

By KAREN SCHMIDT  
Sentinel correspondent

**A**N ALASKAN storm can bring 8-foot tubular waves sweeping around Lighthouse Point giving surfers pumpin' good curl on Steamer Lane. Meanwhile, the same storm may appear as mushy, 3-foot waves ambling in at Capitola Beach where toddlers play at the water's edge. While most local residents have seen the rip curl at Steamer Lane, many still wonder why the surf's up at some places and not others.

Good surfing areas aren't mystery spots, said UC Santa Cruz professor of earth sciences Gary Griggs, but rather points on the coast where wave energy becomes concentrated. Lighthouse Point, Griggs said, is a classic example of a land form that makes awesome waves form because of its unique geologic situation.

"It's a gnarly place to surf when the waves are big," said the tanned, sandy-haired Griggs, who also surfs. "It's not a place for the weak-hearted or warm-blooded." Named for the old shipping lane off Lighthouse Point, today Steamer Lane draws surfers from all over the world.

The great surf, Griggs said, originates mostly from Alaskan storm waves from the northwest that bend around Lighthouse Point. The waves directly hit the point while they're strongest — before they travel through shallow water and lose energy.

# Lighthouse Point: classic example of land form making awesome waves

Waves traveling in the open ocean slow down and lose energy when they near shore. That's because it's harder to move water when it rubs against a sandy bottom, and some of the wave energy gets lost as friction. A wave front arrives at Lighthouse Point fresh and strong, Griggs said, but appears weaker and more diffuse after passing through shallow waters to reach Capitola and New Brighton beaches.

Waves start to bend, as well as slow down, when they near the coast, Griggs said. Scientists call it "refraction." It happens because of varying underwater topography. Different parts of the wave train travel through different depths of water, which changes their speed. Waves begin refracting when the water

5-17-91  
depth is about half the distance between two wave crests. In the end, the incoming wave fronts bend to parallel the coastline.

The refraction around Lighthouse Point, Griggs said, focuses and concentrates wave energy on Steamer Lane. The Alaskan waves from the northwest hit the point and then accelerate to hug the coast as they sweep around to the west. It's like the outside man in a marching band who must speed up when the band rounds a street corner. After swinging around the point, the wave fronts bunch together and become steeper and less stable.

Waves break into tumbling foam when not enough water exists in the shallow water ahead to fill in the

crest. The top of the onrushing crest collapses forward when it becomes unsupported. This happens when the wave height is roughly  $\frac{1}{4}$  the water depth. Thus, a 3-foot wave breaks at a depth of 4 feet; a 9-foot wave breaks at a depth of 12 feet.

While the bending waves at Steamer Lane move fast, the bottom topography allows them to break gradually for long surf rides. The steepness of the bottom, Griggs said, also helps create the tubular waves surfers seek out. Tubes form when steep waves crawl up steep bottoms and break from top to bottom.

Steamer Lane may be the most famous, but Monterey Bay has other fine surf spots, too. Griggs said in addition to points, you can find good surf where bottom contours of the bay bulge up. Manresa State Beach and 26th Avenue are examples of beach breaks, he said, where an underwater bulge creates waves that give short, fast rides: good for beginning surfers.

Monterey Bay's 2-mile-deep submarine canyon also presents an unusual surf situation. "It's a unique example of what seems like a regular coast," Griggs said, "but due to bottom topography, you get something quite different." Because of its great depth, the canyon changes the speed of waves coming into Monterey Bay and concentrates their energy just north and south of Moss Landing. Some of the biggest waves around the bay, Griggs said, roll in near Fort Ord, where surfing is off limits.