
Supplementary information

Coastal wetland resilience through local, regional and global conservation

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Supplementary Table 1 Lists of existing estimates of the global extent of coastal wetlands. Area data shown in parentheses, where available, are 95% confidence intervals.

Type of coastal wetland	Time period	Estimation method	Spatial resolution	Coverage	Area (km ²)	References
Tidal marsh	1973	Global extrapolation based regional studies	/	Global	383700	Woodwell et al. (1973) (ref. ¹)
	2003	Compiled from various sources	/	Multiple countries globally	21988	Chmura et al. (2003) (ref. ²)
	2017	Compiled from various sources	*	Multiple countries globally	54951	Mcowen et al. (2017) (ref. ³)
	2019 (1999-2019)	Satellite imagery analysis	30m	60°N-60°S	90800	Murray et al. (2022) (ref. ⁴)
	2020	Satellite imagery analysis	30m	Global	74910	Zhang et al. (2023a) (ref. ⁵)
	2020	Satellite imagery analysis	10m	60°N-60°S	52880 (32030-59780)	Worthington et al. (2024) (ref. ⁶)
Mangrove forest	1983	Compiled from various sources	/	Global	162210	Saenger et al. (1983) (ref. ⁷)
	1980–1985, 2000, 2020	Compiled from various sources	/	Global	165000, 157050, 148000 (134000-162000)	FAO (1994, 2007, 2023) (ref. ⁸⁻¹⁰)
	1992	Compiled from various sources	/	Global	198479	Groombridge et al. (1992) (ref. ¹¹)
	1993	Compiled from various sources	/	Global	198818	Fisher & Spalding (1993) (ref. ¹²)
	1997	Compiled from various sources	**	Global	181077	Spalding et al. (1997) (ref. ¹³)
	2010	Compiled from various sources	**	Global	152361	Spalding et al. (2010) (ref. ¹⁴)
	2011	Satellite imagery analysis	30m	Global	137760	Giri et al. (2011) (ref. ¹⁵)
	2010	Satellite imagery analysis	25m	Global	137600	Bunting et al. (2018) (ref. ¹⁶)
	2010	Satellite imagery analysis	25m	Global	140260	Bunting et al. (2022a) (ref. ¹⁷)
	2020 (1996-2020)	Satellite imagery analysis	25m	Global	147359 (127925-168895)	Bunting et al. (2022b) (ref. ¹⁸)
	2012	Satellite imagery analysis	30m	Global	81849	Hamilton & Casey (2016) (ref. ¹⁹)

	2016	Satellite imagery analysis	25m	Global	135882	Spalding & Leal (2021) (ref. ²⁰)
	2020	Satellite imagery analysis	10m	Global	145068	Jia et al. (2023) (ref. ²¹)
	2020	Satellite imagery analysis	30m	Global	157250	Zhang et al. (2023a) (ref. ⁵)
	2020	Satellite imagery analysis	10m	Global	147526	Leal & Spalding (2024) (ref. ²²)
Tidal flat	2014-2016 (1984-2016)	Satellite imagery analysis	30m	60°N-60°S	127921 (124286-131821)	Murray et al. (2019) (ref. ²³)
	2020	Satellite imagery analysis	30m	Global	122960	Zhang et al. (2023a) (ref. ⁵)
	2020	Satellite imagery analysis	30m	Global	140923	Zhang et al. (2023b) (ref. ²⁴)
All coastal wetlands	2019 (1999-2019)	Satellite imagery analysis	30m	60°N-60°S	354600 (244800-363900)	Murray et al. (2022) (ref. ⁴)
	2020	Satellite imagery analysis	30m	Global	355120	Zhang et al. (2023a) (ref. ⁵)

Notes:

* The scale of the source data ranges from 1:10000 to 1:4000000, mostly from 1:10000 to 1:100000;

** All source regional maps had a base scale finer than 1:500000;

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Supplementary Table 2 Top 10 nations with the greatest areas of all mapped coastal wetlands, tidal marshes, mangrove forests and tidal flats, respectively.

Rank	Total		Tidal marsh		Mangrove forest		Tidal flat	
	Nation	Area (km ²)	Nation	Area (km ²)	Nation	Area (km ²)	Nation	Area (km ²)
1	Indonesia	43599	United States	18495	Indonesia	29064	Indonesia	14365
2	United States	27450	Canada	8508	Brazil	11342	China	11989
3	Australia	20907	Russia	5150	Mexico	9920	Australia	8903
4	Brazil	17784	Argentina	2424	Australia	9916	United States	6642
5	Canada	14934	Australia	2088	Nigeria	8404	Canada	6426
6	Mexico	13550	Mozambique	1341	Myanmar	5300	India	5584
7	China	13373	Mexico	1194	Malaysia	5259	Brazil	5390
8	Nigeria	9658	China	1169	Papua New Guinea	4508	Myanmar	3319
9	India	9086	Brazil	1052	Bangladesh	4490	Vietnam	3108
10	Myanmar	8741	Ukraine	923	Cuba	3527	Argentina	3084

Supplementary Figure 1 Conservation progress for different types of coastal wetlands. (a) Trends in % of protected tidal marshes, mangrove forests, and tidal flats globally towards meeting the Kunming-Montreal Global Biodiversity Framework target of > 30% protection. (b) Trends in the number of reported restoration projects of tidal marshes and mangrove forests globally. Also shown is the reported survival rate of planted species in these restoration projects. Dashed lines indicate the average survival rates (loess smoothing) and shaded areas indicate 95% confidence interval. Data sources for a and b are the same as Fig. 5a and b in the main text, respectively.

