The Antediluvian

{an · te´· də · lōō´· vē · ən: Before the Flood}

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Ohio's Floodplain Management Newsletter

Reduce flood damage and protect and promote natural functions of floodplains

Creative Use of Vacant Lots to Rehabilitate Neighborhoods & Reduce Hazards

By Kimberly Bitters, CFM—Environmental Specialist
ODNR, Division of Soil and Water Resources—Floodplain Management Program

(Significant contributions were made to this article by members of ASFPM's Natural and Beneficial Function and No Adverse Impact Committees.)

A disturbing and increasing pattern of vacant lots can be found throughout the urban landscape. In some communities, this problem can be a symptom of devastating blight caused by rising unemployment and crime, as well as volatile real estate market pressures. These problems can be further aggravated or initiated by exposure to a natural hazard, such as flooding. Many of these vacant lots were long ago abandoned and remain in absentee owner or bank ownership, which poses serious obstacles to maintenance, property clean-up or mitigation efforts. Often the burden of maintenance falls upon the municipality without the benefit of sufficient property tax revenues to cover the cost of clean-up and/or ongoing maintenance. Still, other vacant lots are City-owned with the majority acquired through back taxes or donation, and, for most, the dwellings have been demolished due to unhealthy or unsafe living conditions.

David Joseph, New York Times; Picture found at: www.dispatch.com/content/stories/home_and_garden/2011/08/14/

Of the vacant structures abandoned as a result of flood exposure, causation may be direct repetitive flood damage or indirect effects by proximity to the flooding source. Deferred maintenance, as well as unhealthy or unsafe building conditions, contributes to a blight spiral that may spread to nearby areas. While the intentional practice of acquiring and demolishing floodprone structures can mitigate the risk of future flooding, the effects of vacant lots can be compounded where mitigated properties are poorly maintained and/or structures are removed in a checker-board pattern. However, these mitigated flood-prone properties have an enormous potential to benefit the neighborhood, as well as the individual property owners, through well-planned flood mitigation practices.

In the midst of these struggling neighborhoods, there is the potential for each community to apply for, and receive, support to voluntarily mitigate the structures that are most impacted by flooding. Frequently, the mitigation funding source is one of FEMA's flood damage reduction programs, including the Hazard Mitigation Grant Program (HMGP), or one of four other hazard mitigation grant programs. These programs provide for a number of options to mitigate the flood potential of the property including acquisition/demolition and relocation. Due to various funding and project limi-

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tations, including permanency of the action, the majority of funded mitigation projects fall into the acquisition/demolition category. Since some property owners are averse to completely giving up their homes, due to sentimental value or family heritage, the potential to mitigate these structures is lost. However, there is a potential solution available related to the large number of vacant lots that are located outside of the high flood risk areas.

To take advantage of the numerous vacant lots outside of the high flood risk areas, a community might consider setting up a creative program that could benefit both the high flood risk property owners and the community at-large. The initiative would essentially create the opportunity for a "land-swap" funded from a variety of sources and intended to meet several community goals. This land-swap could include relocating existing structures currently located in high flood risk areas to City-owned vacant lots in lower flood risk areas. Alternatively, the land-swap could simply be an exchange of parcel ownership and/or development rights so that the previously City-owned property was exchanged for the high flood risk parcel. Both of these options reduce future flood risk to private investment and retain the tax base within the community. Financial institutions holding loans on the floodprone properties may initially be stumbling blocks, but when lenders understand the benefits of improved value-land swaps they may become advocates. As advocates of this practice, some lenders can offer additional loans to help in the relocation process. To maintain eligibility for FEMA mitigation funds, the City must maintain the high flood risk parcel as open space in perpetuity. Such a land-swap program could enable multiple community goals to be met. Private and public gains are realized as existing or planned floodprone structures are positioned out of high flood risk areas to safer locations. In addition, relocation or construction on the previously vacant lot could bring life and reinvestment into these neighborhoods, whose ongoing efforts to revitalize have not yet been realized. Long-term this initiative could motivate change in blighted neighborhoods and bring a renewed energy that may encourage more sustainable private investment.

Whether a mitigation project is pursued as acquisition/demolition or relocation of existing or planned structures, there are numerous benefits for ensuring that the floodplain property will be held as open space in perpetuity. These projects provide numerous benefits to both individual property owners and to the broader community. Benefits include reducing flood exposure to individuals and their properties, reducing public expenditure on emergency response and recovery, affording additional open space amenities, and providing permanent storage area for flood waters. However, there is the potential for vacant mitigated lots to become an eyesore and contribute to the downward spiral of already blighted neighborhoods without proper care and maintenance. In addition, maintaining mitigated sites can be a monetary liability for communities, where lack of funding and an erratic, scattered pattern of mitigated properties to care for can drain already overburdened budgets. These problems stem from an unfortunate lack of planning and, additionally, represent an enormous missed opportunity for the community!

Optimal investment returns, from both federal mitigation and community match dollars, may be achieved through integrating hazard mitigation and open space planning into one cohesive package. Integrated planning efforts will assist in strategically implementing mitigation projects so that multiple community goals are met. Locating projects so as to get the highest return on investment doesn't necessarily have to be complicated. Giving priority to aggregated properties, especially when they are in close proximity and/or connected to existing greenways can be an easy way to meet multiple objectives. Coupling the acquisition with an ecological restoration project that returns the area to a primarily vegetated state with natural sorption capabilities, can greatly expand the flood damage reduction benefits for the neighborhood. In addition, a quick scan of the neighborhood can frequently identify priority needs such as green

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urban parks, recreational facilities, localized stormwater remediation, or community garden initiatives.

When multiple connected properties are available, there is tremendous opportunity to not only provide more space for flood waters, but also to return a hydraulically connected area back into the flood water sponge that it would naturally be. Improving the soil make-up and compaction as well as restoring vegetative diversity can go a long way towards restoring the area's ability to store, slow, and dissipate water effectively reducing the extent of flooding. Restoring natural floodplain function can be accomplished through rain gardens or other low impact development techniques, daylighting culverted streams, or planting and maintaining appropriate native vegetation.

Strategic investment, steered by an integrated mitigation planning effort, can minimize the adverse impacts of existing and mitigated vacant properties and have a tremendous impact on revitalizing blighted neighborhoods. Benefits are compounded when projects can meet multiple community goals: reducing unproductive vacant lots within the City, taking citizens out of harm's way, and ultimately rejuvenating the scarred urban landscape. In this case, multifaceted benefits may stem from giving space to the watercourse to function naturally, thereby allowing it to live up to its potential as an amenity instead of a looming flood threat.

Stream Alterations and Erosion Control Practices

By Katherine Skalak—Environmental Specialist
ODNR, Division of Soil and Water Resources—Floodplain Management Program

Communities that participate in the National Flood Insurance Program (NFIP) have agreed to adopt and enforce regulations that restrict certain types of development within the Special Flood Hazard Area (SFHA). There are a few standards that apply to stream alteration activities. In the Flood Damage Reduction Regulations, the definition of "development" includes nonstructural activities such as dredging, filling, grading and excavation. Stream alteration projects are therefore considered "development", for which a floodplain permit is required in all A Zones. In addition to the floodplain development permit, typically a U.S. Army Corps of Engineers (USACE) 404 or an Ohio Environmental Protection Agency (OEPA) 401 Water Quality Certification is also required by a separate authority. A stream alteration project may change the base flood elevation as well. If that is the case, then permission from the Federal Emergency Management Agency (FEMA) is also required in the form of a Letter of Map Change.

Riprap along stream
Picture taken by Katherine Skalak 2011

Stream alteration is a very generic term that can include riprap, gabions, cross vanes, weirs, lining the channel with concrete, putting in a new bridge, or a complete stream restoration using Natural Channel Design. So why would my community want to use one type of stream alteration over another? Each type of stream alteration has both advantages and disadvantages. Riprap typically consists of rocks or other materials used to protect stream banks and shorelines

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from erosion. Riprap works by deflecting the water away from the soil on the bank. Sounds great, right? Riprap is often used in association with other development to keep streams straight, away from structures, or out of yards. Water flowing near riprap generally moves faster and causes turbulence towards the banks. Since the water is now moving faster, downstream areas that remain unprotected are now more susceptible to bank erosion. Therefore, more riprap is placed and the process continues. Riprap may also require reoccurring maintenance to correct areas where the rocks are being undermined or falling into the stream.

Another method of erosion protection is called a gabion. A gabion is simply a galvanized wire basket filled with rocks. Gabions are used to stabilize stream slopes and to protect them from erosion. So how are gabions different than riprap? Unlike riprap, gabions can be stacked and they are resistant to being washed away by flowing water. Also, they have an advantage over more rigid structures such as concrete because they conform to ground movement, dissipate energy, and allow water to drain. Gabion effectiveness will increase with time as silt and vegetation fill the gaps between the rocks in the gabion. Like riprap, gabions may also increase channel erosion downstream and in some instances they may increase downstream flooding as well. Depending on the design or the placement of gabions or riprap, there are several different outcomes. If gabions are placed in certain ways they may decrease carrying capacity and constrict flow, which will cause upstream flooding. At the same time, the velocity of the stream may be increased due to bank hardening. Increased velocity has the potential to carry a larger sediment load. Beyond the downstream limits of channel hardening, the decreased velocity will cause this sediment to be abruptly deposited, which will reduce the carrying capacity of that stream reach. Another possible outcome of channel hardening is for the stream to lose access its natural floodplain; therefore, the flow may be increased and downstream landowners may be affected by increased flood heights. In designing erosion control alternatives, increased flooding is a likely outcome. That is why these and other issues should be considered along with natural channel design.

Natural Channel Design
Picture found at:
www.oxbowriver.com/index.html

Another channel hardening alternative for erosion control is lining the channel in concrete. This is done to eliminate erosion and promote water conveyance. There are several potential issues with a concrete lined channel. This channel is typically straight so it has the ability to transport water downstream more quickly, which is a benefit for the landowners upstream of the concrete lined channel. The velocity and discharge for a stream are indirectly proportional to the roughness value (Manning's "n") of the channel. For example, if there is a stream that has a concrete lined bottom, Manning's "n" would be 0.014. The same channel with using natural design approach using a cobble bottom and clean sides would have a Manning's "n" of 0.04. Assuming all of the other conditions (side slope, bed slope, width, and flow depth) for this stream are the same, the conveyance would be more than two times greater with the concrete lined stream. So what does that mean for flooding? Assuming the same volume of water is flowing down both streams, the flooding will be decreased upstream of the concrete lined channel. The water has to go somewhere, so flooding will be increased downstream.

Placing riprap, gabions or lining a channel in concrete have been common methods to deal with streambank erosion. Another approach is Natural Channel Design (NCD). NCD is a stream restoration method

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OFMA Update
By Shawn Arden, PE, CFM – OFMA Chair

The Ohio Floodplain Management Association (OFMA) has just wrapped up the 2011 Ohio Statewide Floodplain Management Conference. Over 180 floodplain management stakeholders attended the conference on July 27-28, 2011, which was held at the Doubletree Hotel located in Columbus, Ohio. Many thanks go out to all who were involved in the conference planning and delivery.

As stated at the July conference, there will be a special OFMA Membership Meeting at the November Water Management Association of Ohio (WMAO) conference to adopt our new OFMA Division Operating Charter. OFMA is a subsidiary division of WMAO, and adoption of a new Operating Charter is required to develop consistency both in our internal operations and among the operating charters of the multiple WMAO divisions. Additional information will be posted to the OFMA website, www.ofma.org, during the months of September and October. Please direct any questions regarding this special meeting to my attention.

As always, OFMA is actively seeking new stakeholders to participate on our committees. If you are interested in joining OFMA or assisting on one of our committees, please contact us at ohiofma@gmail.com. Please visit our website for news updates at www.ofma.org.

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that incorporates naturally occurring stream processes, which allow the stream to stabilize and provide the best possible biological function. With the stabilization of the stream, a functioning floodplain is usually created. A functioning floodplain provides area for sediment fallout as well as flood water storage to reduce downstream flooding. One of the drawbacks of NCD is the increased cost as well as space necessary compared to channel hardening.

So what are the requirements for stream alterations in terms of your local floodplain management regulations? In order for the floodplain manager to approve such forms of development on streams designated as special flood hazard area, the applicant must submit a floodplain development permit application prior to start of construction. If the proposed development is an area with floodway, then the applicant must show that placement of the riprap or other stream alternation will cause no rise to the base flood elevation. This is done through a hydrologic and hydraulic analysis conducted by a Professional Engineer. If the proposed development is in an area with base flood elevations but no floodway, then "the cumulative effect of the proposed development, when combined with all other existing and anticipated development, shall not increase the base flood elevation more than one foot at any point" (2006 Ohio Model Flood Damage Reduction Regulation, Section 4.9(B)(1)). In an approximate A Zone (area without base flood elevation or floodway), another criteria for a stream alteration project is found in 44CFR60.3(b)(7), which requires communities to "assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained." This requirement is also addressed in every NFIP community's Flood Damage Reduction Regulations. The 2006 Ohio Model Regulation specifically says that the "bankfull flood carrying capacity of the altered or relocated portion of the watercourse shall not be diminished" and this must be certified by a registered Professional Engineer (2006 Ohio Model Flood Damage Reduction Regulation, Section 4.9(C)). There is a time and a place for stream alteration. Please remember that these activities require the proper permits from the community including Floodplain Development Permit as well as permits from ASACE and/or OEPA.

Upcoming Certified Floodplain Manager Exam (CFM) Dates

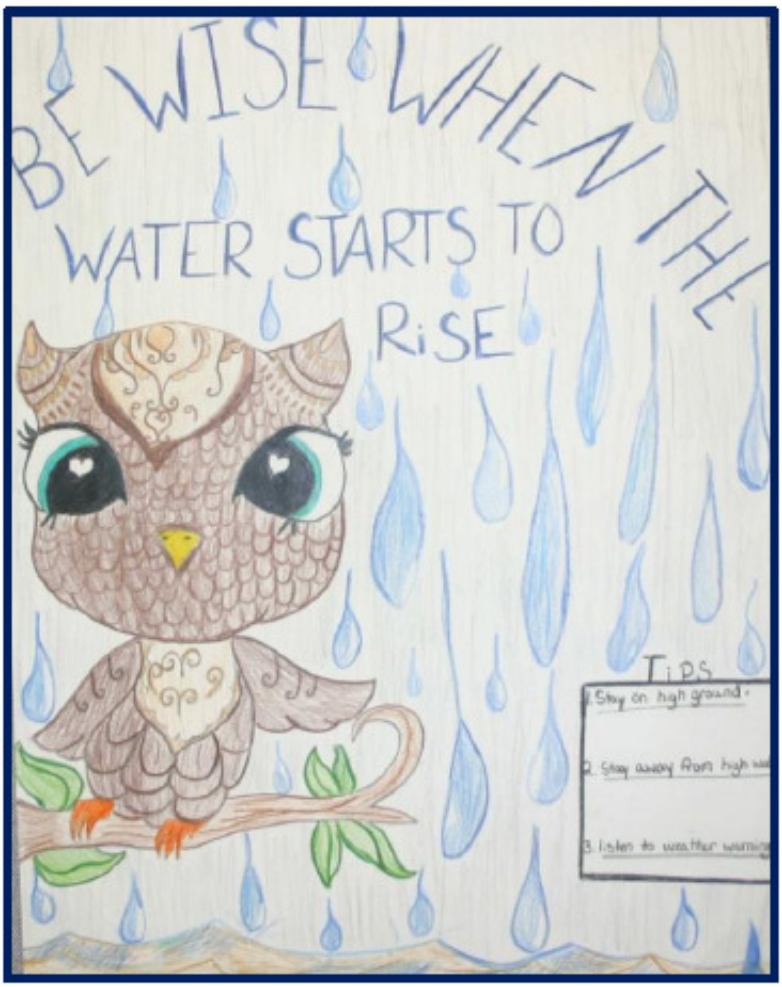
Wednesday, November 9, 2011
1:00-4:00pm
Geauga County Building Department
470 Center Street, Building 8-C
Chardon, Ohio 44024

Monday, December 12, 2011
12:30 - 3:30pm
ODNR
2045 Morse Road, Building I-1
Columbus, Ohio 43229

Severe Weather Poster Contest

By Benjamin Kelley—Environmental Specialist
ODNR, Division of Soil and Water Resources—Floodplain Management Program

The Ohio Committee for Severe Weather Awareness held their annual poster contest ceremony on Saturday, August 6, 2011 at the Ohio State Fair. Lauren Piatt, a fourth grade student in Adams County was recognized as the overall winner in the statewide poster contest. Lauren's poster on flood safety artistically illustrates an owl that informs people to "Be wise when the water starts to rise." The Ohio Committee for Severe Weather Awareness chose Lauren's poster as "the most informative, accurate, and creative" out of the many posters received during its annual Severe Weather Awareness Poster Contest.



As the overall state winner, Lauren received a variety of awards and prizes from the committee and its partners including a $100 savings bond, letter of congratulations from Governor John R. Kasich, plaque from the National Weather Service, smoke detector, personal-sized rain gauge, personalized trophy, and a host of other prizes. Later in the fall, Lauren's school will receive an engraved "traveling" trophy to showcase for the remainder of the school year. In an effort to promote severe weather preparedness, the committee will feature Lauren's poster throughout the year.

This year, a total of 49 students from 30 Ohio counties were honored as regional winners. The students represented grades 1-6 from 36 schools. As regional winners, every student artist received a certificate from the National Weather Service and sling backpacks full of prizes from the offices and their partners that make up the Ohio Committee for Severe Weather Awareness.

Watershed Sequencing for Risk MAP

By Matt Lesher, CFM—Environmental Specialist
ODNR, Division of Soil and Water Resources—Floodplain Management Program

FEMA's Risk Mapping, Assessment, and Planning (Risk MAP) program brings a refreshing way to assess flooding in the Buckeye state. One of the intentions of Risk MAP is to evaluate flood hazards and risk at the HUC-8 watershed level. The size of a HUC-8 watershed can vary greatly from the size of about one county to the size of about eight counties. In the past, FEMA evaluated flooding at the community or county level, therefore the watershed approach brings some new challenges to evaluate flood hazards and flooding risk.

The vision of the Risk MAP program is to deliver quality data that increases public awareness and leads to actions that reduce risk to people and property. The foundation of Risk MAP was laid by the Flood Map Modernization program by updating the paper based floodplain maps to a digital format. However, not every county in Ohio has gone through the update process from paper to digital floodplain maps.

Currently, FEMA, Ohio Department of Natural Resources, and the Ohio Emergency Agency (OEMA) are assessing the status of flood hazards and risk within Ohio. ODNR is in the process of developing a database of flood risk information that will be added to FEMA's national dataset. The Floodplain Management Program and OEMA are working together to combine their resources and apply the information at the watershed level. Once the assessment has taken place, then a preliminary prioritization of the watersheds will be developed for mapping purposes.

The datasets that are used to assess the Ohio watersheds are the Coordinated Needs Management Strategy (CNMS), Average Annualized Loss (AAL), risk deciles, topographic inventory, State and Local identified needs, and mitigation plan expiration date. The CNMS examines the validity of each flood study in the state by determining whether the study is current, requires an updated analysis,

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Watershed Name	Projection to Initiate Risk MAP
Upper Scioto	2011
Upper Great Miami	2011
Cuyahoga	2012
Hocking	2012
Licking	2012
Little Miami	2012
Upper Ohio-Shade	2013
Auglaize	2013
Black-Rocky	2013
Tuscarawas	2013
Little Scioto-Tygarts	2014
Blanchard	2014
Huron-Vermilion	2014
Lower Great Miami	2014
Sandusky	2015
Ashtabula-Chagrin	2015
Muskingum	2015
St. Marys	2016
Cedar-Portage	2016
Lower Scioto	2016
Upper Ohio-Wheeling	2017
Tiffin	2017
Lower Maumee	2017
Paint	2018
Raccoon-Symmes	2018
Ohio Brush-Whiteoak	2018
Mohican	2019
Walhonding	2019
Wills	2019
Grand	2020
Mahoning	2020

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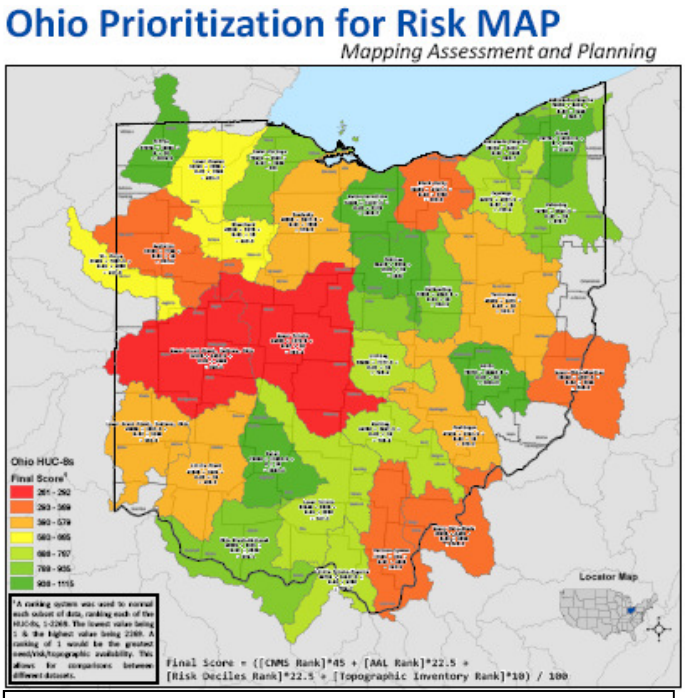
or is unknown. Each studied stream is evaluated on multiple criteria to determine whether the flood study represents the actual flooding hazard. If a flood study fails the CNMS evaluation then it is documented as a need for future update.

The AAL dataset represents the amount of flood risk each community has per year. Risk is associated with the amount of infrastructure that could be impacted by flooding. In its raw form the AAL results may overestimate the amount of losses a community may experience on an annual basis. This dataset can be refined with local input to provide a more accurate annual loss.

Ohio is fortunate to have high quality topographic information available through the Ohio Statewide Imagery Program and local programs. Fortunately, we have been able to use this data as part of our local match, and this has allowed Ohio to receive additional federal funding for flood studies. The greater quality of topographic data also allows for a more precise depiction of the floodplain boundaries on the updated Flood Insurance Rate Maps, thereby helping the local floodplain administrator to have greater confidence in the maps.



Brad Ziss, Stantec;
Map was originally submitted to the Ohio GIS conference based upon preliminary prioritization information, which may change based on future funding limitations.

The risk deciles represent a dataset that takes into account a wide variety of information in order to quantify risk within a watershed. The decile factors include population change, number of homes, flood insurance policies, flood insurance claims, the number of repetitive loss structures, stream miles, and the number of federal declared disasters. All of these factors are combined to examine risk at the watershed level.

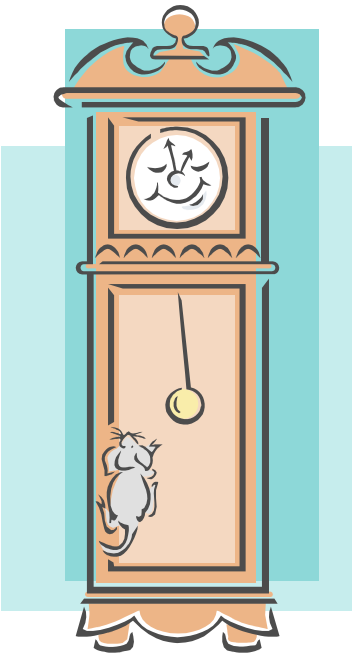
Another source of risk information is obtained through the Community Assistance Visit (CAV) process. The Floodplain Management Program performs CAVs to help communities' understand the responsibilities associated with NFIP participation. As part of the CAV, additional mapping needs are identified including locations where the maps do not accurately represent where local officials believe flooding is taking place. This information, along with additional information relayed through other meetings and correspondence, are used to help prioritize the watersheds.
The Floodplain Management Program is also coordinating with OEMA to identify when community mitigation plans will expire. This is because Risk MAP has the potential to provide technical assistance for mitigation planning activities. A few of these activities are updating mitigation plans and helping communities to incorporate Risk MAP data into their mitigation plans.

Combining all of these datasets allows for a high level assessment of the flood hazards and flood risks in Ohio. The assessment helps provide information to prioritize when the watersheds will be introduced in the Risk MAP program. Please see Table 1 for details on the current watershed mapping prioritization.

Losing Control, Gaining Perspective
50 years (and more) of Ohio Floodplain Management
Part 2 The Floodplain Management Program

By Christopher Thoms, CFM—Program Manager
ODNR, Division of Soil and Water Resources—Floodplain Management Program

Fifty years ago, ODNR's Floodplain Planning Unit was formed. In the previous edition of ***The Antediluvian*** [www.dnr.state.oh.us/Portals/7/pubs/newsltrs/antediluvian/antediluvian_XVII_2.pdf, page 6] we reviewed our first 29 years. In this article, we will continue our review through the last decade. As the Unit placed flood markers to remind people of historic events, the staff also responded to the all- too-frequent current reminders of floods: from Cambridge to Steubenville in eastern Ohio (>$37 million in damages) on August 10-18, 1980, around Ottawa and Findlay (>$18 million) on June 13-14, 1981, seven counties in northwestern corner of the State (>$11 million) on March 13, 1982, north central counties and Preble County (>$20 million) on July 1-2, 1987 all the time providing technical assistance, site and engineering reviews (including Hamilton County's multi-phase Mill Creek flood control project), and helping communities to establish their local floodplain management programs. As FEMA replaced their Community Assistance and Program Evaluation (CAPE) with the Community Assistance Visit (CAV) the Unit's staff was instrumental in refining that process to better serve NFIP-participating communities. In 1988, FEMA introduced the Hazard Mitigation Grant Program (HMGP) to further aid recovery. During 1989, the floodplain management staff helped write a bill containing authority to set and enforce construction-standards for state undertaken or funded floodplain development. Thirty years after the floods that prompted our formation occurred, sadly, flooding once again was a catalyst for enactment of these new flood damage reduction standards. A series of floods from May 29-July 15, 1990 resulted in severe property damage and the tragic loss of lives across 25 counties. Hardest hit were the ravines along Pipe and Wegee creeks, two small streams south of Shadyside in Belmont County where 26 people lost their lives amidst the destruction of nearly one hundred homes. The Unit provided considerable assistance to the survivors; working closely with the Ohio Emergency Management Agency (OEMA) to provide community guidance for HMGP-applicants. The Unit cooperated with a wide range of agencies and organizations to assist in Ohio's overall flood recovery efforts. The previous year's bill was enacted and, along with flood damage reduction language included in the Coastal Management Act, provided the foundation of the Division's reformed Floodplain Management Program (FMP). FEMA launched the Community Rating System (CRS) initiative as a voluntary incentive program to encourage community activities that exceed the minimum NFIP requirements. The CRS discounts flood insurance premium rates to reflect the reduced flood risk resulting from community actions designed to reduce flood losses and promote flood insurance awareness.



While 1990 was very wet, averaging 51.13 inches of precipitation (almost 14 inches above normal), 1991's total annual precipitation was 6.34 inches below normal at 31.51 inches. That year, the FMP released updated model Flood Damage Reduction Regulations featuring a clearer definition of substantial damage. The Ohio Legislature directed the FMP to develop two sets of flood damage reduction standards for SFHA-development, one for activi-

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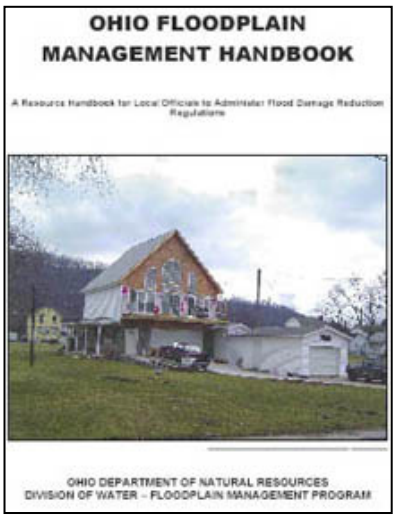

ties undertaken by state agencies and the other for everything else. The difficulty of providing for compliance by state agencies, without improperly subjecting them to local authorities, remained unresolved. Drought conditions continued until record heavy rains in July 1992 (averaging 8.76 inches of precipitation) caused extensive flooding, as in Ross County's Massieville area, where two people died and many homes along Indian Creek were severely damaged or destroyed. Before and after State and Federal disaster declarations, the FMP focused on follow-up, mitigation, and flood mapping activities. In 1993 the FMP revised ***The National Flood Insurance Program Handbook for Local Permit Officials*** to offer a current overview of the day to day responsibilities of a local floodplain administrator. In 1994, with a newly expanded staff, Division and FMP strategies were developed, floodplain management rules were drafted, ***The Handbook*** (2nd edition) was offered, a department website was launched, and ***The Antediluvian*** was first published. A new Water Management Section was formed grouping the Dam Safety, Canal, and Floodplain Management programs. At the Water Management Association of Ohio's (WMAO) 1995 Annual Conference, two statewide organizations were formed: the Ohio Floodplain Management Association (OFMA) and the Ohio Dam Safety Organization (ODSO). Localized flooding occurred in May and then severe storms of August 5 and 8 brought up to 11 inches of rain to parts of Champaign, Logan, Miami, and Shelby counties; with many northern and southern counties also flooded, causing about $15 million in damage with State and Federal disaster declarations for 11 flooded counties. The FMP (continuing in close cooperation with OEMA) once again undertook flood damage assessment, recovery, and mitigation efforts. ***The Handbook*** (3rd edition) was published. The March 1997 storms that swept across most of southern Ohio, (the worst since 1969) resulted in flood damage to about 6,500 homes and 800 businesses at an estimated $180 million in damages. Many Ohio River tributaries experienced record stream flows, in some cases exceeding the 100-year levels. Division staff assisted with damage assessments, dam-inspections, mitigation, recovery, and interagency technical advice as 18 counties were declared State and Federal disaster areas. The FMP sent multiple teams to conduct county-by-county in-services for local officials to provide timely and effective recovery tactics and ensure that all affected communities could maintain/achieve eligibility for disaster assistance. FMP staff were able to provide accurate and responsive information while attending (understandably tense) local flood-recovery meetings and help survivors navigate the range of local, state, and federal agencies and private organizations. The Division's new website also helped to quickly provide critical flood recovery information to anyone with internet access. Higher water levels on the Great Lakes during the summer led to the preparation of state response plans in case serious coastal flood or erosion damage might result. Happily, below normal rainfall over the following years throughout the Great Lakes basin reversed the rising levels. In the fall, the FMP paired with FEMA

Picture taken by Floodplain Staff in Vinton County on March 2, 1997

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staff to conduct a series of streamlined assistance visits (nicknamed circuit-rides) to provide additional mitigation assistance to flood-damaged communities. When storms across central and southern Ohio brought another round of extensive flooding and damage in June and July 1998, the FMP once again deployed to assist. Using the *Smart Recovery* awareness campaign, a joint ODNR/OEMA-initiative aimed at educating and persuading the public (and individuals) about using smart mitigation methods, the campaign's intent was for mitigation to become synonymous with smart recovery. The first goal was to increase general public awareness of natural hazard risks and related costs versus the benefits of mitigation. The second was to convey that individual and community mitigation activities can reduce injuries, deaths, and loss of property resulting from a disaster. The FMP released an update to its model regulations with extensive commentary to better inform NFIP-participating communities. Following two years of extensive flooding where numerous agencies offered well intentioned but, at times, conflicting methods of assistance, the FMP published ***Substantial Damage Determinations: A Guide for Local Permit Officials***, providing an easily usable path for conducting critical damage assessments and post-flood recovery. In 1999, the Association of State Floodplain Managers (ASFPM) first offered the exam to qualify as a Certified Floodplain Manager (CFM) and two FMP staff members achieved this distinction in that first year. Following the panic that all computers would malfunction en masse at the stroke of midnight New Year's 2000, FEMA optimistically developed a computer program for residential damage assessment. At the Ohio State Fair, the Division unveiled a set of four dynamic scale modules (designed by the author) to dramatically demonstrate applications of our various programs (the one dedicated to floodplain management was, of course, the best). In June 2000, the Coastal Engineering Program joined the Division's Water Management Section.

> *The basic problem, which is the source of many flood complaints, was that the houses should not have been built there in the first place, since flood hazards were unavoidable in that area…it is a misconception that the State can provide miraculous relief despite ill-advised building in flood plains and lack of local leadership.*

Though ODNR's Director, General Herbert B. Eagon, made these comments over 50 years ago they are still applicable. That floods will occur and should be planned for was recognized long before the FMP was created. Neither the problems nor the principles are new to us. While sound floodplain management may use a variety of tactics, the objectives of risk reduction and resource protection focus should remain.

We will continue to follow the developments of the FMP in the next edition of ***The Antediluvian***.

CALL FOR ABSTRACTS

The Association of State Floodplain Managers (ASFPM) 2012 annual conference will be held in San Antonio, Texas. This year's conference, which is the 36th consecutive gathering, will have a special emphasis on flood risk reduction mitigation. However, many issues surrounding floodplain management including NFIP, levees and dams, mapping and technology, and No Adverse Impact will be discussed throughout the week.

Submit your abstract by October 31, 2011 to contribute to the conversation! Details are found at: www.floods.org

Farewell

By Richard Roths, AICP—Principle Planner and Region V Regional Program Manager (Retired)
iService Team

As I approached retirement, from full-time employment, it gave me a chance to reflect on 32 years as an Urban Planner and 25 years in floodplain management, mitigation planning, and grants management. From 1979 through early 1986, I worked as a local planner and then, what began as another planning position with the Northeastern Planning Commission in 1986, quickly took on a life of its own. That job became a career, and what you might refer to as a calling.

When French Wetmore, of the Illinois Department of Transportation, and Phil Peters, of the Northeastern Illinois Planning Commission, hired me I looked at the position as another job. But French quickly immersed me in the National Flood Insurance Program (NFIP) by having me read all of the Federal Register citations on the Program. At the time, I thought that it was a real sleeper, but it prepared me for what was to come. The Northern Illinois Floods of 1986 and 1987 opened my eyes not only to what the residents of our communities face, but the reasons that the floods take place. It is not just the rain and the terrain; it is what actions we as communities allow to happen.

French also continued my education by introducing me to the fathers of floodplain management, Gilbert White and Jim Goddard, and giving me the opportunity to listen to their sage discussions on floodplain management. I was hooked. Floodplain management and subsequently disaster management became more than a job, it became a calling, which we had to look at, not only the after effects of the event, but also why the event happened and how we could reduce the damages in the future. Thanks French!

Working with many individuals from the States in FEMA Region V; the Association of State Floodplain Managers; and especially two of ASFPM's Chapter's: the Illinois Association for Floodplain and Stormwater Management (IAFSM) and the Ohio Floodplain Manager's Association (OFMA); the Central United States Earthquake Consortium (CUSEC); and especially Jim Schwab from the American Planning Association (APA) continued to widen my education and offer new vistas. Thanks all!

You probably wonder what I am getting at. We, as floodplain managers, cannot look at our positions just as jobs. The day to day activities, the arguing with citizens, and even the local officials in our communities are all trying to protect the life, health, and safety of the residents and their buildings. We have to look at the bigger picture and look at what we are really there to accomplish. What we are trying to do is to:

- Understand the Risks;
- Educate the public and the local officials;
- Guide development so that it does not occur in high risk areas; and
- Reduce the damages in parts of our communities that have already been developed.

As long as we keep our eye on the finish line, we can handle the rest. We must all take the

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opportunities to learn from each other and use all of the educational opportunities that we are offered. For all of the troubles we face as floodplain managers and hazard managers, many of the individuals that I know continue to stay involved in the field either when they change positions and even after retirement. It is because it has become a calling to many of us. I retired on August 31, but I do not plan to go away completely. I plan to stay involved, particularly in floodplain management and mitigation activities. So, you never know when I might pop-up again or when you might read an article by me.

As I close this article, I want to take the opportunity the thank IAFSM for the Lifetime Achievement Award and OFMA for the Career Recognition Award. I truly appreciate them. But remember a piece of each of those awards should go to each of you, because you all had a hand in creating what I became and you are carrying on the calling.

I also want to remind you to *Keep Your Eye on the Finish Line*-Reducing Risks and Protecting Your Communities!

Certified Floodplain Manager Refresher Course

Date: Thursday, October 13, 2011
Location: Ohio Department of Natural Resources
2045 Morse Rd., Building E-1 (Assembly Center East)
Columbus, OH 43229
Time: 8:00am - 5:00 pm

The Certified Floodplain Manager Exam (CFM) exam measures knowledge of the National Flood Insurance Program and related floodplain management topics. The eight-hour study seminar will be presented in modules, by approved instructors, who have achieved CFM certification. The CFM Refresher will provide a good basis for preparation; however, attendees should not expect to pass the exam without additional study. This course is not a guarantee of passing the CFM exam.

The workshop is targeted at seasoned floodplain managers with two or more years of experience who have read the FEMA 480 publication and studied the materials noted on the Association of State Floodplain Managers' "Exam Prep Guide."

The CFM Refresher is being hosted by the Ohio Floodplain Management Association (OFMA). Those taking the course may earn six (6) CORE Continuing Education Credits (CECs) toward CFM Certification. The CFM Refresher Course fee includes course manual, lite breakfast, lunch, and refreshments. Should you have any questions about your registration, please contact Shawn Arden at 614-898-7100.

Download the Registration Form at:
http://www.dnr.state.oh.us/water/tabid/23389/Default.aspx

Be Aware of Nonstructural Development

By Benjamin Kelley—Environmental Specialist
ODNR, Division of Soil and Water Resources—Floodplain Management Program

In many areas across the state, development of residential homes, commercial buildings, and other structures have decreased dramatically. Construction has come to a crawl and many of the designated Special Flood Hazard Areas (SFHA) are not seeing the structural development pressure as in previous years. Even though structural permitting may be slow in some areas, always remain aware of the obligation to issue a floodplain development permit for nonstructural development. Development is defined as:

> *"Any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials."*
> *44CFR59.1*

Per the above definition, we know that nonstructural development includes any change to real estate, which is not structural. Common projects that fall into this category are bridges, culverts, ditch clean-outs, stream channelization, stream restoration, material storage/removal, excavation in stone quarries, bank stabilization, etc. No matter the scale of these projects, they must not be overlooked. Each one needs the attention of the Floodplain Administrator, whether it is an engineering analysis, a floodplain development permit, or just a passing glance to ensure that the activity still meets the flood safety requirements.

This is an extremely important part of quality floodplain management. Not only is permitting nonstructural development a requirement for participation in the National Flood Insurance Program (NFIP), but it is necessary to keep up-to-date on changes occurring within the SFHA. This information is needed in order to submit new technical data to update your Flood Insurance Rate Map (FIRM). As part of the NFIP requirements, nonstructural development must be tracked and regulated. Benefits of this regulation include reducing flood debris, maintaining flood water storage area, and controlling water contamination by limiting sediment and other harmful materials. Controlling this will help reduce the overall flood risk in your community.

Permitting this type of development is fairly straightforward among the A Zones found on your community's FIRM. It is a NFIP requirement that before a floodplain development permit can be issued, an application must be submitted for review. In a designated FEMA Floodway, as part of the permit application, the applicant must submit a hydrologic and hydraulic analysis, conducted by a registered professional engineer, demonstrating that the proposed development will not result in any increase in the base flood elevation. When a development is proposed within an A Zone with Base Flood Elevation (BFE) but no floodway delineated the requirement is as follows:

> *"…the cumulative effect of any proposed development, when combined with all other existing and anticipated development, shall not increase the base flood elevation more than 1.0 (one) foot at any point." 44CFR60.3(c)(10)*

A hydrologic and hydraulic analysis must also be done for this situation in order to show 44CFR60.3(c)(10) has been met. Review your Flood Damage Reduction Regulation when applying these standards.

When an applicant is seeking a permit for nonstructural development in an Approximate A zone, the hydrologic and hydrologic analysis is not required. As with all floodplain development, these proposed

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activities require an application for Floodplain Development Permit, which needs to be approved by the Floodplain Administrator before the permit is issued. If the proposed development falls within the bankfull stage of the watercourse, such as, an intense cleanout project/channelization or a stream restoration project, then the stream's bankfull flood carrying capacity cannot be diminished. The application must include a engineering analysis, by a registered professional engineer, that demonstrates that this requirement has been met. This situation remains the same in any A Zone found on the community's FIRM. The applicant must receive all other necessary permits from other state/federal authorities.

Please understand, that according to the Code of Federal Regulations and locally adopted Flood Damage Reduction Regulations, a Floodplain Development permit must be obtained for nonstructural development. It is within the community's best interest to be aware of these projects, regardless of their severity, and administer proper permitting of nonstructural development within the designated SFHA. Nonstructural development needs to be taken seriously in order to implement your local floodplain management plans. Consult your locally adopted Flood Damage Reduction Regulation to assist in working towards full compliance.

Flood Insurance versus Disaster Assistance

By Dylan Pendleton—Environmental Specialist
ODNR, Division of Soil and Water Resources—Floodplain Management Program

Flooding is a real, tangible danger across the great state of Ohio. In my first eight months as an Environmental Specialist, I have talked to many property owners that are ill-informed about the differences between disaster assistance and flood insurance. There are a striking number of people that believe when their property is flooded, FEMA will repair their structure for free through disaster assistance. In the great majority of cases, however, this is not the result. This is because most individual assistance is only offered upon a Presidential Declaration of Disaster. And, when there is a declaration, the typical form of disaster assistance is a loan that must be repaid with interest. Out of the 46 Presidential Disaster Declarations in the State since the National Flood Insurance Program (NFIP) was created, 35 have included flooding as a contributing factor. Flooding is an inevitable event, with significant impacts for people and property that have been placed in the way. Generally, if a property is in the designated Special Flood Hazard Area (SFHA), the question is not whether it will be flooded, it's when.

For most forms of individual disaster assistance to be made available, the President must issue a Disaster Declaration. But, in Ohio, many floods occur that are not widespread enough to receive a Presidential Disaster Declaration. Unfortunately, that means that there are many flooded property owners that will not be eligible for any kind of disaster assistance. Even worse, there is a 26% chance of a home in the SFHA being flooded in the life of a 30-year mortgage. As a point of comparison, we commonly hear that there is only a 5% chance of the same homes sustaining fire damage over the same period. That means that these homes are five times as likely to sustain flood damage as fire damage, and unless they purchase flood

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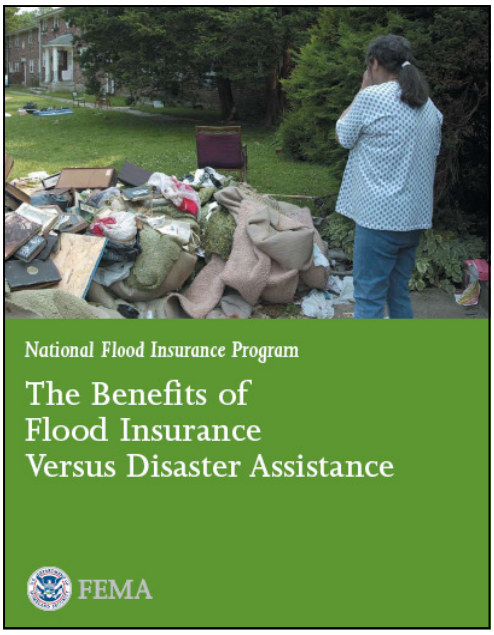

insurance, they are likely to be fully financially responsible for the loss.

A substantial difference between disaster assistance and flood insurance is that structures that have flood insurance are covered whether there is a Presidential Disaster Declaration or not. If the property owner has flood insurance, they are in control. The property owner can choose their deductible, coverage limits, and whether or not to purchase contents coverage in addition to the structural coverage. Also, the property owner files an insurance claim and applies for community floodplain and building permits on their own schedule. If a property owner does not have flood insurance, they must wait to see if there will be any individual assistance available with their best-case scenario being a Presidential Disaster Declaration. If there is a Declaration, the property owner must apply for assistance and then apply for a Small Business Administration (SBA) loan. If the loan is approved, the property owner will then have to repay the loan, with interest, along with any mortgage held on the property. This SBA loan also carries the same mandatory flood insurance purchase requirements as all other federally subsidized loans. Outside of the SBA loan, there is very limited disaster assistance available for the property owner. One option for property owners that are denied the SBA loan, is the Individuals and Households Program (IHP) award. The IHP award frequently comes with a reduced-rate "group flood insurance policy" that lasts only three years. After three years, the property owner must obtain an individual flood insurance policy for the structure. Otherwise, the structure will not be eligible to receive Disaster Assistance in the future. In 2008, the national average IHP award for Presidential Disasters related to flooding was less than $4,000.

In communities that participate in the Regular Program of the National Flood Insurance Program, flood insurance can be purchased to pay for all covered building losses up to $250,000 for homeowners and $500,000 for businesses. Content coverage is also available up to $100,000 for homeowners and $500,000 for businesses. If the insured structure was constructed prior to the first identification of risk (usually called Pre-FIRM), is located within the SFHA, and has received a Substantial Damage Determination, then it may also be eligible for an additional $30,000 of Increased Cost of Compliance. The average cost of a standard flood insurance policy is less than $600 annually for structures that are located within the SFHA. However, the less costly policy option (called a Preferred Risk Policy) that may be available for structures outside of the SFHA, has an average cost of less than $200 annually.

As mentioned above, the SBA loan is the most common form of disaster assistance. Repayment of a $50,000 SBA disaster home loan is $2,880 annually at 4% interest. In addition, flood insurance premiums are required by the federal mandatory purchase requirement if the structure is located within the SFHA. It is important to note that disaster assistance is not meant to make the property owner "whole" after a disaster, it is meant to help obtain the basic living essentials.
Flooding has the most Disaster Declarations of all natural disasters in Ohio when all local, state, and federal events are considered. According to the FEMA publication Flood Insurance Requirements for Recipients of Federal Disaster Declarations (F-695), when an insurable property within the SFHA receives Federal disaster funding, it is required to purchase and maintain flood insurance. If the damaged structure is replaced, property owners must also purchase flood insurance for the new construction. With the great risk of flooding in Ohio, it just makes sense to purchase flood insurance.

How Can Floodplain Managers Help Robert Manning?

By Randall Keitz, P.E.—Floodplain Engineer
ODNR, Division of Soil and Water Resources—Floodplain Management Program

In 1889 the Irish drainage engineer, Robert Manning, suggested a simple general formula (Equation 1) for calculating the velocity of water flowing in an open channel of given dimensions, in which n represents the resistance coefficient. The 'n-value' is an estimation of roughness, or the effects of friction on the movement of water, derived from a visual assessment of shape and character of a river channel (Whatmore, 2009).

$$V = \frac{1.49}{n} R^{2/3} S^{1/2}$$

(Equation 1)

Where, V = average velocity, in feet per second,
n = Manning's roughness coefficient,
R = hydraulic radius, in feet (the cross-sectional area of flow divided by the wetted perimeter), and
S = water surface slope or average channel slope, in feet per foot.

The Manning's equation remains a core component in hydraulic engineering and is used in HEC-RAS modeling to develop flow elevations (e.g., the 1% flood height).
There are many well-established sources to assist in selecting an appropriate n-value for channel and floodplain conditions commonly observed (see Manning's n references below). Even with this guidance, the selection of an appropriate n-value for a floodplain study can be quite challenging. The roughness condition of the channel and floodplain will vary for many reasons. For example, roughness will vary due to:

- Changes in the depth of water flow (i.e., relative roughness);
- Changes in seasons (e.g., winter to summer);
- Changes in channel and floodplain cross-sections (e.g., hydraulic radius); and
- Changes in floodplain vegetation along the floodplain's length (e.g., grass to woods), among with many others.

The Army Corp of Engineers, HEC-RAS Hydraulic Reference Manual indicates that floodplain n-values may vary from a low of 0.025 (short grass pasture, no brush) to a high of 0.200 (dense willows, summer, straight), which is an eight-fold difference. Although this broad range of floodplain n-values may occur on a floodplain, especially over a long period of time (e.g., 100 years), the selection of any floodplain n-value for a flood study has certain consequences, which can be magnified when a community adopts only the minimum NFIP criteria.

To demonstrate, let's consider a site along a stream with an average channel slope of 0.1% and drainage area of 40 square miles. Using hydraulic geometry regression equations for Ohio to estimate bankfull channel dimensions (USGS, 2005), this reach of stream will have a bankfull channel width of about 70 feet. Additionally, stable low-gradient stream systems will generally have a total floodplain width at least five times its bankfull channel width (Williams, 1986). Let's assume a total floodplain width of five times the bankfull channel width or 350 feet and the floodplain is flat. An estimate of the 1% flood flow might be around 2750 cubic feet per second (cfs) (USGS, 2006), and the bankfull channel will carry around 1000 cfs (USGS, 2005). Using a Manning's n-value of 0.035 in the channel for two different floodplain conditions, HEC-RAS was used to estimate the 1% flood flow in the floodplain overbanks for

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a low n-value of 0.025 and then a high n-value of 0.200. For the low n-value the right and left overbanks each carry about 532 cfs and for the high n-value each of the overbanks carry about 188 cfs, which is about a 3-fold difference in floodplain flow. Also, the high n-value results in a flood height or base flood elevation (BFE) that is about 1.3 feet higher than the low n-value.

At first glance, it might appear to be a benefit to select the high n-value for the flood study, which keeps the BFE higher, in order to reduce potential flood damage. However, less flow in the floodplain, 188 cfs in high n-value case, would provide for a narrower floodway or more floodplain encroachment potential assuming a one-foot allowable rise in the floodway. More encroachment potential implies more loss of floodplain storage of flood flows as encroachment fills the floodplain over time. This will result in increased downstream flood heights. Additionally, more encroachment means more loss of the floodplain's natural functions, which implies water quality degradation. Although the selection of a high floodplain n-value for a flood study may have initial benefits, it can create negative long-term consequences.

Now let's consider the low floodplain n-value for the flood study. An initial negative consequence of the low n-value is a lower BFE (i.e., 1.3 feet lower), which increases the potential for flood damage. However, a low BFE with more flow in the floodplain would provide for a wider floodway or less floodplain encroachment assuming the same one-foot allowable rise. Less encroachment potential implies more preservation of floodplain storage of flood flows as encroachment fills less of the floodplain over time. This will work towards reducing the increase in downstream flood heights as compared to more encroachment. Additionally, less encroachment means more preservation of the floodplain's natural functions, which will work towards reducing potential water quality degradation. Although the selection of a low floodplain n-value for a flood study may have initial negative consequences, it can help maintain long-term benefits.

In nearly all cases, a floodplain Manning's n-value will be more balanced between the two extremes, but the issue or conundrum of what n-value to select for a floodplain study will still exist to some degree. The Professional Engineer performing the flood study generally selects the n-values based on site conditions. However, floodplain managers can help reduce the effects or consequences of the Robert Manning n-value conundrum by working with their communities to adopt higher standards. Two fundamental higher standards that work together to help reduce the effects of this issue are:

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Manning's *n* References:

Hicks, D.M and Mason, P.D., Roughness Characteristics of New Zealand Rivers, National Institute of Water and Atmospheric Research Ltd, Christchurch, New Zealand, Sept., 1998.

U.S. Department of the Army, Corps of Engineers, "Hydrologic Engineering Center, HEC-RAS, River Analysis System, Hydraulic Reference Manual, Version 4.1," 2010.

U.S. Department of Interior, Geologic Survey, Water-Supply Paper 1849, "Guide for Selecting Manning's Roughness Coefficients for Natural Channels and Flood Plains," (Barnes) 1987.

U.S. Department of Interior, Geologic Survey, Water-Supply Paper 2339, "Guide for Selecting Manning's Roughness Coefficients for Natural Channels and Flood Plains," 1989.

U.S. Department of Agriculture, Natural Resources Conservation Service, Title 210 Engineering, National Engineering Handbook, Part 650 Engineering Field Handbook, Chapter 7, Grassed Waterways, Dec. 2007.

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- Lower the allowable rise in the floodway (*e.g.*, from 1.0 ft to 0.5 ft or lower), and
- Increase the required freeboard (*e.g.,* from 2 ft to 3 ft or higher).

Assistance for communities wanting to adopt higher floodplain standards can be obtained by contacting the Floodplain Management staff at ODNR.

Article References:

Whatmore, S. and Landstrom, C., "Manning's *N* – Putting Roughness to Work," School of Geography and Environment, University of Oxford, Cambridge, 2009.

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Hey, Richard, Course Manual: "Natural Rivers: Mechanisms, Morphology, and Management," School of Environmental Sciences, University of East Anglia, Norwich, UK, 2003, Section 4, p. 4.

Sherwood, J.M. and Huitger, C.A., 2005, "Bankfull Characteristics of Ohio Streams and Their Relation to Peak Streamflows," U.S. Geological Survey, Scientific Investigations Report 2005-5153, 38 p.

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Food for Thought—Flood Hazard Communication

Looking at Ourselves in the Mirror

By Tim Trautman, P.E., CFM—ASFPM Mitigation POD Coordinator
Mecklenburg County, North Carolina; Flood Mitigation Program

(This article was originally published in the Association of State Floodplain Managers' newsletter, "News and Views," August 2011 and reprinted with permission.)

Flooding has certainly been in the news this year with the Mississippi and Missouri Rivers rising for months on end. Last year in 2010, massive flooding in Tennessee and Rhode Island made headlines, along with a barrage of media and political scrutiny as a result of new Flood Insurance Rate Maps becoming effective in several riverine and coastal communities and behind non-accredited levees. In 2009, flooding along the Red River and elsewhere got substantial media coverage. It seems each year there's some level of catastrophic flooding that gains national attention. Floods offer many "teaching moment" for us to promote wise floodplain management and demonstrate the benefits of taking actions that reduce risk to life and property. However, we should also ask ourselves what we're —teaching the remaining 300 plus days of the year when floods are not newsworthy. What image are we reflecting in the mirror each day that shapes common views about flood risk throughout the country? I'm convinced the Flood Insurance Rate Maps

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(FIRMs), within the context of the National Flood Insurance Program (NFIP), have educated much of our nation the past 40 years.

FIRMs have served a vital purpose since the inception of the NFIP. They've allowed flood insurance to be widely available and laid the foundation for regulating development around rivers, streams, and coastlines. But these maps were developed and are maintained under the premise of flood insurance determinations and for rating policies. We've used them for flood hazard communication and education out of necessity. Although technology has evolved substantially since the initiation of the NFIP, the insurance based fundamentals of the program have not changed. Therefore, the FIRMs have become the national source for flood hazard information and for educating the public about flood risk.

Imagine that we are the head chef needing to feed the nation with flood information. For the past 40 years, we've been baking only one type of cake. Sometimes we vary the ingredients, alter how precisely we measure each one, and produce cakes at varying costs. For many years everyone was happy and healthy consuming our flood insurance products. But a strong case can be made that the cakes we've created have slowly poisoned our efforts to increase public awareness and understanding of flood risk. The NFIP requires that we keep making the same cakes even though we now know some of the ingredients are flawed, unhealthy, and have long term health impacts. This is in spite of advancements that now allow us to bake with healthier ingredients and only produce products that are more likely to lead to action that reduces risk to life and property – FEMA's vision for Risk MAP.

Consider the following messages we inherently convey to the nation through the NFIP and data published on Flood Insurance Rate Maps:

- All properties in the Floodplain have the same likelihood of flooding.
- You're either "in" the Floodplain (*i.e*. have risk), or you're "out" (*i.e*. no risk).
- There are only two levels of flood hazard (1% and 0.2% annual chance flood.)
- Flooding is statistically rare within the entire Floodplain (only a 1% annual chance of flooding).
- Incentives geared toward getting "out" of the floodplain, not on actions that reduce risk.
- Insurance rates have no direct correlation to likelihood of flooding or varied risk.

The FIRM is produced on a static map panel, implying that the Floodplain doesn't change over time. Many of us work hard to counteract this type of misinformation regarding flood risk and residual risk. At times we combat a wide range of misunderstanding which can be further propagated by the news media. At all levels of government, we battle many common misperceptions such as "I'm either in or out of a floodplain" or "I'm at risk of flooding or not" or "The new maps put me into a floodplain" or "The floodplain must be wrong because I've never flooded" or "I flooded last year and therefore I shouldn't flood for another 100 years." I'm sure there are many similar comments that you've heard over the years.

I believe success in changing behaviors that will reduce risk to life and property will only occur if we change the products we produce and reform the way they're used for flood insurance. FEMA's Risk MAP initiative is intended to address many of these core misperceptions and issues. So we are now baking new products. But we are also continuing to bake the same cake that has slowly poisoned the public perception of flood risk. As Dennis Mileti's research on human behavior concluded, we are

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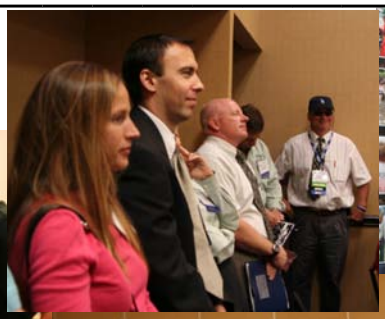
creatures of "monkey see, monkey do". And as long as our residents continue to *see* the inherent messages conveyed by the insurance products we produce, they will continue to *do* things that inevitably increase the consequences of flooding and minimize the number of sustainable actions that protect lives and property.

The vast majority of people do understand the basic correlation between risk and the cost of insurance when it comes to homeowners, automobile, life, and health insurance. They see it, discuss it at the kitchen table, and generally understand it. Those rates are structured such that the greater the risk, the greater the cost of insurance. Most people realize a teenager driving a Porsche is a greater "risk" to insure than an experienced driver in an old Volvo sedan. Therefore auto insurance will cost substantially more.So, imagine an environment where the FIRM as we know it does not exist. Imagine if we only produced products that demonstrated the varying and changing nature of flooding, and the associated consequences. Imagine if we only produced flood maps, assessments and plans which could be used for informed decision making. And imagine if flood insurance rates truly varied based on these hazard products and the predicted financial consequences? I believe it would ultimately change the way people think about flooding. Our products would be entirely consistent with our message. Risk based products integrated into daily public and private decision making would lead to discussions about the risk and cost of flooding, and would eventually foster changed behaviors.

Once all mapping products are produced under the paradigm of flood hazard and risk communication, we can expect behaviors of residents, government agencies, and elected officials to more holistically change. Our products will be consistent with our message and lead to continual "teaching moments." We'd be in a position to continually feed our population with a healthy dose of floodplain nutrition that would lead to a more sustainable and resilient nation.

Ohio Floodplain Management Conference 2011



Adopting Cumulative Substantial Damage and Cumulative Substantial Improvement Standards to Benefit Your Community

By Alicia Silverio, CFM—Senior Environmental Specialist
ODNR, Division of Soil and Water Resources—Floodplain Management Program

When revising your community's floodplain management regulations, it is crucial to ensure that these standards meet the minimum National Flood Insurance Program (NFIP) criteria. Adoption and administration of these minimum standards is not only the fundamental way to uphold NFIP participation responsibilities, but it is your community's means of protecting future development from flood risk. This is also the appropriate time to consider whether these minimum standards will help achieve the level of flood risk reduction necessary for your community's welfare and sustainability. What additional measures can your community take to protect future development? What supplementary regulations can be implemented to guide development toward positive growth and an inherent capability to withstand flood hazards in the long term? Adopting standards for cumulative substantial damage and improvement is an excellent way to protect development proposed within your community from future flood risk.

Cumulative Substantial Damage and Substantial Improvement

Structures that are repetitively damaged by flooding are likely to continue being damaged unless steps are taken to break the cycle. Targeting development susceptible to repetitive flood damage in your local floodplain management regulations is a distinct approach to furthering the sustainability of your community. Adopting standards that incorporate cumulative tracking of substantial damage or improvements will ensure that property owners who repair or increase the value of their structures in high risk areas are required to decrease the risk associated with that development.

According to the NFIP minimum criteria, a structure damaged to 50 percent or more of its market value, whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred, must be brought into compliance with current floodplain management regulations. Similarly, improvements to any structure that exceed 50 percent of the structure's market value would trigger substantial improvement regulations and, in turn, require the structure to be brought into compliance with current floodplain management regulations. By adopting cumulative tracking provisions, your community agrees to monitor and record damage or improvements to structures within the identified Special Flood Hazard Area (SFHA) to determine whether these incremental improvements exceed 50 percent of the structure's market value within a specific amount of time (typically 10 consecutive years). Cumulative tracking enables a community to deter the repetitive cycle of "damage – repair – damage – repair" by requiring property owners who choose to rebuild in floodprone areas to protect their structure against future flood risk according to locally adopted floodplain regulations.

Although ensuring that damages and improvements to development within the SFHA are reviewed for compliance with local standards can be challenging for any Floodplain Manager, it is important to keep detailed permitting records regarding any proposed structural alterations. These records will help confirm that property owners do not purposely avoid compliance by performing a 30 percent improvement one year and a 40 percent improvement in just a few more years. Consistent and thorough floodplain development permitting in addition to meticulous records will help any community implement these standards.

As THE professional responsible for administering your community's floodplain management

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Substantially damaged residential structure in Powhatan Point, Ohio. Picture taken by ODNR staff in 2004.

program, it is also important for you to recognize that you have the chance to help property owners make wise decisions about reinvesting in their structure that is vulnerable to flooding. You have expertise to help evaluate what can be done to mitigate their flood risk. Based on the known flood risk, both mapped and historical, what would be the most appropriate means of flood protection? Could elevation or floodproofing be viable options? Is demolition or relocation of the structure possible? What options are the property owner willing to consider? What resources are available to assist property owners meet floodplain management requirements? Adoption of cumulative tracking of substantial damage or improvements standards enables residents to become more readily eligible for Increased Cost of Compliance funding.

Elevated structure in Powhattan Point, Ohio—ICC Funds were used to elevate this structure using an "enclosure below lowest floor". Picture taken by ODNR staff in 2004.

Increased Cost of Compliance (ICC)

ICC funds work for your community providing up to $30,000.00 in addition to the payment of an individual's flood insurance claim toward costs to comply with community floodplain management regulations. ICC becomes available after a structure covered by a Standard Flood Insurance Policy (SFIP) sustains a flood loss and the community declares the building to be substantially or repetitively damaged (even without a Presidential Disaster Declaration). ICC will contribute toward the cost to elevate, floodproof, demolish, or relocate the building as well as any architectural or engineering fees associated with the mitigation. ICC payment will only be issued if the structure is determined to meet the NFIP minimum requirements after construction.

Over the past few years, ODNR's Floodplain Management Program has worked with hundreds of Ohio communities to revise and update locally adopted floodplain management regulations in response to Map Modernization. In this process, communities have achieved minimum compliance with the NFIP, but may not have taken the time to determine what additional standards may be necessary to achieve flood risk reduction. There is no time like the present! Use this opportunity to consider how your community will manage its flood risk and what resources you can help acquire to assist your residents: adoption of cumulative substantial damage and improvement tracking is just one way.

References

Sample language for inclusion of cumulative substantial damage and improvements standards in your locally adopted floodplain management regulations can be found in ODNR's *Ohio Floodplain Regulation Criteria* at: http://www.dnr.state.oh.us/water/tabid/3518/Default.aspx

Standards and related discussion regarding substantially damage structures can be reviewed in FEMA Publication 213 Answers to Questions About Substantially Damaged Buildings and *ODNR's Substantial Damage Determinations: A Guide for Local Officials.*

Information and illustrations regarding lateral and vertical additions can referenced in FEMA's NFIP Requirements Desk Reference (FEMA-480) manual.

Detailed information regarding ICC is located in FEMA Publication 301 National Flood Insurance Program's Increased Cost of Compliance Coverage Guidance for State and Local Officials.

The Antediluvian

Ohio's Floodplain Management Newsletter

Division of Soil and Water Resources
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