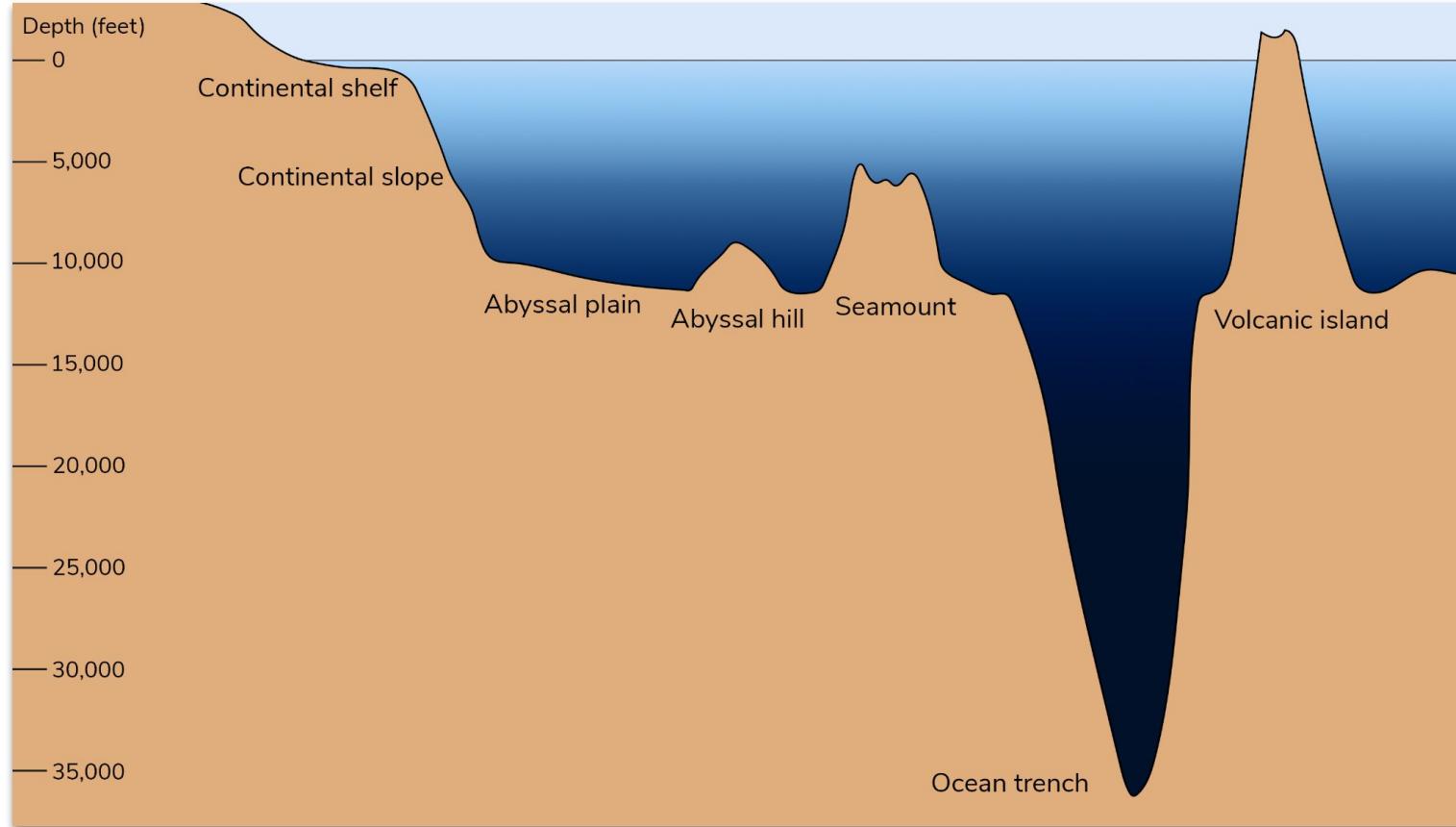

Evolution in the Deep Sea





Depth of the Ocean

Deep Sea



Agenda



Outline

Evolution at the Dawn of Life

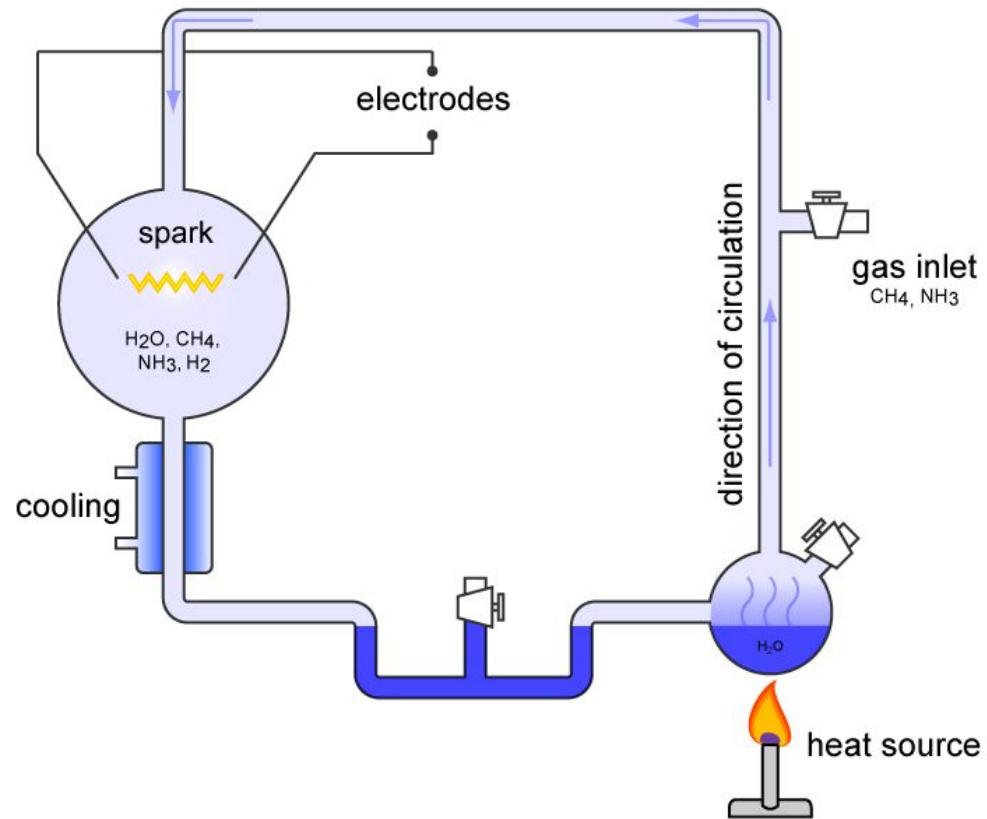
Evolution Today

Evolution Tomorrow?

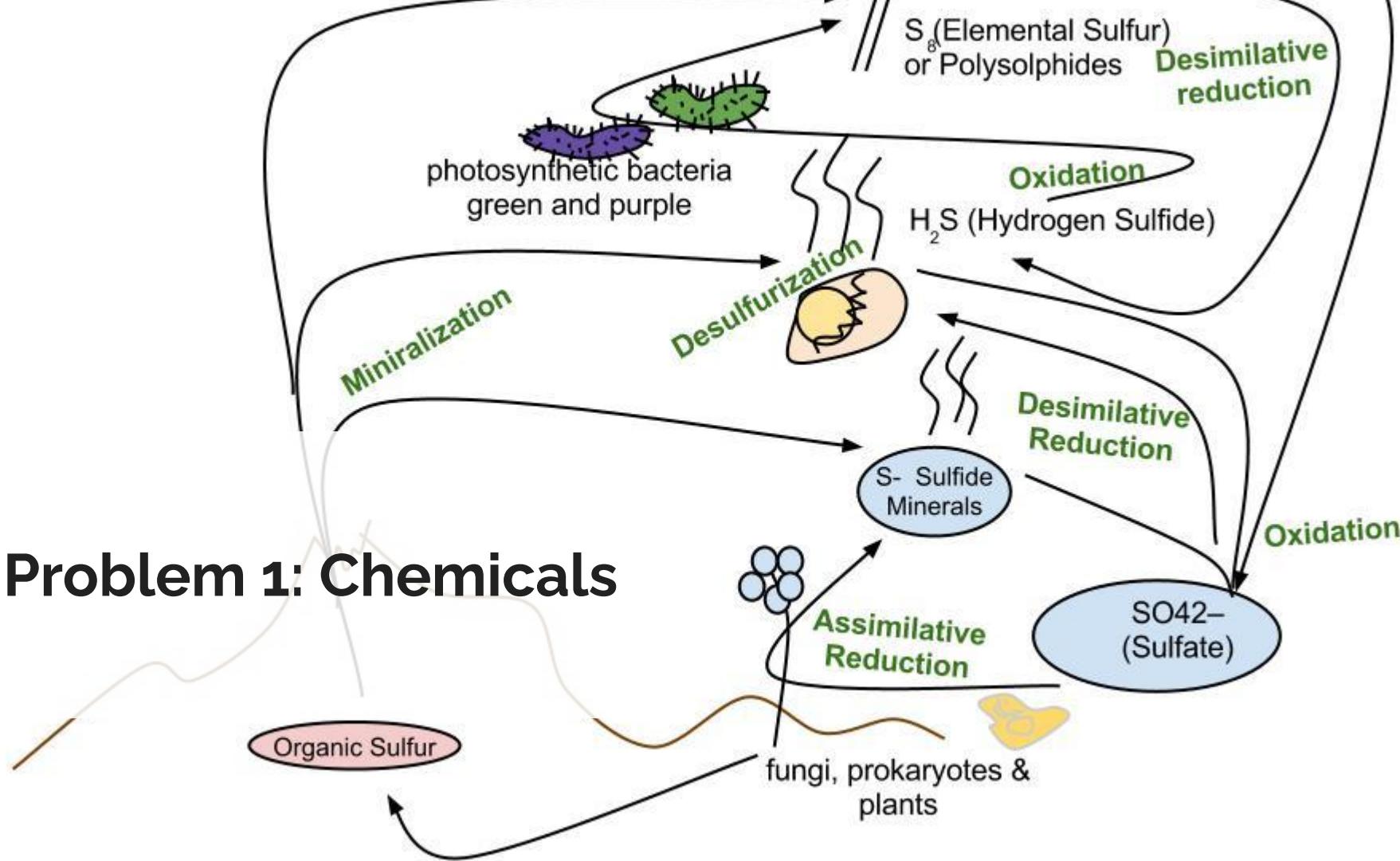
§1: The Origin of Life?



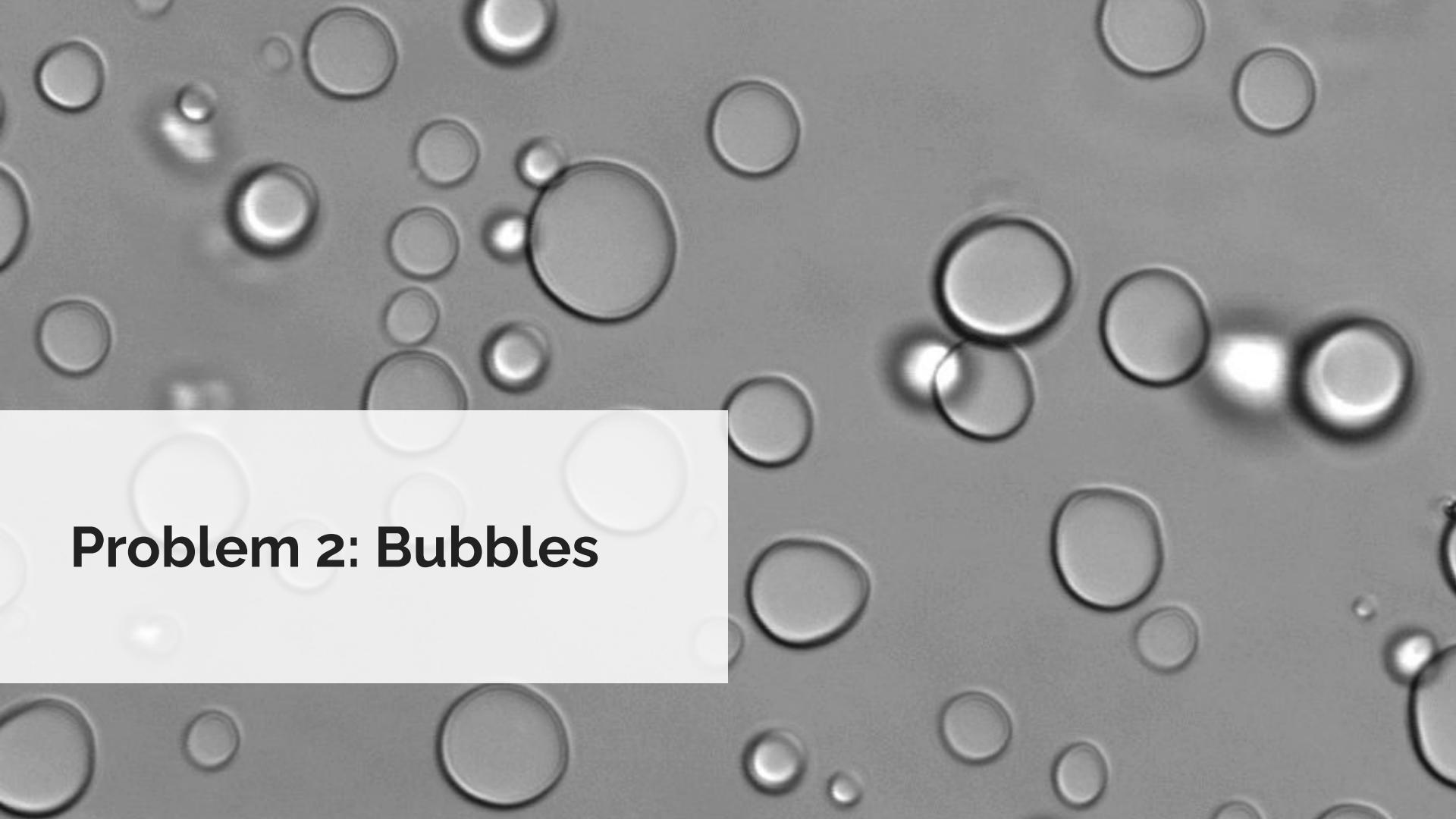
Life's Origin: The High School Version



Miller-Urey Experiment



Problem 1: Chemicals



Problem 2: Bubbles



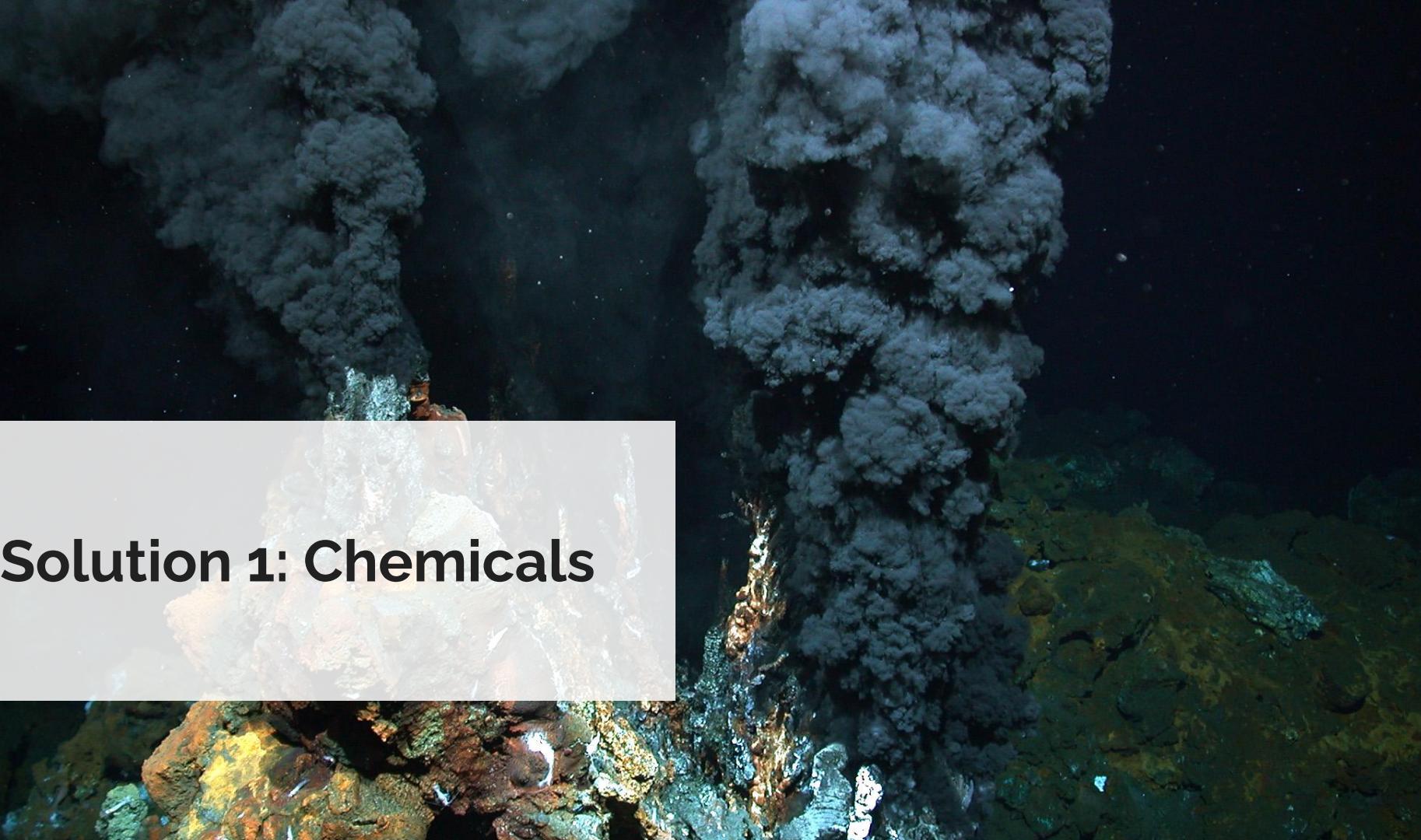
Problem 3: Energy

Life's Origin: An Alternate Hypothesis

Hydrothermal Vents



Solution 1: Chemicals

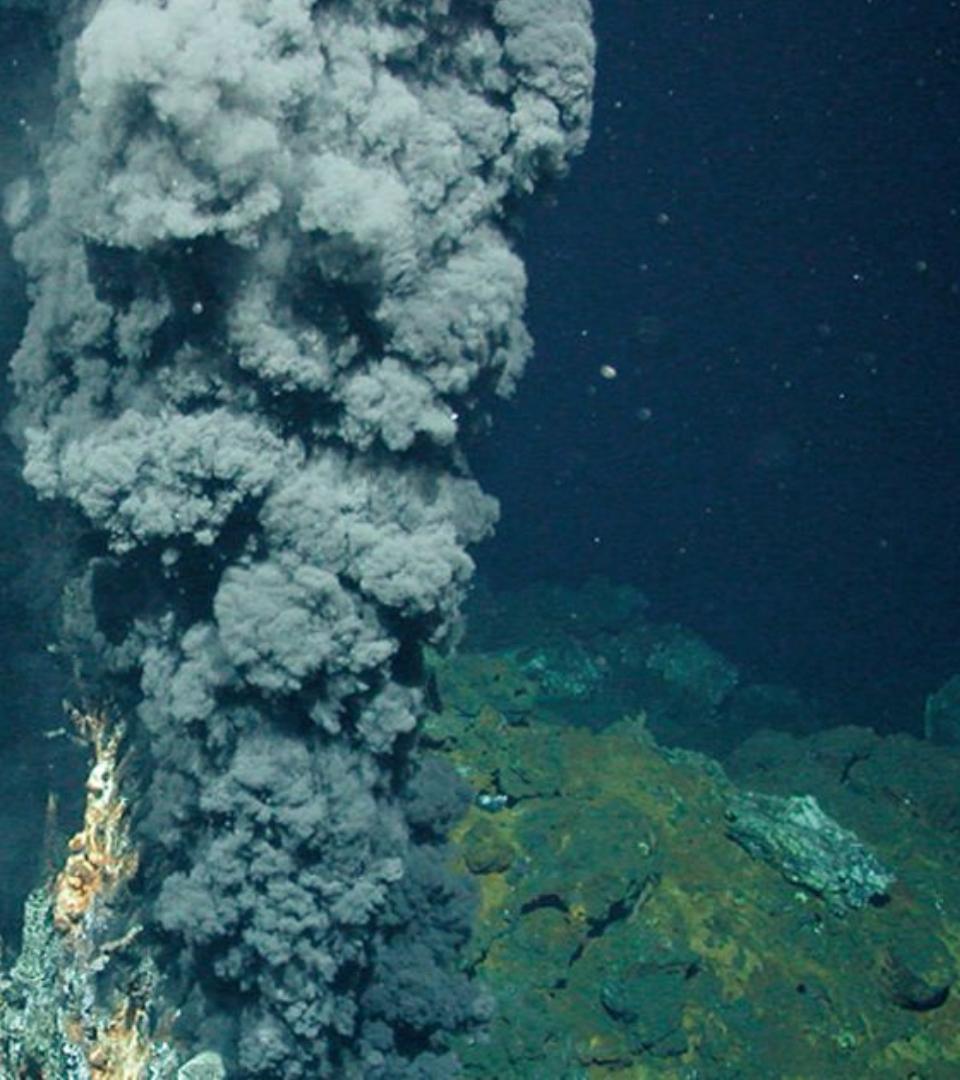


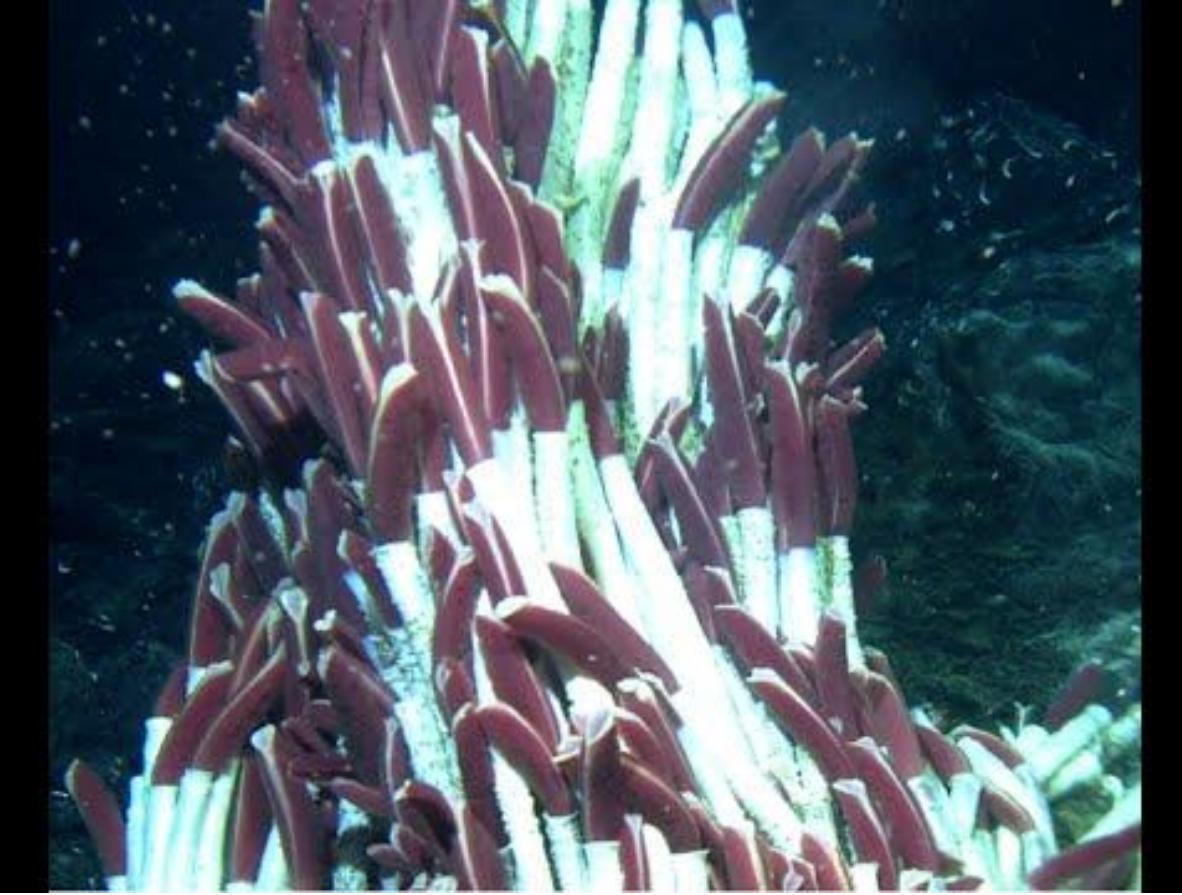


Solution 2: Bubbles



Solution 3: Energy





Hydrothermal Oasis

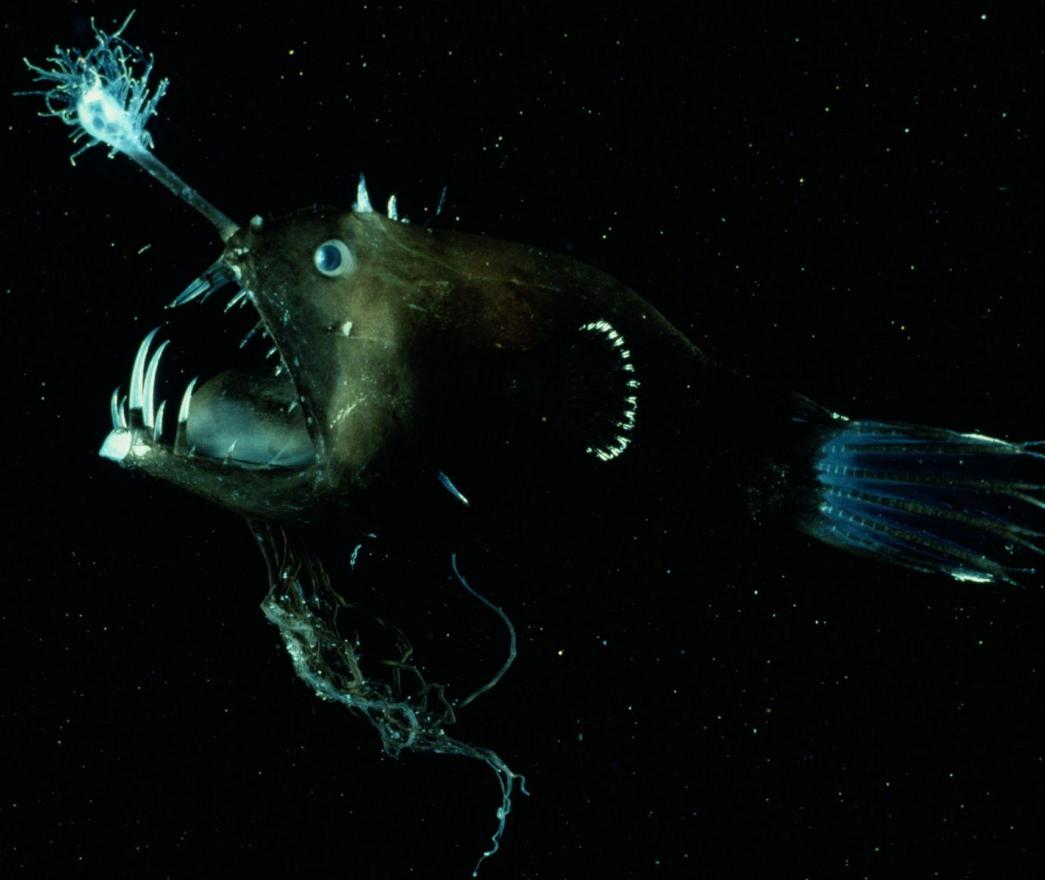
§2: Evolution Today

Too Much Pressure

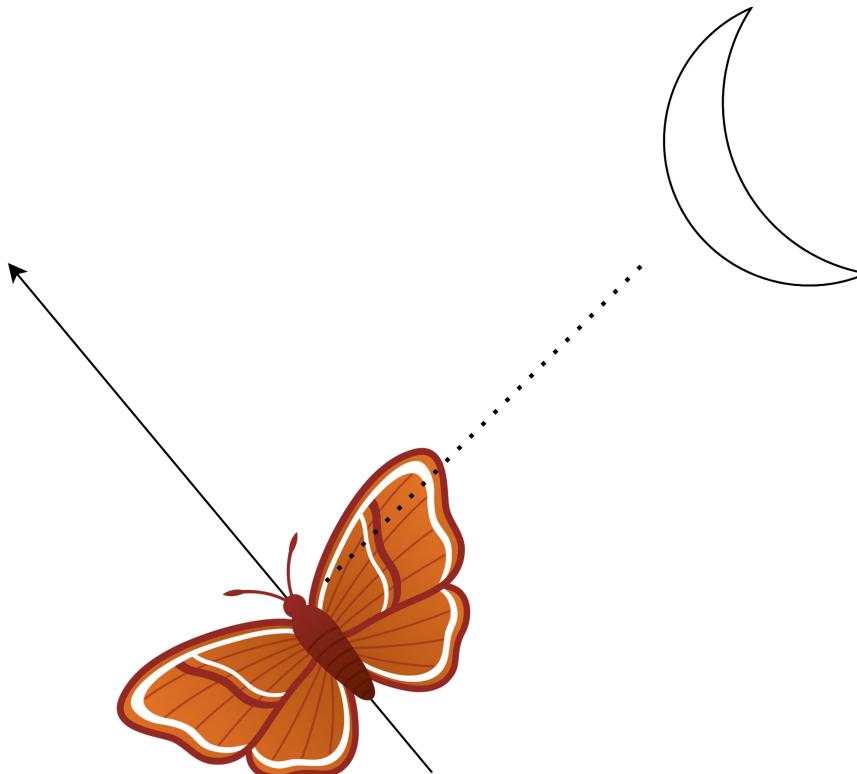


Fat Cell Liquefaction

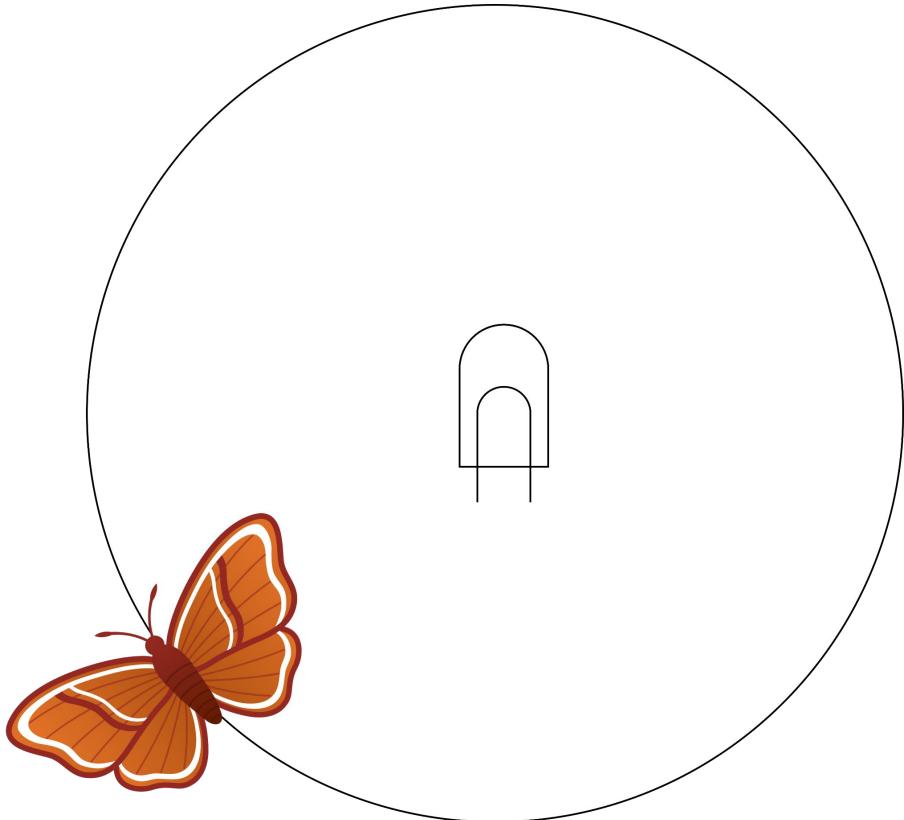
No Light



Anglerfish



Moth vs Moon



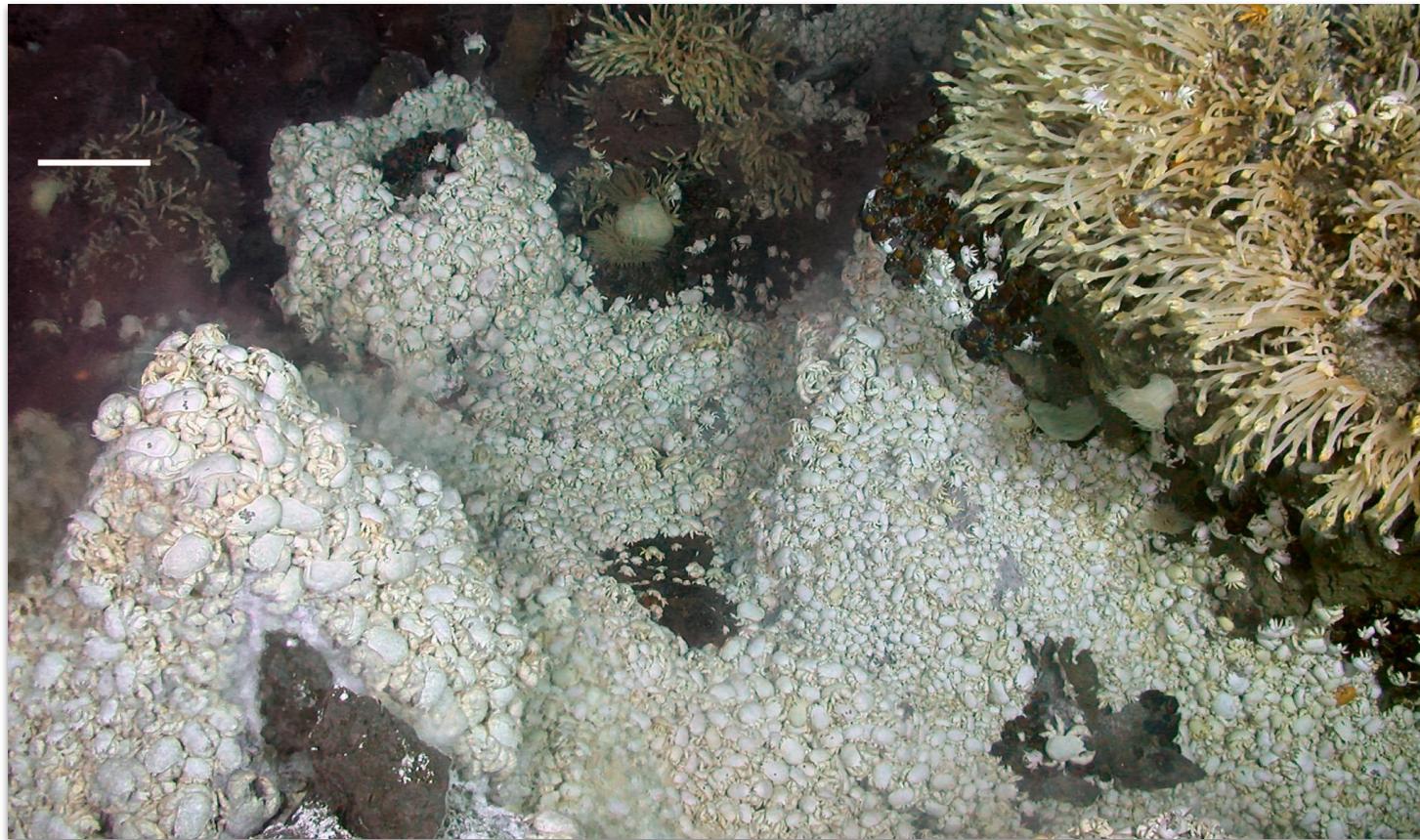
Moth vs LED



Coral Bloom



No Food



Hydrothermal Oasis

A close-up, low-angle shot of an underwater environment. In the foreground, several bright yellow, fan-shaped organisms, likely feather stars or crinoids, are visible. They have long, thin, hair-like appendages extending from their central bodies. Behind them, a large, dark, spherical object, possibly a sea urchin or a piece of debris, sits on the ocean floor. The background is filled with a dense, white, granular substance that looks like falling snow, which is actually marine snow. This snow consists of tiny particles of dead organic matter that have settled from the water column. The overall lighting is dim, typical of deep-sea photography, with some highlights on the yellow organisms and the marine snow.

Marine Snow



Whalefalls

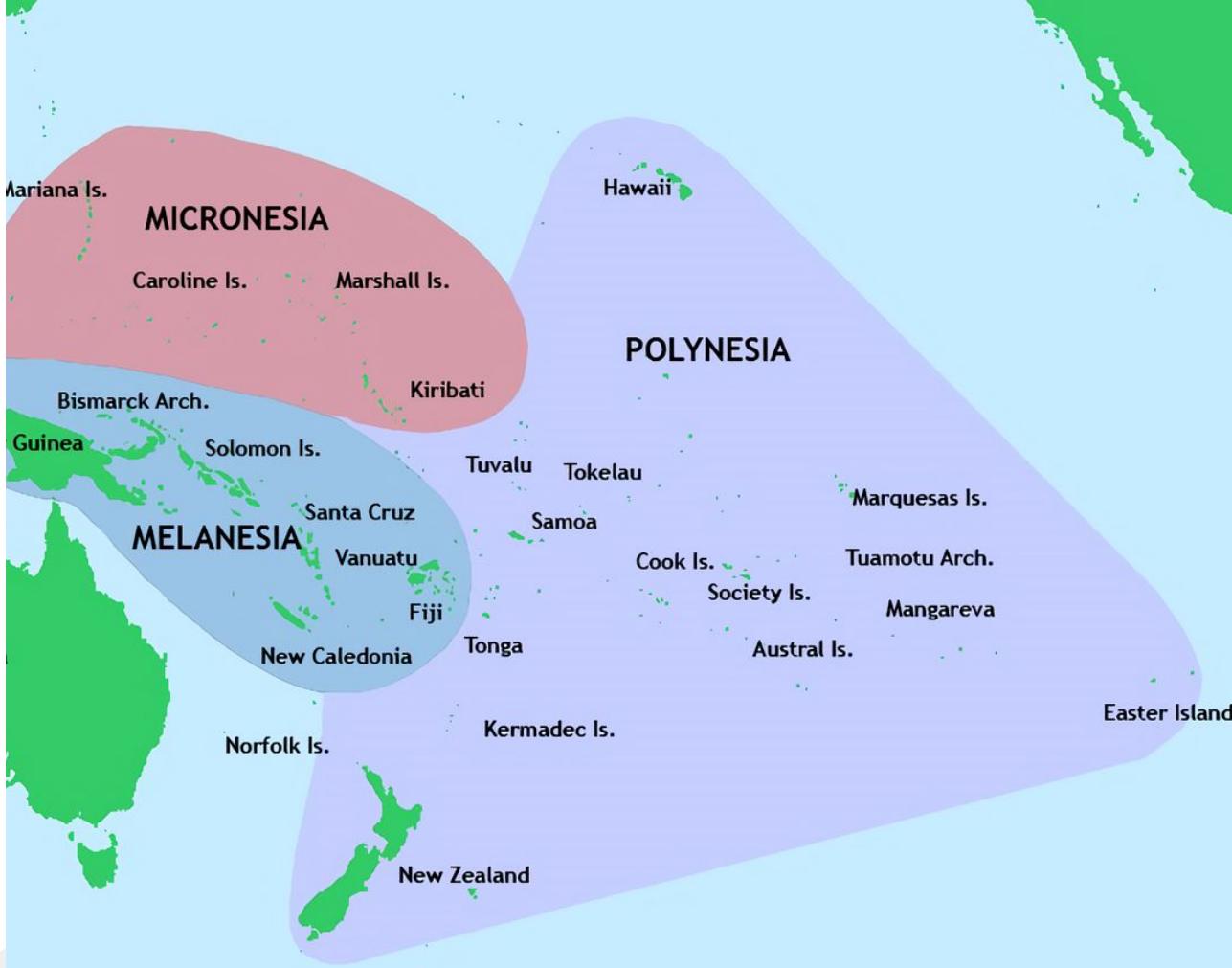
Why are they Scary?



Factors Behind Deep Sea Gigantism

1. Klieber's Rule: Larger animals are more power efficient
2. Bergman's Rule: Colder animals are Larger
3. Island Rule: Small animals grow larger on islands

Analogy: Pacific Islands



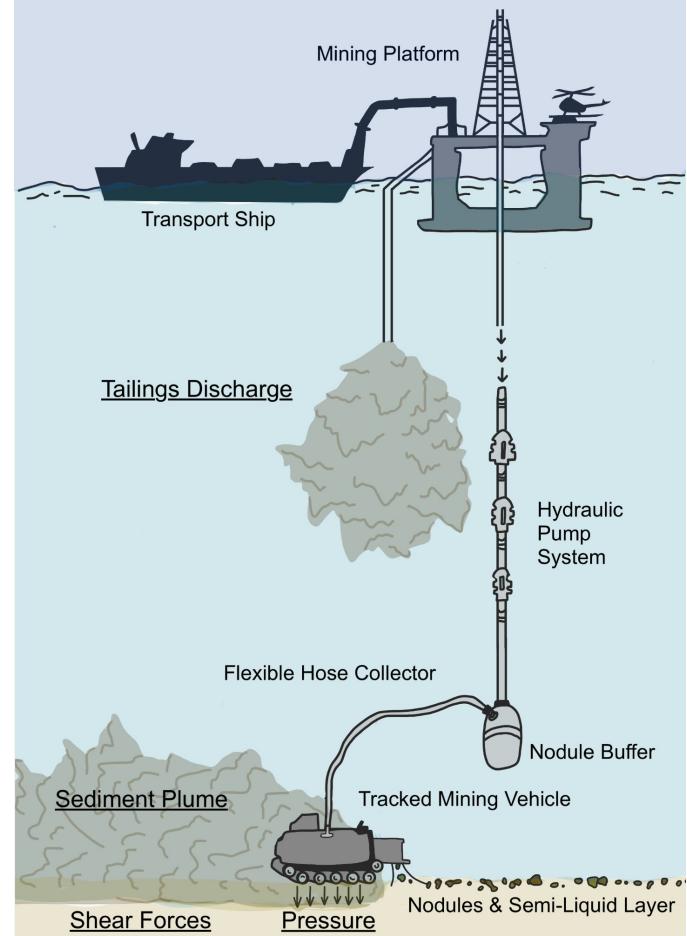




§4: Life's Last Refuge?

Deep Sea Mining

Volcanogenic Massive Sulfide (VMS) Ore





The End