

Module 5: Sedimentation

Topic 1 Content: The Origins of Marine Sediment Notes

The Origins of Marine Sediment

Introduction

There are five different sources for the sediments at the bottom of the ocean. Some are much more common than others. In this interactivity, use the previous and next buttons to learn about each of these different types of sediment.



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Terrigenous Sediment



Over the Earth's long history, the atmosphere has created conditions that slowly wear away at the rocks and the land that make up the continents. Rain, wind, storms, lightening, and ice are weathering factors that break down the solid rocks that rise above the ocean water. Water, air, and ice carry this broken rock down from higher elevations toward the ocean. The movement of these particles of broken rocks is called erosion. When the energy of the air, water, and ice dissipates, the particles are deposited and can end up in the ocean, where they will spend millions of years. This type of is called terrigenous sediment. Because it comes from land, this sediment is mostly located near the continents and islands. Around 15 billion metric tons of this type of sediment reaches the oceans each year.

Image: The brown cloud-like structures are sediments deposited in the Gulf of Mexico by the Mississippi River. Millions of tons of topsoil, rock, and other sediments are transported by the river every year into the Gulf.

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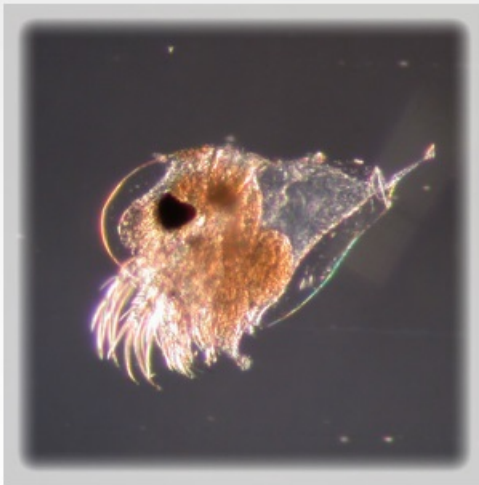
Image: The brown cloud-like structures are sediments deposited in the Gulf of Mexico by the Mississippi River. Millions of tons of topsoil, rock, and other sediments are transported by the river every year into the Gulf.

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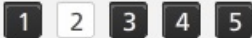
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Biogenous Sediment



Sediments can come from living things, like the small calcium shells of sea creatures, and the skeletons of fish, whales, or other ocean travelers. Another large source of these sediments is from tiny animals: plankton which contain silica. When plankton die, they break down and their silica becomes sediment. Sediment that comes from living things is called biogenous sediment. This type of sediment makes up a large region of the ocean especially in the deep ocean.

Image: Species Evadne spinifera



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Cosmogenous Sediment



Imagine a giant meteor hurtling toward Earth at tremendous speeds. As it reaches the Earth's atmosphere, the meteor heats up and starts to break apart. If it is big enough, the shattered fragments will survive the descent and spread over a huge area. If any of these fall in the ocean, these fragments will eventually settle on the ocean floor and become part of the ocean sediments. Most of the time, these pieces are very small and they end up getting mixed in with other sediments. This type of sediment is called cosmogenous sediment and it is the least abundant sediment type in the ocean.

Image: A bolide, or especially bright, meteor.

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Volcanogenous Sediment



Volcanogenous sediment comes from the eruption of volcanoes. The giant clouds from underwater volcanoes contain dust that will eventually settle and become ocean sediment.

Image: Superheated molten lava from the West Mata submarine volcano



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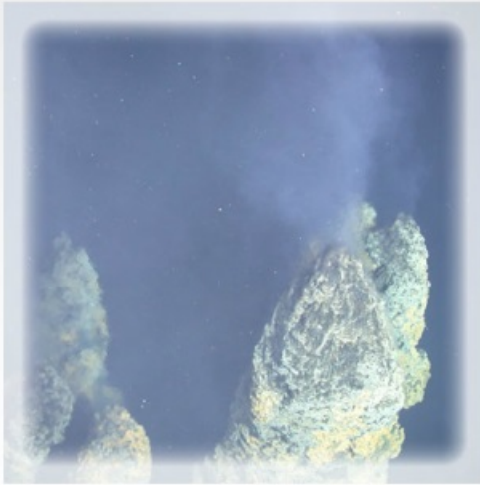
Image: Superheated molten lava from the West Mata submarine volcano

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Hydrogenous Sediment



Sediments can form from chemical reactions taking place near the seafloor. Most of these types of sediments form when particles are precipitated out of solution. This means that the chemical reaction creates a solid particle when the elements come in contact with the sea water. These types of sediments are called hydrogenous sediments.

Two examples of the types of chemical reactions that might create chemical precipitates occur when the magma reaches the ocean at mid-ocean ridges, or where the hot chemical smoke vents out at of a hydrothermal vent. This type of sediment is very uncommon and only makes up around one percent of all ocean sediments.

Image: An active hydrothermal vent chimney spewing out hydrothermal fluids.

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