

What is that black stain on some of the rocks in Buzzard's Bay? What is that sheen on the water?

The April 2003 oil spill in Buzzard's Bay has raised concern about the cleanliness of local beaches and shorelines. In recent months, the public has reported dark, oily-looking stains on jetties, seawalls, and other hard shoreline surfaces. Others have reported seeing sheens on the water. The spilled oil has resulted in oil-stained rocks in some locations (generally less than 1 millimeter thick), and there may still be some small tarballs found on the shoreline especially after heavy surf, but most of the recent reports of oil are actually natural biological occurrences that resemble oil in appearance.



Blue-green algae - Large encrusting black stain-like coating on rocks in the upper spray zone.

The Black Zone

Have you recently noticed a band of brownish-black stain on rocks or other hard surfaces in intertidal areas or just above the high tide line? There are several organisms that live near or on the shoreline that can create dark brown or black stains on rocks. While these areas may appear “oiled” or “oily,” they are naturally-occurring biological communities that are an important component of the coastal ecosystem. This is a common component of northern rocky shorelines often called the “black zone.”

The black zone generally occurs on stable boulders and other hard surfaces near the high tide line. This zone is hardly ever submerged by water, but may get wet from spray of crashing waves. Occasionally, the black zone may extend into the intertidal zone.

The black zone appears to be a bare rock surface, but is really a biological community composed of very tiny and slow-growing black lichens (*Verrucaria* spp.) and blue-green algae (*Calothrix* spp.). In contrast to the spilled oil, which tends to be tacky and has a petroleum odor, the lichens and algae in the black zone are slippery and generally have a marine odor or no odor at all. In addition, the organisms in the black zone often show a slight greenish tinge when scraped with a fingernail.

Other Sources of Sheen

A silvery or rainbow colored sheen on water surfaces may be related to petroleum product, but it may also be related to natural, biological sources such as the presence of iron, decomposition of organic matter, or the presence of certain bacteria. Naturally occurring sheens are typically associated with stagnant water and are often seen near wetlands, pastures, or drainage ditches. Sheens may also occur nearshore as a result of petroleum products from other sources such as marinas and boat traffic, or runoff from parking lots or roads.

Naturally occurring sheens tend to be silver or relatively dull in color, and break apart into small platelets when disturbed. Petroleum sheens tend to be shiny, rainbow-colored and re-coalesce when disturbed. Six months after the April 2003 release, any remaining B120 oil in the environment would tend to be highly weathered and unlikely to produce a sheen on the water.