

A decade of protected area growth

Change in global protected area coverage from 2005 to 2016

Appendices

Appendix 1 - Data, methods, limitations

1.1 Spatial data

The World Database on Protected Areas (WDPA) is the only globally authoritative database on marine and terrestrial protected areas in the world. The April 2016 release of WDPA included a total of 210,167 protected area records, comprising 199,901 polygons and 10,266 points. These include protected areas designated at the national level, as well as protected areas designated under regional and international conventions and agreements (e.g. natural and mixed World Heritage sites).

The base layer used for this analysis differentiates five continental regions (see also Appendix 2). It includes both terrestrial protected areas and marine protected areas under national jurisdiction, i.e. within Exclusive Economic Zones (EEZs), which extend 200 nautical miles (370 kilometres) off the coastline.

Table 1: Datasets used in the analysis

Dataset	Organisation	Date/Version	Reference
World Database on Protected Areas (WDPA)	UNEP-WCMC	April 2016	IUCN & UNEP-WCMC (2015)
Continental regions base layer	UNEP-WCMC	August 2015 (version 3)	UNEP-WCMC (2015)

1.2 Methodology

Geoprocessing was completed using ESRI ArcGIS version 10.3. Spatial data was projected into Mollweide equal-area to support the accurate calculation of coverage area.

The following processing steps were applied to the WDPA prior to analysis:

- Exclusion of UNESCO Man and Biosphere (MAB) Reserves, as many of their buffer areas may not meet the IUCN protected area definition, and core areas overlap with nationally designated protected areas;
- Exclusion of protected areas, whose status is “proposed” or “not reported”;
- Buffering of point records to the reported area, and exclusion of point records for which data providers have not provided a reported area.

Overlap between protected areas was removed in order to avoid double counting and overestimating protected area coverage. A series of spatial dissolves were performed on overlapping records, retaining information on the Status Year and IUCN management categories.

Temporal trends in protected area coverage were established using the “Status Year” approach. The Status Year is the year that the protected area was designated, i.e. recognised or dedicated to long-term

biodiversity conservation through legal means. This information is unknown for approximately 14% of terrestrial and 9% of marine protected areas. Coverage of these sites is accounted for in the year 2005.

1.3 Limitations

The “Status Year” approach is scientifically sound and follows the same methodology used to report to the Convention on Biological Diversity on progress of protected area coverage against Aichi Biodiversity Target 11.

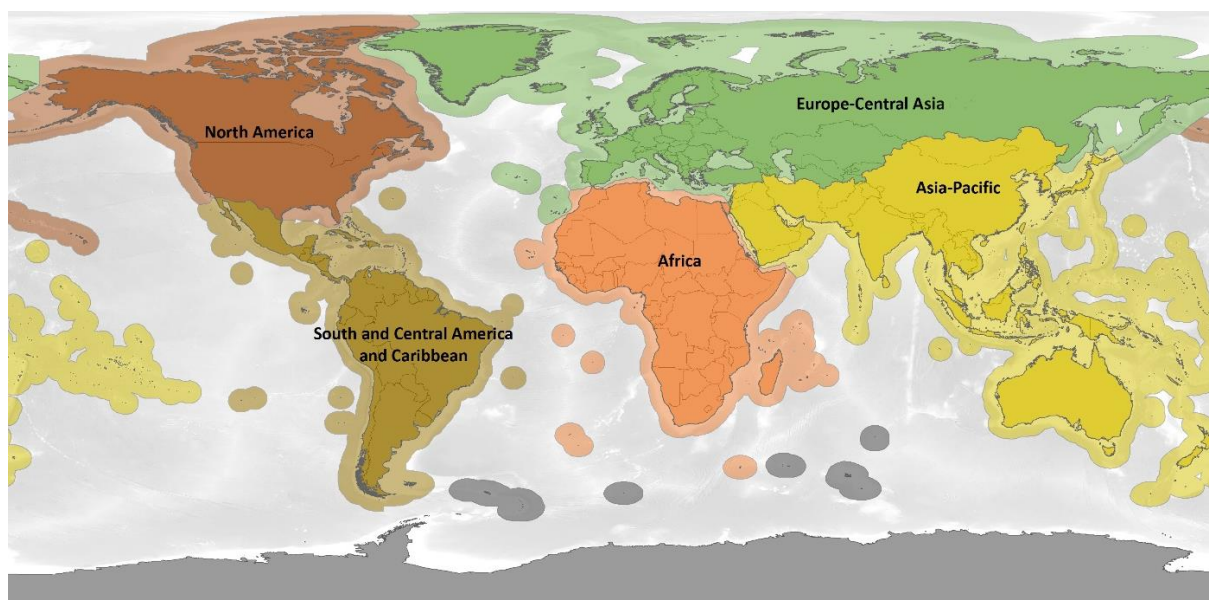
However this approach potentially under-estimates true protected area coverage over time, due to the following factors:

- Areas may have been protected prior to the status year recorded within the WDPA, due to changes in the status of individual protected areas, or changes in the extent of protected areas due to merging, expansion or downsizing. This bias can result in growth curves showing higher growth rates than in reality.
- De-gazetted protected areas are not recorded in the WDPA, and therefore not accounted for in coverage statistics from previous years.
- A time-lag between the creation of protected areas and reporting as part of a global process means that protected areas recently designated may not be fully accounted for in current global figures. For example, the April 2016 release of the WDPA only contains a single record with a Status Year of 2016.
- While the WDPA is the most comprehensive global database of protected areas incorporating the best available information, reporting by individual data providers to the WDPA may not be comprehensive.
- Point records in the WDPA represent 5% of the total number of records, and do not provide detailed information on protected area boundaries. Coverage statistics account for the reported area of these sites, but do not account for point features of an unknown area.
- As noted above, global coverage statistics do not account for UNESCO MAB Reserves as it is difficult to differentiate between the core protected area, the buffer and the transition zones which are usually defined under this designation. Additionally, MAB sites are frequently reported as points, not allowing for a zonal distinction.

Further limitations to the interpretation of individual results are outlined throughout the document where appropriate.

Appendix 2 - Change in continental protected area coverage since 2005: Supporting data

Figure 1: Continental regions considered during the analysis, differentiating land (stronger colours) and the Exclusive Economic Zone (lighter colours).



The boundaries and names shown and the designations used on maps do not imply official endorsement or acceptance by the United Nations Environment Programme or contributory organisations.

Table 2: Absolute coverage values (in million km²) of protected areas in each continental region

Year	Africa	Asia-Pacific	Europe-Central Asia	North America	South and Central America & Caribbean
2005	3.50	4.91	3.77	4.11	4.09
2006	3.57	5.33	3.88	4.17	4.49
2007	3.74	6.75	3.92	4.18	4.63
2008	3.85	6.83	3.97	4.47	4.77
2009	3.93	8.47	4.01	4.49	5.01
2010	4.02	9.17	4.04	4.53	5.36
2011	4.06	9.27	4.09	4.55	5.43
2012	4.37	11.77	4.13	4.56	5.47
2013	4.55	11.91	4.17	4.60	5.57
2014	4.55	13.28	4.29	4.60	5.57
2015	4.55	13.28	4.29	4.60	5.57
2016	4.55	13.28	4.29	4.60	5.57

Table 3: Percentage increase (%) of continental region coverage of protected areas since 2005

Year	Africa	Asia-Pacific	Europe-Central Asia	North America	South and Central America & Caribbean
2006	2.2	8.6	2.9	1.5	9.8
2007	7.0	37.5	4.0	1.8	13.3
2008	10.0	39.0	5.3	8.8	16.8
2009	12.3	72.4	6.2	9.3	22.5
2010	15.0	86.7	7.1	10.4	31.0
2011	16.0	88.7	8.4	10.7	32.8
2012	25.0	139.6	9.4	11.0	33.7
2013	30.0	142.5	10.5	12.0	36.1
2014	30.1	170.4	13.7	12.0	36.4
2015	30.1	170.4	13.7	12.0	36.4
2016	30.1	170.4	13.7	12.0	36.4

Table 4: Percentage (%) of each continental region protected (land and EEZ combined)

Year	Africa	Asia-Pacific	Europe-Central Asia	North America	South and Central America & Caribbean
2005	7.6	4.8	7.6	12.2	9.8
2006	7.8	5.3	7.8	12.4	10.7
2007	8.2	6.7	7.9	12.4	11.0
2008	8.4	6.8	8.0	13.3	11.4
2009	8.6	8.4	8.1	13.3	11.9
2010	8.8	9.1	8.1	13.4	12.8
2011	8.9	9.2	8.2	13.5	12.9
2012	9.6	11.7	8.3	13.5	13.0
2013	9.9	11.8	8.4	13.6	13.3
2014	9.9	13.2	8.6	13.6	13.3
2015	9.9	13.2	8.6	13.6	13.3
2016	9.9	13.2	8.6	13.6	13.3

Figure 2: Change in continental region protected area coverage since 2005, on land.

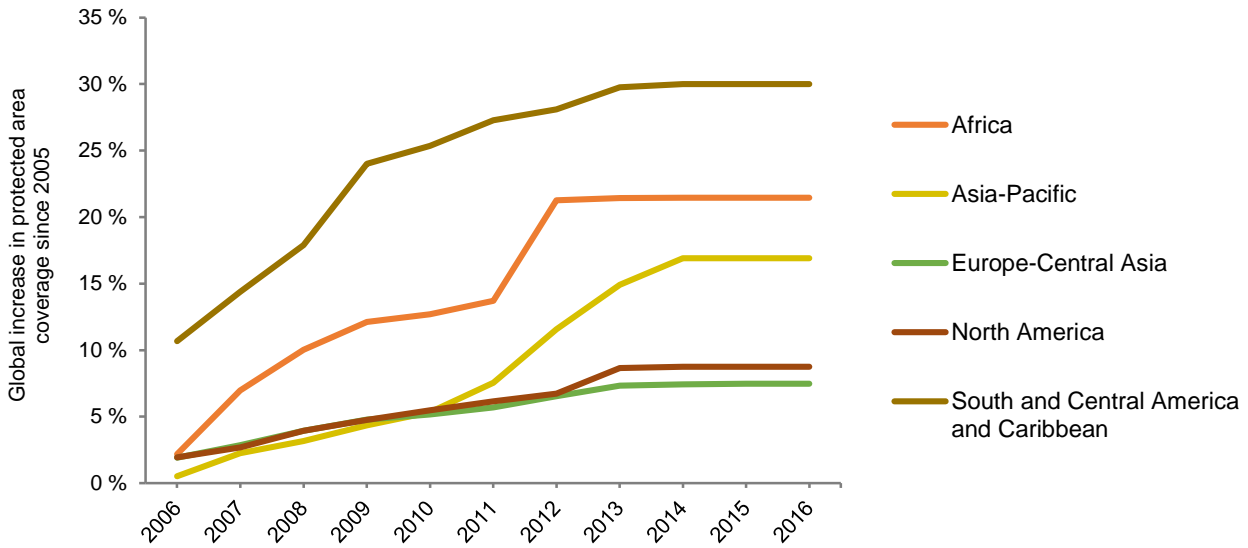


Figure 3: Change in continental region protected area coverage since 2005, in the Exclusive Economic Zone.

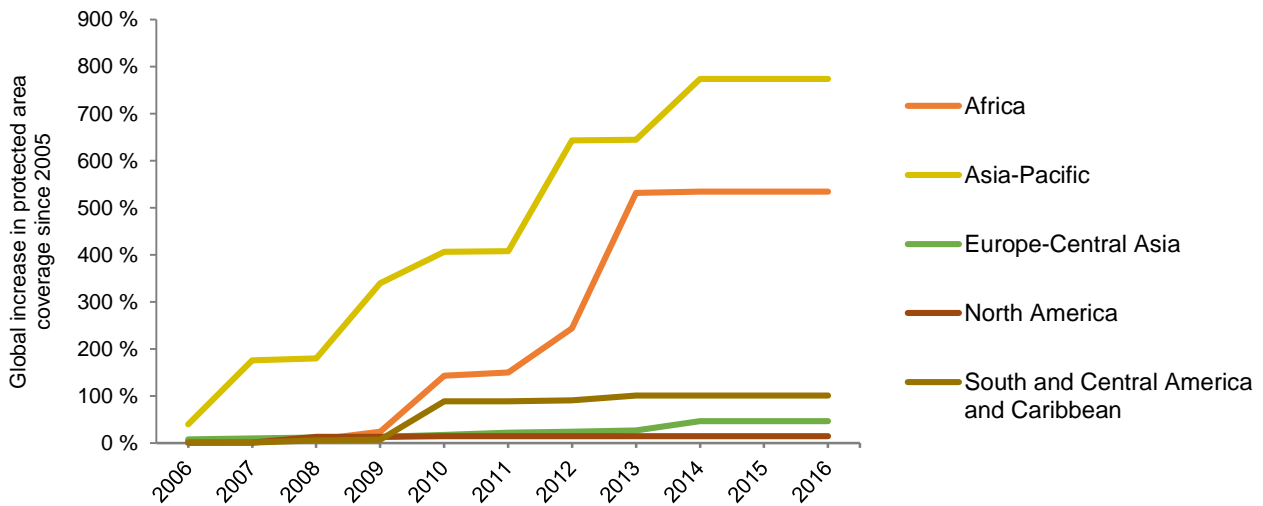
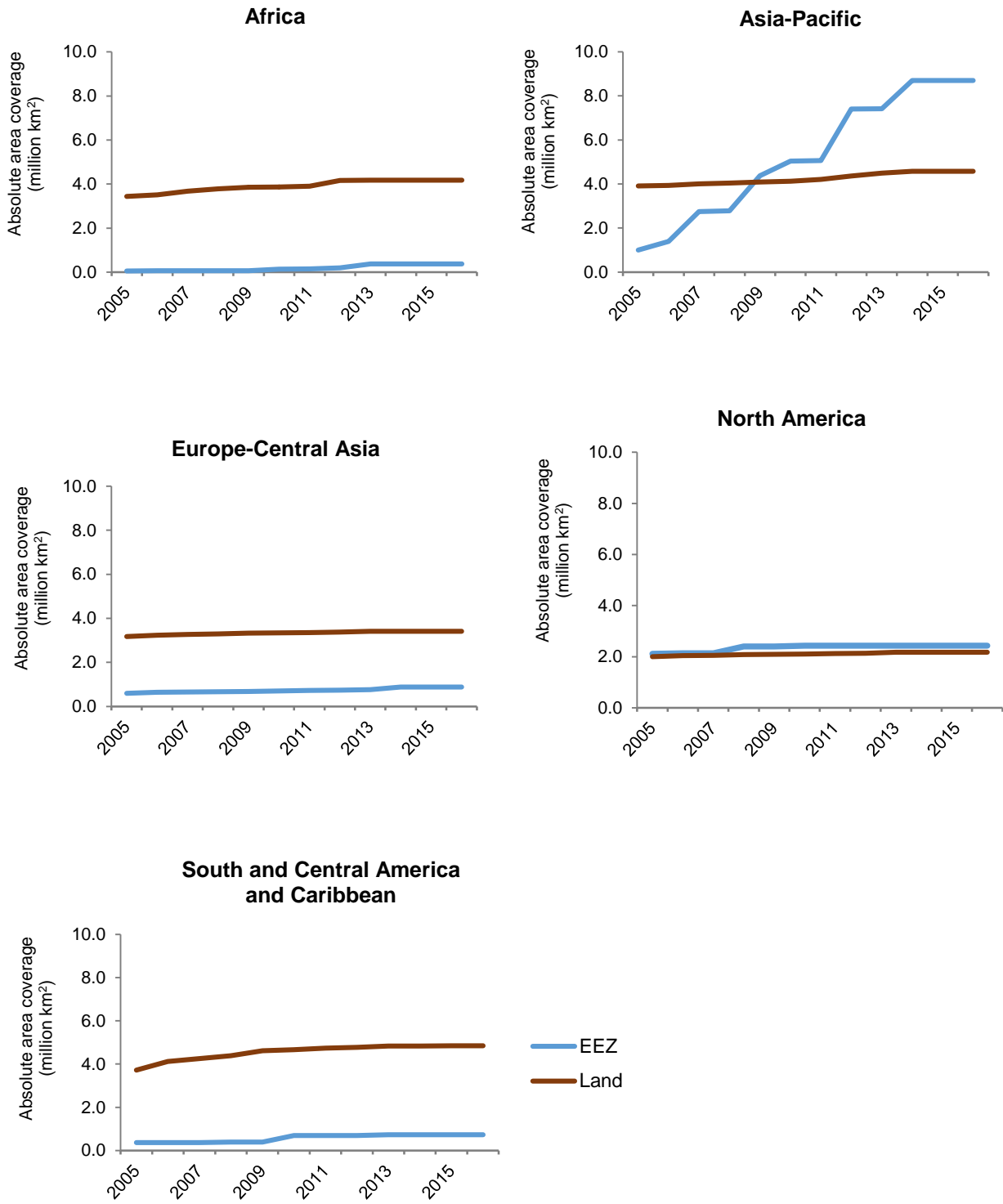


Figure 4: Absolute protected area coverage (in million km²) for each continental region since 2005, differentiating changes in coverage on land (brown) and within the Exclusive Economic Zone (blue).



Appendix 3 - Change in global protected area since 2005, split by IUCN management category, Ramsar sites and World Heritage sites: Supporting data

Table 5: Absolute coverage values (in million km²) for each IUCN category and international designations.

Year	WHS	Ramsar sites	IUCN Ia	IUCN Ib	IUCN II	IUCN III	IUCN IV	IUCN V	IUCN VI	IUCN Not Assigned	IUCN Not Reported
2005	1.80	1.36	0.96	1.11	4.42	0.21	2.16	5.15	2.82	0.17	5.3
2006	1.82	1.45	1.01	1.11	4.48	0.21	2.19	5.22	3.13	0.17	5.44
2007	1.83	1.58	1.02	1.11	4.60	0.21	2.2	5.25	4.71	0.19	5.76
2008	1.86	1.73	1.02	1.11	4.67	0.21	2.2	5.53	4.76	0.19	6.79
2009	1.87	1.79	1.02	1.12	4.74	0.26	2.23	7.06	4.85	0.19	7.14
2010	2.67	1.81	1.18	1.14	4.76	0.26	2.25	7.14	4.89	0.19	7.84
2011	2.67	1.84	1.19	1.15	4.82	0.26	2.36	7.15	4.95	0.19	7.98
2012	2.70	1.90	1.19	1.17	5.70	0.26	3.03	7.21	7.06	0.19	8.26
2013	2.77	2.00	1.19	1.18	5.75	0.33	3.04	7.23	7.09	0.20	8.6
2014	2.80	2.01	1.20	1.18	5.78	0.33	3.04	7.24	8.43	0.27	9.44
2015	2.80	2.01	1.20	1.18	5.78	0.33	3.04	7.24	8.43	0.27	9.44
2016	2.80	2.01	1.20	1.18	5.78	0.33	3.04	7.24	8.43	0.27	9.44

Please note that values for World Heritage sites (WHS) include natural and mixed WHS, and do not account for coverage from cultural WHS.

Table 6: Percentage change (%) of absolute coverage since 2005, by IUCN categories and international designations.

Year	WHS	Ramsar sites	IUCN Ia	IUCN Ib	IUCN II	IUCN III	IUCN IV	IUCN V	IUCN VI	IUCN Not Assigned	IUCN Not Reported
2006	1.1	7.0	5.8	0.4	1.5	0.5	1.3	1.3	11.0	0.6	2.7
2007	1.7	16.1	6.0	0.4	4.1	1.1	1.6	1.9	66.8	13.3	8.6
2008	3.1	27.2	6.2	0.6	5.8	1.7	1.8	7.4	68.8	13.5	28.1
2009	3.9	31.6	6.7	1.2	7.4	23.1	3.2	37.1	71.8	14.2	34.7
2010	47.9	33.0	23.0	2.7	7.9	23.8	3.7	38.5	73.1	14.2	47.9
2011	48.3	35.4	24.7	3.8	9.1	23.9	9.0	38.7	75.4	14.4	50.6
2012	50.0	40.0	23.8	5.7	29.0	24.1	40.0	39.9	150.2	14.7	55.8
2013	53.9	47.2	23.9	6.2	30.2	58.2	40.2	40.5	151.2	20.5	62.2
2014	55.3	48.0	25.1	6.2	30.8	58.3	40.4	40.6	198.7	57.1	78.0
2015	55.3	48.0	25.1	6.2	30.8	58.3	40.4	40.6	198.7	57.1	78.0
2016	55.3	48.0	25.1	6.2	30.8	58.3	40.4	40.6	198.7	57.1	78.0

Please note that values for World Heritage sites (WHS) include natural and mixed WHS, and do not account for coverage from cultural WHS.

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