

KATRINA AND THE PACIFIC NORTHWEST

Bob Carson – 8 September 2005

There have been many warnings of the dire plight of New Orleans and other parts of the Gulf Coast from Galveston, TX to Mobile, AL. These include John McPhee's 1989 book The Control of Nature, a 2001 "Scientific American" article titled Drowning New Orleans, and a 2004 "National Geographic" feature called Gone with the Water. My only quote is from the August 2005 (pre-Katrina) "Geotimes": "This has the potential to become the biggest environmental disaster North America has ever seen in less than a century – as most of Louisiana and much of the coast is below 3 feet above sea level, we could lose as much land as the size of Massachusetts over 100 years".

I lived in New Orleans from 1963 to 1967. I was working for Texaco and proposing oil wells in South Louisiana. Each new well required dredging another canal through the wetlands. Each boat wake caused more erosion of the wetlands. Those wetlands are the buffer between Gulf Coast hurricanes and civilization. As the oil comes out of each well, the land slowly subsides. The same is true of water wells.

I studied geology in Tulane's graduate school. We took field trips to the Mississippi River delta and to eroding barrier islands. The barrier islands are the first line of defense against tropical storms.

The modern bird-foot delta is only 500 years old. The Mississippi River has shifted 7 times in 5000 years. It wants to shift to the Atchafalaya River in SC Louisiana, but we won't let it happen, because the river would abandon New Orleans and Baton Rouge.

I spent a lot of time walking on the artificial levees, looking down at the river, only 4 feet above sea level 100 miles from the sea. On the other side of the levee, I looked farther down at the city, which is mostly well below sea level. These levees prevent most floods from depositing sediment on the flood plain. There are two serious consequences:

1. There's no mud to build the ground up as it subsides due to compaction and its own weight.
2. Subsidence and the canals allow saltwater invasion from the Gulf of Mexico. So what's left of the marshes is dying. As I said, the wetlands are the hurricane buffers.

So New Orleans is sinking while global warming complicates matters. Global warming raises sea level due both to melting glaciers and permafrost, and to thermal expansion of the oceans. Global warming puts more energy into tropical storms.

I experienced two hurricanes while I lived in New Orleans. In October 1964 Hilda, with winds of 135 mph, killed 38. Eleven months later Betsy had a storm surge of 10', caused \$1 billion damage, and caused 81 deaths. I was in the Marine Corps reserve. We were ready to help, but were not called up, perhaps because there was no looting.

Imagine the Pacific Northwest, in particular western Washington and Oregon, as follows:

- The Columbia River blocked to shipping
- Large parts of coastal communities and some cities under water
- Buildings demolished
- Polluted water from sewage, industry, and agriculture

- Severe wave damage
- Fires from ruptured gas lines and fuel tanks
- Hardly any electric power

Perhaps you are thinking: What a flood? What a storm?

Add to this:

- Landslides all over the place
- Parts of the coast and the shores of Puget Sound meters higher or lower, causing long-term shipping problems
- Most bridges, overpasses, and elevated highways collapsed
- Most runways cracked and rails distorted

Now you know that this scenario is more than a flood or a storm.

1100 years ago:

- An M9 EQ shook as the plate boundary from British Columbia to northern California simultaneously ruptured.
- A tsunami perhaps 15-m high hit the entire coast (this happened in Chile in 1960).
- Within minutes or decades, separate faults ruptured on the Olympic Peninsula (two Whitman students are doing geology senior theses there), and in Seattle, Tacoma, Olympia, and elsewhere.
- A tsunami raced north in Puget Sound, overtopping the south end of Whidbey Island.
- Giant landslides occurred in many places, including the south end of Mercer Island, probably causing a tsunami in Lake Washington.

A similar M9 earthquake occurred on our coast on 26 January 1700. We know that date from an orphan tsunami in Japan. Estimates of the recurrence interval for the year 1700 EQ range from 250 to 1300 years.

It is highly unlikely that we will have any warning before the next big west coast earthquake, whether it's in the Pacific Northwest, or on California's San Andreas Fault. We have days of warning for Gulf and East coast hurricanes.

No matter what the natural disaster, we can prepare for its aftermath. We know there will be death and destruction and pollution. We know rescue will be necessary. We know we will need food, water, shelter, hospitalization. We know that events like Katrina are not only tragedies for humans, but also devastation for ecosystems, in part because of severe pollution.

In the case of tropical storms, our inaction regarding global climate change increases the danger not only from hurricanes in this hemisphere, but also from typhoons in the Indian Ocean and cyclones in SE Asia. Carbon dioxide has no passport.

What have we learned from the 1964 AK Earthquake, 9-11-2001, the December tsunami in SE Asia, Katrina?

How much will we educate?

How much money will we spend on preparedness?

What are the relative roles of federal, state, and local governments?

What is national security?