



S

ediment-laden water from rivers and beach erosion moves down the steep slopes of the continental shelf, like an avalanche, or a river of sand and debris. This is called a turbidity current.

U

nderwater landslides of rock, sand, and debris carve steep sided, V-shaped fissures as they move downward, eroding the continental shelf.

B

io-erosion, one element contributing to the formation of submarine canyons, is the erosion of substrates by the activities of living organisms. Clams and worms burrow deep into canyon walls, and sediments on the canyon floor support a diverse community of invertebrates and fishes.

M

ass wasting, largely responsible for the formation of submarine canyons, can be triggered by events like earthquakes, which destabilize sediment residing on steep slopes.

A

byssal fans are formed by accumulation of sediment that is deposited at the base of the submarine canyon, flowing out onto the continental rise in a fan shape.

R

ivers often create submarine canyons at their mouths, where they reach the ocean and masses of sediment and debris are deposited onto the continental shelf.

I

ndus river, originating in the Tibetan Plateau, is Pakistan's largest river, and feeds the Indus Submarine Fan, creating the second largest body of sediment on earth- about five million cubic kilometers of material eroded from mountains.

N

umerous canyons exist on the California coast, including the largest; the Monterey Bay Canyon. It is the largest in North America, similar in size to the Grand Canyon in Arizona. The canyon's bottom is about 2 miles below sea level.

E

rosion of the seafloor by turbidity currents exposes geologically interesting and significant underlying strata in canyon walls.

A bathymetric map of the Pacific Ocean, showing the continental shelves and deep-sea canyons. The map uses a color scale from blue (deep) to yellow (shallow). Several submarine canyons are visible, extending from the continental shelves into the deep ocean.

G

urrents in the ocean, called Longshore Currents, move material like sand along beaches, in a zig-zag fashion, in one direction, eventually dumping into submarine canyons along the coast, ending the migration of that sand.

A

verage length of a submarine canyon is about 35 mi. (55 km.). The world's longest is the Bering Canyon, at 680 mi. (1100 km.) long. The shortest are the canyons off the Hawaiian Islands, at about 6 mi. (10 km.) in length.

N

arrow, steep sided undersea canyons resemble river canyons on land, with sheer rocky walls, up to 3 miles deep.

Y

ounger canyons vary greatly in their sizes and dimensions. Ancient canyons are usually considerably smaller, filled with sand, often harboring hydrocarbon reservoirs, holding oil and/or natural gas.

O

ften the mechanisms of canyon erosion, such as mass wasting, landslides, and slumping, are triggered by earthquakes, volcanism, tidal fluctuation and flooding rivers.

N

ot until the 1960's were the mechanisms and processes of the formation of submarine canyons understood.

S

ubmarine canyons at remote Pacific islands may act as oases that funnel nutrients (and other debris) to the bottom, building an abundance of life-supporting sustenance for sharks, whales, fish, and cephalopods, therefore creating "biodiversity hot-spots".

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Image: "Sediment in Monterey Canyon Flows to Depths of More Than 3,500 Meters". 2000. MBARI. *mbari.org*. Web. 11 Feb 2011.