EDITORIAL

The Ash Wednesday Storm of 1962: 25 Years Later

Each year along the Atlantic Coast about 30 to 40 winter storms generate waves large enough to erode the beaches and frontal dunes. Every hundred years or so one of these storms will be severe enough to have major impact on the barrier islands. It was such a storm in March 1962 that serves as the benchmark for many working in the field of coastal geology.

This year is the 25th anniversary of what is now called the "Ash Wednesday Storm of 1962." This March 7 brings to mind special memories, because on that day I was doing field research on the Outer Banks of North Carolina. The objective of my work was to correlate simultaneous measurements of beach changes with measurements of wave heights, currents and tides.

I had installed wave and tide gauges at the end of a fishing pier 650 feet long, and had set benchmarks at dozens of points along the beach and dunes (Figure 1). My site included a 30-foot tower erected in the frontal dunes to take time-lapse photographs of the beach and nearshore as they changed during storms.

Figure 1. Research site on Outer Banks of North Carolina before the Ash Wednesday storm of 1962.

At the end of the day on 6 March I left the research site and walked up the beach to my rented cottage in Nag's Head. The cottage I was living in was set back about 200 feet from the beach; a neighboring cottage, vacant at the time, was located closer to the beach. At 10:30 PM on the night of 6 March I remember strong winds, so strong, in fact, that they were actually vibrating my cottage.

When I got up the next morning (6:30 AM, 7 March) and looked out the window, I saw water surging across the property. The cottage located seaward was actually moving toward me with the surge and waves. In record time I packed my personal belongings and research gear into a four-wheel-drive vehicle and headed for high ground—Roanoke Island. The beach road was flooded and surges of water up to 3 feet deep were sweeping inland. The road to the causeway that spanned Albemarle Sound and linked Nag's Head with the mainland was also flooded. Most of the Nag's Head motels were boarded up for the winter, and in any event they were too close to the beach for safety. After driving a short distance on the water-covered beach road, I found a two-story motel that was open. Water was already over the first-floor thresholds by the time the proprietor came to the door.

About an hour later, at 8:15 AM, I watched from the motel's second story as the first of the Ash Wednesday Storm's high tides peaked. The storm coincided with the perigean spring tide, one of the highest of the year. Water and waves passed straight through the first floor of the motel and I could see cottages being destroyed as surges and waves topped the dunes. Some of the cottages were literally beaten to pieces by building debris that was caught in the surf-zone and swept along by the waves. The winds reached 75 miles per hour, hurricane force, and they were ripping roofs off—shingles and sheets of plywood flying everywhere.

Figure 2. Overwash deposits on the road 400 feet inland from shoreline.

By 10 AM the tide had receded enough so that I could drive down the beach to check my research site. On the way I had a good view of a fishing pier in Nag's Head collapsing into the surf. Even the low tide in the early afternoon was high; wave uprush was still running above normal high-tide levels.

The Ash Wednesday Storm had little effect on the mainland other than some near record snowfalls, but along 700 miles of the Atlantic coast it caused $300 million in damage and resulted in hundreds of injuries and many deaths.

Along the Outer Banks, much of the beach road was covered in places with up to 5 feet of beach sand (Figure 2). Overwash deposits extended 300-400 feet inland from the beach. Most of the fishing pier that I was using for my research was destroyed, and the 30-foot aluminum camera tower disappeared. The benchmarks made of 2-inch steel pipe that I had driven deep into the beach were bent and broken (Figure 3). The beach around them had eroded up to five feet and the barrier dunes at my site were eroded back more than 120 feet. Later that day I found the pier pilings that I had used to mount my wave and tide gauge 6 miles down the beach and, remarkably, its graph paper was still legible; it showed that electric power had failed just after the gauge had registered a wave measuring 18 feet in height with a 7-second period (Figure 4).

It took several days before changes to the mid-Atlantic beaches and barrier islands became apparent. Beaches were eroded back to the dune lines, and on narrow islands, such as Assateague, the vegetation behind the dunes was buried by overwash sand. Along sections of the Outer Banks, the dunes had been eroded back so far that the original sand fences that had been installed 25 years before were exposed. Roads and driveways were buried by overwash sediment, and lagoon channels were choked with sand and debris (Figure 5).

The storm of 1962 convinced nearly everyone that questionable practices had been followed in the development of the Atlantic coast beaches and barrier islands. It became apparent that man-made sand dunes could not protect beachfront development from a major storm.

Someone once said, "beach sands retain few scars to remind people of their instability." Re-

Figure 3. My research site on 8 March, 1962. Note that the benchmarks, tower and pier are mostly gone, and the waves are still high.

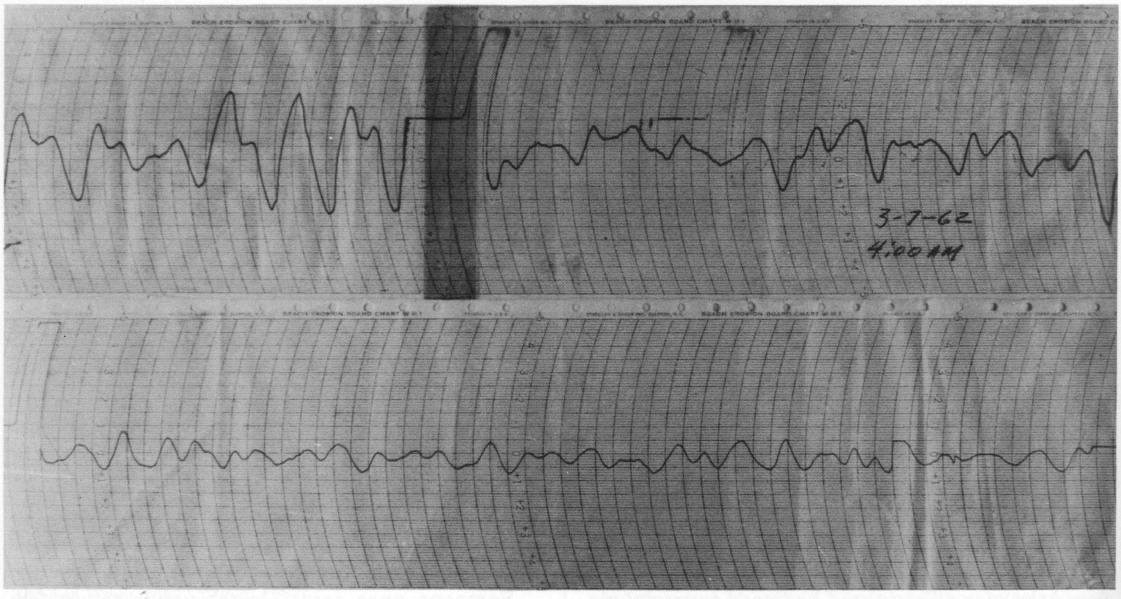

Figure 4. Wave record for 4:00 AM on 7 March, 1962, from gauge mounted on the end of a 650-foot long pier. The vertical scale is divided into 2-foot units.

Figure 5. Nag's Head area that was flooded and overwashed.

building and new development soon resumed on the barrier islands. Wherever the owner of a damaged or destroyed home decided a location was too risky, someone was eager to take over the site. The old cottages destroyed on Fire Island were replaced (Figure 6). Atlantic City rebuilt its boardwalk and piers, and within a few years new hotels, restaurants, and highrise apartment buildings appeared. In Ocean City, Maryland, the frame structures that had been washed off the beach front by the storm were replaced, in some places, with a row of condominiums.

It became clear on 7 March 1962 that understanding the natural dynamics of beaches and barrier islands is important not only from an academic standpoint, but it is also the key to recognizing and estimating both the short-term and long-term hazards of living on them. The events of 7 March, 1962, resulted in a turning point in the development of the field of coastal sciences in the United States. Soon after the Ash Wednesday Storm, increased funding became available for coastal research and there was a dramatic increase in the number of young scientists dedicated to the field. Coastal science is a well-established discipline today, and now we have our own journal. All of this progress cannot be traced back to the morning of 7 March 25 years ago, but in a way, the Ash Wednesday Storm did contribute to where we are today.

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