

Safe Usage of Monetary Valuation

Explains monetary valuation of ocean ecosystem services and assets – one of the most powerful yet most frequently misapplied parts of ocean accounting.

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OUTCOME

Monetary valuation is one of the most powerful and most often misused outputs of ocean accounting. Applied appropriately, monetary values allow ecosystem services and assets to be compared with standard economic measures, inform policy trade-offs, and contribute to extended measures of national wealth. Applied inappropriately, they undermine the credibility of the accounts and support conclusions the evidence does not carry.

This Circular is about whether and when to value, and how to present the result. It does not specify valuation methods: the preference order, the methods at each level, the methods inadmissible in accounts and the worked application are set out in [TG-2.4 Environmental \(including Ecosystem\) Goods and Services](#) Section 3.10, with asset-level net present value in [TG-3.1 Asset Accounts](#) Sections 3.3 and 3.5.3.

After reading it, a decision-maker or compiler should be able to answer four questions. Should this question be answered with a monetary figure at all, or do physical accounts already settle it (Sections 3.1 and 3.2)? What kind of value is this figure – an exchange value from the accounts, or a welfare value from a cost-benefit study – and can the two be placed in the same total (Section 3.3)? How much weight will it bear, given the preference level of the method behind it and whether inadmissible methods have been folded in (Section 3.4)? And how must it be presented so that it is not read as the total value of the ecosystem, as a licence to trade the ecosystem away, or as more precise than it is (Section 3.5)?

Monetary values from accounts will not fully reflect the importance of ecosystems for people and the economy. Physical accounts should always be compiled and released alongside them.

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ABOUT THIS CIRCULAR

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DRAFT

1. Outcome

¶1 Monetary valuation is one of the most powerful and most often misused outputs of ocean accounting. Applied appropriately, monetary values allow ecosystem services and assets to be compared with standard economic measures, inform policy trade-offs, and contribute to extended measures of national wealth.¹ Applied inappropriately, they undermine the credibility of the accounts and support conclusions the evidence does not carry.²

¶2 This Circular is about **whether and when to value, and how to present the result**. It does not specify valuation methods: the preference order, the methods at each level, the methods inadmissible in accounts and the worked application are set out in **TG-2.4 Environmental (including Ecosystem) Goods and Services** Section 3.10, with asset-level net present value in **TG-3.1 Asset Accounts** Sections 3.3 and 3.5.3.

¶3 After reading it, a decision-maker or compiler should be able to answer four questions. **Should this question be answered with a monetary figure at all**, or do physical accounts already settle it (Sections 3.1 and 3.2)? **What kind of value is this figure** – an exchange value from the accounts, or a welfare value from a cost-benefit study – and can the two be placed in the same total (Section 3.3)? **How much weight will it bear**, given the preference level of the method behind it and whether inadmissible methods have been folded in (Section 3.4)? And **how must it be presented** so that it is not read as the total value of the ecosystem, as a licence to trade the ecosystem away, or as more precise than it is (Section 3.5)?

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2. Requirements

- ¶1 **TG-0.1 General Introduction** – Understanding of the GOAP framework and ocean accounting fundamentals

¶2 **Related Circulars:**

- ¶3 **TG-0.2 Overview of Relevant Statistical Standards** – Statistical classifications and standards
- ¶4 **TG-3.1 Marine Ecosystem Asset Accounts** – Physical and monetary asset accounts that apply valuation
- ¶5 **TG-3.2 Flows from Environment to Economy** – Ecosystem service accounts that require valuation

¶6 Readers approaching Section 1 for the first time should begin with **TG-1.0 Ocean Accounting and the Blue/Ocean Economy**, the framing circular for the section, which sets out the ocean economy terminology used throughout, what an ocean account can and cannot certify about a blue economy claim, and the map from a policy question to the circular that answers it. It is recommended reading, not a prerequisite.

3. Guidance Material

3.1 When Monetary Valuation Should Be Applied

¶1 Monetary valuation of ocean ecosystem services and assets is appropriate and valuable in specific decision contexts where monetary comparison provides necessary information.

3.1.1 Integration with National Accounts

¶1 Exchange-value-based monetary accounts support the applications summarised in Table 3.1.1 below⁴.

¶2 **Table 3.1.1: Applications supported by exchange-value-based monetary accounts**

Application	Description
Extended national wealth measures	Comparing values of marine ecosystem assets with other asset types (produced assets, financial assets).
Visibility of ocean contributions	Highlighting the economic relevance of non-market ocean services in a common unit of account.
Supply chain analysis	Assessing ecosystem inputs to blue economy industries (fisheries, aquaculture, tourism, shipping).
Trade-off analysis	Comparing relative exchange values of different ecosystem services to inform allocation decisions.
Adjusted income measures	Deriving degradation-adjusted measures (e.g., net national income less ocean ecosystem degradation).

3.1.2 Ecosystem Asset Valuation

¶1 The net present value approach to ecosystem asset valuation, using the discounted present value of expected future ecosystem service flows, provides a basis for:⁵

- ¶2 Recording opening and closing values of marine ecosystem assets in monetary balance sheets
- ¶3 Measuring ocean ecosystem degradation and enhancement in monetary terms
- ¶4 Tracking changes in marine natural capital wealth over time
- ¶5 Comparing ecosystem asset values across different ocean realms and ecosystem types

¶6 The selection of an appropriate discount rate determines the resulting asset value. The SEEA EA provides a dual framing for discount rate selection: individual market-based discount rates should be applied for ecosystem services whose users are private economic units, whilst social discount rates should be applied for ecosystem services that contribute to collective benefits received by groups of people or society generally (SEEA EA, para. 10.77). For ocean accounting, where many services such as coastal protection and carbon sequestration provide collective benefits, social discount rates may be more appropriate for a large share of the service portfolio. Para 10.78 further notes that social discount rates should be based on rates in active use in government decision-making, or long-term government bond rates where such rates are not available.⁶

¶7 In practice, different discount rates can produce widely divergent asset values for long-lived marine ecosystems, particularly for services such as carbon sequestration and coastal protection where benefits accrue over decades or centuries. Compilers should conduct sensitivity analysis to assess the effect of alternative discount rates on asset values and document the chosen rate and its rationale transparently. The SEEA EA does not prescribe a single rate but encourages consistency within and across accounts.

¶8 Where a country has no published social discount rate and no active long-term government bond market, a situation common among small island developing states (SIDS) and many coastal developing countries, compilers should apply the following fallback approach: (a) use a regional average social discount rate from the relevant regional development bank (e.g., the Asian Development Bank, Inter-American Development Bank, or African Development Bank) as the first option; (b) if no regional rate is available, apply 3% as a conservative international benchmark consistent with IPCC AR6 Working Group III Chapter 3 and the commonly applied lower-bound social rate in climate economics literature, with explicit justification; (c) in all cases, conduct sensitivity analysis spanning at least three rates across a plausible range (e.g., 2%, 4%, 7%) and report results for each. See TG-3.1 for further treatment in the context of asset accounts.⁷

3.1.3 Blue Economy Policy Analysis

¶1 Monetary values from ocean accounts can provide baseline data to support:

- ¶2 Scenario modelling of alternative ocean use patterns
- ¶3 Assessment of climate-related financial risks to ocean-dependent sectors
- ¶4 Design and calibration of marine environmental policy instruments (e.g., marine spatial planning, pollution charges, payment for ecosystem services schemes)
- ¶5 Evaluation of blue economy investment opportunities⁸

3.1.4 Ocean-Specific Applications

¶1 For ocean accounting specifically, monetary valuation is particularly valuable for:

Application	Value Added by Monetary Valuation
Fisheries management	Resource rent trends signal sustainability; depletion costs inform net income measures
Marine protected areas	Cost-benefit framing for protection decisions; ecosystem service value demonstrates returns on conservation investment
Coastal development	Quantifying trade-offs between development revenues and lost ecosystem services
Blue carbon markets	Integration with carbon markets and climate policy; exchange values for carbon credits
Maritime spatial planning	Common metric for multi-use trade-off analysis across fishing, shipping, energy, conservation

3.2 When Monetary Valuation Should Not Be Applied

¶1 Monetary valuation should not be pursued, or should be approached with caution, in the circumstances set out below.

3.2.1 Physical Accounts Are Sufficient

¶1 For many policy questions, physical accounts on ecosystem extent, condition, and service flows provide sufficient information without requiring monetary valuation. Physical accounts may be preferred when:⁹

- ¶2 The policy question relates to biophysical thresholds (e.g., maximum sustainable yield, critical habitat area, water quality standards)
- ¶3 Stakeholders have legitimate concerns about commodification of marine ecosystems
- ¶4 Data and capacity constraints make reliable monetary valuation infeasible
- ¶5 Primary users require physical metrics for environmental management (e.g., tonnes of carbon, hectares of habitat, population abundance)

¶6 **Recommendation:** Always compile and publish physical accounts. Consider monetary valuation as a complement, not a replacement, for physical measurement.

3.2.2 Data Quality Concerns

¶1 Monetary valuation should be approached cautiously when:¹⁰

- ¶2 Underlying physical data (extent, condition, service flows) are of insufficient quality or uncertain
- ¶3 Available valuation methods require assumptions that cannot be validated from observed data
- ¶4 The uncertainty range in monetary estimates is so large as to undermine decision-usefulness
- ¶5 Value transfer from other contexts involves 'institutional mismatch' (different regulatory or property rights regimes) or 'ecological mismatch' (different ecosystem characteristics)

¶6 In such cases, it may be preferable to:

- ¶7 Present ranges rather than point estimates, with explicit documentation of uncertainty
- ¶8 Clearly document methods, assumptions, and data quality limitations
- ¶9 Focus resources on improving physical data before attempting valuation
- ¶10 Use qualitative assessments alongside limited monetary data

3.2.3 Risk of Misinterpretation

¶1 Special care is needed to avoid situations where monetary values may be misinterpreted. Monetary values from accounts:¹¹

- ¶2 **Do not represent** the 'true' or 'total' value of ocean ecosystems (they measure exchange value, not total welfare)
- ¶3 **Do not justify** ecosystem destruction if monetary 'compensation' is paid (non-substitutability and irreversibility matter)
- ¶4 **Do not capture** all relevant considerations for decision-making (cultural values, equity, rights, and biodiversity intrinsic value)
- ¶5 **Are not precise** even when presented as single numbers (they reflect estimation assumptions and uncertainty)

¶6 Clear communication (see Section 3.5) is essential to manage these risks. Compilers should make explicit the limitations of monetary values and the complementary information required for sound decision-making.

3.2.4 Inappropriate Aggregation

¶1 Caution is required when aggregating monetary values across:¹²

- ¶2 **Multiple ecosystem services:** Risk of double-counting (e.g., water flow regulation and water supply may overlap; nursery habitat services and fish provisioning services have an intermediate-final service relationship)
- ¶3 **Different time periods:** Requires appropriate discounting and adjustment for price changes; nominal values from different years are not directly comparable
- ¶4 **Spatial units:** Different institutional contexts (e.g., open-access versus managed access fisheries) may make aggregation misleading
- ¶5 **Different methods:** Mixing values from methods with different uncertainty characteristics (e.g., observed prices versus simulated exchange values) requires careful documentation and sensitivity analysis

¶6 **Decision rule – nursery services and resource rent:** When the resource rent method is used to value fish provisioning services, nursery habitat services (e.g., coral reef or mangrove nursery function) must not be separately valued in the same account. The resource rent is a residual that already captures the combined contribution of all ecosystem inputs to the fishery, including nursery function. Valuing nursery services separately alongside resource rent would double-count that contribution. Separate valuation of nursery services is appropriate only when an alternative method (such as the productivity change method) is used and is explicitly specified to exclude the nursery contribution from the production function. This rule applies at the level of a single accounting area; compilers should cross-check it when populating service rows in monetary supply and use tables. See also **TG-2.4** Section 3.10.6.

3.3 What the accounts can and cannot tell you

¶1 Two properties of accounting values govern every use in Sections 3.1 and 3.2, and a decision-maker who does not hold them will misread the figures.

¶2 **The accounts record exchange values, not welfare values.** An exchange value is what a good, service or asset is or could be exchanged for in cash. A welfare value adds consumer surplus – the difference between what people would have been willing to pay and what they actually paid. Cost-benefit analysis conventionally uses welfare values; the accounts do not, because consumer surplus is not transferred between parties and cannot be reconciled with GDP or national wealth. The practical consequence is that account values are systematically *lower* than the welfare values a cost-benefit analysis would use for the same service, and the two must never be mixed in one total or one comparison without an explicit bridge.

¶3 **The valuation guidance is recommendation, not adopted standard.** The UN Statistical Commission adopted SEEA EA chapters 1–7, the physical accounting framework, as an international statistical standard in March 2021. It recognised chapters 8–11, which cover valuation, as “internationally recognized statistical principles and recommendations” for countries choosing to undertake valuation.¹³ The distinction was deliberate: valuation methods had not reached the methodological maturity of the physical framework. Countries are therefore encouraged but not required to value, and monetary figures should be presented on that footing.

¶4 Both points, together with the SNA production boundary that determines which services can be valued at all, are set out in full in **TG-2.4 Environmental (including Ecosystem) Goods and Services** Section 3.10.1.

3.4 Method selection: what to ask, and where the method is specified

¶1 Method selection is a compilation decision, specified in **TG-2.4** Section 3.10 and, for asset-level valuation, **TG-3.1 Asset Accounts** Sections 3.3 and 3.5.3. What a decision-maker needs is the shape of the preference order, because it determines how much weight a figure will bear.

¶2 The SEEA EA ranks methods by their proximity to observed market transactions:

Level	Basis	Marine examples	How much weight it bears
1	Directly observable prices	Fish quota (ITQ) prices, verified carbon credit prices, aquaculture lease fees	Highest. Defensible in a contested process
2	Prices from markets for similar goods	Fish prices from comparable fisheries, rents from comparable coastal sites	High, subject to a documented comparability assessment
3	Prices embodied in market transactions	Fisheries resource rent, hedonic coastal property premiums, productivity change for nursery services	Moderate. The residual is sensitive to the cost assumptions deducted
4	Prices from revealed expenditures	Averting behaviour where the expenditure was actually incurred; travel expenditure	Lower. Requires an expenditure record, not a plausible future cost
5	Prices from expected or simulated expenditures	Replacement cost for an unbuilt structure, avoided damage cost from modelled scenarios, simulated exchange value	Lowest. Present with sensitivity analysis, never as a point estimate

¶3 Three questions follow for anyone commissioning or citing a monetary figure.

¶4 **At what level was each service valued?** A total that aggregates a level 1 carbon price with a level 5 modelled coastal protection estimate carries the uncertainty of its weakest component, not its strongest. Ask for the level by service, not for the total alone.

¶5 **Is a cost-based figure backed by an actual expenditure?** The distinction between level 4 and level 5 turns on whether the defensive or replacement expenditure has been made and recorded. A seawall that has been built and paid for is evidence; a seawall that would notionally be needed is a model. Both are legitimate, but only one survives audit.

¶6 **Were any inadmissible methods used?** Consumer surplus measures, directly applied stated preference results, non-use values and whole-ecosystem restoration costs do not yield exchange values and are not admissible as account entries. They remain valuable for wider policy analysis and can be presented in complementary accounts and bridge tables – but a figure described as coming “from the ocean accounts” should not contain them.

3.5 Communication and Transparency

3.5.1 Key messages to communicate

¶1 When presenting monetary values from ocean accounts, compilers should communicate the key messages summarised in Table 3.5.1 below¹⁴.

¶2 **Table 3.5.1: Key messages to communicate alongside monetary values**

Message	Description
Valuation concept	Monetary values are based on exchange values consistent with national accounting concepts – they represent what ecosystem services would be exchanged for, not their total economic value or welfare value.
Complementarity	Monetary values should be interpreted alongside physical data on ecosystem extent, condition, and service flows.
Uncertainty	All monetary estimates involve uncertainty, which should be acknowledged and where possible quantified.
Institutional context	Values reflect current institutional arrangements (property rights, regulations, markets) which may understate long-term importance.
Limitations	Monetary values do not capture non-use values, and low monetary values do not mean ecosystems are unimportant.

3.5.2 Documentation requirements

¶1 Transparent documentation should include the elements summarised in Table 3.5.2 below¹⁵.

¶2 **Table 3.5.2: Elements of transparent valuation documentation**

Element	Description
Methods	Clear description of valuation methods used for each ecosystem service and asset category.
Data sources	Description of primary data sources and their quality.
Key assumptions	Explicit statement of assumptions, particularly regarding discount rates, time horizons, and future projections.
Sensitivity analysis	Assessment of how results change with alternative assumptions.
Method comparison	Where feasible, comparison of results using alternative methods.
Uncertainty ranges	Presentation of ranges or confidence intervals where possible.
Version and vintage	Record the version of the valuation model and the vintage (reference year) of all input datasets (e.g., fish stock survey year, extent map edition, carbon price series), and document whether changes in monetary values between editions reflect methodological revisions, data updates, or both. This is particularly important for time-series comparisons used to infer trends in natural capital wealth. ¹⁶

3.5.3 Presentation guidance

¶1 **Do:**

- ¶2 Present monetary values alongside physical quantities and condition indicators
- ¶3 Show time series to reveal trends
- ¶4 Disaggregate by ecosystem type and service to reveal composition

- ¶5 Explain what is and is not included in the estimates

¶6 **Do not:**

- ¶7 Present aggregate 'total value of the ocean' figures without extensive caveats
- ¶8 Compare monetary values across studies using different methods without adjustment
- ¶9 Use monetary values as sole basis for decisions about ecosystem protection
- ¶10 Imply that monetary compensation can adequately substitute for ecosystem loss

4. Acknowledgements

¶1 **Authors:** [To be confirmed]

¶2 **Reviewers:** [To be confirmed]

5. References

1. ¶1 SEEA EA 2021, para. 8.3. Exchange value based monetary accounts support multiple applications including comparing asset values, highlighting non-market services, assessing ecosystem contributions to production, comparing trade-offs, and deriving adjusted aggregates.
2. ¶2 SEEA EA 2021, para. 8.4. Monetary valuation will not be appropriate in all decision-making contexts and associated biophysical data should always be considered alongside monetary values.
3. ¶3 SEEA EA 2021, para. 1.15. Monetary values will not fully reflect ecosystem importance; assessing importance requires consideration of biophysical characteristics, ecosystem condition, and characteristics of dependent communities.
4. ¶4 SEEA EA 2021, para. 8.3. Exchange value based monetary accounts support multiple applications including comparing asset values, highlighting non-market services, assessing ecosystem contributions to production, comparing trade-offs, and deriving adjusted aggregates.
5. ¶5 SEEA EA 2021, paras 10.44-10.51. The NPV approach to ecosystem asset valuation uses the discounted present value of expected future ecosystem service flows.
6. ¶6 SEEA EA 2021, paras 10.76-10.81. The SEEA EA recommends market-based discount rates for services used by private economic units and social discount rates for services providing collective benefits, with sensitivity analysis and transparent documentation of the chosen rate.
7. ¶7 SEEA EA 2021, paras 10.76-10.81; NCAVES/MAIA 2022, Section 3.3; IPCC AR6 Working Group III, Chapter 3. For the 3% benchmark, see IPCC AR6 WG3 Chapter 3 (2022), which uses 3% as an illustrative social discount rate in scenario analyses; the commonly applied lower-bound range in climate economics literature spans approximately 1.4-3%.
8. ¶8 SEEA EA 2021, para. 8.3. Monetary accounts support scenario modelling, risk assessment, and policy instrument calibration.
9. ¶9 SEEA EA 2021, para. 8.5. Physical accounts may be sufficient for many policy questions; monetary valuation not always necessary.
10. ¶10 NCAVES/MAIA 2022, Section 6.3. Discusses fitness for purpose and data quality considerations.
11. ¶11 NCAVES/MAIA 2022, Section 6.5. Recommendations for communicating monetary values to avoid misinterpretation.
12. ¶12 NCAVES/MAIA 2022, Section 6.4. Discusses aggregation issues across services, regions, and time.
13. ¶13 UNSC Decision 52/101, March 2021. The Statistical Commission adopted chapters 1-7 as international statistical standard, recognized chapters 8-11 as internationally recognized statistical principles and recommendations, and noted chapters 12-14 as applications and extensions.
14. ¶14 NCAVES/MAIA 2022, Section 6.5. Recommendations for clear communication of monetary values.
15. ¶15 SEEA EA 2021, para. 10.81. Compilers encouraged to undertake sensitivity assessments and publish documentation.
16. ¶16 SEEA EA 2021, paras 11.3-11.5. Time series consistency requires distinguishing methodological revisions from data vintage updates; version and vintage disclosure enables readers to interpret changes between account editions correctly.