

CHAPTER 1: CAUGHT OFF GUARD

1.1: A Telling Event

On the evening of Sunday, 28 April 2002, a powerful tornado crossed 64 miles of southern Maryland, demolishing large sections of the city of La Plata, an outlying suburb of Washington, DC. The storm killed three people, injured 122, and wreaked more than \$100 million in damages in Maryland.¹⁴ Rated a rare F4¹⁵ on the Fujita scale of destruction,¹⁶ the tornado was one of the most powerful ever to hit the state,¹⁷ and government officials counted their blessings that the death toll had not been higher. United States Senator Paul Sarbanes, D-Maryland, said, “If it had come through at a different time or on a busy day, we’d have really paid a heavy price.”¹⁸

¹⁴ National Oceanic and Atmospheric Administration. “NOAA Issues La Plata Tornado Service Assessment Report.” Press release. 17 Apr. 1997. 17 Nov. 2002 <<http://www.noaaneews.noaa.gov/stories/s1049.htm>>.

¹⁵ National Weather Service Forecast Office, Sterling, VA. “La Plata Tornado: April 28, 2002.” 18 June 2002. 17 Nov. 2002 <http://www.erh.noaa.gov/er/lwx/Historic_Events/apr28-2002/laplata.htm>.

¹⁶ National Climatic Data Center. “The Fujita Tornado Scale.” 12 Sept. 2001. 17 Nov. 2002 <<http://lwf.ncdc.noaa.gov/oa/satellite/satelliteseye/educational/fujita.html>>. F0 = 40-72 mph; F1 = 73-112 mph; F2 = 113-157 mph; F3 = 158-206 mph; F4 = 207-260 mph; F5 = 261-318 mph.

¹⁷ The Tornado Project. “Maryland Tornadoes.” 1996. 17 Nov. 2002. <<http://www.tornadoproject.com/alltorns/mdtorn.htm>>. By way of demonstrating the rarity of this F4 event, consider that from 1950 to 1995, 172 tornadoes struck the state of Maryland, none of them exceeding F3 in intensity.

¹⁸ Barker, Jeff, Laura Barnhardt, and Scott Calvert. “La Plata Twister Md.’s Worst; 261-MPH Winds Leveled Buildings; Claimed 3 Lives; State of Emergency Declared; Charles Co. Seat Begins Cleanup, Rebuilding Tasks.” *Baltimore Sun*. 30 April 2002, Telegraph section: 1A.

A tornado watch was issued for the region more than three hours before the tornado formed, and a tornado warning was issued for Charles County, of which La Plata is the seat, fully eight minutes before the storm took its first life in La Plata.¹⁹

Nonetheless, media accounts of the event featured a rejoinder familiar and exasperating to disaster-preparedness officials: the *Baltimore Sun* reported that “many residents said they were caught off guard;”²⁰ the *Washington Post* reported that “many people said they had known nothing about the danger.”²¹

In an age of media-weather obsession, in which watching The Weather Channel has become a daily ritual for millions of Americans,²² and local TV meteorologists have won the trappings of celebrity,²³ the failure of any citizen to receive and act on a crucial weather warning can seem to emergency managers almost a result of willful disengagement.

But people cannot be expected to keep their radios or TVs turned on all the time. Moreover, not all TV stations or cable services feature severe-weather warning overrides

¹⁹ National Weather Service. “Service Assessment: La Plata, Maryland Tornado Outbreak of April 28, 2002.” Pg. 8. Sept. 2002. 17 Nov. 2002 <<ftp://ftp.nws.noaa.gov/om/assessments/laplata.pdf>>.

²⁰ Barker.

²¹ Gowen, Annie, Thoela Labbe, and Susan Levine. “‘Absolutely Devastating’; Huge Tornado Causes \$100 Million in Damage in Charles, Calvert.” *Washington Post*. 30 Apr. 2002: A1.

²² Moore, Martha T. “So Where’s All This Snow? Easterners Ask.” *USA Today*. 6 Mar. 2001. 17 Nov. 2002 <<http://www.usatoday.com/weather/news/2001/2001-03-06-snowhype.htm>>. Moore reported, “Viewers want to know the forecast for practical reasons. But the number of ‘weather junkies’ is growing. The Weather Channel, a cable network, sees ratings skyrocket during bad weather. Typically, just under a half-million people watch the network at any given moment. The network hit more than 2.3 million viewers during the height of a snowstorm Dec. 30 in the East, according to Nielsen Media Research.”

²³ Welch, Jack. “From the Basement to the Backyard.” *Louisville Magazine/Web Edition*. July 1996. 17 Nov. 2002 <<http://www.louisville.com/loumag/jul/belsk.htm>>.

or “crawls,” not all towns are equipped with warning sirens (La Plata is not²⁴), and electrical service can easily fail during bad weather. In addition, while local TV and radio stations might interrupt programming and relay vital Weather Service bulletins to their audiences, not all do. Federal rules only mandate programming interruptions for national emergencies, but not for weather bulletins.²⁵

Still, one point stands: while the National Weather Service may never be able to sound advance warning for all tornadoes,²⁶ on 28 April the city of La Plata had every good reason to be on guard. When the Storm Prediction Center²⁷ in Norman, Oklahoma issued a tornado watch for the region shortly after 3 p.m., the local Sterling, Virginia office of the National Weather Service used its own local radio facilities—National Oceanic and Atmospheric Administration (NOAA) Weather Radio—to broadcast the

²⁴ Gowen.

²⁵ Federal Communications Commission. *AM and FM Emergency Alert Procedures Handbook*. Pg. 19. 2001. 17 Nov. 2002 <<http://www.fcc.gov/eb/eas/easamfm.pdf>>.

Also see section 11.55.(a) of the Emergency Alert System rules, which state in part, “The EAS may be activated at the State or Local Area levels by broadcast stations, cable systems and wireless cable systems at their discretion for day-to-day emergency situations posing a threat to life and property. Examples of natural emergencies which may warrant activation are: tornadoes, floods, hurricanes, earthquakes, heavy snows, icing conditions, widespread fires, etc.” Federal Communications Commission. *Part 11—Emergency Alert System*. Sec. 11.55. “EAS operation during a State or Local emergency.” 17 Apr. 2000. 17 Nov. 2002 <<http://www.fcc.gov/eb/eas/47part11.doc>>.

²⁶ Watson, Barbara. Warning Coordination Meteorologist, National Weather Service Forecast Office, Sterling, VA. Email to the author. 1 Sept. 2002. Indeed, the La Plata tornado was on the ground for several minutes before the National Weather Service upgraded a severe thunderstorm warning for Charles County to a tornado warning. Even so, the tornado warning went out two minutes before the storm crossed the La Plata city limit.

²⁷ The Storm Prediction Center (<http://www.spc.noaa.gov/>) is responsible for monitoring convective weather trends nationwide, and issuing convective statements and tornado and severe thunderstorm watches. Local National Weather Service forecast offices are normally the originators of specific weather warnings targeted to a local or county area.

watch information from the moment of its issuance. Furthermore, minutes after the tornado had actually formed and started moving toward La Plata, the Sterling office broadcast a tornado warning for Charles County using NOAA Weather Radio, two minutes before the storm entered the town, and, as noted, eight minutes before the first fatality.²⁸

1.2: The Problem

The outcome in La Plata, with the town having been officially forewarned, but not everyone receiving the warning, describes a problem as old as mass communication itself: getting word out to a public that is often disengaged from communication media, too busy to notice bulletins, or perhaps simply fast asleep in their beds. No matter how effective the government might be in identifying dangers and warning against them, those warnings are useless to anyone who does not hear them and hear them in time to act.

If one accepts the premise that warning citizens against surprise disaster is a core function and purpose of government, then the need is manifest for a means of meeting that responsibility. The government should offer a warning service that eliminates any dependence on commercial media. Government owes taxpayers the assurance that they can be warned in their homes, businesses, and automobiles via some medium that is publicly owned so that users need not pay any subscription fee or depend on any corporation for relay of vital government warnings. Common sense dictates that the ideal service would be reliable even in storm conditions, and equipped, literally, to awaken people to approaching danger even when they may not actively be listening for bulletins.

²⁸ Watson.

1.3: NOAA Weather Radio: A Ready Solution

The nation today confronts a daunting combination of budget and security pressures so it may be worthwhile reminding ourselves just now that such a service already exists in NOAA Weather Radio. Anyone in the town of La Plata who possessed a weather-radio receiver on 28 April heard the warning in time to act. Moreover, the security those radios deliver goes far beyond weather bulletins. NOAA Weather Radio can be, and is, used to alert the public in such disparate emergency situations as radiological warnings²⁹, tsunami warnings,³⁰ earthquake-information bulletins,³¹ and announcements of hazardous-material spills.³² Participation by NOAA Weather Radio in non-weather emergency dissemination is largely a matter left up to state and local officials, who must form access agreements with their local or regional Weather Service officials,³³ but the network has the potential to serve as an all-hazards warning device

²⁹ Shiffer, James Eli. "Nuclear Response Assessed." *News and Observer*. 7 Nov. 2001: A1.

³⁰ Sokolowski, Tom. Geophysicist-in-Charge, West Coast and Alaska Tsunami Warning Center. Telephone interview. 27 August 2002. Sokolowski said the Warning Center had been using NOAA Weather Radio to issue tsunami warnings for 15 years, and that in that time had done so on "about 10" occasions.

³¹ National Weather Service. *Aware*. Spring/Summer 2001: 20. The article stated that earthquake news was transmitted over NOAA Weather Radio in western Washington state immediately following the 6.1 magnitude quake on 28 February 2001. Regular programming gave way for approximately two hours to earthquake data, conveying such information as location of epicenter, strength, and level of tsunami risk.

³² National Weather Service. "NOAA Weather Radio." 24 Oct. 2002. 17 Nov. 2002 <<http://205.156.54.206/nwr/>>.

³³ Ditt, Tom. Public information officer, North Carolina Division of Emergency Management. Telephone interview. 10 September 2002.

nationwide, with only a small investment necessary, in funds, and in standardized procedures for funneling various messages to the network.³⁴

The NOAA Weather Radio service is composed of a nationwide network of radio stations broadcasting continuous weather information directly from National Weather Service forecast offices, delivering official warnings, watches, forecasts, and other hazard information 24 hours a day. It is the sole government-operated radio system that provides direct warnings to the general public for natural and man-made hazards.³⁵ In communities with no sirens or procedures for sounding them, Weather Radio is the most direct way government has of alerting you to any approaching danger—short of a knock on your door or a bullhorn in the street.

Marketed by the government as the “Voice of the National Weather Service,” Weather Radio broadcasts are a public service of the National Oceanic and Atmospheric Administration, an agency of the Department of Commerce. The broadcasts are transmitted on seven frequencies within the public service band,³⁶ so persons wishing to receive them must avail themselves of special radio receivers, widely available at electronics stores for under \$50. The units are small and unobtrusive, whether sitting on a nightstand or office table or carried in an outdoorsman’s tackle box or backpack. From them the consumer can receive up-to-date weather information, at the touch of a button, 24 hours a day. Importantly, most units now being manufactured are also able to stand

³⁴ White, Herbert L. Dissemination Services Manager, National Weather Service. Telephone interview. 17 September 2002.

³⁵ National Oceanic and Atmospheric Administration. “NOAA Weather Radio: For Anytime Severe Weather Strikes.” Jan. 2002. 17 Nov. 2002 <<http://www.publicaffairs.noaa.gov/grounders/nwr.html>>.

³⁶ National Weather Service. “NOAA Weather Radio.” 24 Oct. 2002. 17 Nov. 2002 <<http://205.156.54.206/nwr/>>. The frequencies are 162.400, 162.425, 162.450, 162.475, 162.500, 162.525, and 162.550 Mhz.

silent until the National Weather Service triggers a built-in alarm feature, alerting the consumer to listen for critical warning information. In addition, NOAA Weather Radio is the only national warning system that can provide hazard information equally to the hearing- and sight-impaired, with its digital codes easily convertible in available consumer products, rendering alert notification in text, strobe-light, audible-alarm, pillow-vibrating, and bed-shaking devices.³⁷

The growing broadcast network now includes more than 750 transmitters covering all 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories.³⁸ One federal report stated in 1999 that between 70 and 80 percent of the U. S. population was then within range of at least one NOAA Weather Radio transmitter, and the National Weather Service has set a minimum goal of reaching 95 percent population coverage as it continues to expand the network.³⁹ Weather Radio professionals are in fact hoping to reach the ultimate goal of 100% population coverage.⁴⁰

All in all, the facts would indicate that we possess in NOAA Weather Radio a most impressive service, a somewhat under-appreciated dissemination infrastructure that Americans can point to with pride. “It’s a national treasure on some level, and it’s amazing how many people still don’t know about it,” said Ed Gross, retired Chief of

³⁷ A National Severe Storms Laboratory web page lists five consumer-products makers of “special-needs” NOAA Weather Radio receivers. See <http://www.nssl.noaa.gov/NWR/>.

³⁸ National Weather Service. “NOAA Weather Radio.” 24 Oct. 2002. 20 Nov. 2002 <<http://205.156.54.206/nwr/>>.

³⁹ National Weather Service. *Vision 2005: National Weather Service Strategic Plan for Weather, Water, and Climate Services, 2000-2005*. Pg. 11. August 1999. 20 Nov. 2002 <<http://205.156.54.206/pub/sp/stplnall.pdf>>.

⁴⁰ Krudwig, Lawrence J., Warning Preparedness Meteorologist, National Weather Service Central Region Headquarters (retired). Email to the author. 5 November 2002.

Industrial Meteorology at the National Weather Service.⁴¹ Just how many people *do* know about the service, in fact, seems something of a mystery. An extensive document search, and numerous interviews with active and retired National Weather Service weather-radio professionals, uncovered no evidence that the Weather Service has tried to ascertain the nationwide level of public awareness of its broadcast service in at least 20 years.⁴² In conducting the La Plata post-event assessment survey, the National Weather Service found that, of 40 persons interviewed, only one was aware that NOAA Weather Radio existed.⁴³ A post-event service assessment of the 8 April 1998 Southeastern United States tornado outbreak stated, “Even with extensive local promotion of NWR, it is evident that many of the public still do not know of this potentially life-saving tool.”⁴⁴

If not enough Americans know about the existence of NOAA Weather Radio, next to none still recall exactly why and by whom the system was originally built. The story of how Americans came to possess this distinctive national service is beginning to get away from us as principals in the network’s construction retire and die.⁴⁵ Individual milestones in the development of NOAA Weather Radio are duly noted in National

⁴¹ 18 March 2002. Telephone interview.

⁴² Krudwig. Email to the author. 25 September 2002. Krudwig stated that the Weather Service did conduct such surveying in “1978 or 79, but nothing statistically scientific since then.”

⁴³ National Weather Service. “Service Assessment: La Plata, Maryland Tornado Outbreak of April 28, 2002,” p. 18. Sept. 2002. 25 Nov. 2002 <<ftp://ftp.nws.noaa.gov/om/assessments/laplata.pdf>>.

⁴⁴ National Weather Service. “Service Assessment: Southeastern United States Tornadoes, April 8, 1998,” p. 10. July 1998. 25 Nov. 2002 <<ftp://ftp.nws.noaa.gov/om/assessments/setornad4-98.pdf>>.

⁴⁵ Earl W. Estelle, who during the 1970s until 1980 was the Weather Service’s Chief of Public Services Branch in the Meteorological Services Division, and the overall NWR Program Manager, stated in an email, “As far as contacting retirees...I don’t have a clue. Most of the people I worked with are all dead. Trying to find anyone who would have the big picture might be next to impossible. I can’t think of anyone who is still alive and could help.” 15 July 2002.

Weather Service and old Weather Bureau organs and memoranda, scattered in libraries and archives throughout the land. Finding them all would require a search beyond the scope of this paper. But at least—given the system’s reach, and its increasing importance within the national warning-dissemination infrastructure—the mission and potential of NOAA Weather Radio appear worthy of reexamination. An outline of NOAA Weather Radio’s history should be preserved in one document.

We will first examine some historical material on America’s dissemination procedures, beginning with the earliest days of government-issued warnings; then, we will look closely at NOAA Weather Radio—why and by whom the service was built, how it is used, and where the radio service may be headed as the nation confronts unfamiliar “Homeland Security” hazards.