

Montserrat Ecosystem Account Summary

2019 ecosystem account

July 2021



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Document evolution

| | | |
|--------------|---------|------------------------|
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2019 Ecosystem account

At 102 square kilometres with a total population of 4,649 in 2018 (Statistics Department Montserrat, 2020), the island of Montserrat is largely dependent on its wealth of environmental assets. In fact, the environment contributes at least an estimated **23 million XCD** in value to Montserrat in 2019 (Table 2), which is 13% of its estimated GDP in 2019¹ (Statistics Department Montserrat et al., 2020). These environmental assets provide an abundance of benefit to the people across and visitors to the 'Emerald Isle of the Caribbean', including the: exportation of sand and aggregates (10 million XCD per year); value added to the tourism industry (5 million XCD per year); carbon sequestration by ecosystems (1 million XCD per year); and other more difficult to measure values such as protection of buildings and roads from inland flooding events. The economic prosperity and wellbeing of the people of Montserrat are fundamentally linked to the effective management of the environment, and an understanding of the value that it provides.

Ecosystem accounts provide economic evidence that supports the delivery of sustainable value from environmental assets². Effective management of the environment must consider the extent and underlying condition of ecosystems over time, as well as the range of benefits they provide and the economic value of those benefits to different stakeholder groups. Specifically, the data in ecosystem accounts can help address several fundamental questions for policy and planning:

- What environmental assets are present and what state are they in? How does this change over time?
- What benefits does the environment provide? How are these received by beneficiaries?
- What is the economic value of these benefits? How is this value distributed across the population?

The environmental and socioeconomic data produced within ecosystem accounts provide a basis for answering these questions. Their importance is reflected in the development of the System of Environmental Economic Accounting – Ecosystem Accounts (SEEA-EA), by the United Nations (UN, 2021)³. Officially adopted by the UN as a statistical standard in March 2021, the SEEA-EA supports the implementation of ecosystem accounting as a part of National Accounts by National Statistics Offices around the world. Ecosystem accounts provide indicators that compliment national economic and social indicators (such as GDP and demographic trends) and this evidence can support policy development and decision making, such as

- Effective decision-making which impact on the environment and the benefits it provides;
- Action on climate change, including mitigation, adaptation and resilience to impact;
- Delivery of international initiatives, such as the UN Sustainable Development Goals (SDGs)⁴; and
- A green post-COVID economic recovery, and in particular a sustainable tourism sector.

For ecosystem accounts to be a valuable addition to government and organisational policy and planning strategy, they should be embedded into the decision-making process, and updated on an annual basis both to provide current data and to monitor trends over time. A partnership of eftec, the UK Joint Nature

¹ GDP at current purchase prices is estimated as 179 million XCD in 2019 (Statistics Department Montserrat et al., 2020)

² See Box 1 for more detail.

³ More information is available at: <https://seea.un.org/ecosystem-accounting>

⁴ More information is available at: <https://sdgs.un.org/goals>

Conservation Committee (JNCC), the New Economics Foundation, and Montserrat’s Ministry of Agriculture, Trade, Housing, Land and Environment (MAHLE), with Darwin Plus funding from the UK Government, have initiated this process in Montserrat. The aim is for full ownership of the accounting process to be handed over to the Government of Montserrat by Q1 2022.

Physical flow and monetary flow

A range of benefits have been assessed within the ecosystem account, with estimated annual physical flow and monetary values given a confidence rating, as described in **Table 1**. The confidence rating is based on the robustness of the evidence and assumptions used. The summary of the ecosystem account is presented in **Table 2**. The annual physical flow and monetary flow are divided between those measured in accordance with the SEEA-EA standard, and those measured by supplementary methods. The present values (the sum over 25 years), of the benefits are also shown.

Table 1: Description of confidence

| Confidence | Symbol | Description |
|------------|--------|--|
| Low | ● | Evidence is partial and significant assumptions are made so that the data provides only order of magnitude estimates of value to inform decisions and spending choices. |
| Medium | ● | Science-based assumptions and published data are used but there is some uncertainty in combining them, resulting in reasonable confidence in using the data to guide decisions and spending choices. |
| High | ● | Evidence is peer reviewed or based on published guidance so there is good confidence in using the data to support specific decisions and spending choices. |
| No colour | ● | Not assessed |

Table 2: Summary of Montserrat ecosystem account

| Produced at: March 2021 | Physical flow (unit/yr.) | | | Monetary flow (XCDm/yr.) | | | Present Value 25 years (XCDm) |
|---|--------------------------|------------|--|--------------------------|------------|--|-------------------------------------|
| | Reporting (2019/20) | Confidence | Units | Reporting (2019/20) | Confidence | Valuation metric | |
| Ecosystem service flow account (SEEA-EA) | | | | | | | |
| Fisheries | 166,920 | ● | Total volume of fish landings (lbs/yr.) | 1 | ● | Total value of fish landings | 24 |
| Agriculture | 95,387 | ● | Total weight of agriculture production (lbs/yr.) | 0.3 | ● | Total value of agriculture production | 5 |
| | 89,197 | ● | Total weight of livestock production (lbs/yr.) | 0.7 | ● | Total value of livestock production | 20 |
| | 28,344 | ● | Total egg production (dozens/yr.) | 0.3 | ● | Total value of egg production | 7 |
| Water supply | 142,667,360 | ● | Total volume of water consumed (gal./yr.) | 4 | ● | Total value of water consumed | 72 |
| Sand and aggregates | 399,370 | ● | Total volume of sand and aggregate exports (t/yr.) | 10 | ● | Total export customs value of sand and aggregates | 152 |
| Carbon sequestration | 16,552 | ● | Total tonnes of CO ₂ e sequestered (tCO ₂ e/yr.) | 1 | ● | Total value of CO ₂ e sequestered | 33 |
| Tourism | 15,047 | ● | Total number of visitors (visits/yr.) | 5 | ● | Total value added to tourism industry attributed to ecosystems | 89 |
| Total value | | | | 23 | ● | Mix of values | 402 |
| Supplementary information | | | | | | | |
| Other exchange values | | | | | | | |
| Tourism | 15,047 | ● | Total number of visitors (visits/yr.) | 16 | ● | Total visitor expenditure attributed to ecosystems | 268 |
| Welfare values | | | | | | | |
| Cultural value | 2,251 | ● | Number of households on Montserrat (no.) | 0.6 | ● | Total willingness to pay value for cultural services | 12 |
| Non-monetised benefits | | | | | | | |
| Erosion control | | ● | | | ● | | |
| Flood hazard regulation | | ● | | | ● | | |

Extent and condition account

Spatial analysis was conducted to assess the ecosystems present within Montserrat. The quantity (i.e., extent) and quality (i.e., condition) of the present ecosystems are recorded in the extent account (**Table 3**) and condition account (**Table 4**), respectively. Beyond the extent and condition of ecosystems, other indicators for spatial configuration and other forms of capital are also included in the assessment (**Table 5**). The accounts can be used to monitor changes in the environmental assets over time. The terrestrial and marine ecosystem of Montserrat are mapped in **Figure 1**.

Table 3: Extent account

| IUCN Code | Ecosystem | Area (ha) |
|--------------------|--|---------------|
| Terrestrial | | |
| Total | | 11,225 |
| T1.1 | Tropical-subtropical lowland rainforests | 1,077 |
| T1.2 | Tropical-subtropical dry forests and scrubs | 5,188 |
| T1.3 | Tropical-subtropical montane rainforests | 456 |
| T3.4 | Young rocky pavements, lava flows and screes | 2,148 |
| T7.1 | Annual croplands | 31 |
| T7.4 | Urban and industrial ecosystems | 389 |
| F1 | Rivers and streams | 101 |
| MT1.3 | Sandy shorelines | 249 |
| MT2.1 | Epipelagic ocean waters | 849 |
| | Bare ground | 436 |
| | Disturbed ground | 302 |
| Marine | | |
| Total area | | 12,821 |
| M1.1 | Seagrass meadows | 449 |
| M1.3 | Photic coral reefs | 875 |
| M1.6 | Subtidal rocky reefs | 5,542 |
| M1.7 | Subtidal sand beds | 5,940 |
| | Artificial reef | 14 |
| | Sargassum forest | 1 |

Source: See Appendix A.1 for input data sources.

Table Notes: See Appendix D for MAHLE and IUCN ecosystem typology comparison.

Two main types of information available on condition are biodiversity designations (because they reflected high biodiversity value habitats at the time of designation) and the intactness of habitat. Montserrat has extensive areas of intact forest in the Centre Hills, within a protected forest area whose boundary is estimated based on the 1,500-foot contour. The boundary of the forest area that is important for water resources was derived by Montserrat Utilities work in the 1990's and is reflected in a buffer zone around the protected area, which extends slightly below the 1,500ft contour⁵.

Montserrat is in a Caribbean Islands Global Biodiversity Hotspot and part of the Lesser Antilles Endemic Bird Area. Montserrat supports a number of rare species including the endemic Montserrat Oriole, one of the rarest birds in the world. Overall, Montserrat has 3 Important Bird Areas and 2 proposed Ramsar sites, supporting 4

⁵ See: <https://www.protectedplanet.net/centre-hills-protected-forest-area>
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plant, 1 reptile, 1 amphibian, 4 bat, 4 turtle and 2 bird species of global conservation concern, several of which are endemic species (Rayment, 2007)⁶. There are 12 restricted range birds on Montserrat, present in the Centre Hills Forest, and the Important Bird Areas (IBA) identified in the rest of the island, which make up 474 ha outside the 1,500ft contour used to estimate the protected area of forest. Key species for biodiversity conservation, such as Montserrat Oriole (the national bird), turtles and Mountain Chicken, are also of high cultural importance.

Table 4: Condition account

| Category | Sub-category | Value |
|--------------------------------|--------------|-------|
| Land | | |
| Total forest reserve area (ha) | | 1,136 |
| Total agricultural zone (ha) | | 381 |

Source: See Appendix A.2 for input data sources.

Table 5: Other indicators

| Category | Sub-category | Value |
|----------------------------------|--------------|-------|
| Other forms of capital | | |
| Total mineral zone (qualitative) | | Vast |

Source: See Appendix A.3 for input data sources.

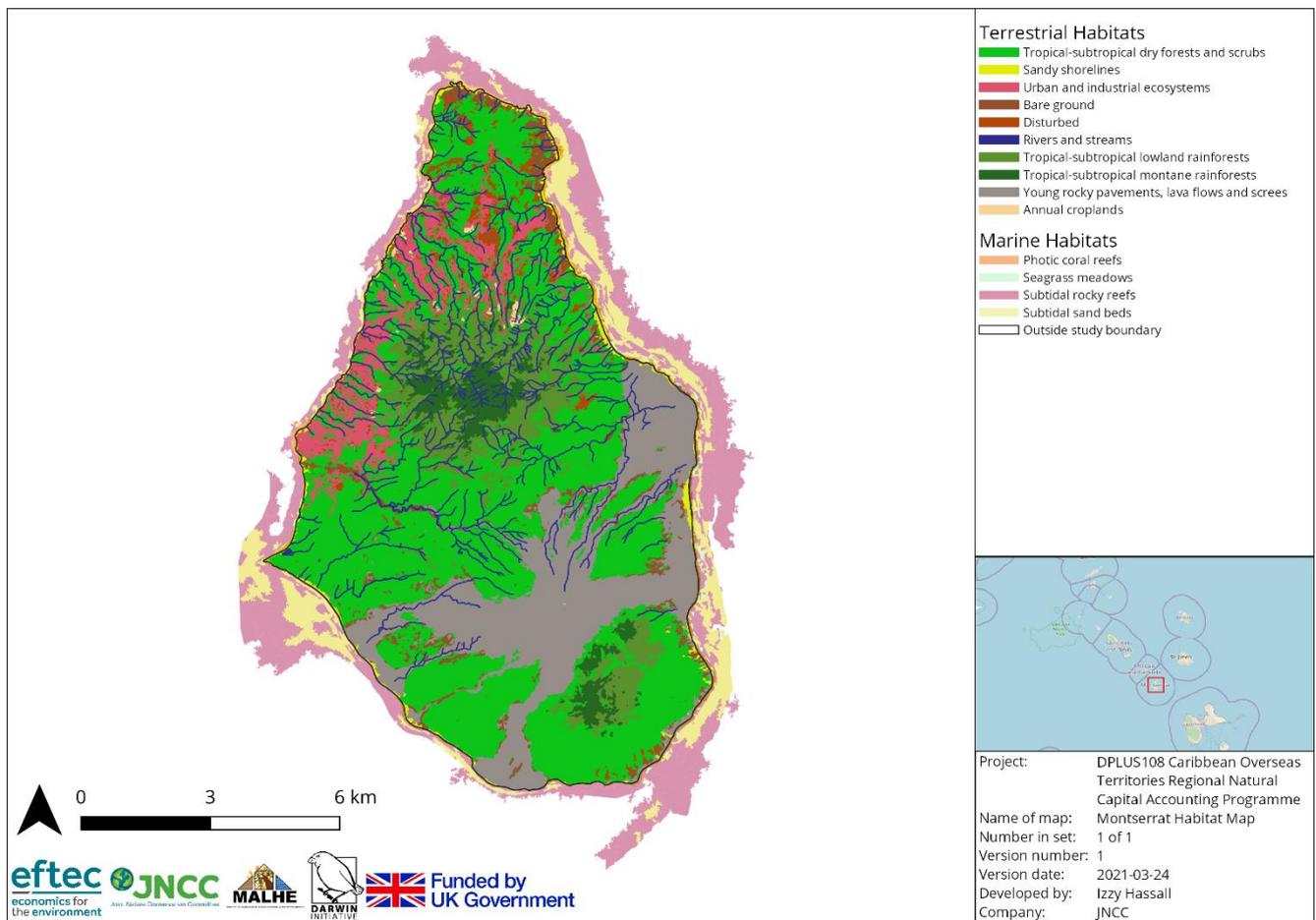


Figure 1: Montserrat terrestrial and marine ecosystems

Source: JNCC GIS analysis of JNCC Montserrat Habitat map.

⁶ Rayment (2007) Costing Biodiversity Priorities in the UK Overseas Territories, RSPB. Annex 10: Montserrat. 2019 ecosystem account | July 2021

Box 1: Ecosystem accounts

The ecosystem accounting approach helps frame the interconnection between humans and the environment in economic terms. The environment can be viewed as an asset, or natural capital, that provides a revenue of ecosystem goods and services, which benefit people. This includes provisioning services, such as agricultural produce or fisheries, regulating services, such as protection from natural hazards and carbon sequestration, and cultural services, such as tourism and local recreation. These benefits can be measured and valued in a consistent and structured manner, and compiled into an accounting framework, called ecosystem accounts. Ecosystem accounts produce environmental statistics which provide an evidence base on the benefits provided by the environment.

An ecosystem account is structured as a set of component accounts, each of which require data to be consistently collected and collated in a systematic way. The main components of an ecosystem account are:

- **Extent and condition accounts** - an inventory that holds details on the state of all ecosystem assets that are present, including their extent and condition (quality and other relevant factors). For example, the spatial area of a reef system, and its health in terms of suitable indicators.
- **Physical flow account** - contains the flow of goods and services which are dependent on the ecosystem assets that are identified in the extent and condition accounts. This includes benefits related to provisioning, regulating and cultural goods and services provided by ecosystems.
- **Monetary flow account** - calculates the annual value of the estimated flow of benefits that are captured in the physical flow account. The overall asset value is estimated based on assumptions about the values of the physical and monetary flows into the future.

This set of accounts therefore monitor the presence and state of different habitats, the benefits these provide, and the value that humans receive from them. When updated year on year they provide a useful means to monitor and evaluate growth or decline in any of these elements, while also helping to understand the relationship between the environment, the services it provides, and how humans use and value them.

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