

¶5 **Phase 2: Network expansion.** Building on the anchor partnership, extend data coordination to additional agencies and data streams. Each new partnership can draw on the templates, workflows, and lessons learned from Phase 1. Priority for expansion should be guided by the accounting priorities identified through the implementation readiness assessment (see **TG-0.8 Implementation Readiness Assessment**). During this phase, the coordination committee (§3.1) is formalised, data sharing agreements (§3.2) are documented, and platform requirements (§3.4) are assessed. The network should aim to establish stable data flows for the minimum set of account types identified as priorities.

¶6 **Phase 3: System consolidation.** With multiple bilateral data sharing arrangements in place, the coordination architecture can be consolidated into a coherent system. This involves standardising data sharing agreements across agencies, establishing a shared platform architecture, formalising quality assurance procedures, and embedding the coordination arrangements in institutional mandates and budgets. During this phase, the focus shifts from establishing new partnerships to optimising existing ones: improving data timeliness, increasing spatial or temporal resolution, and extending time series.

¶7 *Table 3.5.1: Modular implementation pathway*

Phase	Duration	Activities	Outputs
1. Anchor partnership	6–12 months (indicative)	Identify lead agencies; negotiate initial data sharing; compile pilot account	Working data exchange; pilot account; lessons learned
2. Network expansion	12–24 months (indicative)	Extend to additional agencies; formalise committee; document agreements	Multiple data sharing MOUs; formal committee terms of reference; expanded account coverage
3. System consolidation	24–36 months (indicative)	Standardise agreements; deploy shared platform; embed in budgets	Operational coordination system; regular production cycle; sustained institutional commitment

***Note:** Durations are indicative and vary by country context, institutional capacity, and readiness level (see **TG-0.8 Implementation Readiness Assessment**). Anchor partnerships in some pilots have extended beyond 12 months; consolidation may remain incomplete after 3–5 years in contexts with high staff turnover or limited infrastructure.*

¶8 Countries should resist the temptation to proceed directly to Phase 3 without the experiential learning provided by Phases 1 and 2. Data coordination arrangements that are designed in full on

paper but lack the foundation of practical inter-agency collaboration often fail to achieve sustained data flows.

¶9 Risk management matters throughout all phases. Common risks include loss of key personnel (mitigated by documenting procedures and distributing knowledge across multiple staff), changes in agency leadership or priorities (mitigated by embedding coordination in formal mandates rather than personal commitments), and budget constraints (mitigated by demonstrating the value of coordination to decision-makers through early publication of useful accounting outputs). Countries should identify these risks explicitly in their implementation plans and develop mitigation strategies as part of the coordination committee's work programme.

3.6 Time-Series Data Investment Planning

¶1 The SEEA EA emphasises that "ecosystem accounts are most informative when they are not compiled as one-off, irregular or short-term studies" and that "progressively, long time series of ecosystem accounting data can be established"¹⁷. Achieving this requires deliberate investment in data coordination arrangements that sustain data flows over time, rather than project-based arrangements that lapse when initial funding expires.

¶2 Time-series data investment planning addresses three challenges: ensuring continuity of data supply from contributing agencies; managing methodological changes that affect comparability over time; and building the institutional memory needed to maintain consistent production practices.

¶3 **Continuity of data supply.** Data coordination arrangements should be designed for permanence rather than project duration. This means embedding data sharing obligations in agencies' recurrent work programmes and budgets rather than relying on project funding. The coordination committee should maintain a data supply register that documents, for each data stream, the custodian agency, the legal basis for data collection, the funding source, and any known risks to continuity. Where data streams are at risk – for example, because a monitoring programme faces budget cuts – the committee can advocate for continued investment by demonstrating how the data contribute to multiple accounting and policy uses.

¶4 As established in §3.5 Phase 1, coordination should build on existing legislative mandates rather than requiring new ones. Where alignment exists between ocean accounting data requirements and existing collection mandates (such as fisheries catch reporting or biodiversity convention reporting), data sharing agreements should reference the existing legal mandate to strengthen the case for continued data supply.

¶5 **Managing methodological change.** Over the lifetime of an ocean accounting programme, contributing agencies will revise their data collection methods, classification systems, and estimation procedures. These changes can disrupt time-series comparability if not managed carefully. The coordination committee should establish a change notification protocol through which agencies inform the compiling team of planned methodological changes before they take effect. This advance notice allows the compiling team to assess the impact on accounting time series and, where necessary, develop bridging estimates or concordance procedures.

¶6 The classification concordance guidance in **TG-4.6 Data Harmonisation and Interoperability** Section 3.4 provides the technical framework for managing classification transitions. At the institutional level, the coordination committee should maintain documentation of all methodological changes that affect time-series comparability, including the date of change, the nature of the change, the concordance or bridging procedure applied, and any residual comparability limitations. This documentation should be published alongside the accounting data as a "changes and revisions" annex consistent with the quality documentation requirements set out in **TG-0.7 Quality Assurance Principles**.

¶7 **Institutional memory.** Sustained time-series production depends on institutional memory – the accumulated knowledge about data sources, compilation methods, quality issues, and inter-agency relationships that resides within the compiling team. Staff turnover poses a serious risk to institutional memory, particularly in small statistical offices where ocean accounting may be the responsibility of one or two individuals. Mitigation strategies include thorough documentation of compilation procedures (including data source contacts, file locations, processing scripts, and known data quality issues); cross-training of staff so that multiple individuals can perform each compilation step; and periodic compilation reviews where the full production process is documented and assessed.

¶8 The coordination committee should also maintain a shared knowledge base that records decisions made about data integration issues, methodological choices, and their rationale. This knowledge base serves both as institutional memory and as a transparency tool, enabling external reviewers to understand how compilation decisions were made. Over time, this knowledge base becomes a useful resource for countries that are establishing similar coordination arrangements, supporting the knowledge exchange objectives of the broader ocean accounting community.

¶9 **Investment sequencing.** Countries should plan their data investment strategically, recognising that different data streams require different levels of investment and deliver value at different timescales. The following sequence reflects the dependency structure of ocean accounts as described in SEEA EA: ecosystem extent accounts provide the spatial framework upon which condition accounts are built; condition accounts underpin the assessment of ecosystem services; and ecosystem services flows are a prerequisite for monetary valuation (SEEA EA paras. 1.56–1.58). Countries with strong pre-existing ocean economy data or specific policy drivers may adapt this sequence to their circumstances – this ordering should be read as a starting point informed by the dependency logic of ocean accounts, not as a mandatory pathway.

¶10 *Table 3.6.1: Data investment sequencing framework (indicative)*

Priority	Data Domain	Typical Sources	Investment Type	Value Horizon
Immediate	Economic activity (ocean economy)	National accounts, business surveys	Coordination with NSO economic statistics division	Short-term (1–2 years)
Near-term	Ecosystem extent	Remote sensing, land/sea cover maps	Coordination with geospatial/environmental agency	Medium-term (2–3 years)
Medium-term	Ecosystem condition	Environmental monitoring networks	Coordination with multiple environmental agencies	Medium-term (3–5 years)
Longer-term	Ecosystem services (physical)	Biophysical modelling, survey data	Coordination with research institutions	Longer-term (3–5+ years)
Sustained	Monetary valuation	Economic modelling, market data	Integration across all coordination partners	Ongoing

¶11 This sequencing reflects both the relative availability of data and the dependency structure of ocean accounts. Cross-references: **TG-3.3 Economic Activity Relevant to the Ocean** and **TG-3.1 Asset Accounts**.

4. Summary

¶1 National data coordination architectures provide the institutional foundation for sustained ocean accounting. The key elements are:

- ¶2 **Coordination committee models** should be selected to match the country's institutional landscape, with a clear mandate covering scope, authority, and decision-making processes.
- ¶3 **Data sharing agreements** should formalise bilateral data flows using harmonisation standards from **TG-4.6**.
- ¶4 **Trust frameworks** sustain agency participation by addressing provenance, quality feedback, and mutual benefit.
- ¶5 **Platform architectures** – centralised, federated, or hybrid – should match national IT capacity while supporting metadata management, version control, and access control.
- ¶6 **Modular implementation** proceeds through three phases (anchor partnership, network expansion, system consolidation), building institutional capacity incrementally.
- ¶7 **Time-series investment planning** ensures coordination arrangements are sustained beyond initial project cycles through continuity, change management, and institutional memory.

¶8 These elements interlock in the architecture shown in Figure 4.7.1¹⁸: agencies coordinate through a technical working group that governs a shared data platform, which in turn produces the ocean accounts.

¶9 The broader implementation readiness context that complements this data-specific coordination focus is provided in **TG-0.8 Implementation Readiness Assessment**, which guides countries through evaluating institutional, data, and human capacity prerequisites across all dimensions of ocean accounting implementation.

¶10 Data coordination for ocean accounting should build upon existing national statistical system coordination mechanisms wherever possible, adapting proven models from economic statistics, agricultural statistics, and environmental-economic accounting. The GSGF's key elements – governance and institutional capacity, policy and legal, human resources and capability, data and interoperability, and technology and infrastructure – provide a useful checklist for assessing the completeness of coordination arrangements¹⁹.

¶11 Guidance on the broader governance context for embedding ocean accounts in national planning is provided in **TG-1.10 OA and National Planning Integration**. Data source-specific integration guidance is provided in the companion Circulars: **TG-4.1 Remote Sensing and Geospatial Data**, **TG-4.2 Survey Methods for Ocean Economic Activity**, **TG-4.3 Administrative Data Sources**, **TG-4.4 Citizen Science and Community-Based Monitoring**, and **TG-4.5 Integrating Research Data into Official Statistics**.

Implementation Considerations

¶1 For minimum institutional capacity, data infrastructure, and human skills requirements for implementing these data methods, see **TG-0.8 Implementation Readiness Assessment**.

5. Acknowledgements

¶1 **Authors:** [To be confirmed]

¶2 **Reviewers:** [To be confirmed]

6. References

1. ¶1 United Nations, "System of Environmental-Economic Accounting – Ecosystem Accounting" (2021), para 1.52.
2. ¶2 United Nations Expert Group on the Integration of Statistical and Geospatial Information, "Global Statistical Geospatial Framework (GSGF), Version 2.0" (2025), Stage 2: The Key Elements. The five key elements are: Governance and Institutional Capacity; Policy and Legal; Human Resources and Capacity; Data and Interoperability; and Technology and Infrastructure.
3. ¶3 SEEA EA (2021), para 1.52.
4. ¶4 SEEA EA (2021), para 1.51.

5. ¶5 GSGF v2 (2025), Principle 1, Policy and Legal section.
6. ¶6 GSGF v2 (2025), Principle 1, Policy and Legal section.
7. ¶7 United Nations Expert Group on the Integration of Statistical and Geospatial Information, “MoU template for joint work between the NSO and the NGIAs for the integration of statistical and geospatial information.” Available at https://ggim.un.org/meetings/GGIM-committee/14th-Session/documents/Background_document_Institutional_agreement_for_GSGF.pdf (https://ggim.un.org/meetings/GGIM-committee/14th-Session/documents/Background_document_Institutional_agreement_for_GSGF.pdf)
8. ¶8 ISIC Rev.5 was approved by the UN Statistical Commission in 2023 and is being progressively adopted. Countries still reporting under Rev.4 should apply the applicable revision and document the version used in metadata.
9. ¶9 Keith, D.A., et al. (2022). *A function-based typology for Earth’s ecosystems*. Nature, 610, 513–518. The IUCN Global Ecosystem Typology (GET) v2.0 is the authoritative classification referenced throughout the Technical Guidance.
0. ¶10 Timeliness benchmarks should be aligned with the national statistical release calendar. No single authoritative standard specifies T+6 and T+18 month targets for environmental-economic accounting; the 6–12 month (preliminary) and 12–24 month (final) ranges cited here reflect observed practice in environmental-economic accounting programmes and should be adapted to the production cycles of each contributing agency as negotiated in individual data sharing agreements.
1. ¶11 GSGF v2 (2025), Principle 4: Statistical and geospatial interoperability. The four interoperability dimensions (legal, organisational, semantic, technical) are derived from the European Interoperability Framework (EIF).
2. ¶12 SEEA EA (2021), para 1.54.
3. ¶13 SEEA EA (2021), para 1.53.
4. ¶14 GSGF v2 (2025), Principle 4, Technology and Infrastructure section.
5. ¶15 Statistical Data and Metadata eXchange (SDMX), “SDMX Technical Standards, Section 5: Registry Specification – Logical Interfaces” (SDMX 3.1, 2025). Section 5 of the SDMX technical standards defines the logical functionality and interfaces for the SDMX registry, including subscription and notification services that allow automated processing of updates to registered structural metadata and data sources. The current version is available at <https://sdmx.org/standards-2/> (<https://sdmx.org/standards-2/>).
6. ¶16 SEEA EA (2021), para 1.58.
7. ¶17 SEEA EA (2021), para 1.56.
8. ¶18 Figure 4.7.1 illustrates the architecture by which multiple data custodian agencies contribute to ocean accounts through a technical working group that governs a shared data platform.
9. ¶19 GSGF v2 (2025), Stage 2: The Key Elements. The GSGF maturity self-assessment tool, adapted from the UN-IGIF baseline assessment methodology, provides a structured approach to evaluating institutional readiness across these dimensions.

DRAFT