Brazil

SKYTRUTH

Offshore Fossil Fuel Threats and Impacts

November 2025

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Key Takeaways

- Between 2014 and 2024, Brazil's oil production increased by more than 49% and natural gas production increased by over 78%.
- 179 probable oil slicks were observed in Sentinel-1 imagery in the Brazilian EEZ since 2017 (48 from oil and gas infrastructure, 131 from vessels). Oil tankers and infrastructure service vessels were responsible for nearly half (47%) of the vessel slicks with verifiable sources.
- Floating production and storage vessels (FxOs) have become increasingly utilized in the oil and gas industry. A single FxO in the Santos Basin was responsible for 9 slicks. Another FxO location saw an increase in vessel traffic by 430% after it went into operation.
- Oil and gas facilities within Brazil's EEZ were observed to flare 12.5 billion cubic meters of natural gas since 2012, equivalent to the annual emissions of about 6.9 million passenger cars.
- Three methane plumes, each large enough to be considered a super-emitter event at over 100 kg of methane per hour, were captured on the same day in April 2025 from offshore oil and gas infrastructure in the Santos Basin.
- There was an increase in oil and gas vessel traffic in Brazil's EEZ by 81% between 2012 and 2023.*
- There are 162 producing fields and 143 exploration blocks in the Brazilian EEZ. In addition, Petrobras has started exploration for 9 blocks in ecologically sensitive habitats near the mouth of the Amazon River, and has recently been granted approval to drill at a site located 500km from the river mouth.
- 13 of the 160 Marine protected areas (MPAs) in Brazil overlap with oil and gas infrastructure, lease blocks, or detected oil slicks, and nearly all of the MPAs have some amount of oil-related vessel traffic moving through them. Two protected areas near the city of Salvador were particularly impacted by oil and gas development, vessel traffic and oil pollution. The Área De Proteção Ambiental Plataforma Continental Do Litoral Norte and the Área De Proteção Ambiental Baía De Todos Os Santos both contain coral and mangrove habitats that are important for biodiversity and climate protection.
- Of Brazil's ecologically important habitats, including corals, mangroves, seagrasses, salt marshes, and seamounts, about 36% fall into MPAs, leaving 64% vulnerable to impacts including from the oil and gas industry.
- There are 20 important marine mammal areas (IMMAs) that cover over a quarter of Brazil's EEZ. Only about 6% of the IMMA area falls within marine protected areas, leaving 94% of these important habitats unprotected.

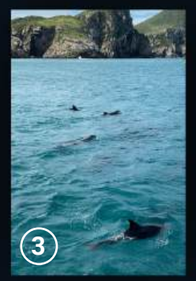
*2023 is the last full year of vessel traffic data from Global Maritime Traffic. See data sources and disclaimers section of the report for more information.

Mangroves in Prado, Bahia

Coral reef in Parque Nacional Marinho dos Abrolhos

Sea turtle in coral reef near Rio de Janeiro

Dolphins near Arraial do Cabo



Humpback whale near Arraial do Cabo, Rio de Janeiro

Introduction

Brazil's Amazon rainforest is renowned for its biodiversity and climate change mitigation potential, but the country's vibrant marine environment receives far less attention.

Brazil's coastal waters are rich in flora, fauna, and critical habitats that support a multitude of species as well as many coastal communities. Brazil's waters cover roughly 3.6 million square kilometers of the ocean, making it the 6th largest Exclusive Economic Zone (EEZ) in the world.

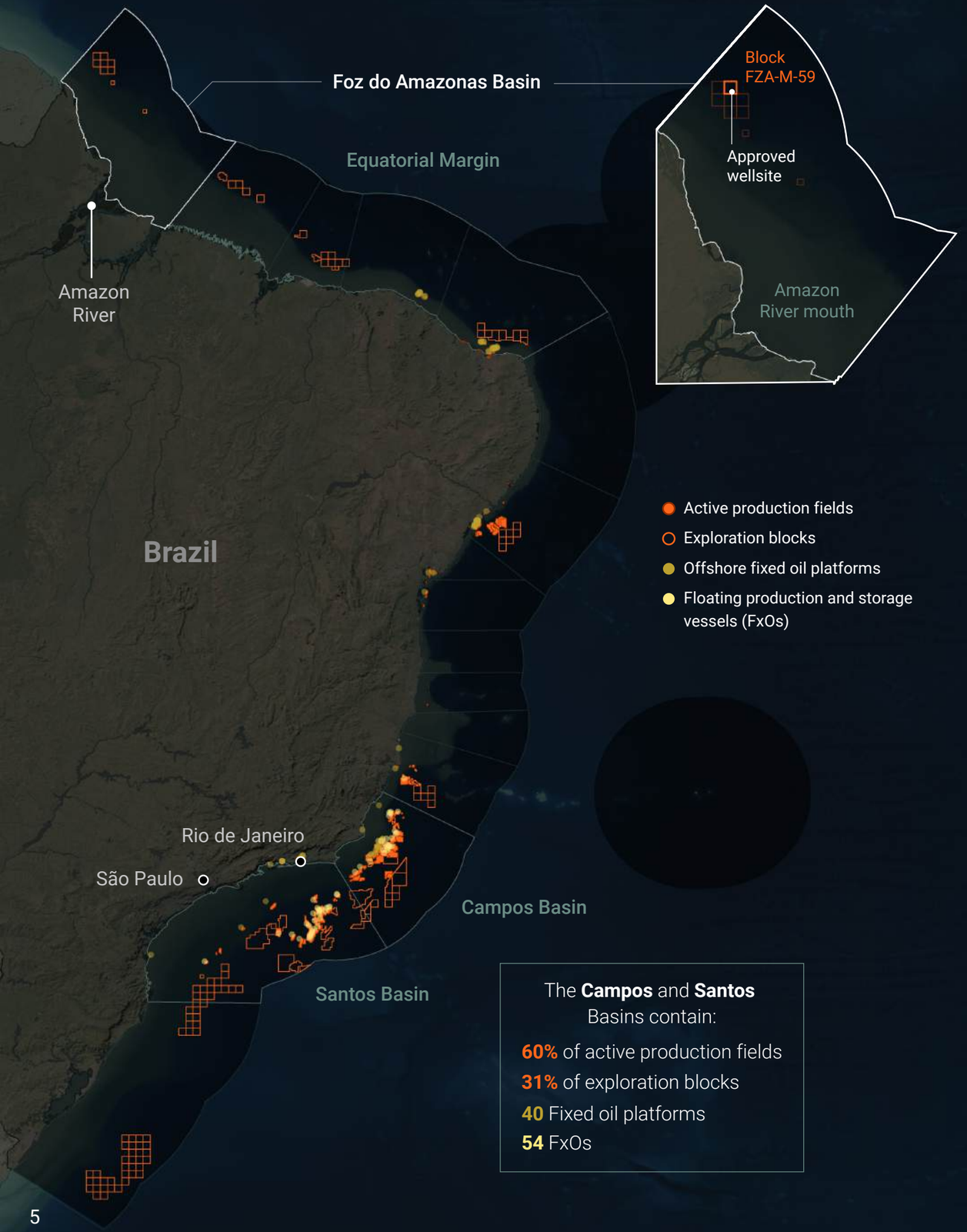
The reefs, mangroves, seagrass beds, and estuaries that comprise this dynamic marine space support thousands of species — including manatees, sea turtles, humpback whales, and numerous commercially valuable fish. Many Brazilians depend on these ecosystems to sustain their livelihoods; 3.5 million people work in the fisheries and aquaculture industries alone. These iconic environments also provide recreational opportunities for Brazilians and visitors from around the world, resulting in a robust coastal tourism industry.

In December 2022, Brazil committed to protecting 30% of its terrestrial and marine areas by 2030, in support of the Kunming-Montreal Global Biodiversity Framework's "30 by 30" initiative. While Brazil has exceeded the 30% mark in terrestrial protection, at least in designation, marine conservation has yet to reach its target, sitting at 26.7%. While that appears to be quite close to the goal, the Marine Conservation Institute analyzed 84% of the marine space that falls within Brazil's protected areas and found only 12% to be fully or highly protected (3.2% of the full EEZ). Meanwhile, the oil and gas industry continues to grow, and with it, threats to Brazil's marine environments.

Recently, the offshore oil and gas industry has explored expanding into ecologically threatened areas like the Amazon River mouth, which contains the Amazon Reef System and the longest continuous stretch of mangroves in the world. The Amazon River mouth also provides access to highly important fisheries vital to the livelihoods of coastal communities. Petrobras, Brazil's majority state-owned oil company, is on track to become the world's second-fastest-growing oil company, driven largely by deepwater projects in the Campos and Santos Basins as well as potential extraction plans in three basins of the Equatorial Margin. Oil spills, vessel traffic, noise pollution, and environmental degradation from oil and gas activities threaten biodiverse habitats and put species at risk. As development progresses, it becomes increasingly difficult to ensure the preservation of Brazil's important habitats.

Implementing effective, equitable marine conservation will require balancing biodiversity goals with traditional uses and ongoing industrial development. This report provides an initial assessment of the threats posed by offshore oil and gas development and their impacts on Brazil's sensitive ecosystems, protected areas, vital species habitats, and coastal communities. It is not intended to be a comprehensive accounting of all impacts, but rather as a foundation for continued analysis.

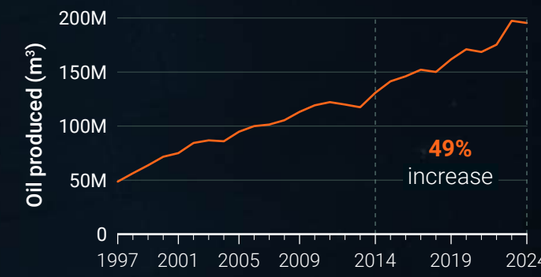
Opposite page image credits: Mangroves: Wikimedia Commons/Jonathan Wilkins; Coral: Wikimedia Commons/RobertoCostaPinto; Sea turtle: Pexels/Victor Bezerra; Dolphins: Pexels/Victor Bezerra; Whale: Pexels/Victor Barbosa

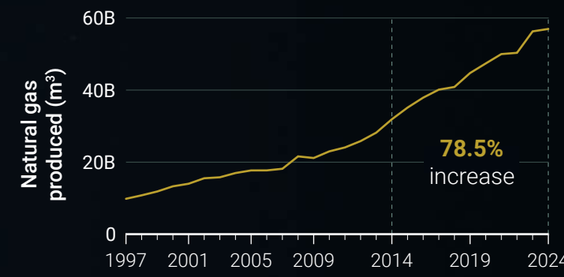


BRAZIL OFFSHORE FOSSIL FUEL THREATS

Growth of Offshore Oil and Gas Development

Brazil began exploring for oil along its South Atlantic coast in the 1970s. In the 1990s, offshore oil production exploded with the discovery of major oil fields in the Santos and Campos Basins. These two basins — near Brazil's 2 largest cities, São Paulo and Rio de Janeiro — account for 94% of Brazilian oil reserves. Petrobras ramped up exploration and development of these basins after the discovery of dozens of large oil fields. This resulted in the drilling of hundreds of wells and extraction of millions of barrels of oil per day.





In the 10 years between 2014 and 2024, Brazil's oil production increased by more than 49%, and natural gas production increased by over 78%. Today, the industry contributes 10% of Brazil's GDP, and Brazil is the largest producer of oil in South America. Petrobras controls 73% of the country's oil and gas output. There are 162 active production fields and 143 exploration blocks under contract in the Brazilian EEZ; 60% of the fields and 31% of the exploration blocks are located in the Campos and Santos Basins. Those basins contain about 40 operational oil platforms as well as 54 floating production and storage vessels (FxOs). An increasingly concerning development for scientists and Brazilians alike is oil exploration and drilling plans around the mouth of the Amazon River. Nine exploration blocks are positioned in the Foz do Amazonas Basin at the mouth of the river. Following pressure from Brazil's President, the Institute of Environment and Renewable Natural Resources (IBAMA) recently granted Petrobras approval to drill in Block 59, 160km from the coast.

Offshore development continues to undermine Brazil's ability to achieve its climate goals, including climate neutrality by 2050. Observatório do Clima (OC) estimates that Brazil would need an 80% reduction of its oil and gas production from its 2022 levels in order to comply with the Paris Climate Agreement. In addition to global climate implications, the oil and gas industry imposes significant harms on local ecosystems and coastal communities in the areas of extraction. Air, water, and noise pollution often accompany oil and gas development harming marine life and the people that depend on the ocean for sustenance.

Oil Pollution

With increased investment in fossil fuel development, oil pollution is an unavoidable outcome. In both the extraction and movement of oil, leaks, spills, and environmental disasters arise and produce devastating impacts to marine ecosystems, local communities, and regional economies. While individual, smaller slicks may go relatively unnoticed, larger spills and chronic pollution can have drastic effects and garner national and global attention.

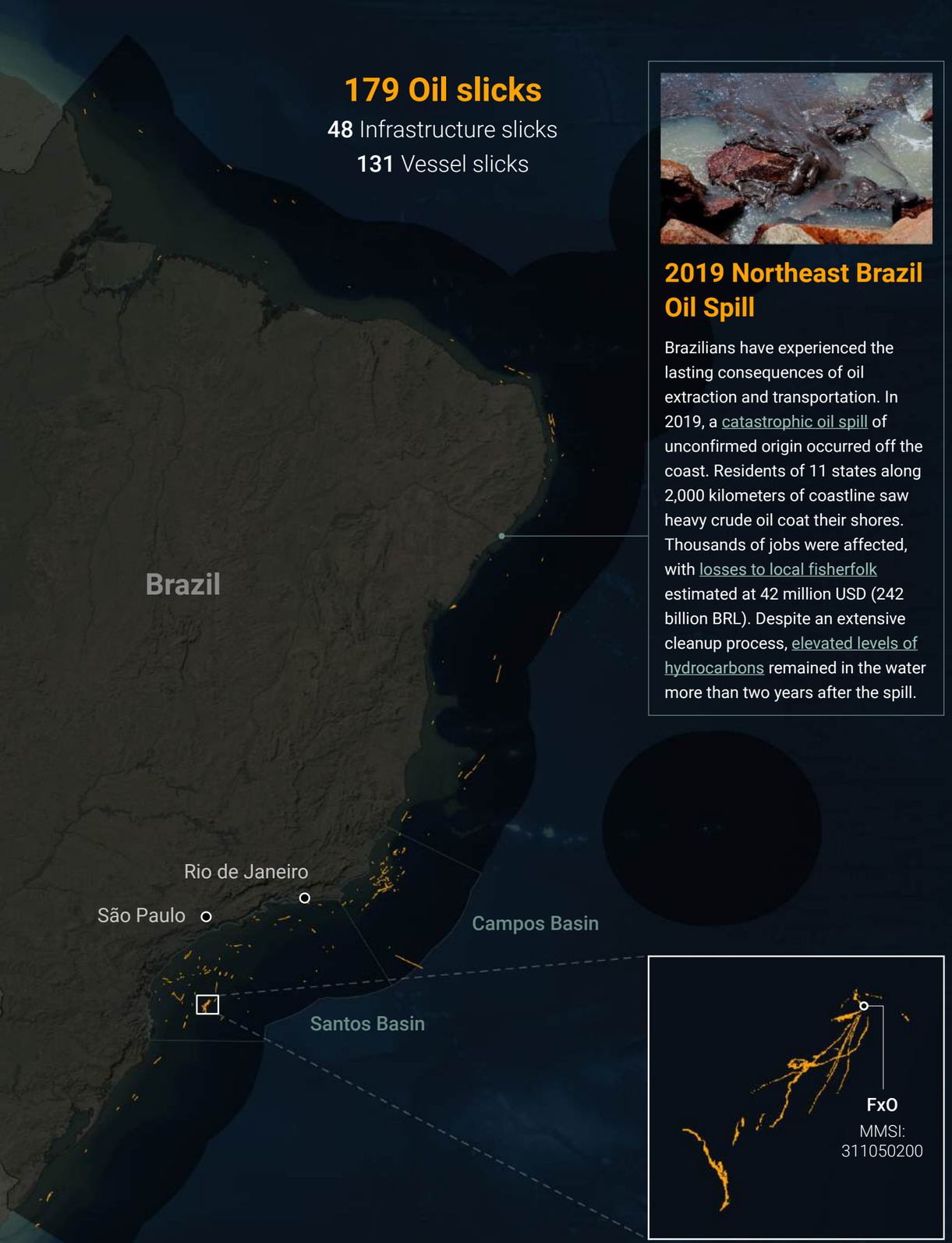
Though larger spills and infrastructure failures attract more publicity, chronic, smaller spills of oily waste by oil and gas facilities and vessels represent a significant and underreported global problem. In Brazil, scientists from the University of São Paulo have estimated that up to 28.5% of large ships traveling the South Atlantic route through Brazil's waters may discharge oily waste, with a 62% chance that the residues reach the Brazilian coastline. Chronic slicks affect water quality and nearshore ecosystems, compromising the artisanal fishing grounds that communities rely on for food and income.

In our analysis of oil slicks in the Brazilian EEZ between January 2017 and September 2025, we found a total of 179 slicks – 48 from oil and gas infrastructure, and 131 likely produced by transiting vessels.

There were 48 slicks associated with oil and gas infrastructure in Brazil's EEZ, 45 of which occurred in the Santos and Campos Basins. In these two basins, where extraction is heaviest, studies have shown concerning trends in water quality with significant impacts on marine life. Floating production and storage vessels (FxOs) have become increasingly in demand in the oil and gas industry for their economic accessibility and flexible use for offshore extraction, production, and storage of oil. Of the 48 infrastructure slicks, a single FxO (MMSI: 311050200) in the Santos Basin was responsible for 9, demonstrating the capacity of one floating vessel to repeatedly pollute the local environment.

Of the 131 oil slicks produced by vessels, we identified likely sources for 75 of the slicks. Oil tankers and infrastructure service vessels were responsible for nearly half (47%) of the slicks with verifiable sources, followed by cargo and cruise ships. Twenty of the 75 responsible vessels were flagged to Brazil, 12 to Panama, and 8 to Malta. There were 8 repeat polluting vessels that generated 20 slicks in total; three of those vessels were Brazilian oil tankers associated with 8 slicks. Additionally, there were 32 slicks associated with vessels operating under "flags of convenience," instances in which a ship flies the flag of a country with notoriously lax enforcement of antipollution and other laws. Three vessels were not broadcasting Automatic Identification System (AIS) signals as required by international law at the time they produced a slick.

Opposite page image credit: Marcos Rodrigues/Government of Sergipe



2019 Northeast Brazil Oil Spill

Brazilians have experienced the lasting consequences of oil extraction and transportation. In 2019, a catastrophic oil spill of unconfirmed origin occurred off the coast. Residents of 11 states along 2,000 kilometers of coastline saw heavy crude oil coat their shores. Thousands of jobs were affected, with losses to local fisherfolk estimated at 42 million USD (242 billion BRL). Despite an extensive cleanup process, elevated levels of hydrocarbons remained in the water more than two years after the spill.

BRAZIL OFFSHORE FOSSIL FUEL THREATS

Vessel Traffic

Growth in oil and gas development has driven an increase in vessel traffic in Brazil's coastal waters. The oil and gas industry in Brazil depends on a fleet of more than 400 offshore support vessels operating primarily in the Campos and Santos Basins. There was an 81% increase in vessel hours in Brazil's EEZ by oil tankers and offshore support vessels between 2012 and 2023. In 2023, oil and gas vessels accounted for about a fifth of the vessel density (vessel hours per square kilometer) in the entire Brazilian EEZ, with about half of the oil and gas vessel traffic occurring in the Santos and Campos Basins.

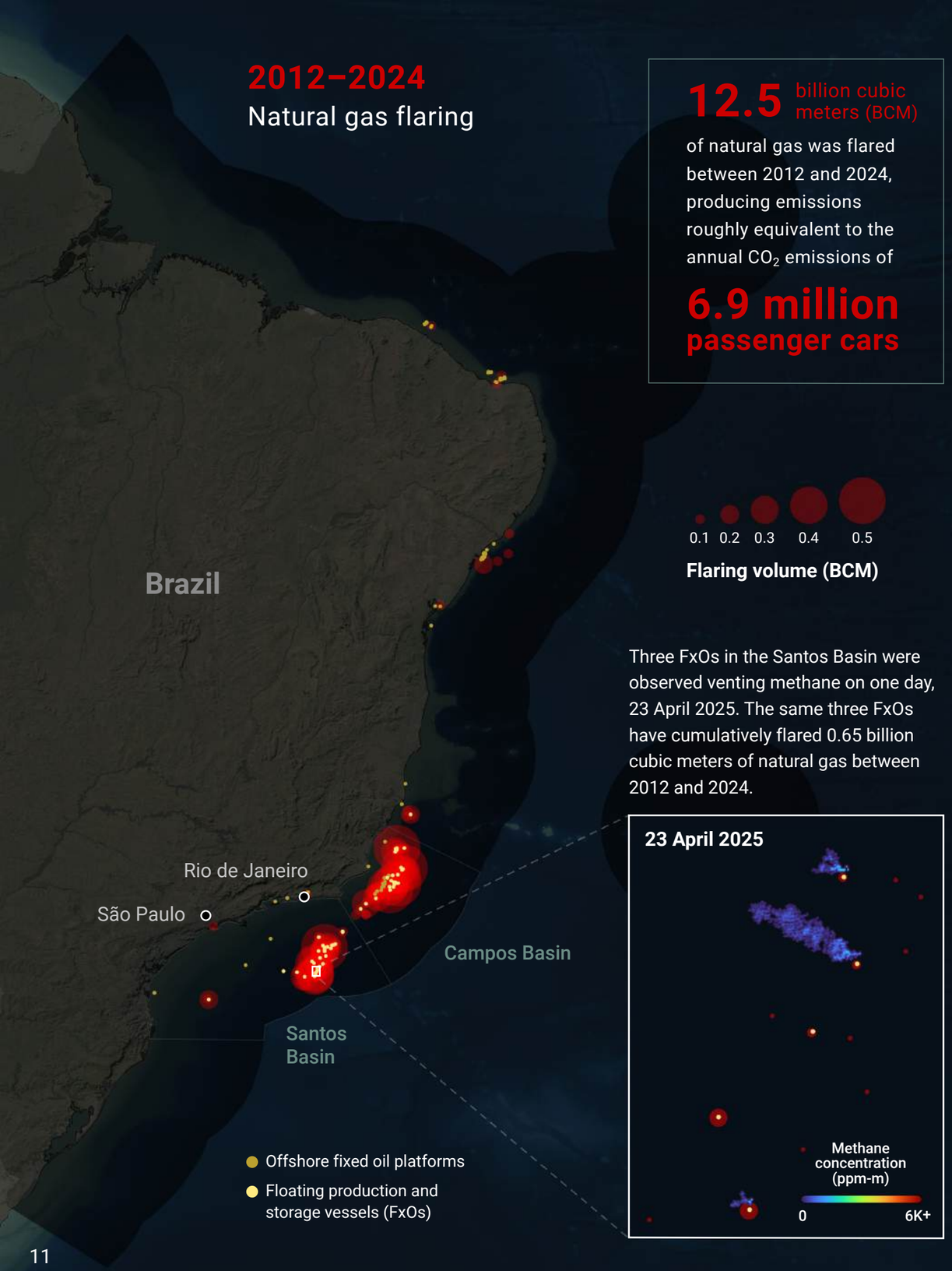
Increased ship movement around platforms contributes to chronic noise pollution, which can interfere with communication, navigation, and feeding behaviors of cetaceans, sea turtles, and other marine fauna. High vessel density also raises the risk of ship strikes on whales and other megafauna and amplifies the likelihood of oil and chemical spills, further compounding ecosystem stress.

These stressors to marine life also have downstream detrimental impacts on local communities. High-density vessel traffic can cause a decrease in fish abundance, negatively affecting fish stocks available to local fisherfolk. The movement of large vessels affects water quality through pollution and turbidity, creating cascading effects through an entire ecosystem down to the photosynthetic organisms at the base of the food web. Changes in water quality also directly influence fish productivity, resulting in monetary loss for fisheries and impacting local and regional economies. Large vessels also emit a significant amount of air pollutants, affecting local air quality which can have adverse effects on human health.

FxOs represent a growing threat, as they have been linked to chronic oil pollution and generate considerable vessel traffic for their service and maintenance. Taking a single FxO location as an example, oil tanker and support vessel density within a 50km buffer increased by over 430% after the FxO went into operation in 2018. With Brazil's continued investment in FxOs, the prospect of increased vessel traffic and chronic oil pollution poses a threat to a multitude of marine habitats in Brazil.

While the basins near the Amazon River mouth remain less trafficked presently, Petrobras and other operators looking to expand offshore development in the area increase the potential risk of vessel traffic impacts to this biodiverse environment. Development in the region may concentrate vessel activity in this critical habitat, supporting concerns that expansion in the Amazon River mouth could bring environmental pressures similar to those experienced in the Campos and Santos.

*2023 is the last full year of vessel traffic data from Global Maritime Traffic. See data sources and disclaimers section of the report for more information.



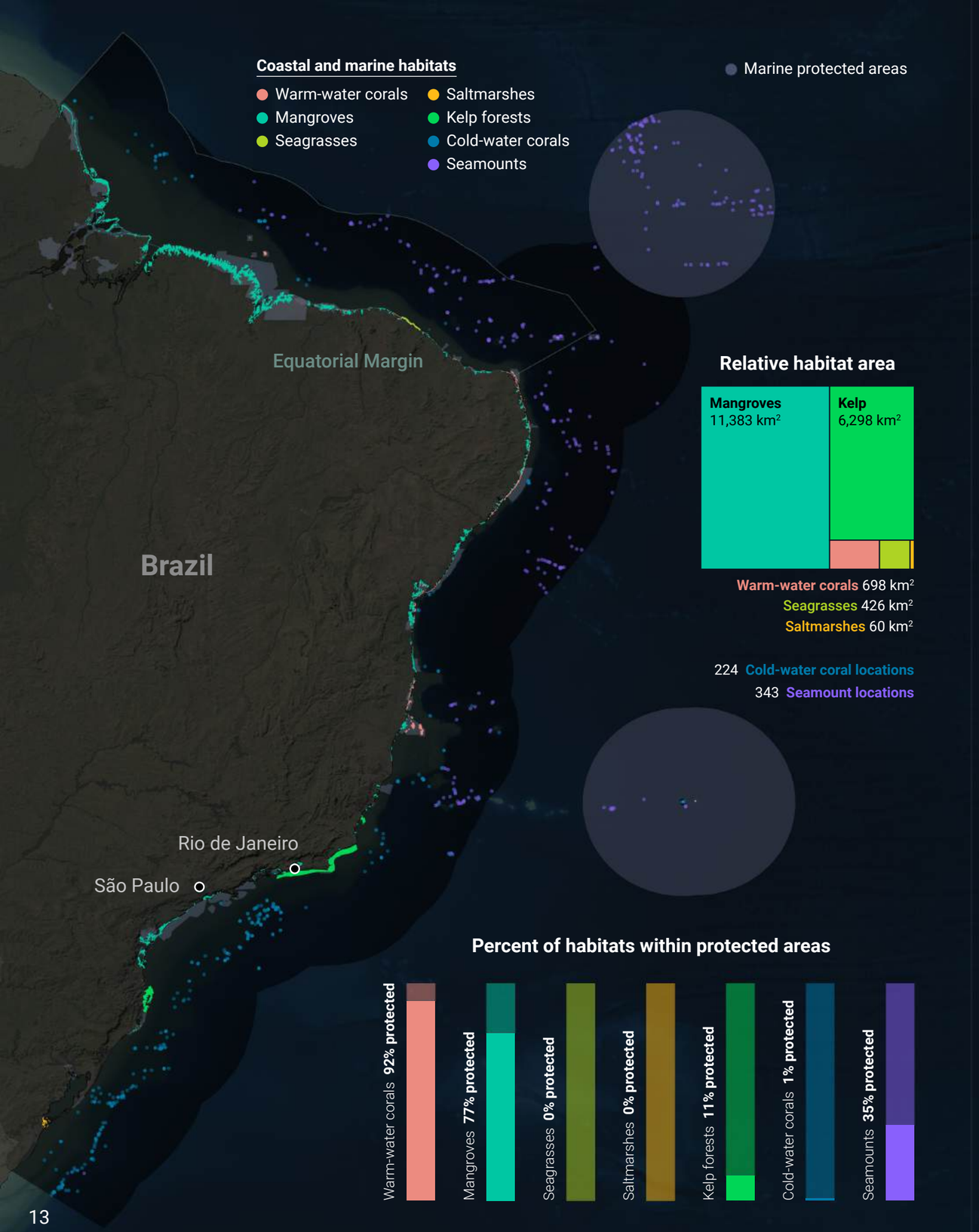
Climate Risks

By 2040, Brazil is projected to produce about 50% of the world's offshore oil, a level of production incompatible with the Paris Agreement goal of limiting global warming to 1.5°C compared to pre-industrial temperatures. Petrobras, with its plan to increase production by 20% by 2030, is in direct conflict with Brazil's stated commitment to climate neutrality by 2050. Globally failing to meet the Paris climate target increases the risk of climate-related disasters and extreme events, which have already been increasing in frequency in Brazil.

The Brazilian government plans to invest between 415–454 billion USD (2.2–2.4 trillion BRL) in oil and gas exploration and production from 2021 to 2030, effectively committing the country to decades of high-emission energy dependence. One of the risks associated with the expansion of natural gas includes more frequent and substantial methane leaks, exacerbating the climate crisis. Flaring, the controlled burning of natural gas released during oil extraction, is a major source of greenhouse gases and a waste of potential energy. While flaring is intended to reduce the direct release of methane, incomplete combustion still allows some methane to escape unburned and emits large quantities of carbon dioxide. Because methane is roughly 80 times more potent than CO_2 over a 20-year period, even small inefficiencies contribute disproportionately to global warming.

Between 2012 and 2024, oil and gas infrastructure within Brazil's EEZ flared 12.5 billion cubic meters of natural gas captured in 7,631 individual satellite observations. This equates to 31,850,000 metric tons of CO_2 equivalent, comparable to the annual emissions of 6.9 million passenger cars.* Although most major oil operators in the country committed in 2018 to reaching zero routine flaring by 2030 — including Petrobras, BP, and Shell — flaring volume from Brazil's offshore infrastructure increased between 2021 and 2024. Additionally, Carbon Mapper captured methane emissions from 3 separate pieces of infrastructure in the Santos Basin on 23 April 2025. Each of the plumes was independently large enough to be considered a super-emitter event at over 100 kg of methane per hour. The combined emission rate from these platforms was a staggering 1,473 kg of methane per hour, equivalent to the emissions of 53 cattle farms. These emissions are a persistent and underreported source of Brazil's offshore climate impact, compounding the broader consequences of Brazil's expanding offshore oil and gas infrastructure.

*The Global Warming Potential (GWP) metric expresses the climate impact of different greenhouse gases relative to CO_2. Flare volume is converted to metric tons of CO_2e following the equation: flare volume (m^3) * flare efficiency * CO_2e weight * 0.001 mt/kg, and assuming a typical flare efficiency of 0.98 (98%) and an assumed weight of CO_2e of 2.6 kg/m^3. Assumed values come from The World Bank estimates.



BRAZIL OFFSHORE FOSSIL FUEL IMPACTS

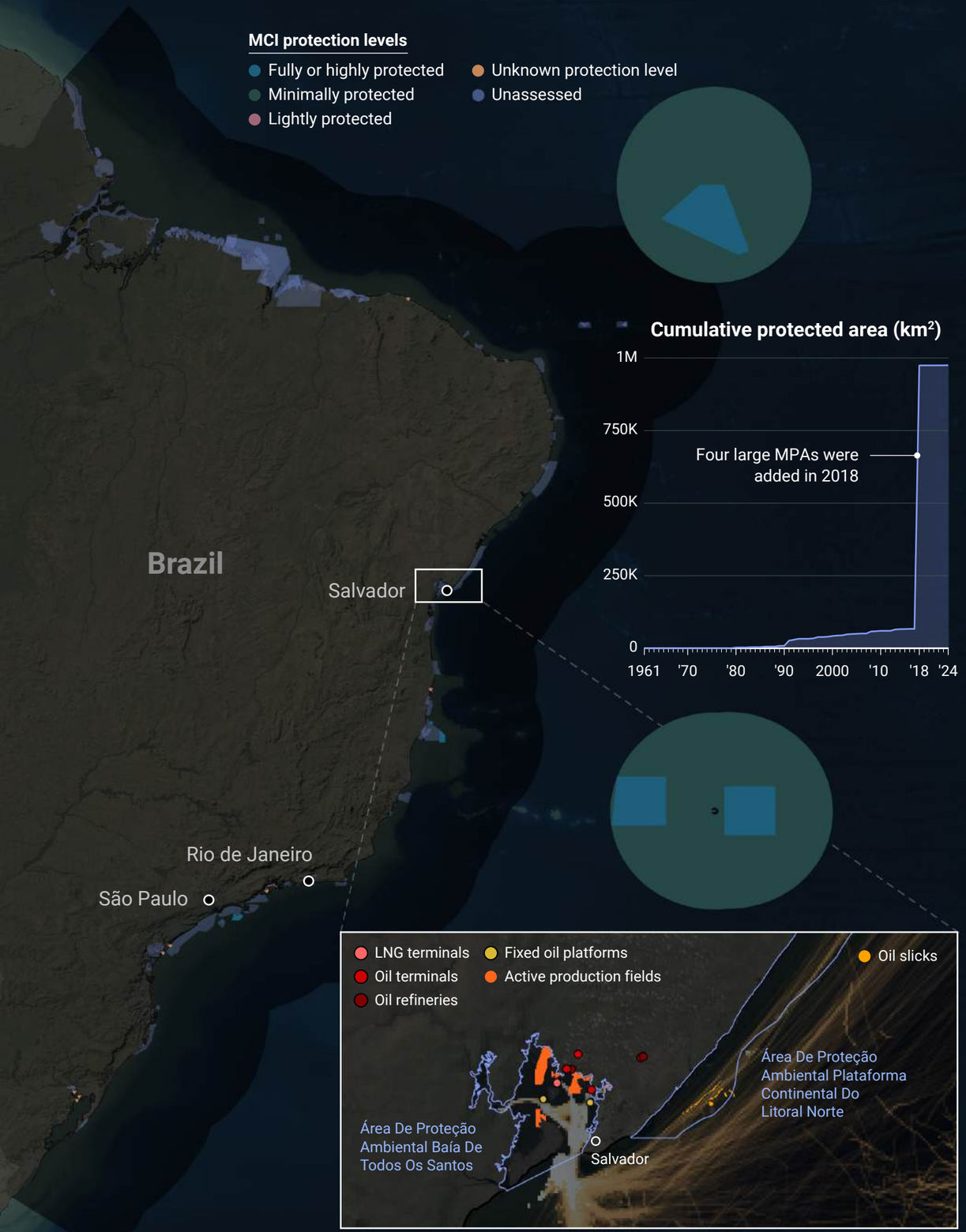
Impacts to Ecosystems and Communities

With cold water in the south and warmer water in the north, Brazil's marine region supports a wide array of species in complex, delicate ecosystems, including mangroves, estuaries, tidal flats, rhodolith beds, seagrass meadows, lagoons, and saltmarshes. Brazil's waters are also home to the only coral reef environments of the South Atlantic, distributed along 3,000 km of the northeastern coast. Many of Brazil's marine habitats are exposed to disturbance from oil and gas development and as a result are subject to deleterious impacts from oil spills, vessel traffic, and noise pollution.

Seagrasses, saltmarshes, and mangroves are recognized as vital "blue carbon" ecosystems, storing up to 71% of carbon held in ocean sediments, and are essential for coastal protection from storm surges. Mangroves in particular have been found to sequester 3 to 20 fold more carbon than terrestrial habitats of equivalent size, making them invaluable for climate change mitigation. Brazil has the largest continuous stretch of mangroves in the world at 1.3 million hectares, the majority of which occur in the Equatorial Margin. Despite providing a multitude of benefits, these habitats are threatened by anthropogenic activities.

About 36% of the area occupied by Brazil's priority conservation habitats — which include warm and cold water corals, mangroves, seagrasses, saltmarshes, and seamounts — falls into MPAs, leaving 64% vulnerable to threats. Impacts from oil and gas development on these habitats are already visible in Brazil — 12 production fields overlap with both mangrove and coral habitats. Although only 1 oil slick was seen to overlap with a kelp habitat, slicks occurring in coastal waters have been known to wash ashore, impacting coastal habitats and coating beaches. There are additionally 2 Liquefied Natural Gas (LNG) terminals situated within seagrass and kelp habitats, and countless other terminals and refineries located a short distance from key coastal habitats.

Coastal communities are dependent on marine habitats for their sustenance and livelihoods. When sensitive ecosystems are polluted or degraded, local economies take a hit. After the 2019 oil spill on the Northeast coast of Brazil, sales for all types of fish decreased by more than 50%, which had a negative impact on local income generation as well as food security. Coastal communities left to clean up oil without proper protective equipment have also experienced oil exposure. Guanabara Bay is still recovering from a crude oil spill of more than 1 million litres by Petrobras in 2000, an incident that is estimated to have affected around 12,000 fishers and cost around 18.5 million USD (100 million BRL) in damages. Studies have also shown that living near an oil or gas well increases exposure to air pollutants, resulting in adverse health effects. Affording more protection to the biodiverse habitats along Brazil's coastline would benefit both marine life and the coastal communities that depend on it.



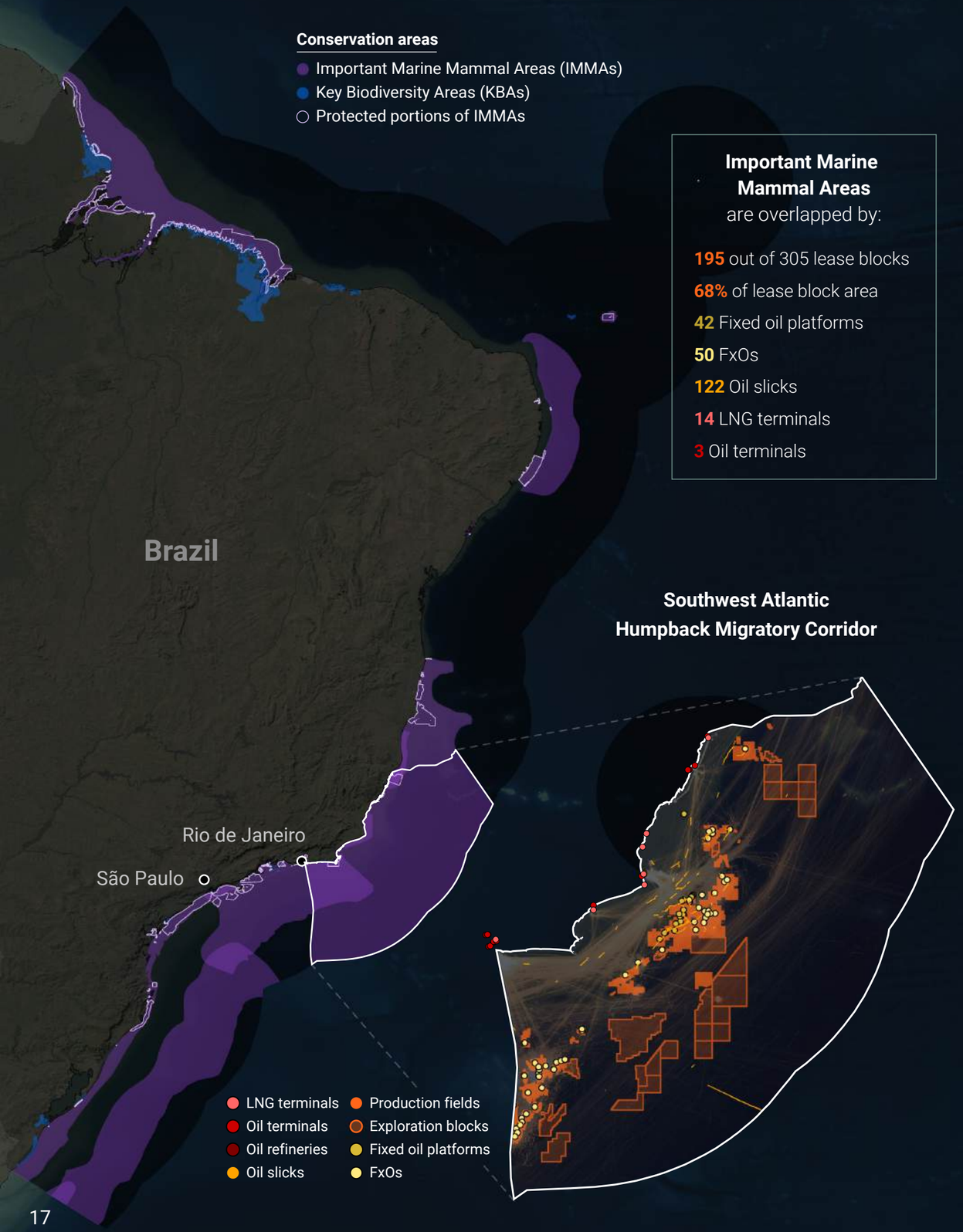
Impacts to Protected Areas

Brazil has 160 marine protected areas (MPAs), covering 981,349 km² — 26.7% of the total marine area. However, many of those protected areas were established after the start of oil and gas exploration and development in the Santos and Campos Basins on the Southern Atlantic coast of Brazil. For most of Brazil's history, only about 1.5% of its EEZ was protected. In 2018, Brazil added 4 large MPAs to rectify the deficit, bringing the percentage protected up to about 24.5%, and has since continued to add some MPAs in pursuit of its 30 by 30 commitment.

The quality of the marine protected areas in Brazil has been questioned due to the prioritization of oil and gas development since the discovery of large oil reserves in the Santos and Campos Basins. In recent years, the Marine Conservation Institute (MCI) assessed 17 of Brazil's MPAs, accounting for 92% of the area under some form of protection. Of the 981,349 km² of protected marine area, MCI found 116,474 km² (~12%) to be fully or highly protected, covering only 3.2% of Brazilian waters.

Additionally, 13 of the 160 MPAs in Brazil overlap with oil and gas infrastructure, lease blocks, or detected oil slicks, and nearly all of the MPAs have some amount of oil-related vessel traffic moving through them — a fact which contradicts their designation as environmentally protected. Transiting vessels produced 7 oil slicks that overlapped with marine protected areas; two of those vessels were flagged to Brazil. One protected area, Área De Proteção Ambiental Plataforma Continental Do Litoral Norte, had two oil slicks occur within its borders, potentially harming its fragile coral and mangrove habitats. This area falls just north of Salvador, the capital city of Bahia. As vessels leave the port at Salvador, rather than going out and around the protected area, they tend to take the shortest route up the coast and transit through protected waters. Another hard-hit MPA also appears near the city of Salvador; Área De Proteção Ambiental Baía De Todos Os Santos is heavily impacted by oil and gas vessel traffic because it overlaps with LNG terminals and multiple oil terminals, refineries, and platforms, and it is one of 6 protected areas to overlap with a lease block.

Brazil has a broad system of management for marine protected areas that can be at the federal, state, or municipal level. These complex, top-down management structures can lead to unintended consequences, including unsustainable practices, erosion of traditional management methods, and ultimately ineffective protections for marine ecosystems. Looking at the impact of the oil and gas industry on environments that have been designated as protected reveals flaws in the design and governance of Brazil's marine protected areas.



Impacts to Conservation Areas and Biodiversity

The coastal waters of Brazil support vibrant ecosystems that are home to an abundance of species of marine mammals, fish, and diverse sea life, including many endangered and critically endangered whales, sharks, and rays. Various cetaceans, manatees, turtles, and commercially important fish rely on migration corridors and coastal nurseries in the Brazilian EEZ for survival. Protection of these sites is vital to ensure healthy and productive ecosystems into the future.

Globally, researchers and environmental organizations have worked to identify locations around the world that represent the most important sites for the preservation of biodiversity, with the goal of bringing more protection to these crucial habitats. Organizations like the Marine Mammal Protected Areas task force and the Key Biodiversity Areas partnership have made marine mammal migration corridors, breeding and feeding grounds, and population-sustaining habitats more visible to policy- and decision-makers, in hopes of securing more protections for the integral environments that support the survival of many species. Important marine mammal areas (IMMAs), and key biodiversity areas (KBAs) represent sites that need to be protected to maintain the health of our ecosystems and planet.

In the Brazilian EEZ there are 20 IMMAs and 18 KBAs. IMMAs cover over a quarter (25.2%) of Brazil's EEZ; some of the largest include the Southwest Atlantic Humpback Migratory Corridor, the Southwest Atlantic Subtropical Continental Slope and Canyons System, and the Northeastern Brazil Antarctic Minke Whale Breeding Habitat. Unfortunately, only about 6% of the IMMA area falls within marine protected areas, leaving 94% of these important habitats at risk.

The threat to unprotected IMMA area becomes clear when looking at oil pollution and fossil fuel development in Brazil: 68% of oil and gas block area overlaps 7 IMMAs, and 122 of the 179 oil slicks in the Brazilian EEZ intersect 11 IMMAs. Crossing the Campos and Santos Basins, the Southwest Atlantic Humpback Migratory Corridor is particularly impacted by the oil and gas industry. Within the corridor we observed 73 oil slicks, 49 FxOs, and 20 operational oil platforms. Additionally, 7 LNG terminals and 8 oil and gas terminals operate on the coastline that runs along the migratory corridor. Being located in a hotbed of oil and gas activity, the corridor is also subjected to significant oil and gas vessel traffic, putting the migrating humpback whales at even greater risk of vessel collisions.

Image credit: Unsplash/Marcos Assis

The Future

Brazil, holding 52% of Amazonian fossil fuel projects, stands at a critical juncture regarding its ocean future. Current government energy plans and Petrobras' investment strategy indicate that offshore oil and gas will remain a cornerstone of Brazil's economy through at least 2035. If these trajectories continue, Brazil is on course to become one of the world's top offshore oil producers by 2040. This outcome is at odds with the Paris Agreement's 1.5°C target and the Kunming-Montreal biodiversity commitments made by Brazil. As the results of this report illustrate, expanding extraction in frontier regions such as the Equatorial Margin threatens to both undermine national and global climate goals, and expose biodiverse ecosystems and coastal communities to chronic pollution, escalating disaster risk.

More than 800 legislators from 96 countries — organized through Parliamentarians for a Fossil-Free Future — released a report in Brazil's National Congress calling for movement toward a fossil fuel-free Amazon. The report states that oil and gas extraction in Brazil's Amazon is linked to deforestation, ecosystem fragmentation, water and soil contamination, human rights violations, and threats to Indigenous Peoples and local communities. It also emphasizes the importance of investing in Indigenous Peoples-led socio-bioeconomies which provide cultural, ecological, and economic benefits.

Observatório do Clima (OC) emphasizes that Petrobras' current strategy risks locking Brazil into a carbon emissions trajectory inconsistent with the Paris Agreement. The coalition calls for a strategic pivot: aligning Petrobras' business plan with Brazil's climate targets by reducing the share of oil and gas in its portfolio, investing in low-carbon technologies such as biofuels and hydrogen, and ensuring that oil revenues support a just and equitable energy transition. These measures would position Petrobras as a partner in decarbonization while maintaining its stature as a source of stable employment and economic driver for Brazilians. On October 22, OC and a coalition of Brazilian environmental, Indigenous, quilombola (Afro-descendant), and fishing organizations filed a lawsuit in the Federal Court of Pará seeking to suspend Petrobras' newly authorized drilling located at the mouth of the Amazon River. The suit argues that the project's approval ignored technical and legal safeguards, failed to consult affected communities, and relied on flawed spill modeling that underestimated risks to the Great Amazon Reef System.

This report underlines how oil and gas development, chronic oil pollution, methane emissions, and vessel traffic are already imposing harmful impacts on Brazil's marine ecosystems. The results presented in this report — 179 oil slicks, significant industrial infrastructure development, major increases in vessel traffic, and oil pollution in protected areas — represent immediate threats to Brazil's coastal ecology and economy. These patterns provide a warning and an opportunity to pivot from an extractive offshore legacy toward a future where Brazil's ocean wealth is measured not just in barrels of oil, but in healthy reefs, thriving fisheries, and resilient coastal communities.

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Methane Imagery and Data © Carbon Mapper,
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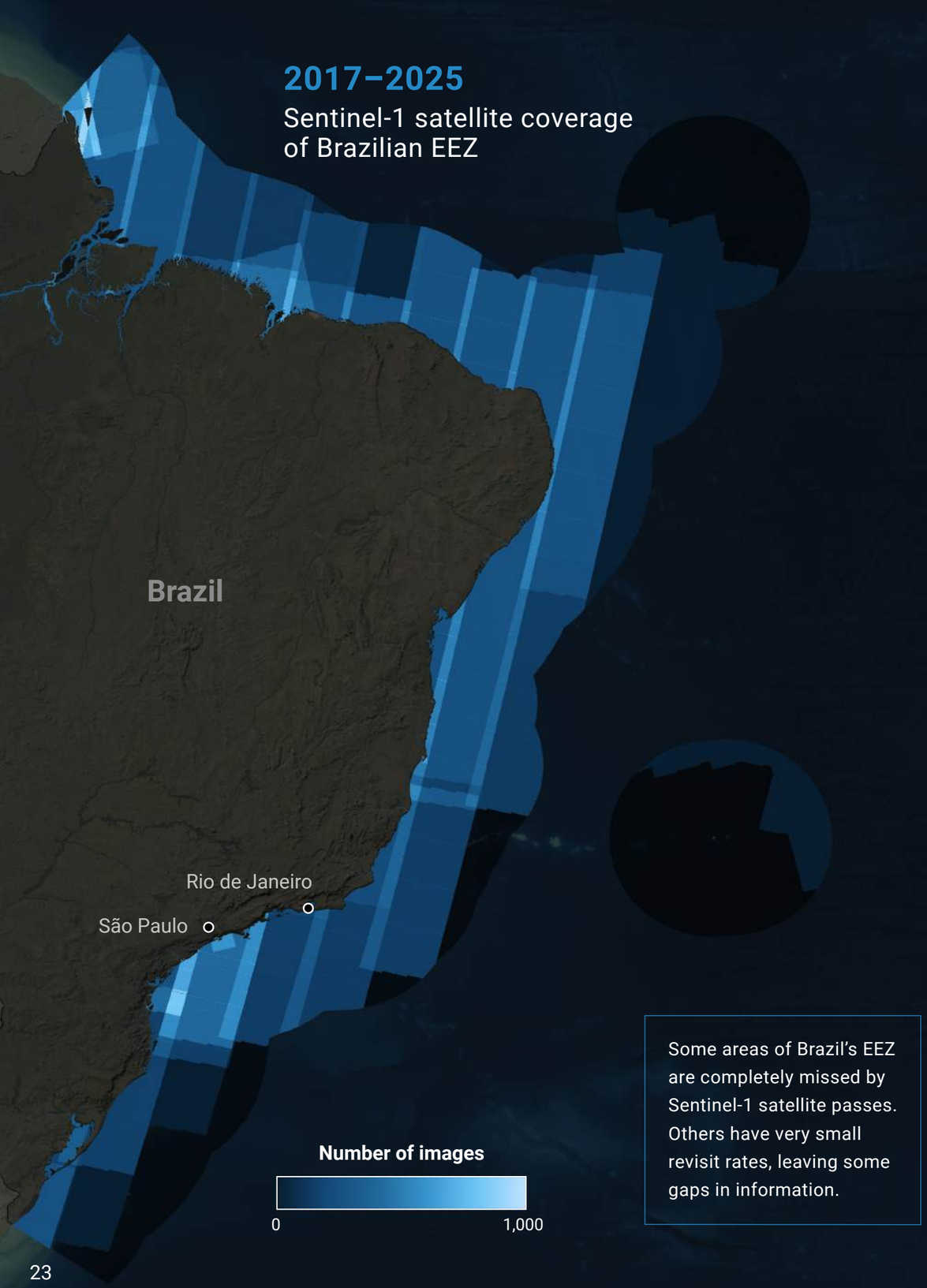

Some areas of Brazil's EEZ are completely missed by Sentinel-1 satellite passes. Others have very small revisit rates, leaving some gaps in information.

Data Disclaimer

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The geospatial analyses in this report are a good faith attempt to describe threats to Brazil's marine ecosystems using the most recently available, accurate, and precise data and methods publicly available. As such, the results of these analyses may change 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. Oil and gas block lease data is obtained from the Brazilian government's geospatial data website, and represents recent data available from that source.

SkyTruth's Cerulean tool is dependent on free radar satellite imagery from the European Space Agency's Sentinel-1 mission. Sentinel-1 provides coverage up to a few hundred to a couple thousand kilometers offshore, covering 47% of global shipping lanes and 85% of offshore oil and gas extraction activity. The revisit frequency varies by area — see the map in the Methods section for coverage of the Brazilian EEZ from 2017 to present. Even where imagery exists, the Cerulean model may not detect all slicks in a given period; therefore, the oil slick data presented in this report represents a conservative estimate of the pollution issue. Cerulean is also limited in distinguishing oil slick type: Cerulean is not able to distinguish between mineral oil and vegetable oil slicks, for example (go here to learn more about how Cerulean works). Because of these uncertainties, Cerulean cannot be used to determine whether an oil slick represents an illegal act, and we recommend that users independently verify Cerulean results before pursuing legal or other action.

Methods

Cerulean-detected oil slicks in the Brazilian EEZ from 2017/01/01 to 2025/09/30 were included in the dataset if they had a Source Collated Score of -1 or higher and a Slick-Source Match of "Weak" or above. All slicks were then reviewed by a human analyst who determined if they were anthropogenic in origin, as well as their likely source. If a single anthropogenic slick was detected in multiple parts by Cerulean, those sections were merged into one entry. This cleaned dataset is presented here. For more extensive methods on how Cerulean detects oil slicks, please visit the Cerulean methods page on the SkyTruth website.

As part of the Open Ocean Project, SkyTruth and Global Fishing Watch teamed up to map and monitor offshore oil and gas infrastructure locations globally, including creating a global map of FPSOs and FSOs (FxOs) engaged in the extraction and storage of oil and gas offshore. This dataset was used for the offshore fixed oil platform and FxO locations.

Individual tanker and service vessel density raster data was downloaded for each year from 2012 to 2023 from Global Maritime Traffic. The rasters were clipped to the Brazilian EEZ and combined to show the density of both oil-related vessel types. Vessel hours were summed by year in the Brazilian EEZ to create the data for the graph.

Conversion of flared natural gas to metric tons of CO_2-equivalent (CO_2e) followed the formula: flare volume (m^3) * flare efficiency * CO_2e weight * 0.001 mt/kg, with an assumed flare efficiency of 0.98 (98%) and a weight of CO_2e of 2.6 kg/m^3. Assumed values came from The World Bank estimates.

Habitat, IMMA and KBA areas were determined by dissolving vector polygons into single flattened layers, then calculating areas in square kilometers. Marine protected area (MPA) boundaries from WDPA (Oct 2025) were also dissolved into a single polygon; habitats, IMMAs and KBAs were then clipped by the flattened MPA boundaries to determine the protected percentages.

Brazil Offshore Fossil Fuel Threats and Impacts

November 2025