

# Deep-sea asphalt mounds found off West African coast

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Graneledone octopus.

Scientists have discovered a large area of the deep seabed strewn with mounds of asphalt off the coast of Angola, hosting rich animal life.

This is the first such discovery in the Atlantic proper or in the Southern Hemisphere, and the first time the creatures living around them have been studied in detail. It arises from a long-term collaboration between energy company BP and scientists at NERC's National Oceanography Centre (NOC).

The researchers found at least 21 kinds of deep-water creature living around the tarry structures, including octopuses, blobfish, sea stars and coral-like sea fans. 'It seems to be a very rich animal community - the asphalt provides a hard surface for them to attach themselves to, so animals like sponges can get a foothold,' says Dr Daniel Jones of NOC,

the study's lead author.

He adds that these rare habitats may turn out to be important for how animals are distributed across the ocean floor, perhaps as stepping-stones that allow species to move into new areas and enable genetic material to flow across widely-dispersed populations.

BP experts first noticed the structures while searching the seabed for signs of energy deposits with the potential for exploitation. The asphalt mounds identified cover 3.7 square kilometres and sit around 2km beneath the surface. Closer investigation with remotely-operated subs revealed more than 2,000 mounds. Some are just inches from side to side; others are hundreds of metres across.

The BP staff alerted researchers at NOC, with whom they have a long-standing collaboration. The scientists examined the geological data and the images from BP's robots in an effort to understand the variety of living things around these structures, and their wider importance for marine biodiversity.



Blobfish on asphalt mound.

'This work is a real example of the benefits of [collaboration](#) between NERC scientists and industry,' says Jones, noting that experts at BP and its contractor Fugro joined NOC staff in writing the paper. 'We get access to BP's high-quality data, while BP gets information that can support its efforts to improve the environmental management of its operations.'

The mounds form when heavy, tarry hydrocarbons ooze up from beneath the sea floor and harden into asphalt much like the stuff that's used to surface roads. Only a handful of other examples are known, and those only since 2004, when a much larger 'tar volcano' came to light in the Gulf of Mexico. They are related to cold seeps - best known as places on the seabed where lighter hydrocarbons like methane leak into the water - in fact, both kinds of undersea fluid flow are found at the Angola site, leading the scientists to suspect that different parts of the same flow of hydrocarbons are somehow being separated on the journey up to the seafloor, with the lighter part emerging as a cold seep and the heavier forming asphalt mounds.



Brisingid sea star on asphalt mound.

'With modern high-resolution mapping technology, it's getting much easier to spot these structures, so it's very likely we'll find more, but they're certainly not common,' says Jones. 'At the moment we have limited information about the ecological role they play, but they obviously support a broad community of organisms and it'd seem sensible to manage them carefully until we know more.'

The study appears in *Deep Sea Research 1* and is open access.

**More information:** Jones, D.O.B., Walls, A., Clare, M., Fiske, M.S., Weiland, R.J., O'Brien, R., Touzel, D.F., 2014. "Asphalt mounds and associated biota on the Angolan margin." *Deep Sea Research Part I: Oceanographic Research Papers* 94, 124-136.

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