

WHAT SLICK IS THAT?

From time to time oily, frothy or jelly-like “slicks” can be seen in our coastal waters or washed up on shores along the coastline.

Natural events or human actions can cause these slicks. Whilst this Environment Note focuses on naturally occurring slicks, a brief mention is made of slicks caused by humans in order to assist in distinguishing the two.

Slicks Resulting from Human Actions

The most likely type of slick of human origin in coastal waters and along beaches is oil, or oil based product, discharged in bilge water from boats or spilled down inland stormwater drains. More rarely, an oil slick might be caused by a shipping accident or accident at an offshore oil well.

To date the occurrence of oil slicks in Territory waters has been rare, due partly to the low level of shipping and mining activities. While the amount of activity and therefore the risk of oil spills is increasing, cooperation between relevant groups has resulted in the development of oil spill prevention and contingency plans for those areas most at risk. These plans have been prepared for Darwin Harbour (see NT Oil Spill Contingency Plan), and for the offshore oil exploration industry in the Timor Sea and Territory coastal waters.

Oil slicks are relatively easy to distinguish. Depending on the type and amount of oil and the period of time the oil has been floating on the water, the slick may be a filmy brown or rainbow coloured sheen, it may be thick and frothy or sticky, or may have broken up into tan coloured balls. There is almost always an oily smell and feel to an oil slick.

Slicks Which Occur Naturally

A more likely cause of slicks in Territory waters is natural. There are two main causes, the most common of which is “blooming” of certain species of algae, the other being mass spawning of corals, which is more prevalent in large reef systems such as the Great Barrier Reef.

Algal Blooms

Many species of marine algae occur as single cells or small clusters of cells which float suspended in the water column and are referred to as planktonic algae. Under certain conditions some species are able to reproduce so rapidly that the accumulation of cells form rafts or slicks on the water surface and these may be washed ashore by prevailing winds.

The conditions that produce these “blooms”, as they are commonly called, can occur as a result of a unique association of natural features including weather, temperature, and nutrients; and in some cases they may be accelerated by the introduction of plant nutrients of human origin such as from sewage effluent or fertiliser runoff.

In the Northern Territory the introduction of nutrients of human origin to the marine environment is generally insignificant and unlikely to be a cause of algal blooms. Algal blooms have been observed to occur, however, on an almost yearly basis and in a variety of localities around the coast.

Research has shown that the algae most commonly involved in these blooms are filamentous blue-green algae of the genus *Trichodesmium*. It appears that in global terms, the Timor and Arafura Seas are a “hot spot” for blooms of these algae, which are the subject of intensive research by the Australian Institute of Marine Science (AIMS).

Trichodesmium, in common with some other blue-green algae, can use nitrogen from the atmosphere and therefore reproduce rapidly in conditions that are otherwise low in plant nutrients. During blooms, filaments of the algae aggregate together in rafts that float to the surface, where they may be seen in long windrows of between a metre to many kilometres in length. Blooms covering up to 52 000km² have been recorded off the Western Australian coast!

The occurrence of these blooms appears to be under some seasonal/climate control, with research to date suggesting that a combination of low wind speed, minimal cloud cover and warm ambient water temperatures contribute to the phenomenon. They are most commonly observed in Top End waters during the September to November transition season. Blooms of some *Trichodesmium* algae produce quite strong poisons (neurotoxins) which can kill other organisms. Large blooms may also have adverse effects on other marine life by lowering oxygen concentrations in surface waters and clogging breathing structures such as fish gills. On the other hand, *Trichodesmium* blooms may provide an important source of food for a variety of invertebrates and fish, which are immune to the toxins or can avoid the other adverse effects of the bloom.

The blooms are commonly known as “red tides” or “sea sawdust”, though the colour of them may vary from red to brown, green or creamy yellow. When dark in colour, and particularly when slicks wash up on beaches and begin to darken with decay, they can easily be mistaken for oil slicks. Their smell as they decay can distinguish them from oil slicks as they usually smell like rotting plant matter rather than petrol or oil, while checking a sample under a microscope will confirm the presence of algal cells rather than oil. Even without a microscope, close examination of a sample in a glass jar of water will help to decide if the material consists of algae or oil, as when gently shaken the algae easily separates into filaments.

Coral Spawn

The annual mass spawning of coral is another natural event that may produce slicks in marine waters. This remarkable event occurs at around the same time every year a few days after a full moon. Spawning is the release of eggs and sperm and is the major reproductive event in the life of a coral. Masses of eggs and sperm are released by many different coral species at the same time. All the eggs and sperm float to the surface where fertilisation takes place and larval corals called planulae are formed. After a few days these planulae settle to the bottom and attach to a suitable place, thus beginning the development of a new coral colony. When all the cells are congregated on the water surface they may form pink or white streaks or slicks. These slicks are a common sight on the Great Barrier Reef where there are extensive areas of corals, many of which spawn at the same time. Large coral reefs occur along some sections of the Northern Territory coast such as around Cobourg Peninsula. Under calm conditions spawn slicks might be observed. The usually pale colour of coral spawn slicks makes it unlikely that they would be mistaken for an oil slick.

Other Natural Slicks

Other slicks may occur naturally, which are not the result of either algal blooms or coral spawn. These may result from a variety of things, some of which will be a unique combination of conditions which are not fully understood. One such example is the frothy slicks sometimes seen around mangroves, which are probably caused by bacterial degradation of the rich organic matter in mangrove forests.

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