

Statement by
Robert M. White
Administrator
National Oceanic and Atmospheric Administration
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Mr. Chairman and members of the Committee:

I thank you for the opportunity to discuss the performance of the National Weather Service and its flood warning system during the disaster which recently struck the eastern United States.

In one tragic week Hurricane Agnes brought flooding of historic proportions -- in terms of geographical extent, duration, and numbers of rivers with record water levels. When it was over, more than 130 persons had died, according to reports, and the destruction is approaching two billion dollars.

As the Administrator of NOAA, I am charged with the supervision of the National Weather Service. From 1963 to 1965, I was Chief of that Service. As Administrator of NOAA and as a meteorologist, I am proud of the Weather Service's performance. I am confident that its warnings and forecasts saved a great many lives and a great deal of property. When Hurricane Agnes came ashore at about 3:00 p.m., June 19, at Panama City, Florida, Weather Service warnings had alerted the entire Nation to her existence, her severity, and her course.

As early as June 21, the potential for a major disaster in the North was recognized by Silvio Simplicio of New York, Director of the Weather Service's Eastern Region, who is responsible for weather and flood forecasting services in the eastern United States. He is with us today.

On that day, Mr. Simplicio gave me his assurance that he had placed the entire regional forecast system on the alert for areas where it was anticipated the storm would have a significant effect. As a result of those and subsequent preparations, advance warnings of floods--and the actual crest--were available to the public and officials in virtually every river basin in the Region.

A major effort immediately got underway. With the aid of sheriffs' offices, police departments and the Corps of Engineers, Mr. Simplicio deployed a number of key hydrologists and technicians to those points deemed most critical--places like Harrisburg, Pittsburgh, Richmond, and Rochester. In the latter case, our hydrologist was able, in cooperation with the Corps of Engineers, to plan a discharge rate from the Morris Dam on the Genesee River which prevented the flooding of Rochester and saved the dam itself.

Throughout the emergency, the Weather Service worked closely with disaster preparedness agencies, particularly the Office of Emergency Preparedness, throughout the east and with its Washington headquarters. Early on June 21, the OEP was formally advised by the Weather Service of the widespread and serious nature of the flood threat. Our staff also worked closely with the Defense Civil Preparedness Agency, formerly the Office of Civil Defense, at all levels and in a great number of communities to enlist its aid in disseminating warnings and taking local action.

Hurricanes are characterized by torrential rains. Agnes was no exception even as she changed into a tropical storm and made her way northward over the eastern part of the Nation. Her path is illustrated in the chart before you.

Because the forecast of that path was so critical to forecasting rainfall in the river basins, it is necessary to understand her very

unusual movement. Agnes moved as predicted up through the Southeastern states. Around Virginia, it intensified and gained new moisture from the ocean. The combination of new moisture and slow progress produced almost incredible rains -- at the rate of an inch an hour for as many as 12 consecutive hours. Never before had the Weather Service been faced with the threat of simultaneous flooding over such a large area and affecting so many population centers.

Over the New Jersey coast, Agnes swung out to sea, as is normal. Up until this moment the storm's path was anticipated. At this point Agnes was forecast to turn inland and she did. The storm was forecast to move north and slightly westward over New York State. We did not anticipate, however, that it would move as far inland as western Pennsylvania. Indeed, if

you will look at the chart I think you will understand that the storm was so erratic in its motion that it was unpredictable.

The second chart shows the total amount of rainfall over the Eastern United States during the six-day period from June 18-24. Over three months' of normal precipitation fell in one week. It would fill a lake the size of the District of Columbia and 2,000 feet deep.

Results of this enormous rainfall and the full extent of the disaster are shown in the third chart.

Rivers in areas colored red experienced record floods. They include such cities as Wilkes-Barre, Harrisburg, and Richmond. Rivers in yellow-colored areas suffered major -- but not record -- flooding; those in green, moderate flooding. Places where crests exceeded records are indicated by red circles.

Our warnings were instrumental in providing time to make possible the evacuation of people, and, where possible, the protection of property. One major achievement was to inform many people who were concerned that they might be in flood-threatened areas that in fact they were free from danger. In New England, where some may have anticipated severe flooding, the Weather Service correctly predicted that the area would be spared, and advised officials in time to avert needless evacuation and other expensive and disruptive protective measures.

I should like to discuss the major river basins, which suffered the most severe flooding.

Let us turn to the James River, which suffered a flood of record during Hurricane Camille in 1969. At that time in 1969, the city of Richmond suffered a major disaster. This time, as Agnes moved up the coast, it was evident that severe flooding was again in prospect. Two days before the James reached

flood stage at Richmond, the Richmond office of the National Weather Service issued extensive flood warnings for the James River Basin. The public and responsible officials were made aware that a major disaster was on the way. Virginia's Governor, Linwood Holton, publically credited advance warning with saving lives.

As the storm moved north over the Potomac Basin, extensive flooding occurred. The Monocacy, a tributary, took record water; the Potomac itself crested at levels not seen since 1936 and 1942, which made it the third largest flood of record.

The National Weather Service office serving Washington issued warnings about 24 hours in advance.

Exposure of the river basins became more acute as the storm moved north, slowed, and turned to the west. The

Susquehanna Basin, for example, suffered record floods over most of its course.

Two of the most serious situations along the Susquehanna involved the cities of Harrisburg and Wilkes-Barre. Events there dramatically illustrate the value of the warnings.

The responsibility for issuing flood warnings for many eastern river basins rests with the River Forecast Office at Harrisburg. This office did a most commendable job; the accuracy of its forecasts was remarkable.

I might add that the office was cut off by flood waters and lost all power. Nevertheless, the staff stayed on duty continuously for four days and four nights, preparing forecasts for much of the

East and receiving and communicating information by telephone.

Flood stage forecasts were issued at Harrisburg at least 24 hours ahead of the flood. The crest there was forecast at 35 feet, and verified within 2 feet of the actual crest, and timed with accuracy.

I need not point out to you what this meant to the people of Harrisburg.

In Wilkes-Barre too, warnings were out a full 24 hours before the Susquehanna reached flood stage, overtopped a 37-foot levee and caused a tremendous inundation. Somewhere between 70,000 and 100,000 persons were evacuated, thanks to those warnings.

Similar stories of evacuation based on advance warnings could be told of other communities -- for instance, Olean, New York; Sunbury, Pennsylvania; and Roanoke, Virginia.

In western Pennsylvania, our forecasters faced a situation unlike that anywhere else in the East. The rainfall associated

with the unusual westward movement of the storm was superimposed upon a river basin already saturated by earlier rains. William Long, our hydrologist at the Pittsburgh Weather Service Forecast Office is with us. He remained at his post six days and five nights and gave the height and timing of the Pittsburgh crest 18 hours in advance. He will discuss the details of the Pittsburgh forecast in his testimony. Let me just say that a torrential rain struck with devastating suddenness around and after midnight of Friday, June 23. This caused an extremely rapid rise of water in the city. On the basis of reports received after 2:00 a.m., Mr. Long was able to issue a warning to the city at 4:00 a.m., about 4 1/2 hours in advance of the flood. Unfortunately, since the torrential rain occurred late at night, the city was sleeping when the warning was issued. However, due

to the alertness and dedication of Mr. Long, the necessary government agencies and industrial companies were warned.

What Pittsburgh experienced was not unlike a flash flood.

Many small streams and valleys are caught in the grip of such floods, which have a terrible potential for death and destruction.

They occur very suddenly and cause extremely rapid rises in a matter of moments.

During this emergency, flash flood watches and warnings were common throughout the region. This Administration has mounted a systematic program to improve the national flash-flood warning capability. This year President Nixon has requested approximately 3/4 of a million dollars specifically for this purpose. We have recently installed a new flash-flood alarm system in

Wheeling Creek, West Virginia, and I can report to you that it worked in this flood.

A disaster such as this inevitably raises the question: Did the Weather Service do its job? Were the warnings adequate?

I believe our system responded promptly and well, and that further analysis will show that it accomplished an enormous saving of life and property.

But let me point out that I see no reason whatever for complacency. The system worked -- but it was stretched to the absolute maximum. Our people served to the very limits of human endurance, day and night.

To determine in detail the manner in which the warning system performed, and to discover where and how improvements can be made, I have appointed a high-level flood warning survey

team which is now in the field. I am awaiting its detailed recommendations.

We must learn from each disaster how to better prepare for the next.

Perhaps we can never hope to be perfect, but we must never stop trying.