

**The  
Economist**

**INTELLIGENCE  
UNIT**

# **COASTAL GOVERNANCE INDEX 2019**



# Contents

About this report	2
Acknowledgements	4
Executive summary	5
Introduction	8
Policy and institutional capacity	11
Business environment for coastal activities	15
Water quality	17
Minerals, energy and shipping	23
Land	29
Living resources	33
Conclusion	36
Appendix: Methodology	37
1. Summary	37
2. Categories and scoring criteria	38
3. Methodology	46

## About this report

The Coastal Governance Index is an Economist Intelligence Unit (EIU) study. With the support of the David & Lucile Packard Foundation, CEA Consulting commissioned this research. Robert Smith was the project manager. Ayesha Khan provided research, analytical and editorial support.

The index is based on wide-ranging desk research and comprises 26 indicators and 47 sub-indicators across six thematic categories:

- 1 Policy and institutional capacity
- 2 Business environment for coastal activities
- 3 Water quality
- 4 Minerals, energy and shipping
- 5 Land
- 6 Living resources

The categories, and the individual criteria within them, are weighted according to a scheme developed in consultation with CEA Consulting. Additional details on methodology and all indicators can be found in *Appendix: Methodology* at the end of this report.

The EIU bears sole responsibility for the content of this report. The findings do not necessarily reflect the views of the commissioning organisations.

The complete index, as well as the detailed scoring for each country, is publicly available at:

[www.woi.economist.com/coastal-governance-index-2019/](http://www.woi.economist.com/coastal-governance-index-2019/)

## About The Economist Intelligence Unit

The Economist Intelligence Unit (EIU) is the research arm of The Economist Group, publisher of *The Economist*. As the world's leading provider of country intelligence, it helps governments, institutions and businesses by providing timely, reliable and impartial analysis of economic and development strategies. Through its public policy practice, the EIU provides evidence-based research for policymakers and stakeholders seeking measurable outcomes, in fields ranging from gender and finance to energy and technology. It conducts research through interviews, regulatory analysis, quantitative modelling and forecasting, and displays the results via interactive data visualisation tools. Through a global network of more than 900 analysts and contributors, the EIU continuously assesses and forecasts political, economic and business conditions in more than 200 countries. For more information, visit [www.eiu.com](http://www.eiu.com).

## About CEA Consulting

Since 1984 CEA Consulting has worked at the nexus of markets, policy and science to address environmental challenges around the world. CEA helps to strengthen the philanthropic community by designing, managing, supporting and evaluating environmental grants and investments. CEA currently supports over a dozen foundations and major NGOs. CEA's expertise includes depth in ocean and fisheries issues, climate change and energy policy, and sustainable agriculture and forestry.

## About the David and Lucile Packard Foundation

For more than 50 years, the David and Lucile Packard Foundation has worked with partners around the world to improve the lives of children, families, and communities—and to restore and protect our planet.

## Acknowledgements

The following experts, researchers, country analysts and specialists contributed to this report. We thank them for their contributions:

### Country analysis:

Diane Alarcon, Laura Ediger, Peter Laurens, Jaekwon Lim, Sastre Consulting and Nick Wolf.

### Model and report production:

Marcus Krackowizer developed the model, while the report was written by Carol J. Clouse, copy edited by Peter Ouvry, and designed and laid out by Mike Kenny.

Jackie Savitz (Oceana), Susan Ruffo (Ocean Conservancy, The Circulate Initiative) and Emily Pidgeon (Conservation International) provided expert input on blue carbon, ocean plastics and offshore drilling as they relate to coastal governance.

## Executive summary

For six months in 2018, the Philippines' Boracay Island, famous for its powdery white sand and raucous beach parties, folded up its welcome mat and told tourists to stay away.<sup>1</sup>

Like many of the world's charming and beautiful places, the island had fallen victim to its own popularity, to the modern phenomenon of overtourism.<sup>2</sup> The booming industry that had become Boracay's economic lifeblood had also nearly destroyed everything that made it beautiful and charming to begin with—raw sewage leaked from an overtaxed drainage system into the turquoise waters and trash littered the streets.

In April 2018, the Philippine president, Rodrigo Duterte, ordered the island, which he described as a “cesspool”, closed to tourists. Workers carted away tons of garbage, and an upgrade of the sewage and drainage systems began. Officials cracked down on non-compliant businesses—nearly 200 hotels, resorts and restaurants that had failed to install their own wastewater treatment tanks—and passed new measures against littering, pets on the beach, and drinking and smoking in public places.<sup>3</sup> The closure put 17,000 hotel, restaurant and other tourism workers on a six-month furlough and cost an estimated US\$1bn in lost tourism revenue.<sup>4</sup>

By the time the island reopened in October—with new rules limiting the number of tourists to 6,000 a day—turtles and sharks were returning to the waters.<sup>5</sup> Some locals told journalists that, despite the economic pain, it was worth it, while some business owners simply picked up and moved to other beaches.<sup>6</sup>

The story of Boracay Island illustrates the challenge that coastal nations face as they attempt to establish coastal management practices that consider the views of the private sector while ensuring sustainable practices in industries such as fishing, energy and tourism. The Economist Intelligence Unit's 2019 Coastal Governance Index, an assessment of government regulation and management of coastal and marine areas across 20 key ocean economies, suggests that progress is being made in some areas.

In this report, we discuss the findings of the 2019 Coastal Governance Index. This includes real-world examples to highlight cases where countries have made improvements since the first Coastal Governance Index was developed in 2015 and instances where more progress is needed. Specifically, we highlight best practices and areas for improvement across two “fundamental” categories (Policy and institutional capacity and Business environment for coastal activities) and four “asset” categories (Water quality; Minerals, energy and shipping; Land; and Living resources).<sup>7</sup> We also note

1 The New York Times. “Idyllic Philippine Resort Island of Boracay Is Closed to Tourists”. 2018. <https://www.nytimes.com/2018/04/04/world/asia/boracay-philippines-tourists-closed.html>

2 Responsible Travel. “Overtourism – What is it, and how can we avoid it?” <https://www.responsiblevacation.com/copy/what-is-overtourism>

3 Time. “The Philippines Most Popular Island Is Shutting Down for Sewage Cleanup”. 2018. <https://time.com/5228802/philippines-duterte-close-boracay-6-months/>

4 The Washington Post. “Philippines reopened paradise after six-month cleanup. So why isn't everyone happy?” 2018. [https://www.washingtonpost.com/world/asia\\_pacific/philippines-reopened-paradise-after-six-month-cleanup-so-why-isnt-everyone-happy/2018/12/02/3af02f92-f038-11e8-8b47-bd0975fd6199\\_story.html?utm\\_term=.e17304e3bcfa](https://www.washingtonpost.com/world/asia_pacific/philippines-reopened-paradise-after-six-month-cleanup-so-why-isnt-everyone-happy/2018/12/02/3af02f92-f038-11e8-8b47-bd0975fd6199_story.html?utm_term=.e17304e3bcfa)

5 The Telegraph. “What's happening in Boracay, the island paradise ruined by tourism?” 2018. <https://www.telegraph.co.uk/travel/destinations/asia/philippines/articles/boracay-closure-when-will-island-reopen/>

6 The Philippine Star. “Was 6-month Boracay closure worth it? Stakeholders weigh in.” 2018. <https://www.philstar.com/headlines/2018/10/28/1863784/was-6-month-boracay-closure-worth-it-stakeholders-weigh-in>

7 For additional information on the Coastal Governance Index research framework, including the selection criteria for the 20 countries included in the index, please refer to Appendix: Methodology at the end of this report.

recent attempts to gut environmental regulations, particularly in the US and Brazil, and we explain what this means for the coastlines of the countries concerned.

### The key findings are:

**Most countries have made progress in balancing coastal sustainability and economic interests since 2015, but even the highest-scoring countries have room for improvement.** Norway maintains the top spot overall in this year's index, the result of a strong policy and business environment for coastal development, but it could do more to establish marine protected areas (MPAs), a key tool to protect marine ecosystems in the face of climate pressure. The US (ranked second) and New Zealand (third) trade places this year. Both countries have strong business environments and fisheries management systems, but lag in various aspects of policy. Nigeria (19th) and Russia (20th), which continue to lack national coastal management policies and strategies, have made little or no progress and remain at the bottom of the index.<sup>8</sup>

**Progress has been particularly notable in emerging markets in Latin America and South-east Asia.** Peru, for example, added a broad domestic coastal management strategy in 2015, shortly after the publication of the previous iteration of this index. Mexico and the Philippines stand out as the only two countries

in the index that mention the use of "blue carbon"<sup>9</sup> for both climate change mitigation and adaptation in their Nationally Determined Contributions (the blueprint that each country created for reducing greenhouse gas emissions under the 2015 Paris Climate Agreement). Chile has made notable improvements to the conservation of living resources, expanding its total MPA to more than 40% of its waters and engaging local communities in the planning and management of coastal ecosystems. Meanwhile, in 2017 Indonesia created the Indonesian Ocean Policy, an extensive strategy for sustainable coastal management.

**Most countries have well-developed water resource management systems, leading to high scores in the index's measure on water quality.** The reason for the consistency and strength in the scoring on this metric is that all 20 countries have national agencies responsible for setting freshwater pollution controls, standards for point source pollution (pollution that comes from a single, identifiable source) and penalties for violating those standards. However, Russia, Nigeria and the South-east Asian countries still have much work to do to clean up coastal areas and waterways and to improve on their past lax policies and enforcement of water resource management. This will require significant co-ordination with the local authorities and water utilities that are typically charged with maintaining water systems, managing pollution and waste, and providing residents with clean drinking water. Indonesia and the Philippines are taking steps towards cleaning up rivers and coastlines, although time will tell whether these efforts will produce long-term, sustained results.

<sup>8</sup> Note: As a result of modifications to the 2015 and 2019 indicator framework, as well as a new weightings system, direct comparisons between rankings in the 2015 Coastal Governance Index and 2019 Coastal Governance Index are not possible. In addition, the results from the 2015 Coastal Governance Index were thoroughly reviewed and researched again to ensure accuracy. In a limited number of cases, research indicated that new information had become available, a relevant law or regulation had not been captured or researchers had disagreed on a score. In those instances, the EIU revised the 2015 scores to reflect the most accurate data. Rescoring the 2015 data was necessary so that the 2019 Coastal Governance Index could capture accurate comparisons.

<sup>9</sup> "Blue carbon" refers to carbon stored and sequestered in coastal and marine ecosystems, such as mangrove forests or intertidal saltmarshes.



The closure of Boracay Island is part of a larger effort to improve water quality in the Philippines, which we highlight in the Water quality section below.

**More effort is needed across all countries to improve management of fisheries and other living resources in coastal areas.**

While there have been some improvements in the index's Living resources category since 2015, most notably in South America and South-east Asia, the movement on fisheries governance and management has been split, with about half the scores improving and half declining (albeit only slightly in either direction). A number of countries, including China, Indonesia, Mexico, Peru and the Philippines, have improved their efforts to control invasive species through ballast water treatment. In addition, nine of the 20 countries have signed up to the Port State Measures Agreement (PSMA) since 2015. Twelve countries in total are party to the PSMA, which is the first binding international agreement specifically to target illegal, unreported and unregulated fishing. However, considering the planet's biodiversity crisis, particularly with regard to overfished seas and deteriorating coral reefs, progress must be made at a much faster pace. At the present rate, the UN target to protect 10% of the earth's marine area by 2020 is unlikely to be met (global coverage is currently at 7.59%)—much less the more ambitious goal of 30% by 2030, which many scientists believe is necessary for recovering ocean health and sustaining our growing human population in the future.

**The index reveals a connection between effective coastal governance and the national level of human development.**

The overall scores on the Coastal Governance Index have a strong correlation (0.72) with the scores on the Human Development Index, which assesses countries' development levels

by looking at life expectancy, education and income per capita.<sup>10</sup> This suggests that countries which are successful at achieving high levels of human development also do a better job of protecting the natural environment. It may also suggest that these same countries balance environmental sustainability and economic development more successfully. Russia (20th) and South Africa (10th) are the two outliers, with the latter having made much more progress around coastal governance than the former.

**Striking a balance between environmental and economic interests can be difficult given the opportunities presented by coastal development.**

Tourism is a prime example of that difficulty, with some of the index's overall lowest scores coming under the sub-indicator on sustainable tourism. However, proponents of the "blue economy"<sup>11</sup> argue that this balance can be reached. The aquaculture industry, for example, has been responsible for much of the coastal deforestation in countries like Indonesia, which has lost 40% of its mangrove forests, but with the implementation of sustainable practices the industry can continue to provide food for a growing human population with limited environmental impact. Likewise, offshore wind provides an alternative energy source to offshore oil and gas, without the same risks to marine environments. Environmental concerns remain fundamental to creating sustainable, steady and long-lasting economic development along the coasts.

<sup>10</sup> United Nations Development Programme (UNDP). "Human Development Index (HDI)". <http://hdr.undp.org/en/content/human-development-index-hdi>

<sup>11</sup> Defined by the World Bank as the sustainable use of ocean resources for economic growth, improved livelihoods and jobs while preserving the health of ocean ecosystems.



## Introduction

In the years since The Economist Intelligence Unit (EIU) published its first Coastal Governance Index study in 2015, a greater sense of awareness around ocean health and coastal resilience has taken hold. For coastal nations, protecting these fragile ecosystems while serving economic interests has always been a challenge, with economics more often than not taking priority over conservation. Now, with the stakes increasingly high (owing to climate change, ocean pollution and other challenges), the traditional mindset which saw these interests as pitted against one another is shifting to one that recognises the economic importance of vibrant coastal ecosystems, the opportunities of a sustainable “blue economy”, and the financial and social risks of business as usual.

The importance of achieving a balance between coastal development and sustainability is underscored by three sobering reports from 2018 and early 2019, which warn that climate change and related crises are even worse than previously believed. Failure to act, they say, will result not only in catastrophic environmental destruction but also in severe economic damage, and human activity now threatens roughly 1m plant and animal species with extinction.<sup>12 13 14</sup>

For coastal and marine ecosystems, the threats include extreme overfishing, ocean acidification and warming temperatures, industrial and

agricultural pollution, and plastic waste. Roughly one-third of marine mammals, sharks and reef-forming corals are threatened with extinction, and more than 85% of wetlands had been lost by 2000.<sup>15</sup> If these crises continue unabated, coastal populations will suffer even harsher storms and more severe flooding than those that we have already begun to see, and we could witness a mass die-off of coral reefs, which would have a knock-on effect for fish and other marine stocks.

Nonetheless the reports stress that we still have time to counter the worst effects of the climate and biodiversity emergencies if we act quickly. This makes the national policies that governments enact now, and the speed at which they follow through on their policies, all the more crucial. The importance of quick action and of engaging all stakeholders—non-governmental organisations, the private sector and local communities—cannot be overstated.

The 2019 Coastal Governance Index finds that most countries have made progress in balancing coastal sustainability and economic interests since the first index was released in 2015. This is an important development given the dire outlook highlighted in the reports noted above. Yet, despite improvements in the conditions for good coastal governance, even the highest-scoring countries in the index have room for further improvement.

Norway maintains the top spot overall in this year's index, the result of a strong policy and business environment for coastal development—but it could do more to establish marine protected areas (MPAs), a key tool

12 The Intergovernmental Panel on Climate Change (IPCC). “Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C approved by government”. 2018. <https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/>

13 US Global Change Research Program. “Fourth National Climate Assessment – Volume II: Impacts, Risk, and Adaptation in the United States”. <https://nca2018.globalchange.gov/>

14 United Nations (UN). “UN Report: Nature’s Dangerous Decline ‘Unprecedented’; Species Extinction Rates ‘Accelerating’”. 2019. <https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/>

15 Ibid.

Figure 1

**Coastal Governance Index 2019: Overall performance**

Rank	Country	Score	Rank	Country	Score	Rank	Country	Score	Rank	Country	Score
1	Norway	89.5	11	Mexico	74.1	19	Nigeria	48.7			
2	United States	85.4	12	Brazil	73.1	20	Russia	44.6			
3	New Zealand	84.4	13	China	73.0						
4	Japan	83.4	14	Indonesia	72.6						
5	France	83.3	15	Philippines	71.4						
6	Chile	82.3	16	Peru	69.5						
7	Spain	80.3	17	Vietnam	65.0						
8	South Korea	80.2	18	India	61.6						
9	Canada	78.6									
10	South Africa	75.7									

to protect marine ecosystems in the face of climate pressure. The US and New Zealand rank second and third respectively, a result of both strong business environments and fisheries management systems. But they both lag in varying aspects of policy. Nigeria (19th) and Russia (20th), which continue to lack national coastal management policies and strategies, have made little or no progress and remain at the bottom of the index.

Mexico has made the most notable progress in the index (from 18th in 2015 to 11th in 2019), through enhanced protection of coastal lands, control of invasive species through the treatment of ships' ballast water, and new policies to address the climate crisis. Mexico's "blue carbon" policies are highlighted in one of this report's three case studies, which describes the country's plan to protect and restore coastal mangrove forests to both mitigate and adapt to a warming climate.

With its robust and comprehensive environmental regulations, the US scores well overall on the index. However, it is important to note that the government's priorities and policies are shifting. Since before taking office, the US president, Donald Trump, has consistently pledged an aggressive rollback of environmental rules, arguing that they hinder economic growth and development. Among other changes, Mr Trump has sought to end protection for public lands and endangered species and has moved to deregulate the fossil fuel industry. While many of these changes are still being reviewed in the US judicial system, this represents a significant shift from previous policies which boosted the US near the top of the index. The current administration's plan to open up vast swaths of the US coastline to offshore drilling faces opposition from environmental activists and coastal business interests—a story that we tell in another of this report's three case studies.

In a third case study, we dig into the crisis of ocean plastic pollution, an issue that over the past few years has entered the public consciousness to an unprecedented extent. The phenomenon even has a name, the “Blue Planet effect”, a term coined to describe the spike in public awareness following the airing of the Blue Planet II television series by the UK's BBC in late 2017.<sup>16</sup> Famously narrated by David Attenborough, the series' final episode shocked viewers with heartbreaking images of affected marine life, such as a sperm whale trying to eat a discarded plastic bucket. The incentive to keep plastic trash out of our waterways is economic as well as environmental, with the crisis costing society billions of dollars each year in lost and damaged resources.<sup>17</sup>

<sup>16</sup> Global Citizen. “88% of People Who Saw ‘Blue Planet II’ Have Now Changed Their Lifestyle”. <https://www.globalcitizen.org/en/content/88-blue-planet-2-changed-david-attenborough/>

<sup>17</sup> Beaumont, Nicola J et al. “Global ecological, social and economic impacts of marine plastic.” *Marine Pollution Bulletin*. Volume 142. May 2019. Pages 189-195. <https://www.sciencedirect.com/science/article/pii/S0025326X19302061>

## Policy and institutional capacity

**Figure 2**  
**Policy and institutional capacity:**  
**Scores and rankings**

Rank	Country	Score
=1	Norway	88.5
=1	South Africa	88.5
=1	South Korea	88.5
4	Indonesia	86.5
=5	Japan	84.6
=5	Philippines	84.6
=5	Spain	84.6
=5	Vietnam	84.6
=9	Canada	80.8
=9	France	80.8
=9	United States	80.8
12	Brazil	76.9
13	Mexico	76.3
14	China	73.1
AVERAGE		71.5
15	Chile	71.2
16	New Zealand	63.5
17	India	59.6
18	Peru	44.2
19	Nigeria	23.1
20	Russia	9.6

● Score 75.1 to => 100   ● Score 50.1 to => 75  
● Score 25.1 to => 50   ● Score 0 to => 25

Source: The Economist Intelligence Unit.

This category comprises seven indicators and 11 sub-indicators related to the policy and institutional capacity of governments with regard to coastal management. In addition to a new sub-indicator that captures mitigation efforts to increase blue carbon, this category assesses the extent to which a coastal management strategy exists, is implemented and engages different stakeholders in the process. The participation of the private sector in coastal governance planning is important in order to ensure economic development. At the same time, it should not come at the expense of social and environmental degradation.

Norway, South Africa and South Korea share the top spot in this category, with South Korea's ranking having improved significantly (by 12 places) since 2015. The improvement has been largely due to the country's enactment of the Act on Maritime Spatial Planning and Management, which took effect in April 2019.

As countries increase efforts to balance environmental and economic interests and preserve natural environments, maritime spatial planning (MSP) has become an important coastal management tool. South Korea's law requires the Ministry of Oceans and Fisheries to develop and implement a ten-year plan that designates and regulates different coastal and marine areas for specific purposes such as fishing, tourism, resource development, environmental preservation, harbour operations and military activities.

Indonesia, which ranks fourth in this category (up six places since 2015), has also made significant progress in its policy efforts. This is largely due to the creation of the Indonesian Ocean Policy (IOP), which was unveiled by the minister of the Co-ordinating Ministry for Maritime Affairs in 2017. The IOP includes optimal and sustainable management of ocean resources, implementation of good ocean

governance, rules on MSP (which includes coastal areas), development of the welfare of people in coastal areas and on small islands, and protection of the marine environment. The decree includes a total of 76 policies and strategies under seven pillars. One of the six principles of the IOP is the blue economy, which integrates land and maritime development and considers resource and environmental carrying capacity.

Indonesia faces serious environmental problems, not limited to its coastal and marine environments. The majority of the country's fisheries are fully exploited or overexploited, and illegal fishing practices are common. In three decades, Indonesia has lost 40% of its coastal mangroves. And like other countries in South-east Asia, the country's waterways are polluted by industrial effluent, sewage and plastic waste. However, the country is moving in the right direction with concerted efforts to clean up coastal waters and restore natural habitats.

Of the 20 countries in the index, only Russia and Nigeria—which continue to occupy the lowest two spots in this category—have no apparent policy guiding coastal management. When the 2015 index was published, these two nations, along with Peru, lacked such a policy. However, the South American country added a domestic coastal management strategy later that year. Issued by the country's Ministry of Environment, the Guidelines for the Integrated Management of Coastal Zones (ICZM) contains seven strategic guidelines, which include strengthening governance and co-ordination, implementing ecosystem-based policies, improving environmental conditions, increasing knowledge via research, and ensuring social participation in the management of coastal areas. Peru's broader environmental policy documents also provide guidance for

coastal management, including promoting sustainable use of resources and conservation of biodiversity, promoting research in coastal zones, and implementing planning in coastal zones using ecological and economic zoning practices.

Finally, it is important under the policy category this year to draw attention to Brazil (which ranks 12th in this category). Brazil is an environmentally critical country (roughly 60% of the Amazon rainforest is contained within its borders), and has seen swift changes to environmental policy since the election of a new administration. Since the current president, Jair Bolsonaro, took office in January 2019, he has sought to weaken the powers of the country's environmental regulators and to eliminate environmental rules in the name of economic growth.<sup>18 19 20</sup> Both he and his environment minister, Ricardo de Aquino Salles, have denied climate science and want to expand industrial activities in protected areas. One example includes government plans to auction several offshore fields in the country's north-east that have been earmarked as "highly sensitive areas" by Brazil's environment institute.<sup>21</sup> A study by the institute said that oil spills in these blocks could lead to the destruction of the Abrolhos islands, an area of 568 sq km that is home to a marine national park.

<sup>18</sup> The Washington Post. "Brazil reduces top environment council, trims independents". 2019. [https://www.washingtonpost.com/world/the\\_americas/brazil-reduces-top-environment-council-trims-independents/2019/05/30/7cc1c2d0-82f2-11e9-b585-e36b16a531aa\\_story.html?utm\\_term=.b0017ad48847](https://www.washingtonpost.com/world/the_americas/brazil-reduces-top-environment-council-trims-independents/2019/05/30/7cc1c2d0-82f2-11e9-b585-e36b16a531aa_story.html?utm_term=.b0017ad48847)

<sup>19</sup> The Guardian. "Exterminator of the future: Brazil's Bolsonaro denounced for environmental assault". 2019. <https://www.theguardian.com/world/2019/may/09/jair-bolsonaro-brazil-amazon-rainforest-environment>

<sup>20</sup> The Associated Press. "Brazil's Bolsonaro eyes new body for environmental policy". 2019. <https://www.apnews.com/969e0de9f0fc4c8e9f5e1a951c6766da>

<sup>21</sup> The Associated Press. "AP Explains: Brazil's environmental changes under Bolsonaro". 2019. <https://www.apnews.com/6ba1d372640641749278a3054f3a47d4>

## The value of blue carbon

The mangrove forests that line the shores of the earth's tropical regions are special not only because they protect coastal communities from storms and floods, help to prevent erosion, provide a habitat for hundreds of fish species and other marine life, and filter pollutants and contaminants out of coastal waters. They also thrive in saltwater, unlike the vast majority of trees and shrubs, which makes them even better—two to four times better per area of coverage—at storing carbon than tropical forests.<sup>22</sup> That is because, in addition to the carbon captured and stored by the root systems of the mangrove trees, the saltwater traps carbon in the soil below. Other coastal wetland ecosystems—tidal marshes and seagrass meadows—are similarly efficient. This concept of carbon storage and sequestration by coastal ecosystems is referred to as “blue carbon”.

“Whereas in a dryland forest almost all the carbon goes into the trees, in a mangrove area at least 50-90% of the carbon is stored in soil below,” Emily Pidgeon, senior director of the Blue Climate programme at Conservation International, explains. “Most of the carbon going into terrestrial soil cycles back into the atmosphere, but in these saltwater systems the carbon gets locked in there for millennia.”

These ecosystems are highly valuable. In Mexico, for example, mangrove-related fisheries in the Gulf of California contribute roughly US\$37,500 per hectare per year to the country's economy.<sup>23</sup> Still, it is the two-for-one climate benefit of mitigation and adaptation that makes these blue carbon systems particularly valuable in terms of the climate crisis.

Home to 5% of the world's mangroves, Mexico is leading the way in blue carbon policy.<sup>24</sup> Mexico is one of only two countries in the index (the Philippines is the other) that mention the mitigation and adaptation benefits of blue carbon in their Nationally Determined Contributions (NDCs). NDCs is the term used to describe each country's intended reductions in greenhouse gas emissions under the Paris Climate Agreement. The country's National Climate Change Strategy guarantees the restoration, connectivity, sustainable use and conservation of ecosystems, including coastal areas and oceans. This includes requiring the government to collaborate in the restoration of coastal mangroves. The General Climate Change Law also calls for the conservation of ecosystems and biodiversity, focusing on marshes, mangroves and coral reefs that provide environmental services fundamental to reducing vulnerability to climate change. In addition, it urges the government to implement programmes to assist in the adaptation of coastal and marine areas.

In the last 50 years, 30-50% of the world's mangrove forests have been lost, largely to aquaculture and other forms of coastal development.<sup>25</sup> Today, mangrove deforestation continues at a rate of 1% each year. Still, there is huge potential for restoration. In Mexico, the Philippines and Indonesia, as

22 The Blue Carbon Initiative. “About Blue Carbon”. <https://www.thebluecarboninitiative.org/about-blue-carbon>

23 Aburto-Oropeza, O et al. “Mangroves in the Gulf of California increase fishery yields”. *Proceedings of the National Academy of Sciences*. 105(30):10456-9. July 2008. [https://www.researchgate.net/publication/51419110\\_Mangroves\\_in\\_the\\_Gulf\\_of\\_California\\_increase\\_fishery\\_yields](https://www.researchgate.net/publication/51419110_Mangroves_in_the_Gulf_of_California_increase_fishery_yields)

24 National Geographic. “The Mangroves of Mexico – By Numbers”. 2015. <https://blog.nationalgeographic.org/2015/02/03/the-mangroves-of-mexico-by-numbers/>

25 American Forests. “Mangroves in the Mist: Coastal mangrove forests need conservation, and fast”. 2012. <https://www.americanforests.org/magazine/article/mangroves-in-the-mist/>



well as a number of other countries, non-profits have teamed up with government agencies and local communities on various restoration projects in recent years.

"We have projects in the Philippines where we're helping communities restore their mangroves as a way of protecting themselves from big storms that come through," Dr Pidgeon says. "These are very poor communities; they don't have the means to build seawalls, but they do, with some guidance, have the capacity to restore their natural coastal protection."

Indonesia has nearly 100,000 km of coastline, home to 23% of the world's mangroves (although the country has lost roughly 40% of its mangroves overall), as well as peatlands, seagrass meadows and coral reefs. The country's seagrasses and mangroves store at least 17% of the world's blue carbon.<sup>26 27</sup> Here, too, the government has begun the research that will allow it to include blue carbon in its national greenhouse gas calculation, Dr Pidgeon says.

"Some of the largest areas of mangroves in the world are in Papua [Indonesia], and they're still intact at this point," she said. "We're working with the government to go in and measure how much carbon is in these ecosystems and work out how we can leverage that to create a climate policy or carbon market to maintain these systems."

Because coastal ecosystems do such a good job of sequestering carbon, they not only serve as a crucial part of the solution to rising global temperatures, but also pose a significant danger if they suffer further degradation. Experts believe that emissions from mangrove deforestation could be as high as 10% of total global deforestation emissions, even though mangroves account for only 0.7% of tropical forest area.<sup>28</sup>

"We should be accelerating restoration of these ecosystems, and we should be doing everything we can to conserve the ones that are left," Dr Pidgeon says. "It's very doable, but it's not trivial to do it. It takes a bit of know-how to do it properly."

26 Alongi et al. "Indonesia's blue carbon: a globally significant and vulnerable sink for seagrass and mangrove carbon". *Wetlands Ecology and Management*. 2016. 24(1): 3-13. <https://www.cifor.org/library/5673/>

27 American Forests. "Mangroves in the Mist: Coastal mangrove forests need conservation, and fast". 2012. <https://www.americanforests.org/magazine/article/mangroves-in-the-mist/>

28 The Blue Carbon Initiative. "About Blue Carbon". <https://www.thebluecarboninitiative.org/about-blue-carbon>



## Business environment for coastal activities

**Figure 3**  
**Business environment for coastal activities:**  
**Scores and rankings**

Rank	Country	Score
1	Canada	91.8
2	Norway	91.7
3	New Zealand	91.2
4	United States	91.0
5	Japan	88.1
6	France	87.7
7	Chile	77.7
8	South Korea	77.1
9	Spain	76.8
	<b>AVERAGE</b>	<b>64.7</b>
10	South Africa	58.1
11	China	54.1
12	Mexico	51.3
13	Brazil	51.1
14	India	49.6
15	Peru	47.9
16	Indonesia	47.4
17	Philippines	46.4
18	Vietnam	45.5
19	Russia	40.6
20	Nigeria	28.3

● Score 75.1 to => 100 ● Score 50.1 to => 75  
● Score 25.1 to => 50 ● Score 0 to => 25

Source: The Economist Intelligence Unit.

This category comprises four indicators and nine sub-indicators related to the business environment and is the only category in the index focused exclusively on the interests of the private sector. Specifically, the category assesses the environment for private-sector activities in coastal areas, such as the ease of doing business, corruption perceptions, the effectiveness of dispute resolution mechanisms and the quality of coastal infrastructure.

Canada maintains the top ranking in this category, followed by Norway, New Zealand and the US. All four of the top-ranking countries see improvements in their scores relative to 2015. In fact, scores generally have improved in this category, most notably for Nigeria (thanks to an improved business environment) and India and Japan (owing to improvements in coastal infrastructure).

Only Spain's and Mexico's scores have declined. While Mexico is the country in the index with the most improved overall score, it continues to struggle with an image of corruption. The Mexican president, Andrés Manuel López Obrador, who took office in December 2018, has made fighting corruption a cornerstone of his policy platform.<sup>29</sup> These efforts could help to restore confidence among private-sector investors interested in coastal development activities.

The private sector has a unique and critical role to play in maintaining a balance between environmental and economic interests on a country's shoreline. The active participation of the business community—through willing compliance with environmental regulations, sustainable business practices, and even the creation of services and products that improve environmental outcomes—can make

<sup>29</sup> The Guardian. "Mexico sells off cars from corrupt rich to give to the poor". 2019. <https://www.theguardian.com/world/2019/may/24/mexico-sells-off-cars-from-corrupt-rich-to-give-to-the-poor>

a significant difference in the sustainable use of coastal areas.

One example of this is the world's first all-electric ferry, operating in Norway, which ranks a close second in this category behind Canada. Called the *Ampere*, the ferry began operating in May 2015 with the aim of reducing nitrogen oxides (NO<sub>x</sub>) and carbon dioxide (CO<sub>2</sub>) emissions, as well as noise pollution on the water. It was the result of an extensive partnership between Norled AS, a shipping company and ferry operator, Fjellstrand Shipyard, Siemens AS and Corvus Energy.

The *Ampere* operates on a 5.6-km crossing in the Sognefjord between the villages of Lavik and Oppedal. It makes approximately 34 trips a day, with each trip taking about 20 minutes excluding the 10 minutes loading and unloading time for cars and passengers.<sup>30</sup> In early 2018, ferry operators reported that the vessel cuts emissions by 95% and reduces costs by 80% compared with fuel-powered counterparts.<sup>31</sup> Five more electric ferries are expected to begin service in Norway in 2020.<sup>32</sup>

30 Ship Technology. "Ampere Electric-Powered Ferry". <https://www.ship-technology.com/projects/norled-zero-cat-electric-powered-ferry/>

31 Electrek. "All-electric ferry cuts emission by 95% and costs by 80%, brings in 53 additional orders". 2018. <https://electrek.co/2018/02/03/all-electric-ferry-cuts-emission-cost/>

32 CleanTechnica. "Corvus Energy Tapped to Power 5 More Electric Ferries In Norway". 2019. <https://cleantechnica.com/2019/01/29/corvus-energy-tapped-to-power-5-more-electric-ferries-in-norway/>

## Water quality

**Figure 4**  
**Water quality:**  
**Scores and rankings**

Rank	Country	Score
1	Canada	99.2
=2	New Zealand	99.1
=2	Spain	99.1
4	Chile	99.0
5	Norway	98.7
6	France	98.6
7	Japan	98.5
8	South Africa	97.3
9	United States	97.0
10	Peru	96.9
11	Mexico	96.8
12	Brazil	96.6
13	India	94.5
AVERAGE		94.4
14	South Korea	93.4
15	Philippines	92.5
16	China	92.5
17	Vietnam	91.2
18	Indonesia	88.6
19	Nigeria	79.4
20	Russia	78.7

● Score 75.1 to => 100 ● Score 50.1 to => 75  
● Score 25.1 to => 50 ● Score 0 to => 25

Source: The Economist Intelligence Unit.

This category comprises three indicators and six sub-indicators related to the management and preservation of water quality. In particular, it assesses whether there is a national agency in charge of freshwater pollution controls, regulatory standards and enforcement. Such indicators are important to develop a proper balance between commercial interests (such as farming), human health, safety and the protection of the environment. And freshwater quality is important to coastal and marine living resources because most inland surface waters eventually flow to the oceans through river systems.

The category represents a high point in the index, with all countries achieving scores within the highest quartile. It continues to be led by Canada (ranked first) and New Zealand (tied for second), while Spain (now tied for second) has improved its position by 11 places. Russia remains at the bottom of the category. The reason for the consistency and strength in the scoring is that all 20 countries have a national agency responsible for setting freshwater pollution controls, standards for point source pollution (pollution that comes from a single, identifiable source) and penalties for violating those standards. However, countries differ widely in how robustly they restrict the “Dirty Dozen” persistent organic pollutants under the Stockholm Convention and how effectively they treat wastewater.<sup>33</sup> These two sub-indicators largely account for the range of scoring.

Russia ranks lowest on the Dirty Dozen metric, which measures the extent to which countries restrict or ban this group of toxic chemicals. The pollution of Russia’s waters began in the Soviet era, when leaders took little action to protect the nation’s inland bodies of water or surrounding oceans and seas. Today, the rate of

<sup>33</sup> The “Dirty Dozen” refers to a group of toxic chemicals typically used in agriculture, pest control, manufacturing and industry that do not break down easily in the environment.

waterborne diseases and industrial pollution in Russia remains alarmingly high. An estimated 35-60% of Russia's drinking water reserves do not meet sanitary standards, and water pollution affects every corner of the country.<sup>34</sup>

Russia's Federal Agency for Water Resources is responsible for setting freshwater pollution controls. The agency's stated duties include designing and establishing water protection zones for bodies of water and their coastal protective barriers and preventing water pollution. Nevertheless, freshwater (including drinking water) pollution remains a major problem in the country. Among the chemicals and contaminants dumped frequently and indiscriminately are compounds containing heavy metals, phenols, pesticides and pathogenic bacteria. Russian agriculture continues to cause severe water pollution by overuse and improper handling and storage of toxic chemical fertilisers, herbicides and pesticides. During the Soviet era, dioxin, a carcinogen, was used routinely as an agricultural insecticide, and it heavily tainted rural wells. It is estimated that more than 10m Russians lack access to good-quality drinking water.

Despite having national agencies responsible for pollution control, a number of the countries in the index do not treat their wastewater adequately. This problem is particularly acute in South and South-east Asia, where many urban rivers are heavily polluted with domestic, industrial and agricultural waste.<sup>35</sup> Four of the five countries with the lowest scores on this sub-indicator—the Philippines, India, Vietnam and Indonesia—are in those regions. The other is Nigeria. While the situation in each coastal city or town is somewhat unique, the confluence of underlying problems that typically lead

to poor water quality look similar: high rates of poverty, insufficient infrastructure, and a lack of resources and/or enforcement by local governments that share responsibility for water management in their jurisdictions.

In the Philippines, for example, all of the above-mentioned factors make the current efforts by the Department of Environment and Natural Resources (DENR) to clean up Manila Bay challenging.<sup>36</sup> The clean-up follows on the heels of the country's closure and rehabilitation of Boracay Island, highlighted throughout this report. The Manila Bay watershed consists of the bay itself and 1,994 km of coastline spread across 178 local governments. Seventeen major river systems drain into the bay, including the systems of the National Capital Region, Metro Manila. Although officially classified for fishing, ecotourism and recreational pastimes such as snorkelling and swimming, the bay is far from safe for these activities.

The river systems of Metro Manila, which include the Pasig and Meycauayan-Valenzuela systems, are among the most polluted in the world.<sup>37</sup> Industrial and manufacturing waste from tanneries, textile factories, gold refineries, municipal dumps and recycling facilities flows into these waterways, along with human waste and rubbish from homes and businesses. The majority of households in the Manila Bay watershed are not connected to sewage treatment facilities—in Metro Manila roughly 22% have coverage, according to data from local water utilities. Compounding the problem, thousands of informal settler families who live along riverbanks and shorelines discharge their waste directly into the waterways. The levels of human waste found in Metro Manila's rivers are so high that "they could be considered

34 BBC News. "The 11 cities most likely to run out of drinking water – like Cape Town". 2018. <https://www.bbc.com/news/world-42982959>

35 The Asean Post. "Southeast Asia's stream of polluted rivers". 2017. <https://theaseanpost.com/article/southeast-asias-stream-polluted-rivers>

36 Rappler. "Manila Bay Rehab: The challenge of cleaning up the nation's waste". 2019. <https://www.rappler.com/newsbreak/in-depth/224306-stilt-houses-manila-bay-rehabilitation-series-part-1>

37 Ibid.

open sewers”, according to an Institute for the Advanced Study of Sustainability Policy Brief report.<sup>38</sup>

In early 2019, DENR began a comprehensive effort to restore and manage Manila Bay’s water quality, which is part of a massive rehabilitation of the Philippines’ famous tourist areas. The government’s plan includes the acceleration of a mandate that requires water utilities to connect all homes to sewage treatment plants.<sup>39</sup> Under an agreement with the Metropolitan Waterworks and Sewerage System (MWSS), the utilities currently have until 2037 to achieve full coverage. But they face acquisition issues, permit delays and even resistance from village officials. DENR wants to fast-track the improvement in coverage to 100% by 2026, a goal that the MWSS calls “unrealistic”. DENR also began in early 2019 to crack down on hotels, resorts and recreational establishments, including the Manila Zoo and Manila Yacht Club, which discharge wastewater into the bay.<sup>40</sup> The agency ordered these establishments to construct their own sewage treatment plants within three months or face fines equivalent to around US\$380-3,835 each day.

A DENR undersecretary, Benny Aniporda, has said that “drastic change” will be felt with the government’s clean-up drive. However, it will take seven years for water quality to meet the department’s standards and 20 years for full rehabilitation.

38 United Nations University: Institute for the Advanced Study of Sustainability. “Southeast Asia’s Stream of Polluted Rivers”. 2017. <https://ias.unu.edu/en/media-relations/media-coverage/asean-post-wui-pb.html>

39 The Philippine Star. “Manila Bay rehab; DENR orders sewage treatment plants put up”. 2019. <https://www.philstar.com/nation/2019/01/13/1884565/manila-bay-rehab-denr-orders-sewage-treatment-plants-put-up>

40 Interaksyon. “A look at Manila Bay’s pollution and the Clean Water Act of 2004”. 2019. <http://www.interaksyon.com/politics-issues/2019/01/17/142335/manila-bay-pollution-clean-water-act-2004/>

## Tackling marine plastic pollution in South-east Asia and China

In the fishing town of Muncar, Indonesia, community volunteers regularly pick up plastic trash from the riverbanks and shoreline.<sup>41</sup> Muncar is located on the eastern coast of the island of Java, where four rivers meet the sea. The area is an estuary that is ideal for fishing, but now fishing workers complain of smaller catches, as rubbish from the more populous cities upstream litters marine feeding areas and debris washing in with the tide interferes with boat propellers and nets.

Across the narrow stretch of the Bali Sea that separates Java from the neighbouring island of Bali, locals rise early to scavenge plastic refuse along the western coast between Kuta and Canggu, one of the vacation island's most popular tourist beaches.<sup>42</sup> Large excavators and trucks fitted with giant rakes follow behind to collect what's left, sometimes repeating the route a number of times each day.

Whether they are volunteers fed up with the plastic littering their waterways, labourers paid to clear tourist destinations or informal collectors who sell certain items to recyclers, for many Indonesians cleaning up beaches and rivers has become a regular part of life. The same scenario is playing out in cities and villages across South-east Asia and China, a region where burgeoning urban populations have overwhelmed local waste-management systems, turning what were once picturesque rivers and coastlines into Ground Zero for the global ocean plastics crisis.

Four of the 20 countries in the index rank as the largest sources of mismanaged ocean plastic pollution.<sup>43</sup> The most land-based marine debris by far comes from China, followed by Indonesia, the Philippines and Vietnam. In 2010 an estimated 3.53m tonnes of plastic debris from China ended up in the ocean, along with an estimated 1.29m tonnes from Indonesia. All four of these countries have begun to take action to address the crisis.

In 2017, for example, the Indonesian government released a National Plan of Action on Marine Plastic Debris, a comprehensive scheme for a 70% reduction by 2025.<sup>44</sup> The strategy includes reducing land- and sea-based leakage, decreasing plastic production and use, policy reform and enforcement, and increased public awareness. The Indonesian government pledged US\$1bn a year to pay for implementation, and highlighted improvements to waste-management and recycling infrastructure as a key part of the plan, along with increased investment in alternative materials (for example, biodegradable plastics) and the use of advanced recycling technologies, plastic waste in asphalt mix

41 HuffPost. "How a Picturesque Fishing Town Became Smothered in Trash". 2019. [https://www.huffpost.com/entry/indonesia-plastic-waste-pollution-solutions\\_n\\_5cab096e4b02e7a705c317c](https://www.huffpost.com/entry/indonesia-plastic-waste-pollution-solutions_n_5cab096e4b02e7a705c317c)

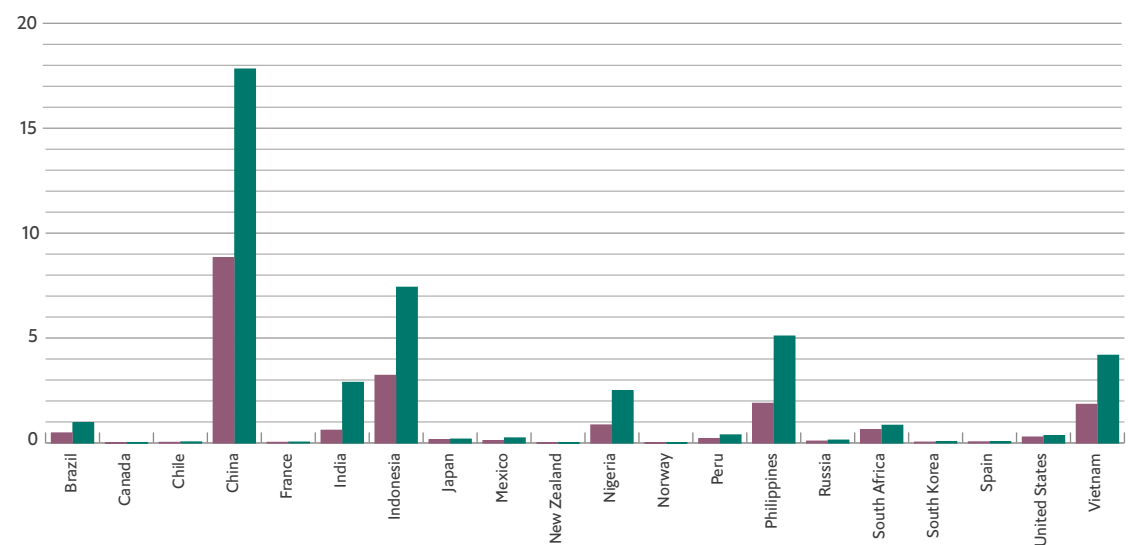
42 Al Jazeera. "Bali looks to turn the tide on Indonesia's plastic waste". 2019. <https://www.aljazeera.com/news/2019/02/bali-turn-tide-indonesia-plastic-waste-190213082141942.html>

43 Jambeck et al. "Plastic waste inputs from land into the ocean". *Science*. 2015. 347(6223). 768-771. <https://science.sciencemag.org/content/347/6223/768/tab-figures-data>

44 Indonesian Waste Platform. "Indonesia's National Plan of Action on Marine Plastic Debris 2017 – 2025 Executive Summary". 2018. <http://www.indonesianwaste.org/en/indonesias-national-plan-of-action-on-marine-plastic-debris-2017-2025-executive-summary-2/>

**Figure 5**  
**Mismanmanaged plastic waste (m tonnes)**

■ 2010 ■ 2025



Source: Jambeck et al. "Plastic waste inputs from land into the ocean". *Science*. 2015. 347(6223). 768-771.

for roads, and waste for energy.<sup>45</sup> International banks, conservation groups and consumer goods companies are offering additional funds to help Indonesia's communities to curb the amount of plastic reaching the sea.

This sort of multi-pronged strategy is crucial, said Susan Ruffo, former managing director for international initiatives at Ocean Conservancy. "There's not just one solution," she said. "You can't just recycle more, or just ban single-use plastics, or just improve waste collection. You actually need to do all of those things. And you need to change people's behavior and consumption patterns. Indonesia's plan does try to address all those different pieces."

The plan also engages stakeholders such as local government and the private sector. "One of the challenges has been that so much of the solution set for this problem needs to be implemented or managed at the local level," Ms Ruffo says. "It's the local governments that have jurisdiction over waste management and collection."

Muncar, which is home to the second-largest fishing port in Indonesia, has a total population of roughly 130,000 but barely a semblance of waste-management infrastructure. Like other growing towns and cities across the region, Muncar's rudimentary collection system has been overwhelmed

<sup>45</sup> The Guardian. "Indonesia pledges \$1bn a year to curb ocean waste". 2017. <https://www.theguardian.com/environment/the-coral-triangle/2017/mar/02/indonesia-pledges-us1-billion-a-year-to-curb-ocean-waste>



by both local waste and plastic debris that drifts downstream.<sup>46</sup> This is happening all across South-east Asia as both populations and their incomes increase. In the past, households typically generated only small amounts of organic waste. Now people can afford to buy consumer goods (many of which come packaged in plastic), but without access to waste-management systems they still often throw their rubbish straight into rivers, or into open dumpsters and other locations where it can easily wash away.

Plastic debris from land-based sources—which makes up 70-80% of all ocean plastic—can enter the ocean environment via multiple routes, but rivers are the most common.<sup>47</sup> In 2015, the top 20 polluting rivers accounted for 67% of river-sourced ocean plastic.<sup>48</sup> The majority of those waterways run through Asia, with six of them flowing through China, including the Yangtze river, which ranks as the world's most polluting river.

The Yangtze is Asia's longest river and also one of world's most ecologically important. The river basin is home to almost 500m people, more than one-third of China's population.<sup>49</sup> The Yangtze flows through 19 provinces on its way to the East China Sea, where it dumps an estimated 333,000 tonnes of plastic each year.<sup>50</sup>

In 2018, as part of its National Sword strategy, China famously banned the imports of foreign plastic waste, largely from the US and Europe, which it had used for years in the manufacture of the inexpensive products that it then exported back to Western markets. At the same time, the country shifted its focus to recycling internally rather than taking on recyclables from the rest of the world, and it moved to crack down on informal recycling plants and build more efficient systems. The Chinese government ordered 46 cities to begin sorting waste in order to reach a 35% recycling rate by 2020.<sup>51</sup>

Creating circular systems that place a value on plastic waste are key to addressing the pollution crisis. "What we've found is that in places where there's any kind of market for materials, the composition of the trash changes," Ms Ruffo says. "So if you're near a place where there's a market for PET bottles, for example, there won't be any in the landfills or in the river, whereas if you go to a place where there's no real market, you see PET bottles and everything else. The composition changes where there are incentives for people to pick stuff up."

46 HuffPost. "How a Picturesque Fishing Town Became Smothered in Trash". 2019. [https://www.huffpost.com/entry/indonesia-plastic-waste-pollution-solutions\\_n\\_5cab096e4b02e7a705c317c](https://www.huffpost.com/entry/indonesia-plastic-waste-pollution-solutions_n_5cab096e4b02e7a705c317c)

47 EcoWatch. "80% of Ocean Plastic Comes From Land-Based Sources, New Report Finds". 2016. <https://www.ecowatch.com/80-of-ocean-plastic-comes-from-land-based-sources-new-report-finds-1891173457.html>

48 Lebreton et al. "River plastic emissions to the world's oceans". *Nature Communications* 8. 2017. Article number: 15611. <https://www.nature.com/articles/ncomms15611>

49 China Daily. "Nearly 500 million people living in cities: Ministry". 2017. [http://www.chinadaily.com.cn/china/2017-08/25/content\\_31099082.htm](http://www.chinadaily.com.cn/china/2017-08/25/content_31099082.htm)

50 Our World in Data. "Plastic Pollution". 2018. <https://ourworldindata.org/plastic-pollution>

51 State Environmental Protection Administration of China (SEPA). [http://english.sepa.gov.cn/News\\_service/media\\_news/201801/t20180102\\_428970.shtml](http://english.sepa.gov.cn/News_service/media_news/201801/t20180102_428970.shtml)

## Minerals, energy and shipping

**Figure 6.**  
**Minerals, energy and shipping:**  
**Scores and rankings**

Rank	Country	Score
1	Norway	100.0
=2	China	91.7
=2	Japan	91.7
4	Canada	87.5
=5	Brazil	84.4
=5	India	84.4
=5	Mexico	84.4
=5	New Zealand	84.4
=5	South Africa	84.4
10	South Korea	83.3
=11	France	82.3
=11	Spain	82.3
	<b>AVERAGE</b>	<b>80.5</b>
=13	Nigeria	79.2
=13	United States	79.2
15	Chile	77.1
16	Russia	76.0
=17	Peru	67.7
=17	Philippines	67.7
19	Vietnam	63.5
20	Indonesia	59.4

● Score 75.1 to => 100 ● Score 50.1 to => 75  
● Score 25.1 to => 50 ● Score 0 to => 25

Source: The Economist Intelligence Unit.

This category comprises four indicators and ten sub-indicators. It analyses the offshore exploitation and use of minerals and the production of fuels, in particular oil and gas, and looks at issues such as permitting, licensing, monitoring and enforcement. Extractive industries are an important sector in the marine and coastal environment, in which commercial interests must be carefully balanced against potential environmental impact. Due to the increased emphasis being placed on shipping industry pollution, and in particular new International Maritime Organisation (IMO) limits on fuel oil sulphur content that will come into effect in 2020, shipping has been added to this year's index. The shipping industry also has a range of effects on coastal ecosystems through the dumping of rubbish and sewage, the release of oil and chemicals, the transfer of invasive alien species (through ballast water and on ship hulls), ocean noise, and by physically striking marine life and dropping anchors on coral reefs.

Norway remains the top-scoring country in this category, reflecting its clear and publicly available rules covering the leasing and administration of offshore oil and gas and mining rights, its regulations requiring environmental impact assessments and on-site reviews of offshore oil/gas and mining projects, and also its collection of oil spill data and rules requiring extractive companies to have plans in place to deal with spills and other accidents. The Scandinavian country, which has the second-longest coastline in the world after Canada's, is also a signatory of the Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC) and related protocols.<sup>52 53</sup>

Norway's status as both one of the greenest nations in the world—for example, it has led in

<sup>52</sup> World Atlas. "Countries With The Longest Coastlines". <https://www.worldatlas.com/articles/countries-with-the-most-coastline.html>

<sup>53</sup> International Maritime Organisation (IMO). [http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-on-Oil-Pollution-Preparedness,-Response-and-Co-operation-\(OPRC\).aspx](http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-on-Oil-Pollution-Preparedness,-Response-and-Co-operation-(OPRC).aspx)

the electrification of its transport sector—and a top fossil fuel producer has left the country open to criticism and charges of hypocrisy as worldwide efforts to mitigate rising global temperatures have intensified in recent years.<sup>54</sup> Norway is western Europe's largest petroleum producer and is the third-largest exporter of natural gas in the world, with much of its supply coming from deep-sea drilling operations in the North Sea. Norway exports nearly all of its oil and gas, while meeting roughly 95% of its own energy needs through hydropower.<sup>55</sup>

In April 2019 the country made headlines when, to the dismay of its powerful oil industry and its worker unions, the Labour Party decided to withdraw its support for oil exploration near the sensitive Lofoten Islands off Norway's Arctic coastline, creating a solid majority in parliament in favour of keeping the area off limits for drilling.<sup>56</sup> However, oil and gas companies including Norway's Equinor (formerly known as Statoil) remain committed to drilling in the Barents Sea, which is also in the environmentally sensitive Arctic region.<sup>57</sup> The Norwegian government opened the Barents Sea for oil and gas exploration in 2017, and in May 2019 Equinor received the green light for one such project.

Seven countries in the index do not have clear regulations that restrict mineral and/or oil and gas extraction in coastal areas. Of these, only Russia and Nigeria are among the world's top oil producers. Only 31 sq km, or 0.02%, out of a total marine area of 182,868 sq km in Nigeria is considered a protected marine area, according to the World Conservation Monitoring Centre's World Database on Protected Areas. Terrestrial

protected areas in Russia were reported at 9.72% in 2016, which included some coastal and offshore waters. These areas have special federal protected status, but Russia's policy makes no specific mention of any prohibition on extracting natural resources.

Norway has also proved itself a leader in cleaning up the shipping industry, as one of only three countries in the index—along with Spain and France—to have ratified at least 18 of the 23 IMO conventions on shipping and maritime pollution.<sup>58</sup> The International Convention for the Prevention of Pollution from Ships (MARPOL), the main international agreement regulating pollution from operational or accidental causes, was first adopted in the 1970s. Six technical annexes have been added in the ensuing years, covering the prevention of pollution from oil, noxious liquid substances in bulk, harmful substances carried in packaged form, sewage, garbage and air pollution. Indonesia, Peru, the Philippines, the US and Vietnam have ratified only 6-10 of the 23 conventions.

The annex covering air pollution came into effect in 2005, setting limits on sulphur oxide and nitrogen oxide content in the fuels used by ships. However, restrictions on shipping fuels have been less stringent than the controls that many countries place on fuels used in land transportation. Some 90% of world trade is transported by ship, generating roughly 3% of total greenhouse gas emissions.<sup>59</sup> Only five countries (the US, China, Russia, India and Japan) emit more CO<sub>2</sub> than the world's shipping fleet.<sup>60</sup>

The IMO restrictions on fuel sulphur content for shipping will be strengthened significantly

54 Foreign Policy. "Norway's Green Delusions". 2018. <https://foreignpolicy.com/2018/09/19/norways-green-delusions-oil-gas-drilling/>

55 Government of Norway. "Renewable energy". <https://www.regjeringen.no/en/topics/energy/renewable-energy/id2000124/>

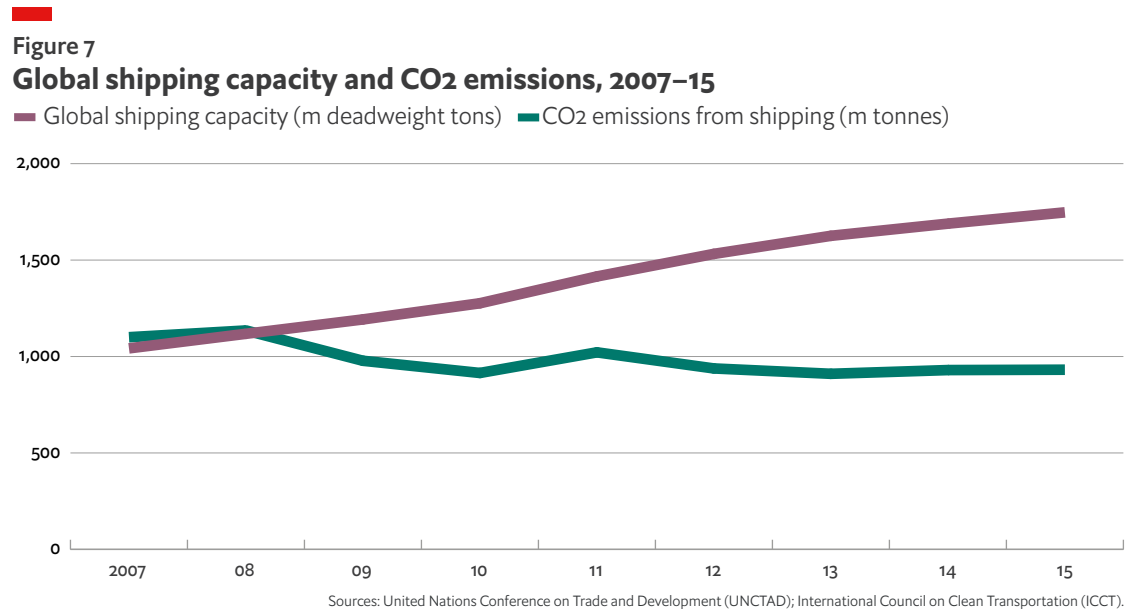
56 World Oil. "Norway's Labor Party rises against oil exploration in Arctic's Lofoten islands". 2019. <https://www.worldoil.com/news/2019/4/7/norways-labor-party-rises-against-oil-exploration-in-arctics-lofoten-islands>

57 Offshore Engineer. "Equinor Lines up Sputnik Well in Barents Sea". 2019. <https://www.oedigital.com/news/465851-equinor-lines-up-sputnik-well-in-barents-sea>

58 International Maritime Organisation. "UN agency pushed forward on shipping emissions reduction". 2019. <http://www.imo.org/en/MediaCentre/PressBriefings/Pages/11-MEPC-74-GHG.aspx>

59 The Washington Post. "Why do we need new rules on shipping emissions? Well, 90% of global trade depends on ships". 2019. [https://www.washingtonpost.com/news/monkey-cage/wp/2018/04/17/why-do-we-need-new-rules-on-shipping-emissions-well-90-of-global-trade-depends-on-ships/?utm\\_term=.0c8c9490ceca](https://www.washingtonpost.com/news/monkey-cage/wp/2018/04/17/why-do-we-need-new-rules-on-shipping-emissions-well-90-of-global-trade-depends-on-ships/?utm_term=.0c8c9490ceca)

60 Oceana. "Shipping Pollution". <https://eu.oceana.org/en/shipping-pollution-1>



beginning in January 2020, when the limit will drop to 0.5%, from 3.5% currently. In addition to contributing to global warming, sulphur contributes to acid rain and can cause serious respiratory health problems, such as bronchitis and asthma. By one estimate, air pollution from shipping was responsible for approximately 60,000 premature deaths globally in 2015, more than one-third of which were in China.<sup>61 62</sup>

Three of the world's most polluted harbours—Singapore, Hong Kong and Shanghai—are in Asia, making the region a hotspot for air pollution from shipping. Hong Kong, as of January 1st 2019, has already implemented sulphur restrictions equal to those under the enhanced IMO regulations. However, 0.5% is still 500 times more than 0.001% sulphur content that is allowed in the fuel used by local buses.

Clearly, the stricter IMO limits on sulphur are good news, but they are only the start of

efforts to address air pollution and greenhouse gas emissions from shipping. The IMO's long-term strategy calls for a 50% reduction in all greenhouse gas emissions from the global shipping sector by 2050 compared with 2008.

In October 2018 the organisation also released an action plan aimed specifically at addressing plastic pollution in shipping. In addition, in May 2019 a total of 187 countries agreed to an amendment to add plastic waste to the Basel Convention, a separate treaty that controls the international movement of hazardous waste.<sup>63 64</sup> The amendment, proposed by Norway, requires exporters to obtain the consent of receiving countries before shipping most contaminated, mixed or unrecyclable plastic waste, thereby providing an important tool for countries in the global South to stop unwanted plastic waste from entering their territory.

61 Hellenic Shipping News. "Hong Kong air pollution and the deadly impact of shipping and cruise industries". 2019. <https://www.hellenicshippingnews.com/hong-kong-air-pollution-and-the-deadly-impact-of-shipping-and-cruise-industries/>

62 The International Council on Clean Transportation (ICCT). "Silent but deadly: The case of shipping emissions". 2019. <https://www.theicct.org/blog/staff/silent-deadly-case-shipping-emissions>

63 Plastic Pollution Coalition. "UN Decides to Control Global Plastic Waste Dumping". 2019. <https://www.plasticpollutioncoalition.org/pft/2019/5/10/breaking-un-decides-to-control-global-plastic-waste-dumping>

64 National Geographic. "Shipping plastic waste to poor countries just got harder". 2019. <https://www.nationalgeographic.com/environment/2019/05/shipping-plastic-waste-to-poor-countries-just-got-harder/>

## Cross-sectoral efforts to change offshore drilling policy in the US

A key turning point in the conversation around offshore drilling policy in the US came in November 2015, when Mark Sanford, a Republican representative from the state of South Carolina, held a press conference in front of the US Capitol alongside a life-sized inflatable blue whale.<sup>65</sup>

Mr Sanford represented South Carolina's first district, which runs along much of the state's coastline. He was announcing to the country his opposition to seismic testing and drilling for oil and natural gas off his state's shore. In addition to the whale and representatives from various environmental groups, Mr Sanford had another group of opponents of offshore drilling with him: nine mayors from his district's coastal towns and cities.

Ever since the administration of the former president, Barack Obama, unveiled a proposal in January 2015 to open the US's south-eastern Atlantic coast to oil and gas drilling for the first time, the mayors had been hearing from their constituents.<sup>66</sup> The Bureau of Ocean and Energy Management's five-year plan included leasing waters off the coasts of South Carolina, North Carolina, Georgia and Virginia in 2021. Organised by an environmental group, Oceana, residents and business owners along this stretch of America's eastern seaboard had been urging local governments to pass resolutions against either acoustic surveys (which are necessary for underwater oil and gas exploration and can harm marine life) or oil drilling.<sup>67</sup>

"We were able to get local chambers of commerce to join in, which represented many, many businesses," from restaurants and hotels to surf shops and fishing families, says Jackie Savitz, Oceana's chief policy officer for North America. "Those local businesses understood that what was being proposed was a trade-off between a healthy, vibrant economy that's based on tourism and an economy that's hoped for based on offshore drilling, and they didn't want to make that trade."

Soon, Ms Savitz and others, including the president of the South Carolina Small Business Chamber of Commerce, Frank Knapp, were on their way to the White House to deliver a thick binder filled with more than 100 anti-drilling resolutions from coastal municipalities.<sup>68</sup> By March 2016 the administration had changed course, and the plan was withdrawn.<sup>69</sup>

The momentum continued, however. The Business Alliance for Protecting the Atlantic Coast, an organisation focused specifically on offshore drilling, formed in September 2016.<sup>70</sup>

In December 2016, a month before leaving office, Mr Obama used presidential powers to ban

65 Plastic Pollution Coalition. "UN Decides to Control Global Plastic Waste Dumping". 2019. <https://www.plasticpollutioncoalition.org/pft/2019/5/10/breaking-un-decides-to-control-global-plastic-waste-dumping>

66 The Atlantic. "Obama Proposes Opening Atlantic Ocean to New Oil Drilling". 2015. <https://www.theatlantic.com/politics/archive/2015/01/obama-proposes-opening-atlantic-ocean-to-new-oil-drilling/446817/>

67 Oceana. "Clean Coast Economy". 2018. <https://oceana.org/publications/reports/clean-coast-economy>

68 The New York Times. "Obama Reverses Course on Drilling Off Southeast Coast". 2016. <https://www.nytimes.com/2016/03/15/us/politics/in-reversal-us-plan-on-drilling-to-be-pulled.html>

69 Ibid.

70 Business Alliance For Protecting The Atlantic Coast (BAPAC). <https://protectingtheatlanticcoast.org/>

permanently new oil and gas drilling in federal waters in the Atlantic and Arctic Oceans.<sup>71</sup> A 1950s-era law called the Outer Continental Shelf Act allows presidents to protect areas from mineral leasing and drilling. The ban affects 46.5m ha of federal waters off Alaska in the Chukchi Sea and most of the Beaufort Sea, and 31 major underwater canyons in the Atlantic from New England to Chesapeake Bay.<sup>72</sup>

The move ensured that future presidents would have to go to court to reverse the ban, and when the newly elected president, Donald Trump, attempted to lift the ban by executive order, his attempt was eventually blocked. In March 2019 a federal judge in Alaska ruled it unlawful, saying that the ban “will remain in full force and effect unless and until revoked by Congress”.<sup>73</sup>

Meanwhile, the battle over the great bulk of both US coasts, which were not covered under the ban and were therefore not part of the lawsuit playing out in Alaska, continued as Mr Trump’s administration rolled out a larger plan for a radical expansion of offshore drilling on both coasts.<sup>74</sup>

“When Trump won, the game was on again. He came in and said, ‘I’m going to drill everywhere,’” Ms Savitz says. “We were really puzzled as to how we were going to succeed. So we decided to replicate what we’d done in the south-east and try and take it to scale.”

Oceana beefed up its team, reinforcing the south-east and adding organisers in the mid-Atlantic region, New York and California. The organisers targeted coastal districts where congressional representatives supported offshore drilling. “What we figured out was, it was the fact that these coastal districts had self-interested business communities,” Ms Savitz says. “That was the linchpin that made this possible.” Soon these representatives too were coming out against offshore drilling, and governors who had previously shown support for drilling were now asking for their states to receive drilling exemptions.

In the US congressional election of November 2018, Mr Sanford lost his re-election bid in the Republican primary to his opponent Katie Arrington, a Trump ally who favoured offshore drilling. Ms Arrington then lost the general election to Joe Cunningham, the first Democrat to win South Carolina’s first district in 40 years, who had made opposition to drilling central to his campaign.<sup>75</sup> While not the only reason for his victory, the issue did play a role.

Today, more than 360 municipalities and over 2,200 elected local, state and federal officials have formally opposed offshore oil and gas drilling and seismic airgun blasting, including more than

71 The Washington Post. “President Obama expected to ban oil drilling in large areas of Atlantic and Arctic oceans”. 2016. [https://www.washingtonpost.com/news/energy-environment/wp/2016/12/20/president-obama-expected-to-ban-oil-drilling-in-large-areas-of-atlantic-and-arctic-oceans/?noredirect=on&utm\\_term=.542782d4406a](https://www.washingtonpost.com/news/energy-environment/wp/2016/12/20/president-obama-expected-to-ban-oil-drilling-in-large-areas-of-atlantic-and-arctic-oceans/?noredirect=on&utm_term=.542782d4406a)

72 Financial Times. <https://www.ft.com/content/bfafa5d2-c79f-11e6-8f29-9445cac8966f>

73 The New York Times. “Trump’s Order to Open Arctic Waters to Oil Drilling Was Unlawful, Federal Judge Finds”. 2019. <https://www.nytimes.com/2019/03/30/climate/trump-oil-drilling-arctic.html>

74 USA Today. “Trump administration set to roll out massive offshore oil plan, but many in GOP don’t want it”. 2019. <https://www.usatoday.com/story/news/politics/2019/03/01/trump-offshore-oil-drilling-plan-faces-resistance-even-before-release/2814275002/>

75 The Post and Courier. “Why Katie Arrington really lost her SC congressional race to Democrat Joe Cunningham”. 2018. [https://www.postandcourier.com/politics/why-katie-arrington-really-lost-her-sc-congressional-race-to/article\\_a7d4af4a-ed0c-11e8-8593-f7cb20045be1.html](https://www.postandcourier.com/politics/why-katie-arrington-really-lost-her-sc-congressional-race-to/article_a7d4af4a-ed0c-11e8-8593-f7cb20045be1.html)

260 along the Atlantic and Gulf coasts.<sup>76</sup> All coastal governors in the US, both Democratic and Republican, now oppose offshore drilling in their states. The Business Alliance for Protecting the Atlantic Coast now comprises 42,000 businesses and 500,000 commercial fishing families.<sup>77</sup>

In April 2019 Mr Trump's administration delayed its bid to expand offshore drilling, saying that it was reevaluating its plan.

<sup>76</sup> Oceana. "Grassroots Opposition to Offshore Drilling and Exploration in the Atlantic Ocean and off Florida's Gulf Coast". <https://usa.oceana.org/climate-and-energy/grassroots-opposition-offshore-drilling-and-exploration-atlantic-ocean-and>

<sup>77</sup> Business Alliance For Protecting The Atlantic Coast (BAPAC). <https://protectingtheatlanticcoast.org/>



## Land

**Figure 8**  
**Land:**  
**Scores and rankings**

Rank	Country	Score
1	New Zealand	96.7
2	Norway	95.3
3	Japan	94.4
4	Peru	93.1
5	Chile	92.5
6	France	78.1
7	United States	77.8
8	Spain	77.2
9	Indonesia	76.4
10	China	76.1
11	Philippines	75.6
12	South Korea	75.3
13	Brazil	73.1
AVERAGE		72.1
14	Canada	61.1
15	Mexico	59.2
16	India	58.9
17	Vietnam	57.8
18	Nigeria	54.2
19	South Africa	44.4
20	Russia	25.0

● Score 75.1 to => 100 ● Score 50.1 to => 75  
 ● Score 25.1 to => 50 ● Score 0 to => 25

Source: The Economist Intelligence Unit.

The land category, comprising four indicators and five sub-indicators, identifies policies related to shorelines. It includes measurements of the coastal governance environment for the tourism and real-estate industries, and in particular the environmental impact of these industries. As such, the category highlights the importance of aligning economic development with coastal resource protection.

The five top-scoring countries (New Zealand, Norway, Japan, Peru and Chile) receive high marks based on their commitment to preserve coastal terrestrial areas, assess the environmental impact of coastal development and mitigate natural disaster risk.

National governments face a 2020 deadline to achieve a terrestrial coastal protection level of 17% under the Convention on Biological Diversity. Eight of the 20 countries in the index, including the five mentioned above, have achieved this target, and another seven have protected at least 10%. Canada, India, Russia, South Africa and Vietnam have protected less than 10%.

Still, policy is about more than numerical targets—implementation and enforcement matter. Policy is also fluid, and the election of a new administration can portend drastic change for better or worse. Nowhere is this more evident than in Brazil, a country with vast natural resources that play a vital role in reducing the impact of rising global temperatures. Brazil scores highly for coastal conservation in the 2019 index, having protected more than 17% of its terrestrial coastline. (It also increased its total marine protected area, or MPA, from 1.5% to 24.5% in early 2018.<sup>78</sup>) However, many of the country's conservation efforts appear to be under threat from the current president, Jair Bolsonaro.

78 ECO Magazine. "Brazil Surpasses 2020 Biodiversity Targets with New Marine Protected Areas". 2018. <https://www.ecomagazine.com/news/regulation/brazil-surpasses-2020-biodiversity-targets-with-new-marine-protected-areas>

The unabashedly pro-business and pro-development Bolsonaro administration has announced a “reassessment” of all of the country’s 334 protected areas.<sup>79</sup> The government’s main target at the moment seems to be areas with complete protection, where farming, ranching, fishing and mining are banned. This includes the Tamoios Ecological Station, a small coastal preserve where Mr Bolsonaro was fined for illegal fishing in 2012.<sup>80</sup> He has said that he wants to turn the area into a “Brazilian Cancun”, a reference to the Mexican resort city that is famous for beaches lined with enormous hotels.

Brazil is one of six countries in the index—along with France, Nigeria, Russia, South Africa and Spain—that do not require on-site reviews to monitor the environmental impact of coastal development. Coastal development in much of the world is the result of a booming tourism industry, which has experienced steady and significant growth for the past two decades, thanks to a growing global population, rising incomes and cheap air travel. In 2018 the total economic value of travel and tourism grew by 3.9% relative to the previous year, reaching roughly US\$8.8trn globally.<sup>81</sup> A significant portion of the tourism industry’s growth is due to a sharp increase in Chinese international travel. In the first year of the new millennium, only 10.5m overseas trips were made by Chinese residents; by 2017 that figure had jumped to 145m.<sup>82</sup> For many countries that are popular beach vacation destinations, tourism can represent a huge chunk—upwards of 60%—of total GDP.

Places like the Philippines’ Boracay Island have been on the receiving end of the tourism industry’s boom. Just over 1m people visited the Philippines in 1990. Last year the figure was 6.6m,<sup>83</sup> and almost a third of those tourists—more than 2m—visited Boracay. Unfettered development on Boracay led to the island’s six-month closure for rehabilitation in 2018 and the enactment of multiple regulations, including a daily limit of 6,000 visitors. Whether Boracay will prove to be a success story remains to be seen.

What is clear now is that striking a balance between the economic value and the environmental impact of coastal tourism is critical, yet most countries have not done this particularly well. This is exemplified by the 20 countries on the index, which score relatively low overall in their commitment to the development of sustainable tourism. New Zealand earns the highest mark, while Nigeria ranks lowest.

Tourism constitutes only 5.1% of Nigeria’s GDP, a comparatively small percentage that sees it placed 152nd out of 174 countries measured by the World Travel and Tourism Council.<sup>84</sup> Nigeria would like to see that percentage grow as it looks to reduce its dependency on oil, and the Nigerian Maritime Administration and Safety Agency has called for a concerted effort to boost the country’s economy through the development of coastal and maritime tourism.<sup>85</sup> How much emphasis will be placed on the sustainability of such development remains to be seen.

Sustainable development is crucial to reduce the economic loss and destruction of life caused by natural disasters. Fuelled by the climate

79 Mongabay. “Former Brazilian enviro ministers blast Bolsonaro environmental assaults”. 2019. <https://news.mongabay.com/2019/05/former-brazilian-enviro-ministers-blast-bolsonaro-environmental-assaults/>

80 Folha de Sao Paulo. “Bolsonaro Wants to Transform Protected Ecological Area into A “Brazilian Cancun”. 2019. <https://www1.folha.uol.com.br/internacional/en/brazil/2019/05/bolsonaro-wants-to-transform-protected-ecological-area-into-a-brazilian-cancun.shtml>

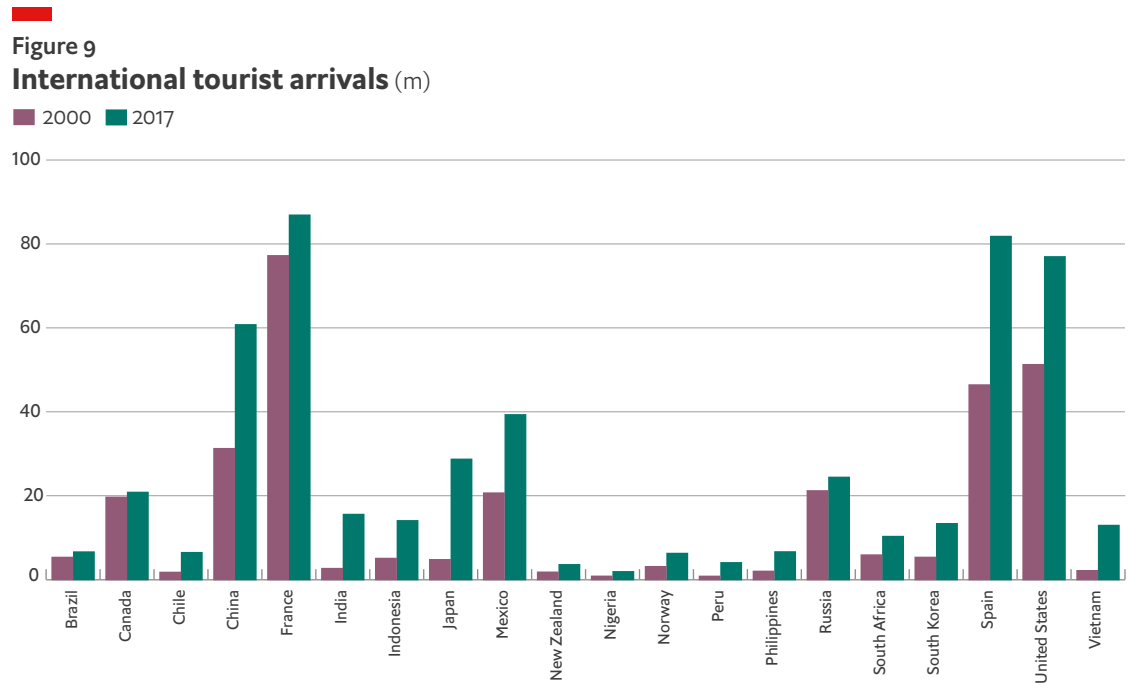
81 World Travel and Tourism Council (WTTTC). “Economic impact”. <https://www.wttc.org/economic-impact/>

82 The Telegraph. “The unstoppable rise of the Chinese traveler – where are they going and what does it mean for overtourism?” 2019. <https://www.telegraph.co.uk/travel/comment/rise-of-the-chinese-tourist/>

83 The Telegraph. “What’s happening in Boracay, the island paradise ruined by tourism?” 2018. <https://www.telegraph.co.uk/travel/destinations/asia/philippines/articles/boracay-closure-when-will-island-reopen/>

84 World Travel and Tourism Council (WTTTC). “Economic impact”. <https://www.wttc.org/economic-impact/>

85 AllAfrica. “Nigeria: NIMASA Targets Maritime Tourism to Grow Nigeria’s Economy”. 2019. <https://allafrica.com/stories/20190520427.html>



Source: World Bank.

crisis, the number of extreme weather events has doubled over the past 20 years and the hurricanes and cyclones that impact coastal areas have increased in strength.<sup>86</sup> For this reason, it is more important than ever to have a natural disaster risk mitigation strategy for coastal areas in place. This can save thousands of lives.

India is a prime example of this. The UN Office for Disaster Risk Reduction (UNISDR) and other organisations hailed government and volunteer efforts that minimised the loss of life after Fani, a rare summer cyclone in the Bay of Bengal, hit eastern India in May 2019.<sup>87</sup> Fani was one of the strongest cyclones to strike India in the past 20 years, with storm surges and powerful winds reaching 115 mph. However, the worst-affected state, Odisha, successfully minimised

the number of deaths: according to official estimates, 64 people lost their lives.<sup>88</sup> To put the death toll in perspective, the 1999 Odisha cyclone (which saw 155-mph winds) killed 9,658 people and caused US\$2.5bn-worth of damage in the state. The 1999 storm led the state government in Odisha to implement a disaster management plan that, along with the near-perfect accuracy of the India Meteorological Department's early-warning system, is credited for the comparatively small number of deaths from Fani.

The Odisha government's "zero casualties" policy for natural disasters includes an extensive network of relief shelters and regular communication with local communities through text message updates. At national level, India's National Disaster Management Plan, which was drawn up by the Natural Disaster Management Authority (NDMA), took effect in

<sup>86</sup> Reuters. "Growing disaster threats put human survival in doubt, warns UN". 2019. <https://www.reuters.com/article/us-global-disaster-risk/growing-disaster-threats-put-human-survival-in-doubt-warns-un-idUSKCN1SL1SX>

<sup>87</sup> The Conversation. "India's cyclone Fani recovery offers the world lessons in disaster preparedness". 2019. <https://theconversation.com/indias-cyclone-fani-recovery-offers-the-world-lessons-in-disaster-preparedness-116870>

<sup>88</sup> AllAfrica. "Nigeria: NIMASA Targets Maritime Tourism to Grow Nigeria's Economy". 2019. <https://allafrica.com/stories/20190520427.html>

2016 and mandates similar policies, such as the construction of multi-purpose cyclone shelters in vulnerable areas. The national plan also mandates a variety of government authorities to co-operate on mapping coastal areas that are vulnerable to risks such as flooding, saline ingress, sea-level rise and storms. In addition, it requires all coastal states and union territories to construct “bio-shields” through afforestation using mangrove, casuarina and/or coconut trees.

Only two countries in the index, Russia and Mexico, lack strategies to address natural disaster risk mitigation on their coasts. Russia is working on creating a strategy for coastal areas, through projects such as Improving Environmental Monitoring in the Black Sea and the Climate East Package (2012-16), which aim to improve and expand environmental governance, green economy, climate change mitigation and water management. Mexico’s 2014-18 National Civil Protection Programme outlines how the system functions nationally and locally and mentions risk management, but does not focus on strategies or actions related to disaster risk management.

## Living resources

**Figure 10**  
**Living resources:**  
**Scores and rankings**

Rank	Country	Score
1	United States	89.9
2	New Zealand	85.1
3	Chile	80.4
4	France	78.3
5	Norway	73.0
6	South Africa	69.6
7	Peru	69.0
8	Mexico	67.3
=9	South Korea	65.3
=9	Spain	65.3
11	Canada	64.1
12	Indonesia	62.6
	<b>AVERAGE</b>	<b>62.2</b>
13	Japan	57.7
14	Brazil	53.6
15	Philippines	52.0
16	China	51.6
17	Russia	50.3
18	Vietnam	40.3
19	Nigeria	36.6
20	India	32.3

● Score 75.1 to => 100    ● Score 50.1 to => 75  
● Score 25.1 to => 50    ● Score 0 to => 25

Source: The Economist Intelligence Unit.

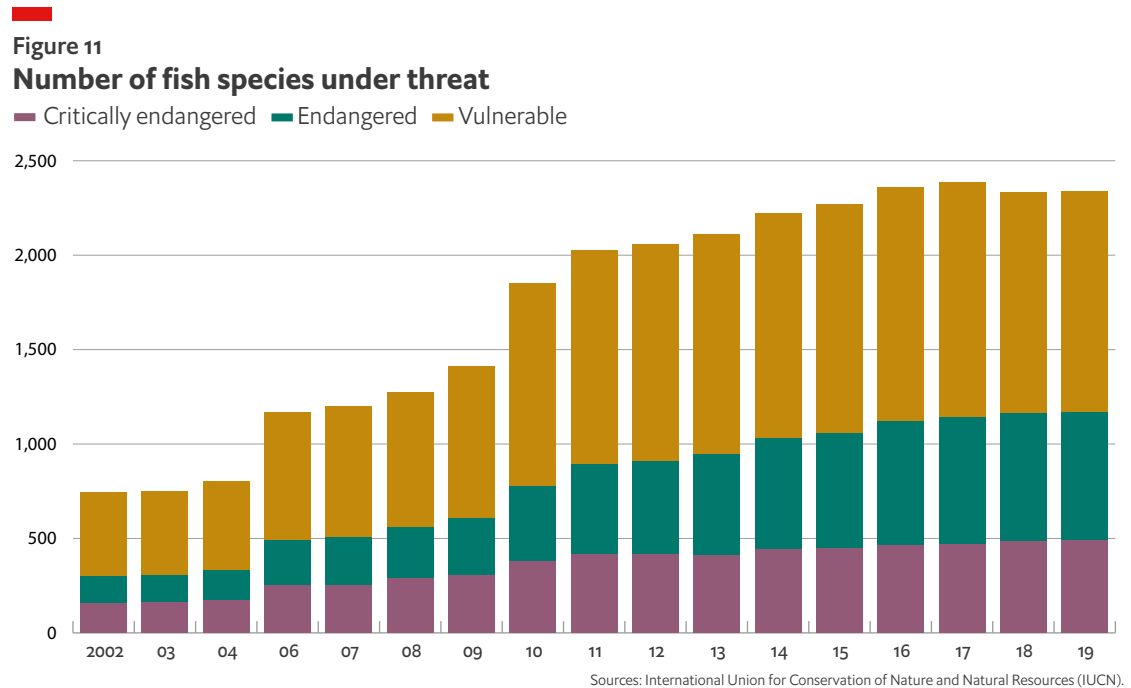
The Living resources category comprises four indicators and seven sub-indicators on the coastal management of living resources, including fisheries and wildlife, and includes a new indicator that assesses government transparency around fisheries management. Sustainable business practices, particularly as they relate to fishing, are a key component of long-term environmental stability. And with the release of the UN's Global Assessment Report on Biodiversity and Ecosystem Services, which warns that 1m species around the globe risk extinction, Living resources is an especially important category in the 2019 Coastal Governance Index.

The US (ranked first) and New Zealand (second) have traded places at the top of this category, but both have strong protection for marine and coastal species and regulations around ballast water treatment.

The US also has robust regulations around fisheries management, which gives it the top score for effectiveness in this area. Sustainable fisheries management is critical to combat global overfishing; nearly 90% of the world's fish species are fully fished, overfished or depleted.<sup>89</sup> Unlike the massive, co-ordinated effort that is required to mitigate rising global temperatures, individual countries can take independent steps to curb overfishing in their national waters through the monitoring and management of fisheries, policy enforcement, and transparent community engagement and subsidies.

Brazil continues to face challenges in effective fisheries management, with both its score and ranking declining on this metric since 2015. The University of Washington found that Brazil's performance had worsened across all dimensions of its Fisheries Management Index—research, management, enforcement,

<sup>89</sup> United Nations Food and Agriculture Organisation (FAO). "The State of World Fisheries and Aquaculture". 2016. <http://www.fao.org/3/a-i5555e.pdf>



socioeconomics and stock—over a similar period.<sup>90</sup> Brazil's government has long had a poor fisheries management database and weak inspection of fisheries activities. While fisheries do voluntarily disclose information, a non-profit marine conservation organisation, Oceana, has since 2014 been urging the government to monitor its fisheries.<sup>91</sup> In 2018, for the first time, the country adopted digital logbooks and quotas to track and limit the catch of tainha, or mullet, a popular food species that is in decline. It is the country's first official monitoring effort in recent years.

Efforts to increase the sustainability of fisheries and marine environments could also be served by greater protection of critical coastal areas through the establishment of marine protected areas (MPAs). MPAs typically include barrier ecosystems such as coral reefs or mangroves, which play an important role in protecting local

residents from natural disasters, nourishing the growing human population, protecting endangered species, and restoring fish and other marine populations to healthy levels.

Under the UN Convention of Biodiversity, member nations have agreed to protect 10% of their marine areas by 2020.<sup>92</sup> With the deadline fast approaching and global coverage currently at 7.59%, it remains unclear whether the international target will be met, much less the goal of 30% by 2030 that was called for by the International Union for Conservation of Nature (IUCN) in 2016.<sup>93</sup> The total area protected has increased steadily since 2010, with growth in recent years driven by declarations of massive offshore MPAs. But while news coverage tends to focus on size and targets, the conversation around MPAs has expanded, with conservationists arguing for more effective planning and management of these areas.

<sup>90</sup> Melnychuk et al, 2018, *Assessing the effectiveness and recent changes in fisheries management systems of 28 fishing nations with the Fisheries Management Index survey*, University of Washington.

<sup>91</sup> Oceana. "Brazil's fisheries support millions, but are far from sustainable" 2018. <https://oceana.org/blog/brazils-fisheries-support-millions-are-far-sustainable>

<sup>92</sup> Convention on Biological Diversity. <https://www.cbd.int>

<sup>93</sup> Pew. "The Push to Safeguard 30% of the Ocean". 2018. <https://www.pewtrusts.org/en/research-and-analysis/fact-sheets/2018/10/the-push-to-safeguard-30-percent-of-the-ocean>

In April 2019 Canada moved to strengthen its MPAs by banning all oil and gas work, mining, waste dumping and bottom-trawling in all MPAs.<sup>94</sup> Along with the new standards, the federal fisheries minister, Jonathan Wilkinson, announced the official designation of the Laurentian Channel MPA off the south coast of Newfoundland and Labrador.<sup>95</sup> At more than 11,000 sq km, the Laurentian Channel MPA is Canada's largest and brings its protected ocean spaces up to 8.27%—a significant increase from less than 1% in 2015.

More notable is the emergence of Chile as a stand-out leader in marine conservation in the years since our 2015 index report. The then Chilean president, Michelle Bachelet, received the UN Champions of the Earth award in 2017 for her “outstanding leadership in creating marine protected areas and boosting renewable energy”.<sup>96</sup> Her administration continued this work in 2018, protecting vast swaths of the country's waters and increasing its total MPA area to more than 40%.

Three sizeable MPAs established in Chile in early 2018 serve as examples of effective planning and management.<sup>97</sup> These areas include large “no take” zones, which play a vital role in restoring threatened and overfished species and have been known to double both the number and the size of fish in a relatively short time.<sup>98</sup> In

the Rapa Nui MPA, which measures 447,398 sq km and protects more than 140 native species, including 27 threatened or endangered ones, Chile has prohibited industrial fishing and mining while allowing traditional fishing to continue.<sup>99</sup> It is one of the few MPAs in the world in which indigenous people have had a hand—and a vote—in establishing the boundaries and level of protection.

In the area of transparency, nine of the 20 countries included in the 2019 index have signed up to the Port State Measures Agreement (PSMA) since 2015. Twelve countries in total are party to the PSMA, which is the first binding international agreement specifically to target illegal, unreported and unregulated fishing. International transparency is important because coastal nations must rely on each other to co-operatively manage and regulate their fishing fleets.

Indonesia leads the way in transparency of living resources management.<sup>100</sup> In 2017, it took the unprecedented step of publicly sharing its government-owned Vessel Monitoring System (VMS) data. These systems are used in commercial fishing to allow environmental and fisheries regulators to track and monitor the activities of fishing vessels. In October 2018 Peru became the second nation to publish VMS data.

94 Canada's National Observer. “Canada banning oil, gas and mining from marine protected areas”. 2019. <https://www.nationalobserver.com/2019/04/25/news/canada-banning-oil-gas-and-mining-marine-protected-areas>

95 Government of Canada. “Backgrounder: Laurentian Channel Marine Protected Area”. <https://www.canada.ca/en/fisheries-oceans/news/2019/04/backgrounder-laurentian-channel-marine-protected-area.html>

96 United Nations Environment Programme. “UN Environment reveals President Michelle Bachelet of Chile as a Champion of the Earth laureate. 2017. <https://web.unep.org/championsofearth/press-release/un-environment-reveals-president-michelle-bachelet-chile-champion-earth-laureate>

97 Smithsonian. “Chile Announces Protections for Massive Swath of Ocean With Three New Marine Parks”. 2018. <https://www.smithsonianmag.com/science-nature/chile-protects-massive-swath-ocean-new-marine-parks-180968275/>

98 Kerwath et al. “Marine protected area improves yield without disadvantaged fishers”. *Nature Communications* 4. 2013. Article number: 2347. <https://www.nature.com/articles/ncomms3347>

99 Mongabay. “Easter Island votes for world's newest marine reserve”. 2018. <https://news.mongabay.com/2018/02/easter-island-votes-for-worlds-newest-marine-reserve/>

100 Global Fishing Watch. “Transparency Initiative”. <https://globalfishingwatch.org/vms-transparency/>



## Conclusion

The challenges that today's leaders face in terms of our oceans and coastlines are significant. Pollution from industry and agriculture, plastic waste, overfishing and the effects of climate change are severely damaging ocean health. Many species of marine wildlife are endangered. Rising sea levels and more frequent and severe storms threaten coastal populations. Demands from extractive industries, fishing, shipping and tourism place unsustainable stress on coastal ecosystems.

We have the knowledge, technology and means necessary to tackle these crises, and over the past decade or so governments around the world, including those of the 20 countries represented in the EIU's 2019 Coastal Governance Index, have made significant progress in doing just that. National policies have been enacted and international agreements have been signed, creating a blueprint for ocean conservation and the more sustainable use of the abundant services that marine ecosystems provide.

But the index results reveal that more can be done in all areas of coastal governance. In particular, this includes increased collaboration between the public and private sectors. Public policy coupled with private-sector innovation and investment could create a future of abundant ocean resources—including healthy food, secure and affordable clean energy, and efficient and lower-carbon transport.

Ultimately, the challenges that we face require a change of mindset. The traditional way of thinking—one that views the environment and the economy as being at odds with each other—is no more sustainable than the unmitigated exploitation of ocean resources. This change is already taking place, as more political and business leaders recognise the economic importance of vibrant coastal ecosystems, the opportunities of a sustainable “blue economy”, and the financial, ecological and physical risks of business as usual.

## Appendix: Methodology

### 1. Summary

The Coastal Governance Index 2019 is largely based on the framework developed for the Coastal Governance Index 2015, which drew on the knowledge of an expert panel convened in January 2015. The current framework has been adjusted to capture developments in coastal governance since 2015, based on input from CEA Consulting and desk research conducted by The Economist Intelligence Unit (EIU). In 2015, the index comprised 24 quantitative and qualitative indicators across six categories. The 2019 index comprises 26 indicators across the same six categories.<sup>101</sup>

### Definition of coastal areas and good coastal governance

For the purposes of the index and this report, we define coastal areas as “the interface where the land meets the ocean, encompassing shoreline environments as well as adjacent coastal waters”.<sup>102</sup> We define “good governance” as governance that balances private investment’s interests and social and environmental concerns in coastal areas.

### Coastal Governance Index indicator framework

#### Foundational categories

1	Policy and institutional capacity
1.1	Coastal management policy and strategy
1.2	Presence of established institution(s)
1.3	National strategies to address climate change†
1.4	Maritime spatial planning
1.5	Stakeholder engagement
1.6	Extractive industries transparency
1.7	Adoption of the United Nations Convention on the Law of the Sea (UNCLOS)
2	Business environment for coastal activities
2.1	Ease of doing business
2.2	Corruption perception
2.3	Effectiveness of dispute resolution mechanisms
2.4	Quality of coastal infrastructure

#### Asset categories

3	Water quality
3.1	Freshwater pollution control agency*
3.2	Regulatory standards for water pollution
3.3	Monitoring and enforcement
4	Minerals, energy and shipping*
4.1	Permitting and licensing
4.2	Monitoring and enforcement
4.3	Risk mitigation for the mineral and oil and gas industries*
4.4	Shipping/maritime pollution†

<sup>101</sup> Framework updates, including adjustments to category, indicator and sub-indicator names, are provided in the Framework updates section, below.

<sup>102</sup> Jan C. Post and Carl G. Lundin, *Guidelines for Integrated Coastal Zone Management*, Default Book Series, August 1996.

5	Land
5.1	Prevalence of coastal protected areas
5.2	Environmental impact of coastal development
5.3	Government commitment to sustainability in coastal tourism development
5.4	Natural disaster risk mitigation
6	Living resources
6.1	Fisheries governance and management effectiveness
6.2	Protection for marine/coastal species
6.3	Ballast water treatment
6.4	Transparency in living resources management†
† Denotes new indicator or adjustment to existing indicator. * Denotes change in category name or indicator name.	

## 2. Categories and scoring criteria

The Coastal Governance Index's six categories comprise two "foundational" categories and four "asset" categories. The foundational categories assess the two key pillars of coastal management. Coastal governance requires sound and distinct institutions that set the bases for coastal governance (Category 1: Policy and institutional capacity) and a friendly business environment to attract and sustain the private sector in coastal areas (Category 2: Business environment for coastal activities).

Coastal areas have a range of resources, and this abundance is at the root of competing-use issues and conservation and social concerns. This index identifies four of these assets: Water quality (Category 3), Minerals, energy and shipping (Category 4), Land (Category 5) and Living resources (Category 6).

The EIU led the research on all the categories, with the exception of Category 6. For the Living resources category, CEA Consulting led the research and provided the data for indicator 6.1 on fisheries governance.

## I. Policy and institutional capacity

This category consists of seven indicators and 11 sub-indicators related to the policy and institutional capacity of government with regard to coastal management. It assesses the extent to which a coastal management strategy exists, is implemented and engages stakeholders.

Indicator	Sub-indicators and scoring schemes
<b>1.1. Coastal management policy and strategy</b>	<p><b>1.1.1 Is there a domestic coastal management policy?</b></p> <p>0=No 1=Yes</p> <p>A policy is a course or principle of action adopted or proposed by a government.</p> <p><b>1.1.2 Is there a strategy in place to implement the coastal management policy identified in 1.1.1 across sectors?</b></p> <p>0=No, or no coastal management policy was identified in 1.1.1 1=Yes, but the strategy is not integrated across sectors 2=Yes, an integrated strategy is in place</p> <p>A strategy refers to a plan of action to implement the coastal management policy. Consideration is given to whether the strategy is integrated across sectors.</p> <p>The strategy may call for Integrated Coastal Zone Management (ICZM), which is a dynamic, multidisciplinary and iterative process to promote sustainable management of coastal zones. It covers the full cycle of information collection, planning (in its broadest sense), decision-making, management and monitoring of implementation.</p>
<b>1.2. Presence of established institution(s)</b>	<p><b>1.2.1 Is there a national authority for implementation of the coastal management strategy identified in 1.1.2?</b></p> <p>0=No, or no coastal management strategy was identified 1=Yes, there are multiple entities responsible for the implementation or co-ordination of implementation of the coastal management strategy identified in 1.1.2, or there is an entity in charge of designing a coastal management strategy 2=Yes, there is one entity responsible for implementation or co-ordination of implementation of the coastal management strategy identified in 1.1.2</p> <p>The authority or authorities should be noted in the strategy document referred to in 1.1.2.</p>
<b>1.3. National strategies to address climate change</b>	<p><b>1.3.1 Is there a strategy in place to adapt coastal areas to climate change?</b></p> <p>0=No 1=Yes, the strategy is partially described 2=Yes, the strategy is fully described</p> <p>This question refers to the existence of a national strategy that addresses the coastal impacts of climate change, e.g. sea level rise, coastal flooding. Adaptation refers to any efforts to adapt coastal areas to mitigate these risks. This strategy may be found in the country's climate change strategy document or in a strategy document covering coastal management.</p> <p><b>1.3.2 To what extent does the country address the management of coastal wetland (blue carbon) ecosystems in its Nationally Determined Contributions (NDCs)?</b></p> <p>0=The country does not address the management of coastal wetland (blue carbon) ecosystems in its NDC, or has not developed an NDC 1=The country addresses the management of coastal wetland (blue carbon) ecosystems through either mitigation or adaptation efforts 2=The country addresses the management of coastal wetland (blue carbon) ecosystems through mitigation and adaptation efforts</p> <p>Blue carbon refers to carbon stored and sequestered in coastal ecosystems such as mangrove forests, seagrass meadows and intertidal salt marshes. Countries that mention managing carbon storage in coastal ecosystems in their NDCs receive credit. Data were sourced from countries' NDCs and from the following study: Herr, D. and Landis, E. (2016) Coastal blue carbon ecosystems: Opportunities for Nationally Determined Contributions. Policy Brief (TNC/IUCN).</p>

<b>1.4. Maritime spatial planning</b>	<b>1.4.1 Is there a domestic legal or regulatory basis for maritime spatial planning (MSP)?</b> 0=No 1=Yes, there is a legal or regulatory basis at subnational level, or MSP is at the planning stage 2=Yes, there is a legal or regulatory basis at national level
	<b>1.4.2 Is there a government entity responsible for maritime spatial planning?</b> 0=No 1=Yes, there is a government entity responsible at subnational level 2=Yes, there is a government entity responsible at national level
<b>1.5. Stakeholder engagement</b>	<b>1.5.1 Do institutions provide citizens with the opportunity to successfully petition government to redress grievances?</b> 0=No 1=Some opportunities 2=Yes This indicator is based on the EIU's Democracy Index as a proxy for public participation in coastal management.
	<b>1.5.2 Does the strategy referred to in sub-indicator 1.1.2 require multi-stakeholder engagement (i.e. private sector, public sector, third sector and private citizens)?</b> 0=No 1=Yes The strategy noted in 1.1.2 must specifically address multi-stakeholder engagement.
<b>1.6 Transparency in rents distribution</b>	<b>1.6.1 Has the country adopted EITI standards?</b> 0=No 1=Membership has been suspended 2=EITI candidate country 3=EITI compliant country, or extractive industries are not a significant economic activity in the country This is a proxy to assess accountability and transparency in distribution of the benefits flowing from the exploitation of natural resources. The Extractive Industries Transparency Initiative (EITI) is a global standard led by a coalition of governments, companies, investors, civil society organisations and partner organisations to promote openness and accountable management of natural resources. It seeks to strengthen government and company systems, inform public debate and enhance trust.
	<b>1.7. Adoption of the United Nations Convention on the Law of the Sea (UNCLOS)</b> <b>1.7.1 Is the country a party to the United Nations Convention on the Law of the Sea (UNCLOS)?</b> 0=Not a member 1=Signed 2=Signed and ratified (or action with the same legal effect has been taken)

## II. Business environment for coastal economic activities

This category comprises four indicators and nine sub-indicators related to the business operating environment for developing coastal economic activities. It assesses the attributes supporting private-sector activities in coastal areas.

Indicator	Sub-indicators and scoring schemes
<b>2.1. Ease of doing business</b>	<b>2.1.1 This indicator is informed by the EIU's Business Environment Rankings.</b> The EIU's business environment rankings quantify the attractiveness of the business environment. The overall score is derived as an unweighted average of ten component category scores. The ratings run from 1 to 10. 1=Worst environment 10=Best environment
<b>2.2. Corruption perception</b>	<b>2.2.1 This indicator is informed by the World Bank's Worldwide Governance Indicators, specifically Control of Corruption (rank).</b> Control of corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and major forms of corruption, as well as capture of the state by elites and private interests. 0=Lowest control of corruption 100=Highest control of corruption

### 2.3. Effectiveness of dispute-resolution mechanisms

This is a composite indicator that considers two indicators from the EIU's Risk Briefing:

#### 2.3.1 Fairness of judicial process: Assesses the extent to which the legal process/the courts can be interfered with or distorted to serve particular interests

0=Very high degree: The legal process is extremely susceptible to distortion by particular interests

1=High degree: The legal process is often distorted by particular interests

2=Moderate degree: The legal process is sometimes distorted by particular interests

3=Low degree: The legal process is rarely distorted by particular interests

4=Very low degree: The legal process is entirely independent

#### 2.3.2 Enforceability of contracts: Assesses the risk that contract rights will not be enforced

0=Very high: Businesses cannot rely on contractual rights being enforced at all

1=High: Businesses will often find that contractual rights are not enforced

2=Moderate: Businesses will sometimes find that contractual rights not enforced

3=Small: Businesses can usually rely on contractual rights being enforced

4=Minimal: Businesses can rely on all contractual rights being enforced by the authorities

### 2.4. Quality of coastal infrastructure

The EIU uses the quality of port, road and rail infrastructure and electricity supply as a proxy for the quality of overall coastal infrastructure. This is a composite indicator based on four indicators from the World Economic Forum's Global Competitiveness Index.

#### 2.4.1 How would you assess port facilities in your country?

0=Extremely underdeveloped

7=Well developed and efficient by international standards

This scale has been adjusted to a 0-6 scale.

#### 2.4.2 How would you assess the reliability of electricity supply (lack of interruptions and lack of voltage fluctuations)?

1=Not reliable at all

7=Extremely reliable

This scale has been adjusted to a 0-6 scale.

#### 2.4.3 How would you assess roads in your country?

1=Extremely underdeveloped

7=Extensive and efficient by international standards

This scale has been adjusted to a 0-6 scale.

#### 2.4.4 How would you assess railways in your country?

1=Extremely underdeveloped

7=Extensive and efficient by international standards

This scale has been adjusted to a 0-6 scale.

#### 2.4.5 To what extent is improved drinking water and sanitation infrastructure accessible in the country?

0=Lowest access

100=Highest access

The EIU uses the indicator on water and sanitation from the Environmental Performance Index (EPI) as a proxy of the quality of water infrastructure in coastal areas. This is a composite indicator which includes the percentage of the national population with (i) access to sanitation and (ii) access to drinking water. It is not specific to coastal areas.

### III. Water quality

This category comprises three indicators and six sub-indicators related to management and preservation of water quality. It assesses the coastal management of the water resource and the extent to which this ensures the quality of the asset.

Indicator	Sub-indicators and scoring schemes
<b>3.1. Freshwater pollution control agency</b>	<b>3.1.1 Is there a national environmental agency responsible for setting freshwater pollution controls?</b> 0=No 1=No, but standards are set by regional (state, provincial) bodies/agencies 2=Yes
<b>3.2. Regulatory standards for water pollution</b>	<b>3.2.1 Do regulations set water quality standards for point source pollution?</b> 0=No 1=Yes  <b>3.2.2 Do regulations restrict or ban the “Dirty Dozen” persistent pollutants under the Stockholm Convention?</b> The answer to this question is based on the EPI’s indicator on pesticide regulation. This indicator assesses whether countries allow, restrict or ban the Dirty Dozen persistent organic pollutants under the Stockholm Convention. The scores run from 0 to 25 based on the EPI’s methodology. 0=Least restrictive regulation 25=Most restrictive regulation  <b>3.2.3 To what extent is wastewater treated?</b> This indicator is based on the EPI’s water resources indicator, which tracks the extent to which wastewater from households and industrial sources is treated before being releasing back into the environment. More specifically, it is defined as the wastewater treatment level weighted by its connection to the wastewater treatment rate. 0=Lowest 100=Highest
<b>3.3. Monitoring and enforcement</b>	<b>3.3.1 Are data on coastal water quality collected?</b> 0=There is no data collection, or information about data collection not publicly available 1=Data are collected but frequency is unclear 2=Data are collected at least once a year 3=Data are collected more than once a year  <b>3.3.2 Do regulations establish penalties for violations of water quality standards noted in 3.2.1?</b> 0=No 1=Yes



## IV. Minerals, energy and shipping

This category comprises four indicators and ten sub-indicators related to the exploitation, use and transport of minerals and the production of energy. It measures the coastal governance environment for the mineral, oil and gas, and shipping industries.

Indicator	Sub-indicators and scoring schemes
<b>4.1. Permitting and licensing</b>	<p>Are there clear rules for obtaining and maintaining tenure?</p> <p><b>4.1.1 For oil and gas:</b>  0=No, or information not publicly available  1=The tenure process is partially described  2=The tenure process is fully described and publicly available, or the oil and gas industry is not a significant economic activity in the country  Tenure is the process of leasing and administering oil/gas rights owned by the state/provincial or national government. Oil/gas lease rules and regulations, which describe the process for obtaining a lease, should include the following details:</p> <ul style="list-style-type: none"> <li>• the entity responsible for evaluating applications</li> <li>• associated fees</li> <li>• required documentation for application for lease</li> <li>• required documentation for application for renewal of lease</li> </ul> <p><b>4.1.2 For mining activities:</b>  0=No, or information is not publicly available  1=The tenure process is partially described  2=The tenure process is fully described and publicly available or the mining industry is not a significant economic activity in the country  Tenure is the process of leasing and administering mining rights owned by the state/provincial or national government. Mining lease rules and regulations, which describe the process for obtaining a lease, should include the following details:</p> <ul style="list-style-type: none"> <li>• the entity responsible for evaluating applications</li> <li>• associated fees</li> <li>• required documentation for application for lease</li> <li>• required documentation for application for renewal of lease</li> </ul>
<b>4.2. Monitoring and enforcement</b>	<p>Do mineral and energy projects require environmental impact assessments?</p> <p><b>4.2.1 For oil and gas:</b>  0=No  1=Yes, or the oil and gas industry is not a significant economic activity in the country</p> <p><b>4.2.2 For mining activities:</b>  0=No  1=Yes, or the mining industry is not a significant economic activity in the country</p> <p><b>4.2.3 Do regulations require on-site inspections to monitor environmental impact?</b>  0=No  1=Yes</p> <p><b>4.2.4 Are data on oil spills collected by a government entity?</b>  0=No data are collected  1=Yes, data are collected but are not publicly available  2=Yes, data are collected and are publicly available</p>

<b>4.3. Risk mitigation for the mineral and oil and gas industries</b>	<b>4.3.1 Is the country a signatory of the Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC) and the Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances (OPRC-HNS)?</b> 0=The country has not ratified the OPRC 1=The country has ratified the OPRC 2=The country has ratified the OPRC and the OPRC-HNS
	<b>4.3.2 Do licensing requirements for oil extraction require licensees to have emergency plans to deal with marine emergencies caused by oil and other harmful substances?</b> 0=No 1=Yes
	<b>4.3.3 Are there offshore areas that are off limits to mineral and/or oil and gas extraction?</b> 0=No 1=Yes
<b>4.4 Shipping/maritime pollution</b>	<b>4.4.1 To what extent has the country ratified the International Maritime Organization (IMO) conventions related to shipping/maritime pollution?</b> 0=0-5 conventions ratified 1=6-11 conventions ratified 2=12-17 conventions ratified 3=18-23 conventions ratified Scores are based on the following IMO conventions related to shipping/maritime pollution: IMO Convention 48, MARPOL 73/78 (Annex I/II), MARPOL 73/78 (Annex III), MARPOL 73/78 (Annex IV), MARPOL 73/78 (Annex V), MARPOL Protocol 97 (Annex VI), London Convention 72, London Convention Protocol 96, INTERVENTION Convention 69, INTERVENTION Protocol 73, CLC Convention 69, CLC Protocol 76, CLC Protocol 92, FUND Protocol 76, FUND Protocol 92, FUND Protocol 2003, SALVAGE Convention 89, HNS Convention 96, HNS PROT 2010, BUNKERS CONVENTION 01, ANTI FOULING 2001, NAIROBI WRC 2007, HONG KONG CONVENTION. While OPRC Convention 90, OPRC/HNS 2000 and BALLASTWATER 2004 also relate to shipping/maritime pollution, they are already accounted for in sub-indicators 4.3.1 and 6.3.1 and are not included in this sub-indicator.

## V. Land

This category comprises four indicators and five sub-indicators. It measures the coastal governance environment for the tourism and real-estate (residential and commercial) industries.

Indicator	Sub-indicators and scoring schemes
<b>5.1. Prevalence of coastal protected areas</b>	The EIU used the share of terrestrial protected areas as a proxy for the prevalence of coastal protected areas. <b>5.1.1 Are there any terrestrial protected areas?</b> 0=No, or share protected is less than 10% of total terrestrial area 1=Share protected is at least 10% and less than 17% of total terrestrial area 2=Share protected is at least 17% of total terrestrial area The scoring scheme is based on the Convention of Biological Diversity's target that at least 17% of terrestrial and inland water should be protected by 2020.
<b>5.2. Environmental impact of coastal development</b>	<b>5.2.1 Do coastal development projects require environmental impact assessments?</b> 0=No 1=Yes For the purposes of this index, "coastal development projects" refers to any real-estate project on the shoreline (housing, hotels, restaurants, etc.). <b>5.2.2 Do regulations require on-site reviews to monitor environmental impact?</b> 0=No 1=Yes Regulations should require on-site reviews to monitor compliance with an environmental protection plan. The monitoring may include reviews of described limits on discharges to the environment, including the sampling and analytical programme to quantify compliance.

**5.3. Government commitment to sustainability in coastal tourism development**

This indicator is based on an indicator from the World Economic Forum's Travel and Tourism Competitiveness Report 2017.

**5.3.1 How would you assess the effectiveness of government efforts to ensure that tourism is being developed in a sustainable way?**

0=Very ineffective (development of the sector does not take into account issues related to environmental protection and sustainable development)

6=Very effective (issues related to environmental protection and sustainable development are at the core of the government's strategy)

**5.4 Natural disaster risk mitigation**
**5.4.1 Does the country have a natural disaster risk mitigation strategy that addresses coastal zones?**

0=No

1=Yes

The strategy may cover the implementation of monitoring systems and plans to manage the impact of natural hazards on coastal areas.

## VI. Living resources

This category comprises four indicators and six sub-indicators on coastal management of living resources, including fisheries and wildlife.

*Indicator*
*Sub-indicators and scoring schemes*
**6.1 Fisheries governance and management effectiveness**
**6.1.1 Fisheries governance and management effectiveness**

This indicator measures the status of fisheries management and regulations in the top fishing nations of the world. Using data gathered through an expert survey that covers several aspects of management systems—including stock status, management approach, monitoring and enforcement, and socioeconomics—this indicator is intended to characterise the level of fisheries governance and management effectiveness by country.

Scored as the average of scores across four dimensions focused on:

- Research, monitoring and assessment of fisheries stocks
- Management response to stock status
- Enforcement of management measures
- Social and economic attributes (e.g. controls on access and entry into fishery, transparency and community involvement, subsidies)

Survey respondents assessed governance and effectiveness based on a list of ten key fish species caught by the country. The ten species include:

- The four species with greatest landings caught by the country in UN Food and Agriculture Organisation (FAO) areas adjacent to the main exclusive economic zone
- The four species with greatest estimated landed value (based on FAO adjacent-landings data and estimated ex-vessel prices)
- The remainder of the ten species, randomly sampled in proportion to their landings and landed value

Answers were provided in a global context, recognising that the survey was conducted across a wide range of countries differing in the development of their fisheries governance systems.

For this indicator, CEA Consulting worked with Dr Ray Hilborn and Dr Michael Melnychuk (University of Washington) to create the methodology for the indicator and collect the data supporting the scores.

**6.2 Protection for marine/coastal species**
**6.2.1 Do domestic laws and/or regulations require the protection of threatened species and populations in coastal areas?**

0=No

1=Yes

Protection should, at a minimum, cover sea turtles and marine mammals.

**6.2.2 Extent of Marine Protected Areas (MPAs)**

0=No MPAs, or the share protected is less than 5% of the total marine area

1=Share protected is 5-9.99% of the total marine area

2=Share protected is at least 10% of the total marine area

The scoring scheme is based on the Convention of Biological Diversity's target that at least 10% of marine areas should be protected by 2020.

<b>6.3 Ballast water treatment</b>	<b>6.3.1 Are there mechanisms in place to control pathways of introduction of alien species to the marine and coastal environment from ballast water?</b> 0=No 1=Yes
<b>6.4 Transparency in living resources management</b>	<b>6.4.1 Is the country party to the Agreement on Port State Measures (PSMA)?</b> 0=No 1=Yes This PSMA aims to prevent, deter and eliminate illegal, unreported and unregulated (IUU) fishing. By abiding by PSMA stipulations countries demonstrate their commitment to ensuring that fishing regulations are followed.
	<b>6.4.2 Does the country publicly disclose data from its Vessel Monitoring System (VMS)?</b> 0=The country does not publicly disclose its VMS data, or the country does not employ a VMS 1=The country publicly discloses its VMS data A VMS is used in commercial fishing to allow monitoring, control and surveillance of fishing activities by environmental and fisheries regulatory organisations. According to Global Fishing Watch, a non-profit organisation that provides commercial fishing monitoring services, "public sharing of VMS data improves surveillance by encouraging vessels to comply with fisheries regulations".

### 3. Methodology

#### A. General

To score the indicators for the Coastal Governance Index, the research team gathered data from the following sources:

- Primary texts, such as laws, regulations and other legal documents
- Government publications and reports
- Academic publications and reports
- Websites of governmental authorities, international organisations and non-governmental organisations
- Websites of industry associations
- Local and international news-media reports

Specific sources by indicator are available on request from the EIU.

Quantitative indicators were sourced from:

- World Bank Governance Indicators
- World Economic Forum
- Yale University Environmental Protection Index
- International Maritime Organisation
- Global Fishing Watch

- United Nations Environmental Programme and World Conservation Monitoring Centre
- Economist Intelligence Unit proprietary databases

#### B. Framework updates

The EIU conducted desk research to identify new indicators that account for the political, institutional, technological and social developments that have had an impact on coastal governance since 2015. CEA Consulting provided valuable insights on potential indicators to include. Based on these factors, the EIU added two new indicators comprising three sub-indicators in total, as well as adding one additional sub-indicator to an existing indicator. Details are included below:

##### 1. Policy and institutional capacity

**1.3 National strategies to address climate change:** This indicator, previously entitled "National strategy to adapt to climate change", was composed of a single sub-indicator (1.3.1 – *Strategy to adapt coastal areas to climate change*) that measured the existence of a national strategy to adapt coastal areas to the risks associated with climate change. However,

it did not assess mitigation measures that are an essential component of efforts to strengthen coastal resilience to climate change. To account for such measures, the EIU added sub-indicator *1.3.2 – Efforts to increase blue carbon* to the index. This sub-indicator captures mitigation efforts to increase blue carbon, or carbon stored in coastal ecosystems. Coastal ecosystems are efficient at sequestering and storing carbon and at increasing coastal resilience by absorbing incoming wave energy while also protecting against flood damage and storm surge.<sup>103</sup> Scoring for this indicator relies on a study from the Nature Conservancy that evaluates Nationally Determined Contributions (NDCs) across many countries.<sup>104</sup>

#### 4. Minerals, energy and shipping

This category was previously entitled “Minerals and energy” and has been revised to its current title to account for the role of shipping in coastal governance.

**4.4 Shipping/maritime pollution:** Category 4 assesses how countries regulate the mineral and oil and gas industries within their exclusive economic zones. However, it did not previously account for the transport of minerals and oil and gas products or for other shipping activities. Shipping is a contributor to water-based forms of pollution that can harm coastal ecosystems, e.g. accidental oil discharges, sewage disposal from ships. The EIU added an indicator to measure how countries regulate shipping pollution to acknowledge the impact of this activity on coastal and ocean health. The indicator is entitled *4.4 – Shipping/maritime pollution*, and includes one sub-indicator (*4.4.1 – Ratification of International Maritime Organization (IMO) Conventions on shipping/maritime pollution*). It assesses the total number

of IMO conventions that a country has ratified, from a list of 23 relevant conventions identified by the EIU.

#### 6. Living resources

##### 6.4 Transparency in living resources

**management:** Category 6 measures coastal management of living resources, including fisheries and wildlife. However, it previously lacked an assessment of government transparency in this space. Efforts to improve transparency can support collaborative government action to ensure sustainable fisheries practices and the rebuilding of marine habitats. This new indicator comprises two sub-indicators: *6.4.1 – Adoption of Agreement on Port State Measures (PSMA)*, and *6.4.2 – Public disclosure of Vessel Monitoring System (VMS) data*. The first sub-indicator measures whether countries are party to the PSMA, which aims to prevent, deter and eliminate illegal, unreported and unregulated fishing. The second sub-indicator assesses whether a country employs and publicly discloses data from a VMS, which allows environmental and fisheries regulatory organisations to track and monitor fishing vessels. These sub-indicators capture countries’ demonstrated commitments to ensuring that fishing regulations are complied with.

#### C. Country coverage

The Coastal Governance Index includes 20 countries. Several parameters were taken into account to determine the country list, including:

- global fishing catch production
- size of the economy
- length of coastline
- oil and gas production
- regional representation
- level of economic development

<sup>103</sup> Lloyd’s Tercentenary Research Foundation.

<sup>104</sup> Herr, D. and Landis, E. (2016), Coastal blue carbon ecosystems. Opportunities for Nationally Determined Contributions. Policy Brief (TNC/IUCN).

Africa	Asia	Europe	South America	North America
1. Nigeria	3. China	11. France	15. Brazil	18. Canada
2. South Africa	4. India	12. Norway	16. Chile	19. Mexico
	5. Indonesia	13. Russia	17. Peru	20. United States
	6. Japan	14. Spain		
	7. New Zealand			
	8. Philippines			
	9. South Korea			
	10. Vietnam			

#### D. Scoring criteria

There are 47 sub-indicators used to construct 26 indicators across six categories within the dynamic scoring model of the Coastal Government Index. The overall scores (0-100) for countries in the index are a weighted average of the six categories as determined by the weighting profile (for more information on index weights, please refer to Section F below), where each is scored on a scale of 0-100 with 100 representing the most favourable coastal governance environment.

Many of the sub-indicators seek to measure the laws and standards of coastal governance. An experienced team of researchers probed the sources listed in Section A to provide informed and comprehensive answers to each question across all 20 countries. The EIU supplied a detailed guidance outlining the criteria and goals, in addition to a scoring scheme, for each question. While the criteria for data collection were rigorous, they remain subjective. Staff from the EIU thoroughly reviewed, calibrated and compared scores to ensure proper justification and consistency across all countries.

Sub-indicator values include binomial observations (0,1) as well as scoring ranges (0-2, 0-3, 0-4). Each sub-indicator is constructed such that higher values always represent more favourable coastal governance conditions. For example, a country with a highly independent

legal process capable of avoiding external interference is assigned a score of 4 for the sub-indicator relating to the fairness of the judicial process (2.3.1). In contrast, a country with a legal process that is highly susceptible to distortion is assigned a score of 0.

Sub-indicator scores are then normalised to calculate the indicator and category scores, ranging from 0 to 100, with 100 representing the most favourable coastal governance environment.

#### E. Calculating the Coastal Governance Index

Modelling the sub-indicators, indicators and categories in the Coastal Governance Index results in overall scores of 0-100 for each country, where 100 represents the most favourable coastal governance conditions and 0 the least favourable. A score of 100 does not suggest that a country has achieved perfect coastal governance; likewise, a score of 0 does not mean that a country has no coastal governance. Rather, scores of 100 and 0 represent the highest and lowest possible scores as measured by the index criteria.

The sub-indicator values are first normalised on the basis of the following equation:

$$x = (x - \text{Min}(x)) / (\text{Max}(x) - \text{Min}(x)),$$

where  $\text{Min}(x)$  and  $\text{Max}(x)$  are the lowest and highest values allowed by the scoring scheme

for any given sub-indicator. Those values are averaged to determine the value of the indicator:

Indicator score =  $\sum$  individual sub-indicators / # sub-indicators

The indicators are classified into six categories: Policy and institutional capacity (7 indicators); Business environment for coastal activities (4 indicators); Water quality (3 indicators); Minerals, energy and shipping (4 indicators); Land (4 indicators); and Living resources (4 indicators). The category values are the average of the indicators that make up the category.

Category score =  $\sum$  individual indicators / # indicators

The category values are assigned neutral weights (please refer to Section E for more details), and this ultimately determines the overall scores and rankings in the index.

## F. Weights

Assigning weights to index components is the final step in the construction of the index, reflecting assumptions regarding the differing importance of the various topics covered by the index. In the first iteration of the index, we assigned neutral weights to the categories, to reflect our examination of coastal governance from an innovative perspective that had been insufficiently examined in the literature. In the current iteration, we have revised category weights to reflect the importance of certain areas that have a greater or lesser impact on sustainable coastal governance. We received input from CEA Consulting in the development of the current weighting scheme, which reflects the latest understanding and consensus on the progress that has been made since this index was last published.

The current weighing scheme assigns greater importance to a country's policy and institutional capacity and to its living resources environment. Accordingly, these categories receive the highest weights, at 23.1% each. All the other categories are assigned a weight of 15.4%, except for the business environment for coastal activities, which is weighted at 7.7%. Within the categories, some sub-indicators have been assigned higher weights based on their greater importance. The exact weights for each category, indicator and sub-indicator are displayed in the table below for easy reference. Readers can download the Excel model free of charge at [www.woi.economist.com/coastal-governance-index-2019/](http://www.woi.economist.com/coastal-governance-index-2019/) and can customise the weights for each category and indicator.



MAIN CATEGORIES		Weight
1)	POLICY AND INSTITUTIONAL CAPACITY	23.1%
2)	BUSINESS ENVIRONMENT FOR COASTAL ACTIVITIES	7.7%
3)	WATER QUALITY	15.4%
4)	MINERALS, ENERGY AND SHIPPING	15.4%
5)	LAND	15.4%
6)	LIVING RESOURCES	23.1%
INDICATORS		Weight
1)	POLICY AND INSTITUTIONAL CAPACITY	
1.1)	Coastal management policy and strategy	23.1%
1.2)	Presence of established institution(s)	23.1%
1.3)	National strategies to address climate change	15.4%
1.4)	Maritime spatial planning	7.7%
1.5)	Stakeholder engagement	15.4%
1.6)	Extractive industries transparency	7.7%
1.7)	Adoption of the United Nations Convention on the Law of the Sea (UNCLOS)	7.7%
2)	BUSINESS ENVIRONMENT FOR COASTAL ACTIVITIES	
2.1)	Ease of doing business	25.0%
2.2)	Corruption perception	25.0%
2.3)	Effectiveness of dispute resolution mechanisms	25.0%
2.4)	Quality of coastal infrastructure	25.0%
3)	WATER QUALITY	
3.1)	Freshwater pollution control agency	33.3%
3.2)	Regulatory standards for water pollution	33.3%
3.3)	Monitoring and enforcement	33.3%
4)	MINERALS, ENERGY AND SHIPPING	
4.1)	Permitting and licensing	25.0%
4.2)	Monitoring and enforcement	25.0%
4.3)	Risk mitigation for the mineral and oil and gas industries	25.0%
4.4)	Shipping/maritime pollution	25.0%
5)	LAND	
5.1)	Prevalence of coastal protected areas	33.3%
5.2)	Environmental impact of coastal development	33.3%
5.3)	Government commitment to sustainability in coastal tourism development	16.7%
5.4)	Natural disaster risk mitigation	16.7%
6)	LIVING RESOURCES	
6.1)	Fisheries	42.9%
6.2)	Protection for marine/coastal species	28.6%
6.3)	Ballast water treatment	14.3%
6.4)	Transparency in living resources management	14.3%

## G. Model correlations

Correlating the Coastal Governance Index to output (dependent) variables reveals some potentially interesting associations. Correlations measure the strength of a relationship between two variables. Scatterplots, which can be found on the “Scatter” worksheet in the index data model, show the correlations between the Coastal Governance Index and a number of variables. Some of these correlations are analysed in the Executive summary and Category results sections of this report. The reader is encouraged to plot more correlations in the index data model.

While every effort has been taken to verify the accuracy of this information, The Economist Intelligence Unit Ltd. cannot accept any responsibility or liability for reliance by any person on this report or any of the information, opinions or conclusions set out in this report. The findings and views expressed in the report do not necessarily reflect the views of the sponsor.

## **LONDON**

20 Cabot Square  
London, E14 4QW  
United Kingdom  
Tel: (44.20) 7576 8000  
Fax: (44.20) 7576 8500  
Email: london@eiu.com

## **GENEVA**

Rue de l'Athénée 32  
1206 Geneva  
Switzerland  
Tel: (41) 22 566 2470  
Fax: (41) 22 346 93 47  
Email: geneva@eiu.com

## **NEW YORK**

750 Third Avenue  
5th Floor  
New York, NY 10017  
United States  
Tel: (1.212) 554 0600  
Fax: (1.212) 586 1181/2  
Email: americas@eiu.com

## **DUBAI**

Office 1301a  
Aurora Tower  
Dubai Media City  
Dubai  
Tel: (971) 4 433 4202  
Fax: (971) 4 438 0224  
Email: dubai@eiu.com

## **HONG KONG**

1301 Cityplaza Four  
12 Taikoo Wan Road  
Taikoo Shing  
Hong Kong  
Tel: (852) 2585 3888  
Fax: (852) 2802 7638  
Email: asia@eiu.com

## **SINGAPORE**

8 Cross Street  
#23-01 Manulife Tower  
Singapore  
048424  
Tel: (65) 6534 5177  
Fax: (65) 6534 5077  
Email: asia@eiu.com