Ocean Frontiers at Risk:

Fossil Fuel Expansion Threats to Biodiversity Hotspots and Climate Stability

Earth InSight

IN PARTNERSHIP WITH:

ARAYARA.org

CEED
CENTER FOR ENERGY ECOLOGY AND DEVELOPMENT

CELCOR

Fossil Free Wider Caribbean

Protect our Biodiversity Suriname

DAN
DEFENSA AMBIENTAL DEL NOROESTE

The Green Connection

Our Islands Our Future

Global Energy Monitor

FORO SOCIAL PANAMAZÓNICO
FOSPA - SURINAME

WATERKEEPER® ALLIANCE

Acknowledgements
This report was prepared by Earth Insight in partnership with: Center for Energy, Ecology, and Development (CEED) (Philippines), Center for Environmental Law and Community Rights Inc. (CELCOR) (Papua New Guinea), Defensa Ambiental del Noroeste (DAN) (Mexico), Fossil Free Wider Caribbean, Global Energy Monitor (GEM), The Green Connection (South Africa), Instituto Internacional Arayara (Brazil), Justiça Ambiental (Stop Mozambique Gas campaign), Our Islands Our Future (Waterkeepers Bahamas), Probios (Suriname), Sauver la Mer et la Pêche (Waterkeepers Senegal), and Waterkeeper Alliance. We gratefully acknowledge the valuable contributions of these partners, whose support—ranging from data sharing and narrative input to regional expertise and outreach—has been instrumental in shaping a publication that elevates the most pressing threats and opportunities at the intersection of climate and nature.

Suggested Citation: Earth Insight, et al. (2025). Ocean Frontiers at Risk: Fossil Fuel Expansion Threats to Biodiversity Hotspots and Climate Stability

Cover Image: Offshore oil extraction facility in Brazil. Image credit: Edafoto via iStock

Ocean Frontiers at Risk | Fossil Fuel Expansion Threats to Biodiversity

Green sea turtle, hovering over healthy coral reef.
Image credit: Envato Elements CC

Executive Summary

This report examines the global expansion of offshore and coastal oil and gas development and its profound threats to marine ecosystems, biodiversity, and the livelihoods of coastal communities–drawing on regional case studies to illustrate these threats.

Much of this expansion is advancing in frontier regions: underexplored areas with significant potential for oil, gas, or Liquefied Natural Gas (LNG) development. The report presents 11 case studies from around the world, spotlighting the environmental and social risks associated with these projects, as well as the growing resistance from frontline communities, Indigenous peoples, and civil society organizations.

Despite urgent global calls to phase out fossil fuels and meet climate targets, governments and corporations continue to invest trillions of dollars into expanding oil and gas infrastructure, entrenching fossil fuel dependence at the expense of ocean health and climate stability.

LNG (Liquefied natural gas) tanker anchored in Gas terminal
Image credit: Envato Elements CC

The results of the analysis raise serious concerns:

- **Oil and gas blocks** cover over 2.7 million km² in the case study frontier regions - an area about the size of Argentina.
- **Protected Area Threats:** 88,500 km² of oil and gas block overlap; 19% of coastal and marine protected areas are at risk across the frontier regions.
- **Important Marine Mammal Areas and KBA Threats:** 70,000 km², or 11%, of Important Marine Mammal Areas (IMMAs) and 49,000 km², or 14%, of marine and coastal Key Biodiversity Areas (KBAs) are overlapped by oil and gas blocks.
- **Coral Reef, Seagrass, and Mangrove Threats:** Approximately 21,000 km², or 15%, of coral reefs, 7,900 km², or 63%, of seagrass meadows, and 2,000 km², or 15%, of mangroves in the frontier case studies are overlapped by oil and gas blocks, placing critical marine habitats at significant risk. These regions are vital for the conservation of marine mammals and ecosystems due to their ecological significance, such as feeding, breeding, or migration activities.
- **LNG expansion threats:** There are 13 Important Marine Mammal Areas with 20 unique species at risk near LNG terminal offshore infrastructure across the LNG case study areas.

Other Key Considerations Include:

1. Impact on Communities: Millions of people who depend on fishing, tourism, and healthy coastal ecosystems face economic and health risks from oil spills, pollution, and habitat destruction. In the Gulf of California alone, LNG developments threaten a $320 million fishing industry that employs over 50,000 people. The fisheries sector in Senegal, which accounts for 3.2% of the GDP and 10.2% of the country's export, is also at risk.

2. Climate and Biodiversity Crisis: Offshore fossil fuel extraction and combustion significantly contribute to the climate crisis, pollution, and biodiversity decline. Projects such as Papua LNG in Papua New Guinea will release greenhouse gases equivalent to Bangladesh's annual emissions.[1] Meanwhile, the Saya de Malha bank in the Indian Ocean, the world's largest seagrass meadow, remains 98% overlapped by fossil fuel blocks and is unprotected, despite its critical role in carbon sequestration.
[2]

3. Growing Resistance: Frontline communities, Indigenous groups, and civil society organizations are leading the fight against these developments. Through campaigns, petitions and lawsuits, groups across the world are challenging powerful fossil fuel companies to protect their coastal and marine areas, safeguard their ecosystems and secure a sustainable future for generations to come.

To tackle the climate crisis as well as the environmental and social threats of offshore and coastal fossil fuel expansion, the following recommendations are proposed:

1. Stop Fossil Fuel Expansion: Halt the expansion of offshore and coastal fossil fuel activities, with a focus on safeguarding protected and environmentally sensitive regions.

2. Remove Unassigned Blocks and Stop New Approvals: Remove unassigned oil and gas blocks, and restrict new licenses, permits, or extensions for offshore and coastal fossil fuel projects.

3. Cease Financial Support: Terminate investments, insurance, and financing for offshore and coastal fossil fuel expansion.

4. Redirect Invest to Clean Energy: Channel funding toward solar, wind, and other renewable energy sources.

5. Undertake Restoration: Rehabilitate habitats harmed by fossil fuel operations through decommissioning, pollution remediation, and conservation efforts.

Manatee surfacing in shallow lagoon.
Image credit: Envato Elements CC

Case Study Highlights:

Gulf of California: LNG developments risk disrupting the "world's aquarium," a UNESCO World Heritage site and critical habitat for 39% of marine mammal species.

Bahamas: Offshore oil and gas activities threaten the Lucayan Archipelago Important Marine Mammal Area (IMMA), home to humpback whales and endangered manatees, as well as the country's tourism-dependent economy.

Barbados: Proposed offshore blocks overlap with 90% of coral reefs and 87% of seagrass meadows, endangering marine biodiversity and tourism.

Suriname: Over 93% of mangroves overlap with oil and gas blocks, threatening critical habitats for such species as the Amazon river dolphin and endangered sea turtles.

Equatorial Margin: Oil exploration near the mouth of the Amazon overlaps with newly discovered coral reefs, while Indigenous and fishing communities oppose the projects.

Senegal: Oil and gas projects overlap with 98% of mangrove forests and 100% of seagrass meadows, jeopardizing critical ecosystems and fishing.

Orange Basin: Offshore oil exploration in Namibia and South Africa threatens marine protected areas and iconic species as African penguins and killer whales.

Mozambique: The Rovuma LNG project risks exacerbating violence and environmental degradation, with civil society groups urging financial institutions to withdraw support.

Saya de Malha: The world's largest seagrass meadow remains unprotected, as oil exploration risks its unique biodiversity.

Palawan: Offshore oil and gas blocks cover 86,400 km², overlapping with coral reefs in the Coral Triangle, the world's most biodiverse marine region.

Papua New Guinea: The Papua LNG project has been labeled a "carbon bomb," threatening the country's sensitive biodiversity and local communities.[3]

Methodology and Analytical Approach

Oil extraction platform in the sea surrounded by hills in Rio De Janeiro in Brazil
Image credit: Envato Elements CC

This report uses geospatial analysis to examine how offshore and coastal fossil fuel developments–including oil and gas blocks, and LNG infrastructure–are encroaching on ecologically sensitive areas and affecting local and Indigenous communities, particularly in regions with previously underexplored hydrocarbon potential.

In this context, "frontiers" are underexplored regions with significant potential for oil, gas or LNG development, in contrast with "mature" petroleum basins.[4] Where exploration activities have begun in a frontier petroleum basin, these activities have only been short-term, and there is not a high volume of production from constant exploration or production. Frontier basins are often synonymous with underexplored basins, and so the time between initial exploration and discovery is typically longer than in mature basins.[5]

Through a series of case studies, this report analyzes some of these frontiers that face substantial plans from governments and corporations for large-scale fossil fuel expansion, with offshore drilling and LNG infrastructure on the horizon. The influx of financing, the drilling of wells, and the construction of ports, pipelines, and processing facilities risk locking these regions into decades of fossil fuel dependency. This concerning shift undermines future pathways for renewable energy transitions, threatens biodiversity, and compromises the well-being of coastal and Indigenous communities.

While this assessment covers a range of important geographies, it should be noted that many other frontier regions are not included in this analysis and will be mapped and examined in future assessments.

Aerial on Crystal Ocean Bay. Bali, Indonesia.
Image credit: Envato Elements CC

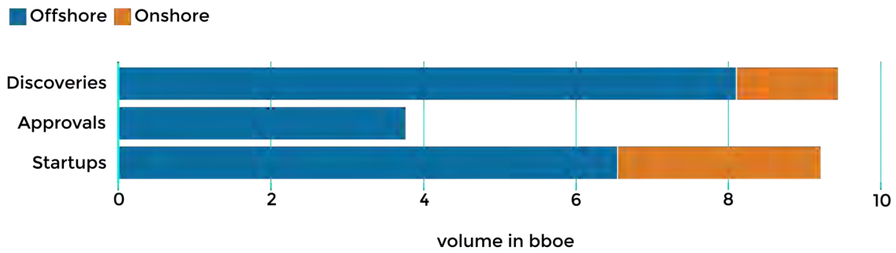
A Global Offshore Push: New Frontiers, New Threats to Biodiversity and Climate

The global expansion of offshore and coastal oil and gas and LNG poses a significant threat to oceans, coastlines, marine ecosystems, the communities that depend on them, and climate stability. Despite the urgent call to meet global climate goals, companies and governments worldwide are investing trillions of dollars in new fossil fuel developments, in contradiction of their green commitments and climate mandates.

The fossil fuel industry is betting big on offshore activities. Last year, companies announced the discovery of at least 8 billion barrels of oil equivalent in new offshore oil and gas fields. In 2024, all twelve projects that reached the Final Investment Decision – the last step before construction of new infrastructure – were offshore.[6]

New oil and gas volumes in 2024 were mostly offshore

Extractable oil and gas volumes from 2024 discoveries, approvals, and startups, measured in billion barrels of oil equivalent (bboe).



Source: Global Oil and Gas Extraction Tracker, February 2025

Global Energy Monitor

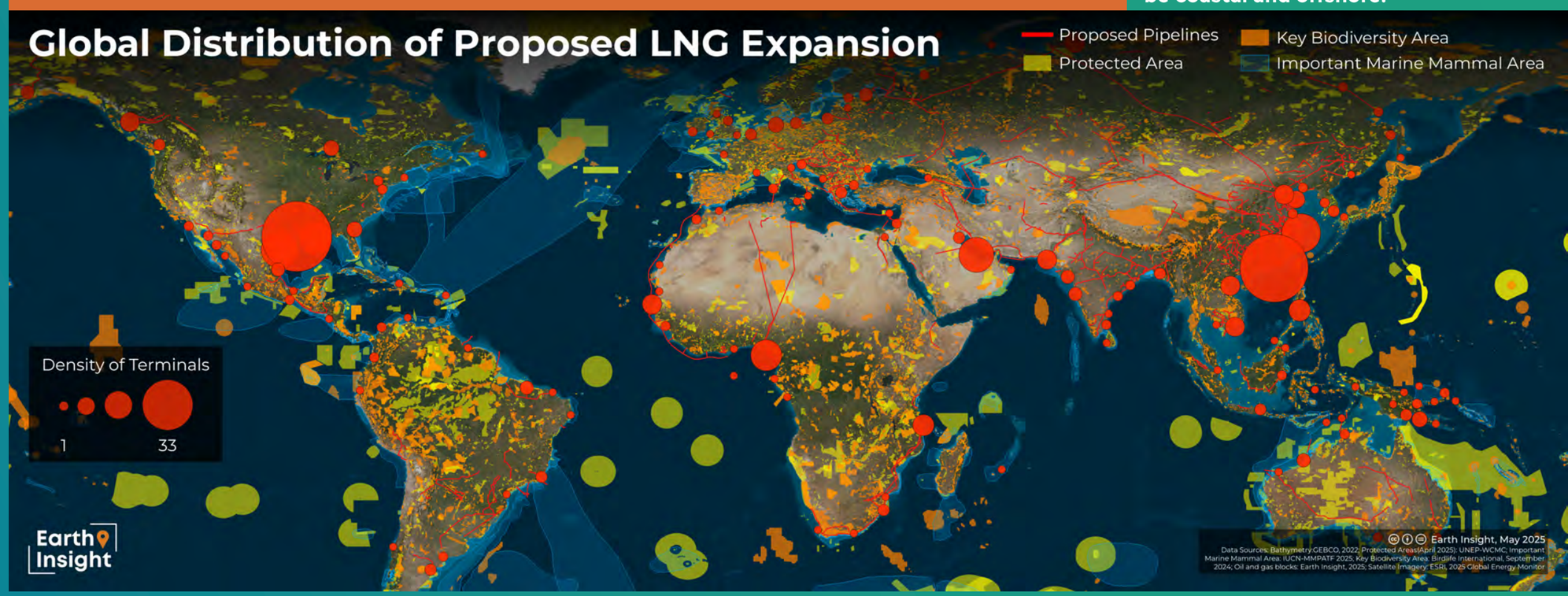
The risks posed by this offshore expansion to ocean ecosystems and global climate goals are manifold. Every stage of the offshore project lifecycle, from exploration to exportation, threatens marine biodiversity. The escalation of emissions, coupled with the degradation of ocean environments, not only jeopardize local ecosystems but also undermine broader climate mitigation initiatives.

Preserving ocean and coastal ecosystems, such as seagrass meadows and mangroves, is critical to maintaining marine biodiversity and human livelihoods. Fishing, tourism and other sources of income for millions of people depend on a healthy ocean. The expansion of offshore and coastal oil and gas brings with it ports, pipelines, processing facilities, and other infrastructure that can permanently alter fragile coastal environments.

Ocean Frontiers at Risk | Fossil Fuel Expansion Threats to Biodiversity

Marine environments also play an important role in protecting human populations against climate change and its impacts. Seagrasses, for example, excel at carbon sequestration – the process by which plants and other organisms remove and store carbon dioxide. While seagrass fields occupy only 0.2% of the seafloor, they are responsible for 10% of all the carbon that is stored by the oceans.[8] Mangroves, on the other hand, are natural defenses against coastal erosion, storm surges and floods – processes that are becoming more destructive with climate change.

In parallel, countries and companies are also investing heavily in LNG infrastructure to process and ship gas from these new developments or from older fields. The total economic investment in proposed and under-construction LNG projects amounts to roughly $1 trillion. A significant portion of LNG import and export projects are planned to be coastal and offshore.[7]



Key Findings

Across the case study regions, there are alarming trends – from significant oil and gas block overlap of critical marine habitats and protected areas to new proposed LNG export terminals in some of the most sensitive ecosystems on the planet. Key findings of the study include:

Amazon River Dolphin in Orinoco Waters
Image credit: Wikipedia Commons CC by 2.0

Overall, this analysis highlights the urgent need to prevent the environmental and social threats posed by the global expansion of offshore fossil fuel development– including risks to the climate, ocean health, and coastal and Indigenous communities. The report puts forward recommendations and solutions aimed at halting fossil fuel lock-in, protecting marine biodiversity, and ensuring that any vision for sustainable development is fully aligned with the preservation of oceans and coastal ecosystems.

Ocean Frontiers at Risk | Fossil Fuel Expansion Threats to Biodiversity

Ocean's Frontier's Analysis Summary

Coral Reef

- In the oil and gas case study areas where coral is present, **15% of coral reef** is overlapped by blocks.
- **About 21,000 square kilometers of coral reef habitat overlap with oil and gas blocks in our case studies, which is roughly equivalent to the size of El Salvador.**

Seagrass

- In the oil and gas case study areas where seagrass is present, **63% of seagrass** is overlapped by blocks.
- About **7,900 km² of seagrass habitat** overlap with oil and gas blocks in our case studies, which is roughly equivalent to the **size of Puerto Rico.**

Mangrove

- In the oil and gas case study areas where mangroves are present, **15% of mangroves** are overlapped by blocks.
- **About 2,000 square kilometers of mangrove habitat overlap with oil and gas blocks in our case studies, which is roughly equivalent to the size of Mauritius.**

Protected Areas

- In our oil and gas case studies, where protected areas are present, **19% of protected areas** are overlapped by blocks.
- About 88,500 square kilometers of Protected Areas overlap with oil and gas blocks in our case studies, which is roughly equivalent to the size of Serbia.
- A total of **129 protected areas** are overlapped by blocks.

Key Biodiversity Areas

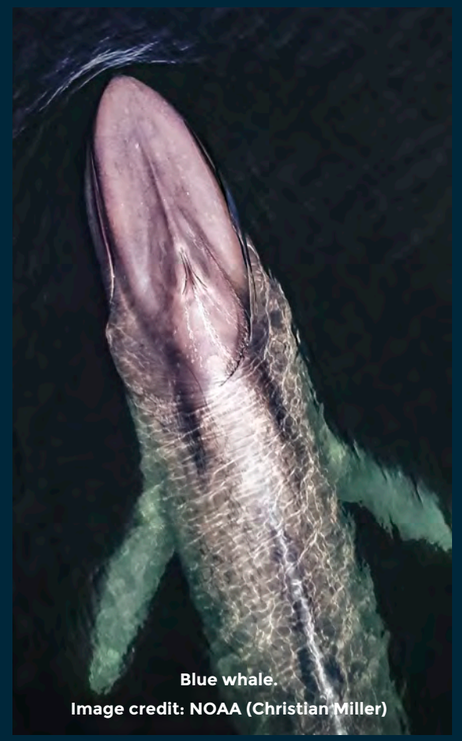
- In the oil and gas case study areas where Key Biodiversity Areas are present, **14% of Key Biodiversity Areas** are overlapped by blocks.
- About 49,000 square kilometers of Key Biodiversity Areas overlap with oil and gas blocks in our case studies, which is roughly equivalent to the size of Slovakia.
- A total of **57 Key Biodiversity Areas** are overlapped by blocks.

Important Marine Mammal Areas

- **In the oil and gas case study areas where Important Marine Mammal Areas (IMMAs) are present, 11% of IMMAs are overlapped by blocks.**
- **Over 70,000 km² of Important Marine Mammal Areas overlap with oil and gas blocks in our case studies, which is roughly equivalent to the size of the Republic of Georgia.**

LNG

- There are a total of **26 proposed Liquefied Natural Gas (LNG)/ Floating Storage Regasification Units (FSRU) terminals** across the case study areas.
- **There are 13 IMMAs near LNG/FSRU terminals across the LNG case study areas.**
- **There are 20 unique species in IMMAs near LNG/FSRU terminals across the LNG case study areas.**



Blue whale.
Image credit: NOAA (Christian Miller)

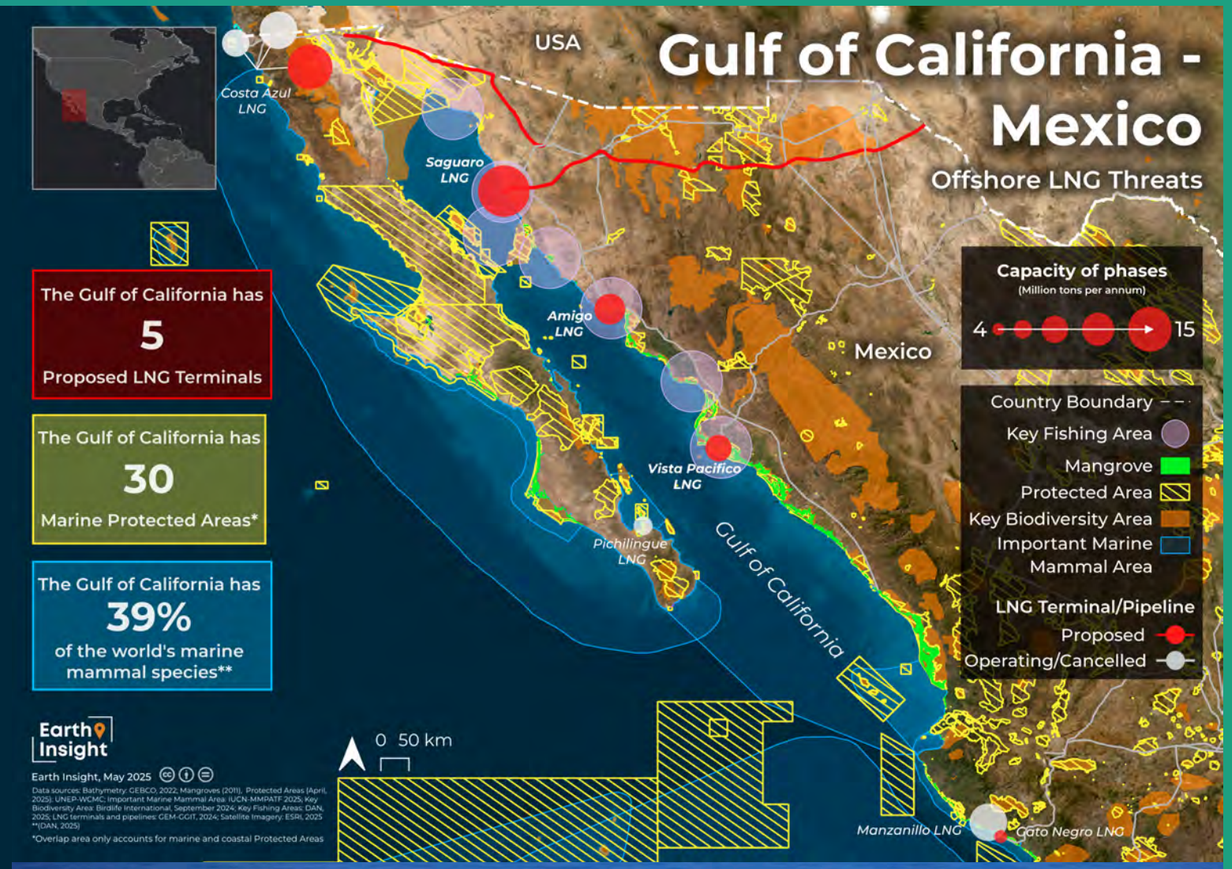
Fishermen prepare their nets at a fishing camp near San Felipe, Mexico
Image Credit: Getty Images (GUILLERMO ARIAS/AFP)

The Gulf of California in Mexico could soon emerge as a major global hub for LNG trade. There are plans to create new pipelines, gas processing facilities, and LNG export terminals to channel gas production from the U.S. Permian Basin in Texas into Asian markets.[9]
The most controversial of these initiatives is Saguaro LNG, led by the company Mexico Pacific. With a planned capacity of 15 million tons per year, this facility would become the largest in the region.[10] However, the project is currently on hold due to five lawsuits on environmental grounds.[11]

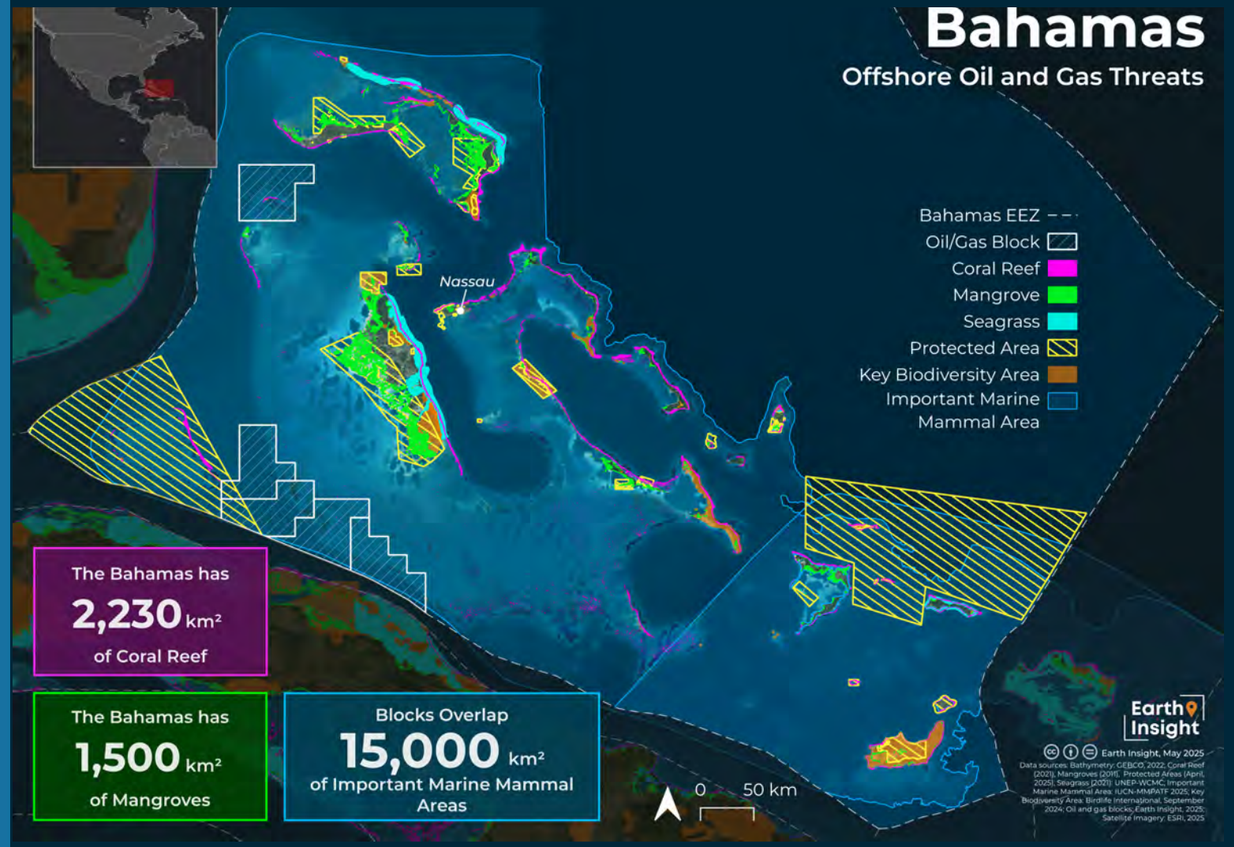
The Gulf of California, often referred to as "the world's aquarium,"[12] is a key marine biodiversity hotspot and whale sanctuary.[13] Nearly 40% of all marine mammal species live in this region.[14] Some of the species that live or spend parts of the year in the Gulf of California IMMA include endangered blue whales, whale sharks, killer whales, California gray whales, and the vaquita, the world's most endangered marine mammal.[15][16]

A growing number of institutions and civil society groups, such as Defensa Ambiental del Noroeste (DAN) warn that LNG activities will have a severe impact on fishing, a $320 million industry that employs more than 50,000 people and accounts for 50-70% of Mexico's total fishery output.[17]

The Ballenas o Gas (Whales or Gas) campaign[18] was launched by Mexican and international environmental organizations to stop the Saguaro project and other LNG developments in the Gulf. It highlights air and water pollution, gas leaks, and collisions between whales and tankers as serious risks from the proposed LNG infrastructure to the Gulf.



U.S. Navy oil spill response vessel during Deepwater Horizon cleanup.
Image credit: WorkBoat (Michael B. Watkins)



The Bahamas does not currently produce any oil. Although licenses were previously granted and exploratory drilling was conducted, no commercially viable oil reserves were found.[19] Local organizations fear that without a permanent ban on oil and gas activities, exploratory activities in existing blocks could be reactivated.

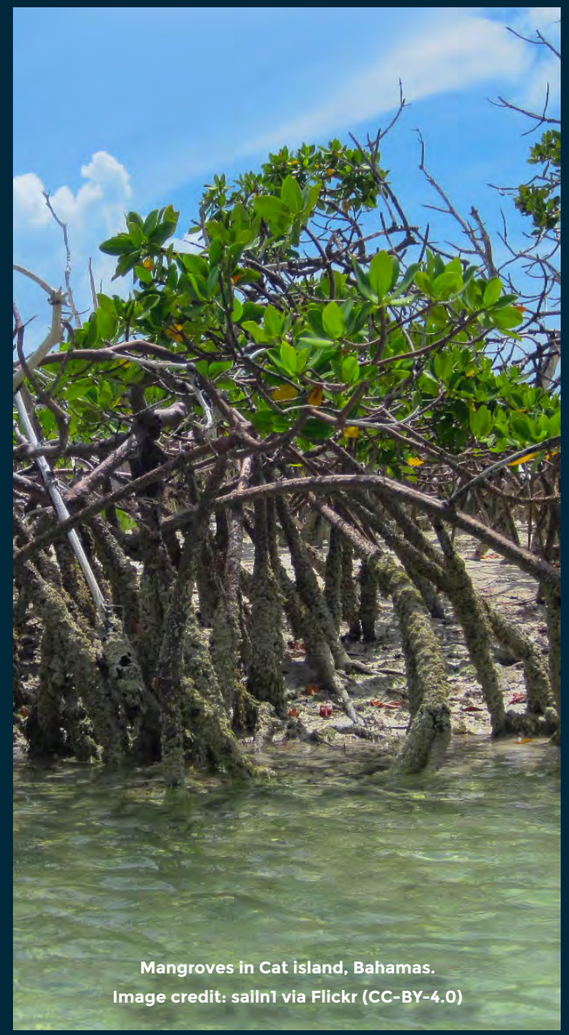
All previous blocks fall within the Lucayan Archipelago IMMA,[20] which in total covers around 320,000 km² of The Bahamas. This IMMA is a unique marine area that serves as a breeding ground for humpback whales (Megaptera novaeangliae) and home to two endangered subspecies of manatees, the Antillean manatee (Trichechus manatus manatus) and the Florida manatee (Trichechus manatus latirostris). The Bahamas is also home to extensive areas of mangroves, coral reefs, seagrass meadows, coastal and offshore protected areas, and KBAs.

Oil and gas development poses a great threat to The Bahamas. Even relatively small oil spills could have severe consequences for tourism, which accounts for 50% of the country's GDP,[21] as well as for the fishing industry, an important source of food and income for local communities.

The Bahamas, like other Small Island Developing States, is highly susceptible to the impacts of climate change, including stronger, more frequent hurricanes and accelerating sea-level rise.[22]

In response, local civil society organizations are actively fighting to prevent new plans for fossil fuel developments. The Our Island Our Future campaign, joined by a coalition of dozens of local organizations and businesses, is advocating for a permanent ban on exploration and drilling,[23] as well as an expansion of the country's marine protected areas.[24]

A national poll[25] conducted in 2024 found that 74% of Bahamians support transitioning the country away from fossil fuels and toward renewable energy sources. Additionally, 86% support a legislative ban on offshore drilling, indicating that drilling is not compatible with the present and future needs of this climate-vulnerable island nation.



Mangroves in Cat island, Bahamas.
Image credit: sailn1 via Flickr (CC-BY-4.0)

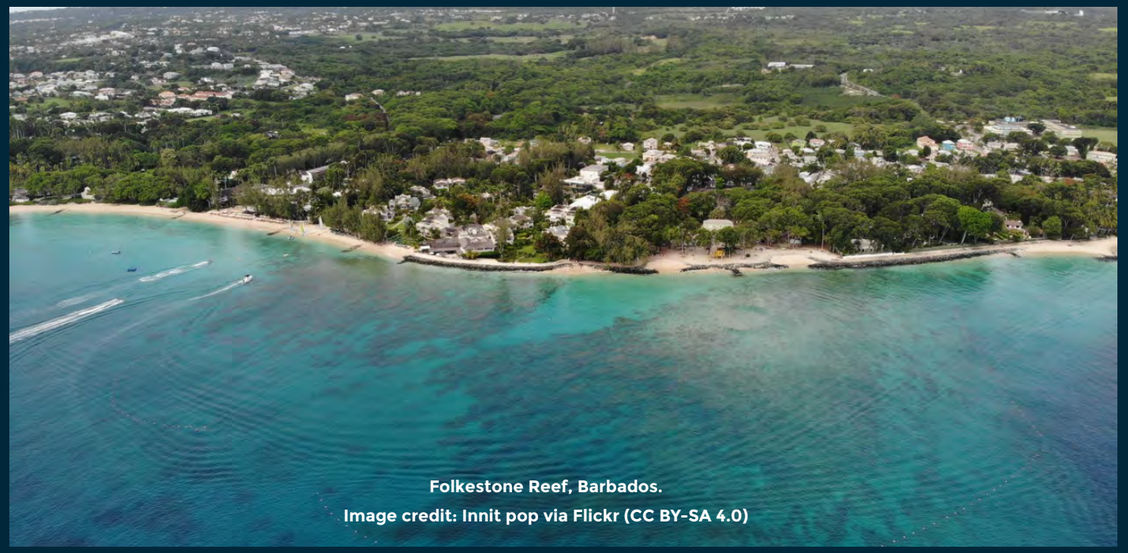
Aerial view of Lucayan Archipelago.
Image credit: NASA Johnson via Flickr (CC BY-NC-ND 4.0)

Barbados currently relies solely on onshore oil production, but the country has long expressed interest in developing an offshore industry, with the first exploration activities conducted more than 20 years ago.[26] While previous searches have failed to find commercially viable reserves, the announcement of a new offshore exploration bidding round[27] has raised growing environmental concerns.

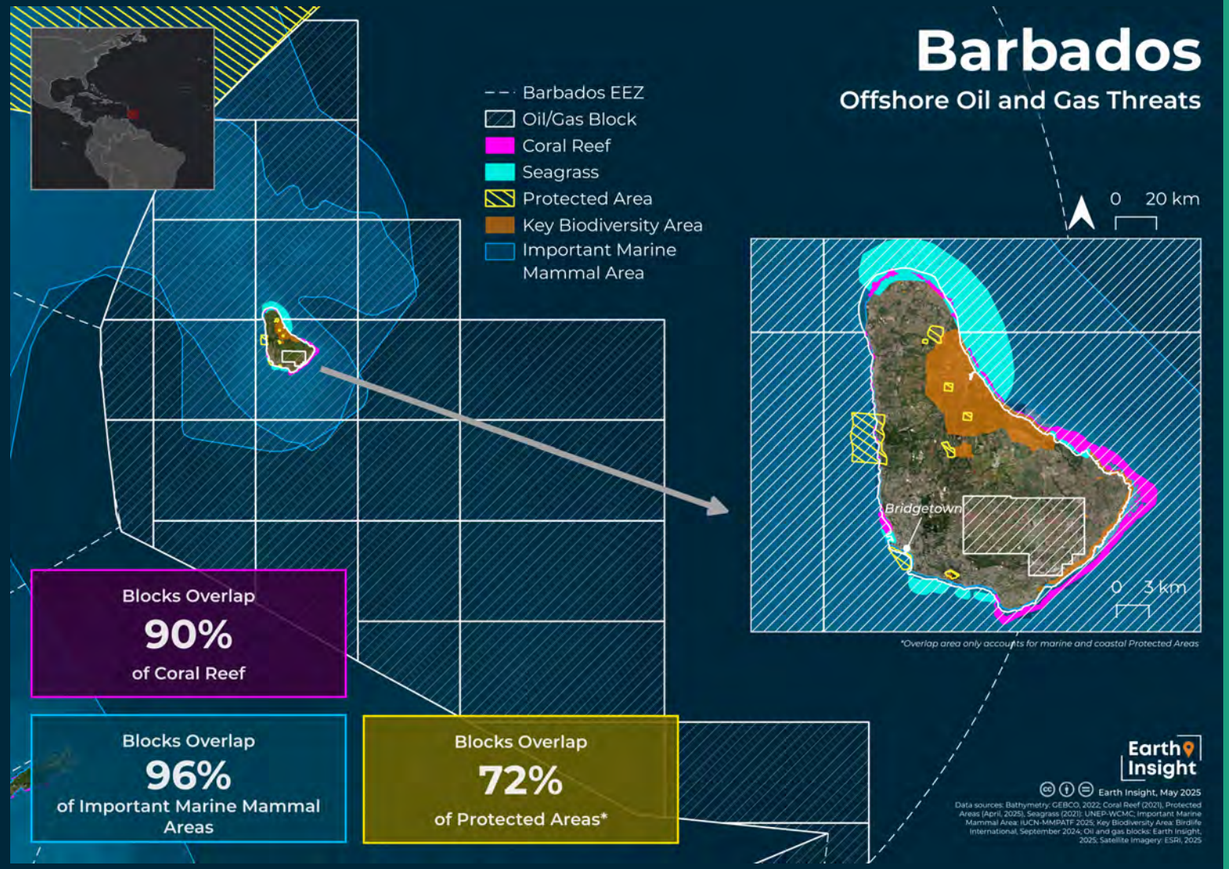
The Caribbean Sea is one of the most biodiverse marine regions in the world,[28] home to mangrove forests, coral reefs and a vast number of marine species. Alarmingly, this analysis shows that proposed blocks have significant overlap with important marine ecosystems, including 87% of seagrass meadows, 90% of coral reefs, 72% of coastal and marine protected areas, and 96% of IMMAs.

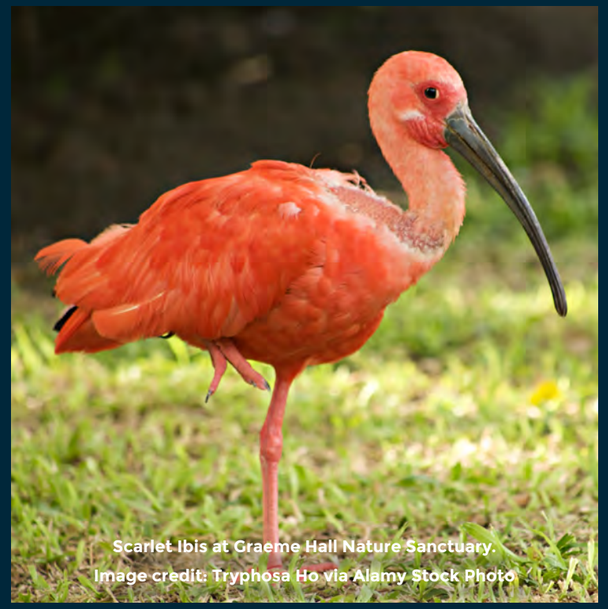
Oil and gas blocks almost completely overlap the Eastern Caribbean Islands IMMA, a region containing diverse marine habitats including a continental shelf, shallow banks, a shelf break, canyons, inter-island channels, deep waters, and seamounts.[29] This area supports up to 22 different marine mammal species, including three distinct populations of sperm whales (Physeter macrocephalus), Fraser's dolphins (Lagenodelphis hosei), pantropical spotted dolphins (Stenella attenuata), and spinner dolphins (Stenella longirostris).

The proposed blocks also overlap multiple coastal protected areas, such as the Folkestone Marine Park – one of the island's most important touristic regions, renowned for its clear waters and diverse marine life – and the Graeme Hall Nature Sanctuary, a wetland habitat supporting numerous native and migratory bird species.



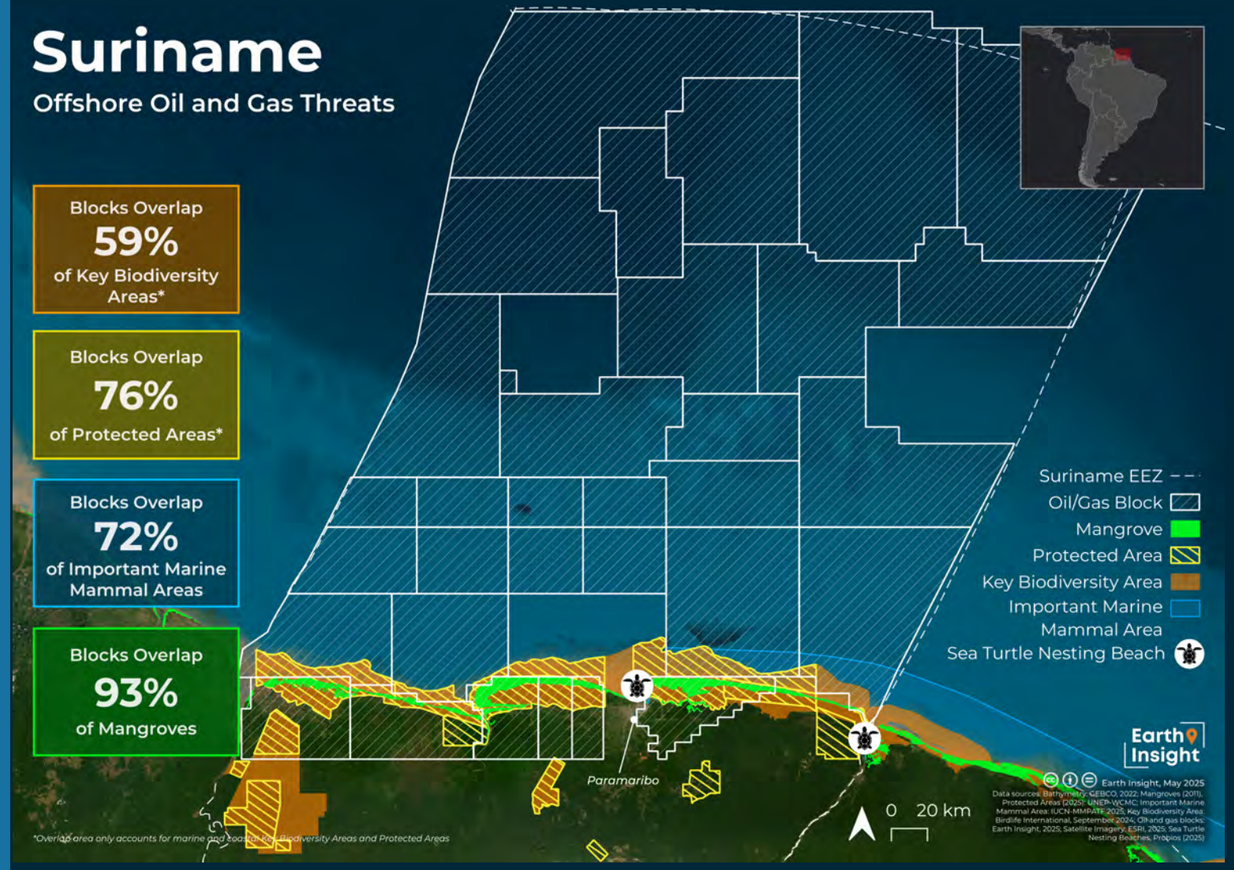
Folkestone Reef, Barbados.
Image credit: Innit pop via Flickr (CC BY-SA 4.0)





Scarlet Ibis at Graeme Hall Nature Sanctuary.
Image credit: Tryphosa Ho via Alamy Stock Photo

Fraser's dolphin in Guadeloupe.
Image credit: Alexandre Roux via Flickr (CC BY-SA 4.0)



Suriname aims to follow the path of its neighbor Guyana, which began oil production just five years ago in December 2019 and has since become the world's third-largest oil producer per capita.[30] Several major companies, including Chevron,[31] Shell,[32] and Petronas,[33] are currently conducting seismic surveys or drilling exploratory wells across various offshore blocks. The country holds about 4.6 million barrels of oil equivalent, of which roughly half is gas.[34]

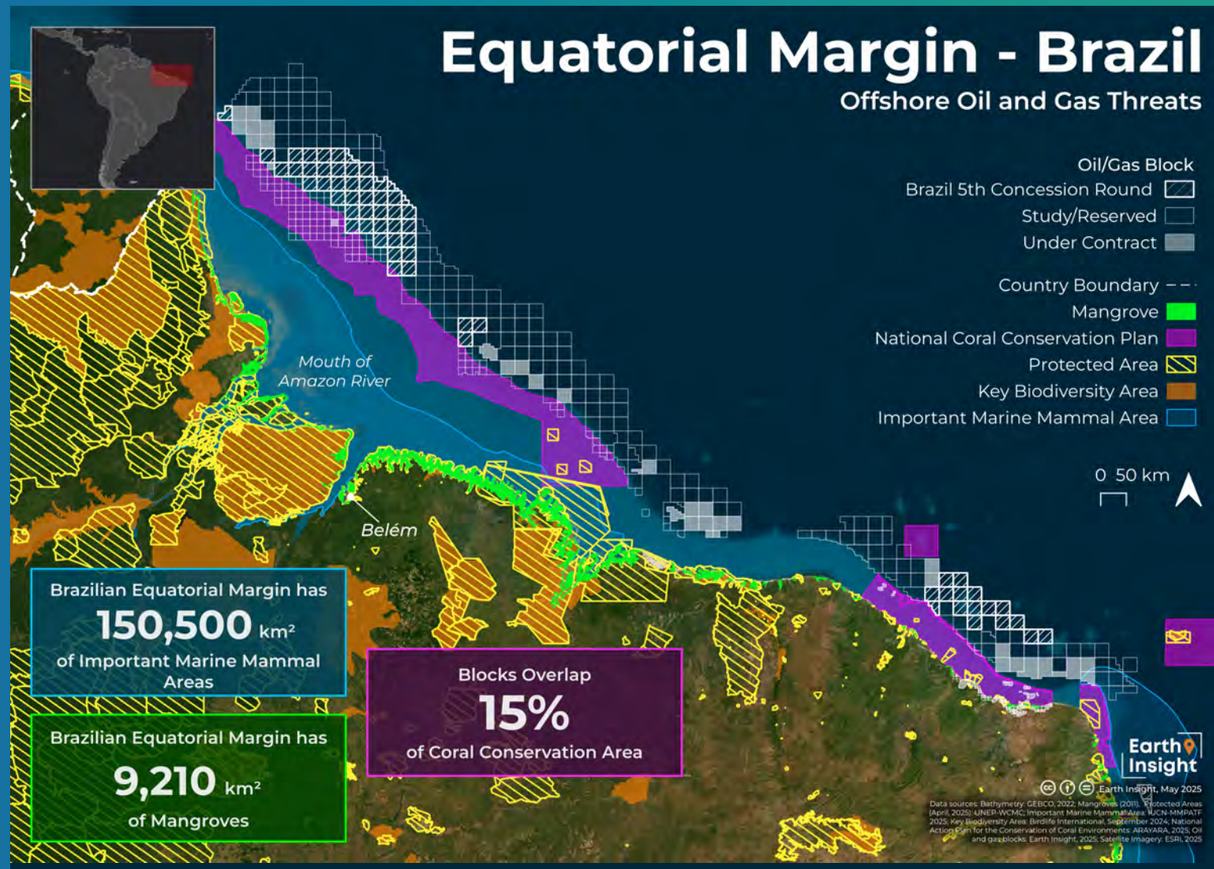
Suriname's planned and operating oil blocks substantially overlap with environmentally sensitive areas. Mangroves, in particular, are highly threatened by these developments, with a 93% overlap with oil and gas blocks. The blocks also overlap 76% of coastal and marine protected areas, 59% of coastal and marine KBAs, and 72% of the Guianas to Amazon Outflow IMMA. This marine area is rich in nutrients due to the outflow of the Amazon River, which makes it an important feeding ground for many species.[35] Some of the iconic mammals that live here include the Amazon river dolphin (Inia geoffrensis), the Guiana dolphin (Sotalia guianensis), the West Indian Manatee (Trichechus manatus), and the Amazonian manatee (Trichechus inunguis).

Green sea turtle.
Image credit: Envato Elements CC

These developments could also have significant consequences for sea turtle populations. The coastal beaches of Suriname serve as critical nesting grounds for several threatened species, such as the hawksbill sea turtle (Eretmochelys imbricata), the leatherback sea turtle (Dermochelys coriacea), the green sea turtle (Chelonia mydas), and the olive ridley sea turtle (Lepidochelys olivacea).

Organizations such as ProBios have been actively campaigning against these fossil fuel projects, raising a range of environmental concerns.[36] Among these are the emission of toxic gases from oil facilities, the risk of oil spills to mangroves and local biodiversity, the disruptive effects of seismic surveying to marine wildlife, and the broader consequences of sea-level rise and other climate change impacts.

Female sea turtle digging a hole to lay eggs.
Image by Cataloging Nature via Flickr (CC BY 4.0)



Equatorial Margin oil exploration threatens the economy, local communities, and the environment with significant risks. Environmental organizations, scientists,[37] Indigenous groups,[38] fisherfolk, and quilombolas[39] (Afro-Brazilian communities descended from enslaved people) have all voiced strong opposition to new fossil fuel plans.

The northeast coast of Brazil is still recovering from the country's largest environmental disaster,[40] a massive oil spill in 2019 that remains largely unaddressed. The damage severely impacted over 440,000 registered fisherfolk across the 140 coastal cities located along the Equatorial Margin.[41]

Brazil sustains the second largest mangrove cover in the world,[42] with about 80% of the country's mangroves located in the Equatorial Margin. A recent study found that Amazon mangroves store twice as much carbon per hectare as tropical rainforests.[43]

The region is also home to large extents of coral reefs, discovered in 2016 and still poorly understood.[44]

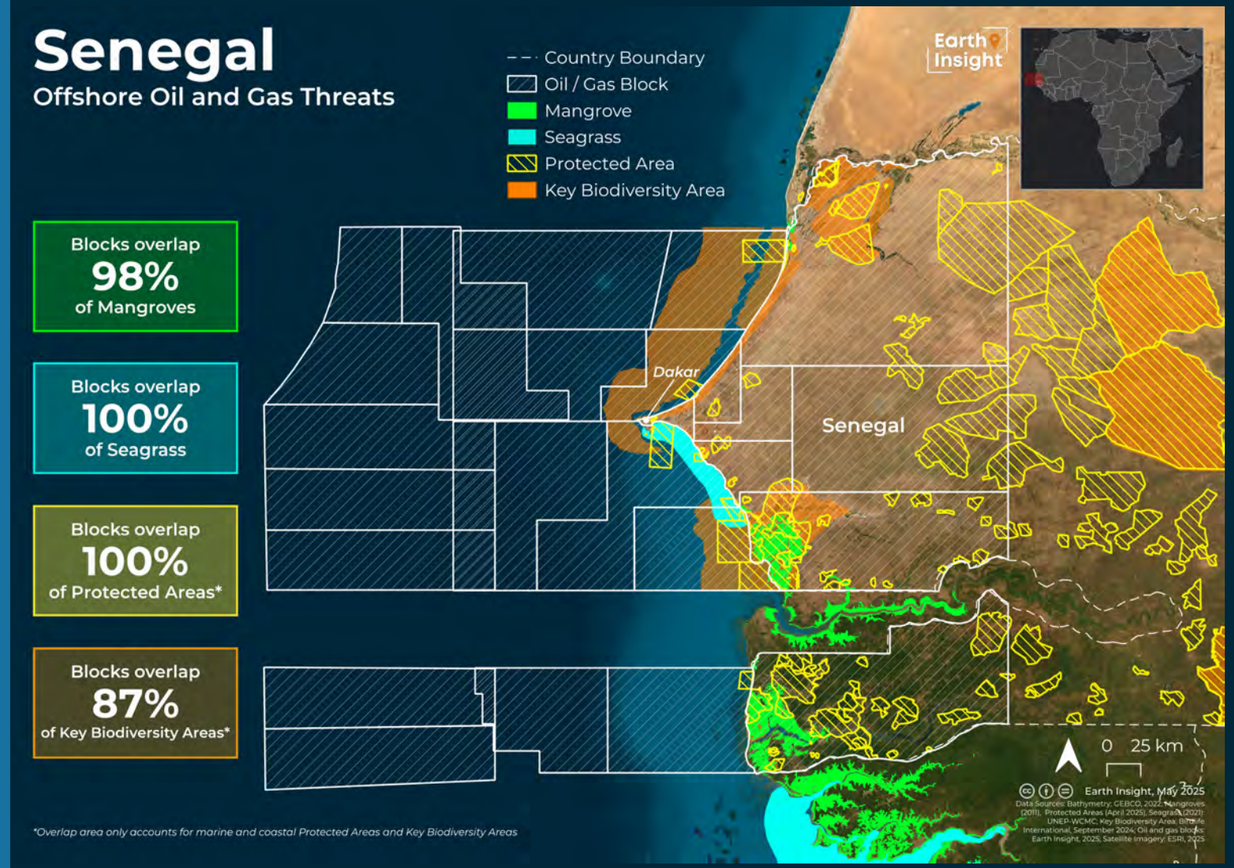
Across the study area, about 15% of the coral area included in the National Action Plan for Coral Conservation,[45] is overlapped by offshore oil and gas blocks.

These blocks also overlap 3,950 km² of the Guianas to Amazon Outflow IMMA, an area that spans 150,500 km² and home to such species as the Amazon river dolphin, and West Indian and Amazonian manatees.[46]

While the Brazilian government has argued that extracting oil from the region will help the country finance its energy transition to renewable energies, there are few details.[47] There are 11 oil and gas blocks in the region owned by foreign companies and another 65 set to be auctioned. Currently, there is no mandate requiring companies to allocate a share of their profits from these blocks to fund Brazil's transition to clean energy.

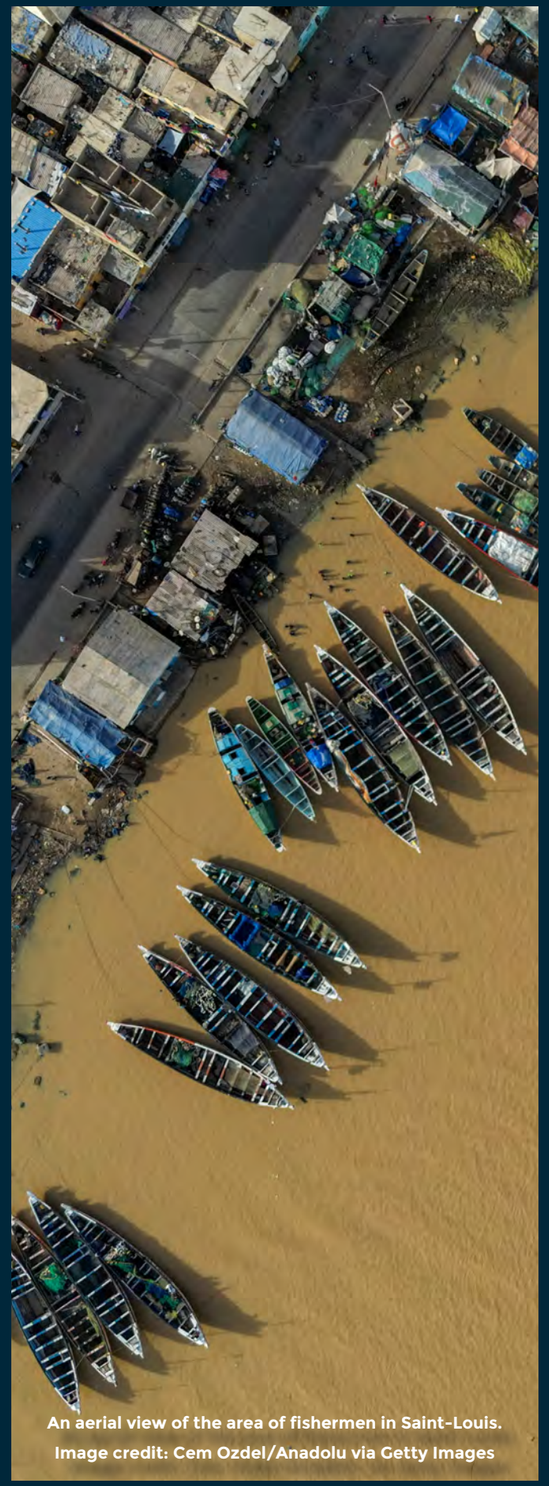
Antillean Manatee
Image credit: Flickr CC (Wildscreen Arkive)

Indigenous peoples Kaingang (PR), Xokleng (SC) and the Quilombola community of Córrego de Ubaranas (ES) protest against the End of the World Auction, a controversial event in 2023 where drilling rights in 602 new exploration areas were sold.
Image credit: Courtesy of Renata Sembay via Instituto Arayara



Senegal has recently started extracting oil and gas from its waters and plans to ramp up production in the coming years. The country's first oil development, the Sangomar field operated by Woodside Energy, achieved first oil in June 2024.[48] A second development, the Yakaar-Teranga gas field led by Kosmos Energy and Petrosen,[49] is awaiting a final investment decision, with production expected to begin in 2028 or 2029.[50]

Mangrove near Ziguinchor, Senegal.
Image credit: Flickr CC (jbdodane)



An aerial view of the area of fishermen in Saint-Louis.
Image credit: Cem Ozdel/Anadolu via Getty Images

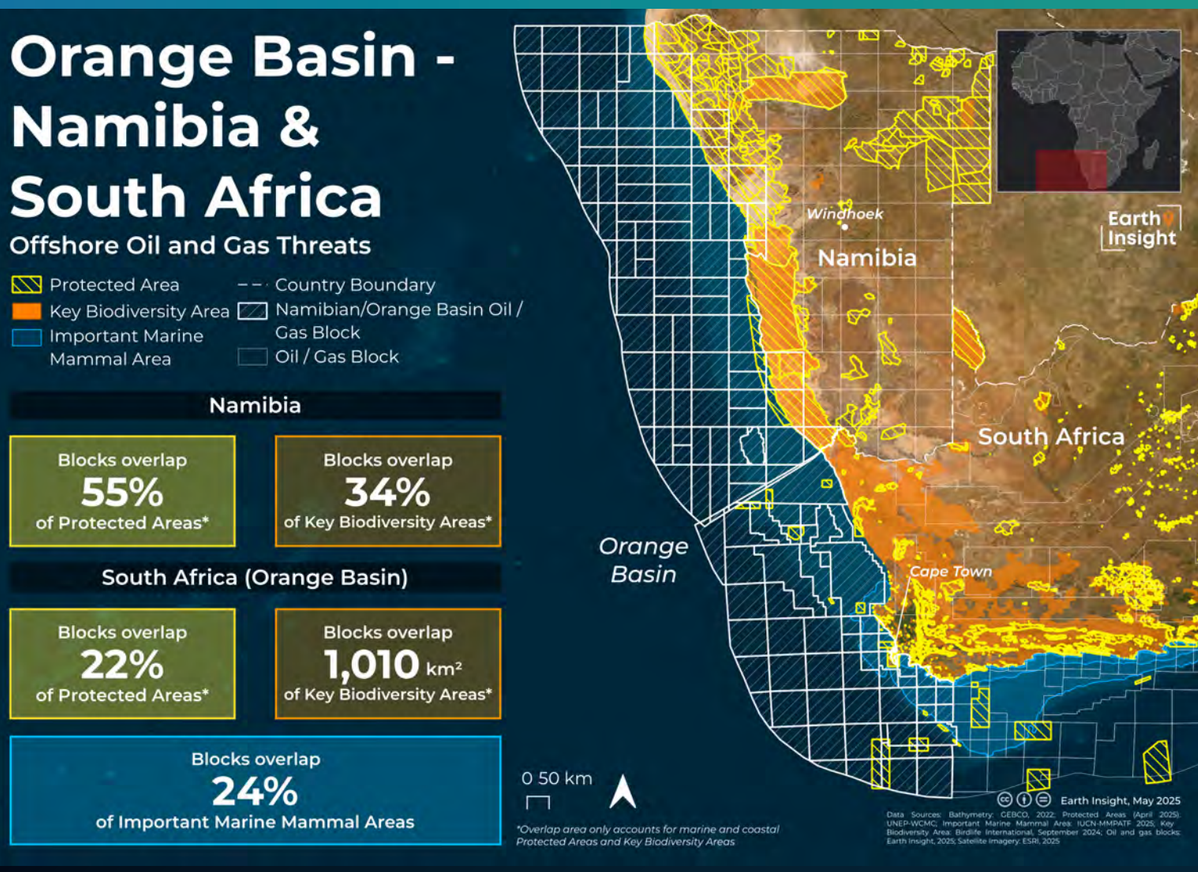
However, these developments are raising growing concerns among local communities. Fisherfolk report that gas operations have reduced their fishing area.[51] The fisheries sector accounts for 3.2% of Senegal's GDP, 10.2% of the country's exports, and employs 17% of the nation's workforce. About 80% of the country's catch comes from artisanal fishing.[52]

The Sauver la Mer et la Pêche (Save Our Coast and Fisheries) campaign has warned of the socio-economic and environmental threats posed by offshore oil and gas drilling in Senegal.[53] Bringing together a diverse coalition of Senegalese fisherfolk, local leaders, women-led groups, environmental activists, and artists, the campaign aims to debunk the myths of economic development touted by oil and gas corporations. Senegalese activists argue that investing billions of dollars towards fossil fuel projects, in a country where solar power is already the cheapest and most cost-effective form of energy, defines both economic logic and environmental responsibility.

Oil and gas projects also threaten important marine and coastal biodiversity. Virtually all of the country's mangrove forests, which have experienced successful restoration initiatives in the last few years,[54] are at risk from these projects, with 98% overlapped by blocks. Similarly, the country's seagrass meadows are 100% overlapped by oil and gas blocks.

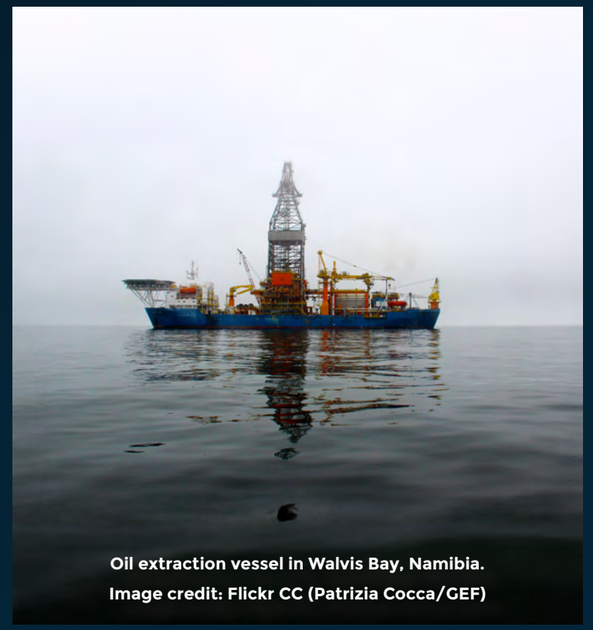
Orange Basin - Namibia & South Africa

Offshore Oil and Gas Threats



Namibia and South Africa are advancing plans to extract fossil fuels from the Orange basin, a marine geological formation located between both countries containing large hydrocarbon reserves. The area has been described as "one of the world's most prospective oil and gas regions."[55]

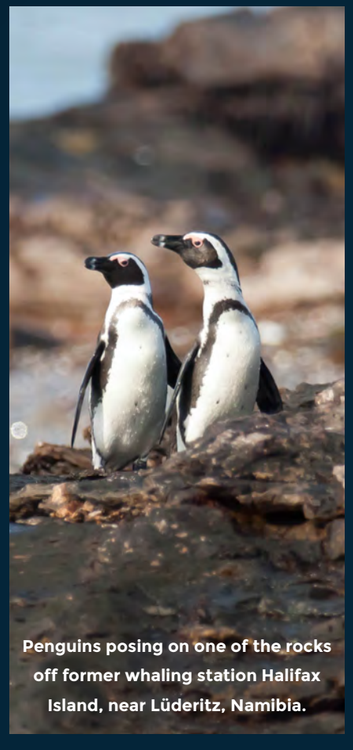
Namibia is currently taking the lead, with various companies exploring the basin's oil and gas potential. Companies like TotalEnergies,[56] Shell,[57] and Galp[58] have all announced large oil discoveries in the region. Estimates suggest the Namibian side of the basin could contain up to 11 billion barrels of oil.[59]



Oil extraction vessel in Walvis Bay, Namibia.
Image credit: Flickr CC (Patrizia Cocca/GEF)

On the South African side, similar energy companies, including Shell[61] and TotalEnergies,[62] are exploring the region. Despite these discoveries, it is unclear if these findings will materialize into full-scale extraction. In early 2025, Shell wrote down $400 million on its Namibian operations, deeming that the resources it had found were not viable for commercial development.[63]

In South Africa, groups like Aukotowa, The Green Connection, and Natural Justice have raised concerns over the impacts that offshore oil and gas wells could have on coastal communities and marine life. Scientists argue that the environmental impact assessment underestimates the risk of a major oil spill and downplays the impacts of oil and gas operations on cetaceans, turtles, and marine protected areas.[64] They also point to inadequate analysis of the potential social and economic consequences of oil spills on coastal communities, particularly those who rely on fishing and tourism.

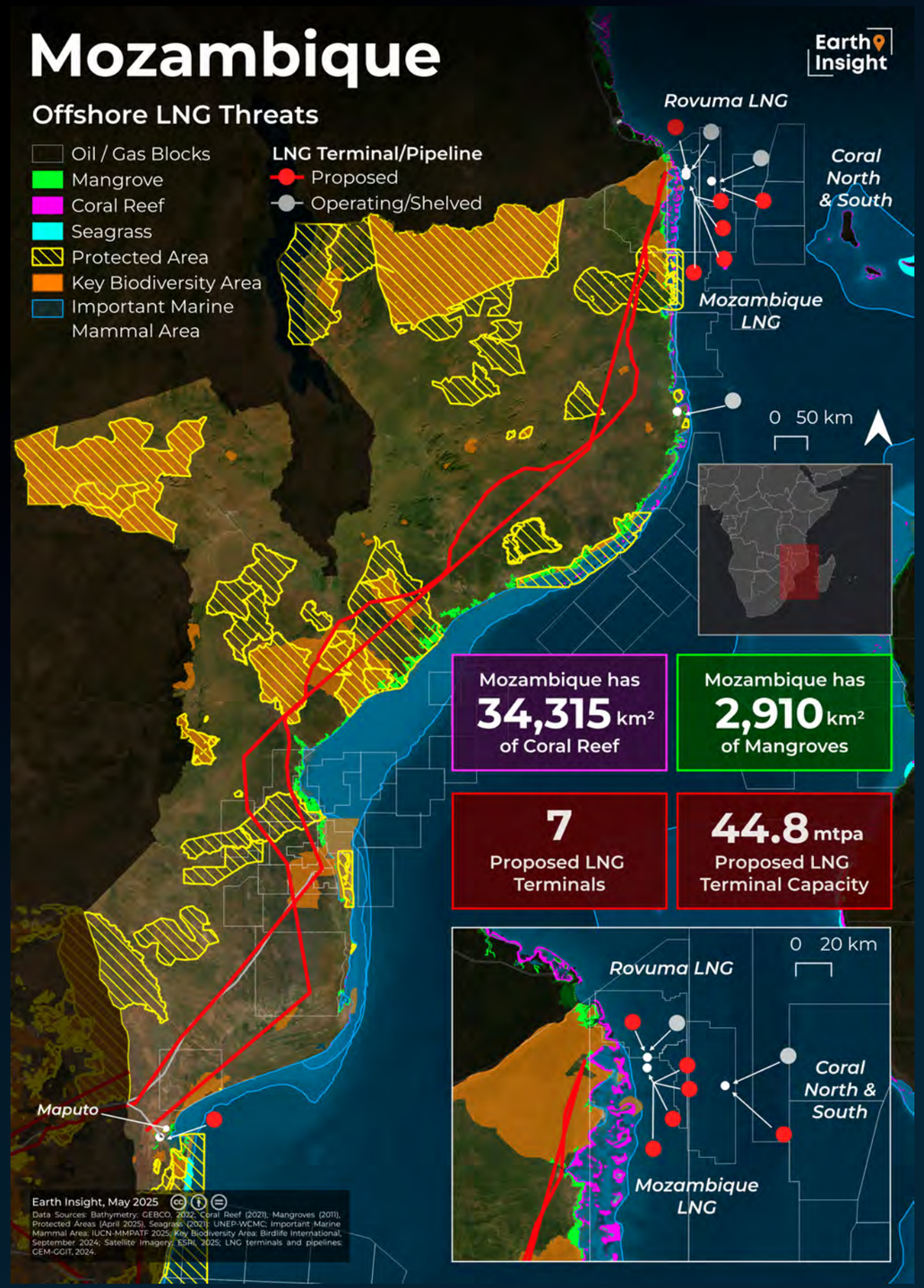


Penguins posing on one of the rocks off former whaling station Halifax Island, near Lüderitz, Namibia.

Namibia's offshore and coastal oil and gas blocks cover 631,700 km², an area larger than France. About 55% of the protected areas in the region are overlapped by oil and gas blocks. These areas include the Namibian Island Protected Area, the second largest marine protected area of the continent. The blocks also overlap important coastal biodiversity areas, such as the Tsau Khaeb and Namib-Naukluft National Parks.

The blocks in the South African side of the basin extend across 363,400 km², an area about the size of Germany. More than 20% of the country's offshore and coastal protected areas[60] are overlapped by oil and gas blocks.

Image credit: Courtesy of Natural Justice via The Green Connection



Mozambique has been developing its presence in the LNG global market since 2010, with LNG first exported in 2022 by the Coral South Floating LNG terminal, led by ENI.[65] Mozambique LNG,[66] led by TotalEnergies, reached final investment decision (FID) in 2019, and Rovuma LNG,[67] led by ExxonMobil and ENI, is awaiting FID. Coral North FLNG, led by ENI, is also awaiting FID this year.[68]

The four projects target fields in the Rovuma Basin, offshore of Cabo Delgado province, estimated to contain over 180 trillion cubic feet of natural gas.[69] The Rovuma Basin is a complex marine system made up of ecologically rich interconnected habitats – seagrass beds, coral reefs and mangroves – that harbour and feed a great diversity of iconic marine life. It is within an important centre of biodiversity for the Indian Ocean and a region where coral reefs are considered particularly vulnerable.[70]

Mozambique LNG began operations in 2019 but was suspended in 2021 after a violent insurgent attack nearby resulted in almost 1,200 civilian deaths.[71] There is concern that if the project resumes activities, this could increase the sense of disenfranchisement in the region - the idea that others are benefitting from the country's natural resources - and result in increased support for the insurgency.[72]

International and Mozambican civil society organizations strongly oppose gas development in Mozambique. In several open letters, financial institutions have been informed of the associated risks,[73] and urged not to provide support to Coral North FLNG,[74] Rovuma LNG,[75] Mozambique LNG,[76] or elements of the supply chain such as LNG carriers.[77]

Liquefied Natural Gas terminal infrastructure.
Image credit: Policy Integrity at NYU Law CC by 2.0

Seychelles and Mauritius have long sought to explore their oil and gas potential. In 2012, they signed a treaty to collaborate in the hydrocarbon exploration of a marine region between both countries, known as the Joint Management Area.[78] In September 2024, they signed an agreement to begin new seismic surveying.[79]

Oil extraction from this area would likely impact the Saya de Malha bank, the world's largest seagrass meadow, which extends over 40,000 km², an area about the size of Switzerland.[80]

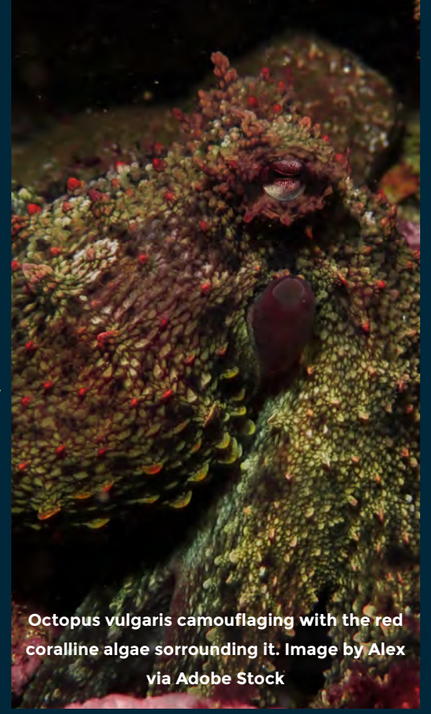
In addition to seagrass, the Saya de Malha bank also hosts corals, red coralline algae and many species of vertebrate and invertebrate species, from mollusks to green sea turtles and a variety of whales. Still, the full extent of its biodiversity remains largely undocumented.

Experts consider the bank one of the least studied shallow sea water regions in the world.[81]

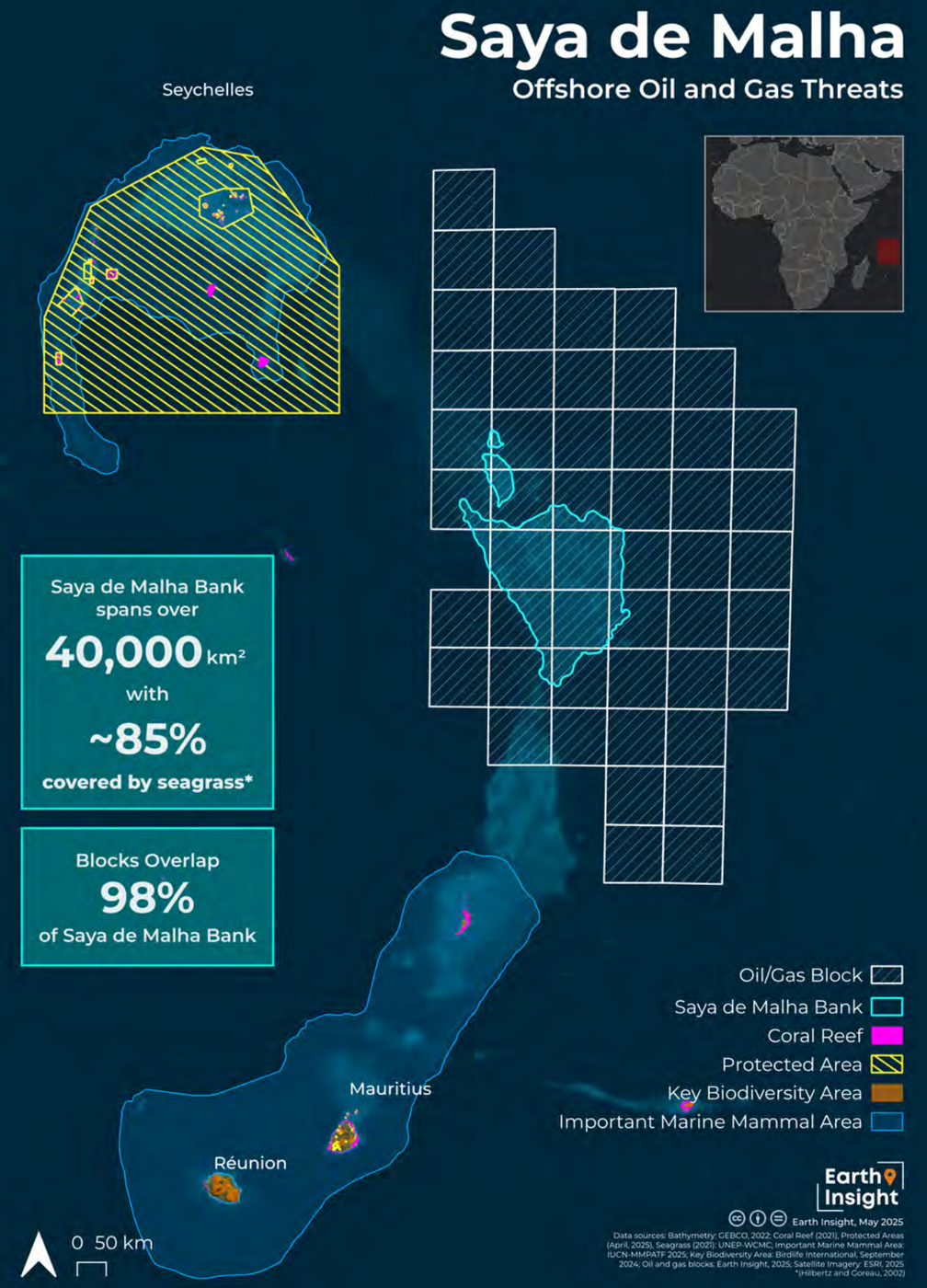
To date, the region is not yet formally protected.[82] Organizations like the High Seas Alliance have been campaigning for governments to ratify the High Seas Treaty, a move which would help protect Saya de Malha and other marine areas in the high seas.[83]

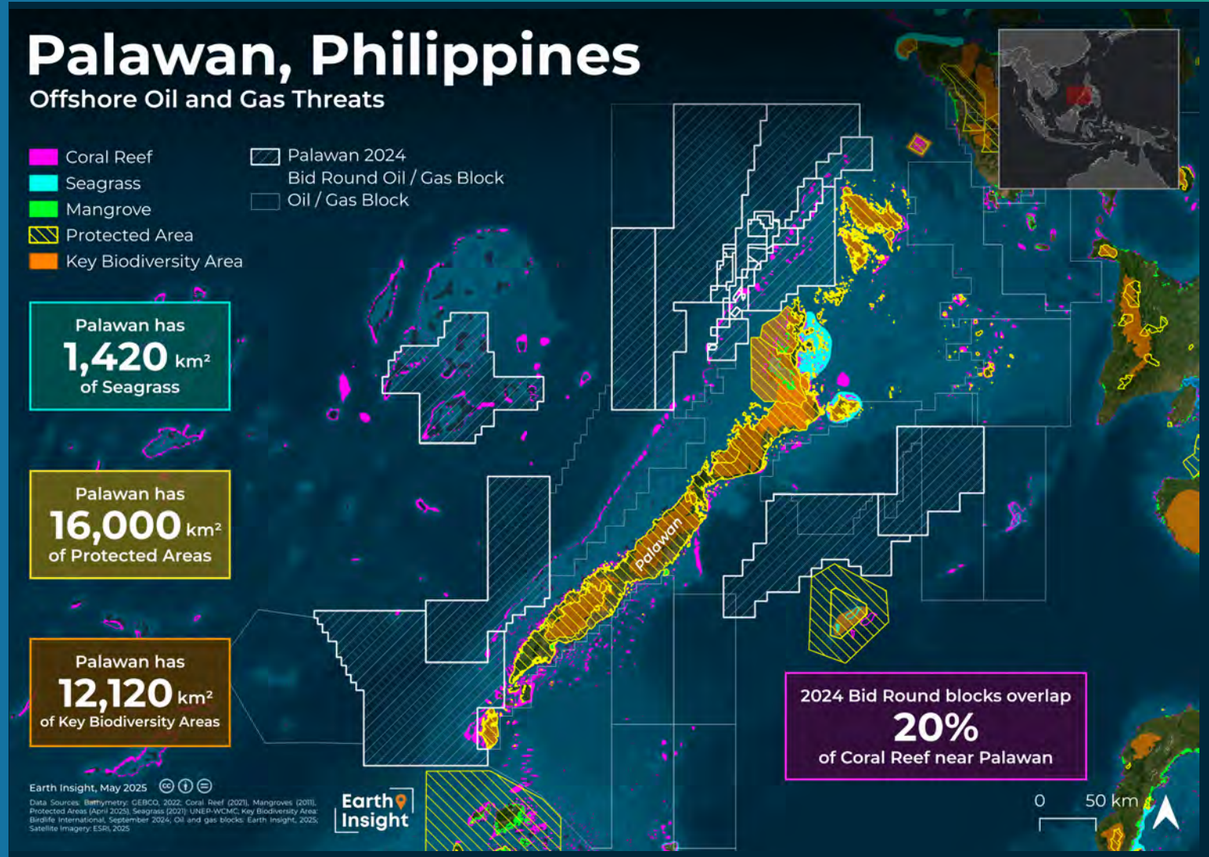
Fossil fuel activities also pose a direct threat to Seychelles and Mauritius. Island states are particularly vulnerable to oil spills, which can have dramatic consequences to ecosystems and livelihoods. In 2020, the shipwreck of a Japanese carrier caused the leak of 1,000 tons of oil near Mauritius, causing the country's worst ecological disaster.[84] The oil not only affected the livelihoods of thousands of fisherfolk, but also left traces of contamination in the island's mangrove forests which persist to this day.[85]

Mauritians marched as public anger festers over the government's handling of a devastating oil spill off the coast. Image credit: Fabien Dubessay via Getty Images



Octopus vulgaris camouflaging with the red coralline algae sorrounding it. Image by Alex via Adobe Stock





The Philippines currently extracts offshore gas from the Malampaya field, a region off the coast of the island of Palawan.[86] But with the field showing signs of depletion,[87] the country is now seeking to attract investments to drill new areas in the same region.[88] Around 50 companies have expressed interest in exploring these fossil fuel deposits.

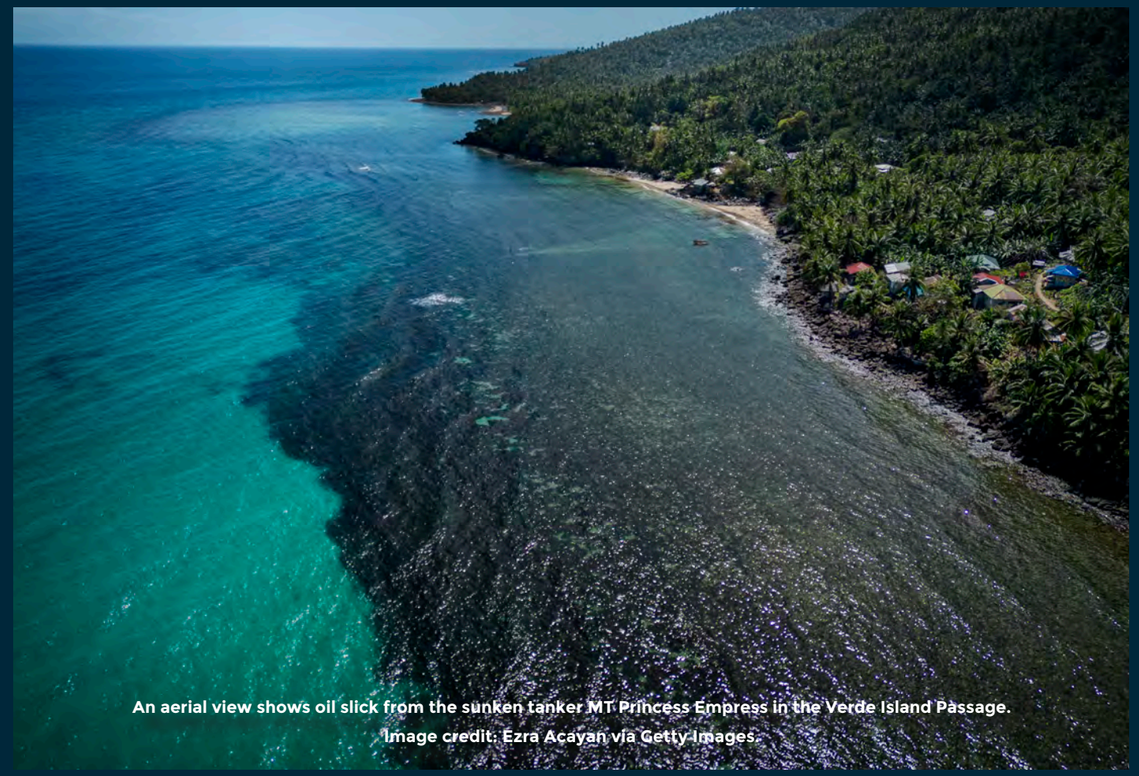
The offshore oil and gas blocks offered in the 2024 bid round surrounding Palawan cover 86,400 km², an area about the size of Austria. The blocks overlap more than 1,000 km² of coral reefs surrounding Palawan and are a part of the greater Coral Triangle region.

Palawan is considered the Philippines' last ecological frontier.[89] As a part of the UNESCO Man and Biosphere Reserve,[90] it holds unique marine biodiversity, with such species as the dugong, the Irrawaddy dolphin, and endangered fish, including the Humpback grouper.[91] The island is also one of the country's top producers of fish and fishery products.[92]

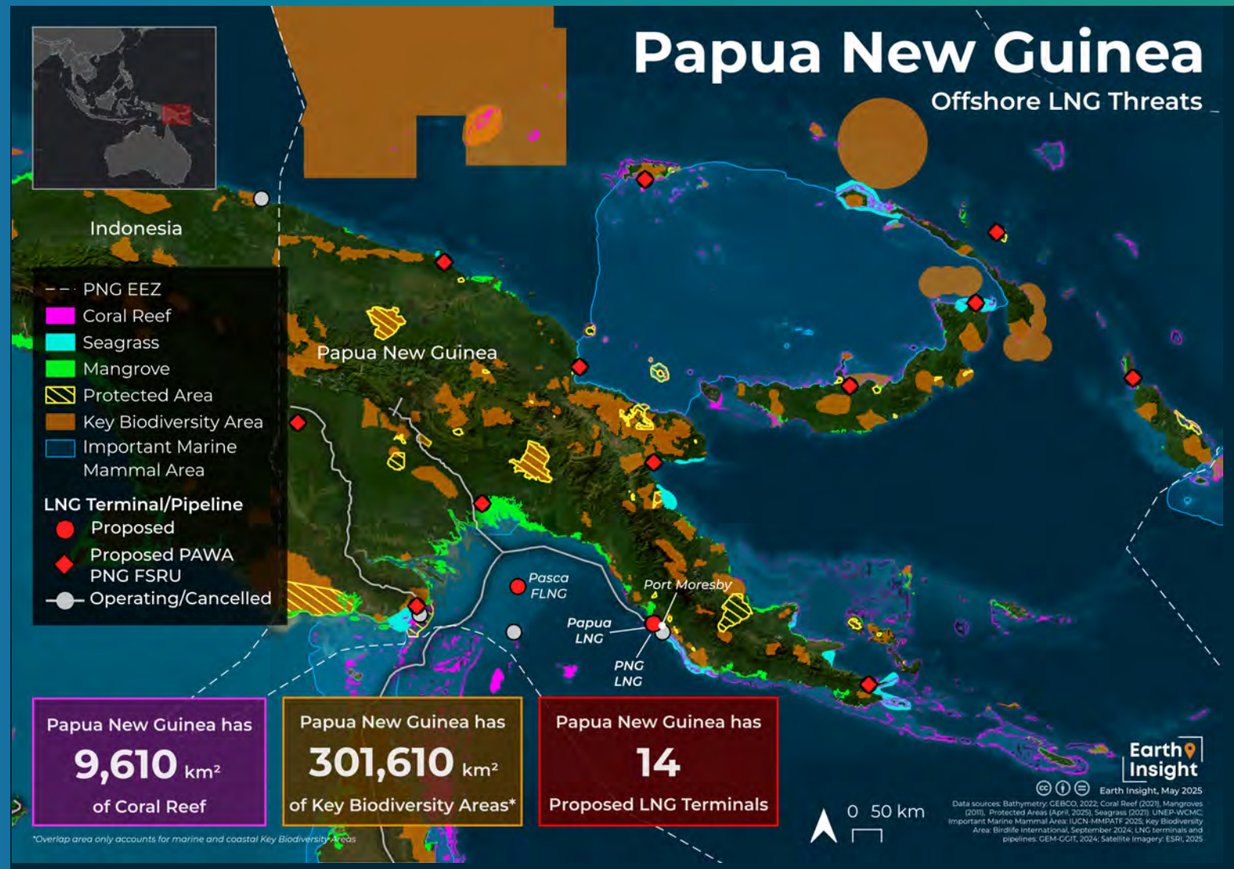
Civil society opposition to fossil fuel developments in the Philippines has been growing in response to the environmental and socio-economic threats posed by these projects. In the Verde Island Passage (VIP), a critical marine biodiversity hotspot, local communities and organizations have mobilized against plans for new LNG infrastructure. Groups, such as Protect VIP, along with coastal and fisherfolk communities, have highlighted the threats to biodiversity, food security, and livelihood, on which millions depend in the Verde Island Passage. [93]

A report from the Center for Energy, Ecology, and Development (CEED) showed that if all proposed gas and LNG projects proceed, an additional 387 tankers will make port in the VIP on an annual basis due to the increased demand for LNG. The increase in marine traffic from LNG projects heightens the risk of oil spills and waste disposal, further endangering the region's fragile ecosystems.

The dangers of fossil fuel activity are not hypothetical. The Philippines has already experienced the fallout: an oil spill in 2023 in the Verde Island Passage[94] and another in 2024[95] in Manila Bay, caused environmental and economic damage, on top of other small oil spills and instances of ships capsizing along the passage.



An aerial view shows oil slick from the sunken tanker MT Princess Empress in the Verde Island Passage.
Image credit: Ezra Acayan via Getty Images.

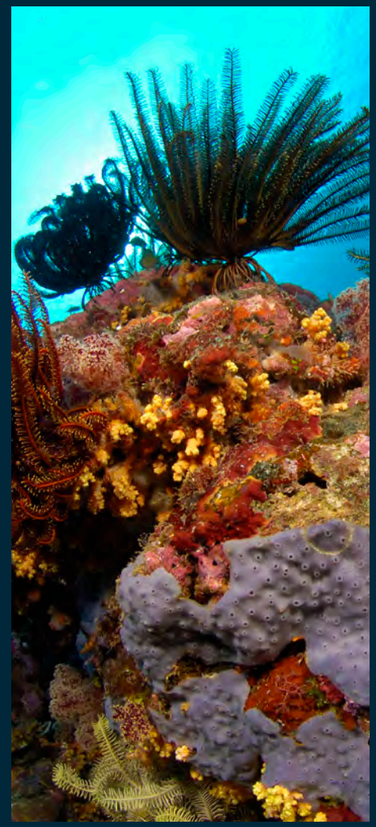


Papua New Guinea is already a relatively large gas producer, exporting about 8 million tons of LNG per year through their PNG LNG project, operated by ExxonMobil.[96] However, the country has plans to both dramatically expand its export capacity and create new LNG import facilities, which threatens continued industrialization of coastlines and sensitive marine ecosystems.

The Papua LNG project, led by TotalEnergies, would increase the country's LNG export capacity by 70%.[97] This would involve the construction of new processing facilities and an extensive pipeline network, with production planned to start in 2028. The country also has plans to create new LNG import infrastructure through the PAWA PNG project, operated by Twenty20 Energy, for domestic power generation.[98]

Fishermen in Papua New Guinea.
Image credit: Flickr CC (ILO Asia-Pacific)

Gas conditioning plant in Papua New Guinea.
Image credit: Angela N Perryman via Shutterstock



The plans have triggered growing resistance from civil society groups and NGOs. Faced with this increased pressure, Papua LNG is struggling to secure financing, with many banks stepping down from the project due to financial risks and concerns about potential impacts to the climate, biodiversity, and local populations.[99] The project has been described as a "carbon bomb" and is expected to emit the same amount of greenhouse gas annually as the whole of Bangladesh.[100]

The stakes for biodiversity are immense. Papua New Guinea is part of the Coral Triangle, the planet's richest marine biodiversity zone, often dubbed the "Amazon of the Seas."[101] The country also hosts the world's third-largest rainforest, home to 5% of all known animal and plant species, many of which are endemic. The planned fossil fuel expansion will also affect protected areas like the Saloum Delta, a UNESCO heritage site with an astounding array of biodiversity.[102] Along its coastline also lie an estimated 40,000 km² of reefs,[103] home to 2,800 fish species and the largest mangrove area in the Pacific.[104]

Addressing Offshore Oil and Gas: Solutions and Shifts

Regional agreements and judicial avenues can also play important roles in challenging ongoing projects and ensuring compliance with environmental protections. Moreover, mobilizing public support through education and advocacy is vital to reinforce policy changes, improve industry accountability, and encourage investment in sustainable, renewable energy alternatives. Financial and insurance companies must adopt and follow strong Environmental, Social, and Governance (ESG) principles that emphasize climate mitigation, environmental protection, and uphold the human rights of indigenous and frontline communities.

The stakes are high. Allowing further offshore expansion will destroy some of the world's most biodiverse regions and impact the lives of millions of people. An integrated approach is needed to reduce the environmental footprint of coastal and offshore fossil fuel activities, protect marine biodiversity, and accelerate the shift to cleaner energy sources–advancing both ecological resilience and socio-economic stability.

To confront the climate crisis and limit the environmental and social harm caused by offshore and coastal fossil fuel expansion, a coordinated set of actions is urgently needed.

Ongoing development in this sector undermines marine ecosystems, places coastal communities at risk, and threatens progress toward international climate targets. Moreover, new investments in offshore.

Mangrove planting in Gazi Bay, Kenya.
Image credit: Flickr CC (Rob Barnes / GRID-Arendal)

Ocean Frontiers at Risk | Fossil Fuel Expansion Threats to Biodiversity

1. Halt Fossil Fuel Expansion: Stop granting new approvals, licences, permits, or extensions to offshore and coastal fossil fuel projects, particularly in protected and ecologically sensitive areas. Preventing further development in these regions is essential to safeguarding marine biodiversity and avoiding long-term environmental degradation.

2. Remove Unassigned Blocks: Permanently retire oil and gas blocks that have not been assigned to investors yet from national planning policies as a proactive measure to avoid locking in future emissions and to reduce exposure to long-term environmental and economic risks.

3. Terminate Financial Support: End investments, insurance coverage, and financing for coastal and offshore oil and gas expansion. Continued financial support for these developments reinforces fossil fuel dependence and diverts resources away from clean energy alternatives.

4. Invest in Renewables: Shift financial resources to solar, wind, and other clean energy alternatives. Expanding investment in clean energy infrastructure is critical to accelerating the energy transition, supporting climate resilience and generating sustainable economic opportunities.

5. Ensure a Just Transition: Adopt policies that make oil & gas companies accountable for paying the full decommissioning of abandoned and idle offshore oil and gas operations, including removing all infrastructure and implementing long-term monitoring, as well as reparations to Indigenous and local communities affected by coastal and offshore oil and gas activities. Engage all affected stakeholders and communities during the transition using a rights-based approach.

6. Restore Ecosystems: Rehabilitate habitats impacted by fossil fuel operations through decommissioning, pollution cleanup, and conservation efforts. Ecosystem restoration is essential for biodiversity protection and for supporting the well-being of coastal populations.

7. Strengthen legal, financial, and policy frameworks and implement international treaties or agreements, such as the Fossil Fuel Non Proliferation Treaty, to prohibit new coastal and offshore oil and gas expansion.

Full Methodology and Data Sources

Data Disclaimer:
The geospatial analyses in this report are an attempt to capture potential threats to ecosystems using the most recently available, most accurate and precise data and methods available. As such, the results of these analyses may change between reports as data and/or methods are updated. The World Database of Key Biodiversity Areas (WDKBA) releases regular updates based on national assessment processes. The World Database on protected areas (WDPA) has known data inconsistencies due to national government data reporting. We have accounted for these inconsistencies wherever possible. The Important Marine Mammals Area (IMMA) dataset contains regions that have not yet been assessed, such as the South East Atlantic Ocean. Consequently, the current analysis may not encompass all IMMAs within that region.

Earth Insight takes a precautionary approach to estimating the potential area under oil and gas threats. Oil and gas data used in the analyses in this report include active production blocks, as well as areas under multiple stages of exploration and permitting. This approach provides the most expansive view of areas under threat of extractive industries.

Value Layer Processing
Before calculating the areas of value layers, duplicate and overlapping features were removed from protected areas, Key Biodiversity Areas, Important Marine Mammal Areas, coral reefs, seagrasses, and mangroves.

Coastal Definition
Coastal protected areas and Key Biodiversity Areas were defined as areas that overlapped with the GADM 4.1 coastal boundary, with a 4km buffer applied.

Oil and Gas Threat Analysis
The areas of value layers under oil and gas blocks were calculated by intersecting the respective value layer with the oil and gas blocks and then summing the resulting areas. The analysis included only marine and coastal Key Biodiversity Areas and protected areas.

Ocean Frontiers at Risk | Fossil Fuel Expansion Threats to Biodiversity

Data Sources:

Coral Reefs: UNEP-WCMC, WorldFish Centre, WRI, TNC (2021). Global distribution of warm-water coral reefs, compiled from multiple sources, including the Millennium Coral Reef Mapping Project. Version 4.1. Includes contributions from IMaRS-USF and IRD (2005), IMaRS-USF (2005) and Spalding et al. (2001). Cambridge (UK): UN Environment World Conservation Monitoring Centre. Data DOI: https://doi.org/10.34892/t2wk-5t34

Country Borders: Natural Earth (2024).

Important Marine Mammal Areas: IUCN MMPATF (2025) Global Dataset of Important Marine Mammal Areas (IUCN-IMMA). February 2025. Made available under agreement on terms of use by the IUCN Joint SSC/WCPA Marine Mammal Protected Areas Task Force and made available at www.marinemammalhabitat.org/imma-eatlas.

Key Biodiversity Areas: BirdLife International (2024) World Database of Key Biodiversity Areas. Developed by the KBA Partnership: BirdLife International, International Union for the Conservation of Nature, American Bird Conservancy, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Re:Wild (formerly Global Wildlife Conservation), NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, Wildlife Conservation Society,iq and World Wildlife Fund. September 2024 version. Available at http://keybiodiversityareas.org/kba-data/request

LNG Terminals/Pipelines: Global Gas Infrastructure Tracker, Global Energy Monitor, September 2024 (Terminals), December 2024 (Pipelines).

Mangroves: Bunting P., Rosenqvist A., Lucas R., Rebelo L-M., Hilarides L., Thomas N., Hardy A., Itoh T., Shimada M. and Finlayson C.M. (2018). The Global Mangrove Watch – a New 2010 Global Baseline of Mangrove Extent. Remote Sensing 10(10): 1669. doi: 10.3390/rs1010669.

Oil and Gas Blocks: Oilbase (2025), Earth Insight; Brazil: Brazilian National Agency of Petroleum and Natural Gas and Biofuels; Senegal: Ministry of Petroleum and Energy of Senegal; Namibia: Ministry of Industries, Mines and Energy; South Africa: Mineral and Petroleum Resources; Barbados: Ministry of Energy and Business; Bahamas: Bahamas Petroleum Company; Suriname: Staatsolie; Saya de Malha: Spectrum Geo, JMA 2D Seismic Survey; Philippines: Department of Energy of the Philippines; Mozambique; National Petroleum Institute.

Protected Areas: UNEP-WCMC and IUCN (2025), Protected Planet: The World Database on Protected Areas (WDPA) [Online], April 2025, Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net.

Seagrasses: UNEP-WCMC, Short FT (2021). Global distribution of seagrasses (version 7.1). Seventh update to the data layer used in Green and Short (2003). Cambridge (UK): UN Environment World Conservation Monitoring Centre. Data DOI: https://doi.org/10.34892/x6r3-d211

Endnotes & References

1 Defund Total Energies.(2023). Papua LNG A Liquified Natural Gas Project in Papua. https://defundtotalenergies.org/en/papualng-2. Accessed: May 19, 2025.

2 Fourqurean, J., et al. (2012). Seagrass ecosystems as a globally significant carbon stock. Nature Geosci 5. https://doi.org/10.1038/ngeo1477. Accessed: May 19, 2025.

3 Ibid. (2023). Defund Total Energies. Accessed: May 19, 2025.

4 Sorkhabi, R. (2019, Dec 5). Geological Basin Classification, GEOExPro. https://geoexpro.com/geological-basin-classification/#:~:text=A%20vast%20majority%20of%20sedimentary,(little%20explored%20or%20drilled). Accessed: May 19, 2025.

5 RystadEnergy (2024, February 28). Upstream majors dive into deeper waters as exploration budgets stay flat in 2024. https://www.rystadenergy.com/news/upstream-majors-drilling-production-oil-gas-exploration. Accessed: May 19, 2025.

6 Zimmerman, S. (2025). Oil and Gas Move's Offshore: Trends and Risks. Global Energy Monitor. https://globalenergymonitor.org/report/oil-gas-extractions-move-offshore-trends-and-risks. Accessed: May 19, 2025.

7 Rozansky, R., et al. (2024). LNG 2024: Latin America and the Caribbean Edition. Global Energy Monitor. https://globalenergymonitor.org/report/lng-2024-latin-america-and-the-caribbean-edition. Accessed: May 19, 2025.

8 Fourqurean et al (2012). Available at https://www.nature.com/articles/ngeo1477

9 Gibbons, B. (2023, July 12). The U.S. LNG export boom is spreading to Mexico, creating new environmental threats. Oil & Gas Watch. https://news.oilandgaswatch.org/post/the-u-s-lng-export-boom-is-spreading-to-mexico-and-its-environmentally-sensitive-gulf-of-california. Accessed: May 20, 2025.

10 Mexico Pacific. (n.d.). Saguaro Energía LNG Facility. https://mexicopacific.com/saguaro-energia/. Accessed: May 20, 2025

11 Collins, J., et al. (2025, April 15). Sheinbaum's energy agenda under fire as Mexican activists slam LNG megaproject. Mongabay. https://news.mongabay.com/2025/04/sheinbaums-energy-agenda-under-fire-as-mexican-activists-slam-lng-megaproject/. Accessed: May 20, 2025.

12 Langenheim, J. (n.d.). Saving Baja's iconic biodiversity. National Geographic. https://www.nationalgeographic.com/environment/slideshow/paid-content-saving-bajas-iconic-biodiversity. Accessed: May 20, 2025.

13 United Nations Educational, Scientific and Cultural Organization. (n.d.). Whale Sanctuary of El Vizcaino. UNESCO World Heritage Centre. https://whc.unesco.org/en/list/554/. Accessed: May 20, 2025.

14 Comisión Nacional para el Conocimiento y Uso de la Biodiversidad. (2016). Baja California. Poster presented at the CEPA Fair 2016. https://www.cbd.int/cepa/cepafair/2016/presentations/postertool/mx-conabio-bajacalifornia-web.pdf. Accessed: May 20, 2025.

15 Marine Mammal Protected Areas Task Force. (n.d.). Gulf of California IMMA. https://www.marinemammalhabitat.org/factsheets/gulf-of-california-imma/. Accessed: May 20, 2025.

16 World Wildlife Fund. (n.d.). Vaquita. https://www.worldwildlife.org/species/vaquita. Accessed: May 20, 2025.

17 Defensa Ambiental del Noroeste. (n.d.). Al servicio de la naturaleza y de nuestro derecho a un ambiente saludable. https://www.dan.org.mx/. Accessed: May 20, 2025.

18 Ballenas o Gas. (n.d.). ¿Ballenas o gas?. https://ballenasogas.org/. Accessed: May 20, 2025.

19 Rolle, R. (2021, February 9). Well, well, well – BPC strike out: Activists celebrate as drilling finds no viable oil deposits. The Tribune. https://www.tribune242.com/news/2021/feb/09/well-well-well-bpc-strike-out-activists-celebrate-/. Accessed: May 20, 2025.

20 Marine Mammal Protected Areas Task Force. (n.d.). Lucayan Archipelago IMMA. https://www.marinemammalhabitat.org/factsheets/lucayan-archipelago-imma/. Accessed: May 20, .

21 International Trade Administration. (n.d.). Bahamas - Tourism-Related Construction and Materials. U.S. Department of Commerce. https://www.trade.gov/country-commercial-guides/bahamas-tourism-related-construction-and-materials. Accessed: May 20, 2025.

22 Wright, A., et al. (2023, March 30). Global warming and The Bahamas. Central Bank of The Bahamas. https://www.centralbankbahamas.com/publications/working-papers/global-warming-and-the-bahamas. Accessed: May 20, 2025.

23 Our Islands Our Future. (2020, June 16). STOP oil drilling in The Bahamas, Push for moratorium on oil drilling and licenses. Change.org. https://www.change.org/p/the-most-hon-prime-minister-help-save-our-bahamian-waters-protect-our-history-heritage-and-home-from-oil-drillingChange.org+4. Accessed: May 20, 2025.

24 Bahamas Protected Areas Fund. (n.d.). Marine Protection Plan. https://bahamasprotected.com/marine-protection-plan/;contentReference[oaicite:3]{index=3}. Accessed: May 20, 2025.

25 The Tribune. (2024, April 18). Poll finds nearly 90 percent against oil drilling. https://www.tribune242.com/news/2024/apr/18/poll-finds-nearly-90-percent-against-oil-drilling/. Accessed: May 20, 2025.

26 Ministry of Energy and Business. (n.d.). Offshore Petroleum Programme. Government of Barbados., https://energy.gov.bb/our-publications/offshore-petroleum-programme/#1608593267448-52aef526-64f5. Accessed: May 19, 2025.

27 BNamericas. (2007, June 5). Barbados to launch offshore exploration round June 22. Rigzone. https://www.rigzone.com/news/barbados_to_launch_offshore_exploration_round_june_22-05-jun-2007-46011-article/. Accessed: May 20, 2025.

28 United Nations Environment Programme. (2017, December 20). Valuing and protecting biodiversity in the Caribbean. https://www.unep.org/news-and-stories/story/valuing-and-protecting-biodiversity-caribbean. Accessed: May 20, 2025

29 Marine Mammal Protected Areas Task Force. (n.d.). Eastern Caribbean Islands IMMA. https://www.marinemammalhabitat.org/factsheets/eastern-caribbean-islands-imma/. Accessed: May 20, 2025.

30 OilNOW. (2024, December 11). Guyana third only to Qatar, Kuwait per capita oil production last year. https://oilnow.gy/featured/guyana-third-only-to-qatar-kuwait-in-per-capita-oil-production-last-year. Accessed: May 19, 2025.

31 Palmigiani, F. (2025, February 10). Chevron readies debut exploration well to target Suriname oil riches. upstream. https://www.upstreamonline.com/exclusive/chevron-readies-debut-exploration-well-to-target-suriname-oil-riches/2-1-1777413. Accessed: May 19, 2025.

32 Kuipers, A. (2024, December 17). Shell to Shell to submit offshore drilling plan in Suriname for environmental approval. Reuters. https://www.reuters.com/markets/commodities/shell-submit-offshore-drilling-plan-suriname-environmental-approval-2024-12-17/+. Accessed: May 19, 2025.

33 Petronas (2024, May 15). Petronas makes latest oil and gas discovery in Suriname's offshore Block 52. [Press release]. https://www.petronas.com/media/media-releases/petronas-makes-latest-oil-and-gas-discovery-surinames-offshore-block-52. Accessed: May 19, 2025.

34 OilNOW. (2024. May 19). WoodMac estimates 4.6 billion barrels discovered offshore Suriname. https://oilnow.gy/featured/woodmac-estimates-4-6-billion-barrels-discovered-offshore-suriname. Accessed: May 19, 2025.

35 Marine Mammals Protected Areas Taskforce. (2023). Guiana to Amazon Outflow IMMA. https://www.marinemammalhabitat.org/factsheets/guianas-to-amazon-outflow-imma. Accessed: May 19, 2025.

36 Probios. (2020). Hazards and Risks with Crude Oil in Suriname. https://www.probios.org/services/oil-and-gas. Accessed: May 19, 2025.

37 Garcia, R. (2025, March 24). Brazil needs to act and "lead by example," says scientist. Valor International. https://valorinternational.globo.com/environment/news/2025/03/24/brazil-needs-to-act-and-lead-by-example-says-scientist.ghtml Accessed: May 20, 2025.

38 Articulação dos Povos Indígenas do Brasil. (2024, outubro 26). A resposta somos nós. APIB. https://apiboficial.org/2024/10/26/a-resposta-somos-nos/. Accessed: May 20, 2025.

39 Conselho Pastoral dos Pescadores. (n.d.). Campanha "Nem um Poço a Mais!" https://cppnacional.org.br/campanhas/campanha-nem-um-po%C3%A7o-mais. Accessed: May 20, 2025.

40 Cerqueira, N. (2024, agosto 28). "Queremos justiça ambiental e reparação aos povos atingidos pelo derramamento de petróleo", diz a coordenadora do Conselho Pastoral de Pescadores, Andrea Souza. Instituto Internacional Arayara. https://arayara.org/queremos-justica-ambiental-e-reparacao-aos-povos-atingidos-pelo-derramamento-de-petroleo-diz-a-coordenadora-do-conselho-pastoral-de-pescadores-andrea-souza/. Accessed: May 20, 2025.

41 Ministério da Pesca e Aquicultura. (2024, março 6). Painel Unificado do Registro Geral da Atividade Pesqueira. http://www.gov.br/mpa/pt-br/assuntos/cadastro-registro-e-monitoramento/painel-unificado-do-registro-geral-da-atividade-pesqueira. Accessed: May 20, 2025.

42 Rovai, A. S., et al. Twilley, (2022). Brazilian mangroves: Blue carbon hotspots of national and global relevance to natural climate solutions. Frontiers in Forests and Global Change, 4, Article 787533. https://doi.org/10.3389/ffgc.2021.787533. Accessed: May 20, 2025.

43 Kauffman, J. B.,et al. (2018). Carbon stocks of mangroves and salt marshes of the Amazon region, Brazil. Biology Letters, 14(9), 20180208. https://doi.org/10.1098/rsbl.2018.0208. Accessed: May 20, 2025

44 Moura, R. L., et al. (2016). An extensive reef system at the Amazon River mouth. Science Advances, 2(4), e1501252. https://doi.org/10.1126/sciadv.1501252. Accessed: May 20, 2025.

45 Instituto Chico Mendes de Conservação da Biodiversidade. (n.d.). Plano de Ação Nacional para Conservação dos Ambientes Coralíneos (PAN Corais). https://www.gov.br/icmbio/pt-br/assuntos/biodiversidade/pan/pan-corais. Accessed: May 20, 2025.

46 Marine Mammal Protected Areas Task Force. (n.d.). Guianas to Amazon Outflow IMMA. https://www.marinemammalhabitat.org/factsheets/guianas-to-amazon-outflow-imma/. Accessed: May 20, 2025.

47 Frost, R. (2025, February 17). Brazil's Lula defends oil exploration in the Amazon as a way to finance green energy. Euronews. https://www.euronews.com/green/2025/02/17/brazils-lula-defends-oil-exploration-in-the-amazon-as-a-way-to-finance-green-energy. Accessed: May 20, 2025.

48 Woodside Energy Group Ltd. (2024, June 11). Woodside achieves first oil at Sangomar in Senegal [Press release]. https://www.woodside.com/docs/default-source/asx-announcements/2024/woodside-achieves-first-oil-at-sangomar-in-senegal.pdf. Accessed: May 20, 2025

49 Global Energy Monitor. (2025, February 22). Yakaar-Teranga Gas Project (Senegal). https://www.gem.wiki/Yakaar-Teranga_Gas_Project_(Senegal). Accessed: May 20, 2025

50 https://energycapitalpower.com/petrosen-targets-2025-fid-for-yakaar-teranga-project/. Accessed: May 20, 2025

51 Lemmerich, P. (2024, April 15). The next fossil fuel trap? – Oil and gas projects in Senegal. Climate Justice Central. https://www.climatejusticecentral.org/posts/oil-gas-senegal-next-fossil-fuel-trap. Accessed: May 20, 2025

52 Bousso, M. (2022, November 22). Senegal: Fisheries and aquaculture in Senegal (Report No. SG2022-0015). USDA Foreign Agricultural Service. https://www.fas.usda.gov/data/senegal-fisheries-and-aquaculture-senegall. Accessed: May 20, 2025

53 Aar Guedj Gui Ak Napagi. (n.d.). Sauver la mer et la pêche. https://sauverlameretlapeche.org/. Accessed: May 20, 2025

54 Fleming, S. (2019, September 3). Senegal is planting millions of mangrove trees to fight deforestation. World Economic Forum. https://www.weforum.org/stories/2019/09/senegal-is-planting-millions-of-mangrove-trees-to-fight-deforestation/. Accessed: May 20, 2025

55 Nikše, D. (2025, February 25). Another oil & gas discovery for Galp in Namibia's Orange Basin. Offshore Energy. https://www.offshore-energy.biz/another-oil-gas-discovery-for-galp-in-namibias-orange-basin/. Accessed: May 20, 2025

56 TotalEnergies. (n.d.). TotalEnergies in Namibia. https://totalenergies.com/namibia. Accessed: May 20, 2025

57 Shell Namibia. (n.d.). Shell Namibia. https://www.shell.com.na/. Accessed: May 20, 2025

58 Galp. (n.d.). Upstream in Namibia. https://www.galp.com/corp/en/about-us/what-we-do/upstream/namibia. Accessed: May 20, 2025

Ocean Frontiers at Risk | Fossil Fuel Expansion Threats to Biodiversity

Humback whale and dolphins.
Image credit: Envato Elements CC

59 Reuters. Namibia's offshore discoveries estimated at $11 billion. (2023, August 23). https://www.reuters.com/article/business/energy/namibias-offshore-oil-discoveries-estimated-at-11-bln-barrels-namcor-idUSL8N3A41HS/. Accessed: May 20, 2025

60 UNEP-WCMC. (2025). Protected Area Profile for Namibian Islands Marine Protected Area (WDPA ID: 555512146). World Database on Protected Areas. https://www.protectedplanet.net/555512146. Accessed: May 20, 2025

61 Esau, I. (2024, November 21). Shell targets two Orange basin exploration wells for 2026 — but not in Namibia. Upstream Online. https://www.upstreamonline.com/exploration/shell-targets-two-orange-basin-exploration-wells-for-2026-but-not-in-namibia/2-1-1742779. Accessed: May 20, 2025

62 TotalEnergies. (2024, March 6). South Africa: TotalEnergies expands its presence in the Orange Basin with a new offshore exploration license. https://totalenergies.com/media/news/press-releases/south-africa-totalenergies-expands-its-presence-orange-basin-new-offshore. Accessed: May 20, 2025

63 Bousso, R. (2025, January 8). Shell writes down Namibia oil discovery in blow to country. Reuters. https://www.reuters.com/business/energy/shell-writes-down-namibia-oil-discovery-2025-01-08/. Accessed: May 20, 2025

64 WILDTRUST. (2023, November 14). Annex B1: WILDTRUST TEEPSA DWOB w APP A. The Green Connection. https://thegreenconnection.org.za/wp-content/uploads/2023/11/Annex-B1-WILDTRUST_TEEPSA-DWOB_w-APP-A_14Nov2023.pdf. Accessed: May 20, 2025

65 Global Energy Monitor. (n.d.). Coral South FLNG Terminal. Retrieved May 20, 2025, from https://www.gem.wiki/Coral_South_FLNG_Terminal. Accessed: May 20, 2025

66 Mozambique LNG. (n.d.). About the Mozambique Liquefied Natural Gas Project. https://www.mozambiquelng.co.mz/about-the-mozambique-liquefied-natural-gas-project/. Accessed: May 20, 2025

67 ExxonMobil. (n.d.). Rovuma LNG. https://www.exxonmobil.co.mz/about/who-we-are/rovuma-lng#Overview. Accessed: May 20, 2025

68 Reuters. (2025, April 8). Mozambique government approves Eni's Coral Norte FLNG plan. https://www.reuters.com/business/energy/mozambique-government-approves-enis-coral-norte-flng-plan-2025-04-08/. Accessed: May 20,2025 202

69 International Trade Administration. (n.d.). Mozambique - Oil & Gas.

70 Obura, D., et al. (2021). Vulnerability to collapse of coral reef ecosystems in the Western Indian Ocean. Nature Sustainability, 5(2), 104–113. https://doi.org/10.1038/s41893-021-00817-0. Accessed: May 20, 2025

71 Gould, T. (2023, June 22). Over 1,190 killed in 2021 Palma massacre, new survey finds. Zitamar News. https://www.zitamar.com/over-1-190-killed-in-2021-palma-massacre-new-survey-finds/. Accessed: May 20, 2025

72 Club of Mozambique. (2025, March 26). Mozambique: Analyst warns of 'complex' local impact of gas project resumption in Cabo Delgado. https://clubofmozambique.com/news/mozambique-analyst-warns-of-complex-local-impact-of-gas-project-resumption-in-cabo-delgado-278646/. Accessed: May 20, 2025

73 StopMozGas. (2025, January 22). Mozambique LNG: Financial institutions so far refrain from taking a stance on allegations of severe human rights violations. https://stopmozgas.org/article/mozlng-fi-no-stance-allegations-human-rights-violations Accessed: May 20, 2025

74 StopMozGas. (2024, February). Coral North FLNG: Final Investment License 2024. https://stopmozgas.org/wp-content/uploads/2025/02/SMG_Coral_North_FIL2024.pdf. Accessed: May 20, 2025

75 BankTrack, Justiça Ambiental (JA!)/Friends of the Earth Mozambique, Les Amis de la Terre France, & ReCommon. (2023, March 20). Who dares to finance Eni and Exxon's dangerous Rovuma gas plans in Mozambique? https://www.banktrack.org/blog/who_dares_to_finance_eni_and_exxon_s_dangerous_rovuma_gas_plans_in_mozambique. Accessed: May 20, 2025

76 Reclaim Finance. (2023, November 17). Mozambique LNG: Call to withdraw your support. https://reclaimfinance.org/site/en/2023/11/17/stopmozambiquelng/. Accessed: May 20, 2025

77 SFOC. (2025, May 13). Global LNG fleet's annual CO_2e emissions soar past 12 billion tonnes while order books shrug off overcapacity warning, study finds.[Press Release].https://forourclimate.org/newsroom/1080. Accessed: May 20, 2025

78 Ministry of Fisheries and Blue Economy. (n.d.). Joint Management Area. https://mofbe.gov.sc/joint-management-area/. Accessed: May 20, 2025.

79 Seychelles News Agency. (2024, April 18). Seychelles and Mauritius agree to petroleum exploration in JMA of Mascarene Plateau. http://www.seychellesnewsagency.com/articles/21177/Seychelles+and+Mauritius+agree+to+petroleum+exploration+in+-IMA+of+Mascarene+Plateau. Accessed: May 20, 2025.

80 High Seas Alliance. (n.d.). Saya de Malha. https://mpa.highseasalliance.org/saya-de-malha. Accessed: May 20, 2025.

81 Webber, M. A., et al. (2023). Cetaceans of the Saya de Malha Bank region, Indian Ocean. Regional Studies in Marine Science, 61, 102830. https://doi.org/10.1016/j.rsma.2023.102830. Accessed: May 20, 2025.

82 Fish Focus. (2023, August 30). Call to protect whales and dolphins at Indian Ocean hotspot. https://fishfocus.co.uk/call-to-protect-whales-and-dolphins-at-indian-ocean-hotspot/. Accessed: May 20, 2025

83 High Seas Alliance. (n.d.). High Seas Alliance. Retrieved May 20, 2025, from https://highseasalliance.org/. Accessed: May 20, 2025

84 Khadka, N. S. (2020, August 12). Why the Mauritius oil spill is so serious. BBC News. https://www.bbc.com/news/world-africa-53754751. Accessed: May 20, 2025

85 Hutchins, R. (2024, December 5). Effects of Japanese oil spill still felt in Mauritius mangroves today. Oceanographic Magazine. https://oceanographicmagazine.com/news/effects-of-japanese-oil-spill-still-felt-in-mauritius-mangroves-today/. Accessed: May 20, 2025

86 Reuters. (2023, May 15). Philippines' Marcos signs 15-year Malampaya gas contract renewal. https://www.reuters.com/business/energy/philippines-marcos-signs-15-year-malampaya-gas-contract-renewal-2023-05-15/. Accessed: May 21, 2025

87 Esmael, L. K. (2025, April 24). PXP Energy widens Q1 net loss on lower Galoc oil output. Philippine Daily Inquirer. https://business.inquirer.net/521415/pxp-energy-widens-q1-net-loss-on-lower-galoc-oil-output. Accessed: May 21, 2025

88 Hilotin, J., et al. (2024, December 20). Philippines: Boom time for oil, gas, coal exploration. Gulf News. https://gulfnews.com/special-reports/philippines-boom-time-for-oil-gas-coal-exploration-1.1721054279700. Accessed: May 21, 2025

89 Santos, R. J., et al. (2023). A review of the impact of oil and gas development on marine biodiversity in the Philippines. Marine Environmental Research, 190, 105123. https://doi.org/10.1016/j.marenvres.2023.105123. Accessed: May 21, 2025

90 UNESCO. (n.d.). Palawan – Man and the Biosphere Programme (MAB). https://www.unesco.org/en/mab/palawan. Accessed: May 21, 2025

91 University of Sydney. (2025, March 7). Palawan State of the Marine Environment Report: hidden challenges in paradise. https://www.sydney.edu.au/news-opinion/news/2025/03/07/palawan-philippines-marine-environment-report-2024.html. Accessed: May 21, 2025

92 Santos, M. D., et al. (2023). Marine fishes of Palawan, Philippines: Species diversity, new records, and conservation status. Regional Studies in Marine Science, 60, 102672. https://doi.org/10.1016/j.rsma.2023.10267. Accessed: May 21, 2025

93 Protect VIP. (n.d.). Protect Verde Island Passage. https://www.protectvip.org/;contentReference[oaicite:3]{index=3}. Accessed: May 21, 2025

94 Center for Energy, Ecology, and Development. (2023, March 7). Oil spill in the Verde Island Passage. https://ceedphilippines.com/oil-spill-in-the-verde-island-passage/. Accessed: May 21, 2025

95 Oceana. (2024, August 7). Oceana gives update on risk of devastating oil spill in Manila Bay. [Press Release]. https://oceana.org/press-releases/oceana-gives-update-on-risk-of-devastating-oil-spill-in-manila-bay/. Accessed: May 21, 2025

96 ExxonMobil PNG Limited. (n.d.). About PNG LNG. PNG LNG. https://pnglng.com/About. Accessed: May 21, 2025

97 Ibid. ExxonMobil PNG Limited. Accessed: May 21, 2025

98 Global Energy Monitor. (2024, December 4). PAWA PNG FSRU Project. https://www.gem.wiki/PAWA_PNG_FSRU_Project. Accessed: May 21, 2025

99 Reclaim Finance. (2025, February 13). More banks rule out support for TotalEnergies' Papua LNG project. https://reclaimfinance.org/site/en/2025/02/13/more-banks-rule-out-support-for-totalenergies-papua-lng-project//. Accessed: May 21, 2025

100 Defund TotalEnergies. (2025, February 13). Papua LNG. https://defundtotalenergies.org/en/papualng-2. Accessed: May 21, 2025

101 Stoyle, G. (n.d.). The Coral Triangle: Amazon of the seas. Oceanographic Magazine. https://oceanographicmagazine.com/features/exploring-the-coral-triangle-raja-ampat/. Accessed: May 21, 2025

102 UNESCO World Heritage Centre. (n.d.). Saloum Delta. https://whc.unesco.org/en/list/1359/. Accessed: May 21, 2025

103 Convention on Biological Diversity. (n.d.). Papua New Guinea – Country Profile. https://www.cbd.int/countries/profile?country=pg. Accessed: May 21, 2025

104 Souter, N. J., et al. (2024). Conservation priorities for Papua New Guinea's terrestrial biodiversity: Integrating threats and ecosystem services. Biological Conservation, 292, 110279. https://doi.org/10.1016/j.biocon.2024.110279. Accessed: May 21, 2025


Earth
InSight