Manual of marine and coastal datasets of biodiversity importance

2015 edition

An introduction to key marine and coastal biodiversity datasets

UNEP

Manual of marine and coastal datasets of biodiversity importance, 2015 edition

Team (UNEP-WCMC)

Lauren Weatherdon, Ruth Fletcher, Miranda Jones, Emma Sullivan, Derek Tittensor, Chris Mcowen, Laurens Geffert, Jan-Willem van Bochove[1], Hannah Thomas, Simon Blyth, Corinna Ravillious, Melissa Tolley, Damon Stanwell-Smith[2], Steve Fletcher, Corinne Martin

In collaboration with

Kristin Kaschner (AquaMaps; Albert-Ludwigs-University of Freiburg, Germany)

Edition

This Manual was first published by Martin *et al*. in 2014. The 2015 edition includes updated annexes (53 new datasets and 24 additional metadata sheets), with minor edits throughout the main text.

This publication is available online at: http://wcmc.io/MarineDataManual

[1] Present address: The Biodiversity Consultancy, Cambridge, UK
[2] Present address: NIRAS Consulting Ltd., Cambridge, UK

Contents

Executive summary

English. Knowledge of marine and coastal datasets tends to be fragmented and/or difficult to access for the non-expert or *ad hoc* data user. To address this lack of information, this document provides an overview of global marine and coastal datasets of biodiversity importance, and also includes some datasets of regional interest. This non-exhaustive review has resulted in the identification of 128 datasets, databases, and data portals. Detailed standardised metadata are presented for 69 of these reviewed datasets. The various challenges, gaps and limitations that can be presented by coastal and marine data are also discussed. A set of four annexes provides a wealth of information, including background factsheets on topic areas (Annex 1), a preliminary inventory of 128 global and regional datasets (Annex 2) and dataset-specific metadata on 69 of these (Annex 3). Annex 4 contains a sample of 10 marine mammal spatial distribution maps, as modelled using the AquaMaps approach.

Français. La connaissance des données marines et côtières est généralement fragmentée et/ou difficile d'accès pour le non-expert ou l'utilisateur ad hoc. Pour remédier à ce manque d'information, ce document donne un aperçu des données marines et côtières d'importance pour la biodiversité, à l'échelle mondiale, et inclut également des données d'intérêt régional. Cet inventaire non exhaustif a permis d'identifier 128 ensembles et/ou portails de données. Des métadonnées détaillées et standardisées sont présentées pour 69 d'entre eux. Les défis, lacunes et limites qui peuvent être présentés par les données marines et côtières sont également discutés. Quatre annexes fournissent de nombreux renseignements: des fiches thématiques (Annexe 1), un inventaire préliminaire de 128 ensembles et/ou portails de données aux échelles mondiales et régionales (Annexe 2), et des métadonnées pour 69 d'entre eux (Annexe 3). L'annexe 4 présente un échantillon de cartes de distribution pour 10 mammifères marins, basées sur l'approche de modélisation AquaMaps.

Español. El conocimiento acerca de los conjuntos de datos marinos y costeros tiende a ser incompleto y/o no siempre está al alcance de las personas no expertas o los usuarios ad hoc. Para remediar estas carencias referentes a la información, este documento pretende ofrecer un sumario que agrupe todos los datos marinos y costeros de importancia para la biodiversidad a nivel mundial, e incluye además conjuntos de datos de interés regional. Este inventario no exhaustivo ha permitido identificar 128 conjuntos y/o portales de datos. Para 69 de estos 128 conjuntos se presentan metadatos detallados y estandarizados. Los desafíos, lagunas y limitaciones que podrían surgir a partir de estos datos son igualmente discutidos. Cuatro anexos proporcionan numerosas reseñas: fichas temáticas (Anexo 1), un inventario preliminar con 128 conjuntos de datos a escala mundial y regional (Anexo 2), y metadatos para al menos 45 de ellos (Anexo 3). El Anexo 4 contiene una muestra de mapas de distribución para 10 mamíferos marinos, todos ellos basados en una modelización obtenida a través de AquaMaps.

Русский. Знание о морских и прибрежных массивах данных, как правило, имеет фрагментарный характер и / или к нему трудно получить доступ неэкспертным или специальным пользователям данных. Для решения этой отсутствия информации, В настоящем документе содержится обзор мировых морских и прибрежных массивов данных, имеющих важное значение для биоразнообразия, а также определяются несколько массивов данных, представляющих интерес для регионов. Это не исчерпывающий обзор, который привело к идентификации 128 массивов данных, баз данных и информационных порталов. Подробные стандартизированные метаданные представлены для 69 из этих рассмотренных массивов данных. Обсуждаются также различные проблемы, пробелы и ограничения, которые могут быть представлены прибрежными и морскими данных. Ряд четырех приложений содержат богатство информации, в том числе и вспомогательные справочные материалы по тематическим областям (приложение 1), предварительная перечень 128 глобальных и региональных массивов данных (Приложение 2) и специфичные метаданные для 69 из этих массив данных (Приложение 3) . В приложении 4 содержится образец 10 карт пространственного распределения морских млекопитающих, смоделированных с помощью подхода «AquaMaps».

中文. 关于海洋与海岸数据的知识通常是碎片化的，并且往往对非专业人员和一次性数据用户而言，难以获取。为了解决这方面信息缺乏的情况，本报告对全球重要的海洋和海岸生物多样性数据提供了一个概括，其中包括了相关的区域尺度的数据。这份非详尽的概括涵盖了128个数据集、数据库和数据门户，其中的69个包含了详细的、标准化的元数据；并讨论了关于海洋和海岸数据的挑战、数据缺口以及局限性。位于报告最后的四张附录提供了丰富的信息，他们分别是背景资料简报（附录1），128个全球和地区尺度数据的初步清单（附录2），69个数据的元数据（附录3）和10类海洋哺乳动物的空间分布地图样本（附录4，使用AquaMaps方法）。

إلى بها الوصول يصعب أو/ و مجزأة تكون أن إلى ميل تبدى الساحلية البحرية البيانات قواعد معرفة .ا**لعربية** لمحة الوثيقة هذه دقة قدم المعلومات، فـ الـ نقص هذا لمعالجة .المسـ تخدم بـ يانات مخصصة أو الخبراء لغير بعض أي ضادوت شمل والعالمية، الـ بحري الـ بيولوجي الـ تنوع أهمية الساحلية الـ بيانات قواعد عن عامة قواعد 128 تـ حديد فـ حصري غير الا سـ تعراض هذا أدى وقد .الإقـ ليمية الأهمية ذات الـ بيانات مجموعات هذه من 69ل مـ فصل موحد الوصفية الـ بيانات يـ عرض تم .الـ بيانات وبـ وابات الـ بيانات، وقواعد الـ بيانات يـ قدمها أن يمكن الـ تيوال قيوال ثغرات الـ تحديدات مخـ تلف أي ضاوت ناقش .اسـ تعراضها تم الـ تي المجموعات ذلك فـ بـ ما المعلومات، من ثـ روة يوفـ ر مرفـ قات أربـ عة من مجموعة وهناك .وال بحرية الساحلية الـ بيانات العالمية الـ بيانات قواعد 128 من أولـ ية وقائمة ،(1 الملحق) الموضوع مناطق عن أساسية حـ قائق وثـ يقة 4 المرفـ ق ويـ تضمن .(3 الملحق) هؤلاء من 69 عن محددة بـ يانات الوصفية والـ بيانات (2 الملحق) والإقـ ليمية AquaMaps. نهج بـ اسـ تخدام غرار وعلى المكاني، الـ توزيع خرائط الـ بحرية الـ ثديـ يات 10 من عـ ينة

1. Introduction

Knowledge of marine and coastal datasets tends to be fragmented and often difficult to access for the non-expert or *ad hoc* data user. Data users may find it difficult to assess the suitability of a particular dataset for their specific needs, and to access the information necessary for optimal use of these data. These issues can be compounded by a lack of information on the biodiversity features for which there are datasets available. To address this lack of information, this document provides an overview of global marine and coastal datasets of biodiversity importance, including some datasets of regional interest.

In this document, *datasets of biodiversity importance* are defined as those datasets that can be used to identify geographic areas which contain significant biodiversity, in the broadest sense of the term. We define as *marine* a dataset covering a section of the sea, without any terrestrial component (e.g. coral, seagrass bed), whilst a *coastal dataset* would have both a marine and a terrestrial component (e.g. mangrove, saltmarsh).

In addition to the information provided on existing datasets, the various challenges, gaps and limitation which can be presented by coastal and marine data are also discussed (section 4), including spatial and temporal gaps and bias, data types (e.g. point, polygon), modelled versus observed data, and spatial and temporal scales. The ways in which the scientific community aims to address these availability and quality issues are also highlighted. Such issues also exist in the terrestrial realm, but they tend to be significantly more acute in the marine realm: data users are confronted with significant and specific difficulties in the identification and use of coastal and marine datasets.

The document is structured as follows:
- *section 2* gives some background to the work and discusses the scope of the review;
- *section 3* provides information on the different datasets reviewed and highlights how these have been grouped into 11 categories;
- *section 4* discusses the issues around data and highlights the gaps which can occur, along with some additional information on data use; and
- a set of four annexes provides a wealth of information including links to background factsheets on topic areas (*Annex 1*), a preliminary inventory of global datasets (*Annex 2*), and dataset-specific metadata on a subset of these datasets (*Annex 3*). *Annex 4* contains a sample of marine mammal spatial distribution maps, as modelled using the AquaMaps approach.

It is hoped that these documents will improve understanding of the different datasets that have been produced by various organisations around the world.

2. Aim and scope

The starting point for this work was an identified need to better document and explain the various marine and coastal datasets currently curated and/or distributed by the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC), including what these datasets show, why they were created, how they can be used, their limitations, and access details (such as the data owner details, use restrictions, web map service links[3]). To date, more than 30 marine and coastal datasets can be viewed and/or downloaded from UNEP-WCMC's *Ocean Data Viewer*[4] (ODV). This documentation work resulted in the development of standardised 'metadata'[5] sheets for each of these datasets, as well as for other datasets internally curated by UNEP-WCMC that are not available through this online data portal.

The scope of the work included an initial review of marine and coastal datasets of biodiversity importance created and curated by UNEP-WCMC and other organisations or scientific initiatives. This non-exhaustive review resulted in the identification of a total of 128[6] datasets and/or databases and data portals. Datasets were grouped into 11 broad categories listed in Table 1. To date, UNEP-WCMC has produced detailed standardized metadata[7] for 69 of these reviewed datasets. These metadata were written in the same standardized format as the information produced for datasets curated by UNEP-WCMC to provide a comparable source of information for the variety of datasets that have been created for the marine environment. Standardised metadata were created to collate, as far as possible, all relevant information on the individual datasets into one location for ease of access and comparison.

In addition to the dataset-specific metadata, complementary 'background factsheets', often relevant to several datasets, were developed to provide general information on biodiversity features (e.g. ecology, creation methodology, etc.), and explanations of its biodiversity importance including, where relevant, policy and governance aspects. Hyperlinks to background factsheets that are available to date are provided in Table 1.

---

[3] These can be used in web mapping applications such as ArcGIS.com, SeaSketch, etc.

[4] http://data.unep-wcmc.org. Note that protected area data are downloadable from Protected Planet (http://www.protectedplanet.net/), not from the ODV. For commercial use of these datasets, please contact business-support@unep-wcmc.org.

[5] Metadata are "data about data".

[6] See Annex 2 for a summary table listing all the datasets reviewed.

[7] See Annex 3 for a compilation of metadata sheets available to date. Metadata were written in priority for datasets curated/distributed by UNEP-WCMC, and for datasets likely to be of interest to UNEP-WCMC within the framework of its projects.

Table 1. Eleven broad categories used to classify the 128 datasets that have been inventoried. Associated background factsheets are available on the *Biodiversity A-Z*[8]. SDM: Species Distribution Modelling (see section 4).

Category	Factsheet name	Factsheet URL
Biogenic habitat	Warm-water coral reef	http://wcmc.io/warm_coral_reef
	Cold-water coral	http://wcmc.io/cold-coral
	Mangrove	http://wcmc.io/mangroves
	Seagrass	http://wcmc.io/seagrass
	Saltmarsh	http://wcmc.io/saltmarsh
Species habitat	Marine turtle (nesting site)	http://wcmc.io/turtle-nesting-site
Species distribution		
Biodiversity metric		
Area of biodiversity importance	Marine Protected Area	http://wcmc.io/MPA
	Key Biodiversity Areas	http://wcmc.io/KBA
	Ecologically or Biologically Sensitive Area	http://wcmc.io/EBSA
	Vulnerable Marine Ecosystem	http://wcmc.io/VME
	Particularly Sensitive Sea Area	http://wcmc.io/PSSA
	UNEP Regional Seas Programme	http://wcmc.io/regional_seas
Biogeographic classification	Global 200 Ecoregions	http://wcmc.io/ecoregions
	Seamount	http://wcmc.io/seamounts
	Hydrothermal vent	http://wcmc.io/vents
	Cold seep	http://wcmc.io/seeps
Environment descriptor	Environment descriptor	http://wcmc.io/environment-descriptors
Ecosystem services and natural capital		
Ecological status and impact		
Databases and data portal		
Administration		

This document is by no means an exhaustive inventory of all existing datasets of biodiversity importance. Rather, it should be considered a *living* document that will be continuously updated as more datasets are created and feedback is received. In this regard, we welcome comments from data curators, owners, users and experts so that this document can be maintained as accurate, updated and useful as possible. Further factsheets are also planned and will be included in future updates of this document. It is hoped that this document will facilitate