Proteus Highlights 2012

This report describes the key activities and results of the Proteus Partnership workplan in 2012.

2012 saw the renewal of the Proteus Partnership and the review and design of the workplan and strategy for the next 3 year phase. The views of the Partners were sought in the development of a new structure and approach to Proteus which continues to meet the needs of the all members of the Partnership, whilst supporting the improvement of biodiversity information for decision making. This new approach was launched in a strategy for the next phase from 2013-2015.

World Database on Protected Areas

2012 was another year of growth for the World Database on Protected Areas (WDPA), with a 5% increase in the total number of records in the dataset. Efforts to improve and update data continued, with almost one third of records (31%) reviewed, validated or updated in 2012. The WDPA is now representative (as of January 2013) of 196,787 protected areas worldwide. Alongside this increase in total number, one of the key measures of quality - the ratio of boundaries to points - remained steady at 89%.

The processes for updating the WDPA continue to be refined alongside the IUCN and WDPA standards, which include not only the inclusion of new records and the update of existing records, but also the review and removal of records from the WDPA for sites that do not meet the criteria for inclusion. As a result of these quality control processes, a total of 1,042 protected area records were removed from the database. Removal took place after review and confirmation by data providers that they: did not conform to the IUCN definition; were proposed sites which had not been designated; or had been delisted.

Updates to Country Data

Over the course of the year, UNEP-WCMC received new or updated data for protected areas across 139 political geographies. Direct correspondence with governments resulted in update or validation for all records of protected areas for 23 countries. The status of those updates (whether they are for areas protected under national laws or international conventions and agreements, or both) is shown in Figure 1 below.

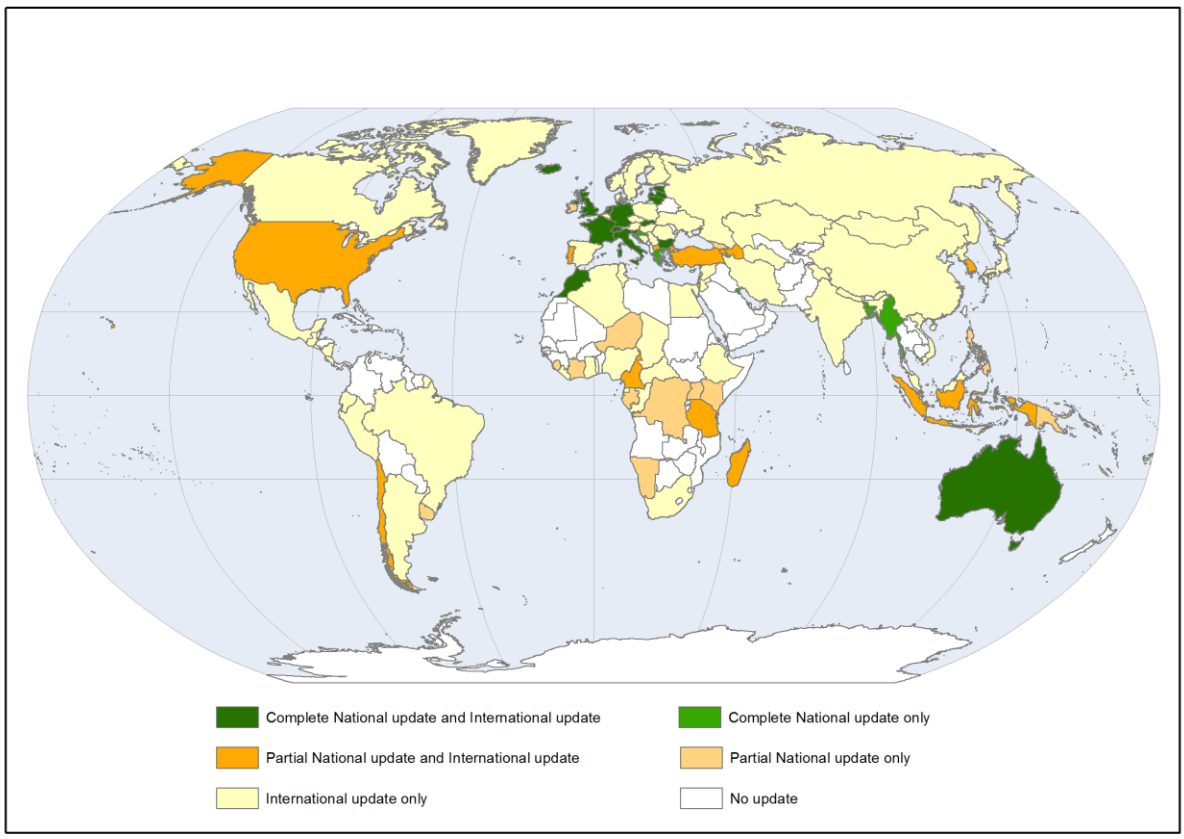


Figure 1: Updates to countries in the WDPA in 2012

Further details on the updates to the countries that have undergone review within the WDPA in 2012 are shown in Appendix A.

Updates to Regional Data

Natural and Mixed World Heritage sites: These sites continued to be updated, with the six World Heritage Sites inscribed in 2012 added to the WDPA as polygons during the year. The WDPA continues to include data on all Natural and Mixed World Heritage sites.

Ramsar Wetlands of International Importance: As part of the ongoing partnership with the Ramsar Convention, UNEP-WCMC has implemented a data sharing protocol. This defines the process through which the WDPA and the Ramsar database will be linked.

The Ramsar Secretariat together with Wetlands International will verify national submissions of GIS data received by them from the official Ramsar focal point in each country, through the official processes of the Convention. Once the boundaries and attributes of these submissions have been verified by the Ramsar Secretariat, this data will be made available to UNEP-WCMC. Through this partnership, the Ramsar Secretariat provided verified data for 545 Ramsar sites in 2012.

Mediterranean Protected Areas Network (MedPAN): UNEP-WCMC and MedPAN are collaborating to ensure all marine protected areas in the Mediterranean are included in the WDPA. The commitment to update the WDPA was acknowledged explicitly in the strategy and planning documents of MedPAN finalized at the 2012 Annual Forum. Specially Protected Areas of Mediterranean Importance (SPAMIs) and other Mediterranean designations, both national and regional, will be officially included through the efforts of MedPAN in the coming years. The database that MedPAN has developed for the region is based on the WDPA Data Standards.

This collaboration has already allowed UNEP-WCMC to compile information and data for all SPAMI sites designated under the Barcelona Convention (otherwise known as the Convention for the Protection of the Mediterranean Sea against Pollution).

Marine Protected Areas of the Atlantic Arc, OSPAR Marine Protected Areas and Circumpolar Protected Areas: In a similar collaboration, the WDPA Team is also liaising with the Agence des Aires Marines Protégées, the Oslo and Paris Convention Secretariat and the Conservation of Arctic Flora and Fauna Working Group to support the development or improvement of regional protected area databases based on the WDPA Data Standard, all of which either provide direct updates to the WDPA or indirect updates through the European Environment Agency's Common Database on Designated Areas, as the official processes dictate.

Improving Data Contacts

The WDPA team has continued to maintain and improve data contacts across the globe, particularly for priority countries nominated by Proteus Partners, or where UNEP-WCMC has not historically had good contacts to provide data. This work has led to improved data access in 2012. Of particular note are the examples below:

- The WDPA team is currently implementing an expert review of protected areas data in China, Japan and the Republic of Korea. This work will continue into 2013, and has involved national workshops in each country in 2012, in collaboration with the government agencies and local NGOs. The main outcome of the review will be significantly improved datasets for all the countries involved. Data are already being made available through these projects and are currently undergoing internal review at UNEP-WCMC.

- Through the UNEP-WCMC project 'Protected Areas Resilient to Climate Change' in West Africa, the WDPA team is working with the focus countries (Gambia, Sierra Leone, Togo, Mali and Chad) to improve their protected areas data. Gambia and Sierra Leone have already been updated in the WDPA in 2012, and work is ongoing in the other countries to accurately map, via GPS, the protected area boundaries on the ground.

All of the established partnerships are still thriving and UNEP-WCMC continues to work through both formal and informal partnerships with several protected area agencies in both governmental and non-governmental organisations, including Birdlife International, Conservation of Arctic

Flora and Fauna, Conservation International, The European Environment Agency, IUCN, The Nature Conservancy, World Commission on Protected Areas and WWF.

Updates to the ProtectedPlanet.net Interface

A substantial amount of development effort went into the supporting processes and administration area of protectedplanet.net reducing the bottleneck in updating the WDPA. This involved improving the performance and stability of large updates to protectedplanet.net.

An ESRI ArcGIS Server web service was developed, linking directly with the protectedplanet.net database. This will allow anyone in the Proteus Partnership to stream live data directly into their systems. This functionality will be rolled out in the 1st quarter of 2013.

An extension of the web services created for the Proteus Partners was the development of an 'embeddable protected areas widget'. This allows anyone with a website to add a live stream of protected areas information from protectedplanet.net to their website.

A significant amount of the underlying infrastructure of protectedplanet.net was upgraded in line with the latest software releases making the website significantly more stable. The website now has an uptime of 99.999%. Automatic monitoring and diagnostic tools were added to the site reducing the input required from the technical staff to upkeep the database. A further 43 bugs were fixed to reduce the error rates in protectedplanet.net.

myPolygon

Recognising the need of Partners to make the best use of the WDPA, myPolygon has been completely re-engineered. The tool gives non-GIS users access to the most up to date version of the WDPA for online analysis. Everything from the analytical engine that performs the analysis, to the user focused website has been designed to make it easier to analyse protected areas data. Based on user-feedback received on the prototype, myPolygon will allow users to upload GIS data or draw areas of interest and get back an analysis of the protected areas overlapping with those sites.

Integrated Biodiversity Assessment Tool

A number of functionality improvements and data display changes were made in response to Partner feedback in 2012, including improved display of protected areas designated under international conventions and agreements and introducing mobile operating system compatibility so that subscribers can access IBAT on tablets and mobile devices. A key development to the tool in 2012 was the introduction of a feature to save locations and generate reports on overlap with biodiversity data:

- ***Entering locations***. The map tool now offers the entry of a location both in decimal degrees and degrees/minutes/seconds. In addition to providing coordinates, a user is able to place a location marker on the map, and drag this to their desired position manually. It is now possible to name, save and reload locations once they have been inputted to the tool.

- ***Generating reports***. Reports can be produced for the location points entered. The report details the protected areas and key biodiversity areas found within 1 km, 5 km and 10 km of the user's location. A quick start guide for generating reports has been distributed to all Proteus Partners[a]. Feedback from IBAT users on the content, functionality and format of the report is welcomed. Please provide any feedback to businessandbiodiversity@unep-wcmc.org

Finally, the data layers in IBAT were all updated in October 2012. IBAT now includes the most up to date available information on Key Biodiversity Areas and Threatened Species. The major changes to each data layer are described in reports available on the home page of IBAT. Any Partners who require a global download for data in IBAT should contact UNEP-WCMC.

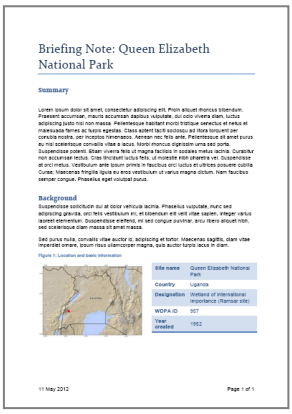
[a] It is also available for download in the Partner area of www.proteuspartners.org

Support to Proteus Partners

Technical Support

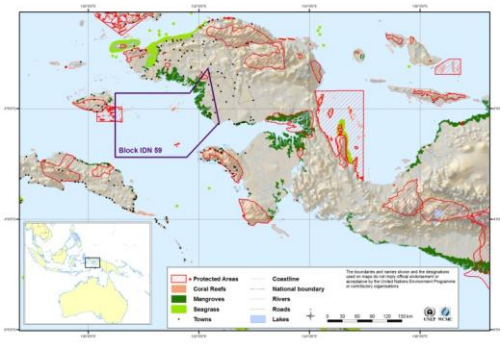
Provision of technical support to Proteus Partners in 2012 was more extensive and with greater take-up by Partners than in recent years. The technical support provision was used by Partners for spatial analysis exercises, briefing notes, tutorials and training.

Reports produced covered subject matter such as: reviews of specific protected areas; research to resolve confusion over multiple contradictory boundaries; the protected areas system for a specific country and their likely future development; a review of the evidence for the range of a Critically Endangered species; and analysis of overlap between biodiversity sensitivities and areas of interest to Partners.


Briefing Note: Queen Elizabeth National Park

Summary

Background



Training and Tutorials

Training sessions were delivered to six Proteus Partners in 2012l; these included face-to-face training courses, tailored to the requests made by individual Partners. Training has varied from one to three days in length, and has been designed to support the use of the Proteus resources in the Partner's biodiversity assessment process. For example, one training course spent two days looking at the tools and data in the context of the Partner's biodiversity policy, and the final day was spent supporting the attendees in using the tools to apply the policy to their operating sites. Sessions typically focus on: introducing the concepts; describing the available data; hands on use of tools; explaining how to interpret and analyse the datasets; looking at quality and limitations; working with the tools and data in the context of company policy. Several partners have elected to use some or all of their technical assistance hours to cover part of the cost of these training courses.

Online training materials have been developed for the three most commonly used sets of tools and resources within the Partnership: The WDPA and ProtectedPlanet.net; IBAT and the Biodiversity A-Z; and The Ocean Data Viewer. Presentation versions of these tutorials are now available in the Partner are of the Proteus website, and video versions will also be available shortly.

Pilot Study: Analysing Biodiversity Data in the Context of Water

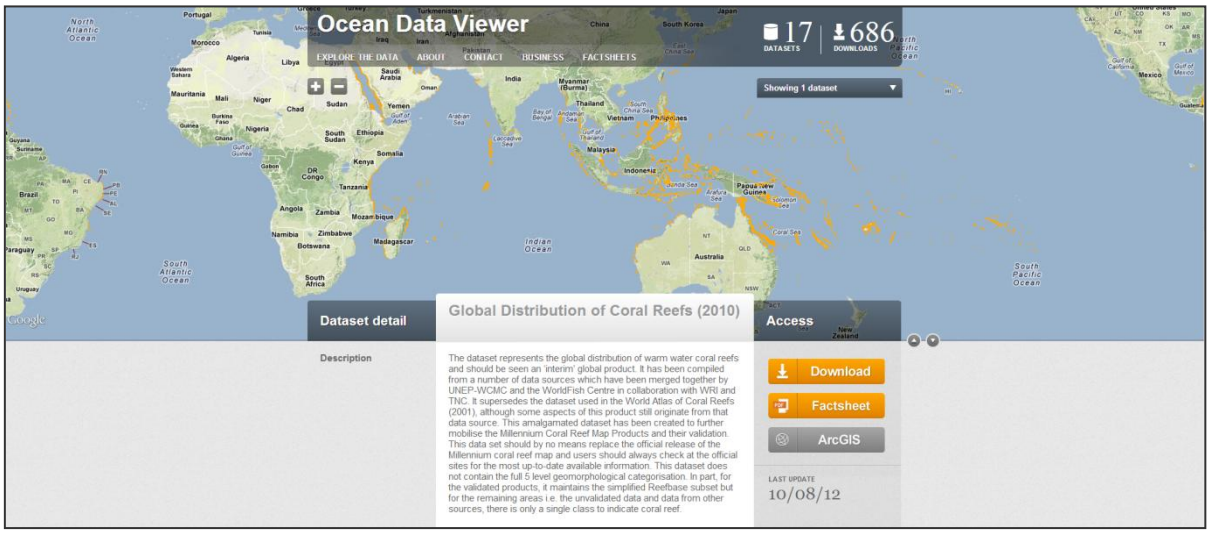
One of the most common ways biodiversity data are used by companies is to conduct initial screening of locations to identify potential impacts on biodiversity. This often takes the form of a straightforward spatial assessment based on set buffer distances around the location. While this approach provides a valid consistent and universally applicable methodology, it does not take into account some environmental factors which might mean features at greater distances could potentially be impacted by operations. One major factor which may be overlooked is the way water can act as a vector, increasing the range of impacts along rivers and other watercourses. During 2012, a pilot study was undertaken by UNEP-WCMC to look at the interplay between water and biodiversity, and to delineate areas of influence for potential biodiversity impacts on the basis of presence of water courses. This study looked first at existing methodologies and tools available to business to ensure that any development does not duplicate existing effort. Following this literature review an approach which took watercourses into account and identified possible features from biodiversity data layers which lie downstream was developed. The results of the study, and the options to develop this work into an approach which Proteus Partners can use will be presented and discussed at the Partner meeting in 2013.

Marine and Coastal Data

There were two major updates made to marine and coastal data in 2012, as well as validation tools and the implementation community which will support future data improvement across a variety of datasets and habitats. The Ocean Data Viewer - the main portal for Proteus Partners to view and download data - was refreshed to make it faster and more accessible, and factsheets helping Partners to make best use of the data available were developed.

Coral Reef Data

The global ***warm water coral reefs*** dataset was updated and is available to download from the Ocean Data Viewer (along with an updated fact sheet and metadata). This current global (warm water) coral reef layer was created from various sources and the different datasets have been individually assessed through a collaborative review, which standardised the attributes describing the data. This combined dataset has created a consistent spatially explicit baseline for local and global warm water coral reef monitoring. Accompanying the data is a report describing the process taken to standardize the current attributes to allow consistency and compatibility across different warm water coral reef datasets. Users of this dataset can now access guidance on how to interpret the data attributes in relation to existing classifications of attributes.



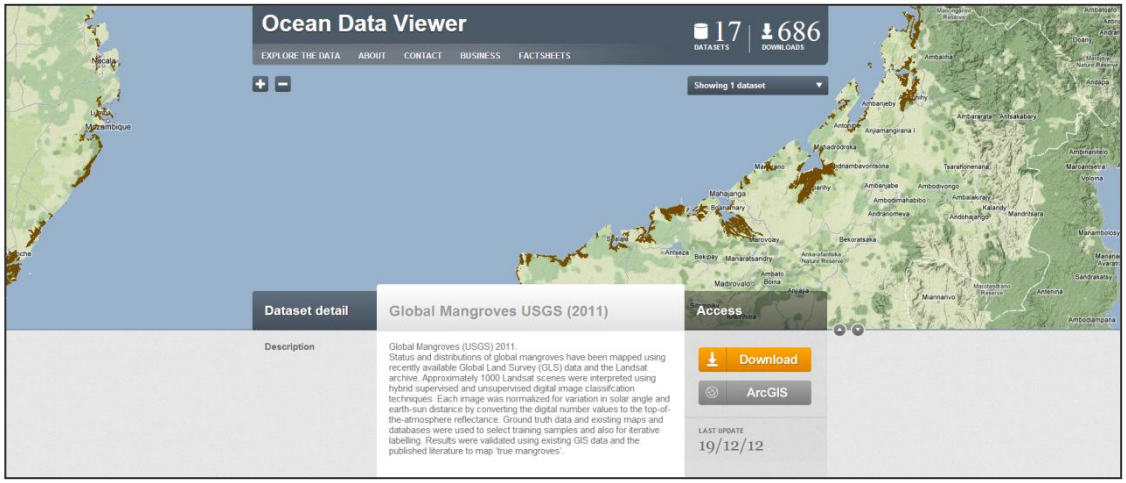
The global distribution of ***cold water coral reefs*** was gathered from numerous sources and collated for use in July 2012. This data layer is comprised of data points indicating observed reefs of varying sizes and stages of development. Following a careful process of seeking permissions, the amalgamated dataset has been made available for view by Proteus partners through a link from the Ocean Data Viewer. UNEP-WCMC will continue work on extending the terms of the user licenses for this dataset and therefore its wider availability.

Mangrove Data

Considerable work on the distribution of mangrove forests has been undertaken by a number of organisations in the last few years, helping UNEP-WCMC to improve and make available datasets at both the regional and global scales.

At a *regional scale*, understanding of changes to mangrove forest cover over the past decade has improved significantly for Cameroon, Gabon, Republic of Congo and Democratic Republic of Congo and this has allowed UNEP-WCMC to create country-specific maps comparing mangrove habitat extent data from 2000 and 2010 to depict the loss of mangrove habitats, as well as highlighting potential deforestation hotspots. Preliminary results of this work were presented as a poster at the World Conference on Marine Biodiversity in September 2011 (see Appendix B). At a *global scale*, two new mangrove datasets have been incorporated into the UNEP-WCMC repository to improve the global baseline inventory of mangroves:

- The "Global Mangroves USGS (2011)" data from United States Geological Survey was produced solely from satellite imagery and was made available for download from Ocean Data Viewer in September 2012. This layer results from a collaboration between USGS and UNEP-WCMC, and shows the status and distributions of global mangroves as mapped in 2011 using the recently available Global Land Survey (GLS) data and the Landsat archive.



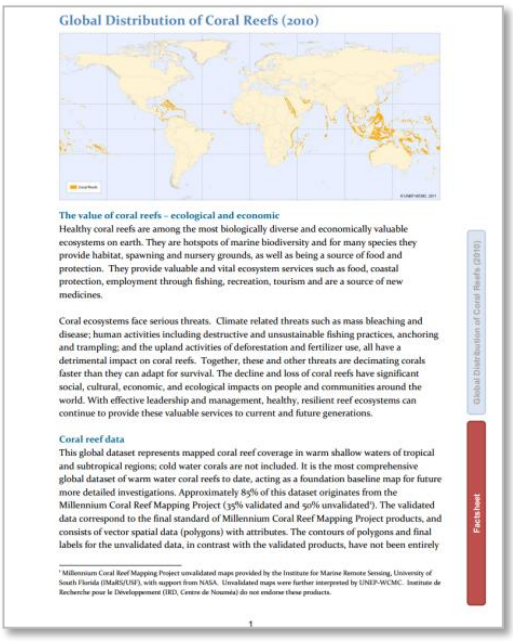
- The "Global Mangrove Layer (2010)" data from the Mangrove Partnership Dataset was derived from a variety of sources, including existing vector data and satellite imagery, but at present is only available for viewing on the ArcGIS server. This is the online version of the World Atlas of Mangroves, and was developed in a joint initiative by UNEP-WCMC, the Food and Agriculture Organisation of the United Nations (FAO), the International Society for Mangrove Ecosystems (ISME), the International Tropical Timber Organization (ITTO) and other organisations. It was developed separately from the USGS dataset and represents the first significant update to the 1997 UNEP-WCMC Global Mangrove dataset to provide an overview of the distribution of mangroves worldwide at approximately the year 2006.

In comparing these two datasets, there is obvious correlation in terms of global distribution of mangrove habitat, but considerable disparity at finer spatial scales, which should be analysed and corrected where possible, if it is to be useful at the regional or local level. However, both datasets need more processing before they can be effectively compared. This will form part of the workplan for 2013 and lead to a more accurate mangrove data layer that can be used at finer scales for analysis and planning.

Saltmarsh Data

To improve the global map of saltmarsh distribution, UNEP-WCMC developed a more formalised 'Global Saltmarsh Network'. Over 500 contacts points have been assembled as part of a database of organisations with saltmarsh expertise, including governmental, scientific and non-governmental organisations in 163 countries. Spatial data for a global saltmarsh layer has been acquired for Europe, South America, Australia, and North America. Most of the permissions required to make these regional datasets available for download have been granted. In 2013 the Global Saltmarsh Network will be invited to participate in the generation of an extensive baseline dataset for worldwide saltmarshes. To ensure high quality of the global dataset, UNEP-WCMC will continue efforts to standardize metadata, fix incorrect coordinate systems and identify gaps in data availability. The saltmarsh dataset will also form the main focus of work for the newly developed habitat validation tool (see below for more detail) designed to facilitate more efficient expert review and revision. This work will continue into 2013 to produce a higher quality saltmarsh dataset for Proteus partners.

Developing Factsheets, Standardising Data and Facilitating Validation


Global Distribution of Coral Reefs (2010)

The value of coral reefs – ecological and economic

Healthy coral reefs are among the most biologically diverse and economically valuable ecosystems on earth. They are hotspots of marine biodiversity and for many species they provide habitat, spawning and nursery grounds, as well as being a source of food and protection. They provide valuable and vital ecosystem services such as food, coastal protection, employment through fishing, recreation, tourism and are a source of new medicines.

Coral ecosystems face serious threats. Climate related threats such as mass bleaching and disease; human activities including destructive and unsustainable fishing practices, anchoring and trampling; and the upland activities of deforestation and fertilizer use, all have a detrimental impact on coral reefs. Together, these and other threats are decimating corals faster than they can adapt for survival. The decline and loss of coral reefs have significant social, cultural, economic, and ecological impacts on people and communities around the world. With effective leadership and management, healthy, resilient reef ecosystems can continue to provide these valuable services to current and future generations.

Coral reef data

This global dataset represents mapped coral reef coverage in warm shallow waters of tropical and subtropical regions; cold water corals are not included. It is the most comprehensive global dataset of warm water coral reefs to date, acting as a foundation baseline map for future more detailed investigations. Approximately 85% of this dataset originates from the Millennium Coral Reef Mapping Project (35% validated and 50% unvalidated[1]). The validated data correspond to the final standard of Millennium Coral Reef Mapping Project products, and consists of vector spatial data (polygons) with attributes. The contours of polygons and final labels for the unvalidated data, in contrast with the validated products, have not been entirely

[1] Millennium Coral Reef Mapping Project unvalidated maps provided by the Institute for Marine Remote Sensing, University of South Florida (IMaRS/USF), with support from NASA. Unvalidated maps were further interpreted by UNEP-WCMC. Institute de Recherche pour le Développement (IRD), Centre de Nouméa) do not endorse these products.

Global Distribution of Coral Reefs (2010)

Factsheet

To assist potential users of the marine and coastal ecosystem data, factsheets have been created for the mangroves (1997), seagrasses and coral reef data layers.

Being able to compare the source and accuracy of datasets is essential for assessing the potential uses of the information. Standardisation of core attributes of the data allows users to interrogate multiple datasets and to meaningfully combine them together in analyses. Core attributes were defined and standardised for seagrass, mangrove and saltmarsh datasets, in collaboration with the International Blue Carbon Scientific Working Group (IBCSWG). These attributes are awaiting approval from the International Blue Carbon Initiative (IBCI). Once finalised, these attributes will be incorporated into global 'blue carbon' assessment

programmes and will be essential to developing work on establishing the carbon sequestration value of different coastal habitats.

Ensuring that global datasets are subject to regular update and improvement is a constant challenge. In response to this, UNEP-WCMC developed an online validation tool that allows experts to review datasets and amend errors more quickly and easily. New data for these habitats can be added by registered users and existing data can be validated or removed. The beta version of the tool is available through (http://validation.unep-wcmc.org/) and, prior to being finalised, its functionality is being tested by stakeholders using warm water coral reef and mangrove data for Africa. The tool was launched in May 2012. Over 80 global conservationists were introduced to the tool and its capabilities in relation to more rapid validation of global and regional datasets. Both the habitat validation tool and the resulting data collation work were presented to various national and international audiences, notably to the International Blue Carbon Scientific Working Group. The objective was to highlight the value of high quality data as part of UNEP-WCMC's Better Data, Better Decisions initiative. Ultimately, the validation tool represents an innovative practical method to improve the spatial and temporal resolution of global critical habitat datasets in the future, as well as a way to strengthen links with important habitat experts by allowing them to use the tool to incorporate their knowledge and relevant survey data.

Improving Data Access

The Ocean Data Viewer is the main web portal that showcases the marine and coastal ecosystem data available from UNEP-WCMC. It provides important supporting ecological and source information to describe these data, and allows users to download the layers in both shapefile or map services formats, where possible. In 2012, some major changes were made to the Ocean Data Viewer infrastructure, switching it to a more stable ArcGIS server to increase usability and speed. In addition, the loading time and resolution of individual habitat data layers were adjusted in order to improve the display speed and enhance the user experience when visiting the site.

Appendix A: Updates to the WDPA in 2012

Country	Update status[a]		Polygons			Polygons replacing Points	Points		
	National	International	New	Updated	Deleted		New	Updated	Deleted
Algeria		Yes		1				2	
American Samoa	partial		9	1			1	3	
Andorra		Yes	1						
Argentina		Yes	2	4			1		1
Armenia	partial	Yes	25	10		5	1		
Australia	complete	Yes	2,281	7,830	212	44			3
Austria		Yes		3			1		
Azerbaijan	partial	Yes	13	28		2			1
Bangladesh	complete		6			1			
Belgium		Yes		1					
Bosnia and Herzegovina		Yes		2					
Brazil		Yes		2					
British Indian Ocean Territory	partial					1			
Bulgaria	complete	Yes		783		21	6	145	
Cameroon	partial	Yes	13	23	6				1
Canada		Yes					3		
Central African Republic		Yes	1						
Chad		Yes	1						
Chile	partial	Yes			43		1		40
China		Yes	4	1			4		

[a] Update status refers to whether the data on national sites were updated (either a complete update of all sites provided by the national authority, or a partial update) and whether any updates were made to sites designated under international agreements and conventions

Country	Update status[a]		Polygons			Polygons replacing Points	Points		
	National	International	New	Updated	Deleted		New	Updated	Deleted
Congo		Yes	1						
Congo, The Democratic Republic Of The	partial								1
Cook Islands	partial		4	1			1	4	
Costa Rica		Yes					1		
Côte D'Ivoire	partial		2	12					
Croatia	complete		8	222		56	1	156	
Cyprus		Yes		1					
Czech Republic		Yes	2						
Denmark		Yes		27					
Ecuador		Yes					2		
Egypt		Yes	2						
El Salvador		Yes							3
Equatorial Guinea		Yes		3					
Estonia	complete	Yes	119	11,080	461	9	15	958	
Ethiopia		Yes					1		
Faroe Islands		Yes					3		
Fiji	partial		94	6			3		
Finland		Yes		49					
France	complete	Yes	243	1,700		2	3		1
French Guiana		Yes		2					
French Polynesia	partial						4	3	
Gabon	partial			13					1
Gambia	complete		3	3	1	3			
Georgia	partial		28	9		16			2
Germany	complete	Yes	1,624	14,362			2		
Ghana		Yes					1		
Greece	complete			768					

Country	Update status[a]		Polygons			Polygons replacing Points	Points		
	National	International	New	Updated	Deleted		New	Updated	Deleted
Greenland		Yes					1		
Grenada		Yes					1		
Guam	partial						1	5	
Guatemala		Yes		1					
Hungary		Yes		25			1		
Iceland	complete	Yes	9	96					
India		Yes	1				3		
Indonesia	partial	Yes			5		3		
Iran, Islamic Republic Of		Yes		1			1		
Ireland	partial			155					
Israel	partial	Yes		148	4	11	1		1
Italy	complete	Yes	113	760				2	1
Jamaica		Yes	1						
Japan		Yes					9		
Jordan		Yes					1		
Kazakhstan		Yes		2			1		
Kenya	partial		9						
Kiribati	partial						6	9	
Korea, Democratic People's Republic Of		Yes					1		
Korea, Republic of	partial	Yes	10	3			6		
Kuwait	complete		24			13			6
Latvia	complete	Yes		327					
Lebanon		Yes	1			1	3		
Liberia		Yes							5
Liechtenstein	complete	Yes		41					
Lithuania	complete	Yes	22	317			2		
Macedonia, the Former Yugoslav Republic Of	partial	Yes		4					

Country	Update status[a]		Polygons			Polygons replacing Points	Points		
	National	International	New	Updated	Deleted		New	Updated	Deleted
Madagascar	partial	Yes	55	4			2		
Malaysia		Yes					1		
Maldives		Yes					1		
Marshall Islands	partial							1	
Mauritius		Yes					1		
Mayotte		Yes					1		
Mexico		Yes	2	1			19		
Micronesia, Federated States Of		Yes					1	2	
Monaco	partial	Yes		1				1	
Mongolia		Yes					1		
Morocco	complete	Yes	1		1		150	7	35
Myanmar	complete		3	41	1				2
Namibia	partial		16						
Nepal		Yes							1
Netherlands	complete	Yes		1,997				2	
New Caledonia	partial			3			2	9	
Nicaragua		Yes					2		
Niger	partial			1	1				
Nigeria		Yes		9					
Northern Mariana Islands	partial							5	
Norway		Yes	1	32					
Palau		Yes	1				10	2	
Papua New Guinea	partial		2	4			15		
Peru		Yes		1			1		
Philippines	partial		143	111	2	24			
Poland		Yes					1		
Portugal	partial	Yes	39	86		3	6		

Country	Update status[a]		Polygons			Polygons replacing Points	Points		
	National	International	New	Updated	Deleted		New	Updated	Deleted
Qatar		Yes					1		
Romania		Yes	2						
Russian Federation		Yes	1				1		
Saint Kitts And Nevis		Yes					1		
Saint Martin		Yes	1						
Samoa	partial						65		
Serbia		Yes					2		
Seychelles		Yes		1					
Sierra Leone	partial				2	5	4		7
Slovakia	complete	Yes		1,128					
Slovenia	complete	Yes	563	499		13	19	847	1
Solomon Islands	partial		44	2			37		
South Africa		Yes		19					
South Georgia and the South Sandwich Islands	partial		1						
Spain		Yes	265	29			6	4	
Sweden		Yes		51			3		
Switzerland	complete	Yes	3,012	3,152					
Syrian Arab Republic		Yes					1		
Tanzania, United Republic of	partial	Yes	12	4					
Timor-Leste	complete		25			4			2
Togo		Yes					1		
Tokelau	partial							3	
Tonga	partial			7			6	3	
Tunisia		Yes		1			15	2	
Turkey	partial	Yes	20	12		3	1		1
Turkmenistan		Yes							1
Tuvalu	partial		5	1					

Country	Update status[a]		Polygons			Polygons replacing Points	Points		
	National	International	New	Updated	Deleted		New	Updated	Deleted
Uganda	partial		661						
Ukraine		Yes					2		1
United Kingdom	complete	Yes	59	8,871					9
United States	partial	Yes	219	73	176	4	2		
United States Minor Outlying Islands		Yes					1		
Uruguay	partial		1	12		2		6	
Vanuatu	partial			5				1	
Viet Nam		Yes	1						
Areas beyond national jurisdiction		Yes		1					
Total			**9,831**	**54,986**	**915**	**243**	**477**	**2,182**	**127**

Appendix B: Mangrove Data Poster Presentation

Global mangrove mapping techniques: a comparison of two approaches and their implications for real world decision making

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Background

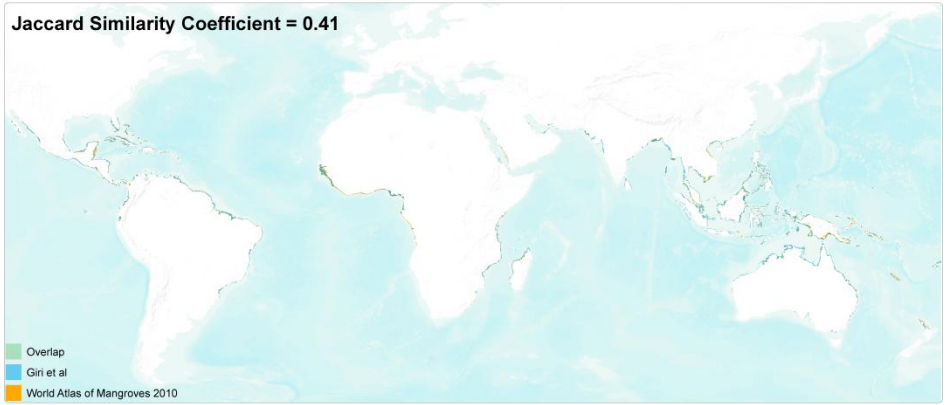
Mangrove forests provide a range of ecosystem services including shoreline protection, food, nesting and nursery grounds for terrestrial and marine species, many of which are commercially important, wastewater processing and carbon storage. In order to improve our understanding of the spatial stocks and flows of ecosystem services of mangroves, there is an urgent need for standardized, reliable mangrove data of appropriate spatial and temporal resolution.

Purpose

The purpose of this study was to perform a preliminary comparative analysis of two global spatial mangrove datasets. Understanding the advantages, limitations, and implications of using different methods for mapping marine and coastal habitats is essential for informed decision making.

Materials and Methods

We compared two global mangrove datasets: 1) a globally comprehensive mosaic dataset of mangrove data [1] (1999 - 2003) and 2) Giri et al [2] comprehensive 30m resolution global mangrove classification derived using hybrid supervised and unsupervised digital image classification of Landsat scenes (1997 - 2000). Validation was conducted using other datasets and expert review. Both datasets were analyzed in vector format. Areal statistics were calculated globally and by country.The degree of spatial overlap and similarity of the two datasets was estimated using Jaccard's coefficient of similarity [3], for the global datasets, as well as for four sample countries.

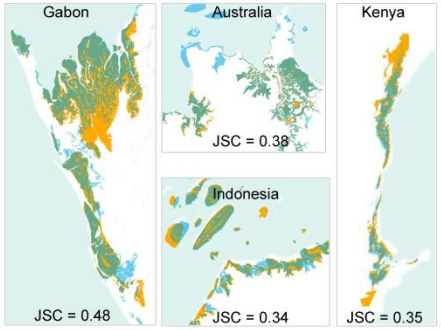


Results

The total area of mangroves calculated was 150,410 km² in 113 countries and territories and was 140,055 km² in 111 countries and territories in the Atlas GIS and Giri et al respectively. Mangroves occured in 105 countries in both datasets. The global area differs by 10,355 km² (6.9%)

Country	Rank		Area (km²)		
	Atlas GIS	Giri et al	Atlas GIS	Giri et al	Difference
Indonesia	1	1	29,863.92	27,063.98	-2,799.94
Brazil	2	2	12,881.74	10,589.57	-2,292.17
Mexico	3	4	9,246.71*	7,296.58	-1,950.13
Nigeria	4	5	7,390.85	7,009.04	-381.81
Malaysia	5	6	7,097.27	5,579.87	-1,517.40
Australia	6	3	6,250.47**	9,641.50	+3,391.03
Mozambique	7	14	5,238.72***	3,216.16	-2,022.56
Bangladesh	8	9	4,969.60	4,404.78	-564.82
Cuba	9	10	4,963.14	4,280.83	-682.31
Colombia	10	21	4,101.51	2,132.14	-1969.37

Table 1: Top 10 mangrove rich countries in the Atlas GIS dataset and their corresponding ranking in Giri et al.'s dataset and the area (km²) difference between them. It is important to note that the area values calculated from the Atlas spatial data are different from those cited in the Atlas itself.



Conclusions

Independently, both of the datasets assessed here are a good indicator for mangrove presence globally. However, these two datasets also show relatively low levels of spatial overlap, at global and smaller scales. This appears to be the case even for Gabon when the source data and processing approach was broadly similar, highlighting the importance of a consistent protocol with adequate validation.

The level of uncertainty observed is of real concern for practical applications of the datasets. Much more extensive and small-scale comparative analysis of the datasets is necessary before solid conclusions about these uncertainties and their implications can be drawn. However, this exploratory analysis does highlight the importance of the use of standardised protocols for habitat mapping, and in particular, of the value of extensive ground-truthing, validation, and local review of remote sensing products. Nevertheless, despite the different approaches taken to create the datasets the result are two comprehensive, global coverage's of mangrove data, with similar estimates of total area.

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