

Our Ocean Backyard — *Santa Cruz Sentinel* columns by Gary Griggs, Director, Institute of Marine Sciences, UC Santa Cruz.

#79 April 23, 2011

Rogue waves



The Norwegian tanker Wilstar was hit by a large wave in 1974, which tore open the bow of the ship.

The German container ship *MS München* left Bremerhaven, Germany, on a cold day in late 1978 headed for Savannah, Georgia. On December 12, the ship, two and a half football fields long and described as unsinkable, vanished with one unintelligible distress call. All that was found in a wide search of the general area was some scattered debris and an unlaunched lifeboat that was originally secured on the deck 65 feet above the water line. Its attachment pins had been “*twisted as though hit by an extreme force*”. The best guess at the time was that the ship had been struck by a very large wave.

While seaman for many years have described huge waves or walls of water at sea, they weren't usually given much credence until recently. Encounters with such large waves have become more frequent over the past 15 years or so, however, indicating that perhaps these weren't all just sailor's exaggerations or nightmares.

In February 1995, the *Queen Elizabeth II* encountered what was described as a 95-foot wall of water in the North Atlantic. The ship's captain said it "*came out of the darkness*" and "*looked like the White Cliffs of Dover*". He was able to determine the wave's height because the crest was level with the ship's bridge. The wave broke over the bow with explosive force and smashed many of the windows and part of its forward deck. That same year, an oil platform in the North Sea with a wave gauge measured a single rogue wave with a height of 84 feet, for the first time.

Two cruise ships that take tourists across the South Atlantic to Antarctica, the *MS Bremen* and the *Caledonian Star*, collided with rogue waves nearly 100-feet high within a week of each other in early 2001. Both vessels had their bridge windows broken and the *Bremen* drifted without navigation or propulsion for two hours. The First Officer of the *Caledonian Star* stated that it was "*just like a mountain, a wall of water coming against us*".

Just four years later, in April 2005, The *Norwegian Dawn*, a cruise ship with 2500 passengers on board, encountered rough seas between the Miami and New York City, including three 70-foot high waves. Windows were smashed on the 9th and 10th decks, and 60 cabins were flooded, although damage otherwise was minor. In March 2007, Holland America's cruise ship *MS Prinsendam* was hit by a 70-foot high wave in the Antarctic part of a voyage around the tip of South America.

In the 21 years between 1981 and 2001, 124 ships over 600 feet long were reported to have sunk, often by what is usually called "severe weather". That's a ship lost every two months!

A 5-year project was initiated by the European Space Agency in 2000 to look into how common rogue waves might actually be and if they might explain the losses of these large ships. Using twin satellites that use radar to observe waves at the sea surface, scientists initially evaluated 30,000 images for a 3-week period when the *Bremen* and the *Caledonian Star* were damaged. Even though this was a brief period of time, the team of scientists identified 10 giant waves from around the world oceans that were over 80 feet in height! This came as a big surprise and provided strong evidence that large rogue waves are far more common than was previously believed.

This initial series of observations also revealed that these giant waves often occur where ordinary wind waves encounter ocean currents. The strength of the current

seems to concentrate the wave energy, much like a lens will concentrate light. These conditions normally occur far out to sea, however, so no need to worry about rogue waves attacking you on the beach.

And while we are on the subject of being on the beach, Sandy Lydon and I will be leading Bay Walk No. 3 on three successive Saturdays in May, so future columns may provide an update of these adventures ambulating completely around the shoreline of Monterey Bay. Unfortunately, these trips are completely full but there are a few spots left on a China-Tibet trip this October/November. Visit www.sandylydon.com if your interest is aroused.