

Observer

Shaken and Stirred Up: Earthquakes, Fault Lines, Drilling and Floods Stoke Debate over Building Dams in North Texas

BY CHRISTIAN MCPHATE

TUESDAY, MARCH 15, 2016 AT 4 A.M.



Shady Shores flooding

John MacKenzie

The earthquake struck in the middle of the morning, shaking houses on their foundations and rattling dishes in cabinets.

Surprised residents from Valley View, a town about 60 miles north of Dallas, all the way west to Pilot Point poured into the streets in the fall of 1985. "It felt like the buildings were going to come down," Valley View Justice of the Peace Royce Martin told the local newspaper.

The U.S. Army Corps of Engineers, the federal agency in charge of our nation's dams, was busy moving bodies out of 16 historic cemeteries when the earthquake struck. The Corps had displaced two ghost towns – the Sullivan Settlement and Toll Town, both settled and abandoned in the 1800s – and various farms to make way for the Ray Roberts Lake, a 29,000-acre-foot reservoir being built to provide water for the growing communities in North Texas. Dallas and Denton proposed the reservoir project in the early '60s, but construction on the dam didn't begin until the early '80s.

A year before the earthquake struck the area in 1985, the Ray Roberts Lake team had finally acquired all the property it needed to dam the Elm Fork Trinity River. Comanches, Kiowas and Tonkawas once hunted the land and drank from the river. The region was a flashpoint of conflict, but settlers battled floods more often than the Native Americans. The river was a dangerous place in the spring, and officials and townspeople in support of the project hoped the new lake would tame it.

Phillips & Jordan Construction Co., a Knoxville, Tennessee-based builder, began construction on Ray Roberts Dam in June 1982, starting with 225 employees and eight subcontractors and ending with 40 employees laying stone known as "rip rap" on the sides of the dam. The new lake was originally called the Aubrey Reservoir, but the name was later changed to honor a representative to Texas' 4th congressional district, Herbert Ray Roberts. The original price tag of \$48.6 million to build the dam increased to more than \$51 million when it was finally completed in 1986, a year after the earthquake struck.

The 3.3 earthquake was felt north toward Gainesville and south toward Denton, John Minsch, a geophysicist with the Earthquake Center in Denver, told the *Denton Record-Chronicle* in a Sept. 20, 1985, article. It wasn't the first to strike the area, either. A local resident named Doris Heying remembered another earthquake that registered 4 on the Richter scale occurring on March 20, 1950. Heying told the paper the most recent earthquake set her kitchen to rattling and even shook a man out of his bed. "There was a rumble – didn't sound like a sonic boom, just a rumble – then the whole house started shaking," she reported. "It felt like the whole house was going to fall down."

The newspaper never reported how the earthquake may have affected the Ray Roberts Lake dam or whether it had caused the Corps to alter its plans and reinforce the earthen dam to withstand quakes. The *Observer* reached out to several Corps officials, but they were not even aware an earthquake had struck the area when the agency was constructing the Ray Roberts Dam. Clay Church, the Corps' public relations official, did say "a 3.3 magnitude earthquake event would not have resulted in design changes since the energy associated with this type of event would not be capable of damaging the dam."

But earthquakes and their potential effect on the dam were enough of a concern for the Denton Fire Department to create an earthquake evacuation plan for the city in 2007.

The lake was supposed to take about a decade to fill, but nature had other plans. Dam experts, surveys and calculations all pointed to the fact that the new Ray Roberts Lake wouldn't flood private property, either. "You know that lake that was supposed to take 10 years to fill and was only supposed to flood once in 50 years?" Mary Watson, a resident who lived on the north side of Ray Roberts in Cooke County, told the local newspaper in the late '80s. "Well, it'll be three years in June [since the lake was completed], and it's getting too close for comfort."

The heavy downpour that caused the lake to fill faster than expected reportedly was similar to the flood of 1981 that sent the Elm Fork Trinity River over its banks. "In 1981, it didn't bother us, because the lake wasn't there," Jan Leonard, a local resident who missed two days of work because she couldn't get out of her flooded driveway, told the paper.

Not long after the flood struck the area, surface slides appeared on the earthen dam, partly caused by saturation. The Corps sent workers to repair it, but said surface slides on earthen dams were a common occurrence.

"The main reason for the work is aesthetics," Sally Werst, public affairs officer for the Corps, said at the time. "It has nothing to do with the integrity of the dam. Those cracks just don't look nice."

Over the years, the local newspaper reported on lake levels rising at Ray Roberts Lake and other repair issues affecting the dam. The dam received a moderate-to-high-risk classification in March 2012 as a result of issues with seepage, stability and erosion, as

well as consequences to potential loss of life and economic, environmental and other risks. Yet the Corps was always quick to point out that the dam “is operating as designed.”

There was never any mention of the earthquake after the initial report appeared on Sept. 20, 1985. The tremors felt for miles faded into memory, and fears of an earthquake causing a breach in the new dam were forgotten, only to resurface years later when the oil and gas industry began poking holes in the ground around the Corps’ dams in Grand Prairie and later Lewisville, causing the Corps to initiate a study on Joe Pool Lake dam to find out how oil and gas extraction affects its integrity.

Today, the Ray Roberts Dam is undergoing a 10-year evaluation by the Corps to determine if the earthen dam’s risk classification needs to be changed from a moderately high risk to a high risk. An increase in rating means either indirect or plausible evidence suggests that a known defect or the sort of severe flood or earthquake that might occur once every 1,000 to 10,000 years would likely trigger potential dam failure, while a very high risk rating indicates direct or substantial evidence suggests a flood or earthquake with a return period less than 1,000 years would likely trigger potential failure, according to a 2012 document by the Federal Energy Regulatory Commission. (The chance of a 1,000-year flood occurring in a given year are 0.1 percent and vanishingly small for a 10,000-year-flood.) Still, either rating means the Corps needs to pay closer attention to the dam and, hopefully, the conditions around the earthen structure like oil and gas extraction.

For the Corps to determine a change in risk, a number of factors come into play, such as the effects of a long period of drought followed by the short period of a flooding. The increased seepage from the rising lake levels is also considered, but one factor not included in previous risk assessments (since it wasn’t known) is the fault line under Ray Roberts.

Some critics say it’s time for the federal agency that monitors our nation’s dams to pay closer attention not just to the fault lines near or underneath their dams but also to the subsurface exploration by the energy industry near or underneath their lakes. In North Texas, their demands are gaining extra heft these days. A swarm of small earthquakes shaking parts of Dallas and its suburbs has cropped up in recent months in a region where seismic activity is usually unheard of. The sudden spate of quakes has been linked by some researchers to the widespread use of “fracking” to pull out hard-to-reach oil and gas locked away in subsurface shale formations.

Adding to the worries was a report in the *Dallas Morning News* in December that revealed problems of seepage and slides affecting the dam at nearby Lake Lewisville, described by the newspaper as one of the nation's most dangerous, one whose failure could endanger 431,000 people.

Together, North Texas' suddenly shaky earth, the fracking boom and doubts about dams the Corps already operates are stoking a debate about how the state will supply water to a booming population. At the center of that fight is a dam not yet built, this one on the Sulphur River north of Ray Roberts. Landowners and industry in five counties whose livelihoods will be drowned under the proposed Marvin Nichols reservoir are being joined by experts who fear what may happen if the Corps impounds another 85 million tons of water above little-researched fault lines.



The view from the top of Lake Ray Roberts Dam.

Ed Steele

The problem is, according to the Bureau of Economic Geology in Austin, maps of fault lines across North Texas were not available at the time of the Ray Roberts' construction in 1982, nor are more detailed ones currently available because most earthquake research over the past 15 years has been directed toward areas where earthquakes are more common than Texas. Studying earthquakes "is especially

challenging because they happen infrequently and without any advanced warning," according to the U.S. Geological Survey.

The oil and gas industry launched a missile in June 2015 when Andrée Griffin, vice president of geology and geophysics at XTO Energy, revealed a map of subsurface shale with fault lines in North Texas to the Texas Railroad Commission. The fault lines on the map slant north to south across Dallas, Tarrant and neighboring counties, and they bear nicknames like "Big D Fault," which runs underneath Oak Cliff, Love Field and the Medical District, and the "Airport Fault," which snakes under the DFW airport.

The Corps stresses that a 3.3 earthquake isn't strong enough to affect the Ray Roberts Dam, but 30 million tons of water seems like a lot to put atop a fault line in an area known to be seismically active in the past. Peter Hennings, a research scientist at the Bureau of Economic Geology in Austin, says an earthquake can occur from the weight of a reservoir putting pressure on the fault line. It's called reservoir-induced seismic activity, and it's happened numerous times globally.

Seismologists have known of the connection between water and seismicity for nearly a century. In the 1930s, seismologists began warning about the dangers of increased earthquake activity after reservoirs were built. In the '60s, a 6.3 earthquake struck near the Koyna Dam in India, killing 177 and injuring more than 2,000 people. A decade later, researchers began studying earthquake activity in South Carolina after two new reservoirs were built. They spent 10 years researching and discovered that as the reservoir's levels increased, pressures rose at depth in the earth below and migrated over time to trigger nearby faults.

Reservoir-induced seismicity hasn't occurred in Texas, but the drilling industry's practice of disposing of waste water by injecting it at high pressure underground has been tentatively linked to earthquakes in places like Azle, a suburb of Fort Worth, according to a 2014 report in Nature Communications. "On the basis of modeling results and the absence of historical earthquakes near Azle, brine production combined with wastewater disposal represent the most likely cause of recent seismicity near Azle," researchers wrote.

Texas doesn't have consistent seismic activity like its neighbors on the West Coast, so Texas dams, buildings, bridges and roadways aren't built with earthquakes in mind, Hennings says.

Not much was known about the subsurface faults in North Texas, at least not until the

oil and gas industry began implementing its new hydraulic fracturing technology and mapping out deep shale while searching for gas pockets in early 2000s. But the subsurface geology of North Texas has a long and complex geological evaluation over the years, and some of the crystallized rocks that have been found at depths of 12,000 to 15,000 feet below the surface in Texas, Hennings says, look similar to rocks found elsewhere in areas known for consistent seismic activity.

"[The subsurface faults] need to be considered when siting water impoundment [like the Ray Roberts or Joe Pool reservoirs]," he adds. "It would be important in North Texas for a strong partnership between the public and the research sector of industry to work together to develop better publicly available interpretations of the faults."





Susan Read at Joe Pool Lake

Mark Graham

Susan Read was worried about the Joe Pool Lake dam that filled the horizon not far from where she lived. She'd seen one of the oil and gas industry's thumper trucks in her neighborhood slamming the ground with a heavy plate to induce seismicity to locate gas pockets for extraction. The force of the impact sends a wave of energy through layers of rock below in search of petroleum or gas or to map subsurface faults.

Read says her neighbors' houses shook each time the thumper's plate slammed into the ground. Seismic equipment lines were crisscrossing all over her residential community of Westchester in south Grand Prairie. Read had grown up in Grand Prairie and once held the Miss Grand Prairie crown, but she had never witnessed the oil and gas industry using seismic testing equipment to determine where to drill nor, like many North Texans, did she know much about hydraulic fracturing.

Read, who's also a singer, watched disbelief, fear and then anger spread among her family, friends and neighbors as energy giants Chesapeake and XTO moved into the area to extract natural gas. About 500 people filled a local Baptist church in 2010, with half of them simply trying to find out if they might sign a lease and become one of the new breed of Texas' millionaires. The other half fumed.

"If I hadn't experienced that, I don't know if I would have been that outraged," Read says.

Read banded together with several neighbors to form [The Westchester-Grand Prairie Community Alliance](#), a neighborhood group determined to halt the oil and gas industry from drilling in their neighborhood or so close to the Joe Pool Lake dam. They began attending City Council meetings, putting together a petition, pushing for a moratorium against fracking and drilling and traveling to Austin to speak with members of the Legislature.

She met Carl Dimon, a former petroleum engineer for Exxon, at one of their alliance's meetings. He'd gone out and measured one of the wells located on church property near Joe Pool Lake dam, one of the Corps' "high-hazard" structures, and discovered the wellbore was only 850 feet away from the dam. Even though the faults under Joe Pool Lake were considered shallow and normally don't pose much of a threat, according to a former dam safety coordinator for the Corps, a 3,000-foot exclusion zone from Corps-controlled dams had been established to keep oil and gas drilling away.

Chesapeake, however, was planning to ignore it, according to Dimon's measurements.

"I wrote a letter to the Corps and asked, 'Are you aware this well is being drilled within 850 feet of this dam?'" Dimon told the *Fort Worth Weekly* in February 2015. "Do you have any studies that indicate that is safe?" I do that in spirit. I'm still a registered professional petroleum engineer, and our code of ethics says we should be concerned with public safety. God only knows what happens if that dam fails."

The Corps replied to Dimon's December 20, 2010, letter with their own letter on Feb. 18, 2011, thanking him for the information. "Until we received your letter, we were not aware that drilling was proposed in such close proximity to our project," wrote Col. Richard J. Muraski Jr., the commander of the Corps' Fort Worth District. "You correctly summarize that we are concerned about impacts to the dam and appurtenant structures that could occur as a result of drilling and hydro-fracturing within 3,000 feet of any Corps project."

Fracking operations creeping near Corps dams across North Texas are just one of several reasons the Denton Fire Department created a "dam failure response plan" in 2010. "The dam is unlikely to experience a catastrophic failure unless it experiences some sort of seismic activity," the fire department quoted a 2007 document published by the North Central Texas Council of Governments. "The most likely cause of any future seismic activity would be from earthquakes originating in Oklahoma, Tennessee or Missouri.

"[But] it does cite the possibility of seismic activity resulting from oil and gas production in the area," according to the fire department's report.

The Denton Fire Department also discovered that a Southern Methodist University geological heat flow study showed that numerous geological fault lines and a tectonic boundary are located in the North Texas area.

The Corps' former dam safety manager, Jason Vasquez, told the *Weekly* that Joe Pool

Dam was in fairly good condition because it was a newer dam, although 2,000 of the state's others dams are either creeping toward or past their 50-year lifespans, or normal working period of being considered safe. The older the earthen dam, the more seepage in its foundation and dam body occurs, weakening its integrity if not controlled. The foundation can be maintained by reinforcing or installing relief wells. Lewisville Lake dam, for example, is more than a decade past its lifespan and known as "high risk of failure under an extreme event," according to the December 12 *Morning News* report.

The veteran petroleum engineer, the former beauty queen, the citizen group and the federal agency weren't able to budge Chesapeake, which drilled the well 850 feet away from the Joe Pool Dam and planned to drill four more despite the Corps' 3,000-foot exclusion zone, according to the Texas Railroad Commission's records. The problem is that the Corps' exclusion zone at the time only related to vertical drilled wells, not horizontally drilled ones. The Corps' Southwest District in Fort Worth implemented a new policy in March 2011 to include it, but the policy gave "no clear statutory authority" for the Corps to stop drilling within 3,000 feet of the dam if it was occurring on private land. "The gas industry jumped into this loophole," Read says. "They jump through loopholes well."

The Corps also sent a letter, in 2011, to Senator John Cornyn, alerting him to the fact that they were implementing a moratorium on all further oil and gas exploration and production activities upon public lands. "The Fort Worth District has received increased numbers of applications for oil and gas activities," wrote Col. Richard Muraski Jr., the commander of the Corps' Fort Worth District. "Some of these activities are in direct support of actions and operations which violate [the Corps' policy] on oil and gas exploration near critical Corps flood-control structures."

Muraski also approached Grand Prairie City Council about enacting a six-month moratorium against oil and gas drilling and fracking near water-retention structures to give its engineers time to conduct studies to verify that drilling and fracking activities would not affect the integrity of the dam because there was extraction taking place at an oil and gas unit just west of the dam, with its horizontal lines snaking through the shale below within the 3,000 feet of the Corps' exclusion zone. "Significant dam safety concerns have been identified at Joe Pool Dam," he wrote. "As a result, that project is currently considered to be high priority with respect to implementation of measures that will reduce risk to thousands of persons and properties located downstream. Our engineers believe that drilling and fracturing activities at Chesapeake Energy's Corn Valley drill site may increase the risk to the project, and possibly contribute to a

catastrophic dam failure.

The city agreed, passing a moratorium on September 6, 2011, then extending it every six months since that time.

Two years later, the Corps returned to the City Council, requesting that “extraction” be included in the moratorium because the process removes the space from between rocks, which could cause compression, and active wells were producing near the dam. “The Corps is done with the science portion of the study,” Jim Cummings, environmental services director, told the council. “But now they have to go through a political process, so it is hard to tell if this will ever be resolved.”

The city manager, Tom Hart, suggested that the city send a letter to the Corps, telling them that “there are three active wells that will be affected by [including ‘extraction’ in] the moratorium, and if there is science for extraction request, that they take action rather than the city.”

Not long after the city’s decision, Read learned that Chesapeake planned to shut down the drilling site on church property near the dam, plugging the well in April 2014. A residential neighborhood was going to be built atop the drilling site. “Well, that sounds crazy,” Read recalls thinking at the time. What sounded even crazier – the Bureau of Land Management, a federal agency created to sustain the health, diversity and productivity of more than 247.3 million acres of public land, leased property on the western end of the dam for oil and gas exploration. The energy giant XTO currently has three wells producing within 3,000 feet of the Corps’ exclusion zone, according to December 2015 production records from the Railroad Commission.

The Corps initiated the “Mineral Exploration and Production Activities In Close Proximity to Flood Risk Management Structures” study in March 2011 in response to receiving a number of inquiries and requests in connection with oil and gas development near dams and levees. The Corps plans to release the study later this month. The study will allow the Corps to better coordinate risk assessment and create responses to mineral exploration and production activities in close proximity to dams and other major water-retention structures. Some critics wonder why the Corps has taken so long to study oil and gas exploration near dams since the industry has seen a boom in hydraulic fracturing since the early 2000s.

Driving around the neighborhood where Chesapeake plugged the well and Joe Pool Lake dam looms in the horizon, Read, who recently returned to the area, credits the veteran petroleum engineer Dimon for recognizing the danger to Joe Pool Lake dam and

informing not only her group but also the Corps about hydraulic fracturing's possible effects on the dam's integrity.

But even after the Corps' study is published, the federal agency still can't control what happens on private property within 3,000 feet of its dams and watersheds.



Joe Pool Lake Dam map

Susan Read

William Crowder, a veteran professional geologist from Dallas, would rather forget the April 20, 2014, public hearing called by the Texas Water Development Board to discuss the Marvin Nichols Reservoir, a proposed lake that water planners in the Dallas area want to build that would be larger than both Lewisville Lake and Ray Roberts Lake combined, covering parts of five counties in Northeast Texas, including Bowie, Red River and Titus. Named after Marvin C. Nichols, a famed water expert and engineer, it will be the largest reservoir in the state.

Damming the Sulphur River will create the 72,000-acre lake, destroy a rare habitat known as the bottomland hardwood forest and lead to millions in losses for the local economy, one that includes paper mills, sawmills and logging. Generations of working family farms and ranches will be displaced. "It's our private property that they're seeking to take ... at the expense of our economy, at the expense of our environment," state Rep. David Simpson, a Republican from Longview, told the *Texas Tribune* in January 2015.

DFW's regional water planners claim it's needed for the projected 13 million people who will be clogging the corridors around Interstate 35 East, I-635, I-75 and the Dallas Tollway in 2060.

Sawmill workers, steelworkers, farmers, ranchers and other people whose property would be submerged have fought the Marvin Nichols Reservoir since Dallas water planners began seriously promoting it as an alternative water source in 2001. The Texas Conservation Alliance, a Dallas-based nonprofit dedicated to protecting Texas' natural habitats, formed a coalition of landowners, private property rights groups, timber industry leaders, sportsmen, conservationists, business people, labor unions and, eventually, elected officials in Northeast Texas to oppose the reservoir's inclusion in the state water plan, even though the Legislature had approved its creation after Nichols' death in the late '60s.

"The basis for our opposition," the alliance posted on its website, "is that there are options that would be cost-competitive for the water developer, do far less damage to the natural environment, avoid forcing thousands of Texans off their lands and livelihoods and have significantly lower negative economic repercussions for the society as a whole."

The battle became the talk of the town in Northeast Texas as dozens and dozens of people began attending meetings in small towns like Boxelder, Cuthand and East Delta, demanding to know how Dallas, a city more than 100 miles away, could take their land.

As the battle continued over the years, more and more information about the devastating effects of building Texas' king of lakes appeared like road signs screaming for regional water planners to turn around and head back to Dallas. But state and local officials have so far ignored all warning signs by scientists, industry leaders and common folk, leading men like Crowder, a professional geologist for 30 years, to lose their cool and drop a few curse words.

Crowder had been attending meeting after meeting, warning of the sleeping giant, a major fault line lying dormant in Northeast Texas. He even put together a petition with more than two dozen signatures from professional engineers, geologists and geophysicists warning local officials and Texas Water Development Board Director Carlos Rubinstein and former Gov. Rick Perry that the proposed lake would be built atop the Mexia-Talco fault, and the question wasn't "if" but "when" that sleeping giant would awaken.

"The building of the reservoir," he wrote in the petition, "will pose a potential threat to the public health and safety of northeast Texas by imposing new physical forces and pressures across a zone of crustal weakness that has been stable and tectonically dormant for the past 100 years."

At the hearing, Crowder looked like an old professor addressing the small crowd and government officials. He started by telling everyone that he'd recently stood before the Sulphur River Basin Authority, the state agency that manages the river to be dammed, and showed them maps and other data that demonstrated the position of the Talco fault in relation to the proposed Marvin Nichols Lake, which would submerge more than 70,000 acres of prime timberland.

"But what do you think happens when you stack 85 million tons of water on top of it?" he asked the crowd and the officials at the hearing as he pointed at a map of the proposed lake. "What happens to the Talco field and the wells? All of that has been ignored. I'm a professional geologist. If I ignore the most important element of my study, I'm guilty of omissions, liability, negligence and unaccountability!"

He stopped and spoke to some water officials who seemed to be ignoring him in the back of the room. "Are you getting this, water people?" he asked. "I'm talking to you." Their reply was inaudible. "I heard your talk," he told them, "and you're for this lake, and you're ignoring the most important element, which is the Talco fault!"

Sawmill and papermill workers, loggers and ranchers and steelworkers also were being ignored, despite showing up at meetings en masse as well as heading down to Austin to plead with legislators to remove the Marvin Nichols Lake from the state water plan. "Region C [Dallas] encroaching on Region D's resources is really an encroachment on sovereignty with regard to economic and environment impact on livelihoods," says Charles Scott, vice president of the United Steelworks Local 1148, who drove to Austin to protest the dam. "These towns [in Northeast Texas] are disappearing."

John Jones, a sawmill owner, believes that some of those millions of people predicted to be living in the Dallas area by 2060 simply need to move to East Texas if they need water. "I feel like [Dallas-Fort Worth region] is England, and they're treating us like one of their colonies; and the state government is going along with it."

Max Shumake, a veteran who lives on his family farm in Northeast Texas, agrees with Jones. "We kind of feel like the Israelis right now," he says. "What this has done is disrupted the lives of thousands of people with that hammer [the Marvin Nichols]

hanging over their heads – ‘We’re going to take your land, your livelihood.’”

Crowder told local and state officials at the public hearing that he had read Dallas water planners’ 429-page plan about the Marvin Nichols the night before the hearing. “Not one word, not one sentence about the Talco fault,” he said. “This lake will never be built. I stake my professional reputation and my license to practice in Texas on it. People are not stupid. They are not apathetic, and they are no longer disconnected ... and leaving data out is the same damned thing as lying.”

Nevertheless, the state water board gave Dallas water planners its blessing in late 2015 and approved their request to keep the Marvin Nichols Reservoir in their portion of the state water plan. The Corps, which would build the dam, would not answer questions related to the issue of faults under the proposed reservoir.

Colby Walton, a spokesman for the water board’s Region C, pointed out that Freese and Nichols, a Fort Worth engineering consultant firm, looked at the fault line issue and determined that “the dam will not be affected by the fault line,” he says.

The dam won’t be built for decades, Dallas water planners also claim. But its inclusion in the state’s water plan opens it up for state funding, and, Crowder says, Dallas could also vote to pass a bond for its construction sooner rather than later.

Crowder submitted an open records request to the Sulphur River Authority for all technical information and data concerning the Marvin Nichols and all related geological and engineering studies. He received a registered letter from the river authority not long after submitting his request that claimed all geological or geophysical information is exempt from disclosure.

“They are totally ignoring it, no interest in the science,” he says. “Nobody is interested at all. They are conveniently ignoring it.”





Lewisville Lake Dam construction

Provided photo

Paula Woolworth, an alderman for the small lakeside community of Shady Shores, surveyed the flood damage still affecting the area a couple of months after the Thanksgiving rainstorms. Lewisville Lake was trying to recede from her constituents' homes and roads, but rain was drizzling and more lingered in the forecast. It's been the wettest year on record for North Texas, leaving the sister earthen dams to the south at Lewisville and to the north at Ray Roberts saturated, over-filled and seeping.

An investigative report by the *Dallas Morning News* had recently revealed dam integrity issues, and residents across North Texas immediately bombarded their local officials with phone calls, demanding to know what they planned to do about the 65-foot wave they feared was waiting to be unleashed by a failing dam. Local media outlets picked up the story. The Corps fell into damage control mode and sent officials to local government meetings, released press releases and invited members of the press out to Lewisville Dam to take a tour of the damage, estimated to cost \$16.4 million to repair.

In a Dec. 15 press release, the Corps discussed a study at the dam that would "provide a solution to known seepage with potential for piping issues," a threat to the foundation

that could lead to dam failure. The seepage was first identified in July 2005, but the Corps didn't say why it's taken 16 years to repair it.

The Corps also reassured everyone that the dam was "operating as designed," but local politicians still took it upon themselves to find funding to help the Corps with some of the repairs.

In all the craze that followed the wake of the *Morning News'* investigation, no one ever mentioned Lewisville Lake's sibling to the north. Similar to Lewisville's dam, Ray Roberts has been affected by erosion, seepage and surface slides over the years, and the earthquake that had knocked people out of their beds and into the streets had long since been forgotten.

Woolworth hasn't forgotten. As a town council member for Shady Shores, she keeps a close eye on issues affecting the lakes because she's been taught to think of them like a network: What happens to one affects the other. When she attended the Corps' public hearing on Lewisville Dam in August 2013, she wondered why Ray Roberts wasn't part of the discussion since its lake levels and integrity issues affect its sister lake to the south.

"This part of the road is underwater," she says, pointing to South Shady Shore Road disappearing into the lake like a boat ramp. "It's our main connection to one of our key fire stations."

Many homes in Shady Shores were built in the '50s when Lewisville Lake was known as Lake Dallas and much smaller. Residents didn't have to worry about floodwater, she says, until the lake expanded a few years later.

On this day in early January, she's not thinking about earthquakes or the oil and gas crews who will later want to drill wells under Lewisville Lake since the Bureau of Land Management planned to auction natural gas leases around the lake. She's concerned about how to help her constituents who all want to know what officials are doing about the flooding. She's discussed possibly raising roads like South Shady Shores or maybe installing some retention ponds, but it takes money to provide flood protection. She also realizes it's a temporary fix for a permanent problem: "taking pervious land and making it impervious with a concrete slab and [residential or commercial] development," she says. "There is less and less land to absorb all of this water, so it's going to run off into the lakes."

In an echo of Crowder's worries about the Nichols', she says she just hopes the Corps is factoring it into its calculations and modeling as it works to finish Ray Roberts' risk

factoring it into its calculations and monitoring as it works to finish Ray Roberts' risk assessment.

"We have 2,600 residents, and we all go away under a wall of water if something happens to Ray Roberts," she says.

Sponsor Content



©2016 Dallas Observer, LP. All rights reserved.