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Rethinking Defenses Against Sea's Power

Flood Experts See Lessons in New Orleans

By *Molly Moore*

Washington Post Foreign Service

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VROUWENPOLDER, Netherlands -- Each year, thousands of Dutch schoolchildren stand atop the behemoth steel gates that rise above North Sea waters here, listening to the story of the floods that gobbled up the southwestern Netherlands 52 years ago and reshaped the political, environmental and psychological landscape of their nation.

The way Ted Sluyter tells it, "The Misery of 1953," as the worst flood in modern Dutch history is known, bears clear parallels to the New Orleans disaster.

"The scientists told us the dikes were too low; we knew they were in bad condition," said Sluyter, who organizes the mandatory school tours of the world's most formidable sea defense system and recounts history with the urgency of a breaking news bulletin. "The politicians said we needed to spend money on military defenses and reconstruction after World War II. The plans for the dikes went in the fridge."

Now, the country that has been building dikes and battling the sea since the Middle Ages is using the lessons from the New Orleans flood as a political catalyst to reexamine its own flood defenses -- many of which were developed in response to the calamity of a half-century ago.

On Feb. 1, 1953, a high-tide storm breached the famed Dutch dikes in more than 450 places. Nearly 1,900 people died, many as they slept. More than 47,000 homes and other buildings were swept away or splintered in the icy inundation.

"We said, 'Never again,' " said Maarten van der Vlist, a senior adviser for the Dutch Directorate of Transport, Public Works and Water Management, which is responsible for the safety of a nation that is the size of Maryland, but half of which lies at or below sea level.

Dutch politicians followed up with a \$3 billion, 30-year program to strengthen the protections. The country built an elaborate network of dikes, man-made islands and a

1 1/2 -mile stretch of 62 gates to control the entry and exit of North Sea waters into the country's low-lying southwestern provinces.

But now environmental, engineering and flood experts say those defenses might be insufficient. In the 21st century, population growth and climate change caused by global warming have left the country's interior, through which flow the Rhine, Maas and Schelde rivers, more vulnerable to flooding than ever, they say. High river dikes -- similar to those built in the United States to regulate the Mississippi River -- are now seen more as a contributor to major flooding than a protection against it.

A five-year study due to be published in January is likely to include disturbing new calculations of flood threats to the Netherlands and gaps in the country's readiness, according to experts and government officials familiar with the findings. Major deficiencies in evacuation plans for the most populous Dutch cities are likely to be outlined in the study.

"Our fear was that it would be hidden," said J.K. Vrijling, a specialist in flooding risk analysis at the Technical University campus in Delft, a town of 17th-century brick rowhouses, picturesque canals and the country's most sophisticated water research centers. "New Orleans is a good lesson for us. It has illustrated the real case of a flooded city. Now people will be more ready to believe us than before."

Across Europe, the greatest natural threat in the coming years will be flooding, as global warming sends more water gushing through passageways bordered by densely populated areas and overdevelopment, according to many water and engineering experts. The potential for catastrophic devastation and death is so high in so many countries that the European Union is preparing continent-wide guidelines for water management and flood control.

Despite the Netherlands' successes in battling the seas, Vrijling and other specialists said, Dutch politicians often dodged the most controversial issues. A scientist who warned of the high probability of the 1953 floods was prohibited by the government from publishing his direst predictions, which ultimately proved correct.

Although the government conducts an assessment of flood risks and water management every five years, government censors deleted all references to possible death tolls in the 1991 report, according to Vrijling. He said the report, scheduled for release in January, is expected to include death projections.

Scientists now are debating the standards the government set half a century ago to protect its citizens.

The Netherlands' strongest sea defenses were designed to stand up against a storm so strong it would occur only once in 10,000 years. The river levee and dike systems were built to withstand a 1,250-year storm. By comparison, most U.S. abatement programs are designed to withstand floods or storms that would occur statistically every 30 to 100 years.

"Our level of safety is higher than anywhere else in the world," said Huib de Vriend, director of science and technology for Delft Hydraulics, an independent foundation that advises governments and companies around the world and is offering to assist the U.S. Army Corps of Engineers in draining and disposing of the polluted waters in New Orleans. A satellite photograph of southern Louisiana is tacked to his wall.

But de Vriend and others caution that the storm probability figures are based on computer models rather than data. In addition, climate changes are skewing the calculations. Severe river flooding in the mid-1990s that came close to breaching levees made experts start to doubt the one-in-1,250-years storm capability of their defenses, he said.

As a result, in the last several years, Dutch experts and political leaders have dramatically revamped their theories of flood control along the rivers. The government is debating a \$2.2 billion plan to redesign its river management, moving away from building higher dikes and levees to contain the water and developing a "room for the river" approach that would allow some areas rivers along rivers to flood, releasing the growing gushes



Ted Sluyter, who organizes school tours of the Dutch sea defense system, says the calamitous 1953 flood bears clear parallels to the New Orleans disaster. (By Molly Moore -- The Washington Post)



BY NATHANIEL VAUGHN KELSO — THE WASHINGTON POST

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from spring rains and melting ice.

The proposal has encountered strong resistance from farmers who would be displaced from the planned flood plains. Proponents of the plan point out that river flooding in the mid-1990s forced the evacuation of thousands of people and tens of thousands of farm animals.

Since the Dutch system was designed 50 years ago, scientists have discovered that seas are rising faster and the country is sinking faster than expected. It has fallen 12 feet in the last 1,000 years and the rates are increasing, according to Dutch statistics. The surrounding seas, in turn, are rising about 23 to 39 inches per century, the figures show.

Dutch scientists say that both the country's politicians and its younger generation have become complacent in the last 50 years. A generation that has never experienced a catastrophic flood is questioning the need to funnel billions into research and new systems.

That's a big part of the reason that Ted Sluyter stands atop rows of floodgates that weigh up to 480 tons each and lectures students and others on the dangers of the sea.

"I still get goose bumps when I look at the film from 1953," said Sluyter, referring to the grainy footage that runs daily in the Waterland Neeltje Jans exposition center near the floodgates. "When I saw the television pictures of New Orleans, I felt those same goose bumps."

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