

**Opinion**

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# Oil Spill on Brazilian Coast and the Lack of Answers



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## Abstract

Recently the Brazilian coast has been suffering from contamination by crude oil. The oil has already reached the entire northeast region of Brazil and advances to part of the southeast. The source of this crude oil remains unknown yet, and to date, effective action has focused on the manual gathering of oil fragments that reach the beaches, mostly done by volunteers who are risking their lives handling the crude oil without appropriate personal protective equipment. The compounds of this crude oil are highly toxic and carcinogenic, and can cause dermatitis, acute intoxication and eventual reproductive difficulties, as well as have deleterious effects on marine organisms and compromise the entire food chain. In addition to the environmental aspects, the impacts reach the socioeconomic spheres, since there is a whole population that depends directly or indirectly on tourism, gastronomy and artisanal fisheries. This leak is the largest environmental accident in the country, where the major concern, now, is the effects that were or will be caused on the Brazilian marine and coastal ecosystems, and of course the population health. Periodic surveys and monitoring of beaches, animals and populations in the affected regions are extremely necessary actions, which need prioritization.

**Keywords:** Brazil; Oil spill; Environmental impact; Animal death; Intoxication; Scientific research; Ecological imbalance

## Introduction

Since August 30, 2019, the Brazilian coast, a region where tourism and artisanal fisheries have vital importance, has been suffering with crude oil contamination. By the end of November, the oil had reached all northeastern Brazil and part of the southeastern. The oil spill has contaminated in all, 11 states, 126 cities and 803 beaches, including 14 protected areas. The source of this crude oil (until the end of this article) remains unknown so far. One suspicion, based on satellite images analyzed by federal police, is that the oil came from a leak from the Greek oil tanker Boubolina, which was carrying 1 million barrels of crude oil originating from Venezuela, which route bypassed northeastern Brazil at the end of July with final destination in Malaysia. Another theory for the oil origin, identified by researchers at the Satellite Image Analysis and Processing Laboratory (Lapis), points to a large leak below the sea surface.

Effective actions focus on the manual gathering of oil fragments that reach the beaches, an action that so far has collected approximately 4,000 tons of contaminated waste on the beaches affected. Although the government has deployed army soldiers, marines, environmental and state officials to collect contaminated waste on the beaches, since the first stains were found volunteers

are risking their lives handling crude oil without protective gear. Health experts and government offices have issued warnings and calls to the public to avoid direct contact and exposure to the oil, but it is very difficult for those who depend on the beach for their sustenance and for those who recognize the scale of the environmental disaster; just seat and wait for effective solutions. Because of that, media worldwide shows scenes of researchers and volunteers risking themselves to contain the stain.

Crude oil is a very toxic substance, with many components harmful to the health of living organisms, such as volatile compounds and highly toxic and carcinogenic polycyclic aromatic hydrocarbons. Volatile compounds might be inhaled during oil handling without proper protection, and hydrocarbons - including toluene, xylene and benzene - may cause damage to the central nervous system. Those products that make up oil have a very rapid absorption into the body, either by epidermal contact, by airways or even by ingestion. The scientific literature presents several studies on oil exposure, and immediate effects include dermatitis and acute intoxication (headache, nausea, vomiting, difficulty breathing). On prolonged contact for example, in case of contaminated food ingestion, genotoxic damage and possible

reproductive difficulties may occur. It is worth mentioning that some volunteers sought health services presenting symptoms of intoxication during the process of oil removal from the beaches.

In addition to the toxic effects on exposed persons, there is also a deleterious effect on marine organisms directly affected by this contamination. Recent studies show that after the oil spill, coral mortality on the Brazilian coast has increased tenfold, in addition to a high drop in diversity and number of species, possibly leading to environmental decline in the region, compromising the food chain and causing a big ecological imbalance. Marine animals suffer as much with intoxication from ingestion of the substance itself and from contaminated food, as from the difficulty of locomotion caused by contact with the sticky liquid. Turtles, birds, fish and mammals have been found dead. Estuaries, nurseries of many marine species, also suffer with this spill, as they are extremely porous areas, with high absorption power of contaminants.

The impacts go beyond the negative effects on marine fauna and flora, going through the economic and social aspect, there is a whole population that depends directly or indirectly on tourism, gastronomy and artisanal fisheries. The first direct damages are those related to fishing equipment and vessels, which when in contact with oil are completely useless. Indirect damage falls on fishermen and residents who have stopped fisheries because the contaminated animals, considering that this contamination is cumulative in the food chain and can contaminate humans. Fishermen who cannot work because of the oil will receive advance insurance, which is a government benefit given to fishermen registered in the reproductive season. What the government released was an early portion of the benefit rather than an additional portion, and in some locations only lobster fishermen will receive insurance, fishermen of other affected animals will be deprived this benefit following the logic of the early release.

### Conclusion

This leak is the largest environmental accident in the country. Regardless the source of the spill, our main concerns, now, are the effects that were or will be caused on the Brazilian marine and coastal ecosystems, and of course, the population health. The

magnitude of the impact remains unknown, and considering that the oil continues to advance towards the south coast of Brazil and still reappears in the first contaminated sites, this shows us an urgent need for periodic research and monitoring of beaches, animals and populations of the affected areas. Economic and social activities should also be monitored until fishing is fully released and tourist activities restored, due to unsuitable beaches. The affected population needs logistical and psychological support, as mental illness associated with economic inactivity can also occur, such as chronic stress, anxiety and depression, psychosocial effects related to reduced paid work. The identification and analysis of all the impacts caused by this massive contamination are essential in order to support action plans to serve the population, the environment and the economy, considering that the effects must persist for an indefinite period due to the characteristics of the oil.

Until this article was finished, the navy and the government kept monitoring the beaches for new spots but considered the situation under control. Investigation about the source and responsibility follows the first suspicions but without significant progress. And there is still a lack of clear policies to serve the affected population and regarding the necessary environmental remediation. In between so many indecisions and pronouncements without scientific basis on the part of government representatives, we are living a difficult period for science in Brazil, which sometimes has cut resources and discredited studies, and sometimes has its resources recomposed, but not corrected, compromising essential research to development, growth and maintenance of the country. In this case of the oil spill, a national research funding agency linked to the ministry of education has been able to provide a public notice for research to bring about possible remedies for this event and preparations for possible future events. World science lives, today, a moment like that experienced in the Middle Ages, when beliefs without grounding in facts of any kind dominate the thinking and speech of extremists, both in the large population and in legal representatives. Disasters such as this forcefully bring about the importance of valuing and prioritizing scientific research, as it has the means to meet the needs of unbridled advances in human activity.



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