



VOLUME 10, NO.35

NEWSLETTER

SPRING 1992

**AND THE RAINS CAME,
and CAME and CAME!**

The rains started in west Central Texas about a week before Christmas 1991. By New Years Day we had new records for December rainfall and the most wide spread flooding in our history with the Colorado, Brazos, and Trinity River Basins flooding simultaneously. Severe flooding and damage occurred from the Fort Worth-Dallas area to the Gulf of Mexico and east to Louisiana.

The weather pattern that caused the unusually widespread and persistent rainfall in December re-occurred in January and again in February. More flooding was the result each time.

In March central Houston suffered the worst flooding in many years when an unseasonal series of thunderstorms dumped over eight inches of rain on the city in a nine hour period. Thousands of automobiles were left stranded by the fast rising water as drivers were forced to abandon them to seek safety. Hundreds of homes were flooded.

The past three months have been dramatic reminders that the floodplain is exactly that, an area that has evolved to carry floodwater. Occasionally it will be underwater, **all of it.**

Remind your citizens about the floodplains in your community. You may be next.

JOB 1 - HANDLE THE FLOOD!

JOB 2 - GET THE WORD OUT!

Action by the public is most productive when based on knowledge of associated facts. **The Public Awareness initiatives taken by LCRA** before, during and after the December 1991 flooding may prove to be the most effective long-term floodplain management action they could have taken. Their pro-active efforts throughout the Colorado River watershed offer lessons for all of us.

- ◆ Beginning December 19, 1991 LCRA told citizens, state and local officials and the media, of the conditions on the Highland Lakes and the Colorado River.

- People upstream of Lake Travis had to know how much would be held.

- People downstream of Lake Travis had to know how much would be passed.

- ◆ Updates were faxed to approximately 60 locations every two hours: radio stations, newspapers, TV stations, county judges, emergency managers, the National Weather Service and other key personnel.

- ◆ Approximately 30 press releases were made over 3 month period.

- ◆ Press conferences and interviews at critical stages were carried by local, state and national media.

- ◆ A telephone Lake Level Number was established with a recorded message that was updated around the clock.

- 17,666 calls in December
- 9,564 calls in January
- 24,683 calls in February

- ◆ A Hotline number in the Public Information Office handled an additional 2,000 calls a day.

- ◆ LCRA personnel handed out material at the Mansfield Dam Observation area.

- ◆ Public meetings were conducted by the General Manager and key staff at eight locations in the watershed:

- | | |
|----------------|--------------|
| - Lago Vista | - Smithville |
| - Lake Travis | - Wharton |
| - Buchanan Dam | - Columbus |
| - Bastrop | - La Grange |

- ◆ Water sample testing kits for use by private well owners are being distributed and picked-up at 12 communities along the river.

- ◆ Clean-up of damaged homes and property was assisted by placing 22 dumpsters at strategic locations and providing front-end loaders.

- ◆ Created a Flood Exhibit depicting history of Mansfield Dam, previous floods and the Christmas Flood of 1991. The exhibit has been shown throughout the LCRA area.

- ◆ Used extensive ads in area newspapers explaining how the Highland Lakes chain of dams worked to protect Central Texas.

- ◆ Created a 23 minute video about the flood and LCRA actions to control it. The Video was distributed to employees and LCRA customers.

- ◆ Citizen suggestions are still being taken to further improve warning and public awareness efforts in the future.

From top to bottom the people of the LCRA were tested by this record flood. They excelled, individually and as an organization.

Llano River at Llano
6.83" of rain
Peak Flow 82,315 CFS
(Dec. 20, 5:30 p.m.)

Colorado River at Red Bluff
6.56" of rain
Peak Flow 47,137 CFS
(Dec. 21, 11:01 a.m.)

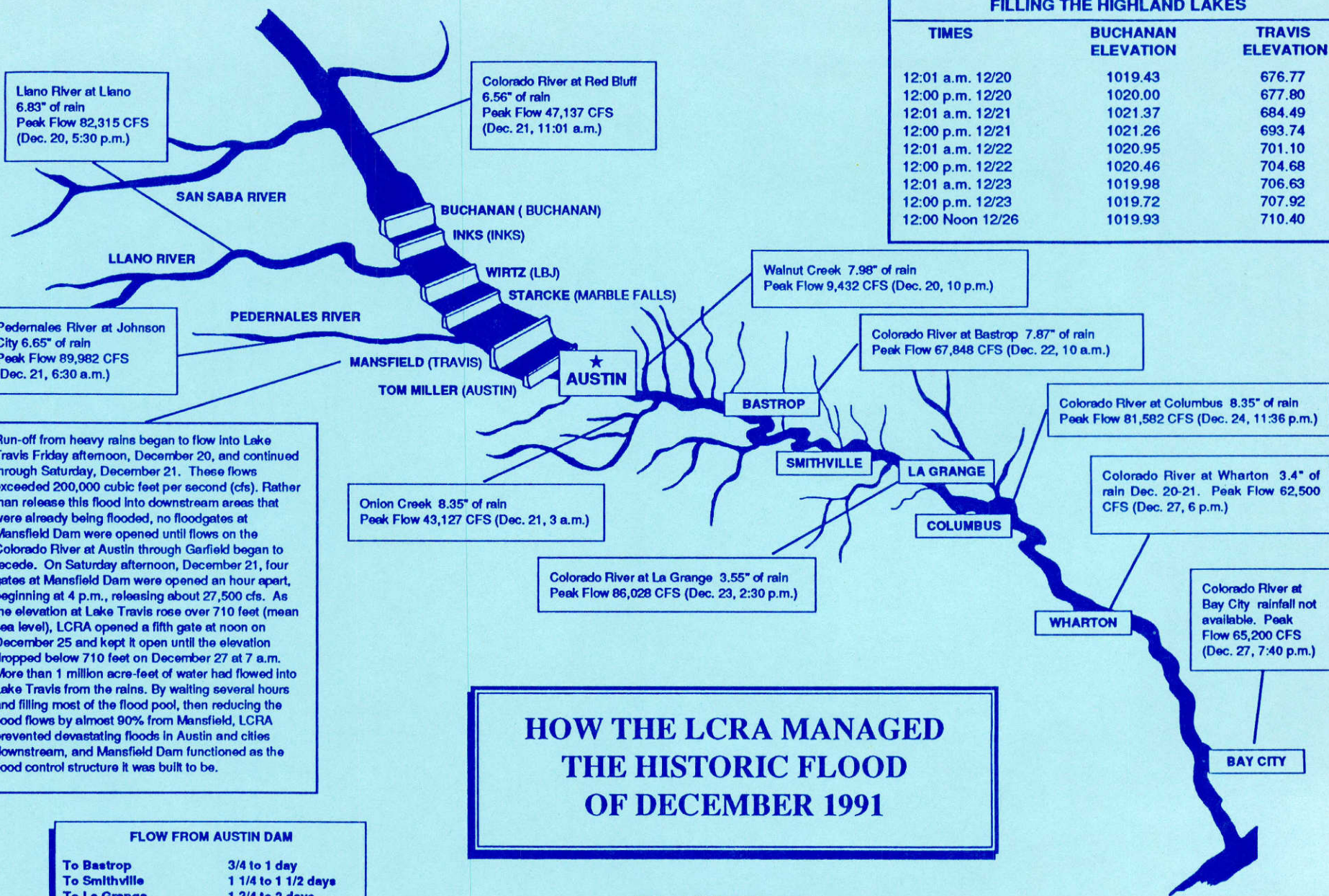
Pedernales River at Johnson
City 6.65" of rain
Peak Flow 89,982 CFS
(Dec. 21, 6:30 a.m.)

Run-off from heavy rains began to flow into Lake Travis Friday afternoon, December 20, and continued through Saturday, December 21. These flows exceeded 200,000 cubic feet per second (cfs). Rather than release this flood into downstream areas that were already being flooded, no floodgates at Mansfield Dam were opened until flows on the Colorado River at Austin through Garfield began to recede. On Saturday afternoon, December 21, four gates at Mansfield Dam were opened an hour apart, beginning at 4 p.m., releasing about 27,500 cfs. As the elevation at Lake Travis rose over 710 feet (mean sea level), LCRA opened a fifth gate at noon on December 25 and kept it open until the elevation dropped below 710 feet on December 27 at 7 a.m. More than 1 million acre-feet of water had flowed into Lake Travis from the rains. By waiting several hours and filling most of the flood pool, then reducing the flood flows by almost 90% from Mansfield, LCRA prevented devastating floods in Austin and cities downstream, and Mansfield Dam functioned as the flood control structure it was built to be.

FLOW FROM AUSTIN DAM

To Bastrop 3/4 to 1 day
To Smithville 1 1/4 to 1 1/2 days
To La Grange 1 3/4 to 2 days
To Columbus 2 1/4 to 2 3/4 days
To Wharton 4 1/4 to 5 days
To Bay City 5 1/4 to 6 1/4 days

Rainfall amounts from Dec. 20, 1991, 12:01 a.m. until Dec. 24, 1991, Noon.
Information on this document is taken from records as of Dec. 31, 1991.



FILLING THE HIGHLAND LAKES

| TIMES | BUCHANAN ELEVATION | TRAVIS ELEVATION |
|------------------|--------------------|------------------|
| 12:01 a.m. 12/20 | 1019.43 | 676.77 |
| 12:00 p.m. 12/20 | 1020.00 | 677.80 |
| 12:01 a.m. 12/21 | 1021.37 | 684.49 |
| 12:00 p.m. 12/21 | 1021.26 | 693.74 |
| 12:01 a.m. 12/22 | 1020.95 | 701.10 |
| 12:00 p.m. 12/22 | 1020.46 | 704.68 |
| 12:01 a.m. 12/23 | 1019.98 | 706.63 |
| 12:00 p.m. 12/23 | 1019.72 | 707.92 |
| 12:00 Noon 12/26 | 1019.93 | 710.40 |

Walnut Creek 7.98" of rain
Peak Flow 9,432 CFS (Dec. 20, 10 p.m.)

Colorado River at Bastrop 7.87" of rain
Peak Flow 67,848 CFS (Dec. 22, 10 a.m.)

Colorado River at Columbus 8.35" of rain
Peak Flow 81,582 CFS (Dec. 24, 11:36 p.m.)

Colorado River at Wharton 3.4" of rain
Dec. 20-21. Peak Flow 62,500 CFS (Dec. 27, 6 p.m.)

Colorado River at Bay City rainfall not available.
Peak Flow 65,200 CFS (Dec. 27, 7:40 p.m.)

HOW THE LCRA MANAGED THE HISTORIC FLOOD OF DECEMBER 1991



Lower Colorado River Authority
P.O. Box 220
Austin, Texas 78767-0220

For recorded information on lake levels:
Call 1-800-776-5272, ask for lake levels: In Austin, 473-3333

LOCAL INITIATIVES IN FLOODPLAIN MANAGEMENT

*An Invited Comment from
Diana L. Simms, Lower Colorado River
Authority*

One of the results of the Texas flood disasters is renewed interest in and discussion about floodplain management. The goal of any floodplain management program is two-fold; to reduce the threat to life and property from flooding and to achieve beneficial use of floodplain lands.

For many communities and counties, these objectives are addressed through participation in the National Flood Insurance Program (NFIP) which is administered by the Federal Emergency Management Agency (FEMA). Communities that participate in the NFIP adopt and maintain regulations that guide development in flood hazard areas in accordance with FEMA standards. If FEMA standards change, communities are responsible for revising their regulations to comply with the new federal requirements.

Unfortunately, many communities believe that their responsibilities end once compliant regulations are in effect, when in fact they are just beginning. Once development standards have been adopted, a permit system must be established under which an official or agency of the local jurisdiction issues a permit prior to initiation of any construction or nonstructural development in the community 100-year floodplain.

Finally, the flood data furnished by FEMA serves as the basis for a community's regulations. It is therefore ex-

tremely important that a community's map and corresponding data be as accurate as possible. If any floodplain development occurs which will alter the 100-year flood elevations, discharge, or floodway configuration the community must notify FEMA and request that the current flood maps and/or Flood Insurance Study be revised accordingly.

Therefore, even though the NFIP is a federal program, it is based on local administration of federal requirements. Local officials have a great deal of responsibility to ensure that at any given time, the local regulations comply with federal standards, permits are being issued for all floodplain development and the community's flood data is as current and accurate as possible. In order for the NFIP to be effective there has to be sound local administration of the program requirements. Without local initiatives, the overall objectives of reducing future flood losses cannot be met.

In recognition of the importance of a concerted floodplain management effort at the local level, the Lower Colorado River Authority is in the process of conducting a study to assess the needs of communities throughout the LCRA operating area to support their active participation in floodplain management. During the next few weeks, I will be talking with many of you regarding problems you are currently having in administering your programs in order to determine what assistance, if any, the LCRA might provide that will enable you to be more effective in your flood plain management efforts.

SOME OTHER PLACES TO FIND THE HAZARD INFORMATION YOU NEED

(Excerpted from Natural Hazards Observer - September, 1991)

The Natural Hazards Information Center is certainly not the only university-based group in the U.S. that produces works on hazards and disaster management. Regular readers of the Observer are well aware that such organizations as the Disaster Research Center (DRC) at the University of Delaware and the National Center for Earthquake Engineering Research (NCEER) at the State University of New York at Buffalo; and the Hazards Assessment Laboratory (HAL) at Colorado State University are equally prodigious producers of useful hazards information. An additional center that produces salutary publications is the Hazard Reduction and Recovery Center (HRRC) at Texas A&M.

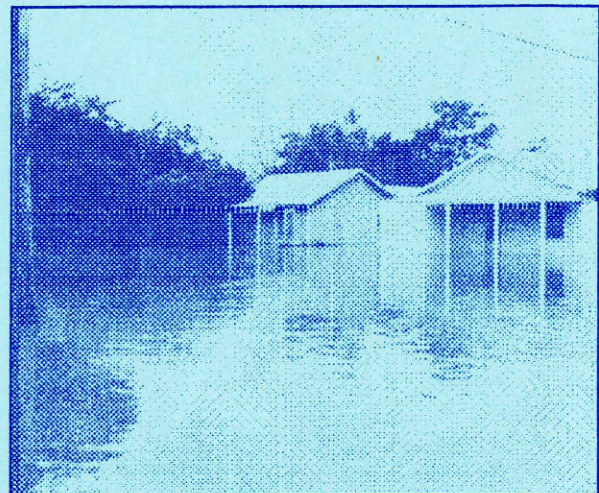
HRRC at Texas A&M

The Hazard Reduction and Recovery Center was established in 1988 to conduct research on hazard mitigation, disaster preparedness, response, and recovery. The staff of the HRRC includes over 25 resident and associated faculty fellows from a variety of disciplines - architecture, planning, engineering, sociology, geography, psychology, epidemiology, and policy analysis. The center studies the full range of natural and technological hazards, from floods and tornadoes to chemical accidents and lifeline failures. The purpose of the research is twofold. First, it aims to reduce the vulnerability of communities by enhancing miti-

gation and preparedness. Second, it attempts to contribute to the future recovery of communities struck by disaster by improving response and long range recovery planning.

The center also offers an extension program in hazard management and disaster preparedness. In cooperation with the Texas Agriculture Extension Service, extension specialists within the center have developed instructional material and provided workshops to local officials.

The results of the HRRC's research are distributed through several channels, including a publication series that encompasses books, monographs, reports, and articles. For a complete list of these publications and additional information about the center, contact the Hazard Reduction and Recovery Center, College of Architecture, Texas A&M, College Station, TX, 77843-3137, 409/845-7813; FAX 409/845-4491.



ARE TEXAS FLOODPLAIN ADMINISTRATORS CERTIFIABLE?

(Comment from Executive Director of TFMA)

Each time I ask the question "Are Texas Floodplain Administrators certifiable?" a smile comes on my face. We must be slightly insane to choose flood plain management as our professional career. The hours are long, the pay is short and the work is stressful. But you know it is worth it all when the flood strikes and you see homes which you permitted spared damage and the countless number of lives you may have saved through an effective public awareness program.

Seriously, floodplain management has become a very important function of state and local government. In Texas, we are faced with more floods than just about any other state and most often, we lead the nation in annual flood related deaths. It is time to raise flood plain management to the professional level it so rightly deserves.

Your **Texas Floodplain Management Association** has moved to the forefront in an effort to accomplish this difficult task. During a recent conference call, the TFMA Board of Directors committed the Association to a path of higher visibility and service of developing a strategic plan to incorporate new goals and objectives to take us through the 1990's. One of the primary goals will be the development of a formal training and education program coupled with a professional certification process.

For those of you who attended the 1991 TFMA Annual Conference in San Angelo, you got a taste of things to come. Last year, we added a 1/2 day training session to our conference agenda with outstanding results. In response to demands for more training, the 1992 TFMA conference will feature a full day training session for local floodplain administrators.

(More on TFMA elsewhere in this issue)

TWO YEARS LATER

(Excerpted from ASFPM, News & Views, February, 1992)

Its been over two years since the devastating blast dealt South Carolinians by Hurricane Hugo in September of 1989. Just now can South Carolina begin to put Hugo's effects behind them, but they will long remember events in terms of "before" or "after" Hugo.

A large chunk of the clean-up effort was handled by the Soil Conservation Service. Most of South Carolina's 170 SCS employees were detailed to work in the 20 counties damaged by the storm, working sunrise to sunset 6 days a week, along with SCS staff from 10 other states. Emergency Watershed Protection (EWP) program work was begun in October 1989 and finished in May 1991, at a cost of \$27.5 million.

EWP Program

Actions

Costs

| | |
|----------------------|----------------|
| Watercourse cleaning | |
| 2,343 miles | \$23.1 million |

Dune stabilization
54 miles 1.1 million

River restoration
349 miles 3.3 million

Protection provided: 61,191 homes, buildings; 6,252 roads, bridge crossings; and 172,836 agricultural acres.

The work was accomplished through the use of individual contracts (ranging from a few thousand dollars to \$1 million) sponsored by local units of government. Contract sponsors included the state governor's office, 3 state agencies, 20 soil and water conservation districts, 20 county governments and 62 cities and towns.



NATIONAL FPM RESOURCE CENTER

Individuals searching for information on a specific flood-related topic can call the Floodplain Management Resource Center at (303) 492-6818 between 8:00 am and 4:00 pm Mountain Time. A staff member will review the data base and inform the caller of the publications that fit their needs and how they may be obtained.

There is NO CHARGE for using the FRC. This multi-disciplinary effort is financed by the ASFPM; Corps of Engineers; Federal Emergency Management Agency; Tennessee Valley Authority; EPA Office of Wetlands, Oceans, and Watersheds; Rivers, Trails, and Conservation Assistance Program of the National Park Service; Eveready Flood Control, and Illinois Association for Floodplain and Stormwater Management.

If you have any documents or audiovisual presentations on these topics or if you know of any documents that would be appropriate for inclusion in the FRC, please send the information to:

Clancy Philipsborn, ASFPM Project Manager; c/o The Mitigation Assistance Corporation; Box 382; Boulder, CO 80306; (303) 494-4242

Help the FRC grow! Send documents. Promote its use at meetings and conferences. Call Clancy for promotional materials or with any questions you may have.

NATURE'S CLASSROOM

(DEBRIS LINE, Vol. 6, No. 2)

In nature's classroom is found a small stream originating from a spring in a limestone cave. The water is a constant 61 degrees as it flows for two miles before it joins the river.

Found in the area around this small stream are: Hill Country turkeys, raccoons, jackrabbits, fence lizards, catfish, water moccasins, armadillos, and several species of birds. Also found in the area are Gage's map turtle (colorful), Guadalupe bass, four-lined skink, green kingfisher, Texas salamander, the endangered golden-cheeked warbler and the rare Honey Creek blind salamander.

There are quartz geodes and milky quartz which can be found near the volcanic intrusions adjacent to the river. The Germans who settled this area in the early 1870's used to call the geodes "catheads" due to the resemblance to a cat's skull. There are also Indian arrow heads found in the area. Nature has, within this classroom, also provided fossils of snail, coral, clam, and nautilus shells.

Among the flora within this area can be found: blooming Mexicanhat, red sage, bluebonnet, mullen, Ashe juniper, live oak, agarita, Texas persimmon, cedar elm, Spanish oak, walnut, pecan, Mexican buckeye, sycamore, baldcypress, spicebush, palmetto palms, fronds of maidenhair fern, giant epipactis orchid and red columbine.

"Quiet, clear pools in shades of green provide the right surface for pads of a pond lily, known as spadderdock, and

reflect the image of sweeping beards of Spanish moss draping from the branches of surrounding trees." is how portions of this area are described in Texas Parks and Wildlife - July 1991.

One of the Texas Hill Country's first European colonists, Prince Solms-Braunfels described the area as "A land of milk and honey, of perennial flowers, of crystal streams rich and fruitful beyond measure."

This is also a floodplain; and not long ago the land was to be sold to a developer. Thanks to the Texas Nature Conservancy, the area was purchased and will not be developed and another floodplain and natural oasis will be spared the fate of the big blade.

REFERENCE: Texas Parks and Wildlife - July 1991



RARE DISEASE ASSOCIATED WITH SWIMMING

In addition to the pollutants, fire ants, etc. that get flushed into the rivers and lakes by floodwaters, this article highlights one hazard you may not have heard about.

(Excerpted from Texas Watch, December/January 1991)

In July 1991, a young man from Tarrant County who had recently taken a swim in Lake Granbury died of an unknown illness. Family members and others expressed concerns that possible fecal contamination of the lake had contributed to his death. Subsequent autopsies and tests revealed that he had died of a disease termed primary amebic meningoencephalitis.

Primary amebic meningoencephalitis is a disease of the brain and its membranes. It is caused by infection with microorganisms called ameba found in water, soil, and decaying vegetation. Three different groups of amebae including *Naegleria*, *Acanthamoeba*, and *Leptomyxid*, can cause this disease.

Ameba are single-celled, microscopic animals. They are members of the group of animals called protozoans which are all single-celled animals. *Paramecium* is an example of another type of protozoan. There are many, many different types of ameba that live in water and soils.

The man from Tarrant County died specifically of infection due to *Naegleria fowleri*. This naturally-occurring ameba is found in most bodies of fresh water including lakes, ponds, swimming pools and mud puddles. The ameba survive by feeding on bacteria. They are not parasitic ameba. They do not need to infect a human host in order to continue to survive. They thrive in brackish waters especially when the tempera-

ture of the water is above 90°F. Most human infections occur in the summer in the southeastern and southwestern United States. The ameba gains access to the brain through the nose. The time period from exposure to the water harboring the amebae to onset of illness is one to two weeks.

Early symptoms include fever and severe headache. The disease progresses quickly to include vomiting, stiff neck, and confusion. Death occurs within two to ten days. Only a few persons have survived this disease.

The disease of meningoencephalitis caused by the ameba called *Naegleria fowleri* is rarely reported in Texas. Although many people are exposed to the amebae in Texas waters, the disease occurs only rarely.

Since 1980 nine cases of this disease have been reported in Texas. All these people were children or young adults. All occurred in the summer months of June through September. All infections were acquired from swimming in a lake, river, swimming pool, or a drainage ditch. All nine people died.

Given the popularity of swimming and the widespread distribution of *Naegleria*, additional cases of amebic meningoencephalitis will occur. It is difficult to establish specific control measures. However, the public may be able to minimize the chance of contracting the disease by avoiding swimming in warm, stagnant waters.

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This edited information was provided by Jeff Taylor of the Texas Department of Health. Jeff works in the Environmental Epidemiology Program and can be contacted by calling 512/458-7268 or writing Texas Department of Health, 1100 West 49th Street, Austin, TX 78756.

TFMA NEWS

RE-NEUED EFFORT FOR TFMA

Membership in the Texas Floodplain Management Association has continued to be strong despite our past lack of service. Our new direction for the 90's will be more service oriented to our membership. The Board of Directors has committed the Association to several immediate actions:

- 1) Develop long range strategic plan.
- 2) Broaden scope of the Association to address other water concerns such as watershed & stormwater management.
- 3) Develop formal training and education program.
- 4) Develop Professional Certification program.
- 5) Form strong working committees to address the issues facing Floodplain Administrators.
- 6) Publish quarterly newsletter.
- 7) Conduct regional training sessions.
- 8) Become clearing house for technical publications and focal point for advances in field of floodplain management and hazard mitigation.
- 9) Develop an awards program to recognize excellence in our field.
- 10) Distribute certificates and other materials in a timely manner.
- 11) Increase coordination and cooperation between other professional associations and organizations.
- 12) Maintain TFMA State Chapter status in Association of State Floodplain Managers.
- 13) Bring the national ASFPM conference to Texas in 1995.
- 14) Increase and broaden the scope of our membership.

Currently, TFMA membership stands at 229. With all the floods occurring in Texas, interest should be high among the state's floodplain administrators. We have the opportunity to double our membership this year if everyone recognizes the potential benefits of belonging to a professional organization. Our first newsletter for 1992 will soon be mailed to current members along with membership renewal forms and announcement of the 1992 TFMA

Annual Conference. If you feel you would benefit professionally from membership in TFMA, please fill out the application form and return with your check as soon as possible.

TFMA 1992 ANNUAL CONFERENCE

The site for this year's TFMA conference has been moved from Waco to Austin. Major flooding along the Colorado River and Lake Travis has provided a golden opportunity for us to see floodplain management and hazard mitigation in action. A tentative date has been scheduled for June 16-18, 1992 at the Austin Crest Hotel.

The conference agenda is now being formalized but some of the major highlights include:

Flood Hazard Mitigation in the 57 County Texas Flood Disaster

Permitting Rebuilding After the Flood

Review of the Christmas Floods

Legal Challenges to the NFIP

Reauthorization of the NFIP

El Niño

Community Rating System

Full Day Training Session

Half Day Technical Field Trip

TFMA Business Meeting & Banquet

Plus Other Interesting Topics and Opportunities to Share Information

If you are new in the field or need a refresher, then this conference is for you. If your community experienced recent flooding, you should consider attending. Credit toward professional certification will be awarded to those who attend the training session.

To receive more information and the conference registration form, please fill out the enclosed conference interest form and return to the Texas Floodplain Management Association.

TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION

P.O. Box 162632, Austin, TX 78716

APPLICATION FOR MEMBERSHIP

NAME _____

TITLE _____

EMPLOYER/COMPANY _____

ADDRESS _____

CITY/STATE _____

WORK PHONE () _____ EXT. _____ HOME PHONE _____

MEMBERSHIP CLASS APPLIED FOR:
(Please Check One)

- FULL MEMBERSHIP - - - - - \$30
- ASSOCIATE MEMBERSHIP - - - - - \$25
- STUDENT MEMBERSHIP - - - - - \$10
- CORPORATE SPONSOR - - - - - \$50

(NOTE: Only Full Memberships Have Voting Privileges.)

TYPE OF MEMBERSHIP: (Please Circle One) NEW RENEWAL

ARE YOU INTERESTED IN SERVING AS A REGIONAL DIRECTOR?

- YES
- NO

MAIL COMPLETED APPLICATION AND CHECK TO:

Texas Floodplain Management Association
P.O. Box 162632
Austin, TX 78716
(512) 264-1556

PLEASE COMPLETE FORM BELOW

1991 TFMA CONFERENCE INTEREST FORM

- Yes, I plan to attend this year's conference in Austin, Texas on June 16-18, 1992. Please send conference form.
- I may attend, but I would like more information on this year's conference and training session.
- I do not plan to attend this year's TFMA conference.

NOTE: Utilize top of this form for name and return address.
TFMA membership is not required for attendance.

FIA ON NFIP REGULATION

(Excerpted from Natural Hazards Observer - September, 1991)

Deep floods or floods with high velocity waters frequently cause substantial damage to both residential and commercial buildings. Communities participating in the National Flood Insurance Program (NFIP) have certain responsibilities when issuing permits for the repair and reconstruction of these "substantially damaged" buildings. To clarify this obligation, FEMA's Federal Insurance Administration (FIA), the body overseeing the NFIP, has recently published **Answers to Questions About Substantially Damaged Buildings** (1991, 22pp.).

The booklet attempts to answer the common questions about NFIP regulations and policy regarding substantially damaged structures. It is in four parts - "Introduction", "Definitions and Regulations", "How to Determine Substantial Damage", and "The Post-Disaster Permitting Process" - and is intended to act as a guide for local building inspectors, zoning administrators, and other permit officials who enforce the floodplain management requirements of communities participating in the NFIP. In some cases, the publication may be useful to the owners of damaged structures as well.

Individual free copies of **Answers to Questions About Substantially Damaged Buildings** can be

TEXAS WATER COMMISSION
DAM & FLOODPLAIN SAFETY SECTION
1700 NORTH CONGRESS AVENUE
POST OFFICE BOX 13087
AUSTIN, TEXAS 78711-3087

ADDRESS CORRECTION REQUESTED

obtained by writing the Federal Insurance Administration, FEMA, 500 C Street, SW, Washington, DC 20472.

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REMEMBER

Your community receives one copy of this Newsletter. Please circulate to all key personnel with responsibilities in Floodplain Management or Emergency Management.

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