

OUR LOCAL GEOLOGY

Stories of Motion

TECTONIC MOTION: Creating the Structure of the Region

As the Pacific and North American tectonic plates collide, they have uplifted the Olympic Mountains to the west, depressed the Puget Lowland, fueled the volcanic Cascade Range to the east, and caused the many faults and fractures that weave through the region, including the 100-mile-long southern Whidbey Island fault zone to the east of Fort Worden.



GLACIERS IN MOTION: Shaping the Region

Over the past 2 million years, at least six glacial cycles have occurred in the Puget Sound region. These southbound glaciers gouged and shoved the land they crossed and carried immense loads of rock from the north that were deposited here as the ice moved and melted. The north-south trend of most Puget Sound landforms reflects the southward paths of these ancient glaciers.

By about 17,000 years ago, the most recent ice advance had reached its maximum extent near Olympia. In our region, the ice was as much as 4,000 feet thick and its great weight pressed down the regional land surface. By about 16,000 years ago, most of the ice had melted away, leaving this region under water as sea level rose.

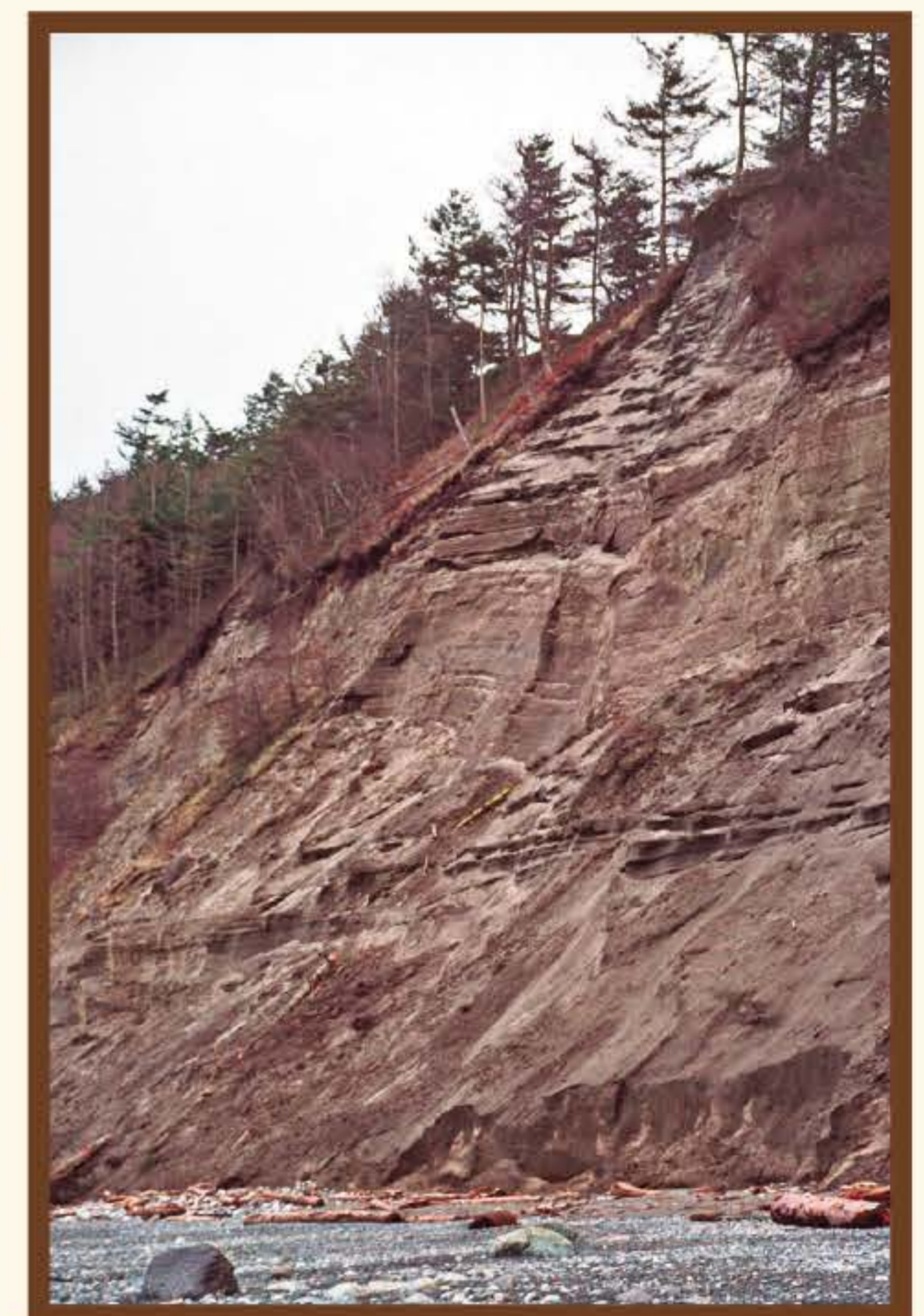
Within a few thousand years after the ice melted, the land surface had risen again to its present level. To the northeast, the flat top of Whidbey Island is the remnant of the raised sea floor and, here in the park, we can find tiny marine fossils atop Artillery Hill. Below ground, deep layers of glacial sand-and-gravel deposits create aquifers that provide water for regional wells.

BLUFFS IN MOTION: Creating the Beaches

Glacial and interglacial processes deposited layer upon layer of the material that both built and shaped the land here at Fort Worden and, indeed, the entire Puget Sound region. As this material erodes out of the bluffs, it feeds the beaches.

The lower portion of the park's Artillery Hill bluff is mostly sediment from ancient interglacial streams, whereas the upper portion includes massive glacial deposits of silt, sand, gravel and boulders deposited and compacted by ice.

The north face of the bluff is continually eroded by wind and water, and gravity brings the eroded material tumbling down to beach level. The more stable east face of the bluff is now protected from wave action by the broad beach where the campground is developed.



BEACHES IN MOTION: Creating Wonder for Us All

Fort Worden's beaches contain a tremendous variety of rocks and all—from pebbles to boulders—are gifts from the northern glaciers, brought to light as they erode out of the bluffs.

The north-facing beach is one of the most active in the state. The sand, gravel, and boulder texture of this beach changes dramatically from tide to tide and from season to season. Powerful waves and wind drive eroded material eastward, forming both a dynamic beach and the north side of the Point Wilson spit.

In contrast, the calmer east-facing beach and the south side of Point Wilson are built largely of sand that erodes from the bluff south of the park and that is moved northward by waves traveling up Puget Sound from the south. The park's pier has interrupted this movement of sediment, trapping material and forming the wide beach just south of the pier.

