



FEMA DR-1295-NJ

## New Jersey Reduces Damage from Hurricane Floyd

These mitigation stories from Hurricane Floyd illustrate some of the ways people, industry and government in New Jersey reduced potential damage from the storm



Some solutions are “hard”, such as pumping stations

Other remedies are “soft” environmental approaches to control flood damage

Still others rely on common sense



Some projects cost millions; some cost next to nothing



## Wayne, NJ NJ Blue Acres Program

According to local officials in Wayne, NJ, a staggering 700 homes in the municipality are in the Passaic River floodway. Floodways include a river's channel and certain contiguous areas. Any structures in a floodway, in addition to being at great risk from flooding, can increase the height of a 100-year flood.

Some of Wayne's oldest neighborhoods are squeezed between the Passaic River and high railroad embankments. These areas - Old Wayne, Hoffman Grove, Fayette Avenue and Hobson Avenue - are particularly subject to severe flooding. To reach them, cars drive through a few scattered, narrow tunnels under the railroad embankments. When the Passaic River rises, the long, unbroken embankments confine floodwaters, much as though they were levees.



The building at 17 Island Street, acquired under the NJ Blue Acres Program, will soon be demolished. Note the high water mark at four feet on the garage door.



The former owners of these vacant houses on Fayette Street wisely chose to move from the Passaic River floodway.

Seventy homeowners in Wayne Township's floodway have said they are interested in participating in the latest round of buyouts. Of these, thirty-five homes are on the State's current list for acquisition. As of September 1999, when Hurricane Floyd hit, the State had closed on ten of these properties.

Under New Jersey's Blue Acres Program, money from bond issues is used to buy homes in floodways and floodplains. Any structures on these properties are demolished or removed. The land left may be left to grow wild, or minimally developed for passive recreation.



40 Hobson Street was acquired before Floyd hit. The debris line on the fence shows floodwaters were 2 1/2 feet deep.

## Dunellen, NJ

### Newly Elevated Home is Safe From Floyd's Flooding

Over the years, the meandering, picturesque Green Brook flooded streets and homes in Dunellen, NJ. In 1996, it again overflowed its banks and destroyed the Jackson Avenue home of Michael and Maryann Robinson. Fortunately, they had flood insurance. The proceeds and a second mortgage helped the Robinsons rebuild.

The Robinsons elevated their new home four and one-half feet. The foundation was constructed with special openings to allow floodwaters to pass through freely. They purchased flood insurance on both the new house and its contents.



Maryann Robinson didn't want storms to flood her home again.

The Green Brook overflowed again in September 1999, during Hurricane Floyd.



Portions of Jackson Avenue were submerged in over three feet of water, affecting several neighboring residences. The Robinson's elevated home was high and dry, although their air conditioner compressor, located outside, must be replaced.

The first floor of the Robinson's home on Jackson Avenue is 4 ½ feet above the base flood elevation.



## Franklin Township, NJ

# Trapped by Floodwaters, Elizabethtown Water Company Workers Rise to the Occasion



The state-of the art Elizabethtown Canal Road Water Treatment Plant cost approximately \$100 million.



Oleg Kostin, Superintendent of Plant Operations, points to high water mark on Canal Road.

The Elizabethtown Water Company has two water treatment facilities. Finished water from both plants is distributed to customers through the same system. The Raritan-Millstone plant produces 165 million gallons of finished water a day. Production at the three-year-old, state-of-the-art Canal Road Water Treatment Plant is usually 40 million gallons a day.

The Raritan-Millstone plant on Chimney Rock Road South, Bridgewater, had 18 inches of flooding during Hurricane Doria in 1971, a 50-year event. Afterward, management raised the berms protecting the plant to the 500-year flood frequency flood level. River encroachment permits were being sought to add a security wall this year. The newly constructed Canal Road plant is sited above the 500-year flood level.

By 10:00 pm, September 16, 1999, rains from Hurricane Floyd had passed and skies were clearing. Both the Raritan-Millstone and Canal Road water treatment plants were operating normally.

A worker leaving Raritan-Millstone for the night drove toward the railroad grade crossing in front of the plant. As he arrived at the crossing, the gates came down in front of his



truck. He waited in the darkness for an approaching train.

Instead, he was astonished to see water rushing down the track toward the plant. Using his cellphone, the worker warned other employees of the imminent flood.

“I expected a few inches,” Kostin said. “Within two minutes, the water was up to our knees. Within ten minutes it was up to our chests.”



Workers at Raritan-Millstone raced to shut down equipment. Two men waded through chest-high water to gas-powered pumps that couldn't be closed down from the control room. Concerned about falling water pressure in the distribution system, Superintendent Oleg Kostin telephoned the staff at the Canal Road Plant and told them to crank the plant up to maximum capacity.

Chamber at the raw water intake for the Canal Road Plant was submerged. Under twenty feet of water, its top was barely visible. There was water everywhere, but new problems arose when the raw water intake screens became clogged with debris. The problem was temporarily solved when a huge tree fell and smashed a hatch cover, allowing water to flow freely into the intake pipes.



The water rose until 4 am, eventually putting the Raritan-Millstone plant under 12 feet of water. The Backwash Control

At the peak of the crisis, the Canal Road plant was running flat out, producing 75 million gallons of treated water a day - double its rated capacity.

Ten workers, including Kostin, remained at Raritan-Millstone through the night. Trapped by floodwaters, Kostin monitored the situation at Canal Road by cellphone. The crew watched the night rescue operations in awe. From a vantage point at the top of the plant, they could see a fire burning out of control in nearby Bound Brook while clattering news helicopters illuminated the scene. When morning came, US Coast Guard helicopters evacuated the men.

The plant crew's rapid emergency response mitigated potential health hazards due to the flood. The Canal Road plant helped maintain water pressure, even though it was lower

**The crew's efforts succeeded.  
No contamination occurred**

than normal. Concerned that lowered water pressure would cause back-siphoning, Elizabethtown stepped up chlorination measures and issued precautionary boil water advisories.

Fortunately, the water remained safe for consumption. Extensive monitoring and testing in the days following Hurricane Floyd showed the crew's efforts succeeded - no contamination occurred.

Post-Floyd, Superintendent Kostin is accelerating plans to install a big emergency generator at the Canal Road Water Treatment Plant. The flooded emergency generator at Raritan-Millstone will be replaced as quickly as possible. Twenty-six damaged pumps, all electrical systems, instrumentation systems and power generation equipment are being replaced or factory reconditioned. The company is moving forward with plans for the security wall. The controls for the Backwash Control Chamber will be moved from the Raw Water Intake on the Raritan River to high ground at the Canal Road plant. Elizabethtown plans to be ready if history repeats itself.

## Little Ferry, NJ

### Pumping Station Tested by Hurricane Floyd



Mike Monforte, Little Ferry Department of Public Works, at the new Losen Slote Pumping Station. The new system easily handled waters from Hurricane Floyd and saved many residences from flooding.

The Borough of Little Ferry is tucked away in the New Jersey Meadowlands, bordered by the Losen Slote. The Dutch-named creek empties into the Hackensack River. A 100-year old wooden tide gate was inadequate to control the flow between the Losen Slote and the tides on the Hackensack River.

The small, low-lying community flooded repeatedly, even with just a few inches of rain.

In 1999, after years of repeated flooding Little Ferry replaced the wooden tide gate with a modern, high capacity pumping station. The \$2 million facility is equipped with an emergency generator that self-tests monthly, to ensure the pumping system will continue to operate even if there is a power failure.



The pumping station went on line in July, 1999, just in time to defend the community against the flood waters unleashed by Hurricane Floyd.

Residents were understandably concerned when Hurricane Floyd put the new pumping station to the test. The new system performed beyond expectations and vulnerable residential areas were spared flooding.



Local officials expressed concern that the proposed continued development of the Meadowlands will only increase flooding in nearby communities.



## Lodi, NJ

### Hurricane Floyd Puts Cleared Land Under 6 Feet of Water

The Saddle River divides the Borough of Lodi; four bridges connect the two halves. In 1977, a severe storm flooded homes and the Borough's sewage pumping plant in the riverfront area west of Main Street. The plant, built above the 100-year base flood elevation, was unaffected by the 1977 flooding. But homes in the area were badly flooded.



Soccer and baseball fields at Lodi's Voto Tedesco Park. The park is dedicated to two Lodi police officers who lost their lives in the line of duty

After the 1977 event, Lodi became one of the earliest communities to participate in a buyout program using federal funds. In 1982, under Section 1362 of the National Flood Insurance Program, the Federal Emergency Management Agency purchased six flood damaged homes. The Borough of Lodi paid the cost of demolition. Ten additional homes were purchased and demolished using a federal matching grant available under the provisions of the Emergency Flood Control Bond Act of 1978. One homeowner in the target area reportedly refused to participate in the buyout.

The land cleared in the 1982 buyout was set aside for recreation. The site was improved with a softball/soccer field, and elevated toilet facilities. Chain link fencing and lights were added. The well-used park was dedicated to two Lodi policemen, Voto and Tedesco, who died in the line of duty. The soccer program is so popular, the Borough wants to build another soccer field.

On September 16, 1999, Hurricane Floyd caused the Saddle River to overtop its banks with a vengeance. Floodwaters reached from Avenue E to Central Avenue on Main Street. All four bridges were under water and impassable.



The single target house that wasn't bought out in 1982 suffered over three feet of water in the first floor.

Voto Tedesco Park lay under six feet of water. Lodi's Sewage Pumping Station, built for a 100-year flood, had four feet of water and was off line for three days. Water and sewage flowed into houses nearest to the pumping station and river. Voto Tedesco Park facilities, although submerged, survived the flooding. The sixteen families who formerly lived on the site had made the smartest move of their lives.



Lodi's sewage pumping station, built to the 100-year BFE, was flooded by Floyd

## Fairfield, NJ

### Elevated Home in Passaic River Floodway Escapes Undamaged

The Passaic River curls between tree lined banks right in the backyards of the houses on Camp Road. The street's name reveals the origin of the homes there as former summer cottages.



When the Boltons bought their Camp Road home it was already elevated. Their back yard ends at the Passaic River.

Maria and George Bolton enjoy their elevated home with its views of the river. Mrs. Bolton smiles as she describes the river's beauty even in winter, when ice forms on the stream and snow clings to bare tree limbs. Her sister bought a house across the street. Further down the road, another neighbor mentions that their grown son owns the house next door.

The Boltons and their neighbors appreciate the secluded beauty of the tiny neighborhood. Home prices and taxes are low, and the Fairfield school district is excellent. There is just one problem: Camp Road and its homes are in the floodway of the Passaic River.



### The former summer cottages are in the floodway of the Passaic River

After an especially severe flood in 1984, many Camp Road residents elevated their houses. Six years ago, the Boltons bought their home. The former owner had already elevated it. The furnace and the pressure tank for their well were raised on 32" pedestals of concrete blocks.



**Yes, Maria Bolton can really use the elevated washer and dryer. Both load from the front.**

Flooding from Hurricane Floyd sent 29” of water into the Bolton’s utility room. As the water quickly rose, the family struggled to move the washing machine, which had not been elevated, upstairs. When floodwaters receded, the furnace and pressure tank were unharmed. There was no structural damage.

The Boltons hosed the mud out of the utility room and washed the walls and floors down with bleach and pine oil. They brought the washing machine back downstairs and created a new 32” platform for the washer and dryer from cinder blocks and plywood.

“It floods here at least once a year, but we are prepared for it,” Maria Bolton said. “The house is elevated, and we have a pressure washer to make clean up easier. Now we have the washer and dryer elevated, too.” It is a small price to pay, she feels, to live in the Fairfield School District.



## FEMA DR-1295-NJ



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