

Flood News for Michigan Floodplain Managers

A Newsletter of the
Land and Water Management Division
Michigan Department of Environmental Quality
www.michigan.gov/deq

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Friday the 13th Flooding in Northern Michigan

By Sue Conradson, P.E., MDEQ Cadillac Field Office

On Thursday, June 12, 2008, a major storm swept in off Lake Michigan into Manistee and Mason Counties and dumped an estimated 11 inches of rain over six hours and produced wind gusts up to 80 miles per hour. This storm rapidly moved northeast into Wexford and portions of Lake, Missaukee, and Osceola Counties. The violent thunderstorms knocked down trees, damaged buildings, and brought widespread flooding to the area that washed away parts of some roads and left some bridges unstable or impassable.

This rain followed what had already been a wet early June. All across Mason and Manistee Counties, farm fields were covered with water, houses were surrounded, and ditches were full. The rain that fell also caused flooding on the Lincoln, Big Sable, Pere Marquette, and Manistee Rivers. This flooding brought back vivid memories of the September 1986 floods which also affected these same areas. Based on USGS stream gage information, the June 13-14 flooding on the Big Sable and Little Manistee Rivers exceeded a 500-year (0.2 percent) flood event, the flooding on the Pere Marquette and Manistee Rivers was approximately a 20-year (5 percent) flood event, and the flooding on the Pine River was between a 200- and 500-year flood event (0.5 to 0.2 percent).

Numerous roads in the region were affected. A 440-foot section of US 31 between Manistee and Ludington washed out early Friday morning. This severed the main connection between these two towns and resulted in an 80-mile detour for drivers. The Michigan Department of Transportation (MDOT) estimated the repair cost for US 31 to be \$250,000. Portions of 42 roads in Mason County were closed due to swamping and washouts, 9 roads in Manistee County were closed, and approximately 25 were down to a single lane of traffic. These were also road washouts in Missaukee, Wexford, and Osceola Counties, along with shoulder washouts along hundreds of miles of gravel county roads. Hamlin Lake area residents were completely cut off from the towns of Manistee and Ludington, as all the access roads out of the area were closed.



Photo: Culvert washout in Mason County due to June 13 storm



Photo: Stiles Road Washout

Mason County received over 100 calls from residents and business owners whose structures were damaged. Most had flooded basements, with up to 5 feet of water. A few homes washed off their foundations or had basement cave-ins.



Photo: US 31 washout between Ludington and Manistee

In Ludington, the rain that fell overtaxed the sewer force main at Madison Street, causing the pipe and a 50-foot section of the road to collapse, meaning 90 percent of the city's raw sewage flowed directly into Pere Marquette Lake. The raw sewage continued to empty into the lake for 60 hours while the force main was repaired. An estimated 15 million gallons of untreated sewage and 10 million gallons of storm water went into the lake. The Health Department closed three public beaches and three boat launches near Ludington.

North of Ludington, the level of the water at the Hamlin Dam peaked at 9.8 feet on the dam's gauge. The normal summer level for the lake is 7.42 feet. Boats that got loose during the flood event were piling up against the dam structure. Ludington State Park was evacuated on Friday due to the potential for dam failure from the high water and flooding in the campground. The park remained closed until Monday, June 16th.

In Lake County, the worst damage involved a large mudslide north of Luther that sent a bank full of trees onto North State Road and a 30-foot wide sinkhole on 11 Mile Road west of Irons.

In Wexford County, Lakes Cadillac and Mitchell were out of their banks, causing water over the road around the lake, flooding 25 homes, and flooding over 75 percent of the Mitchell State Park, leading to the park being closed to the public.



Photo: Building flooded along the Lincoln River north of Ludington

Governor Jennifer Granholm declared a state of emergency in Lake, Manistee, Osceola, and Wexford Counties. In Mason County alone, officials estimate the flooding from the storm caused an estimated 4.8 million dollars in damages to public infrastructure, cleanup costs, and other services. On July 14, the federal government made a federal disaster declaration for this area and ordered federal aid to supplement state and local recovery efforts.

Community Official Responsibility After New FEMA Flood Maps Are Final

Situation:

- You are an existing and seasoned, brand new, or hopeful community official;
- You may have been involved in the FEMA effort to produce new flood hazard maps for the county which includes your community's jurisdiction; or
- You have not been involved but have been informed or have learned of the effort; or
- You have recently taken on or will take on a new role in your community having one or several duties related to community development, emergency management, or citizens' health, safety, and welfare; and
- You have just received a letter from FEMA. It explains that its map modernization effort that has been under way for the last year and half or so and has resulted in the finalization of the county-wide Flood

Insurance Study and new Digital Flood Insurance Rate Maps (DFIRMs). The maps will become effective by date certain.

Now what?

What should this mean to you and any one of your fellow community officials? The first thing it should mean to you is that it should not be ignored – there could be serious economic consequences to the community within the next several months.

If you're totally in the dark on this project and do not know which way to turn, the very best move is to call Les Thomas, NFIP Coordinator, at the Michigan Department of Environmental Quality (MDEQ), Land and Water Management Division, Lansing, Michigan, 517-335-3448. In a few minutes of discussion you should be on track with what actions the community officials need to be considering to avoid any negative consequences.

An additional option to consider if you need to learn more about the FEMA map modernization effort and the National Flood Insurance Program (NFIP) is to do research on the web. The following are excellent sites to gain a better understanding of what your obligations to your community citizens are as related to the NFIP and the production of new FEMA flood hazard maps.

https://www.floodsmart.gov/floodsmart/pages/about/nfip_overview.jsp

<https://www.ready.gov/floods>

<https://www.fema.gov/national-flood-insurance-program>

<http://www.fema.gov/media-library/assets/documents/1150?id=1480>

The principle obligation an official has if the community is not currently participating in the NFIP is to become as knowledgeable about the program as possible. Knowledge will assist community leadership in making a factually informed decision about becoming a participating community of the NFIP.

If your community is already participating in the NFIP, the primary responsibility is to ensure the appropriate administrative actions, such as ordinance amendments and/or adoptions and passage of resolutions, are completed prior to the effect date of the new maps.

The MDEQ has available for community use the NFIP enrollment application and model documents (ordinance and resolutions) at the following website:

http://michigan.gov/deq/0,1607,7-135-3313_3684_3725-122959--,00.html

***** Notice *****

The 2006 Michigan Building/Residential Code Rules and 2006 Michigan Rehabilitation Code Rules were filed with the Secretary of State on April 2, 2008 and took effect August 1, 2008

Michigan Bureau of Construction Codes (BCC) Contact Information

Telephone Numbers:

Administration (517) 241-9302 **fax:** (517) 241-9570
Office of Administrative Services (517) 335-2972 **fax:** (517) 241-9570
Office of Management Services (517) 241-9313 **fax:** (517) 373-8547
Boiler Division (517) 241-9334 **fax:** (517) 241-6301
Building Division (517) 241-9317 **fax:** (517) 241-9308
Electrical Division (517) 241-9320 **fax:** (517) 241-9308
Elevator Safety Division (517) 241-9337 **fax:** (517) 241-6301
Mechanical Division (517) 241-9325 **fax:** (517) 241-9308
Office of Local Government & Consumer Services (517) 241-9347
Office of Land Survey & Remonumentation (517) 241-6321 **fax:** (517) 241-6301
(includes State Boundary Commission)
Plan Review Division (517) 241-9328 **fax:** (517) 241-9308
Plumbing Division (517) 241-9330 **fax:** (517) 373-8547

Mailing Addresses:

P.O. Box 30254 (Codes: general correspondence)
P.O. Box 30255 (Codes: permits, licenses, and other documents containing payment)
P.O. Box 30704 (Office of Land Survey & Remonumentation)
Lansing, Michigan 48909

Overnight packages for

Administration, Office of Administrative Services,
Office of Management Services, Building Division,
Electrical Division, Mechanical Division,
Office of Local Government and Consumer Services,
Plan Review Division, and Plumbing Division

should be addressed to:

Michigan Department of Labor & Economic Growth
Bureau of Construction Codes
Attn: Division or person's name you are sending materials to
2501 Woodlake Circle
Okemos, MI 48864

Overnight packages for

Boiler Division, Elevator Safety Division, and
Office of Land Survey and Remonumentation (including State Boundary Commission)

should be addressed to:

Michigan Department of Labor & Economic Growth
Bureau of Construction Codes
Attn: Division or person's name you are sending materials to
6546 Mercantile Way
Lansing, MI 48911

Digital Vision: A New Generation of Maps

The FEMA Flood Map Modernization (Map Mod) efforts throughout the United States continue to generate new digital flood hazard products as part of its multi-year effort to update the flood maps nationally. The new maps are reliable, easier to use, and are being made available in digital format.

Digital Products Available

FEMA's distribution of many of its map products in a digital format during the past few years has resulted in a 50-percent reduction in paper map orders from the Map Service Center (MSC). Online product delivery provides users with the information they need quickly, often at no cost, bypassing the need for mail delivery of paper products. Users can still order a paper map from the FEMA Map Service Center website of <http://msc.fema.gov> or by telephone at 1-800-358-9616.

A FIRMScan is a full-size digital image of any paper map that can be ordered or downloaded from the MSC. In addition, users can create a digital FIRMette, the simplest way to access flood hazard information for a specific location. FIRMettes show a section of the official Flood Insurance Rate Map (FIRM). FIRMettes can be printed on a standard office printer and include the map scale, north arrow, and the map identification information that is used in all aspects of the NFIP, including floodplain management, flood insurance, and enforcement of mandatory flood insurance purchase requirements. Users can create a FIRMette free of charge on the MSC website.

Geographic Information System (GIS) users can employ the Digital Flood Insurance Rate Map (DFIRM) database product that has been designed for use with specialized GIS software. Using the DFIRM database in a GIS provides a more flexible and powerful tool for mapping and analysis than traditional map products can provide. DFIRM databases can be downloaded or delivered on a compact disc (CD) from the MSC. GIS users can also access GIS flood data as a Web mapping service. Access the "**Tools and Links**" page on the website for information about the Web mapping service.

For users who want to do more than the basic FIRMette product allows, the DFIRM Map Viewer provides some of the capabilities of GIS online. Users have more control over the display of flood hazard information and other mapping information shown on the Map Viewer, including the ability to combine flood hazard information with maps of other hazards. The **Map Viewer** is also available on the MSC website.

Getting the Right Information Out Quickly

FEMA updates the GIS version of the flood maps each time a Letter of Map Revision is issued. By the end of 2007, this updated version of the data was being displayed on the Map Viewer, and planning was under way for distribution of these data. FEMA is committed to making mapping products as user friendly and accessible as possible.

Reducing the Cost of NFIP Coverage

Susan Bernstein, FEMA

Many factors go into the rating of a flood insurance policy, although three components are primary: the age of the building, the method of its construction, and the flood zone in which it is located. With a bit of research, insurance agents can lower the premiums for some clients while still protecting the property against flood losses.

Grandfathering

FEMA revises and republishes Flood Insurance Rate Maps (FIRMs) for a variety of reasons, including when a community:

- Makes structural improvements (dams, levees, etc.) to reduce the potential effects of flooding;
- Experiences new development that increases the risk of flooding and thereby expands the floodplain;
- Revises geographical boundaries in a way that results in the designation of additional flood hazard areas; or

- Provides FEMA with information to better delineate the Base Flood Elevation (BFE) in flood risk zones in the area.

To recognize and assist policyholders who have remained loyal customers of the NFIP by maintaining continuous coverage or who built in compliance with the FIRM in effect at time of construction, the NFIP has "Grandfather Rules." Grandfathering allows these policyholders to benefit in the rating for their buildings and, in many cases, maintain the lower premium they had before the FIRM was revised.

Always check to see if the property owner may qualify for the Grandfather Rule, allowing the insured to use the old flood zone premium rate.

Is the Home Elevated?

Another strategy for reducing a client's premium is to determine whether the property is at or above the BFE.

The BFE is the expected depth of surface water during a major flood event known as the Base Flood. Buildings with their lowest floor at or above the BFE experience little or no damage during a major flood event. BFEs are shown on the community's FIRM. Making sure that the BFE and identified flood hazard areas are accurate is the main purpose for updating FEMA maps. Meeting the BFE could result in a lower insurance premium, even if the home was built pre-FIRM.

How does your client determine if the lowest floor of his or her home is at or above the BFE?

Ask your client to check with a local community official (start with someone in the building permit or planning and zoning department) to see if there is any information on file that would be helpful in estimating the elevation of the structure's *lowest* floor. If the building does not have a basement, the elevation of the lowest floor may already be at or above the community's lowest floor elevation requirement. If so, the property owner will need to secure an elevation certificate confirming that his or her home already meets the BFE requirement. The possibility of a lower premium is worth the trip to the town hall.

Letters of Map Change

An LOMC (Letter of Map Change) is a letter from FEMA that reflects an official revision to an effective FIRM. There are several types of LOMCs, including the Letter of Map Amendment (LOMA), Letter of Map Revision (LOMR), and others. All LOMCs are issued in place of physically revising and republishing the effective FIRM.

If the land where your client's structure is built meets or exceeds the BFE, he or she may wish to look into obtaining a LOMA. This is a document provided by FEMA to amend the FIRM. The LOMA confirms that the structure is officially excluded from the high-risk Special Flood Hazard Area (SFHA). Being removed from the SFHA could result in a much lower premium, especially if the property qualifies for an NFIP Preferred Risk Policy.

After your client confers with the appropriate community official, he or she can contact the FEMA LOMA Depot to discuss the application process. FEMA Map Specialists can be reached at 877-336-2627. Further information about LOMCs and other map changes can be found on the **Letter of Map Amendment (LOMA) and Letter of Map Revision-Based on Fill (LOMR-F) Process page** on the FEMA website.

Deductible Rates

If all else fails, explain to your client that various deductible options are available for NFIP insurance. The higher the deductible selected, the lower the premium to pay. Remember to inform your client that a higher deductible will result in his or her being responsible for paying for damage up to that amount, out of pocket.

You may want to have the policyholder sign an endorsement stating you have explained the consequence of a higher deductible.

Valuable Coverage

Regardless of the degree of flood risk your client faces, low-to-moderate or high, it is wise to purchase a flood insurance policy. Between 30 and 35 percent of all flood claims come from low-to-moderate flood risk areas. Always encourage your client to buy flood loss protection, even if the lender holding the mortgage for the building being protected does not require it.

Susan Bernstein is Editor of the eWatermark and writes regulations for the NFIP. She worked as the Mitigation Division Legal Liaison to WYO Companies and the FEMA Office of General Counsel for 10 years.

Paying NFIP Premiums by Credit Card

Did you know that NFIP policyholders can pay their annual flood insurance premium with a credit card?

Paying the full amount of their annual flood insurance premium up front can be challenging for some consumers. However, the NFIP Servicing Agent and most of the Write Your Own (WYO) insurance companies selling NFIP policies offer insurance agents the option of processing their customers' credit card payments using the Internet. Although the full premium charge is made to the credit card at the time coverage is purchased or renewed, policyholders then can choose to spread payments to the credit card company over several monthly installments.

Let the policyholders in your community know about the increased convenience of paying their NFIP premiums by using VISA, American Express, MasterCard, Diners Club, or Discover credit cards.

Credit Card Payments to a WYO Company

If NFIP coverage is placed through a WYO company, the agent may contact the company for instructions about how to offer the credit card option. Procedures for accepting this form of payment may vary slightly between WYO companies but usually just involve collecting the basic information (the cardholder's name as well as the card number, expiration date, and security code) needed for credit card reimbursement. The policyholder must authorize credit card payment before the charge can be made.

Renewals made through a WYO company also may be paid for by credit card. The WYO company carrying the coverage will provide its agents with information about how to process credit card payments for renewals.

Credit Card Payments to the NFIP Servicing Agent

Many insurance agents who place coverage through the NFIP Servicing Agent can process their clients' credit card payments online. Details about how to do this are available by sending an email to the NFIP Servicing Agent (agencyservices@covansys.com). Those agents unable to process credit card payments using the Internet can submit a signed Credit Card Payment Form to the NFIP Servicing Agent when they send the property owner's application for insurance or endorsement application to the NFIP Servicing Agent. This form is available in the Forms Library on the **NFIP Servicing Agent's website**. Applications and endorsements received with a Credit Card Payment Form are processed as usual, though the payment is charged to the indicated credit card.

Facilitating Premium Payment

The credit card payment option can reduce financial barriers to flood insurance purchase for many property owners. And for some consumers, the deciding factor in whether or not to purchase coverage in a moderate-risk flood zone, where it is

prudent but not required, may be what the credit card payment option offers: convenience. For more information about credit card payment, see pages

APP 6, REN 2, and MAP 4 in the **Flood Insurance Manual**.

FEMA Releases MHIP Version 3.0

Ernie Lepore

FEMA has released the latest version of the Multi-Year Flood Hazard Identification Plan (MHIP), Version 3.0, which details FEMA's plan for prioritizing and delivering modernized flood maps for areas of the United States with the greatest flood risk. MHIP Version 3.0 amends Version 2.0 dated September 2006 and Version 2.5 dated April 2007.

MHIP Version 3.0 provides:

- Detailed tables of flood map production targets;
- Stakeholder input information;
- A summary of FEMA's progress in meeting Key Performance Indicators for the Flood Map Modernization program; and
- Appendices that provide a detailed listing by State and county for all map production activities, both scheduled and completed

MHIP Version 3.0, as well as previous versions, is available on FEMA's Flood Hazard Mapping Web site at <http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping>. Interested parties with questions pertaining to the updated flood map production sequencing in MHIP Version 3.0 are encouraged to contact their appropriate local and state officials, who are working with one of FEMA's 10 Regional Offices.

Source: Ernie Lepore (703) 317-6276

NATIONAL FLOOD HAZARD LAYER UPDATE

David Taft and Michael Baker Jr.

On July 14, 2008, the Federal Emergency Management Agency (FEMA) started updating the National Flood Hazard Layer daily. New Digital Flood Insurance Rate Map (DFIRM) data now is reflected on the NFHL as of their effective dates, providing users with access to the most current flood hazard information. Online NFHL services, including *MapView* - Web, NFHL Web Map Service (WMS), and Google Earth™ utilities, provide access to these data immediately. The updates also are included in the monthly releases of NFHL Geographic Information System (GIS) data, which is packaged by individual state. For more information, visit the FEMA Map Service Center website at <http://msc.fema.gov> or call toll-free at 1-800-358-9616.

David Taft and Michael Baker Jr. (703) 960-8800

How is Michigan's State Construction Code Related to Floodplain Management?

Simple answer is that the State Construction Code contains special structural building criteria for development within flood prone hazard areas throughout the state. Michigan's single state construction code is based on the International Codes with additional provisions specific to the Michigan program. The International Codes

are considered by the FEMA to contain the minimum floodplain loading construction criteria that the NFIP requires participating communities to enforce in their efforts to manage floodplain development within their jurisdictions.

Just like there are special loading criteria in the Code for such commonly understood aspects of building like roof snow loads, wind loads, frost depths, and soil conditions, the Code also requires compliance with flood hazard loading criteria. Such criteria includes requirements related to minimum elevations, mechanical and electrical systems, water supply and sewage systems, venting, foundations, and use of resistant materials.

The most important purpose of a building code is to ensure public safety, health, and welfare, which are certainly issues of concern when developing within flood prone areas. There are many examples where people have lost lives or good health due to poorly or inadequately constructed buildings. Flooding is the most common natural hazard to contend with, it makes perfect sense to have building construction regulations designed to guide people away from the high risk flood areas or to reduce the flood risk level for flood prone area structures.

That is what Michigan's single state construction code does for individuals choosing to build in high risk special flood hazard areas. These areas are defined by the FEMA flood maps that may be in effect for community jurisdictions and by Michigan's Floodplain Regulatory Authority found in Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Anyone having intentions of siting any kind of construction in high risk flood areas should be familiar with the flood loading criteria contained in the effective state construction code and plan on designing and building accordingly. Doing so provides assurance that the flood risks have been reduced, flood damages mitigated, and represents responsible development and support of effective floodplain management, which the community must demonstrate to be a compliant NFIP-participating community.

There are several aspects of construction that are affected by the flood loading criteria of the Code. One principle criteria to comply with is the lowest floor elevation criteria for various types of buildings. There often is uncertainty amongst the regulated community and even the regulators about the elevation requirements. See the following article on elevation requirements.

State Construction Code Floodplain Elevation Requirements

*Jeffrey H. Bednar, P.E., CFM, Senior Project Engineer
Anderson, Eckstein and Westrick, Inc.*

I have on more than one occasion been asked to determine what finish grade elevation buildings need to be at within flood zones. Some of you may have also run into this situation. I finally decided to write it all out, so if this is of any use to you, feel free to keep it and/or pass it on to your clients. Of course, standards and references are subject to change, so I am not guaranteeing or certifying the accuracy of this information for use on any particular project.

Michigan Building Code says that Type II buildings identified by ASCE shall have the lowest floors elevated 1 foot above design flood elevations. Type III and IV buildings shall have the lowest floors elevated 1 foot above the 500-year flood level. Design flood elevation is the elevation of the

"design flood," including wave height, relative to the datum specified on the community's legally designated flood hazard map. The design flood is the flood associated with the greater of the following two areas: 1) area with a flood plain subject to a 1-percent or greater chance of flooding in any year; or 2) area designated as a flood hazard area on a community's flood hazard map, or otherwise legally designated.

ASCE defines the buildings based on Occupancy Category:

TYPE I: Buildings and other structures that represent a low hazard to human life in the event of failure, including, but not limited to:

- Agricultural facilities

- Certain temporary facilities
- Minor storage facilities

TYPE II: All buildings and other structures except those listed in Occupancy Categories I, III, and IV.

TYPE III: Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to:

- Buildings and other structures where more than 300 people congregate in one area
- Buildings and other structures with daycare facilities with a capacity greater than 150
- Buildings and other structures with elementary school or secondary school facilities with a capacity greater than 250
- Buildings and other structures with a capacity greater than 500 for colleges or adult education facilities
- Health care facilities with a capacity of 50 or more resident patients, but not having surgery or emergency treatment facilities
- Jails and detention facilities

Buildings and other structures, not included in Occupancy Category IV, but with potential to cause a substantial economic impact and/or mass disruption of day-to-day civilian life in the event of failure, including, but not limited to:

- Power generating stations (cogeneration power plants that do not supply power on the national grid shall be designated Occupancy Category II)
- Water treatment facilities
- Sewage treatment facilities
- Telecommunication facilities

Buildings and other structures not included in Occupancy Category IV (including, but not limited to, facilities that manufacture, process, handle, store, use, or dispose of such substances as hazardous fuels, hazardous chemicals, hazardous waste, or explosives) containing sufficient quantities of toxic or explosive substances to be dangerous to the public if released.

Buildings and other structures containing toxic or explosive substances shall be eligible for classification as Occupancy Category II structures if it can be demonstrated to the satisfaction of the authority having jurisdiction by a hazard assessment as described in Section 1.5.2 that a

release of the toxic or explosive substances does not pose a threat to the public.

TYPE IV: Buildings and other structures designated as essential facilities, including, but not limited to:

- Hospitals and other health care facilities having surgery or emergency treatment facilities
- Fire, rescue, ambulance, and police stations and emergency vehicle garages
- Designated earthquake, hurricane, or other emergency shelters
- Designated emergency preparedness, communication, and operation centers and other facilities required for emergency response
- Power generating stations and other public utility facilities required in an emergency
- Ancillary structures (including, but not limited to, communication towers, fuel storage tanks, cooling towers, electrical substation structures, fire water storage tanks, or other structures housing or supporting water, or other fire-suppression material or equipment) required for operation of Occupancy Category IV structures during an emergency
- Aviation control towers, air traffic control centers, and emergency aircraft hangars
- Water storage facilities and pump structures required to maintain water pressure for fire suppression
- Buildings and other structures having critical national defense functions

Buildings and other structures (including, but not limited to facilities that manufacture, process, handle, store, use, or dispose of such substances as hazardous fuels, hazardous chemicals, and hazardous waste) containing highly toxic substances where the quantity of the material exceeds a threshold quantity established by the authority having jurisdiction.

Buildings and other structures containing highly toxic substances shall be eligible for classification as Occupancy Category II structures if it can be demonstrated to the satisfaction of the authority having jurisdiction by a hazard assessment as described in Section 1.5.2 that a release of the highly toxic substances does not pose a threat to the public. This reduced classification shall not be

permitted if the buildings or other structures also function as essential facilities.

These definitions are from the Building Code and ASCE.

Responsible Flood Risk Leadership

Many things in our day-to-day living go without saying and are logically accepted as truthful, factual, or beyond reproach. Such is the case when it comes to the business of floodplain management. No one will argue that floods are one of the last events that anyone wants to experience. No one will deny that floods can and do inflict pain and agony and cause tremendous losses of property and life. Many people will acknowledge that floods can occur in places often not thought of as flood prone. Most people can understand that man cannot have complete control over flood waters, as their magnitudes are often larger than what control structures were designed for. No one should disagree that there would be far fewer public health, safety, and welfare issues to contend with if we didn't build, live, and operate businesses in high flood risk areas, or if sound and effective management of floodplain development occurred. However, as evidenced by this year's national weather events, development continues to occur in high risk floodplains across the nation.

Community leaders are continuously challenged to be aware of flood hazards within their communities and to manage community activities in such a way that flood hazard risks will be minimized and flood losses reduced. Wise and effective community leadership informs and protects citizens to the maximum extent possible within its control.

Many types of flood control infrastructure have been developed and constructed over the years with the intent of controlling flood waters and providing the best possible protection against flooding. The Katrina and Rita hurricanes and recent Midwest storm events have demonstrated how much reliance the nation has on the effective design and integrity of levee structures for flood protection.

Levee construction for flood protection has not been limited to coastal areas and large rivers such as the Mississippi. Levees can be found anywhere in the country, even Michigan. Historical community leadership has often determined that the value of maintaining existing and anticipated uses of floodplains for habitation and/or agricultural activities is worth investing in efforts to eliminate the floodplain from the natural flooding processes through designing and construction of levees and levee systems.

It is fair to presume, when community leaders make initial decisions to construct a levee or levee system, there is an understanding that such structures cannot be constructed to protect against all flood events. The decision makers likely understand from a need and economic standpoint there is a limit to the size of the levee. For example, if it is agricultural land and crops that are to be protected, the levee may be designed to protect up to a lesser storm event than if the area to protect is used for habitation. Responsible leadership and logic should make it clear that, whatever design level is used, the levee as constructed will only reduce the flood risk up to that level. Beyond that, the flood risks behind the levee remain, and public awareness of such risks will provide an opportunity for people to be prepared for the inevitable flooding rather than believe they will always be safe with no risks.

However, time passes, leaders change, and an ever-changing community populace can cause understandings and awareness to be forgotten. What can develop is a false sense of security or even complete ignorance of what the levee system is and what it is designed to do. This is especially true as the time period since the last major storm/flood event becomes longer.

Therein lies an important role of responsible community leadership. The community will benefit if it maintains a continuous effort of awareness and comprehension by its citizens of the true risks associated with community flood protection efforts. Community leadership should never give the impression that constructed flood protection structures, such as levees, eliminate all flood risks and the citizenry will be completely safe from

flooding. Doing so would misrepresent man's abilities to control nature. Giving a false impression of complete safety represents unwarranted disregard of multitudes of real life flooding situations across the nation. Many times the power and fury of large storm and flooding events have overwhelmed flood control structure design capacities, resulting in tremendous property losses and even lives.

This spring's flood events in the Midwest and elsewhere further demonstrated how levee structures can protect as designed or can lead to disaster when they fail to function. Such potential demonstration for levee failures exists with all such structures, even in Michigan communities, where levees exist.

Responsible floodplain management leadership can be easily and readily demonstrated through various community actions to inform, educate, and protect citizens from all flood hazard risks. The following actions may be of interest to the responsible community leader:

1. Recognize that flood hazards may exist in the community.
2. Recognize all waterbodies have floodplains.
3. Recognize obligations to the citizenry to take actions to provide protection opportunities to minimize the flood hazard risks and reduce flood impacts.
4. Identify as many flood prone areas as economically feasible by working with the respective state floodplain management agency and the FEMA through its map modernization program to produce new digital flood maps on a county wide basis.
5. Become familiar with the National Flood Insurance Program (NFIP) and understand that it is a program designed to provide citizens across the nation affordable insurance protection against flooding events and that its availability requires the community's commitment to effective floodplain management and enrollment into the NFIP.
6. Michigan communities can initiate the NFIP enrollment process by working with the state NFIP coordinator: Les Thomas, Michigan Department Environmental Quality, Land and Water Management Division, PO Box 30458, Lansing, Michigan 48909, thomasl@michigan.gov, 517-335-3448.
7. If your community already participates in the NFIP, make sure that the obligations the community made to FEMA are being met and that the NFIP criteria are being applied to all development within the community's floodplain.
8. Identify an official position (full-time or part-time) within the community's government to function as the community floodplain manager.
9. Identify all flood prone properties in the community and maintain a file on the parcel to which ownership and changes to the parcel can be recorded. This would facilitate flood hazard notifications to future new owners.
10. Understand that the floodplain identification procedures used by the FEMA and state floodplain management agencies use best available technology and nationally recognized and accepted engineering and computer modeling methods to identify the special flood hazard areas and create the most affordable flood maps used by the NFIP.
11. Understand that the NFIP and the premise that it is based upon has your community's and your citizens' best interests in mind, which is to minimize the flood hazard risks and reduce flood impacts to human health, safety, and welfare across the nation.
12. Recognize that all the best engineering analysis and computer modeling abilities can only go so far and that nature knows no boundaries. It has ultimate control in the magnitude of the event that any community citizen will be forced to endure. Communities need to consider meeting any minimally required levels of protection or consider higher levels of protection based upon what they determine to be economically feasible and acceptable. Citizens then need to be informed of the protection level decisions and the resulting potential hazard risks.
13. If your community has flood control structures within its jurisdiction or may be impacted by failed structures outside your jurisdiction, maintain an effective notification and education plan for your citizenry so they will always be aware of the true flood hazard risk levels associated with such structures.

“Flooding is an act of God – Flood Damages are an act of Man”

(August 1966 House Document 465)

Community Official Expected Role and Leadership?

You are a community official or you are considering becoming one in the future. Along the way, you may have had some thoughts about what your responsibilities in the role will be, and maybe one of the first ones you thought of was having to deal with various hazards within the community. Some of the hazards you may have considered are probably those we regularly hear about via the daily news reporting, i.e. traffic accidents, fires, robberies, assaults, and meth houses. But, had you also considered climatic hazards such as wind and water, particularly flooding? If not, that's understandable. The extremes of climatic hazards are not everyday occurrences, and the old adage of “out of sight, out of mind” can come into play. This can affect everyone's thought or lack of thought process – even a community leader's.

Failing to give consideration to flood hazard issues, when flooding is generally an infrequent event, is easy to do. Preoccupation with other daily happenings and events can easily fill a community leader's time. However, nationwide efforts to strengthen homeland security and emergency preparedness and planning for all hazards at all levels of government may be helping to increase community and public awareness of flood hazards.

The Michigan Department of Environmental Quality (MDEQ) has recently been part of an outreach effort in cooperation with Michigan State Police (MSP) regional emergency managers around the state. MDEQ's dam safety and flood engineering staff present dam safety and floodplain management workshops that target the role and responsibilities of the local emergency manager. These workshops are held at MSP regional locations and have been well received. Such efforts can help bring the issue of floodplain management and flood preparedness to the forefront, helping community leaders to not forget the hazards of flooding. It can assist leaders in meeting obligations to the citizenry of initiating actions necessary to inform and promote flood awareness and floodplain safety throughout the

community. One wise and reasonable action available to community officials to help in their efforts of responsible leadership is consideration to the communities' participation in the National Flood Insurance Program (NFIP).

The NFIP supports officials' efforts in addressing safety as it relates to floodplain development. This is done through the NFIP's requirement for participating communities to implement minimum construction criteria considered necessary to reduce and mitigate flood hazard impacts. In turn for implementing such standards, all citizens in the community have affordable flood insurance available. Further community support is provided by FEMA's development of flood insurance studies and flood hazard maps using nationally accepted technological, scientific, and engineering concepts and modeling methods to identify special flood hazard areas.

All water bodies have floodplains. The role of modern day floodplain management is geared to avoid flood hazards, and to do so in ways that will not cause adverse impacts to others. Flood hazard areas are often not readily recognizable. This is especially true for community officials who are not trained or have limited experience in floodplain identification. Effective leadership in such a situation recognizes the tremendous value in using information and resources prepared by trained and experienced professionals to meet community official obligations to the citizens. Using the NFIP flood insurance studies and flood hazard maps to make permitting decisions on floodplain development further demonstrates reasonable and responsible leadership by any local official.

Legal consequences for a community may potentially develop when local officials choose not to use professionally prepared and industry accepted NFIP flood insurance study and flood hazard maps because they believe the information is not applicable. Veering from a norm and using unfounded personal opinions rather than factual

technical and scientific data to base community decisions on can set the stage for governmental liability, becoming a major issue for a community to defend. As an example, if a community official allows development in an identified 1-percent chance floodplain without requiring construction criteria designed to minimize flood impacts, and the 1-percent chance flood occurs, impacted citizens may have cause for liability judgments against the community.

Another example could be when a community official knows of, but may not agree, with existing data which identifies flood hazard areas. An official who uses their personal belief to give improper guidance and a false sense of security to citizens that there is no flood hazard or need for concern and there is safety from flooding, may be setting the stage for legal action against the community if a flood event impacts those people. Official actions in cases like this may potentially be considered "actionable negligence" from a legal perspective.

Black's Law Dictionary, Revised Fourth Edition, defines "actionable negligence" as: The breach or nonperformance of a legal duty, through neglect or carelessness, resulting in damage or injury or another. *Fidelity & Casualty Co. v. Cutts*, 95 Me. 162, 49 Atl. 673.

It further goes on to say: It is failure of duty, omission of something which ought to have been done, or doing of something which ought not to have been done, or which reasonable man, guided by considerations which ordinarily regulate conduct of human affairs, would or would not do. *Goff v. Emde*, 32 Ohio App. 216, 167 N.E. 699, 700. and: Essential elements are failure to exercise due care, injury, or damage, and proximate cause. *Rountree v. Fountain*, 203 N.C. 381, 186 S.E. 329, 330.

Legal research by Attorneys Jon A. Kusler, Esq., and Edward A. Thomas, Esq., finds that "At

common law, all individuals (including public employees) have a duty to other members of society to act "reasonably" in a manner so as not to cause damage to other members of society. "Actionable negligence results from the creation of an unreasonable risk of injury to others. In determining whether a risk is unreasonable, not only the seriousness of the harm that may be caused is relevant, but also the likelihood that harm may be caused." The standard of conduct is that of a "reasonable person" in the circumstances. Negligence is the primary legal basis for public liability for improper design of hazard reduction measures, such as flood control structures, improperly prepared and issued warnings, inadequate processing of permits, inadequate inspections, etc. See discussion; *Kunz v. Utah Power & Light Co.*, 526 F.2d 500 (9th Cir., 1975).

If you have not considered what your role as a community official should be with respect to climatic hazard potentials such as flooding, it may be a very good idea to consult your community's legal council to learn more on the matter.

The national Association of State Floodplain Managers (ASFPM) is actively addressing the subject through legal research and educational outreach efforts with its state chapter associations such as the Michigan Stormwater-Floodplain Association (MSFA). The MSFA is currently pursuing with assistance from the State Bar of Michigan the sponsoring of a legal workshop on this issue. Specifics that the workshop will likely address are community liability, takings doctrine, property rights, and "no adverse impact" concepts.

Progress information on this workshop sponsoring effort will be provided in future editions of this newsletter. Consideration is being given to having the workshop as part of the 2009 annual conference at the Double Tree Hotel in Bay City, March 10-13.

Presidential Candidate Outreach

Hello Responsible Community Leaders and Floodplain Managers;

On August 15, 2008, the Association of State Floodplain Managers (ASFPM) transmitted the following letter and message to this country's two 2008 Presidential candidates. The ASFPM believes that it is critically important to responsibly work toward affecting this nation's response to natural disasters by bringing to the candidates' attention the ASFPM's major policy positions on issues regarding flooding and disasters.

The ASFPM gives its approval and support to sharing the following letter and message with citizens, colleagues, and political positions in your communities and circle of influence as you see appropriate.

Questions and comments may be directed to Larry Larson, Al Goodman, George Riedel, or in their absence, Diane A. Brown, ASFPM Communications and Events Manager. Direct 608-441-3003, fax 274-0696, email diane@floods.org, website: <http://www.floods.org>

Subject: Success Factors for Your Administration – Flooding and Disaster Response

Dear Senator,

The occurrence of flood related disasters, and whether they are managed well or poorly, is a direct function of the methods and focus that a presidential administration opts to place on this policy area. The previous three administrations, including the current one, dealt with these issues in very different ways. All three faced serious flood disaster challenges, but only one will be viewed by history as having had an effective flood disaster management strategy and policy.

Hurricane Andrew, in 1992, demonstrated how weak leadership within the Federal Emergency Management Agency (FEMA), with few direct ties to the White House and ineffectual ties to the States, undermines response and recovery efforts.

The Midwest Floods of 1993, the largest regional riverine flooding experienced in decades, demonstrated how strong leadership within FEMA, closely aligned to both the White House and to the States, brought about an organized response, and perhaps one of the most creative and effective recoveries to date.

Hurricane Katrina demonstrated how even an experienced FEMA team can be rendered less effective by being moved into a department with little understanding of natural hazards. The resulting infighting distanced the White House from FEMA.

Effectively managing and mitigating flood disasters is a wholly non-partisan goal whose achievement represents the best that government has to offer its citizens. This only happens, however, when the government's resources are organized and managed for success.

The following comments are based on this Association's collective experience with flood disasters and their mitigation over the past decades, and are offered in the spirit of fostering discussion about improvements to existing approaches. ASFPM has 13,000 members and 27 State Chapters throughout the nation, whose focus is helping the 21,000 flood-prone communities in the nation reduce their flood losses and enhance those floodplain resources that reduce flood losses naturally. Please see our web site at www.floods.org.

FEMA Purpose and History

The Federal Emergency Management Agency (FEMA) is tasked with responding to, planning for, recovering from, and mitigating against natural disasters. The United States has a long history of natural disaster response dating back to the Congressional Act of 1803, commonly regarded as the first piece of national disaster legislation.

Up until 1979, emergency and disaster activities were fragmented. More than 100 federal agencies were involved in some aspect of disasters, hazards, water management, and emergencies. Parallel programs and policies existed at the state and local levels as well, compounding the complexity of national disaster relief. The National Governors Association sought to minimize the number of agencies with whom state and local governments were forced to work. The governors asked President Carter to centralize federal emergency functions. In response, FEMA was formed in 1979 by Executive Order 12127, merging many of the separate disaster-related responsibilities into a single independent agency.

Move an Independent FEMA to Cabinet Level Status

Placing FEMA in the Department of Homeland Security (DHS) in 2003 led to the following problems, all of which were predicted by this Association and by other professionals acquainted with the history, goals, and operations of FEMA, and all of which seriously hamper flood disaster mitigation, planning, response, and recovery:

- It introduced a layer of bureaucracy between FEMA, the White House, and the States, that culminated in a diminished responsiveness and effectiveness.*
- It reduced the focus, resources, and capabilities FEMA could bring to natural hazards issues.*
- It increased the nation's vulnerability to natural hazards.*

We would urge your administration to support legislation to remove FEMA from DHS and to take steps to elevate the stature of FEMA in your administration – up to and including creation of a cabinet post for the FEMA Director. An effective DHS for national security is warranted, but that security is best generated by a culture and a focus that are emphatically different from those that provide effective response to and mitigation of natural hazards.

Presidential Commission on Natural Hazards in the Year 2050

Explosive population growth (from 100-150 million additional people in the United States by 2050), diminishing federal funding resources, the growing insurance crisis, and issues such as climate change are beginning to render our existing systems for natural hazards management ineffectual. In essence, our tradition of disaster relief, meshed with more frequent and severe hazards such as flooding, and a rapidly increasing and more exposed public are all aligning to put this nation at level of risk that we can neither afford nor manage. This trend is reversible, but the nation will need time to make the necessary adjustments in policy and programs.

Further, the nation has experienced a growing shift in responsibility from individuals and local communities towards State and Federal governments for the problems of living with, responding to, and recovering from natural disasters, particularly floods. People willingly develop and live in areas that are simply too hazardous, and do not accept personal responsibility or take appropriate actions. Local governments (communities) permit development in “at-risk” areas, without taking the consequences into account. The result is increasing exposure to flood risk and levels of flood damage. This trend must be reversed in order to minimize flood risk in the future.

To reduce flood risk, historically the nation has relied on structural measures (such as dams, levees, channels, etc.) that “keep floods away from people.” Their use has resulted in additional development in floodplains, setting the stage for catastrophic flood impacts. We need to move more aggressively to the use of nonstructural measures that, instead, keep the people away from the floods. Measures such as buyouts,

elevation, or relocation of flood-prone structures and floodplain zoning set the stage for reducing the impacts of future floods.

We urge your Administration to establish a Presidential Commission charged with evaluating future potential risk related to natural hazards and begin to identify the long-term policy adjustments (through the year 2050) that will be necessary if we are to ensure the continuity and sustainability of our economy, our culture, our ecosystems, and our nation.

Improving Water Resource and Water Management Policies and Programs

Water resources for drinking, navigation, manufacturing, agriculture, and other uses are facing stresses never previously encountered by this nation. For approximately 25 years there has been an identifiable lack of coordination among the nation's water resources programs. The stove-piping between and within such agencies as the U.S. Army Corps of Engineers, FEMA, the Natural Resources Conservation Service, the Tennessee Valley Authority, the Bureau of Reclamation, the Environmental Protection Agency, and others begins with the committee structure in Congress, and has led to a mirror stove-piped structure in the Office of Management and Budget. It is further replicated by the States, until, finally, it falls to the local level of government to attempt to integrate the various policies and programs before effective action can take place.

Improved coordination could be had through such simple steps as an updated Executive Order on how the federal government will reduce its impact on flood losses, the creation of a presidentially directed coordinating body of staff and policy makers, or even aligning water resource management agencies under a broad, common goal. Already populations are demanding more clean surface water and ground water than is available. Climate change and population explosion will only make this worse, bringing the potential to unravel a century of water resources investments. Strong and coordinated Federal leadership will be needed to work with States and between States to address this emerging and critical problem.

NFIP Reform and Catastrophic Disaster Insurance

Recently, the National Flood Insurance Program (NFIP) has been receiving a lot of attention. This program, enacted in 1968, establishes a quid pro quo whereby the Federal government underwrites flood insurance policies in exchange for communities' adopting, administering, and enforcing land use and building standards in flood hazard areas. Overall, this program has served the country well. In aggregate, structures built to the minimum standards of the NFIP result in over \$1.5 billion in avoided flood losses annually. Also, the program has been largely self sufficient, paying claims from program income while occasionally borrowing from the U.S. Treasury, but always paying borrowed funds back with interest (of course, the exception is the program's \$17 billion debt resulting from Hurricanes Katrina and Rita). Finally, the flood maps that identify flood hazard areas are the nation's most comprehensive set of risk maps available.

The current draft NFIP reform legislation focuses on enhancing the self-sufficiency of the program and addresses the need to have those who live at risk of flooding pay for that risk. Also, these proposed reform measures recognize the broad array of flood hazards (coastal inundation, riverine, residual risk areas behind levees, etc.) and establish an ongoing mapping program that the ASFPM believes is critical. Finally, proposed reform legislation (the House version) includes poorly crafted policy directed at adding wind coverage to the NFIP. There is clearly a need to consider indemnification for wind damage along with other natural hazards in some broader context, but not as a simplistic "add on" to the NFIP. We believe there is an opportunity for the next administration to provide leadership in crafting a comprehensive, catastrophic disaster insurance mechanism that is tied to mitigation actions that reduce risk.

Continued funding for Science and Climate Change Research

Inadequate data and aging science and engineering are increasing the nation's vulnerability to flooding, particularly as increased development encroaches onto flood-prone lands. Massive development in

watersheds and coastal areas, coupled with changing climate, requires enhanced data collection and the development of forward-looking tools. Reliance on inadequate data and aging science is like navigating one's car by watching the rear view mirror instead of looking out the windshield. We would urge your administration to invest in the science and data needed to manage our water resources and hazards effectively, starting with expansion of the nation's stream gaging network and including research on regional impacts of climate change, which will provide information that communities and states need to adapt wisely.

Investment in Infrastructure

The nation's economy is dependent on sound and functioning infrastructure. By everyone's account, our infrastructure is in terrible condition today. We fully anticipate that there will be significant attention devoted to the repair, rehabilitation, reconstruction, and reform of infrastructure during your administration. Our recommendation is two-fold. First, investments in infrastructure are primarily a local responsibility, and to the greatest extent practical the Federal government should not convey the notion that any repair or upgrade will be shouldered solely by the Federal government, even though there clearly will be some need for support through loans, incentives for strong local and State action, seed grants, or funding proportional to the Federal interest. Second, there needs to be a strong policy that encourages sustainable actions or that eliminates using infrastructure as an enticement to lead people to build or live in areas vulnerable to natural disasters. Development, in most cases, follows the infrastructure. Any funding for infrastructure upgrades should be predicated on meeting multiple goals, such as increasing public safety, reducing hazard exposure and improving environmental and economic sustainability.

Disaster response, hazard mitigation and long term recovery

Historically, disaster assistance programs in the United States have been directed at returning people and communities back to normal as quickly as possible after a disaster. Unfortunately, in our rush to do this, we too often restore them to their previous at-risk condition. This was again demonstrated with the catastrophic disasters caused by Hurricanes Katrina and Rita. Although it will always be necessary for the federal, state, and local governments to have programs to administer assistance after disasters, the ASFPM believes that the post-disaster recovery period should be used as much as possible to encourage, facilitate, and reward actions that lessen the potential damage from future floods, and that build overall local resiliency.

The Robert T. Stafford Act is an amended version of the Disaster Relief Act of 1974 that created the system in place today, by which a Presidential disaster declaration after an emergency triggers financial and physical assistance through FEMA and other federal agencies. Both direct disaster assistance and mitigation assistance are made available through the Stafford Act to individuals, businesses, and communities. By definition, mitigation assistance is that which results in long-term enhancements in public safety and property damage. Although disaster assistance will provide resources for repairing damaged property, additional mitigation assistance is used to make the damaged property more resilient to the impacts of the hazard. For example, disaster assistance may provide funds to repair a school; additional mitigation funds might be used for the purchase of hurricane shutters or to retrofit the building to make it more resistant to flooding.

One important concept that is now integrated into the Stafford Act is that of pre-disaster mitigation. The concept is that it is important to take mitigation action before a hazard event occurs. Thus, pre-disaster mitigation grant programs and hazard mitigation planning initiatives are key components of the nation's overall strategy for loss reduction. The Act serves as the cornerstone of disaster response by the federal government; however, it is in need of revisions to fully incorporate all response and recovery actions that are needed by the impacted communities.

Mitigation provides \$4 in benefits to the nation for every dollar invested, according to a recent independent study. Your administration will be able to leverage federal mitigation dollars to reduce future disaster costs. As such, both pre-disaster and post-disaster mitigation will be important.

Conclusion

Should your campaign staff and/or transition team desire to meet with us and be briefed on these topics or other similar matters, please contact Larry Larson, ASFPM Executive Director at 608-274-0123 or larry@floods.org. You should be aware that we will be sharing these ideas with other organizations and those hosting debates in order to emphasize during this campaign the importance of these issues.

Thank you for your attention.

Sincerely,



*Al. W. Goodman, Jr., CFM
ASFPM Chair
Mississippi State Floodplain Manager*



*Larry A. Larson, P.E., CFM
ASFPM Executive Director*

CHAPTER MEMBERSHIP MICHIGAN STORMWATER-FLOODPLAIN ASSOCIATION MEMBERSHIP FORM

Name _____ Representing _____
 Address _____ City/State/Zip _____
 Telephone () _____ E-mail _____ New ____ Renewal ____

MICHIGAN STORMWATER-FLOODPLAIN ASSOCIATION CHAPTER RENEWAL = \$35.00 per calendar year.
 Please complete this portion for state association membership. The state association has no provision for accepting credit cards. Questions may be directed to Roger S. Clark, MSFA Treasurer, 517-853-0221 or msfatreas@yahoo.com . Please mail this form and your check to P.O. Box 14265, Lansing, MI 48901-4265.

<p>Editor: Les Thomas Articles are by the Editor unless noted otherwise.</p> <p>For questions, comments, or information, contact:</p> <p>Les Thomas MDEQ LWMD P.O. Box 30458 Lansing, MI 48909-7958 Telephone: 517-335-3448 Fax: 517-373-6917 e-mail: thomasl@michigan.gov</p>	<p>The MDEQ will not discriminate against any individual or group on the basis of race, sex, religion, age, national origin, color, marital status, disability, or political beliefs. Questions or concerns should be directed to:</p> <p>MDEQ Office of Personnel Services P.O. Box 30473 Lansing, MI 48909</p>	<p>This newsletter is supported by funding under a Cooperative Agreement with the Federal Emergency Management Agency. The substance and findings are dedicated to the public. The MDEQ, LWMD, is solely responsible for the accuracy of the statements and interpretations contained in this publication. Such interpretations do not necessarily reflect the views of the federal government.</p>	<p>Printed by Authority of Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.</p> <p>Total Number of Copies Printed: 2,900 Cost Per Copy: \$.79 Total Cost: \$2,291.86</p> <p style="text-align: right;">EQC2760</p>
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**Department of Environmental Quality
Land and Water Management Division
P.O. Box 30458
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Flood News for Michigan Floodplain Managers

**A Newsletter of the
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Michigan Department of Environmental Quality**