

Topography statistics for the surface and seabed area, volume, depth, and slopes of the world's seas, oceans and countries

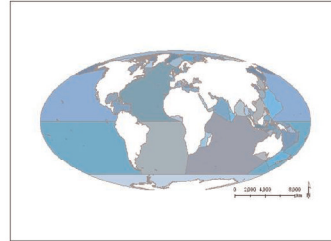
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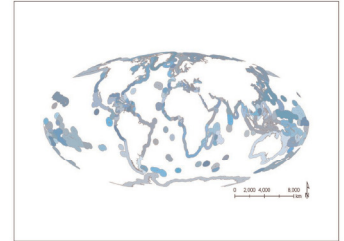
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We produced a new terrain map of the oceans from the best available resolution global bathymetry⁽¹⁾ using a Geographical Information System. From this map, we calculated the following statistics for each sea and ocean, and each country's Exclusive Economic Zone⁽²⁾: sea surface and seabed area, volume, mean, maximum and standard deviation of depth and slope.

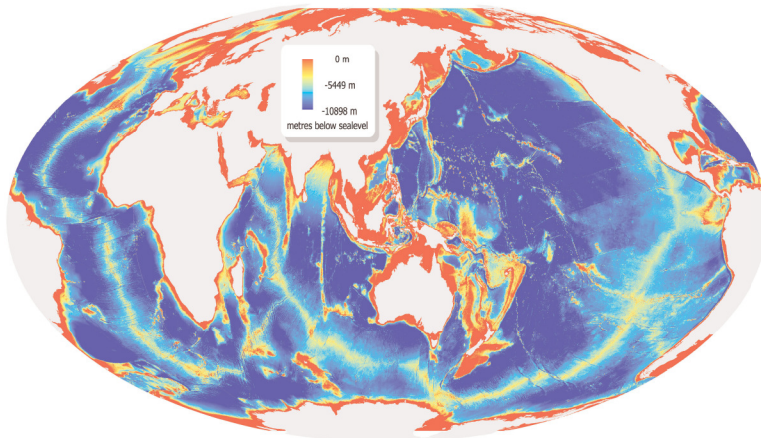
- Total sea surface area, 353 million km²,
- Total seabed area, 354 million km²,
- Total volume, 1 trillion litres or 1.3 billion km³,
- Deepest depth, 10,898 m in Micronesia, North Pacific Ocean



Seas and Oceans

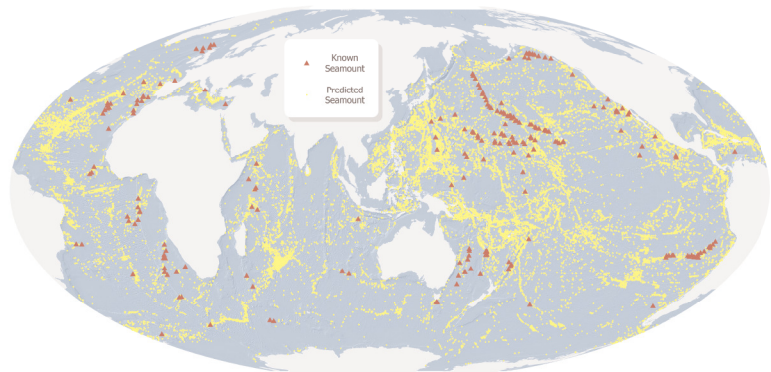


Exclusive Economic Zones



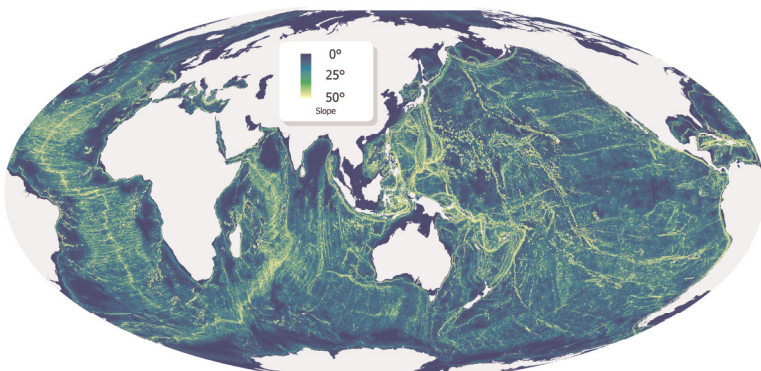
Bathymetry

We predicted locations of 56,741 seamounts (> 1,000 m high) with 74% within 30-min distance of known seamounts. We also identified over 1 million circular seabed features that may be seamounts or sea-hills.



Seamounts Distribution

We found that the ocean was very flat; 71% of seabed had a slope of < 1°. However this significantly underestimates slope due to the source data resolution.



Seafloor Slope

The terrain map and the statistics, produced by standardised methods, should be reproduced when improved primary data become available. They provide a quantitative basis for comparing patterns of marine biodiversity at the species and habitat levels. We suggest the coefficient of variation of seabed slope as an index of topographic variation. It may be no coincidence that Indo-West Pacific islands are the most topographically and biologically diverse region.

Statistics for EEZ with Surface Area > 10,000,000 km²

Country	Surface (km ²)	Seabed (km ²)	Volume (km ³)	Deepest Depth (m)
Antarctica	85,088,677	85,171,570	206,921,779	-6,101
Russia	68,797,163	68,832,335	68,935,058	-9,558
Australia	68,126,648	68,195,006	152,725,829	-6,591
Indonesia	57,763,467	57,879,196	121,219,180	-9,552
French Polynesia	47,363,546	47,473,741	190,698,431	-5,837
Canada	43,725,706	43,742,742	37,474,153	-5,282
New Zealand	40,676,283	40,738,945	100,045,445	-10,188
Japan	39,570,661	39,707,432	147,215,162	-10,340
Alaska	36,484,705	36,543,042	86,667,140	-7,874
Mexico	32,098,304	32,164,178	89,124,315	-6,692
Brazil	31,238,151	31,280,627	82,515,492	-5,571
Micronesia	29,715,482	29,790,607	117,383,085	-10,898
Chile	27,843,788	27,898,097	99,152,909	-8,202
Hawaii	24,526,132	24,596,092	112,124,449	-6,944
United States	23,678,236	23,702,287	43,519,506	-5,307
Papua New Guinea	23,412,784	23,470,352	64,112,538	-9,030
Marshall Islands	19,757,330	19,815,222	91,994,124	-6,557
Cook Islands	19,451,052	19,489,044	90,715,315	-6,642
Greenland	18,114,622	18,124,088	26,000,154	-4,371
Philippines	17,673,266	17,728,632	58,559,961	-10,070
Line Group	16,305,042	16,338,756	76,259,945	-6,418
India	15,993,682	16,004,179	30,874,626	-4,799
Solomon Islands	15,726,410	15,780,929	49,248,402	-9,036
Norway	15,579,486	15,585,444	14,328,272	-5,646
South Georgia and the South Sandwich Islands	14,333,807	14,369,751	49,508,040	-8,159
New Caledonia	14,073,393	14,106,739	38,227,260	-7,410
Seychelles	13,222,039	13,248,098	49,031,344	-5,863
Fiji	12,634,342	12,674,910	34,365,066	-5,859
Mauritius	12,617,243	12,647,736	43,188,403	-5,627
Madagascar	11,779,751	11,791,604	36,554,585	-5,593
Argentina	10,631,604	10,637,936	8,140,333	-5,612
South Africa	10,512,131	10,520,890	26,794,357	-5,719
Kiribati	10,378,255	10,398,004	47,127,217	-6,461

Statistics for Seas and Oceans with Surface Area > 1,000,000 km²

Seas and Oceans	Surface (km ²)	Seabed (km ²)	Volume (km ³)	Deepest Depth (m)
South Pacific Ocean	76,306,593	76,460,453	305,318,447	-10,798
North Pacific Ocean	63,994,578	64,101,721	297,233,417	-10,898
Indian Ocean	57,536,924	57,610,843	232,240,844	-7,907
South Atlantic Ocean	40,017,439	40,069,278	158,743,911	-8,180
North Atlantic Ocean	33,984,447	34,035,110	131,815,360	-8,525
Southern Ocean	21,167,949	21,186,153	70,628,284	-7,412
Philippine Sea	5,631,744	5,652,721	24,598,181	-10,070
Arabian Sea	4,189,089	4,193,429	13,739,945	-5,780
Coral Sea	3,989,352	3,996,418	9,991,039	-9,036
Tasman Sea	3,297,144	3,300,806	11,114,480	-7,376
South China Sea	3,263,814	3,268,632	4,217,928	-5,147
Caribbean Sea	2,819,429	2,828,125	7,219,167	-8,227
Bering Sea	2,377,709	2,380,738	3,993,390	-6,957
Bay of Bengal	2,167,240	2,168,277	5,662,742	-4,481
Sea of Okhotsk	1,623,376	1,624,109	1,297,500	-4,009
Gulf of Mexico	1,516,903	1,518,067	2,344,179	-3,995
Norwegian Sea	1,419,663	1,420,641	2,491,481	-2,566
Barents Sea	1,361,120	1,361,159	231,926	-505
Mozambique Channel	1,355,458	1,356,629	3,100,111	-4,533
Great Australian Bight	1,289,983	1,291,005	4,060,353	-6,095
Mediterranean Sea - Eastern Basin	1,155,715	1,157,541	1,954,656	-4,878
Greenland Sea	1,107,521	1,108,818	1,660,577	-5,662
Japan Sea	1,042,032	1,043,584	1,629,936	-4,578

Further statistics are available from the authors

Data sources

⁽¹⁾ Global topography V12.1 (Sandwell 2009 http://topex.ucsd.edu/MWW_html/mar_topo.html) – a 1-min dataset produced from satellite measured gravitational anomaly with a spatial accuracy of 20-160 km trained against depth measurements from ships which have an accuracy of about 2 km. Thus while the resulting map has a spatial resolution of 2-minutes (ca. 2 km at equator) it will overlook depth variations smaller than 20 km (e.g. sea hills).

⁽²⁾ Maps of world's seas, oceans and country's EEZ from www.vliz.be/AmdcdData/Alimar