

## Oddball Tropical Systems

### **Hurricane Damage in Southern California**

**Saturday, October 2, 1858**

[Map 30 San Diego label]

It was the only hurricane known to have a direct impact in Southern California. Reports from California newspapers of the era tell of a “terrific and violent hurricane” hitting San Diego and the southern California coast. Meteorological records imply that the eye never came ashore, but “extensive damage was done in the city” (which was not more than a town with fewer than 1000 residents). Some homes were reported to have collapsed.

A strong El Niño was believed to have been underway in 1858. Uncommonly warm nighttime temperatures had been reported that fall, perhaps because the ocean water temperature was well above normal. The effects of the Category 1 hurricane (as it passed offshore of San Diego) were felt throughout Southern California. At San Pedro boats were tossed ashore and heavy rain fell throughout the region. Parts of the Los Angeles area also reported gusty winds.

### **Tropical Storm Comes Ashore in Long Beach**

**Monday, September 25, 1939**

[Map 31 Long Beach label]

Normally, when Pacific hurricanes take a northward track they die out because the ocean water off Southern California is quite cool. During the El Niño year of 1939, the water was warm enough that a storm was able to maintain some of its strength as it moved north.

On September 25<sup>th</sup>, a 50 mph tropical storm came ashore at Long Beach, the only tropical storm or hurricane to ever make landfall in California. Rainfall ranged from about 5 inches in the Los Angeles basin to a foot in the surrounding mountains. This was the only tropical system known to have come ashore on the West Coast.

### **Alice2 Becomes a Hurricane**

**Friday, December 31, 1954**

[M Graphic 26 Alice2 Radar]

[Caption] **Radar view of Hurricane Alice taken January 1, 1955. U.S. Navy photograph.**

[Map 32 Alice2 Track]

The only January hurricane on record received the first 1955 name, Alice. Subsequent information showed that the system had developed in the northeast Caribbean on December 30<sup>th</sup>, 1954, however, and reached hurricane strength the next day. So, technically, the storm belonged on the 1954 list.

At that time, the naming system was in flux. The same list was being used each year, beginning with Alice. When *this* Alice was retroactively moved into 1954, which already had an Alice, this storm became Alice2. See page 92, Hurricane Names.

Alice2 had 80 mph winds when it passed through the northern Leeward Islands on January 3, 1955.

### **The Hattie, Simone, and Inga Trifecta**

**Tuesday, October 31, 1961**

[Map 52 Hattie etc.]

With winds at or near Category 5 strength, Hurricane Hattie came ashore just south of Belize City, the capital of what was then called British Honduras (south of Cozumel, Mexico on the Yucatan Peninsula). The city was 75% destroyed and about 275 people died. In 1970 the seat of government was moved to higher ground 50 miles further inland.

Hattie quickly died out over Central America the next day. At the same time Tropical Storm Simone was developing 175 miles to the southwest on the other side of the Sierra Madre mountains on the Guatemala coast. Many texts indicate that Simone came from the remnants of Hattie, but that does not appear to be the case as both storms were active at the same time.

Simone moved toward the north across Mexico and died out near the Gulf coast on November 3<sup>rd</sup>. A day and half later Tropical Storm Inga formed 150 miles to the north, perhaps from Simone's remnants.

It's sexy to think that all of these storms were really the same system. As I noted, it's likely not true. A full reanalysis of all of the available data will be undertaken by NOAA in the next couple of years. We'll await that work for the final word.

### **Hurricane (Cyclone) Catarina Makes Landfall in Brazil**

**Sunday, March 28, 2004**

[M Graphic 27 Catarina Satellite]

[Caption] **Hurricane Catarina as seen from the International Space Station**

[Map 33 Catarina Track]

Since the satellite era began in the mid-1960s, no hurricane had been seen in the South Atlantic until Catarina. Normally, the upper-atmosphere winds are too strong and often the water temperatures are too cool to support tropical cyclones. It's extremely rare for the atmospheric conditions to come together to allow tropical development.

On March 20, 2004, an extratropical low pressure system moved off the southern Brazil coast, and continued southeast for the next two days. On the 22<sup>nd</sup> it stalled over moderately warm water, about 77°F. The atmospheric pattern became very favorable and the storm quickly developed into a hurricane and drifted back toward land. On Sunday, March 28, 2004 the first South Atlantic hurricane on record came ashore in the Brazilian state of Santa Catarina. The strongest winds measured on land were 63 mph, but it's likely sustained winds of over 75 mph came in with the storm. At least three people died and there was widespread destruction to homes and crops.

There is no official naming system for South Atlantic tropical cyclones. This one got its name because it made landfall in Santa Catarina. Other hurricane-like storms that form south of the equator, mostly near Australia, are called cyclones, so this storm is sometimes called Cyclone Catarina.

## **Other South Atlantic Tropical Cyclones**

A strong tropical depression/weak tropical storm was seen by satellite drifting away from the coast of Africa in April 1991. And another similar system appeared in January of 2004, two months before Catarina, offshore of the central Brazil coast. It made landfall as a weak system. Then in February and March 2006 systems showed up on the satellite that appeared to be trying to organize into a tropical cyclone, but they never fully organized. The odds, of course, favor that there have been other tropical cyclones in the South Atlantic in the years before satellites. They clearly don't happen very often, however, and likely would have been dismissed as just a garden-variety bad storm if one did manage to come ashore.

### **Vince Makes Landfall in Spain**

**Tuesday, October 11, 2005**

[Map 34 Vince Track]

"If it looks like a hurricane, it probably is, despite its environment and unusual location". So said the National Hurricane Center on October 9, 2005 when it upgraded Vince to a hurricane, the farthest east of any hurricane on record. The ocean water temperature was only about 74°F, and the upper atmosphere pattern seemed only marginally favorable. But, the satellite presentation was impressive.

Vince weakened as it headed toward the Iberian Peninsula, making landfall near Huelva, Spain on October 11<sup>th</sup> as a Tropical Depression. Still, Vince is the only tropical cyclone to ever come ashore in that part of the world.

### **Delta Hits the Canary Islands**

**Monday, November 28, 2005**

[M Graphic 28 Delta Satellite]

[Caption] Tropical Storm Delta near hurricane strength November 24, 2005. Courtesy NASA.

[Map 35 Delta Track]

At the end of the excruciating hurricane season in 2005 there was another odd storm in the eastern Atlantic. Like Hurricane Vince, Delta formed from an extratropical low pressure system. As it moved over warm water it gained tropical characteristics and was designated Tropical Storm Delta on November 23<sup>rd</sup>.

The storm drifted very slowly for a few days, but then interacted with an upper-level system and was moving to the east at 30 mph by Monday the 28<sup>th</sup>. The storm had lost its tropical characteristics by that time, but still had winds of at least 65 mph when it hit the Canary Islands that evening. There was widespread damage on the islands of La Palma and Tenerife. Thousands of people had to be housed in emergency shelters. The remnants of Delta finally came ashore in Morocco.