Underwater avalanches strip California's beaches

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Underwater avalanches strip California's beaches of sand that never returns to shore, according to studies conducted at The University of California's Scripps Institution of Oceanography.

Theodore K. Chamberlain, Graduate Research Geologist, has conducted extensive surveys of the heads of the submarine canyon that lies just a few yards offshore from the La Jolla campus of The University. He has found that there is an annual pattern of sand deposition and removal.

Sand picked up along the beaches travels in currents parallel and very close to shore. When these currents reach the submarine canyon heads, the sand settles out. It accumulates for months or a year until some force sets the whole mass rolling down the bottom of the canyon.

This force can be one of several things: "Earthquakes are a known cause", Chamberlain says. "Another is the big load of sand brought in by severe storms." A contributing factor appears to be the decay of seaweeds and other organic matter trapped between layers of sand. These may "grease" the way for the sandslide.

Although he has never seen an underwater sandslide, Chamberlain believes that they must occur very rapidly. "The canyon's heads can certainly be flushed free of sand in as little as two days. I've dived into them and found the floors covered with sand. Two days later they were swept clean.

It may be only a matter of hours or minutes for the sand to start moving down the canyon to deeper water.

About 250,000 cubic yards of sand settle in the canyon heads each year-- enough to fill all the cars in a freight train eleven miles long. It comes from as far north as Newport Beach, site of the next submarine canyon to the north. Almost all of the sand carried by the longshore currents is deposited in the canyons and eventually makes its way far out to sea, where it forms a wide and thick fan on the ocean floor. This fan may be as much as three million years old, Chamberlain says.