

This is Ryan Aylward from the National Weather Service with a science community comment.

Many of us watched on TV recently as Hurricane Lane approached Hawaii. Though the storm brought dangerous flooding to the islands, especially the Big Island, thankfully Hurricane Lane rapidly weakened as it approached the islands, as was forecast by the Central Pacific Hurricane Center (part of the National Weather Service), resulting in less wind damage than could have occurred if it had made landfall.

Rarely do hurricanes impact the Hawaiian Islands. Hawaii's most notable hurricane and the last to directly hit the islands was Hurricane Iniki back in 1992. It made landfall on the island of Kaua'i causing in \$5.4 billion in 2017 equivalent dollars in damage and sadly resulted in 6 deaths.

More typically we hear of hurricanes impacting parts of Mexico, the Caribbean, and the United States Gulf of Mexico and Atlantic shoreline. So why do we almost never hear of tropical systems, either Tropical Storms or Hurricanes, impacting the west coast of the United States? The answer is in the ocean water temperatures.

Hurricanes need three ingredients to survive and strengthen: Light winds in the upper atmosphere, moisture laden air, and warm ocean temperatures. If one of those ingredients isn't present then forget it. A low pressure system may develop but strengthening into a tropical storm or hurricane isn't going to happen. We often get light winds aloft in the summer over California and the eastern Pacific and we all know how humid the environment is here on the west coast. So these ingredients aren't holding back tropical storms from developing in our region.

Along the west coast of the United States, the persistent North Pacific Current and California Current bring cold water south along the California coast. Water temperatures can range from near 60 degrees off the Eureka coast to 45 degrees when the north winds really crank up causing upwelling. Temperatures warm gradually as you travel farther south, but even by the time you were to reach San Diego water temperatures are typically in the 70s, only warming into the 80s until your halfway down the Baja California in Mexico.

So what is the water temperature required for a hurricane to form and strengthen? Those that study hurricanes have found it to be approximately 82F. This is why every so often a tropical storm or hurricane may approach San Diego and LA with their 70-80F water temperatures but these storms cannot move any farther north and impact San Francisco or the Eureka area.

When you think about it, we live in a pretty amazing place here in Northwest California. Yes, we have to be ready for earthquakes, tsunamis, wildfire, and river flooding; but overall we don't have to be as concerned about other major weather hazards. Flash flooding is rare, tornadoes almost never happen, and the cold ocean water temperatures protect us from hurricanes. We are definitely blessed in this regard.

This has been Ryan Aylward with a community comment.