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One by one, the Arch steps become part of the Mississippi River. Lenore K. Sullivan Drive is usually lined with tourist's cars but only the trees mark where this river-most St. Louis street once was.

St. Louis District Remembers the Flood of '93

"Any river is big and magnificent," said Dave Busse, Chief of Potamology. "You have to have respect for the river."

Water may look benign, but it has awesome power and this power was truly demonstrated in '93. No one knew exactly what to expect but the ingredients were there for '93 to be a unique year.

"Have you heard of the *Perfect Storm*," asked Busse?

"Well, the 1993 flood was a *Perfect Flood*. There was a wet fall, heavy snowfall, a wet spring and rain, rain and more rain," he said. "In fact some areas in Iowa, Kansas and Missouri received 35-45 inches of rainfall in a three to four month time period."

The Flood of 1993 was to be the greatest recorded flood in St. Louis and the second costliest weather related

disaster to the strike the United States, exceeded only by Hurricane Andrew.

The summer began hot, humid and steamy. Rainstorms pounded the region over and over again. The rainwater combined with river water to form the largest volume of water ever recorded to flow past the Arch, 1.08 million cubic feet per second (cfs), a volume great enough to fill Busch Stadium once every minute.

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District Commander Colonel James Craig briefs CBS newsmen Dan Rather on '93 flood conditions.

The Commander's Perspective is usually Colonel Williams' chance to update the District on current issues. For this special edition of Esprit he graciously relinquished the column to a former District Engineer, Col. Jim Craig, USA (Ret.). Col. Craig led the District during the Great Flood of '93 and these are some of his thoughts.

As I get older, I enjoy reflecting on the past: shared memories, shared experiences, and friendships. When I was asked to contribute to a tenth anniversary edition of the Esprit on the Flood of '93, I gladly agreed.

As I think back, the spring of 1993 was very wet, and the entire flood control system was tested, but proved its worth. It worked, with only minor flooding!

For example, as I remember, the spring crest in St. Louis was 36.5', not the 40' it would have been without Mark Twain Lake. In May, it looked as if the river had crested and was receding. To say we were wrong is an understatement.

In June, the river continued at high levels, and then in July and August, Mother Nature reminded us who is really in charge. From July 1 on, the focus of the District was on flood fighting and

prevention. All existing gage records were broken, and a new term, "extended crest," came into being. For example, the St. Louis gage was over 40' for several weeks.

There are some memories that come to mind.

There are always disagreements in a district like St. Louis where so many valuable team members work together for many years, but when an event like the Flood of '93 occurs, the entire district pulls together and accomplishes miraculous things.

As a team you gathered over 13 million sandbags, you let countless numbers of contracts in virtually no time, and you gave freely and willingly of your time to numerous communities in need.

When Locks and Dams 24 and 25 were in crisis, you volunteered to fill sandbags. Although most volunteers were women, I did spot the district counsel and members of his team filling sandbags too.

The river finally crested at the beginning of August, and then slowly receded, although not completely until late fall. It was an event without precedence in modern times with record river levels, flood duration, and area of flooding.

Through it all, the team performed magnificently and selflessly. Through the efforts of the team in place at that time, as well as the team members who preceded you, the flood control reservoirs accomplished their purpose by reducing the crest in St. Louis by 3 ft.

The urban floodwalls withstood the flood.

I do remember a day when Jack Niemi suggested I accompany him to the north end of the St. Louis Floodwall. When we got there water was spouting from under the wall. Jack, with the engineer-

ing team, calmly developed a solution that was quickly and effectively implemented by contracting and construction. Can you imagine the repercussions had the wall failed?

Unfortunately, most of the agricultural levees were overtopped, with significant damage. I remember flying over the north end of the Columbia Drainage and Levee District, and watching it breach, with the Gummersheimer farmhouse being uprooted and destroyed, and feeling totally helpless in front of Mother Nature. In fact, I have a photograph of the event on the wall in my study to remind me of it.

I remember watching the Kaskaskia levee disappear, and hearing of a district team member and his vehicle going into the Bois Brule breach, but miraculously surviving.

I also remember sitting in the district office late in the evening discussing the deliberate breaching of a levee, with Claude Strauser, George Postol, Dave Mueller and Jack Niemi, among others, and making a decision that we would try to convince the levee district to breach the levee, rather than risk destruction by the force of water coming from the north.

Through it all, my most lasting memory is of a group of professional district team members whose selfless dedication, forethought, and calm analysis saved an enormous potential loss of life and property. For that memory I am grateful and will always regard it as an honor to have served with the District.

Editor's Note: Colonel Jim Craig, USA (Ret.) has since left the Army and lives with his wife in Houston, Texas. He is a construction general manager with Kellogg Brown & Root. He had just returned from Algeria when he agreed to write this column.



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St. Louis District®

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Remembering the Flood of '93 cont.

1993 was to be a year of unbelievable numbers.

The St. Louis gage was over 40 feet for 38 consecutive days surpassing the previous record of eight days in 1973. The Mississippi River crested at the St. Louis gage at 49.58 feet on Aug. 1 exceeding the previous record in '73 by 6.35 feet.

The Mississippi River was flooding, but so was the Missouri River. These two powerhouses were in turn back flooding connecting rivers and tributaries.

With all that flooding, the rivers seemed to blend together. Mike Dace, Ordnance and Technical Service branch chief, remembers taking a helicopter trip with Rep. Jerry Costello (D-Ill.) flying over the



The Missouri and Mississippi Rivers overflow their borders and submerge acres of dry land. The two rivers become one mighty force.

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confluence of the Mississippi and Missouri rivers.

"It was just one big pool of water," Dace said. "You couldn't tell where one started and one ended."

The District's flood fight began in early July when the District's Emergency Operating Center opened.

The EOC and the Water Control Section of the Hydrologic and Hydraulics Branch went to 24 hour, seven days a week operation on July 8.

Locks 24, 25, 27 and Kaskaskia River Lock and Dam closed early in July. Melvin Price closed on July 10. All traffic on the Mississippi above the Ohio River was stopped July 11.

Sector engineers were dispatched, along with sufficient Corps personnel, to all the problem areas.

At the time the District had seven flood fight teams comprised of 85 employees.

Field personnel worked alongside levee

districts, locals, volunteers and National Guard units raising levees, conducting inspections and building berms and sandboil rings.



A Corps work boat carries sandbags to National Guard soldiers.

The small private levees in the northern part of the St. Louis District were overtopped by early July. By July 10, the town of West Alton, Mo., sat under ten feet of muddy water.

Massive flood fight efforts were mounted along the River Des Peres in South St. Louis, at Kimmswick, Ste. Genevieve and other threatened towns. Each time they thought they had the river



Flood fighting takes on a new perspective as a boat operator carefully approaches farmers and soldiers anxiously awaiting sandbags .

beat, the crest prediction was raised.

The St. Louis flood protection system included 39 federal systems, 43 non-federal systems, 713 miles of levee protection and five reservoirs.

More than 70 percent of the federal/ floodwall and levee protection system in St. Louis District held.

Those levees that breached or over-topped had held to their constructed level and in some cases beyond thanks to massive sandbagging efforts.

There were miraculous events. Keach Drainage and Levee District on the Illinois River survived water six feet higher than it was constructed to hold back.

The summer of '93 is full of miraculous events and heart breaking loss. It was a summer full of exhaustion, dedication, tears and triumph.

Every experience and story is unique to 1993 and this special issue will highlight some, but certainly not all.

Linda Collins, who now works for the Bureau of Alcohol, Tobacco and Firearms, was the Con-Ops secretary during '93.

She isn't sure if it was her fortune or misfortune staying in the District during '93. Collins felt she was doing her part by just staying at her desk doing her regular job.

People were working long hours and sometimes sleeping in their offices overnight. Collins remembers there was concern over Mel Price, which had just recently been constructed.

"Nothing was normal. It wasn't even a 'normal' flood if you can say there is such a thing," she added.

The memories of 1993 are a flood in and of themselves for Mark Alvey, chief of the Geotechnical Branch. One story leads to another and there are countless stories to tell.

He remembers the unmistakable and stomach-turning smell of dead animals and rotting crops.

Alvey also remembers the dedication of the flood fighters. Mike P. Navin (junior) and Mike J. Navin (senior) worked in Alvey's sector.

Mike P. caught a serious case of poison ivy during '93 but went right back to work. His father Mike J. was involved in a serious accident where he broke his jaw and lost a few teeth but he too was back to work in a few days.

The flood fight teams were "extended family," Alvey explained. They wanted to be there for each other and they didn't want to let the other team members down.

There was a larger family beyond just Corps employees.

Mike Kruckeberg who worked along the

Illinois River remembers how the Ladies Auxiliary Group and local church groups would prepare meals everyday that would be served by the Red Cross, and farmers, who stood to lose everything, were donating crops to the Red Cross.

It was an amazing time for all those involved.

Millions of people were impacted within seven Corps districts. Forty-seven people died as a result of the flooding, and there were at least \$15 billion in damages. Roads, bridges and railroad tracks were closed and communities were isolated.

Over 13 million sandbags, 112 portable pumps, 163 rolls of snow fencing and 9,044 rolls of plastic were distributed during flood-fight operations. The seven Corps districts involved in the flood fight, St. Paul, Rock Island, Detroit, St. Louis, Memphis, Kansas City and Omaha, distributed 31 million sandbags.

Close to 400 St. Louis District employees (254 office and 143 field) actively participated in the flood fight. Every fight during '93 was intense, every loss devastating.



A St. Peters' homeowner shows "NO FEAR" as flood waters creep closer.

This issue is a tribute not only to the flood fighters but also to everyone in the District who supported them.

Every effort has been made to ensure names, locations and dates are accurate, but little editing has been done to alter material or people's memories.

There will be much debate, maybe even arguments, over terms used and sequences of events. There are many ways to remember the flood. This is a sampling of just a few.



Locks First to Fight

The Great Flood of 1993 was unlike any other recorded Midwest flood. It was a flood of varying personalities. There was the fast moving current of the Missouri River, sweeping across the plains; there was the Upper Mississippi River rushing down the grand staircase of locks and dams, and there was the widening mouth of the Lower Mississippi as it sped past St. Louis on to expansive freedom past Cairo, Ill.

There is no one story like another.

Flooding along the Missouri River was a unique challenge. In '93 the Kansas City District handled the Missouri River levees. This often caused frustration on the part of citizens living in St. Charles and Chesterfield. The St. Louis District EOC provided callers with assistance to the best of their ability but often had to direct callers to K.C.

The Upper Mississippi staircase flood was its own challenge. The flood was coming and everyone knew it. Mother Nature had put into motion a flood that could not be stopped.

Signs came early in the year that the flood was going to be big.

Except for the last two days of December, Mark Twain Lake spent all of 1993 at flood control pool.

"Open river" started at Lock and Dam 24 as early as March 24.

The heavy winter snows were melting, water run off was saturating the ground and storms began to drop rain, rain, rain and more rain. Dave Busse and Claude Strauser, hydraulic engineers, can often be heard saying, "Levees don't cause floods; rain causes floods."

And boy did it rain!

Dennis Foss, Mark Twain Lake operations manager, said it felt as though the rainstorms were stuck and kept running the same track over and over again.

There was in fact a weather front sitting over the East Coast blocking in rainstorms that simply had nowhere else to go. The Midwest was getting hammered.



The Mississippi waits only a few feet away as floodfighters rush to fill more bags, but only one shovelful at a time.

Frontline defense during the flood was the District's lakes and levees. The locks and dams were greatly impacted but it is important to note that they are not for flood protection; they are low water structures used to aide in navigation.

Locks and dams play a crucial role along inland waterways by helping to maintain a nine-foot navigation pool upstream of their location. But once the gates are lifted and it is "open river," "God is in control," explains Claude Strauser.

Once the river was left to its own devices in 1993, flood stage predictions and crest locations consumed people's every waking hour. If the river was going to rise so many inches, then sandbag walls had to be raised a similar amount. There was definitely no rest or end to the "Summer that Never Was."

Lock and Dam 24

The average river stage at Lock and Dam 24 is 17-18 feet and flood stage is 25 feet. LD24 went to open river in March and gates would not be lowered back into the water until Oct. 7.

Open river lasted 197 days in 1993 compared to the previous record of 110 days in 1973.

LD24 reached flood stage on April 1

and remained at flood stage for 188 days. The river crested at 37.73 at 2 a.m. on July 29.

Lock and Dam 24 was the first St. Louis District project to face the rushing floodwater of the Mississippi.

A call was sent out for volunteers.

The waters surging through Rock Island District would soon arrive at St. Louis and action had to be taken quickly.



Flood waters rush past Lock 24's control cabinet and machinery shed.

LD24 would be impacted first, but LD25 would not be far behind.

The electronic switch gear used for the lock gates was stored below ground, and a wall of sandbags had to be constructed in order to save the machinery. (Note to readers: The gears have since been moved above ground.)

The project crews couldn't do it all so volunteers were needed. Flood fight support at LD24 totaled 211 people.



Volunteers and crew worked over a period of seven different days, including two weekends, and together they filled 50,000 sandbags with two million pounds of sand.



Tom Quigley
volunteers.

Tom Quigley, who works in Engineering, was working a detail in operations that year. He oversaw the locks and dams and saw a great benefit to asking for district

“The beauty of volunteers is you have lawyers, working next to park rangers, engineers, technicians, and other district specialists. It really brought the people of the District together. Many of those who volunteered had never seen a lock.”

After the flood, recommendations were made that the District’s flood fighting efforts be contracted out. Quigley doesn’t believe this to be necessarily the best solution. He still encourages the idea of volunteers.

The locks and dams are strictly Corps structures, unlike levees, which have a combination of federal and private involvement, he explained. “It left a great feeling saving our own structures,” Quigley said.

“Everyone came out on weekends and during the week. It was one of the most gratifying experiences I’ve had in the Corps,” he added.

Sue Horneman remembers Tom Quigley asking for volunteers from Regulatory and the whole office went and sandbagged for several days.

Phyllis Thomas, IM librarian, volunteered to help sandbag on a weekend. Having sandbagged all day Saturday, she got home just in time to shower and dress for her evening bartending job, and after only a few hours of sleep, she returned to LD24 on Sunday.

Help also arrived from as far as Wappapello Lake, the District’s southern most project.

In the midst of all this it was time for LD24 to take their group picture. On the wall next to the Readiness Branch you’ll



Lock 25 became completely isolated when the Winfield Levee broke on July 3. Lock personnel had to get to work by boat.

see LD24’s group photo taken against a background of sandbags and rising water.

Lock and Dam 25

The rising water was on everyone’s mind. How high would it get, when and where?

All radios were tuned to stations giving updates on river stages and the crest’s progress.

As the river rose, sandbag walls had to keep up. The pace continued.

Sandbaggers would battle not just one crest, not two, not even three, but four crests.

LD25 faced the river waters shortly after LD24. LD25 faced a unique situation when the area levee broke and 25 quickly became an island.

The only way to get to it was by boat.

Quigley explained that sandbags had to be filled on the Illinois side of the river and then ferried over to the project.

An area ferry owner volunteered the use of his boat during this critical time.

The National Guard also flew in a diesel engine to pump water out of the basement in order to protect the switch gear.

Kaskaskia Lock and Dam

Most people know that the Mississippi and Missouri rivers flooded, but area tributaries were greatly impacted too.

Mark Twain Lake and its Clarence

Cannon Dam successfully protected the Upper Salt River from flooding but the lower Salt was backed up by the Mississippi.

This was also the case with the Kaskaskia River, which is home to Lake Shelbyville, Carlyle Lake and the Kaskaskia Lock and Dam.

Robert Lockhart, Lock and Dam operator and ranger at Kaskaskia Navigation Project, explained that they weren’t getting flooded from the top but from the Kaski getting backed up by the Mississippi. For a time the river was flowing backwards.

Kaski’s 1993 flood battle was a bit of a yo-yo. The lock was in and out of operation four times. It initially went out of operation on April 13 and was back up and running on April 19. It wasn’t too long before it closed again from May 7-23. The longest down time was from July 4 to August 28, although on August 26 they did start locking through during daylight hours only. The lock was closed one last time on Sept. 23 and reopened on Oct. 8.

It was indeed a bizarre flood that left 18 inches of mud along the lock walls, created one critical situation after another, evicted many area families from their homes and boasted mosquitoes, in the memorable words of Robert Lockhart, that were “so big they had



Boeing stamped under ‘em.”

Robert Lockhart contributed the following thoughts for this special edition of *Esprit*.

When I was much younger, I’d hear the old-timers talking about this or that “great flood.” They always mentioned having water “neck deep to a tall giraffe,” or they might point to a nearby building and say, “There was water up to the tops of those windows.” It all seemed so far away until the summer of 1993.

Having survived several floods over the years, the crew here at the Kaskaskia Navigation Project went into our normal, ‘batton down the hatches’ mode in the early summer of ‘93.

The sandbags were filled and placed where needed, and everything that was movable had been taken out of the main building and hauled uphill to the parking lot. All the forecasts were saying the same discouraging thing - “more water



Kaskaskia’s control house and dam appear to be in the middle of a lake.

curve ball like that. People were wading into the river up to their necks to place even more sandbags around the office building.

The lock looked like a brick building and a row of lights sticking out of a huge lake. The dam amounted to two huge gates, some steel I-beams, and a concrete walkway and handrail poking above the same lake.

And the water just kept coming up!

No one expected to need covers for the office windows so they needed to be produced in a hurry using several sheets of plywood, some all thread nuts, and several two-by-sixes.

1993 seemed like a great year to own stock in a company that made caulking; heck we needed enough here to keep three shifts working the entire summer.

We eventually had to resort to boats because the water was too deep to wade in, and it just kept coming up.

After a while the days just began to blur together: come to work, run boats here, refill gas tanks on these pumps or generators, go back, refill the gas cans, and run back out to refill more gas tanks. Then do it over and over again.

The evening news told the stories of this levee giving way, that town being flooded, that house floating down the river, and, of course, the crest finally

starting to slowly work its way down the Mississippi.

Kaski was lucky in one respect. We wound up with a fantastic crew, and everyone that spent the summer of ‘93 here can feel good about their part in the flood fight. They managed to save the project, its electrical and hydraulic systems, as well as its buildings. It wasn’t easy, but no one expected an easy time.

The things a person remembers about a time like the flood are strange.

Just a few of the of the hundreds are: huge mosquitoes; wading in our parking lot in chest waders; taking a boat to get from the levee, where we parked, to the ring of sandbags keeping water from the shop; cases and cases of 12oz. cans of water provided by Busch brewery; tractors and port-a-potties on top of piles of sandbags in the parking lot, with water almost topping the sandbags; walking from the shop over a set of stairs to cross the sandbags, along a row of picnic tables to a small work flat to get into the boats; finding a nest of rabbits in the sandbags behind the shop, and getting to work along the levee because the normal entrance was under seep water.

Oddly enough, the good memories outweigh the bad ones, or maybe time has just erased the worst ones.



Assistant Lockmaster Gary Buckholtz and Lock Operator Phil Skaggs work to secure the control house door

coming.”

It wasn’t long before we had topped all of our old crest marks and still more water was coming. Soon that summer went from a typical flood to our scrambling from one problem to the next.

The crew at Kaski included a few new people, and they received a real baptism of fire.

Just imagine your first summer at a new job, and Mother Nature throws a



Mel Price Lock and Dam faced its first flood fight during the very hot summer of 1993. The project had been built taking into consideration the flood of record, 1973. The possibility of river water topping the lock walls was never considered. **Tom Miller**, Mel Price Lock and Dam lockmaster, shares the unique story of Mel Price's first flood fight.

January of 1993 wasn't a typical January from the very start.

By Jan. 5, a time when the river is usually at low water, we had lifted the dam gates out of the water and gone to open river. The water remained fairly high for the rest of the winter.

By March 5, we were at open river again, but there was no way to anticipate what was to come.

On June 10, the river had crested for the fourth time as rains continued. Concern started to build among the crew at Melvin Price as we watched the weather patterns throughout the upper Midwest.

By the end of the month, we started preliminary plans for a flood fight.

It is important to note that Mel Price was a new facility with no previous flood experience. In fact, Mel Price was built with the then record flood of 1973 in mind. No one ever dreamed that the Mississippi River would top the lock walls here.



Mel Price lock personnel make their way along the main lock wall in wadders.

On July 2, the Coast Guard closed the river to all traffic except those vessels with special permission. The pool reading was 424.2, two feet higher than the previous record.

On July 10, Mel Price officially went out of operation. The river was 2 1/2 feet



The lock crew brave waist-deep floodwater to secure the control house at Mel Price Locks and Dam.

from coming over the top of the lock walls. It was raining and the river stage forecast looked ominous. We split the staff up into two 12-hour shifts and began working seven days a week. Within a couple of days the lock walls were under water, and we were going to and from work by johnboat.

There seemed to be no end as the river level kept rising. We continued our flood fighting efforts in the 100-degree heat. We built increasingly higher walls of sandbags and learned from and reacted to each new crisis as it happened.

We learned that spray insulation foam, the kind you can buy in a can, works very well as a watertight sealant. We sprayed it in construction joints on the lock wall to buy us an extra day to sandbag control cabinets before the water finally topped the walls. We also set up snow fence at different places to defuse the current so we could work in a safer manner.

As the water level kept rising, a call was made for help from the local population. A couple of groups showed up to help fill sandbags, but the heat was just too much for most people. At least one volunteer had to be evacuated by ambulance from heat exhaustion. In less than half a day, the crew of Mel Price was alone again.

By July 18, the rain had slowed down somewhat and we showed a crest of

436.2, three feet higher than the record crest of 1973. This was short lived, as a new wave of thunderstorms began moving across the upper Midwest. By July 30, the water was rising almost faster than we could deal with it, although our sandbagging efforts continued.

By this time most of the crew was used to spending the majority of their 12-, sometimes 16-, hour shifts working outside on the lock walls in chest deep water.

On Aug. 1, the final crest came as a welcome sight.

The river stage at Alton was 42.7, almost 22 feet above flood stage. As the Mississippi made its slow descent, efforts switched from flood fight to recovery and maintenance.

The lock had to get back into operation, and although the river remained closed to traffic, the lock was back in operation on Aug. 17. The river was reopened to commercial traffic on Aug. 22.

Every time I hear someone bashing government employees, I tell them the story of the 1993 flood. I tell them how 20 federal workers, working six weeks straight, seven days a week, at no less than 12 hours a day, saved a billion dollar civil works project paid for largely by tax dollars.

It usually takes the wind right out of their sails.



Emergency Operations

During any flood event it is very important that the Emergency Operating Center, (EOC) and Water Control work closely and that was the case during the '93 flood. Jake Scanlon remembers the flood well.



Jake Scanlon

When the EOC was first activated people would call specifically for him or Emmett Hahn. Jake and Emmett were trusted by many in the community but as it got busier the personnel that were helping to staff the EOC had to start screening the calls.

Staffers asked callers their questions and assisted first if possible. There was so much work to be done that individual staffers were given sole responsibility over certain things.

One employee tracked water levels and frequently updated the EOC's board with Water Control's numbers. Two others strictly handled requests for pumps and sandbags.

Everyone was working 14 to 16 hour days.



Mike Rector and Steve Farkas explained technical issues to concerned callers.

Jake said it was hard not being in the field and actually witnessing some of the flood events but he added that there was satisfaction in being able to help people when they called in.



Paul Kornberger, foreground, assists a caller in the EOC. Wally Feld, Linda Collins and John Wilkus (L to R) pictured in background.

Ten years later it's hard to remember all the stories but there are some that stand out.

It just blew Jake's mind when he heard what some National Guard soldiers had done up at Keach levee. The river water started to rush over the batter board and part of the wall broke. The soldiers, along with civilians, got into the water on the riverside and remained there until the wall was fixed.

And then there is Kaskaskia Island where there was the sand boil to end all sand boils. Mark Alvey called in from the field and said he just didn't know what more to do. Sand boils were popping up all over the place and they were starting to connect.

Jake said his first response was to tell him to get the hell out of there. A vortex was seen on the riverside where the water was funneling under the levee. Mark got in his truck and said to Jake "there it goes."

There was silence on the phone and Jake became very concerned. Another employee had to get on the line and tell Jake that Mark couldn't talk just then. It was a very emotional time and Jake felt for Mark and all those in the field. They had spent all that time trying to save the levee and it was devastating to lose it.

And no one can forget watching live television Aug. 1 and seeing the

Gummersheimer's farmhouse get washed away. The news stations ran the coverage repeatedly and Jake said it felt like a "big failure." People had done everything possible in the area. "You feel so bad because that's somebody's home."

There were humorous parts of working in the EOC too. Eager individuals called with their suggestions on how to tame the great Mississippi and alleviate all the floodwater.

One caller suggested drilling holes in the riverbed and letting the water drain out. Another offered up draining the pipelines that go to New Orleans and channeling water through them.

If anything is for certain there was never a dull moment during the height of the '93 flood and the EOC was a vital piece of the District's success.



NBC video cameras captured a dramatic moment as the floodwaters swept the Gummersheimers' farmhouse away.



Ron Dieckmann, hydraulic engineer, remembers

During the 1993 flood, I acted as the primary Hydrologic and Hydraulics technical person. I provided updates to field personnel, advised Emmett Hahn and his staff in the EOC and assisted the Media Center.

While covering for Gary Dyhouse in the Media Center, I was invited to do a live interview with KSDK-TV's 5 o'clock news.

I also helped Water Control by making flood forecasts for the lower Illinois River at locations not covered by the National Weather Service.

Even when I wasn't at the office working on the flood, the flood was still controlling my life.

My wife owned a craft store in historic Kimmswick, Mo. During big Mississippi River floods, the town has to be sandbagged for protection.

I spent considerable time either sandbagging or moving my wife's merchandise out of the shop. Everything had to be stored in our garage when we feared the temporary sandbag levee would not hold back record stages.

Luckily the levee held, saving the town from an estimated 10 feet of floodwater.



The Water Control personnel worked around the clock during the flood of '93. (L) David Busse (with back to camera), Laurie Busse, Claude Strauser (center) and Art Johnson.

Bill Groth retired from the St. Louis District in the late 90's having spent years in the Regulatory Branch, but he will always have a connection to those who fought the flood. During the flood, Bill was working the night shift in the EOC. He witnessed a whole different side of the flood often missed by those working during the day. Bill was kind enough to submit some of his most vivid memories.

The first thing I remember about the '93 flood was the day the operations center was activated for 24 hours. I believe the St. Louis gage was close to 35 feet and I told some of the folks in the office that we'd hit 50 feet. I don't know why. It was just a gut feeling, and I didn't miss it by much.

The floodwall at Maline Creek was one of the "biggie" events. We received a call sometime after midnight that the parking lots behind the floodwall were bulging and they needed someone from the Corps to come up and check it out.

No one seemed to be available to go, except Sue J. Summers (now Sue Horneman), wildlife biologist from Regulatory. She had just come back from her sector, Alton, Ill., and said that she would go. Finally, we got Ed Demsky to go with her.

In the meantime, we were calling every quarry in the area looking for stone. No one was open. Finally, stone came from the supply that Metropolitan St. Louis Sewer District (MSD) had. It seems we came rather close to losing the wall had it not been for all the stone dumped on the outside later that morning.

I also remember how difficult it was to "lie" to folks all up and down the river as to what was the stage forecast. The Corps almost always had a higher stage than the "official" forecast.

It got so bad that there were meetings at the Washington level to allow the Corps forecasts to be given out. I did hint whenever possible. In the long run, it may have been best, because if towns like Kimmswick and Ste. Genevieve had known our forecasts, they may have just given up the fight. As it was, they just kept working.

I remember calming many citizens, particularly those who sounded elderly. Some of them called every time they saw a pile of sand. I told them the levees were holding, and even if they did break, there would be some time to get out of the area. I always suggested that they pack a couple of suitcases and have them by the front door or in their car. One with clothes and the other with valuables that couldn't be replaced should flood waters damage them.

I remember having to call the DE in the middle of the night when there was a levee break and one of our trucks and driver "disappeared."



1993's record stage of 49.58 ft was just 2 feet shy of the top of the floodwall.

During the last week in July, I remember the tension and concern when the Lemay, Mo. propane tank farm's water levels got so high that the tanks were beginning to float. If they had broken loose, or the lines and valves had ruptured, there could have been a massive explosion.

I remember nightly calls from news media across the country and around the world. CNN seemed to call about the same time every night, and it was usually the same person. We got so we recognized the voice as soon as we answered the phone. I was even reconnected to an old friend from grade and high school when he called after hearing an interview I'd done. The Media Center did not work 24 hours so we had no alternative but to talk to the media.

One of the highlights though was the comradeship that was felt by most that were on the night shift. Maybe I'm a little prejudice but I think it was greater than during the day.



St. Louis Floodwall Threatened

By Ed Demsky

As the old saying goes “War is Hell,” and so was the flood of 1993. We were constantly fighting the enemy, the river, and we never knew what the river was going to do next. We had to be constantly on our guard so that the river did not overpower us or outsmart us.

The Geotechnical Branch’s involvement with the flood of 1993 started right after the Fourth of July holiday and lasted almost until the end of August. The whole branch was put on flood duty by the branch chief, George Postol, and this meant we would all work seven days a week, 12 hours a day for the duration of the flood.

The work hours were grueling but fighting the river was worse. Some battles we won and some we lost.

We had a large group of very dedicated employees in the branch that gave the flood battle their all. A large number of geotech’s employees (flood fighters) had never been involved in a flood fighting effort. We were baptized under fire.

During the height of the flood, we had about 30 flood fight teams in addition to the EOC team.

The geotech teams were charged with solving seepage and levee stability problems. EOC teams were to advise the locals, to provide them with flood fighting supplies, and administer the construction contracts.

Teams consisted of employees from geotech, structural engineering, project management, civil engineering and A/E.

Assistance also came from project offices, other districts, divisions, Army personnel and the Waterways Experiment Station.

My job consisted of giving the flood teams their instructions each morning, communicating information between the flood fight center and the flood fight teams, obtaining all the necessary equipment for the teams (cars, phones, boots, etc.), getting hotel rooms for the personnel from other districts, and trying



Seepage cascades over a ledge forming a small waterfall at the St. Louis Floodwall near Riverview. Three thousand acres of industrial and commercial development are protected by the St. Louis Flood Protection System.

to keep the hotels from kicking them out on the weekends when there were Cardinal baseball games. I also put together quantity and cost estimates for emergency repairs made by contractors.

Weeks were spent working 12-hour days, seven days a week. Everyone was exhausted and there was no end in sight.

On Thursday evening, July 22, about 10 p.m., I got a call from Ben Ventrella in the EOC wanting me to look at a sand boil by the St. Louis Floodwall near Riverview. Never having been involved with the St. Louis Floodwall, I had no idea where he wanted me to go, or how I would find it in the middle of the night. He said someone would go with me and when I arrived at the District Office, I met Susan Horneman and proceeded to Riverview to see the sand boil.



Engineers had to think fast to stop the rushing flood waters.

When we arrived at Riverview there were people all over the place. There were city of St. Louis workers: street department personnel, police, firemen and MSD personnel. The first person to approach me was the fire chief asking if people should be evacuated. I suggested we wait until I assessed the situation.

When I got near the floodwall to look at the sand boil I saw a geyser of water 18 inches in diameter shoot four feet up into the air. What a sand boil!

MSD personnel, the head of the street department and I met to decide on a plan of action. Dennis Siebel, the area engineer, was also at the site. He was in a johnboat investigating a whirlpool that had developed riverside of the flood.

Things were quickly getting worse. We decided to dump a truckload of sandbags on the geyser. A truck backed up and dumped sandbags that were swiftly blown away like confetti by the powerful geyser. A city employee who was standing there jumped on the geyser and was popped off. We clearly needed a new idea.

We decided to dump truck loads of large rock (football to basketball size) on the geyser to slow down the water flow and then dump six-inch minus (six-inch size rock down to powder size) rock on the geyser to shut it off — we hoped.



Logistically I was worried where all this rock was going to come from at midnight but within an hour the first truck of rock arrived. One truck after another dumped rock for four hours. Somewhere in the middle of this operation the mayor of St. Louis showed up to survey the situation. About 4 a.m., when 95 percent of the flow had been stopped, we had a second meeting.

A massive amount of rock had been placed against the floodwall and I began to fear that a nearby building might collapse, but work had to continue. A decision was made to place rock on the riverside of the floodwall to completely seal the water off.

The MSD guys wanted to stop placing rock and to drive sheet piles riverside of the floodwall. My gut feeling was to continue placing rock. I didn't want to stop what was working, but on further discussion, we decided to call George Postol to get his thoughts on the issue.

My goal had been to not call George in the middle of the night, because I had done this a few years ago at 2 a.m. on New Years Eve with a problem during the dewatering of Lock and Dam 25. But it looked like I could not achieve my goal and I called him. He agreed to drive the sheet piles.

Sue and I headed back to the District Office where I got my car and drove back to Riverview. George arrived



Tom Quigley contacts the District Office, via new technology, a cell phone.

shortly after me. We were the only two people at the site. Everybody else had cleared out. What we did not realize was the street department was in charge of placing rock and sandbags but the city's engineering department was in charge of placing sheet piles. So the rock placers left and the sheet pile placers were still sleeping.

George called the EOC to try to get a hold of the city's engineering department. Next he paced off an area where he wanted to build a dike around the area in case water started to flow again.

A number of phone calls were made and it was discovered that there were no sheet piles available, and if there were any, we could not get driving equipment in the area because of low power lines blocking the route of the equipment.

So it was back to placing rock, that is, if we could find someone.

An engineer from the city showed up about the same time as Jack Neimi, chief of project management for the Corps. A discussion ensued between Jack and the city engineer on who would pay for the placement of the additional rock. It was decided the city would pay.

About this time the press arrived. There was a young lady reporter that insisted that she wanted to see the crane that was going to show up but she also had to be somewhere else. I told her she could go there first and the crane would be here when she got back. Rock placement finally resumed. Hurrah!

George decided he was going to walk on top of the floodwall to get a better look at something, I don't know what. While he was up there a section of the floodwall shifted a couple of inches because of the foundation material that



A contractor drives sheet pile to initiate permanent repairs to the damaged floodwall.

had been removed by the water flowing under the wall that night. George almost fell into the river.

After that he decided that the void under the floodwall needed to be grouted shut. After about 36 hours on the job, I was finally able to go home, not to bed but to a graduation session at UMSL where my son was attending a summer program in science. This marked the end of another typical day of flood fighting.

Within a few days the rock was placed on the riverside of the floodwall, and the dike around the area was completed. The grouting under the floodwall was accomplished the next week. The water stopped flowing and the city of St. Louis was saved. And all of this because of one small sand boil — just a little bit more complicated than the Dutch boy that stuck his finger in a hole in a dike.



Service Base Remembers

It was an eerie feeling going to work at the Service Base during the '93 flood, according to Karen Bautsch, district training coordinator. "It was a pretty incredible experience knowing the river on the other side of the floodwall was way over your head."

Capt. Steve Jones, retired M/V Pathfinder captain, felt it was an incredible time too. "It was really quite unbelievable." Jones, who retired four years ago, saw a lot in his 30-year career. He saw the Mississippi River stage at St. Louis at minus 5 and close to 50.

The '93 flood brought everyone together, said Capt. Jim Pierce, Dredge Potter captain. "Everyone worked as one. Everyone cared."

The 12 person crew of the Dredge Potter, five person crew of the Pathfinder, and 18 permanent employees of the Service Base all worked together during '93.

The entire Corps fleet had been tied off for the flood duration. Because of the high water the fleet's electricity had to be cut from the Service Base. Dredge Potter was responsible for maintaining generators to provide power for itself and the other vessels.

Service Base personnel had to weight down the trestle in order to keep it from washing away. Water was up over the stairs and the access to the fleet that used to be via stairs through a closure, was now elevated above the floodwall.

The Motor Vessel Pathfinder was responsible for monitoring the fleet. If one were to break loose, the Pathfinder would mobilize immediately and recover the vessel. The crew was on call 24 hours a day.

They stayed on the boat most of the time aside from a daily visit to the Service Base. The crew had to be ready at a moment's notice should anything happen.

During the flood, maintenance was performed on both the fleet and the floodwall.



The crane trestle railings lie just below the surface of a flood swollen Mississippi. Thousands of pounds of scrap were placed in an effort to stabilize the wood structure and prevent further damage. See photo below.

River water was seeping under the floodwall closure gate creating a green slick where there are normally dry walkways.

The increasing height of flood water on the outside of the floodwall was seen daily by those at the Service Base.

Regardless of having confidence in the wall, it was still a concern. Jones recalls telling his wife to come get his car out of the parking lot when the floodwall began leaking in North County.

Sandbags and pumps were provided to the public at the Service Base and work crews were sent to Kaskaskia Lock and Dam and Lock and Dam 27.

Everyone was working 12 to 16 hour days, seven days a week, with no time off, Pierce said. The crews were sleeping on the dredge and the Pathfinder. Pierce's wife and kids had to come to St. Louis in order to have lunch with him.

"It was kinda like living in a night-

mare. You couldn't wake up from it," Pierce said.



The crane trestle towers high above your head during normal river stages.



Rob Davinroy, River Engineering, remembers

During the flood, we did helicopter recon on a regular basis. Mostly, we used private companies. I was able to log many hours up in choppers, video taping levee breaks, performing damage assessments, etc.

One particular week the U.S. Coast Guard volunteered to take Don Coleman and me up in one of their Black Hawk helicopters. Not knowing what we were getting ourselves into, we accepted the offer and met two young pilots at Parks Airfield.

The Black Hawk was a huge craft, with open doors on both sides — not what we had in mind. I was use to the comfort of the closed-door private choppers. With great reluctance, we boarded and took off.



Army Black Hawk similiar to the one Rob Davinroy and Don Coleman used.

One of our missions that day was to videotape a recent levee break, but we soon found out that unless we were willing to lean out or “dangle” off the exposed open compartment, we would not see anything.

Just about the time we realized we were not going to be able to use this craft for videotaping, we noticed that the two pilots were frantically operating the

controls. We heard the words “auto rotate” discussed back and forth between them, and then guessed we were in some sort of peril.

No sooner had we reached full accent, the pilots were bringing us straight down, and I mean straight down, no angle, no hovering, straight down. As Don and I dared to peer out or “lean” out of the Black Hawk, all we could see was water. The earth came fast, and the landing was a little “hard,” to say the least.

We realized that by a miracle we were on dry land, the pilots had luckily found an isolated patch of land on the end of the runway at St. Charles Airport. As we got out of the chopper, we thanked the two pilots, but as we walked away, Don and I vowed that we would avoid Black Hawk helicopters in the future.

*Forever in My Heart
Memories of the Flood of 1993
By Debbie Miller*

It wasn't enough to see it on the news or hear about it on the radio. I wanted my four daughters to get involved and know what it was like to help those in need. So what better thing to do on a lazy, hazy summer day than to help save a few homes from being consumed by flood waters.

I had listened to the radio that morning and heard that sandbaggers were needed on Bamgartner/Old Baumgartner Road near Lemay Ferry not far from where we lived. I promised the girls a movie if they would agree to sandbag for a couple hours.

Erika, my youngest, was only 7 years old and had recently broken her elbow in a gymnastics accident. She had two pins keeping her elbow together. Her sisters Lauren, Cristy and Jennifer agreed to help Erika, so off we went.

It was 95 degrees that day, humidity close to 95 percent and when we arrived at the site, the stench of sewage and dead fish was unbelievable. Never had I imagined it would be so bad! Once again I reiterated to the girls only two

hours of work and then we'd get cleaned up and take in a matinee.

Time flew by and before we knew it we were going on four hours. We were hot and tired and filthy. As promised, we got cleaned up and went to the movies. Unfortunately, we had worked to no avail as a few days later we heard the three homes we were hoping to save were overtaken by floodwaters of the Meramec River.



Erika's mom and sister help her maneuver a 25-pound sandbag.

A few weeks later a friend phoned us and said she had seen our picture in the St. Louis Homes & Gardens Magazine. One thing led to another and the freelance photographer who snapped our picture while we were sandbagging contacted us.

We became instant friends. One and a half years later, Erika, who was now 9 years old, was diagnosed with leukemia. The photographer enlarged the flood picture to 4' x 6' and presented it to us one night while at Children's Hospital.

During Erika's two-year battle with leukemia, the photographer agreed to cover Erika's treatment on film. Unfortunately, he was also there with his camera at Erika's funeral; she died January 3, 1997 from a secondary leukemia.

Ten years later and six years after Erika's death, I still remember that hot summer day, and as I drive past those three homes which have since been rebuilt, I smile and think of how proud I was of my four daughters for lending a hand and hopefully becoming stronger people because of it.

Editor's Note: Debbie Miller is married to Fred Miller, ED-P. She works for The Leukemia and Lymphoma Society. The Flood of '93 not only impacted Corps employees but their families too. Her contribution to this special edition of Esprit is in memory of her daughter Erika, their "family angel."



River Des Peres

Dennis Stephens, chief of hydrologic engineering, had just returned home from a week with the Explorers at Swift Explorer Camp, Saturday, July 10, 1993, when his wife told him he needed to call work immediately. St. Louis city and county were asking questions about the availability of a model for the River Des Peres Basin.

Stephens arrived at work early Sunday and began to retrieve the models and prepare "what if" maps for the River Des Peres at different St. Louis river stages. Two days later Stephens was flood fighting with Don Fender, the River Des Peres sector engineer.

Stephens' family also assisted during the flood. He remembers his son working till 3 o'clock in the morning July 17 helping to raise the levee between Monsanto and the Lemay Pumping Plant. The Mississippi River was rising and they had to be sure the levee was high enough.

The key to the River Des Peres project, according to Stephens, was the people who worked it during the flood - the city, MSD and volunteers. The flood called for innovative thinking. Not everything they tried worked, but everyone worked together and shared in the successes and failures.



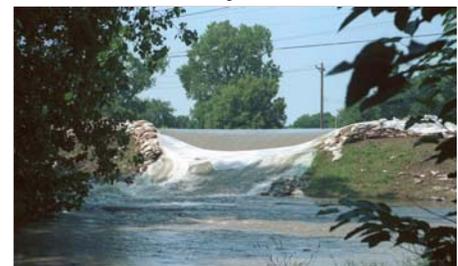
Backwater flooding has claimed a large area along the River Des Peres. Northbound Broadway just disappears into the Mississippi. Lemay Bank rests behind a wall of sandbags and it will be a long time before there's another baseball game.



The Germania levee broke on July 20. Water blew out the sandbag levee and local residents, some still in business attire, created a human wall and closed the failure. Apparently when the sandbaggers could not stop the water, they stooped down using their bodies to slow up the water, placing sandbags between them and the river. This worked and the closure was successful.



The city had no stockpile of sandbags and material. Sandbags being used between Morganford and Gravois were stolen on July 20.



The sandbag levee failed between Alabama and Virginia Streets.



Brian Kleber, PM-N, started off his remembrance of 1993 with a few simple words that actually say a lot. HOT...LONG DAYS...MUGGY ...HUMID...and did I mention LONG DAYS. Here is the way he remembers it.

The 1993 flood was a time when the District really pulled together. It was a time of can do and cutting through the red tape as quickly as possible although you can never fully eliminate the red tape.

We watched on TV as people's homes were washed away by floodwaters, and we wanted to make sure it did not happen on our watch and in our area.

My area was the east side levees between Alton, Ill. and East St. Louis. My partner was Janet Ulivi. Our job was to patrol the levees and report anything that needed to be looked at by the experts. We coordinated our findings with the area and sector engineers and the Geotech engineers.

We saw sand boils and other seepage problems at Chain of Rocks. While our immediate challenge was to stop

the problems from progressing further, eventually we would develop the Chain of Rocks Deficiency Correction project. We also saw a major failure at a closure structure in East Alton, which in later months also led to a deficiency correction study for the Wood River Levee.

But most of all, we saw the communities working with us to combat these problems.

After the flood receded, I was involved in repairs done to the non-Federal levees (PL 84-99) in Missouri from St. Louis to the Salt River. Mike Rector's shop was a key player in defining the damages and scoping out repairs.

I met with many levee boards, and we were usually able to work out a plan where they did part of the work and we did part. In this way, repair costs were shared.

We had a common purpose. We kept our customers - the people who had suffered most from this disaster of 1993 —uppermost in our minds. It was a very rewarding period with much satisfaction from our accomplishments.

Wood River Levee District

Editor's Note: What I've discovered in compiling these '93 flood stories is that a lot of these memories are snapshots in time. There's not a lot of detail outside of a line or two but the story is still there. Many of Sue Horneman's memories regarding the flood are such snapshots.

Sue was one of the first Corps employees to arrive at the St. Louis Floodwall when the call came in that something was wrong. "It was like a war zone," she said. There was lots of noise and commotion. Big trucks were backing up and the night was pierced with their loud "beep-beeps." She remembers watching firefighters walking along the top of the wall, dumping sand bags onto the river side, taking a quick cigarette break, and then returning to the ledge.

During the flood, Sue worked on her flood team in Wood River, which includes the city of Alton. Sue remembers as the flood progressed pressure built up under the streets and popped up sidewalk concrete slabs.

There was a phone booth out in the middle of a pool of water and all you could see was the blue top stating "Telephone." She thought to herself that the phone probably still worked.

And in the midst of the flooding she remembers that the casino stayed open. People would park up on high ground and shuttles would pick them up and drive down to a special ramp that had been constructed to maintain access to the casino.

She also remembers the prisoners that were sent to help. Sue remembers the prisoners were just happy to be out and it was so quiet. All you could hear was the sound of sand being shoveled into the bags, she said.

Because of the flood's duration, soil everywhere was getting soggy. Sue remembers telling local business owners not to pump out their basements because the pressure might collapse the walls. Against her advice, many continued, and some paid with collapsed basements.



Count the bags in this photo and multiply the result by 25 to get the number of pounds of sand. A wall stands as a single example of the tremendous effort involved in fighting floods. This scene was repeated over and over again all along the flood's path.



Sue also remembers walking on top of a levee with the fire marshal and sinking up to her knees in the saturated levee. The fire marshal plucked her out of the ground and set her on her feet saying "Sue, if you're going to be in charge then you are going to have to stay 'on top' of things."

These are some of Sue's snapshots but her most memorable story will be recounted here and like most of the flood stories it all began with a sand boil.

The people living along the Wood River Levee were getting very tired as the flood fight dragged on. People were weary and anxious.

Sue Horneman had shown many local volunteers how to inspect levees. At night they would come out and walk the levees with her looking for problem areas. The helpfulness of the people and the volunteer assistance is still awesome to Sue, even today, a decade later.

A call came in one night that a sand boil had been sighted along the Wood River Levee. Sue went out to investigate and did in fact find a few sand boils popping up. She called into the EOC and they told her that it wasn't a problem. It was something to be expected with the flood's duration, and that a sand bag ring needed to be built around the boil.

Sue checked in with the levee commissioner and it was agreed that with everyone very concerned at the time the best thing to do would be to keep things "low key." Sue called the levee district and requested some sandbags and four men to help stack them. Next thing she knew two convoys of National Guard soldiers showed up and truckloads of sand bags.

"Ma'am, what do you want us to do," the eager soldiers asked a flabbergasted Sue?

"Well first of all you can stop calling me ma'am."

Their response: "Yes, ma'am."

It was probably a sign of things to come. In fact the "low key" operation Sue was hoping for would quickly become something much bigger, so much bigger that people across the river



Alton Belle Casino invented creative ways to accommodate their patrons and was able to remain open during the entire flood.

would wonder what was going on.

Sue instructed the soldiers on how to build the sand bag barrier and the work began. It soon became evident that the sand bags weren't really doing the trick. She called back to the EOC and was instructed to build a ring levee around all the little sand boils in an effort to equalize the pressure.

Sue called the levee district and explained what needed to be done. "Well, so do you need rock because we've got LOTS of rock?" asked the eager district. "I'm not really sure," said Sue. Not too long after, several trucks arrived full of rock and they proceeded immediately to build a road so the trucks would have access down the side of the levee.

It was getting dark and Sue's "low key" operation needed more light. She called the levee district and requested some flashlights.

Before she knew what was happening in came the equivalent of stadium lights that illuminated the area so brightly they generated calls from across the river wondering what was going on.

As the calls came in, the road was being built and dozens of soldiers threw sand bags, up drove the levee manager in

his Winnebago. With a gleam in his eye and an eager heart he said that it was the "command center."

Without even being asked, or knowing who he was, a man came out with flares and closed off the adjacent road.

The great thing about the flood was that everyone was eager to do what they could and if you needed rock or sand bags then you were most likely going to get a lot of them.

Gary Lee, the area engineer, showed up the next morning and cried out when he saw Sue's "low key" operation, "My God! What happened?"

The words, tears and laughter poured out from Sue and feeling a bit left out, Gary sheepishly said, "All the fun stuff happens at night."



A setting sun marks the beginning of another night's flooding in Alton, Ill.



Columbia Bottoms

Editor's Note: During the Flood of 1993 Keith A. McMullen and Karl Tilkens worked along the Prairie du Pont, Fish Lake and Columbia Levee districts respectively from July 8 to Aug. 21. Following the flood they wrote a report based on their experiences. The following are excerpts from that report.

On July 8, 1993 the St. Louis District Corps of Engineers officially began the great flood fight of 1993.

Record amounts of rainfall on top of a very wet spring caused rivers to overflow their banks. Floodplain farmland had already accumulated enough moisture to last the entire summer, so the saturation point had already been reached.

As the Mississippi River continued to rise the floodplain areas began to see more seep water. More pressure and stress was placed on the levees protecting homes and farmland from the mighty Mississippi River.

The Corps of Engineers began to see many problems arise: sand boils, slides, soft spots, low spots, pump station problems, just to name a few. Within days everyone had been trained in how to set up a levee of sandbags in case the need would arise.

Water coming out of the relief wells was very clear, a good sign that they were doing their job, but this was a constant topic of concern for many locals and levee district personnel.

With all the water coming out of the relief wells and flooding more cropland, many seemed to think that relief wells were bad.

Hydraulic engineers had to explain to them the importance the wells had in relation to the levee, in that they were allowing the stress and pressure to be lessened, thus keeping the integrity of the levee intact a while longer.

The continued presence of floodwater was causing added stress not only to local levees but also to trees and crops located within the floodplain.

Cornfields became lakes. Areas where the water had flooded the crops could be

easily identified as time went on. The crops closest to the seepwater turned a light green first and then progressed to a deathly yellow as more and more acres of cropland succumbed to the flood.

On July 31 matters began to get worse. The river was still on the rise, rain was predicted and a terrible thunderstorm was brewing. Around noon that day the indication that the Columbia levee would not hold was evidenced.

You could hear water running underneath the rock that had been placed on top of the levee. The toe of the levee was very soft and things did not look good. George Postal said that we did not have much time.

The other bad spot actually had water eroding away the rock. Sandbags were thrown into the hole created, but it really seemed that a matter of hours were all that was left.

One could easily see that the Columbia levee was no longer a challenge for the mighty Mississippi. Water was overtopping in many places and was pooling on the track.

I stood just south of "Luhr's Landing" at approximately 8 a.m. on Aug. 1.

Water was pouring over the top of the levee and dropping down over the country road. Rock and soil was being eroded away.

I was safety conscious enough to be wearing my life jacket; however, I realized quickly, that the safest place was to be on top of the bluff. I was able to drive safely out of the area, despite going through approximately three feet of water just east of Virgil Gummersheimer's farm.

Before 9 a.m. on Aug. 1, the levee had finally succumbed to the mighty thrashing of the Mississippi River. Near Virgil Gummersheimer's farm the levee had breached and water began rushing in.



Thousands watched helplessly as NBC cameras recorded the raging torrent.

The two weeks prior to the breach at Columbia were very stressful. Everyone was tired and not all the information was available to us all the time for one reason or another, mostly because things happened so fast.

The amazing thing about the flood that differs from most natural disasters is the duration of the event. Days, weeks then months and nothing seemed to change. It is no surprise that all personnel associated with the flood were under such a great deal of stress.

Teamwork was a key factor in the Corps of Engineers fight against the perils of Mother Nature. Everyone who played a part came together with their neighbor in order to get a job done faster and with less chance for failure. In reflection, it was this teamwork that carried everyone through to the next day. It was a dangerous tour of duty. Fact is every day Corps employees placed their lives at risk in order to do their job.

Support from Dave Mueller, sector engineer, was excellent. He corrected Mayor Simmons several times stating that Karl and I were the experts and that he had the highest confidence in our abilities. This is one chance for Karl and I to personally thank Dave and all his staff for all of their support and for continually relying on our abilities throughout the flood event, through the good times and the bad.



A small flow soon became a torrent.



“Water is lazy and it will find the easiest route,” explained Pat Conroy, geotechnical foundations. He visited Public Affairs recently to provide background information for this ‘93 flood issue but our conversation quickly became an education on the geotechnical branch, levees, seepage, sand boils and how all that interplayed during the flood.



Pat Conroy

Under and through seepage is normal, anticipated, expected and planned for with levee construction, Conroy explained. But it is important to note that none of our levees had been constructed with the intent of being under water for months at a time.

Sand boils are often a part of flood fighting and they do signal a critical juncture. Usually they start out as pin boils with just a nub of water sputtering out. As the flow of water increases, momentum builds and the water begins to carry sand to the surface creating what looks like a volcano.

Sand boils will often pop up in strange configurations. Matt Hunn witnessed this while flood fighting at Prairie du Rocher.

Hunn became perplexed as several sand boils popped up at equal intervals and in a straight line. A local farmer was able to tell him that a fence use to be there but had been pulled out. Water being “lazy” had looked for and found the path of least resistance.

A lot of great insight and information came from the locals, and Conroy came to depend on this while working the Illinois side during ‘93.

People living behind levees such as Columbia, Harrisonville, Stringtown #4, Fort Chartres and Ivy Landing, and Prairie du Rocher, have lived on that land for generations, Conroy said. He came to depend on their knowledge of the land and historic trouble spots. Pat would ask

the townspeople where to start looking when he arrived in a new area

Being out in the “country” had its challenges. Conroy is a self-confessed “city boy” and on top of that he is colorblind.

While working the Fort Chartres and Ivy Landing Drainage District, Conroy remembers Gilbert Dinan, board of commissioners chairman, trying to point out something in the distance.

“Now, do you see where that timothy meets the elderberry?” Dinan asked. Conroy gazed off into the horizon perplexed and unable to tell. Changing his tactic Dinan pointed out the colors of each, but Conroy remained confused.

Dinan began to lose his patience. Conroy sheepishly had to explain that he is a city boy, born in the city, always lived in the city. He couldn’t distinguish the difference between the timothy or the elderberry, not to mention the color of either because of his colorblindness.

Conroy recalls Dinan looking at him with a look of “disgust and pity” and said, “NOW, do you see those two white birds over there?” “Yes,” Conroy cheered! “I can see the two white birds.”

Flood fighters had to find many different ways to communicate.

Conroy also remembers working alongside one of the summer co-op students named Patrick Kuhne at the Harrisonville levee. Kuhne came in one morning looking awful and Conroy asked if he was feeling all right, wondering if he’d been out drinking. Kuhne explained that he hadn’t been out drinking. In fact he’d gone to bed early only to have nightmares about sleeping next to a sand

boil. When Kuhne awoke he was exhausted and practically hanging off the side of the bed.

As the 1993 flood rose above the 1973 levels, a 30-year flood, Conroy recalls wanting to see the 100-year flood. His earlier, self confessed “machismo attitude” quickly retreated as under and through seepage problems began to increase, and he saw the worried faces of those living behind the levees.

Conroy would see a 100-year flood in 1993. In fact he would see an even greater flood.

By today’s computations, 1993 was a 175-year flood, said Dennis Stephens, chief of hydrologic engineering. At the peak 1.08 million cubic feet of water was flowing past St. Louis per second.

Most of the levees south of St. Louis are 50-year flood protection and were never intended to hold back that amount of water.



Levees are designed to hold floodwaters at bay for a limited amount of time. In 1993, there was too much water for too long.

“The fact that so many levees survived as long as they did is a real testament,” Conroy said.

“With a lot of hard work the levees were able to withstand higher levels than they were ever designed for,” he added.

There were definitely lessons learned during ‘93. In Geotech they have addressed subtle shortcomings revealed during ‘93 and designs have been tightened up.

“None of us want to see a design flood again,” Conroy said.

Neither do we.



Richard “Bucket” Hagan inspects a sandboil ring levee



Praire du Rocher Saved!

The field during the '93 flood was every bit a combat field. People, property and livelihoods were at stake and individuals were working to the point of exhaustion. Flood fighters got little sleep, often operated on adrenaline and usually couldn't remember the last time they ate.

For the St. Louis District the flood of '93 was "our war." There were no guns or bombs but there



Matt Hunn

was a persistent and unyielding foe - the river waters. Certain steps can be taken to manage the river but we can never control it.

The summer of '93 was filled with a lot of sweat, tears, and even sometimes blood. Situations at some of the levee districts got very dangerous and volatile. Everyone wanted to do what they could to save the levee but sometimes the need to save lives and get people out of a dangerous area was the priority. Defeat was never easy to handle.

Triumphs were also a part of '93. On the Illinois River, Keach Levee survived while the river waters overcame the four surrounding levees. And Prairie du Rocher was saved when it seemed all was lost.

Right before Corps employees were heading off to enjoy their Fourth of July holiday, George Postol gathered together his geotechnical employees and prepared them for what was to come.

The following Monday, the force was mobilized and left for the field.

Matt Hunn, geotech engineer, and Greg Bertoglio, civil engineer, spent the first week patrolling several levee districts among them Columbia, Harrisonville and Prairie du Rocher.

It was soon evident that it was an area too big for them to handle together daily. Efforts were split and Hunn spent his time assisting the Prairie du Rocher Drainage and Levee District (D&LD).

For him it would be a very exhausting, passion-filled experience. For Hunn it would be his war.

Hunn and the people of Prairie du



Volunteers and National Guard soldiers worked long hours shoulder to shoulder at Prairie du Rocher.

Rocher had been sand bagging for weeks. On July 22 the Kaskaskia Island D&LD breached taking some of the pressure off of the Illinois side but not enough.

August 1, 8:30 a.m., the Columbia D&LD levee began to overtop. The southern part of the riverfront levee breached and by 9 a.m. there were several locations being overtopped. Approximately 14 thousand acres were flooded and by 11:30 p.m. the north flank levee of Fountain Creek breached and cascading river water began to inundate the Harrisonville D&LD.

A plan had to be established quickly.

Prairie du Rocher was the next levee district in line and it was feared they would be next. George Postol and Claude Strauser arrived at Prairie du Rocher Aug. 2. There was a plan, a plan that had never been done before.

A deliberate breach would be made in the lower flank of Stringtown-Ft. Chartres so that the area would begin to fill from the bottom and counteract the rushing water from the north.

The levee had to be breached in a particular area to prevent the river from reclaiming its former course.

A controlled breach was attempted on Aug. 3. As water flowed into the lower flank of the Stringtown-Ft. Chartres levee district, the people of Prairie du Rocher continued to sandbag.

For over a month National Guard soldiers, citizens and volunteers had worked shoulder to shoulder sandbagging

at Prairie du Rocher. All those long hours fighting the rising flood waters would not be in vain. Thanks to the Stringtown-Ft. Chartres breach, pressure was eased off Prairie du Rocher and the levee was not overtopped.

The Corps' unconventional solution worked.

Emotions would not be that high again as the Mississippi River began to lower. The flood's crest was on its way to New Orleans.

Although the crest was gone the hard work was not over. Communities had to recover and levees had to be repaired. Corps employees continued to work long hours alongside the flood victims.

Levee repairs were critical. The threat of possible spring flooding hurried efforts to restore minimum flood protection to the area.

The Flood of '93 would be fought well into the new year.



Hunn shoulders sand bags with the National Guard troops



The Fight for Kaskaskia Island

The Great Flood of 1993 definitely took front-page news but for the District there was an untold story.

When the year began there were many changes on the horizon. The District was set to restructure; the Corps of Engineers Financial Management System (CEFMS), the Resource Management System (RMS) and the Real Estate Management Information System (REMIS) were being implemented, and in order to meet the District's Full-Time Equivalent (FTE) ceiling the District was allowing 50 to 88 people separation or early retirement.

Seventy plus people left active employment in the District on Sept. 17 and about 10 others applied and were accepted for Voluntary Early Retirement Authority (VERA)/Voluntary Separation Incentive (VSI).

It was a time of great change and in the midst of this, one of the nation's greatest natural disasters was taking place.

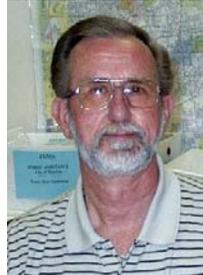
Charlie Dees took the early retirement option and retired from the Corps of Engineers in September 1993.

He started with the St. Louis District in construction at Rend Lake March 1966. He went on to work at Mark Twain Lake in 1973, Lock and Dam 27 in 1974 and returned to Rend Lake in a management position in 1975.

During his career, Charlie assisted with Hurricanes Hugo and Andrew. Since leaving the Corps he has been a reservist with FEMA: "A good fit," he said.

In June 2001, Houston, Texas had a bad flood and he was sent in as a special assistant.

Charlie explained that as a reservist you can say no "but when it gets in your blood, you get the call and you want to go." Charlie has now been in Houston for two years.



Charlie Dees

Charlie Dees still remembers the '93 flood.

"The river water was high early in the year," he said. Many realized that the flood would be big and would most likely set a new record.

Charlie worked three major areas during '93: Ste. Genevieve, Kaskaskia Island and Bois Brule. Kaskaskia Island was a unique situation because they were using push boats and barges to ferry back and forth.

There were a few sand boils inside the Kaskaskia Island levee but there was one particular boil that was proving resilient.

Crews had sandbagged it numerous times.

Charlie left Kaski Island early the morning of July 22. A fresh ring of sand bags circled the stubborn sand boil and he believed things were under control. He went back to his room, quickly showered and shaved, and headed back to the field. On the way a phone call came in "the boil was erupting something fierce." He told the crew they needed to get out.

Charlie arrived at the levee and was walking along inspecting when he saw a crack. They got in their truck and started backing up. Right in front of them, "I saw the seepage berm lift up and a chunk of levee got washed away by the river." A big gush of muddy river water started to cover the island.

Charlie went up into a helicopter to survey the area and look for homeowners. He remembers setting down and instructing a couple to get to the levee because the water was coming. Once the helicopter landed there were microphones in his face.

For two days and two nights he would have no sleep.

It is an experience he will never forget. A site he witnessed twice and hopes to never see again. You see Charlie Dees began his flood fighting days in 1973 and was at Kaskaskia Island in '73 when it breached. "I can still vividly see it. It was a very scary moment, very similar to what had happened in '93."



Mark Alvey, far right, assists the heroic attempt to ring a huge sand boil, that was "erupting something fierce," at Kaskaskia Island. Moments later, the levee breached and the same Corps employees would be involved in evacuating the island. Kaskaskia Island, an already small community, was made even smaller following the flood as some farmers choose not to return.



Close Call at Bois Brule

Editor's Note: The 1993 flood was made up of many memorable, sometimes heart-stopping moments.

The Gummersheimer's farmhouse getting washed away on live TV is probably one of the most memorable. But there is another story that I'm sure every district employee heard at least once during '93.

It is the story of a Corps employee and his truck getting washed off the Bois Brule levee when it breached. The story probably got told a number of different ways in the weeks following, and it accumulated more than a few embellishments with each retelling.

But only those who were there can really tell us what actually happened. And maybe after ten years, even their memories are fading, or maybe in fact, it feels just like yesterday.

With the help of three men who were there, here is that story. It is the story of Harold Smith getting washed off the Bois Brule levee at 2:30 a.m. July 25 and living to tell about it.

Harold Smith was a maintenance worker at Rend Lake for almost 30 years. He retired from the Corps six years ago this September and continues to work part-time as a school bus driver.



Harold Smith operated heavy equipment for Rend Lake



A daytime view of the Bois Brule levee breach where Harold Smith and his Corps vehicle were pulled into the Mississippi River.

Working for the Corps suited him. "If I'd been told as a youth to create the perfect job I just never could have come up with such a good place to work as the Corps," he said. "The Corps has always felt like a big family."

It would be a member of that "big family" who would rescue Harold from the Bois Brule levee and sped him to the hospital.

Harold was no stranger to flood fighting when the '93 flood began. He had been a member of a flood fight team for twenty years. The close call at Bois Brule would end his flood fighting days. When he arrived home from the hospital, his wife informed him in no uncertain terms that his levee inspecting days were over.

Harold and Richard "Bucket" Hagan had been friends for years and were both working the same sector during '93.

Together, with many others, they provided support to Ste. Genevieve, Kaskaskia Island and Bois Brule.

Bucket was literally at home working the Bois Brule Levee. It was his hometown area and he was very familiar with the local roads and cutoffs, a familiarity that would pay off, maybe even help save Harold's life.

During the flood, the St. Louis District received help from other district and division offices. An example of that assistance was Ken Klaus who flew in from Vicksburg District for a ten day TDY.

Harold met Ken at the airport and drove him to the hotel. Ken accidentally left his camera and boots in the truck. He didn't sweat it figuring he would pick them up later. Little did he know they would soon be submerged in the mighty Mississippi.

Ken spent July 24 with Bucket and Mark Alvey, and they discussed the plan to put a rock dike in to reduce seepage at Bois Brule.

Kaskaskia Island Levee had breached on July 22 and no one wanted to see the same thing happen to Bois Brule. Bois Brule had a large sand boil located at its base and everyone was worried.

Having worked close to a 14-hour day, Bucket and Ken returned to their hotel. A call came in shortly after midnight, so soon after laying down that Ken felt as if his head simply bounced off the pillow. Both men got dressed and headed out. There was a problem. There was a bad sand boil and they needed to come quickly.



Bucket Hagan found Harold Smith's Corps vehicle one mile from the breach, Spring 1994. Until recently it sat at the Service Base as a reminder of '93.

Harold was working the nightshift, inspecting a different sand boil. He soon realized his sand boil was in pretty bad shape too. Off in the distance he could hear the sound of running water — a sound you don't want to hear when fighting a flood. Harold walked back up the levee and got in his truck with the intention of finding the leak.

Bucket and Ken had arrived at the sand boil and after working on it for awhile, some locals came running up, shouting that a section of the levee had broke and a Corps employee was lost in the break.



2003 photo of Richard "Bucket" Hagan taken in recognition of his recent life saving efforts at Lock 24.

Bucket had been present when Kaski had breached. He calculated how the water might flow and quickly pulled off the main road and used the back roads to get near the supposed breach site.

Once he and Ken were close, Bucket stopped the truck. They could see the creeping water, but they couldn't see anyone. Bucket blasted the horn a few times and flashed the lights and then grew still. Off in the distance he could see something. A man was holding onto the levee. It probably wasn't a good idea to venture below a levee break Ken pointed out, but Bucket rushed out of the truck to get his "buddy."

Harold lay shivering on the side of the levee. He had a bad cut on his leg and looked as though he'd been "beaten for a week," according to Bucket.

The river water had swept him back and forth like a twig over the distance of a quarter mile. It was the water's power that possibly saved Harold's life. He had just gotten into the cab of his truck to go check out the leak when the levee broke beneath him. The truck was flipped almost straight up and fell to its side.

Water had rushed through the truck's open windows. Its force basically popped Harold out of the truck. Fortunately he had just gotten in, so he didn't have his seatbelt on.

For a moment he lost consciousness and resigned himself to his fate, but moments later he realized he was alive and he was swimming with all his might against the current. On one of the whips of the horseshoe-like current Harold was able to grab onto and climb up the levee side. But he was unable to stand.

Bucket ran to Harold's side and wrapped him up. They headed back to the truck while the breach was growing around them. The truck radio and phone were ringing off the hook. People needed to know what was going on; what did they need to do; how much time did they have to get out of the area.

Bucket and Ken rushed Harold to the hospital where he was checked into the ICU. He remained under intensive care for 24 hours and spent another four days in the hospital.

Considering what he'd been through he was very lucky.

Harold is quick to give the "Good Lord" all the credit for his being here today. He recounted this story in June 2003 and said that, especially at this time of year, it feels like it was just yesterday.

Bucket said it was like waking up in a nightmare. "Adrenaline was pumping BIG time, and had we not left when we did we would have gotten washed away."

On Easter Sunday of 1994 Bucket recovered Harold's truck just about a mile below the breach. It seemed a strange chain of events that allowed him to recover the truck, the driver of which he had helped rescue. The memories came rushing back and it felt as if it had just happened yesterday.

Ken's boots and camera are still missing.



The breach at Bois Brule levee



Illinois River Flood Fight

Joe Kellett, currently the Deputy District Engineer for Planning, Programs and Project Management, was a sector engineer on the Illinois River working the Keach Levee and Drainage District during the '93 flood.



Spring flooding proved only the beginning. All too soon Joe Kellett (R to L), Stan Ebersohl and John Helfrich would return to fight summer's record flood.

Many of Joe's memories are snapshots of the Corps serving the nation during one of the greatest natural disasters. Here are just a few.

Watching Bill Gidcomb reassure a National Guardsman who could not swim, that the safest place for him was on top of the levee. If the levee broke, Bill reasoned, everyone could walk out along the top the levee. According to Bill, "The only unsafe place on the levee is the break. So don't stand there."

Seeing Glen McCabe use his carpentry skills on the flood fence with a squad of National



Glen McCabe

Guardsmen in tow. He tried to teach them accelerated lessons in carpentry but spent most of his time pulling out bent nails.

Listening to Mike Kruckeberg give lessons to a group of National Guard soldiers on the proper way to shore up a soft levee area with a picket fence and sandbags.

Hearing the police pounding on Stan Ebersohl's hotel room door at 3 a.m. and seeing Stan and the police drive away with the lights flashing and sirens howling. He later phoned to tell us the police had taken him to the Nutwood Levee, which was overtopping.

Calling the "War Room" for help from Marge Robbins, Mike Rector or Dennis Fenske, who were always calm, dependable, and fast. They made sure we had whatever we needed to fight the flood — bags, sand, rock, pumps, boats, barges, and even divers.

Receiving a lot of great advice from Jake Scanlon on flood fighting the Illinois River along with a lot of lousy jokes and a couple of good stories. He knew every weakness on every levee and was the right person to consult in every situation.

Getting water for a red-faced, overheated Ed Riiff after he walked seven miles of levee in 90-degree heat to check flood fence and sandbag elevations.

Marveling at Jeff Stamper as he did a structural design analysis of flood fencing on the back of a plastic foam lunch plate. The flood fencing was haphazardly hammered together by volunteers. Jeff found the weaknesses and designed a fix with scrap lumber and sandbags that held even when we raised the fence beyond the designed height.

Watching in curiosity as Tom Niedernhofer devised a braking system for a pump that was wildly spinning backwards out of control and pumping floodwater into Keach. Tom placed 4 x 4 timbers on either side of the pump shaft, lashed them together, and pulled the lashing tight until the pump slowed enough for a diver to safely block off the intake pipe.

Phoning Ray Kopski every morning, afternoon, and evening to get the "real" river forecast. Everybody including farmers, volunteers, and National Guard soldiers gathered around the phone when I called Ray. He always gave the right information and could answer all our questions. Ray's expertise was confirmed when the official forecast stated

that the Illinois River had crested. In fact the River would crest more than a week later.

Ray figured out that the forecasters were using river stages from a gage located directly across from a levee that had broken. This caused the gage to give erroneously low readings. Ray got us the right info. While others lost a lot of ground because they stopped working, we were back to work long before the official forecast was corrected.

Walking behind Tom Niedernhofer in the dinner line at the Red Cross Center. He had three plates full of food and two marriage proposals by the time he reached the end of the line. A good portion of his flood experience was dodging levee commissioners with eligible daughters.



Tom Niedernhofer and Mike Kruckeberg patrol along the Illinois River.

Congratulating Stan Ebersohl when he convinced (pressured) a National Guard General Officer that we needed the troops to work on Sunday if we were going to hold off the floodwaters. Earlier the company commander had decided that the troops needed rest just days before the crest.

Cheering with a mud covered Dave Berti, who was standing on top of a sandbag wall surrounded by a group of soaking wet farmers in the black of night and screaming to me, "Joe, you should have seen it. It was incredible. They're heroes! The wall broke and they jumped in the breach with sandbags and shut it off!"

Obeying Stan Ebersohl's order to forget what I was presently doing and get some sleep after 36 hours at Keach during the crest.



Mike Kruckeberg worked the Illinois River during '93. Illinois River flood fight teams had been mobilized in April for spring flooding but nothing could have prepared them for what was to come. Kruckeberg shared many great memories from '93. He witnessed many of the failures along the Illinois and his write up is much like a series of vignettes. Here are Kruckeberg's free flowing memories.

During the '93 flood I was the assistant area engineer on the Illinois River. 1993 was a Mississippi River flood. The Illinois River flood was unique because it was a back water flood. As the Mississippi rose it backed up the Illinois and hence the problems went up the river rather than following the flood peak down river.

There was so much work to do and so little time to get it all done, but we did it as a great team.

I remember the massive volunteer efforts. Local friends, neighboring towns, National Guard troops and prisoners were out helping. The area prisoners, "boot campers," were first time offenders in special prisons getting their lives straight. They were the best workers.

All the levee districts were requesting the "boot campers." Surprisingly many of them graduated from their programs and came back as volunteers.

People stopped by on their vacations and decided to stay and help fill sand bags rather than continue. Sand bags arrived by IDOT truck convoys in Eldred, Ill. from the University of Illinois campus in Campaign, Ill. (about 160 miles). I'd pass the convoy every night on my way back to Jacksonville.

One night I stopped at a parking lot in



Anheuser-Busch provided safe drinking water to thousands



Car perched a top a twenty foot pool is the only visible marker of Nutwood's salvage yard. Mike Kruckeberg returned months later as seen on page 26.

Jacksonville, Ill. where people were filling bags. I just wanted to thank them for their efforts. They wanted to know how we were using the bags and why it took so many. People didn't know why, but they just kept filling them.

In an effort to explain, I built a small sand bag wall on the parking lot. The wall I built showed the volunteers how their efforts were helping the levee districts 30 to 60 miles away.

It was then that they realized how many bags it took to cover miles of levee. My small sand bag wall was the last thing left on that lot after the flood.

I also remember the massive amount of Red Cross efforts everywhere; eating a bologna sandwich and drinking a canned Budweiser water (still a souvenir on my desk) while sitting on a sand bag wall on top of a levee; going on National Guard helicopter inspection rides, and seeing everybody in flood fight tee shirts. Many towns made their own tee shirts and they quickly became a hot collectors item where proceeds went to the flood victims.

I remember certain things about each levee I worked on.

When the **Nutwood Drainage and Levee District (D&LD)** levee failed I remember standing there in the morning watching the water pour through the levee breach. I also remember being the last vehicle out of town and closing the

road as the water came over the road.

Later we drove a boat inside the levee in order to assess damage.

We had to be careful of electric poles and lines in the water. I took a picture next to a local junkyard that has a car mounted on top of a pole. Water was at the bottom of the tires and it looked like the car was sitting on top of the water. I was up there recently and the car is still there.

One day when I was working at the **Eldred D&LD** a small Ford Pinto came rolling into a lot where they were filling sand bags.

A young lady crawled out of the car so packed full of boxes and stuff she could barely see to drive. She asked for the National Guard.

She had started an effort in Chicago to collect toiletries from hotels. When she had the stuff, she loaded up her Pinto and took off, not really knowing where to go. She just happened to show up in Eldred.

She had soap, shampoo, deodorant and wash clothes she wanted to give to the Guard. It looked like she was giving away money when the Guard found out she was there.

The day we had to quit fighting in Eldred was terrible.

The water was coming over the levee for miles where we had not even placed bags yet. Some of the bag walls had



A Hillview citizen boats down a side street after levee breach.

failed in small areas and slid off inside the levee. Local farmers trying to save their homes would lock arms with others and slowly work their way out a short distance into the water flowing over the levee.

This was very dangerous.

We told them to stop, but they wanted to save their homes and property.

They would pass sandbags out along their line and put the bags in the flowing water and hold them with their feet. Eventually they would rebuild the wall and keep moving along until they had closed the hole in the sandbag wall.

Late that afternoon, we were getting reports of higher forecasts, more bag failure spots and more water running over the top of the levee. There was serious concern for the lives of everyone on the levee and inside the district.

I took a helicopter ride with the Adjutant General for the Illinois National Guard. During that flight, it was decided to recommend that we stop all efforts and evacuate everyone. He had the helicopter hover over the levee while he jumped to the ground so he could help assist in vacating all Guard personnel and other volunteers.

I flew back to the flood fight staging area. I met with the levee district commissioners. I told them the Guard's recommendation.

It was devastating.

We jointly agreed that it was the right decision. We did not want anyone killed. I remember calling into the EOC

that night on my way back to the motel in Jack-sonville.

I remember telling them we were quitting and that I hoped I never had to make that decision again in my lifetime.

This was about 5 weeks into the flood. All of our efforts over long

days and nights went down in one night.

The next morning, we watched from the bluff as water poured into the district from a breach that had formed the night before, and then it was time to turn and head for the next district. All of the farmers, national guard, prisoners and local folks just headed up river to the next district to help their neighbors in need there. They had just lost their homes, but were ready to help the next person.

Hartwell and Hillview D&LD both failed the same night. They were next to each other and they had big sand bag efforts going on. We had sand bags on so many miles of levee, in so many different districts, it was hard to keep track of just how much effort was

performed up and down the river.

We had millions of bags stacked and thousands of feet of flash board fencing built up to over four feet high in some areas for miles and miles. These levees were not designed to withstand water level above the top for an extended length of time.

They became saturated sponges of sand, soil and water. Eventually they just gave way to the massive water loads.

The morning after Hartwell and Hillview failed, I was in the Keach D&LD just downstream. I saw the Illinois River running backwards, **UPSTREAM!!!** There was so much water going into Hartwell and Hillview it was pulling water upriver.

Keach was a victory. After Nutwood, Eldred, Hartwell, Hillview and many other small levee failures, there sat Keach, right in the middle, **DRY!!!!** All efforts were turned to Keach.

Keach became the line in the sand. It was like people said "No More."

The Guard set up around-the-clock monitoring with guardsman walking the levee at night. They had helicopters flying observation with infrared night vision to keep track of personnel on the levee in case of an emergency.

The temporary levee held and together we saved Keach. For some miraculous reason it stayed dry.



Cars in a Nutwood auto parts lot are covered in sand and debris from the receding Illinois River.



Tom Niedernhofer now works with the Corps in San Francisco but during the '93 flood he was a member of the Illinois River flood fight team.



Tom Niedernhofer on flood fight patrol along the Illinois River

"Illinois is a super team. There is a lot of integrity and everyone takes flood fighting very serious," Niedernhofer said.

Spring floods along the Illinois River brought the team out for two weeks in April but nothing could prepare them for what was to come.

Over the Fourth of July weekend Niedernhofer was in Cincinnati at a car show, and he could tell by the evening news that the flood fight would begin as soon as he got home.

Niedernhofer faced a unique challenge during '93 being single and away from home 51 straight days. "I had to make arrangements with my neighbor to mow my lawn and pick up my mail until I got it forwarded," he said.

Disaster response is nothing new to Niedernhofer. While at the District, he assisted with many disasters among them Hurricane Andrew, Northridge Earthquake, Oklahoma City and the World Trade Center.

The '93 flood wore him out the most. "It took forever and time wears you out."

Niedernhofer was a sector engineer assigned to Griggsville and LeGrange Lock and Dam, but because it was a backwater flood there was no effort on the Upper Illinois.

"Everyone moved south to Nutwood, Eldred and Keach," he said. "Fighting

the flood is moving one place to the other."

Niedernhofer spent a lot of time at Eldred Drainage and Levee District. He worked nights along side Dave Berti from Mark Twain Lake.

At one point the river came up 15 inches in a few hours. The levee began overtopping in several locations on July

30 and they couldn't fight all the areas.

"It was heartbreaking when it went over," he explained.

The Illinois River is primarily agricultural levees and they are built to a certain level, explained Niedernhofer.

He believes the levees did a great job. "They were never intended to hold back water for several months."



As the river continues to rise, citizens of Hardin, Ill. build their sandbag walls to new heights. Hard work and perseverance kept many property owners dry. Hardin sits across the river from the Nutwood D&LD.

A remembrance from Edward Riiff, hydraulic technician.

The flood of '93' was very frustrating. After three weeks of feverishly working on levees, I had two levees, Hillview and Hartwell, collapse within two hours of each other.

I thought of all the man hours poured into the effort by citizens, National Guard troops, prison inmates, state and local authorities and numerous District employees.

I wondered what we done wrong to lose it all in one night.

Eventually I had to accept, as we all did, that after a month of being saturated, Mother Nature just took over.

You've heard the term, "You can't fight Mother Nature." I realized in 1993 just how true that statement is.



Hillview, Ill. is inundated by flood water.



Triumph at Keach Levee

As Mike Kruckeberg explained it Keach Drainage and Levee District became the line in the sand for those fighting along the Illinois River. The surrounding four districts had overtopped and Keach was the lone survivor. It took a lot of hard work and many close calls but Keach would survive the Great Flood. Joe Kellett was the sector engineer working Keach. Here is how Joe remembers one of the close calls.

The Great Flood of 1993 was a very powerful experience for me as it was for many people. It brought home what the Corps of Engineers does for the nation in a very personal way. During the flood of 1993, I was a sector engineer on the Illinois River working at the Keach Levee and Drainage District.

I got to know every farmer and landowner in Keach, and they helped me understand what was at stake. The economic loss they faced was significant.

The Illinois River flood occurred in July and August, so all of the crops were in the ground. If Keach flooded, not only would there be no harvest, no income, and no profit, but every dollar already spent to plant and fertilize the



Jeff Stamper inspects a portion of the Keach Levee enforced by a wood levee, sandbags and plastic. Hard work and some risk saved the levee district.

fields would be lost. This loss would be economically devastating and put farmer's livelihoods at risk.

There was also the emotional attachment to Keach. Many of these farmers spent their lives farming the bottomland within Keach. Their parents and grandparents had worked these same lands, and the flood endangered the very houses where they grew up.

After weeks of fighting the flood,

Keach was the only surviving levee on the lower Illinois River and its fate was extremely uncertain as the flood crest approached.

The crest would be more than 3 feet higher than the top of the levee.

Days before the River would crest it was already trickling over the top of the sandbags and less than an inch from the top of the flood fence.

The levee had been raised by placing sandbag walls on the flank levees and constructing a 3-foot high wooden flood fence, covered with plastic, along the mainline levee. Aug. 3 we had spent the last 24 hours working to shore up trouble spots and pile bags into small breaches of the sandbag wall.

Tired from no sleep and exhausted from lugging sandbags all night I was ready to give way to the day shift and go home. I met up with levee commissioner Dean Blevins on the way to my truck.

Dean and his family owned homes and farmed quite a few acres within Keach, so he had a considerable stake in this flood fight. He was standing on top of the levee staring down at the drainage ditch that ran along the toe of the levee. The ditch was running unusually full. Dean told me that something wasn't right as he headed out along the mainline levee.



Farmers and volunteers fought passionately against an uncaring river in order to save homes and livelihoods. With crops in the ground, families stood to lose everything if the river won.



I stopped and watched as Dean walked down the levee and around a bend until he was out of site. Within a few minutes Dean's voice came blaring over my radio. "Help, I need help. Get down here with everybody and everything you've got!"

I started running along the levee until I could see Dean and then I saw a wall of water cascading over the top of the levee. A twenty-foot section of 3-foot high flood fence had completely collapsed and another twenty feet on either side of the collapse section was leaning back with water pouring over the top. We stood there together for a moment in shock. I thought to myself that the levee could never stand up under the heavy flow that was rushing down its backside.

More local farmers arrived and stared in disbelief at the cascading water. I moved down to the toe of the levee to look for erosion. I was trying to estimate how long the levee would last.

To my astonishment the levee was actually holding. There had been some erosion, mostly of grass and topsoil, but the clay levee was holding.

I called to Dean that the levee was holding. Dean's son, Steve, raced up on a 4-runner to tell us that sandbags were on the way. Quickly, the first orange coast guard johnboats arrived.

Since there were no roads along the landside of the levee the easiest way to bring the bags to a location was to float them to it. The Coast Guard along with the Corps was supplying johnboats and operators to help.

We carefully slid into the water around the last standing fence post and formed a sandbag chain. It was immediately obvious that the bags wouldn't hold. As each bag was dropped the power of the rushing water just washed it away and down the levee.

Steve Blevins with his father supporting him carefully slid out into the torrent of water and facing the river he dropped a sandbag in front of his feet. Then he carefully placed another bag next to it and then another and another. Other



What happened at Keach Levee is similar to what happened at Eldred Levee, pictured above. National Guard soldiers and farmers stood in the breach as they fought to save the levee.

farmers soon slid out into the waist deep water and began placing sandbags in front of their feet. They were all standing waist deep in the breach supporting the sandbags against the swift moving water.

More johnboats with bags began to arrive along with more help.

Running toward us at full speed was a squad of about 15 national guardsmen. Out in front was a young lieutenant, who without hesitation plunged into the white water. The troops, however, froze as they reached the edge of the gushing water and stared with wide-eyed fear at the breach. The lieutenant frantically waved for his troops to move into the water. A few soldiers made insincere movements as if to follow the order, but most continued to just stand and stare in disbelief.

The lieutenant shouted his order with more urgency, but the best he could muster was a few men timidly sticking their feet into the water. Finally, irritated and upset the lieutenant stomped through the water back to his troops. He grabbed the first man he met by the collar, pointed sternly to the water and yelled, "Get in there!"

Slowly and cautiously the soldier moved into the water and took up a position placing sandbags. The others soon followed with the lieutenant encouraging his troops to get into the water.

His task became more difficult as some troops lost their footing and were swept down the levee with the rushing water. They each emerged from the drainage ditch soaking wet, but uninjured. The lieutenant was unrelenting as he called for them to move around the cascading water, come back to the top of the levee, and get back into the water where they were placing sandbags.

As the last guardsmen positioned themselves to place sandbags, a load of boards arrived.

I had sent one of the local teenagers back on the 4-runner to get the hammers and send a load of wood. We needed to brace the sections of leaning fence. From his johnboat a Coast Guard reservist threw the wood to me piece by piece. I drove a hub stake about 3 feet behind the first leaning post and wedged a 4 foot long 2 x 4 brace between the hub and the leaning post.

I made the mistake of pushing the



leaning post forward to straighten it before I was ready. I was going to drive a couple of nails through the brace and into the post to keep it in place. When I reached for my hammer I let go of the post and it slammed back under the force of the floodwater. This caused the leaning flood fence to shutter and fall further as a surge of water spilled over the top.

“Oh No! HELP”, I shouted as I pushed back on the post with all of my strength. Within moments, three or four sets of hands joined me to push the fence back into place. I quickly nailed the brace and together we moved along the leaning fence driving hubs and nailing braces behind every post until the leaning fence was stable.

By now the soldiers and farmers had formed a human and sandbag wall across the breach and were placing sandbags as quickly as they could.

I moved down along the backside of the levee and carefully examined it for any further signs of erosion. The erosion had not progressed on most of the levee, but it was clear that the toe was beginning to erode.

I yelled to Dean to hurry, because the levee was beginning to erode. From the toe of the levee I looked up at the farmers and soldiers, about 20 or 25 standing in the waist deep torrent. I knew that if the levee itself suddenly and swiftly failed, as levees often do in these conditions, the men standing on the levee would not survive. If the twenty foot high levee gave way it would unleash a wall of water and mud that would slam those men into the farm fields below.

I called back to the loading area for the Corps lifejackets that we had in reserve. While the soldiers were already wearing lifejackets, the farmers were not. I wanted to give them every chance, if the unthinkable happened.

By now the news helicopters had arrived. We knew when the neighboring levees failed by the sight of the news helicopters circling off in the distance.

Now it was Keach’s turn for the news ‘copters, like vultures over a kill, to circle another failing levee.

Through the noise and confusion of the situation, I continued to stand at the base of the levee watching intently for any sign of failure. The levee’s toe continued to slowly but surely erode. I shouted over the rushing water, “Dean, this is too dangerous. It’s taking too long. You need to get off the levee.” He only glanced up for a second and went back to placing bags. I repeated it for the second time, but he only looked down and shook his head no.

A couple of the guardsmen began moving out of the water, but the young lieutenant immediately called them back. “Get back here,” he screamed, “We don’t leave unless they leave!” I shook my head and shouted back to Dean, “You got 15 minutes! Just 15 minutes! Then I am telling them to leave.”

I looked down at the toe of the levee once more and then back at the men. They had a lot of bags in place, but as they tried to stack the bags the water pushed the newly formed wall over. I looked at the extra wood braces lying on the backside of the levee and I called to Dean to drive the 2 x 4 braces into the levee to anchor the bags. Dean nodded in agreement and I handed a couple of braces and the sledgehammer out to him.

Dean searched for a way to hold the wood in place against the current while he drove it into the ground. Nothing seemed to work until Dean held the wood against the current, while his son, Steve, drove the brace.

They drove one post then carefully shuffled a few feet and drove another post and then another until Steve raised the sledgehammer and just slumped. Fighting the floodwaters all night and now struggling to stand against the powerful current of the breach had taken its toll. Dean caught his son and pulled him upright. His son braced himself against the water once more and Dean took the hammer from his hands.

Dean drove the brace and continued to

drive more braces until he too reached the point of exhaustion.

Another farmer, Charles, took up the task of driving posts until he too was exhausted and then another took his place.

Slowly, the braces were placed and the bags were stacked against them until the torrent of water was necked down to a trickle. Finally, the soldiers and farmers stood behind a solid wall of wood and sandbags that was holding back the floodwaters once more.

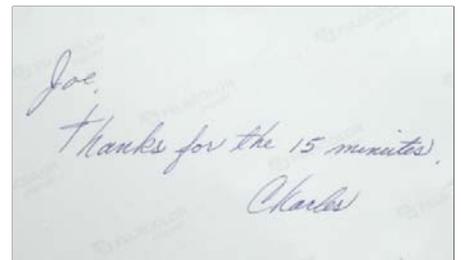
Soaked and exhausted, Dean looked at me and grinned. “You know,” he said. “I wasn’t leaving that levee no matter what.”

“I figured that was the case,” I replied. “I’m glad it held.”

There wasn’t much time for any more talk; the river was now cresting. We had many more areas to shore up for Keach to survive the Great Flood of 1993.

Editor’s Note: While Joe Kellett was working at the Rock Island District he had a picture hanging in his office. It was a picture taken from the news footage showing water spilling over Keach Levee.

Because of the distance it is difficult to see the details, but you can see the running water, and you can make out two johnboats in the water and multicolored dots signaling the farmers and National Guardsmen standing in the breach.



The picture tells the story but the back of the photo tells a story too. Written in blue ink are six simple words: “Joe, Thanks for the 15 minutes.” And indeed that is often what the ‘93 flood came down to—minutes.



Media Center Insider

By Jim Brown,

There are many interesting experiences related by those who fought the '93 flood in the field. Those of us who served in the Media Center had just as memorable an experience — perhaps not as dangerous an experience as some, but every bit as unique.

What some may not know is that the Media Center was not a planned entity like the Emergency Operations Center, but sort of an afterthought that developed after we realized that we had a serious flood on our hands. For those of us serving in the media center there was no preparation, no training, and no options to be exercised. We were drafted.

I believe that the idea of having a media center originated in the Hydraulics Branch, Engineering Division.

The Hydraulics Branch had the awesome responsibility of regulating the projects that were subjected to the most severe hydrologic conditions ever imposed on them as well as forecasting the additional flows yet to be endured. They operated the water control center that affectionately became known as the War Room and they had data and statistics that were in high demand by literally everyone.

In addition to the War Room, there was the Emergency Operations Center (EOC) primarily operated by the Readiness Branch in Construction-Operations Division.

The EOC directed the fighting of the flood, which included learning the latest conditions of the flood protection facilities and levees, sending supplies, pumps, and people to assist the locals.

They coordinated with emergency response teams from a variety of sources, and constantly made decisions that affected cities, industries, and lives. In order to accomplish their work, the EOC also had an enormous cache of information that everyone was after to further their knowledge and understanding of the flood.

How could all of this information be disseminated appropriately without interfering with critical operations? Thus, the creation of the Media Center.

The Media Center was to be the official St. Louis District Corps of Engineer point of contact for the outside world.

We took that load off the War Room and the EOC, addressing what turned out to be an onslaught of information requests from around the world that would have interfered with the critical decision-making that was going on in the other offices.

I think that the media center was originally to be handled by the Public Affairs Office, but it didn't take long for them to realize that they needed help from persons with technical expertise to field the questions they were receiving regarding the geotechnical and hydraulic characteristics of the flood.

I understood the duties to be answering telephone calls, dispersing river stage information and describing the status of the condition of levees. That didn't sound too difficult. I could do that.

I originally thought it was overkill to be located in the big conference room off the lobby of the 4th floor. We had a dozen phones, two televisions and only half a dozen people. Little did we know that the space would rapidly become too small for maps, charts, photos, easels, SITREPS, forecasts, fax machines, computers, and myriad other aids that became necessary to explain the flood.

Our original purpose, explaining the flood to outsiders, never really changed. What did change was the scope of that



Jim Brown discusses early flood developments with a reporter.

effort. What was originally intended to be answering phone calls from local media, organizations, citizens regarding the progress of the flood, turned into live and taped camera and radio interviews that extended around the world, and showed up in worldwide publications.

This became a greater challenge than we had envisioned.

I remember spending one 20-minute telephone conversation with an individual who seemed refreshingly polite and inquisitive, although not particularly technically oriented, who at the end of our conversation gave me a very nice compliment and then identified himself as Peter Jennings. I was thankful that I was on my good behavior.

What originally started as putting out information and describing status and conditions turned into very risky discussions of controversial issues and challenges from extremists with far out agendas that were contrary to the basic missions and charters of the Corps of Engineers.

For example, it was bad enough listening politely to accusations that the Corps caused the floods by building the levees, but was even tougher telling them we were mandated by law to fix the ones that failed.

All had to be done while being a professional, courteous, accurate and



dignified official Corps of Engineer spokespersons.

Researchers writing books and newspaper and magazine journalists began setting up shop in remote corners. Sales people with new technologies and innovative flood fight techniques, complete with demonstrations, also flowed into the conference room.

Those of us in the hot seat — myself and Gary Dyhouse — acted as the main technical spokesmen. We were ably assisted by Ron Dieckmann, Ken Koller, Joe Schwenk, Ken Kruchowski and Mary Lou Lawson, from our Public Affairs Office, and other public affairs specialists here on TDY from various districts and divisions. Together we manned the phones and assisted reporters.

The Media Center operated seven days a week for the duration of the flood. Our typical day was from about 6 a.m. to 6 p.m., often longer depending on the day's developments.

We had to spend the slower hours of the early morning watching the news and reading papers to learn what the public was exposed to and would be asking about.

There were visits to the EOC to learn the latest on situations that developed overnight. About mid-morning to noon there was a briefing for the DE, followed by discussions of significant issues. On occasion we had to establish a "corporate position" on controversial issues or decide on the best alternative for handling the latest bad situation.

It was not possible for more than one member of the media center to attend these gatherings but all had to know the new information in preparation for the day's "inquisition."

It was a challenge for the attendee to fully explain the new-found information to those that had to hold down the fort in the media center. We constantly had to look for or create opportunity to have media center discussions so that we were all on the same sheet of music and telling the public the same information.

We also had to make time to learn

about each other's expertise, since each of us had to address several related issues in one telephone conversation or interview.

We had to be careful not to cause undue distress while relating as accurate information as possible without overstating or understating the significance of what was going on. Our most important goal was to be understood regardless of how many ways it took to explain.

As we learned what it took to become more efficient and effective, it was interesting to see the media relationships developing.

Some were egotistical, there on "deadline," needing to finish a story that began who knows where. They were in and out so fast that it would make anyone suspicious of the outcome.

Others would stand in line, searching out individuals who had helped them in the days before, preferring to build on the working relationship. Most reporters worked very hard at understanding and relating accurate information.

One of the fun things we did was coming up with analogies in order to explain the flood. Some examples were sand castles losing strength when super saturated and a full garden hose (the upper Mississippi) flowing into an almost empty bathtub (Mississippi below the Ohio River), etc.

Other light moments included listening to the "good" ideas of callers.

One person called with a solution to the flood that he spent a good ten minutes refusing to tell me because he was afraid that he wouldn't get credit. Again, being patient although extremely busy, I urged him to either take this opportunity and tell me or find someone he trusted.

He finally confided in me, suggesting that we dig a ditch to the southeast region of the country that was having a drought at the time. I thanked him for his idea and assured him that, if it was used, I would make sure he got credit.

We learned patience, tolerance, how to think on our feet, and much, much more.

I think we did a pretty good job in

general. This type of organization could have been the first of its kind for the Corps of Engineers and there is little question of the importance of the media center to the public, to the media and to the Corps.

Not only did we achieve our original objective of relieving the War Room and EOC, but our message reached all corners of the globe.

On a personal note, I was quite familiar with the majority of the projects that were being challenged by the flood. I knew the performance characteristics and had a feel for the consequences of the loading placed upon them.

My colleagues were out there in the rain, the mud and blazing sun for endless lengths of time, fighting the flood. They also interfaced with the public, but in a very different way.

They worked side by side and looked into the eyes of those whose lives were being affected by what they were doing. In my mind, these were our District heroes.

There was not a day that passed that I did not admire their efforts.

Editors note: The Media Center was highly appreciated by the local and national journalists and all echelons of the Corps of Engineers and has received numerous letters, awards, and recognition for their efforts. The most notable include Corps of Engineers Commanders Award and the Locke L. Mouton Award for Public Affairs Excellence. At the height of the flood the Media Center was averaging 150 calls a day.



Chief of Engineers Lt. Gen. Art Williams hosts a press conference, Aug. 4, to discuss recovery efforts.



Lake Projects Impacted Too

The Upper Mississippi River and its levees garnered most of the media attention during 1993. The St. Louis District lakes battled the flood of 1993 too. Lake Shelbyville, Mark Twain and Wappapello contributed their stories for this special edition of Esprit.

Lake Shelbyville

Lake Shelbyville is usually a place where people come to relax and enjoy a top quality recreational experience.

In the fall of 1993, Lake Shelbyville was not the same place that visitors remembered.

Heavy rains in southern Illinois flooded Carlyle Lake, broke levees and caused the Mississippi to overflow its banks. In order to prevent additional damage to Carlyle Lake, Lake Shelbyville had to hold water back.

Holding water back, along with large amounts of water collected from the northern Kaskaskia Watershed, caused Lake Shelbyville to reach at the time its second highest pool level — 617.66 National Geodetic Vertical Datum (NGVD).

A lake level 18 feet above normal pool made boat access very challenging. With only one high water boat ramp available most people were limited to bank fishing and getting a large boat onto the lake was tough if not impossible.

Needless to say, boat traffic was very limited, and it was rare to see recreational boating, hunting or fishing on Lake Shelbyville waters in the fall of 1993.

The lake level caused challenges not only for visitors, but also for the staff. Some staff members continued to operate and maintain Lake Shelbyville while others volunteered to help with flood duties along both the Mississippi and Illinois Rivers.

Park Ranger Leanne Cruitt spent time helping fill and place sandbags at Lock and Dam 25, as well as many levees along the Mississippi and Illinois Rivers.

Leanne remembers that Lake



Leanne Cruitt at the helm in '93.

Shelbyville summer employees volunteered to help with the flood too. She specifically remembers Amy Kimmel, a summer employee, who spent her 21st birthday filling, throwing, and stacking sandbags. Park Ranger Bill Maxedon, civil engineering technician Don Brown, budget technician Sharon Cable and purchasing agent Linda Warner joined Leanne and Amy at Lock and Dam 25.

Leanne Cruitt was mobilized from Lock and Dam 25 to Jacksonville, Il. to act as the office engineer for the flood fight team.

Her first few weeks were spent in Starlite Motel keeping track of payroll, requisitioning supplies, recording river stages, and taking daily status reports. Once it was known that she had a governmental boat operator's license, Leanne spent the rest of her flood duty time ferrying sandbags.

There was such a tremendous need for help along the levees that people were sometimes recruited on the spot.

Maintenance worker Gary White was assigned to go pick up a truck at a flood site and return immediately to Shelbyville. He returned home more than a month later.

He was recruited so quickly that his wife had to bring extra clothes and personal items to him the next day.

Once it was learned that he had a boat operator's license, he was recruited and fought the flood for over a month driving a boat full of sandbags for 15 hours each day.

Former Lake Shelbyville civil engineer technician William (Bill) Gidcomb was part of the Illinois River flood fight

team, activated the first working day after the Fourth of July holiday.

Bill's first job was at the east approach to the Hardin Bridge at East Hardin, Il. His team ran some levels and determined there was only four tenths of a foot freeboard on the Nutwood Levee. Hundreds of volunteers, residents, levee personnel, and state and federal personnel labored in the heat and humidity to fill, transport, and place sandbags to build the levee higher.

Despite their efforts, the Nutwood Levee overtopped, and workers hurried to build an earth barricade around the Village of Nutwood for protection.

Following lessons learned at the Nutwood Levee, the flood team began in the Eldred District.

The first problem the team faced was fixing a jammed flap valve that was open on the Eldred pump station. Divers were used to disconnect the valve, and a National Guard helicopter was used to lift the valve out.



Diver surfaces after removing valve.

Once the valve was removed, volunteers, levee district personnel, the Illinois National Guard, and state and federal employees worked around the clock to help the levee district and the surrounding areas.

The Eldred District was lost due to levee overtopping, as workers could not keep up with the rapidly rising river.

Consequently, the Spanky Levee District, a small levee district adjacent to the Eldred district, was also overtopped.

All the access roads to Calhoun County south of the Florence Bridge were inundated and access to the Eldred district was soon restricted to flood flight activities only.

Bill's vivid memories include the ominous sight of a farmhouse well hand



pump running continuously because of the rapidly rising water table; wildlife sensing danger and scrambling to higher ground; the Red Cross soup kitchen, the Illinois National Guard and the Green County Emergency Services and Disaster Agency set up in a local fire station, and the stifling heat and humidity creating almost unbearable working conditions.

Immediately following the flood, Bill was assigned to oversee contract work on a number of levee repairs on and around the Mississippi River in the southern portions of the St. Louis District. He was TDY in that area for a full year.

Bill retired in 2001 after more than 35 years of federal service, nearly all of it with the US Army Corps of Engineers, St. Louis District.

About the flood, Bill will always remember the feeling of helplessness, as Mother Nature produced nothing but more water, heat and humidity.

Even though it was tough at times, he'll never forget the dedication and professionalism of the U.S. Army Corps of Engineers flood fight team, the excellent support from the EOC, and the sacrifices made by the personnel at Lake Shelbyville.

Mark Twain Lake

Spring rains in 1993 produced flood pool levels at Mark Twain Lake prior to the "big flood" even starting.

April and May rains forced the pool well into the 620s or 15 plus feet above normal.

In June, the lake level started to fall and the beach reopened just in time for summer but it was closed prior to the Fourth of July holiday.

In late June, many areas of Iowa and Missouri received record amounts of rainfall.



Dennis Foss

Mark Twain Lake, along with the Mississippi and Missouri rivers, was on its way to record level highs as well as record level flood durations.

Dennis Foss, operations manager, said he didn't know it at the time, but Mark Twain would stay in flood from July well into October.

July and August became known as the "Summer That Never Was" at Mark Twain Lake.

In July, many staff members were called away to fight floods in their sectors. Some would be gone for months.

In July for approximately a three week period there was only one bridge open between Mark Twain and St. Louis, the I-70 bridge in St. Charles. All other bridges on the Missouri and the Mississippi rivers were closed well up into Iowa.

"We were stranded from going any direction except north," said Foss. Needless to say seasonal visitation in Mark Twain County plummeted to record lows.

The lake remained open as some small boats could launch from access roads but boaters had to duck their heads to get under highway bridges that were normally 30 feet above the water.

Campgrounds were above the flood pool so they were open. The marinas were open too because their facilities were on pontoons.

The Management Office did go to 24 hour operations to keep the public informed of the latest lake levels, release plans, and also to perform hourly safety inspections and walkovers of the dam.

The lake stayed well into flood pool all July and August. It was within one to two feet from surcharge elevation most of the summer, a very nerve racking time.

A few inches would be released only to have another rainstorm take the lake back up to where it had been or even higher.

Releases remained minimal due to the extreme flooding on the Mississippi River. Everyone hoped that surcharge

releases would not have to be made. Surcharge releases have to be made in order to protect the integrity of the dam i.e. she's full!



Just a few more feet and "she's full!"

Mark Twain staff members assisted Chris Morgan and his crew sandbag Lock and Dam 24's control house. Fortunately this was a success story.

Another success story was assistance given to Hannibal, Mo. The city was loaned a large pump that enabled them to sandbag and keep operable the city's only pump station providing potable water.

Other area stories were not as happy: the sabotage of a levee in West Quincy, Mo., that resulted in flooding of thousands of acres; the failure of a portion of the Sny Levee in Ill. that had successfully held back floods for 90 years, flooded tens of thousands of acres.

In September, after the record crest had passed St. Louis, Mark Twain was releasing and the lake had started to fall significantly. It was thought the worse was over but then another rainstorm came and it proved to be the biggest of the year.

The lake went to another all time record high, this time just inches from surcharge. After that, releases again were increased and the lake went back to normal pool by winter, almost one year since it had been at that elevation.

All total the lake received 58 inches of rain during 1993 - two inches short of being classified a rainforest.

In 1993 the water just never went away, Foss said. What struck everyone was the flood's magnitude and duration.

"It felt like there was no winning that year," Foss added.



Indian Creek recreation area at Mark Twain offered unique fishing opportunities in 1993. Compare this photo with one below taken this year.

The rainstorms felt like they were stuck on a track that was repeated over and over again, week after week. The entire recreation season was lost and many small businesses closed and the marinas were hit hard.

Lake personnel are still explaining what appears to be a bathtub ring around the lake.

Ten thousand acres of wooded tree line, mostly oak hickory, was lost during 1993.

The trees were accustomed to being under water for maybe three weeks at a time but the trees were unable to survive three months.

Attempts have been made to replant water resistant trees but they can't grow high enough or fast enough to survive regular yearly flooding.

Over all Foss said that Mark Twain Lake and Clarence Cannon Dam were a raving success story.



Indian Creek comfort station, 2003

The project held back the water and did what it was designed to do.

The project prevented \$1 million in damages to the upper half of the Salt River. Unfortunately not all of the Salt River could be protected since the mighty Mississippi backed up the lower half.

Wappapello Lake

The great summer flood of 1993 did not affect the facilities at Wappapello Lake.

Nevertheless, Wappapello employees answered the call of duty in a very positive manner.

Assistance was provided by staff in management, administration, maintenance and by rangers and summer employees.

Duties consisted of sandbagging, levee inspections and patrol and rescue efforts; answering the numerous telephone calls in the Cape Girardeau office; logistics administration, and creative time keeping.

Wappapello Lake also provided communication equipment (cell phones and hand held radios) and patrol vehicles.

Everyone felt the need to get involved and did so according to their capability and availability.

Some employees were sent north to

Lock and Dam 24 and successfully assisted in saving the control house.

Others went to locations that included the Big Five Levee Area just across the Mississippi River from Cape Girardeau in Alexander County Il.; the Missouri side of the Mississippi River at Chester, Il.; and the Degonia Fountain Bluff and Grand Tower Levee Districts.

Time was of the essence. Twelve-hour patrol shifts from 6 p.m. to 6 a.m. and 8 p.m. to 8 a.m. were conducted anywhere from seven to sometimes twenty-one days consecutively.

No one was forced to work flood duty or go to other locations to help out, but Wappapello employees wanted to help and they did so voluntarily.

There were some exciting and anxious moments experienced by those on the front line. One of the most memorable incidents was the levee break that washed in a Rend Lake employee and Corps of Engineer vehicle. Wappapello employees were called upon quickly and responded in assisting with the search and rescue.

In spite of all that Mother Nature dispensed to the Midwest during this critical time, Wappapello continued to provide quality service to its customers. Special events were on schedule, facilities well maintained, and day-to-day operations continued.



Volunteers from Wappapello Lake filled sandbags on the Illinois side of the river and then a ferry took them to Lock and Dam 25.



Rachel Garren, CO-T, contributed the following thoughts having talked with many co-workers who were “left behind” during the flood.

Ten years have passed and it seems that we sometimes overlook the efforts of those indirectly involved in fighting the Great Flood of '93. There were many who were not directly involved in assisting the Readiness Branch in flood fighting, but did help the District.

Several offices were overwhelmed while trying to conduct business without the help of many of their staff members. Work had to be prioritized and many things had to be placed on the backburner.

Because of the national media coverage on the flood, most of the public from outside of our immediate area assumed that the entire Midwest was under water. That had a negative impact on people visiting our lakes, even though some areas were totally unaffected by the flood.

There really was a “great flood” of work that continued to be done with the dedication and hard work of those who were left behind in understaffed offices. Every individual who worked for the District in 1993 should be commended for their contributions whether they were directly or indirectly involved in conducting business during the Great Flood of that year.

Zerega, a very talented, experienced manager who kept me straight on more occasions than I care to mention.

My main focus was to develop a comprehensive recovery plan. We had to get good damage assessments, determine those we had the authority to rebuild using federal funds, develop the reconstruction plan and seek funding. Office of Counsel would review every project to ensure we had the authority, principally under PL 84-99.

The damage in the field was amazing especially in areas where the levees had collapsed. Ever since I left the District I have hung in my office an overhead photo of the Bois Brule Levee. It shows the break and the extensive sand mountain, which the water had deposited inside the levee. In numerous towns the sandbag walls were massive, demonstrating the grass roots volunteer effort, which had been mobilized.

I also vividly remember the St Louis airport with its hangars under water; Lock and Dam 25 virtually underwater; the town of Valmeyer being completely inundated; the town of Ste. Genevieve valiantly constructing an enormous stone, earth and sandbag levee which saved most of the town; the constant vigilance to surround sand boils caused by seeping water; and the several feet of water in downtown Hannibal.

Anybody who witnesses a flood of this magnitude is awestruck over the power of flood waters. I was most surprised to

Recovery Begins

In 1993, Major (P) Greg Kuhr was sent TDY to the St. Louis District from the New Orleans Area Office to assist with the recovery effort. He would spend five months at the District heading the Recovery Task Force.

When he arrived the District seemed to be in transition. There was a feeling of satisfaction from having endured the initial onslaught of flooding and the mood was now changing to one of vigilance and alertness to any potential catastrophes, such as floodwall or levee failure.

Greg Kuhr is now a colonel in the United States Army stationed at Fort Benning, Ga. I was able to track him down using AKO and he was kind enough to share his thoughts on the '93 flood.

Did I feel prepared? As a project engineer with the New Orleans Area Office I had worked on projects consisting of levee and floodwall construction and numerous dredging jobs. Technically, I felt somewhat comfortable with the construction of flood protection structures.

From a leadership standpoint, I had learned to rely on the experience and

talent of Corps employees. I knew that St Louis District would be similar to New Orleans, with technically competent engineers, savvy project managers, meticulous construction inspectors and highly motivated emergency managers. I was not disappointed.

TDY personnel augmented the existing district staff to create the recovery task force. The greatest need was for experienced damage survey teams who could accurately assess the damage. This information fed the district's engineering staff in developing reconstruction assessments. The principal project manager was Mr. Jim



Wreckage and sand left behind by the raging floodwaters.



see so many farms in the lowlands, immediately behind the levees. After seeing the aftermath of broken levees and homes, farms, livestock and everything else inundated, you have to wonder what were these people thinking. I know they did their own personal assessment that the value of the fertile land outweighed the likelihood of a flood and amazingly, many were eager to rebuild in the same place.

The process of getting protection back to the levees was all teamwork. The District's great staff analyzed the damage assessments, developed repair plans, obtained funding, and awarded contracts for the rehabilitation. Captain Scott Fehnel headed up the Borrow Investigation Team (BIT), which was charged to find suitable levee fill material.

Each project required close coordination with the local sponsors and many levee districts, to ensure the Project Cooperation Agreement clearly set forth responsibilities. Additionally, there was significant cooperation between the District and other agencies, such as Federal Emergency Management Agency (FEMA), the local levee districts, and state agencies.

There were innovative steps taken to solve problems during '93, many of them a result of agencies under pressure.

Local communities struggled to fill sandbags quickly because of the time-consuming and tedious nature of shoveling sand into the bags.

This forced some to try large bins with chutes that could accelerate the filling process.

Some towns experimented with larger box containers, called 'concertainers', which could be filled with any material to act as a floodwall in lieu of sandbags.



Chutes helped accelerate the process.



A farmer's yard is littered with rotted crops, dying vegetation and other debris. A water mark on the side of a barn shows the flood water height.

There was even an experiment with a water-filled, elongated bladder which could be used to quickly encircle sand boils or add weight to the inside of the levee face.



Motor Vessel Simpson

The District was innovative in its use of the MV Simpson, the District's survey boat. The boat used state-of-the-art technology to survey levee breaches while they were still under 20 feet of water. Understanding the contour of the soil or sand bed under the breach assisted the engineering staff to develop rehabilitation plans, saving months in the process.

I was proud of the District's accomplishments. They did everything possible to minimize the damage and then postured themselves to immediately begin repairing the damaged levees. Timing was critical as failure to repair the levees before the winter would mean

another season's crops would be lost. I will always remember my short stay in St Louis District. Although I was Chief of the Recovery Task Force, it was the entire District staff that pulled together as a team. COL Jim Craig, the District Engineer, readily accepted me and made me feel part of the District.

I learned how a District operates and how it can pull together to accomplish the impossible. In my future jobs as the Deputy Commander in New Orleans and later as the Commander of the Far East District, I probably challenged my staff even more after seeing what St Louis District had accomplished. We all need to be challenged in order to grow and really understand our potential. What's the old saying - life is like a 10 speed bike, we never use all of the gears.

I can't say enough about the tremendous talent that existed in the District while I was there. There were so many heroes who made the District great - people like Gary Dyhouse, Emmett Hahn, Bill Sutton, Jim Zerega, Bill Levins, Brian Kleber, Jake Scanlon, Claude Strauser, and so many more.

I labored to ensure I didn't get in their way as they worked their magic. They should all feel proud for saving the livelihood and properties of thousands threatened by the floodwaters.



District Introduces Innovative Flood Fighting Techniques in '93



Concertainers were a new type of floodwall developed in England. They were briefly used in '93 to ring sandboils. Concertainers are foldable, stackable, easily transportable and can be set up and filled with any available material.



Water dams were a plastic tube filled with water also used to ring sandboils. They were placed along levees as berms adding weight and stability to the landside slope. Water dams were easily placed and quickly filled.



Highway barriers covered in plastic were also used in lieu of conventional sand bag walls. Missouri towns such as Kimmswick, Ste. Genevieve and Elsberry benefited from this technique.

Editor's Note: Jim Zerega is an experienced program manager who always seems to get the more challenging assignments. Well he certainly got one in '93 when he served as the principal project manager for the recovery task force. For this special issue of Esprit Jim shared some of his memories.

After the flood crested in August 1993 and began to recede, many levee districts along the Mississippi, Illinois and lower Missouri Rivers were faced with the prospects that they would be flooded again in the Spring of 1994 or sooner.

Dozens of levees had been breached.

Farms, businesses and communities that had been protected by levees were now open to direct flooding from the rivers.

The St. Louis Floodwall had also been seriously damaged, and many pump stations were inundated and damaged.



Bois Brule pump station severely damaged by the flood waters.

Repairs were begun under the Public Law 99 program. The scope of the repairs needed in the St. Louis District was monumental.

The District Commander, Colonel Craig set up a levee repair task force. Major Greg Kuhr was brought in TDY from New Orleans to lead the task force. Later on Emmett Hahn took over as the leader.

A great many District staff and TDY personnel were involved in the work. I was the lead project manager for the task force, and because of the widespread damage we asked for volunteers to serve as project managers in four regions within the District.

Steve Farkas, Brian Kleber, Mike Kruckeberg and Mark Alvey volunteered to serve as the regional project managers, and let me just say, they had a big job.

The logistical and financial aspects of bringing in all the TDY help, and getting the funds for each levee report and then each levee project were also monumental. Ed Ewing and Donna Kavanagh solved one problem after another. It would be impossible to name all the people who worked so hard on the levee repair effort.

A few memories do stand out for me.

I remember attending a public meeting in Columbia, Ill. when Steve Farkas

explained the repair process to about 500 flood victims. You should have seen the look on these peoples' faces after their homes and farms had been flooded. I saw shock, tears and quiet resolution.



Rebuilding would be a long, slow process for many flood victims.

I also remember the spirit demonstrated at our regular task force meetings while we reported our progress on repairs and planned the next week's work. There was a "can do" attitude, and I remember being a little surprised at how much actually was accomplished in so short a time. I remember Mike Rector, Craig Donis, Bill Nettles and Joan Schick at those meetings, plus many others.

There was the time I had to travel by johnboat to cross the flooded Nutwood Levee District in order to attend a public meeting in Hardin, Ill.

I was with the levee district president and his wife. It was cold and windy and



A huge scour hole, some 80 feet deep, remained where flood waters rushed over the Columbia Levee and into the Harrisonville Levee. Repairs would not be done in time for spring flooding. Farmers did not have crops in the ground yet so there were no further damages.

we had to wear trash bags to keep warm. The task force focused first on repairing levee breaches and the St. Louis Floodwall.

The bottom line is, despite the fact that we had to deal with another flood and more damage in the fall, and despite the fact that we had to do our construction work during the winter months, the District repaired well over 100 levee breaches before spring flooding in 1994.

Only one breach was not completely repaired, the huge breach on the south flank of the Columbia, Illinois Drainage and Levee District where the 1993 flood crashed over the Columbia levee and then through the Harrisonville northern flank levee. This breach was partially repaired when spring flooding occurred in 1994. Floodwater backed into the levee district, but crops had not yet been planted.

All the other breaches and the St. Louis Floodwall were repaired and the floodwaters were kept at bay.

Editor's Note: Steve Farkas works in Design and Mechanical Engineering. During the flood he worked in the EOC, first with Mike Rector and then Dennis Fenske. He worked there for about 6-8 weeks, working 12-hour days.



Mike Rector (L) and Steve Farkas (red shirt) spent hours on the phone.

Two engineers were assigned to the EOC so that they could explain technical issues to callers. Afterwards Steve served as a regional project manager along with Mike Kruckeberg, Brian Kleber and Mark Alvey.

Steve oversaw recovery work done from Wood River to Prairie du Rocher. Areas on certain levees had been washed

away, occasionally there were scour holes, the one left behind by the Gummersheimer's house was 70 to 80 feet deep, and some levees looked like Swiss cheese. It was a challenging time but an experience Steve will never forget.

What I remember most about the '93 flood is just the volume of water. No matter what we did the water kept getting higher.

I remember when I first started with the Corps that everyone talked about the "'73 flood this" and the "'73 flood that." Once we passed the '73 flood levels, we entered uncharted territory. The higher stages created new problems. I learned a great deal and now find myself talking about the '93 flood to the new engineers.

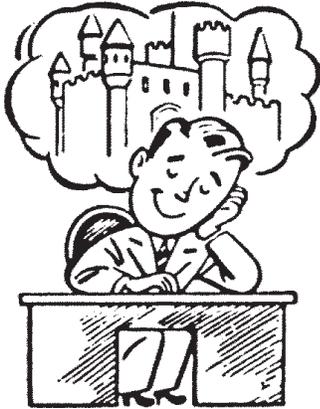
Farkas hopes the stories of the Flood of 1993 never go out of date because of a worse one.



"Some of the levees looked like Swiss Cheese."



The Way I Remember It



The Great Flood of 1993 was an occurrence of nearly mythological proportions. Appropriately then, there is a great deal of myth that surrounds certain aspects of this rampage of Mother Nature. Many of the “factoids” (Mistruths repeated until they become facts) growing out of the flood seem to center around the Illinois side of the river, including the flooding of the city of Valmeyer and the purposeful breaching of the Harrisonville Drainage and Levee District (D&LD) levee south of there.

First, nobody sacrificed Valmeyer for anything. Enough said! Let’s look at what did happen. We will follow the flow of floodwaters to see what really occurred.

Let us enter the story at the Columbia D&LD, one of the main stem federal levees on the Illinois side of the river, south of St. Louis.

Like many other levees in the region, this earthen structure was assaulted for weeks by rising floodwaters. Kind of like the Timex watch that is “water resistant” versus “water proof” Rolex, this levee resisted as long as it could. Seepage and sand boils emerged as the Mississippi River gradually at first, and then faster, leaked through the protective structure.

The Corps of Engineers awarded no fewer than three emergency contracts to stabilize seepage and levee district personnel built sandbag levees around numerous boils.



The Mississippi River breaches the Columbia Levee and enters the Harrisonville Levee District.

But between 8 and 9 a.m. on August 1, while the levee continued to hold, it was overtopped in several places at its northern end. This event marked the first overtopping of this regions major main stem levees - those protecting property from the main stem, or the Mississippi, as opposed to a tributary. Mom Nature, unable to defeat the protection afforded by the levee - kind of an insurance policy - simply trumped it and brought more water than the insurance was designed for.

More than 14,000 acres of land, and many farms and homes were quickly flooded as the water rose at the rate of nearly one foot an hour.

At about 11:30 p.m. that same day the levee was overtopped at its lower flank, along Fountain Creek. With the levee there, separating the Columbia and Harrisonville D&LDs being overtopped, the combined force of the progressive flooding broke through the northern flank of the Harrisonville D&LD and the city of Valmeyer had to be evacuated immediately.

The Harrisonville, Stringtown #4, Fort Chartres and Ivy Landing #5 D&LDs comprise one continuous levee system, were protecting some 46,500 acres of farmland and many homes.

As the water began to fill the system, it was feared that the southern flank levee along Prairie Du Rocher Creek would overtop, and cause the upstream flank levee along Prairie Du Rocher D&LD to overtop and break in a manner similar to that which had already occurred in Columbia. This in turn would cause flooding in the city of Prairie Du Rocher.

A massive sandbagging effort ensued to raise the northern flank levee to prevent its overtopping.

On the morning of August 2, the St. Louis District sent a team of experts to the area to assess the eroding situation. The team consisted of the Chief of the Geotechnical Branch, George Postol, the Chief of the Potamology Section, Claude Strauser, and the East-side Flood Fight Area Engineer, Dave Mueller. Options we discussed as they flew over the site in a helicopter and formulated their recommendations.

Options presented to the levee commissioners of the three districts immediately under threat, including the commissioners for the Prairie Du Rocher and Modoc Levee and Drainage District (the next levee district south), were:

* Let the flow of the Mississippi River come down the system at its own rate



The lower flank of the Fort Charters Levee is breached so that water can cushion the rushing water from the north.

and take the chance of the lower flank levee being overtopped, which could break the Prairie Du Rocher Creek southern flank levee, similar to what happened at the northern flank levee of Harrisonville.

* Open the triple 72" drainage structures (6-foot pipes through the levee, with closures) on the lower end of the Fort Chartres riverfront levee to build up the water in the lower end of the system to build a pool to cushion the force of the coming flow.

* If opening the triple 72's was not enough, then make a cut to a section of the lower end of the riverfront levee to increase the inflow of water at the lower end of the system. This water would fill the interior of the lower end of the levee system and create a "cushion" for the on-rushing water coming down from the upper end of the levee system. This would also provide an outlet for the water after the system filled, hopefully preventing overtopping of the southern flank levee.

The local levee commissioners initially chose the second option, to try to open the triple 72's. Two of the gates

were opened and one could not be opened. At 6:00 p.m. on August 2, the commissioners next decided to request the Corps of Engineers to degrade a section of river front levee. A local contractor working in the area was awarded a contract on August 3rd to remove as large a section of levee as he could safely remove within a short window of opportunity.

A 400' section of levee was excavated to a depth of 4-5 ft deep. During this excavation floodwater was flowing into the levee system.

Local groups suggested blasting more outlets to speed the flow of water out of the levee district. The Corps recommended against this because of the possibility that blast vibrations would cause damage to saturated levees in the area. But contrary to Corps guidance, in the predawn hours of August 4, local citizens set off explosive charges in two locations, in an attempt to enlarge the openings in the levee and provide an outlet for the water entering the levee system.

A few hours after the blasts, the Corps contractor used his equipment to enlarge

the two openings to a depth of about 5 ft. By this time, floodwater was flowing out of levee system into the river.

Even though water overtopped the sandbagged flank levee of Prairie Du Rocher Creek in some isolated locations, the levee held and the city of Prairie Du Rocher, with its historic buildings and rich heritage, was saved.

Flooding land to cut off further flooding didn't meet with universal approbation when we did it.

In fact, I think more than a few questioned whether we, like the levees, had been under water too long and had lost our senses. Like starting a backfire to stop a wild fire's spread, this initiative - which was boldly supported by our Commander, Colonel Craig, saved the day - and Prairie de Rocher. It enabled us to build a water cushion to prevent the progressive flooding from hammering into the next levee and overtopping it. Also, as the flood crest passed, the breeches enabled the water to immediately start to recede.

I certainly don't take the credit. I don't think any one person can claim that. And we certainly didn't have precedent to call upon.

What we had was experience, ideas, and more importantly, trust. We had trust in each other and we had the trust of the citizenry of the region we fought to save - at least to save as much as we could.

Why was Prairie de Rocher made the line in the sand/water? There are two reasons. First, it was next in line. Second, the area was of great historical significance and we grasped that value as we struggled with our recommendations. In fact, considering historical value in a flood fighting decision set a precedent that was noted as follows:

That's the way I remember it.

Claude Strauser

Many of the facts cited here are from a flood report Claude co-authored with Tom Lovelace



Tom Lovelace was chief of the Hydrologic and Hydraulics Branch (commonly called the H & H Branch) from 1969 until retiring in 1998.

One of our jobs in the H & H Branch is to collect and analyze hydrologic data 365 days a year. As a result, we started the '93 flood fight earlier than most. We were in a "flood alert" mode for about six months from mid-April to mid-October.



Tom Lovelace

There was not one '93 flood but a series of four flood crests. I have lasting memories of the stress and fatigue my staff faced as each flood crested higher and the months dragged on.

Stress levels were higher once we went to 24-hour operations. It became necessary to closely monitor everyone to ensure they had back up, got enough sleep and had time away from the job.

I went through two major long duration floods during my career. Looking back, what made the 1993 flood different from the 1973 flood, other than the higher crest, was the immense increase in media coverage in 1993.

In earlier floods, the H & H Branch would supply flood data and river forecasts to the EOC. They in turn would pass that information to the flood fight teams and answer public inquiries and media requests.

Around mid-June, the media demands got so overwhelming that a separate "Media Center" had to be set up.

The "Media Center" was staffed with the appropriate public affairs and technical experts best able to deal with constant national and international press, TV and radio requests. This worked very well as I no longer saw TV crews roaming the halls trying to interview stunned summer employees in their cubicles about their views of the Flood of 1993.

The flood was an overwhelming experience. When I first started to recall that summer, I found myself feeling even more pride the District than I remembered feeling at the time.

Archeologist at the Breach

Shielding Landmarks from the Mississippi's Wrath: from the "Federal Archeology Report", Volume 6, No. 3, Fall 1993, ISSN 1057-1582, pages 12 and 13.

On August 1, in a last-ditch effort to rechannel the Mississippi's raging floodwaters as they bore down on a historic Illinois community, the U.S. Army Corps of Engineers, St. Louis District made two unprecedented moves: one, deliberately breaching a levee, and two consulting an archeologist before doing it.

To the north just hours earlier, the Mississippi swamped the upper flank of the Harrisonville Illinois Levee, inundating 46,500 acres of farmland in the French Colonial district southeast of St. Louis.

Fort de Chartres state historical site, one of the earliest settlements of the middle Mississippi Valley (1753) and one of the few reconstructed forts of the period, was covered with eight to ten feet of water. Other archeological sites - the original Fort de Chartres (1719), the Waterman Site (ca, 1750), the Kolmer Site (1750), and the Mathews Site (a Mississippian period temple complex) - suffered the same fate.

To control the impact of the relentless floodwaters on the next downstream levee, which shielded the historic community of Prairie du Rocher, the Corps planned to breach the lower flank of the Harrisonville levee just south of the spreading waters. Hopefully, the ensuing "controlled" flood would act as a brake for the water rushing down from the north, protecting Prairie du Rocher from the river's fury. Taking the brunt of the onslaught were farmland and several communities that unfortunately could not be protected.



Ft. Chartres before the flood of 1993

However, before the Corps implemented its daring plan - and at the request of Senior River Engineer Claude Strauser, District Archeologist F. Terry Norris, and Chief of Curation and Archives Analysis, Michael Trimble were called in to advise.

Norris and Trimble briefed St. Louis District Commander Colonel James Craig, and Deputy District Engineer Jack Niemi on where to cut the breach to avoid flooding threatened sites. The breach did its job as planned and Prairie du Rocher survived the destructive force of the floodwaters.

It was one of the only times in Corps history that cultural sites were considered in such a crisis. St. Louis District officials say their high regard for the past work of Strauser and Norris was key to their decision.

Constant innovation and an unceasing search for new solutions characterized the Flood Fight of 1993. As this issue of Esprit emphasizes, the Great Flood of 1993 was so far out of proportion to anything in recorded history that there simply was no "operators manual" to fight it. Bold decisions, implemented by brave and dedicated people like those nameless people who filled and placed sandbags until they finally turned the river back, can win a fight. I'm correct when I say we won't always win, but on this occasion, we combine the precise measures of inspiration with perspiration to cook up a victory.



Myths and Misconceptions

Editor's Note: Following the 1993 Flood, Gary Dyhouse, retired Chief of Hydrologic Engineering, wrote an article addressing some of the flood's myths and misconceptions. Portions of that article are reprinted here by permission of the author. Like all of the personal recollections in this special edition of Esprit, it represents the findings and opinions of the author, not necessarily those of the Corps of Engineers.

Myth 1: "The flood was caused by man, and primarily by the Corps of Engineers."

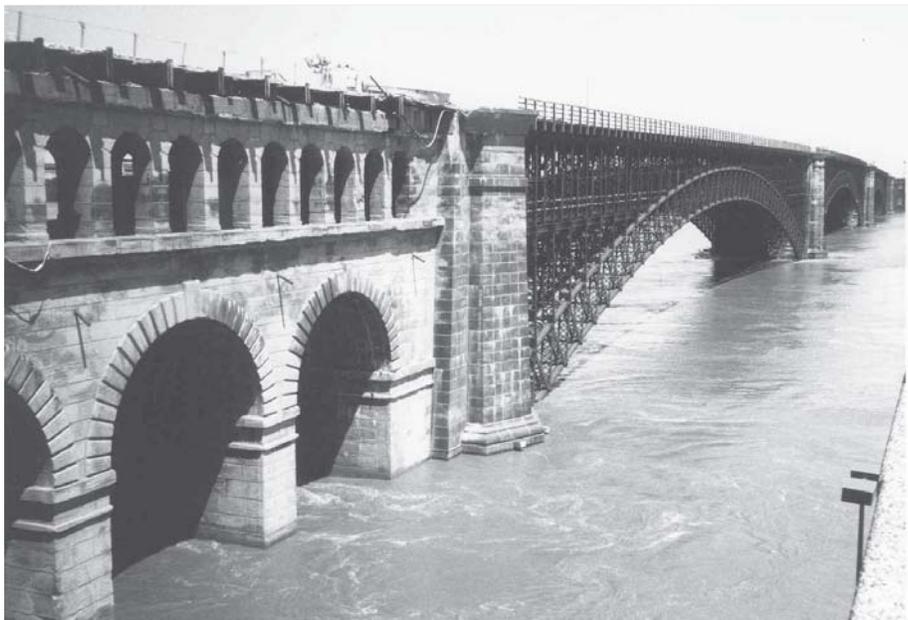
Contrary to the beliefs of some, the Great Flood of 1993 was not caused by levees, loss of wetlands, navigation structures, flood plain development, or any of several other reasons that have been brought up by various individuals. The flood was caused by unprecedented rainfall over wide areas of the basin and over many months of time.

The total average rainfall in a year was delivered to much of the Missouri and Mississippi River watersheds during the first seven months of 1993.

July rainfall totals ranging from 200 to 600 percent above normal were common.

This unprecedented rainfall caused the Great Flood 1993 to break all records for stage, volume, peak discharge, duration and frequency for one thousand miles of the two rivers and for many of their major tributaries.

The total water volume passing St. Louis during the main body of the flood,



Eads built his bridge to withstand the Mighty Mississippi. The strength of his structure was severely tested by the record flood of '93.

from June 26 to Sept. 13, was about 112 million acre-feet. This volume could cover the entire State of Missouri to a depth of 2.5 feet or fill a box one mile wide by one mile long by 33.1 miles high.

Myth 2: "The river has been over-engineered and straight-jacketed by levees."

A case could be made for the exact opposite of this statement for the Upper Mississippi River and Missouri River systems.

The vast majority of all the levees are private or non-federal in construction and the amount of engineering and design that entered into the construction of these is generally small.

Since most of these levees are protecting farmland, they are not intended to withstand extraordinary floods, like 1993. Straight-jacketing the river would mean that the rivers were largely confined to their channels during the flood, also a statement which is exactly the opposite of what occurred except in some urban areas.

The low agricultural levees were totally submerged in most areas and the river flowed from bluff to bluff, in some reaches over five miles wide. Only in urban areas were the rivers confined, to prevent the billions of dollars in potential damages to residential, commercial and industrial properties in cities like St. Louis and Kansas City.

Myth 3: "Wetlands would have soaked up the floodwater like sponges."

Wetlands have a great value for water quality, as well as for fish and wildlife habitat; however, flood plain wetlands have a negligible value for flood reduction for rivers like the Missouri and Mississippi.

If all of the leveed agricultural areas which filled up with water had been wetlands prior to the 1993 flood, little difference in river stages would have



The St. Louis Floodwall protects the District's Service Base and the nearby Defense Mapping Agency from many feet of flood water.



been seen at any location along the Missouri and Mississippi Rivers.

Fifteen or more feet of water occupied the flood plain throughout the two river systems and whether the land use was initially agricultural or wetlands would have had no bearing on downstream flood levels.

Conclusions of a White House Task Force on the Great Flood of 1993 confirm that restored wetlands would have had only a minimal effect, at best, on 1993 Missouri and Mississippi River flood levels.

One final thought: If wetlands were “sponges” and soak up floodwater, how could one explain the major floods at St. Louis which occurred in 1785, 1844 and the 1850’s, when the Mississippi and Missouri River Basins had over twice as much area in wetlands than in 1993?

Myth 4: “Since many levees overtopped, levees don’t work...?”

Overtopping levees made the news almost every night during the flood. However, it was not pointed out that these levees were not designed to withstand floods of the magnitude of 1993.

Essentially no levees “failed” during the flood since a failure would imply that the structure did not do its job up to the design river level.



A tired levee yields to months of soaking floodwaters and slowly gives away.

The overtopping or breaching occurred in nearly every case after the design water elevation had been exceeded—in some cases by many feet.

All levees and floodwalls that were designed for floods similar to or greater than 1993 did their job and prevented flooding to the protected areas.

If the urban levees did not exist during the 1993 flood, damages in the St. Louis area would have measured in billions of dollars, compared to actual damages.

The Great Flood of 1993 was probably the largest flood seen at St. Louis since the first European settlers entered the area in the 1700’s.

Damages from floods can be greatly reduced by structural solutions, such as levees and reservoirs. This was the case in 1993, but absolute flood control or flood prevention is seldom practical.

Non-structural flood solutions, such as land use planning, flood plain zoning, flood insurance relocations, flood forecasting and warnings, should be included with traditional structural flood reduction measures like levees and reservoirs.

No one method, be it levees, reservoirs, wetlands, relocations, etc. represents the “best” solution for flood reduction. We should remember this as we look ahead to improving the management of future floods.

Fighting floods combines sand, sweat and gravel. It doesn’t matter whether you’re making concrete or a sand bag wall.

Communités, volunteers and the “volunteered” all worked together to ward off the river’s wrath with what was available to them. Some teams were more successful than others. What really matters is, they tried.



Cape Girardeau, Mo. continues with business as usual protected by a Corps-designed and built floodwall.



A “Thank You” sign says it all.



Retiree's Corner



*Editor's Note: **Emmett Hahn**, retired Chief of Readiness, led the Emergency Operations Center during the '93 flood. Emmett's familiarity with the '73 flood proved invaluable two decades later. His expertise and professionalism were once again called on as he played a key role in the District's flood fight.*

For some of us it has been 30 years since what was then the flood of record for the St. Louis gage in 1973. Even harder to believe is that it has been ten years since what some people called 'the summer that never was.'

There are many memories of that summer. Most of them have to do with the supreme efforts of many individuals. While 24 federal and non-federal levees were breached or overtopped, numerous other levees were saved due to the hard work of local interests, Corps of Engineer flood fight teams, field and office personnel.

The EOC (Emergency Operations Center) was activated on July 1st, and remained staffed until August 27th. During the peak stages of the flood it operated on a 24-hour schedule.

One significant event I will always remember happened on August 1st the day of the crest.

It was a Sunday and the day crew had been working for about two hours. The EOC office was staffed with about 15 people. Conversations flowed overhead as telephones rang constantly with incoming reports, requests for stage



Ken Kruchowski (center), public affairs, and Lou Chiodini (R), program management, take notes as Emmett Hahn briefs the Media Center on the flood.

information and calls for assistance from the field.

One of the calls was from a local television station that had a helicopter south of St. Louis above the Mississippi River. They reported a levee overtopping and began airing live coverage. Pretty soon our people in the field began informing us the Columbia levee was being overtopped in several locations. It was quickly apparent that the entire 14,000 acres in that system would be lost.

I recall that everyone in the EOC stopped whatever they were doing and turned toward the TV. I don't think the telephones stopped ringing, but I don't recall hearing them, as the EOC grew very quiet. We all watched in silence as the levee system overtopped and the Gummersheimer farmhouse got carried away.

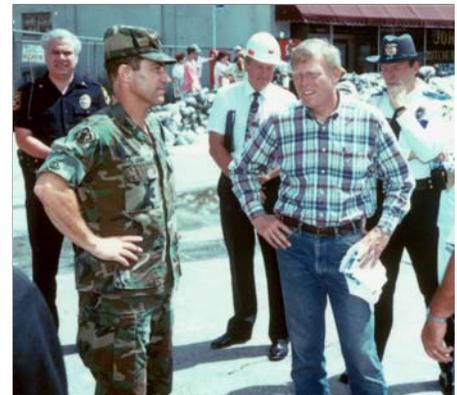
This loss resulted in the overtopping of the upper flank of the Harrisonville Levee and created a concern that this 'domino effect' would continue through the remaining levees.

The next day Dave Mueller, George Postol and Claude Strauser met with the levee commissioners to discuss how to avoid this setback. Several options were

discussed and the commissioners asked that the Corps breach the lower end of the Harrisonville Levee in an attempt to save the downstream levees.

This option worked. It was just one of the many decisions that district personnel working with flood fight teams made that helped to avoid further losses.

It was a pleasure to work with the fantastic staff in the EOC, the great group of area flood fight engineers and their staffs in the field, and the dedicated individuals from all the elements within the District.



COL James Craig meets with Congressman Dick Gephardt (D), Mo. to witness the devastation firsthand and to discuss relief options.



Gary Dyhouse, retired Chief of Hydrologic Engineering, remembers

It's been ten years since the Great Flood of 1993? That doesn't seem possible.

July to August 1993 was exciting but scary, satisfying but agonizing.

Day to day, hour to hour, even minute-to-minute, we were drawn into the drama of the flood. The time flew by each day and we didn't really want to leave the office or the field for fear that something would occur that would require us there.

Twenty-four seven was the rule for much of the District throughout July and early August.

For those six weeks, I worked in the District Media Center, along with other personnel from GeoTech, Emergency Operations and Public Affairs. We were available to assist the media with inquiries concerning the flood and Corps operations.

My background was in hydrology, hydraulics and the impact of Corps levees and reservoirs. When we started the Media Center following the Fourth of July weekend, I wondered if the press would try to link the old environmental "saw" that "levees caused floods" with the 1993 event.

I didn't have to wait long!

Fed by environmental groups, the national media immediately began trying to attribute the levees along the Mississippi River as being the cause of the flood. I was grateful that we had performed enough physical and mathematical model tests during the 1980s to thoroughly refute these claims.

About halfway through the flood, one of the Post-Dispatch writers even told me that he stopped listening to the environmental clamor on this subject because the Corps did such a good job of explaining what the impacts of levees and reservoirs were on the flood. This was one of the few times I remember the Post-Dispatch ever complemented or even believed the Corps!

The most frustrating memory of my media experience was the frequent

interviews, I or other engineers in the Media Center, would give on technical subjects.

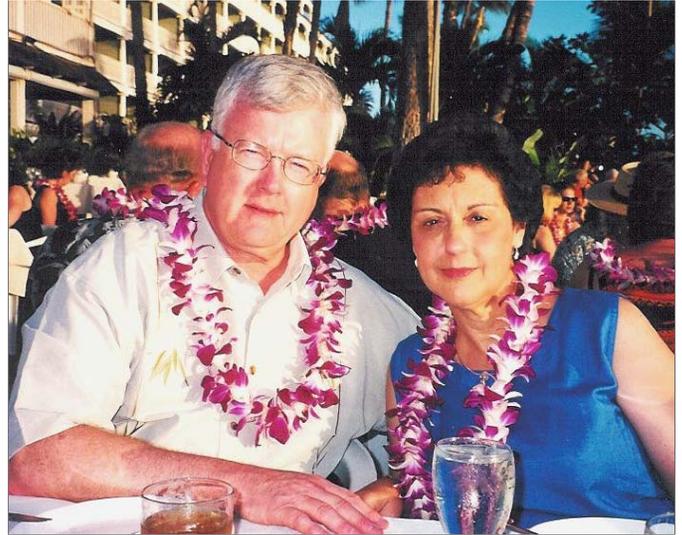
When the interview appeared on TV or in print, an environmentalist, from a local university or a wildlife group, who had no engineering background or expertise in river systems, would present an opposite statement. When I questioned a reporter on this, he said that

their job was to present both sides of an issue and let the reader or viewer decide what was correct. To me, this always seemed like getting a second opinion from the trash collector about whether you really needed a heart transplant!

The most embarrassing memory occurred on the second day of the Media Center operation when I discovered that no conversation is off the record unless you say it is. I spent 15-20 minutes doing an interview with the Associated Press on the flood and we were in the process of ending the interview when the reporter suggested we must be pretty busy. Yes, I said, "We were so busy that we didn't have time to go to the bathroom."

Needless to say, that was the only quote of mine used in the interview and appeared nationwide on the AP. It took a while to live this down, especially since the DE told me in a meeting later that week that I needed to take time to use the facilities.

We also got many humorous suggestions from the general public on how to reduce the flood. One fisherman suggested we put thousands of boats on the river, pointing upstream and rev the engines so the propellers would increase the velocity of the Mississippi and speed the water to the Gulf.



Gary and Diane Dyhouse vacationing in Maui in 2002.

Since we had a severe drought in the southeastern U.S. during the flood, another caller wanted to know why we couldn't just load up all the railroad tanker cars in the area with floodwater and ship them to the Southeast, thereby eliminating both the flood and the drought.

Another caller wanted all the barges tied up along the river hauled out of the water so the water level would lower. My favorite however was from the elderly lady that wanted to know why we didn't drill holes in the river bottom so that the water could drain out!

July and August were exciting times. Interviews with local, national and international media, TV and radio appearances, being told by friends that they watched me on CNN while in Europe are all experiences that I will never forget.

The successful performance of the great majority of Corps levees and reservoirs that we helped construct and operate during that great flood are even more gratifying memories. While I wouldn't trade anything for the events and experiences of that summer, I definitely would not want to go through a repeat of that awesome event.



Jack Niemi retired shortly after the Great Flood of '93. He had a long and distinguished career with the St. Louis District, U.S. Army Corps of Engineers beginning in 1962. From 1989 to 1993 he served as the Deputy District Engineer for Project Management. Mr. Niemi, one of our distinguished civilian employees, shared this remembrance of the '93 flood.

There were many memorable events in The Great Flood of '93. The two that stand out in my memory came within a few days of each other: the near disaster at the St. Louis



Jack Niemi

Floodwall at Riverview Boulevard and the failure of the Harrisonville levee system in Illinois. The first was a non-event for the media since there was no disaster, but the second received significant coverage.

On July 22 a geyser erupted behind the upstream flank of the St. Louis Floodwall and a vortex appeared in the water on the riverside. It was a near

heart stopping sight to see the water shooting into the air behind the flood-wall. Flood protection failure at this location would have caused extensive flooding in the city. The problem was immediately discovered and action was taken to dump rock in the landside hole and to pour rock fines into the riverside vortex in order to choke off the flow.

A rock-ring levee was also constructed on the landside to contain the water should the wall fail. It took some time for the dumping of rock and fines to stop the flow of water but not before the flood wall tilted about 4 inches. The ring levee was not required, but it was ready if needed.

The second event was the failure of the Harrisonville levee system in Illinois on the Mississippi River. The upstream flank levee failed on Aug. 1. The concern was that the rapidly flowing water would rush through the levee district, breach the downstream flank levee, jump across Prairie Du Rocher Creek, breach the upstream flank levee of the Prairie Du Rocher Levee District, and flood the town of Prairie Du Rocher.

Quick action was taken to deliberately flood the lower portion of the Harrisonville levee system in order to

cushion the impact of the water rushing toward it. The gravity drains were opened and a portion of the levee was mechanically removed to let water in. The Prairie Du Rocher Levee District, against the advice of the St. Louis District, also dynamited a portion of the levee.



The Gummersheimer farm after the levee breach.

These actions prevented the breaching of the Prairie Du Rocher Levee District and the town was saved from flooding.

My most enduring memory however is the superb work done by the many people of the St. Louis District who worked as a team to do what they had been trained to do - fight the flood.

They worked long hours, many times risking their lives as Harold Smith did when his truck was swept into the Bois Brule levee breach. He miraculously survived being tumbled through the rushing water before being swept up on the levee on the opposite side.

All those who participated in fighting The Great Flood of '93 will, as I do, remember it the rest of their lives.



Col. James Craig, Jack Niemi and Chief of Engineers meet in the DE's office to discuss current flood conditions and recovery efforts.



A johnboat proves to be the best mode of transportation down main street, Grafton, Illinois



The St. Louis District did not fight the Flood of 1993 alone. The magnitude of the flood was so large that personnel from other Corps offices were asked to assist.

A total of 55 personnel came from the Lower Mississippi Valley Division, Memphis, Vicksburg and New Orleans Districts, and the Waterways Experiment Station among others.

The request for pumps from local interests was tremendous. St. Louis District quickly loaned its twenty pumps and had to borrow from other Corps districts. Memphis, Vicksburg, Detroit, New Orleans and Louisville Districts loaned a total of 64 pumps, and the Federal Emergency Management Agency was contracted and made available 32 excess pumps from Miami.

The Corps of Engineers, Coast Guard and the towing industry established a joint Traffic Control Center in mid-July to evaluate requests for emergency vessel movements and develop criteria in implementation procedures for the timely and orderly reopening of the waterway to commercial navigation.

The towing industry, which was losing 3-4 million dollars each day during the river closure, exercised great restraint to protect life and property.

The Missouri and Illinois Army National Guards, the U.S. Coast Guard and contract carriers provided aircraft support during the flood event. The U.S. Army Reserve Command for Military Support, stationed at Scott Air Force Base, Belleville, Ill., also provided support.

Two task forces from the Missouri National Guard, northeast and southeast, were set up to assist in different areas of the flood region with the dividing line being the Missouri River. Within the St. Louis District, 375 soldiers from the Northeast Task Force Unit and 1,015 from the Southeast Task Force Unit were activated and participated in flood fight efforts.

Approximately 4,600 Illinois National Guard members, from more than 65 task force units, assisted with flood efforts in the St. Louis District area.

These soldiers performed activities from sandbagging to security to logistical support. They also operated 31 helicopters to transport sandbags and performed various other missions.

The USCG had 254 active duty Coast Guard men and women, 141 reservists and three auxiliaries who assisted with flood fight activities throughout the St. Louis District area.

The American Red Cross operated 28 shelters in the St. Louis flood region during the peak stages of the event. These shelters provided beds, meals, nursing care and counseling to approximately 900 people. In addition, they operated ten fixed kitchens and 55 mobile kitchens. The Red Cross served approximately 1 million meals a day to flood fight victims and flood fight volunteers.

The Salvation Army responded to the basic needs of approximately 12,000 evacuees in the St. Louis area alone.

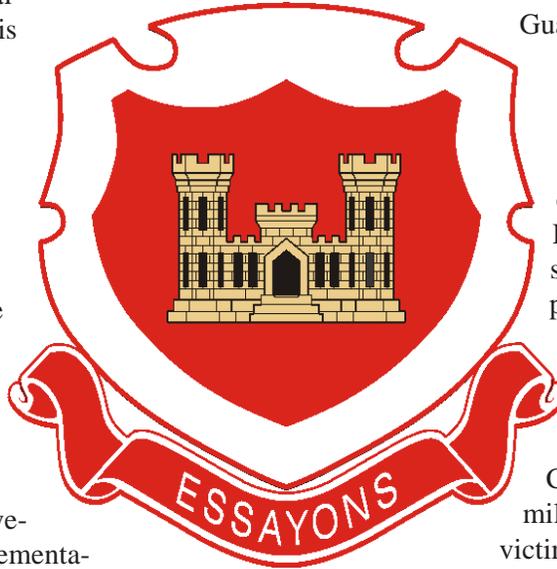
The Flood of '93 impacted thousands of people. Their grief was eased, if just for a moment, by the interagency cooperation that was present during '93.

It is sometimes hard to see the positives in an event like the flood, but one positive was the way in which everyone pulled together.

The manner in which different agencies, communities, levee districts, neighbors and volunteers pulled together is a true testament to the resilience and possibilities of the human spirit.

Many District employees who fought the flood have retired or moved on, but their legacy lives on. Their legacy and yours lives on in the pages of this special edition of Esprit.

Let us not forget the lessons learned, nor the tireless efforts waged by all who fought the Great Flood of 1993.



For over 200 years the Corps' motto has been "Essayons, " Let Us Try.