The Antediluvian

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

Volume XVI, Issue 2 Spring 2010

Ohio's Floodplain Management Newsletter

Reduce flood damage and protect and promote natural functions of floodplains

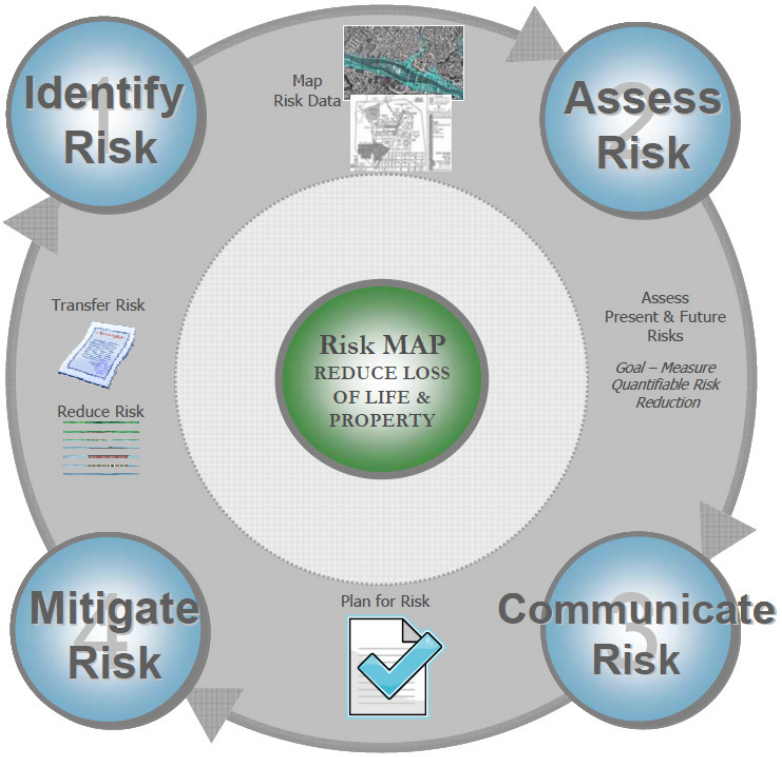
And you Thought Map Modernization was the End of the Road!

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

Do you remember the Map Modernization Scoping Meeting we conducted for your county's flood map update, when you had the opportunity to describe your community's mapping needs? If your county didn't have a Scoping Meeting, do you have mapping needs that should be addressed? Well, FEMA's latest mapping initiative will attempt to address both of these situations with Risk Mapping, Assessment, and Planning (Risk MAP). Funding from the National Flood Insurance Fund and Congressional appropriations have allowed FEMA to move forward with Risk MAP in order to "deliver quality data that increases public awareness and leads to action that reduces risk to life and property" (Risk MAP Multi-Year Plan, 2009).

The major objectives of FEMA's Risk MAP initiative are to:

1. Assess the nation's flood risk and use this information to increase public awareness of risk. This consistent, quantitative flood risk assessment will be used to track progress toward reducing flood risk and to target resources.
2. Increase public awareness of risk from natural hazards and establish a baseline of local knowledge and understanding of risk management concepts.
3. Ensure 80 percent of the nation's flood hazard data are current—these data are new, updated, or deemed still valid.
4. Continue to meet the statutory requirements of the NFIP through assessing, on a watershed basis, the need to revise and update all floodplain areas and flood risk zones identified, delineated, or established (Risk MAP Multi-Year Plan, 2009).



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FEMA's Risk MAP Life Cycle is based on four, key components associated with risk reduction—identification, assessment, communication, and mitigation (see illustration above).

Identification involves accurate and precise flood hazard data and mapping that communities can use to make more informed risk management decisions. If your community already has modernized maps, we want to build on those data sets so they better reflect reality. On the other hand, if your community doesn't have modernized flood maps, we want to bring them into the digital world so you can take advantage of tools and practices involving DFIRMs and Risk MAP.

Once the risk has been adequately identified, we need to assess vulnerability via risk assessments. In order to plan for mitigation efforts, we must be able to identify the threats to our communities. FEMA plans to work with communities in establishing a process to evaluate risk on a regular basis to ensure mitigation practices are reducing vulnerability over time.

Identification and assessment alone will not get your community to the promised land of "Risk Reduction." Risk communication efforts must be enhanced so people not only understand the value of mitigation, but they also see a measurable reduction of current and future vulnerability within their community. With new technologies and media outlets, FEMA plans to implement a comprehensive national outreach strategy that will provide people with targeted messages about risk and risk reduction initiatives.

Tying all of this together is mitigation planning. The previous three stages are beneficial in their own regard, but their impact is not felt without integrating them into a plan of attack. By applying engineering and planning practices with advanced technologies, Risk MAP will help communities develop strategies to maximize flood loss reduction.

As with most other large-scale initiatives, this will not happen overnight. As we transition into Risk MAP, it makes sense that we are first going to build on the products developed from Map Modernization. Currently, we are working on bridging flood hazard data gaps in both modernized and non-modernized counties. For Fiscal Year 2009, mapping projects have been initiated in Butler, Clermont, Columbiana, Franklin, Hamilton, Holmes, Medina, Mercer, and Morgan Counties. These projects range from restudies and new studies to countywide projects and LOMR incorporations. Outside of those mapping projects, ODNR and FEMA are continuing to compile mapping needs and leverage data so we can better prioritize future projects. Needless to say, we may be finishing Map Modernization, but flood hazard data development is far from over!

FEMA Needs Your Input!

FEMA has developed a strategic plan that outlines Risk MAP's goals and objectives, and it reviews FEMA's approach to strategic planning and stakeholder roles and responsibilities. As with Map Modernization, FEMA wants **your** input because it takes all of the stakeholders' involvement to make this a truly effective risk reduction initiative. The strategic plan is available for download at http://www.fema.gov/library/viewRecord.do?id=3587

FEMA Sanctions: A Response to Local Actions

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

Last year, I received a call from Iraq. A young man was calling from a war zone to ask for my blessing to marry our youngest child, our only daughter. With all the apprehensions of a father (as in George Banks' opening soliloquy in *Father of the Bride*), I had much I wanted to say to him but, recognizing where he was calling from, what he was doing there, and recalling that I too had once been in the position of a young suitor nervously seeking the blessing of my future father-in-law, I chose not to keep him in suspense, I gave my blessing and told him we would speak at-length later. With all this, our household has been in much suspense and hope concerning his safety and their future.

Since the inception of the National Flood Insurance Program (NFIP), participating communities were told that failure to administer their local programs in compliance with the minimum federal standards could result in the FEMA sanctions of *Probation* and *Suspension*.

> **Probation:** *the formal notice that implementation of your floodplain management program is regarded as noncompliant with the minimum criteria of the NFIP. Probation results in a fifty-dollar ($50.00) surcharge to the premium of every flood insurance policy (new or renewed) sold within your community for a period of no less than one year from the date which probation became effective.*

> **Suspension:** *the formal notice that implementation of your floodplain management program is regarded as noncompliant with the minimum criteria of the NFIP. In suspended communities, no flood insurance would be available. Federal regulations prohibit federal agencies and some federal instrumentalities from making grants, loans, or guarantees for the acquisition or construction of structures in identified flood hazard areas without the availability of flood insurance. The availability of federal and state disaster assistance may be affected by the suspension of a community from the NFIP.*

Most Ohio communities choose to administer their floodplain management program in such a way as to reduce flood damage and not to risk FEMA sanctions. However, despite intense efforts by both FEMA and ODNR staffs, some Ohio communities have been suspended from NFIP-participation. Most commonly, this is due to failure to adopt or update compliant flood damage reduction regulations as required. Sanctions for non-enforcement have been less frequent, but that may be changing. FEMA does not implement sanctions without warning and those sanctions are the result of community actions and decisions. Citizens of sanctioned communities suffer the uncertainty of confronting the contradiction between local flood safety laws, improperly enforced, and the resultant increased risks.

While NFIP-participation is voluntary, for communities wanting to remain in (or rejoin) the NFIP, enforcing your local flood safety law is required. Of course, since a sanctioned community does not have less flood risk, it is still important that they enforce their local flood damage reduction standards while under sanction. A community on probation for non-enforcement must correct or mitigate the examples FEMA provides of deficiencies in and violations of their regulations before FEMA ends that sanction. FEMA and ODNR stand ready to assist. FEMA may choose to end probation upon a good faith effort by the community in the expectation that the community will continue to correct or mitigate all deficiencies in and violations of their regulations. A community suspended for non-enforcement must correct or mitigate all deficiencies in and violations of their regulations before rejoining.

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Avoiding actions that can result in sanctions is clearly the preferred path and happily, the most frequently chosen by most Ohio communities. Undertaking actions that both reduce flood risk and protect floodplain resources are the twin objectives that all citizens and levels of government should work toward. The vast majority of floodplain management choices are local, therefore leaving FEMA, the State, and your citizens in much suspense (and hope) as we all await those local decisions. There is much to discuss and, should you choose, we can speak at-length about it.

Low Impact Development

Lynd Morris, NFIP Bureau and Statistical Agent

(Source: eWatermark NFIP http://watermark.nfipstat.com/lowimpact_dev.htm printed on 4/26/2010)

In natural environments such as forests, rain is intercepted by trees and other vegetation as it falls to the ground. After passing through the forest canopy and bushes, rainwater is absorbed in the soil or is held in small, temporary ponds where it will eventually evaporate into the atmosphere. Except in the case of flash flooding, a relatively small portion of the rainwater falling in forests flows into surface streams. However, significant runoff develops when trees and other vegetation are cleared, soil is scraped off or eroded, and natural depressions in the ground are graded to make a site uniform for new construction.

When buildings are erected and roads and parking lots are paved with nonabsorbent materials, rainfall has nowhere to go. Instead of soaking into the ground or evaporating from temporary ponds, rain falling on impervious surfaces quickly runs off. As it travels, water gathers force, debris, and pollutants. It flows across roads, sidewalks, and parking lots, picking up spilled oil, detergents, solvents, road salts, pesticides, and fertilizer and depositing them in small streams and rivers. The increased volume and velocity from the urban runoff resulting from thunderstorms or rapid snowmelt can cause stream banks to erode, carve new channels, and choke waterways with sediment.

Flooding can be a serious consequence of urban runoff. Sometimes property damage caused by urban runoff occurs near the point of origination. More frequently, flooding and water pollution resulting from runoff caused by urban development is delivered to communities further downstream.

EPA Promotes a Better Way

In December 2007, the Environmental Protection Agency (EPA) published Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices. This publication explains how Low Impact Development (LID) mitigates the impacts of urban stormwater erosion, pollution, and flooding by mimicking the way rainfall is absorbed and runoff is slowed and filtered in a healthy natural setting.

"LID comprises a set of site design approaches and small-scale stormwater management practices that promote the use of natural systems for infiltration, evapotranspiration, and reuse of rainwater," explains the report. "These practices can effectively remove nutrients, pathogens, and metals from stormwater, and they reduce the volume and intensity of stormwater flows. LID techniques manage

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water and water pollutants at the source and thereby prevent or reduce the impact of development on rivers, streams, lakes, coastal waters, and ground water."

Managing Runoff, Naturally
Instead of removing stormwater as quickly as possible and managing it in large facilities at the bottom of drainage areas (as many older drainage systems were designed to do), LID stormwater management works by installing smaller landscape features onsite to mitigate the volume and rate of runoff while also removing pollutants. LID landscaping features rain gardens, grassed swales, cisterns, rain barrels, permeable pavements, and green roofs. Although LID is typically used to maintain the predevelopment hydrology of a site, it can also be used to retrofit existing developments to reduce runoff volume, speed, and pollutants.

LID Landscape Features
LID employs a number of strategies mimicking the natural slowing and filtering of rainwater runoff in an undeveloped site. Rain gardens are shallow, low-lying places in residential or commercial areas that have been planted (often with native vegetation) to manage runoff from nearby impervious surfaces by slowing it before it enters the groundwater system, filtering out pollutants, and absorbing some portion of the total rainfall. Plants used in rain gardens allow water vapor to return to the atmosphere through evapotranspiration.

- Grassed swales are shallow, open channels constructed along roads or parking lots and planted with flood-tolerant and erosion-resistant plants. Grassed swales are designed to slow runoff and sometimes incorporate small check-dams, which are low enough to permit stormwater to continue to flow at its peak but encourage temporary ponding when volumes decrease. Ponding filters out pollutants before groundwater is absorbed.
- Cisterns and rain barrels are aboveground, temporary storage containers designed to slow and hold rainwater, usually from the roofs of buildings. Downspouts from eaves or gutters direct the flow of rainwater to the container. Later, retained water can be reused for irrigating gardens or lawns.
- Permeable pavement is porous material used to cover low-traffic areas such as residential driveways, alleys, walkways and entryways, terraces, and stalls in parking areas. Porous forms of asphalt and concrete allow water to percolate into the soil beneath while filtering out pollutants. Paving blocks also can be used to produce a porous parking or walking surface.
- Green roofs are protected with some form of waterproofing, partially or completely covered with soil, and planted with vegetation. As much as 75 percent of stormwater can be retained in the soil and vegetation on a green roof before it is slowly released back into the atmosphere through condensation and transpiration.

Case Studies Show LID Savings
The EPA report summarizes 17 case studies of developments in the United States and Canada where LID practices were used. In most cases, implementing well-chosen LID practices saved money—total capital savings ranged from 15 to 80 percent, with only a few exceptions—for developers, property owners, and communities, while protecting and restoring water quality. EPA anticipates that, as LID practices gain wider use, they will become even less expensive.

While the EPA report focuses on the cost reductions and savings achievable through the use of LID practices, it also describes the many amenities and associated economic benefits communities can experience when LID features are installed. "These include improved habitat, improved aesthetics, expanded recreational opportunities, increased property values due to the desirability of the lots and their

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proximity to open space, increased total number of units developed, increased marketing potential, and faster sales," says the EPA report.

Mitigation Best Practice in Kane County, Illinois

The Mill Creek subdivision in the town of Geneva, Illinois, is a 1,500-acre, mixed-use community built as a conservation-site design development. It uses open swales to channel and treat stormwater, and the subdivision has a lower percentage of impervious surfaces than conventional developments. When compared with conventional development, the conservation-site design techniques used at Mill Creek saved approximately $3,411 per lot. Nearly 70 percent of these savings resulted from reduced costs for stormwater management, and 28 percent of the savings were found in reduced costs for site preparation. Mill Creek is one of 17 case studies of LID costs and benefits featured in the December 2007 report released by the Nonpoint Source Control Branch of the U.S. Environmental Protection Agency.

EPA Recommendations

According to the EPA, Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices can serve as a primer for low-impact site design and supply background information about the benefits of LID. The report provides developers and planners interested in implementing or promoting LID projects in the community with a breakdown of site development costs for traditional and low impact scenarios, which can be useful when presenting new designs to stakeholder groups who are unfamiliar with LID costs and benefits. More information is available at the EPA Green Infrastructure website and EPA LID website.

2010 Ohio Statewide Floodplain Management Conference

NEW! HEC-RAS Training on August 10, 11, 12, 2010

An exciting new feature at the 2010 conference - view the course agenda on the conference website.

Certified Floodplain Manager (CFM) Refresher Course on August 10, 2010

One-day course designed to assist you in preparing for the CFM Exam.

Certified Floodplain Manager (CFM) Exam on August 10 & 12, 2010

Exam preparation and registration information is available at: www.floods.org

Scholarships Available to Ohio Floodplain Managers!

OFMA is offering scholarships for local Floodplain Managers to attend the 2010 Ohio Statewide Floodplain Management Conference. Honors and criteria are posted on the conference website.

The conference brochure will be available in June. Detailed conference information is posted at:

http://www.dnr.state.oh.us/Water/tabid/17934/Default.aspx

OFMA Website Updated: www.ofma.org

OFMA has made some big changes to their website and can now provide frequent updates! The organization is continually adding content and new features, so we hope that you'll take some time to visit us!

You can also contact OFMA directly at our new email address! Please email the organization at ohiofma@gmail.com

OFMA Update

By Shawn Arden, PE, CFM—OFMA Vice-Chairman
ms consultants inc.—Water Resources Project Manager

Greetings from the Ohio Floodplain Management Association (OFMA)! The winter months have been a very busy time for OFMA. As we are all anxiously awaiting the summer, the OFMA Executive Board has been hard at work planning to build OFMA into a stronger association.

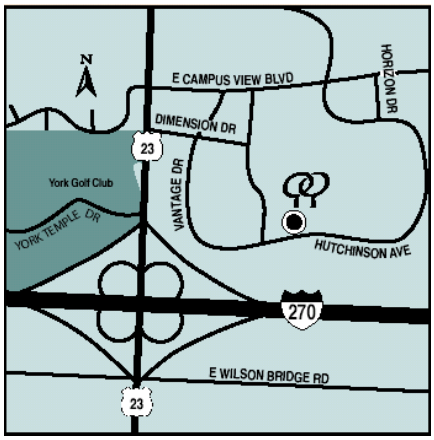
During our strategic planning session in December, the Executive Board identified several areas for development in 2010. First, the Executive Board created three new special committees for 2010 to oversee emerging or special topics:

- Strategic Planning: to continue planning, implementation, and assessment of the strategic plan throughout the year
- Academic Research and Development: to build relationships with academia and gather R&D information on projects related to floodplain management
- Floodplain/Stormwater: to partner with stakeholders involved in the connections between floodplain management and stormwater management.

In addition to creating new special committees, the Executive Board identified three strategies for 2010. These include 1) developing additional OFMA partnerships to promote floodplain management and to grow the association membership, 2) implementing targeted outreach sessions focused on why floodplain management is important (health, safety, economic impact, natural and beneficial functions of resources), and 3) supporting floodplain managers with resources and professional development services. Action plans for each of the above items were assigned to the OFMA Standing Committees for implementation. The Executive Board believes each of these actions will be instrumental to the overall success of OFMA in the upcoming years.

These are exciting times at OFMA! As our association grows, we are always looking for interested stakeholders to join our association and/or participate on our committees. For more information, please visit the OFMA website at www.ofma.org, or contact Shawn Arden, Education/Outreach Committee Chair at sarden@msconsultants.com.

OFMA wishes everyone a prosperous 2010, and we look forward to seeing you at our Annual Statewide Floodplain Management Conference in Columbus on August 11-12, 2010!



2010 OHIO STATEWIDE FLOODPLAIN MANAGEMENT CONFERENCE

August 11-12, 2010

Doubletree Hotel Columbus/Worthington
175 Hutchinson Avenue, Columbus, OH 43235

Severe Weather Student Poster Contest

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

The Ohio Committee for Severe Weather Awareness held their annual statewide poster contest ceremony Saturday, August 8, 2009 at the Ohio State Fair. Sydney Michael, a fourth grader in Adams County was recognized as the overall state winner. Sydney's poster artistically illustrated tornado safety and preparedness information. The safety message was "Don't Monkey Around with Tornadoes!" The Ohio Committee for Severe Weather Awareness chose Sydney'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, Sydney received a variety of awards and prizes from the committee and its partners, to include a $100 savings bond, letter of congratulations from Governor Ted Strickland, plaque from the National Weather Service, t-shirt and thermos from the *Ohio News Network*, and a personalized trophy. In addition, her school received the engraved "traveling" trophy to showcase for the remainder of the school year. In an effort to promote severe weather preparedness, the committee will feature Sydney's poster throughout the year.

This year, a total of 49 students from 29 Ohio counties were honored as regional winners. The students represented grades 1-6 from 33 schools. As regional winners, every student artist received a certificate from the National Weather Service as well as a sling backpack full of prizes from all of the partners that make up the Ohio Committee for Severe Weather Awareness.

2009 Winning Poster from the Ohio Committee for Severe Weather Awareness annual Poster Contest
Artist: Sydney Michael, 4th grader from Adams County

Maximized Flood Risk Reduction Benefits of Riparian Buffers

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

(This article was originally submitted as part of the ASFPM Foundation's 2010 Gilbert F. White National Flood Policy Forum background materials.)

As part of a broader flood risk reduction strategy, well-designed processes to create riparian buffers have the potential to satisfy both the demand to reduce disaster impacts and encourage positive growth. However, market pressures and scarce resources require that preservation activities be implemented in the most efficient manner available. In addition, maximizing flood risk reduction benefits requires intentional location and methods of creation as well as extensive outreach efforts to both garner public support and influence property owner decisions in and around the preserved riparian corridors. Simply requiring a building setback from a watercourse certainly has direct flood risk reduction benefits. However, the potential for risk reduction can be much greater when the riparian corridor is preserved or rehabilitated to a natural vegetative state and property owners are persuaded to make decisions that allow the riparian corridor to maximize the natural floodplain functions.

Creation of riparian buffer zones can provide a significant economic benefit to property owners and encourage community-wide growth. Quantifying the risk reduction values of preserved vegetated riparian corridors is difficult due to the indirect nature of some of these opportunities. However, evaluation can be considered through both avoided costs as well as increased real estate values surrounding the natural amenity. Benefits of a naturally maintained watercourse include dissipated peak flows and velocities, balanced sedimentation and erosion processes (that help maintain channel location and minimize meandering), and groundwater recharge. These beneficial functions of a natural floodplain can reduce both the number and extent of flood events. The savings associated with avoided flood damages is one of the most straight forward ways to quantify potential value. Reduction in costs are also associated with maintenance of natural flood water storage capacity through reduced stormwater infrastructure costs. Vegetated riparian corridors provide decidedly superior pollutant filtration, and can reduce costs of silt fencing, monitoring, reporting *etc*. that must be borne by both the developer and the community. The cheapest path to improved drinking water quality is preserving the natural function of the vegetated stream corridor.

Community-wide positive growth can be supported by protection of riparian buffers. Many times, the integrity of our natural systems is critical to maintaining the recreation-based tourism sector of the economy. In addition, real estate values are increased simply by proximity to natural amenities such as an unspoiled natural stream corridor. Whether it is a result of the view, access to recreation, the intangible feeling associated with a connection to nature, or some other reason – people will pay more to live near a natural stream corridor. Probably for this reason, many companies consider natural amenities an important part of their criteria for choosing a location. By preserving or rehabilitating a natural stream corridor, the nearby development potential will dramatically increase in value. Of course, simply creating a riparian buffer will not immediately produce these benefits. Maximizing the risk reduction benefits of these buffers requires a number of intentional efforts including prioritized method and location of buffer, public participation in decision-making, implementation of a management plan, and clear connections to a watershed-based risk management strategy.

Prioritized Method and Location of Buffers

Strategically locating riparian buffers for optimal risk reduction will require extensive consideration of the unique local characteristics. While there are a variety of possible methods to create riparian

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buffers, the most efficient method may vary based on development patterns, geography, political constraints, and other factors. Legal adoption of setbacks to establish riparian buffer zones, outright purchase of land, conservation easements deeded to open space, purchase or transfer of development rights and project design that intentionally avoids identified riparian areas are a few options. Buffer zones can be adopted through local zoning, subdivision, NFIP floodplain, or stand-alone ordinances specifically designed to implement buffers. Within these local codes are a variety of forms including overlay or floating zones, specific districts, and qualified easement requirements. Just a few options for establishing regulatory setbacks are single or variable minimums, differing use zones, and watercourse-specific applications. Communities have great flexibility in the application of this type of regulation as long as it can be clearly tied to the health, safety, and general welfare of citizens.

Prioritization of location requires vulnerability analysis to determine which areas most need protection. High development pressure identified by recent growth and anticipated watershed development trends may warrant attention; however, existing or anticipated investments such as infrastructure as well as land characteristics that enable development should also be considered. Of particular importance in identifying priority locations, is protection of environmentally sensitive areas such as headwaters, wetlands, endangered or threatened species habitat, and/or connectivity to these resources. Creating continuous green corridors should be given special consideration for the ability to strategically serve multiple objectives, drastically improved ecological function, as well as their advantage in floodwater absorption and storage capacity. Existing water quality measures can help to identify other highly functioning ecological systems that deserve special consideration including NDPES attainments, high scores on qualitative habitat evaluation index (QHEI) and index of biotic integrity (IBI), or other established measures of quality such as Scenic River or Cold/Warm Water Habitat designations. Especially in the event that a vulnerability analysis shows a particular need for flood risk reduction in an area that does not have an existing high quality watercourse, rehabilitation opportunities should be considered for currently degraded watercourses. Further, uncovering culverted streams through the process of "daylighting" has significant potential for urban areas that are in need of flood risk reduction and are willing to explore creative alternatives.

Public Involvement in Decision-Making Process

Putting forth the effort for involving the public as critical stakeholders in the decision-making process of developing and implementing a flood risk reduction strategy is crucial to success. Public participation benefits the process by improving outcomes, enabling politicians to securely make decisions based on the long-term community vision, and garnering public support for bringing riparian buffers into the future. Collaboration with stakeholders allows for the collection of a wide breadth of expertise, historical perspective, and personal experiences that local officials may not otherwise have accessed. In an effort to efficiently and effectively use our scarce resources it is important to tap into this important knowledge base. Also, full consideration of alternatives in a public forum assists in tailoring solutions to local needs. Without an earnest effort to solicit public input it is difficult for sometimes-controversial land use control efforts to gain credibility. Perhaps most important, long-term support of riparian buffer programs is necessary to maintain the flood risk reduction benefits. If public support is lost the regulatory setback can easily be repealed or maintenance and administrative funding for enforcement can be withdrawn. Emerging from public participation is a sense of shared responsibility for the success of the program.

Half-hearted efforts to involve the public can be counter-productive to these endeavors. Strong facilitation of group discussion as well as providing a valid opportunity to offer input into assessing a range

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of alternatives, is crucial. Citizens must be educated on the actual risk – which is frequently very different than perceived risk – and then provided the opportunity to participate in determining how to best implement a solution. Public skepticism of the actual risk stems from vague information that hasn't been well disseminated. To combat these problems, present a well communicated risk assessment or vulnerability analysis. Public understanding of exactly who and what is vulnerable helps build support for solutions, such as riparian buffer creation. Enabling personal connection to both the resource and process can grant local officials the political backing necessary to bring about change. Participation strengthens citizen satisfaction and empowers stewardship, which carries maintenance of riparian buffers into the future.

Implementation of a Maintenance Plan

A clearly articulated maintenance plan with continued public outreach is critical to capitalize on the full risk reduction benefits of riparian buffers. Local efforts will be maximized by proper management of the protected lands and surrounding areas. With most riparian buffers this requires that property owners make choices in land use that are compatible with maintaining the natural vegetated state. While enforcement may be an option, it requires administrative authority and physical access to maintain the desired vegetative state once it has been achieved. Funding should be built into the maintenance plan to allow for some upkeep of riparian species, invasive species control, marking boundaries of protected land, and general enforcement of maintenance.

Aggressive public education and outreach efforts on maintenance, allowable and prohibited uses, as well as best management practices can be built directly into the funding mechanism. Successful public education can be accomplished through local governmental efforts; however, they can be dramatically enhanced by partnering with other entities with similar goals. County Soil and Water Conservation Districts are a particularly powerful partner due to their existing administrative infrastructure, relationships with property owners, and a tremendous wealth of local knowledge. There are many other partnerships that could enhance outreach efforts including local watershed groups, non-profit environmental conservation and land trusts, as well as local schools and universities.

Strong disincentives for returning the land to production or development should be clearly laid out. To maintain political support for such enforcement efforts, it is crucial to clearly communicate permitted/prohibited activities and their appropriate locations. In addition, a great deal of effort must be expended to educate the public and dispel commonly held myths that the structural methods of erosion control, bank stabilization, and dredging are beneficial to long-term flood control.

Conclusion

Support for local efforts in creating vegetated riparian buffers as part of a comprehensive risk reduction strategy can be found through watershed-level management. Finding holistic solutions to mitigating adverse development impacts is most successful when conducted as a multijurisdictional effort where both Priority Conservation Areas and Priority Development Areas are identified and incentivized. In this way, watershed-level management can also help to reduce the strains of regional competition through alignment of policies. By combining resources and reducing political fragmentation, many challenges to implementing risk reduction solutions can be overcome. Cohesion amongst jurisdictions in adopting riparian buffers enhances recreational value, which can boost citizen satisfaction and support; improve ecological function, thus improving flood reduction capabilities; and overall maximize the monetary investment of the program. Clearly, a flexible approach, driven by public demand for efficient sustainable solutions to flood risk is needed. As part of watershed-based planning efforts to reduce flood risk, the benefits of vegetated riparian buffers can be maximized.

DFIRM Data and FIRMettes: A Closer Look

By Tim Beck, CFM—GIMS Specialist
ODNR, Division of Soil and Water Resources—Floodplain Management Program

It's time to dust off your open compact disc drive that you have been using as a coffee cup holder and put it to some use. The new digital map file images are large and have been provided by FEMA in a new format. Some Floodplain Administrators might be wondering how to handle these new files. This article will explore a few issues related to the size and type of files that you've been provided as well as thoughts on application of this new data.

The new Digital Flood Insurance Rate Maps (DFIRM) come in a Portable Network Graphics (PNG) format. A PNG file is like a TIFF or JPEG image, where the image is compressed; however, there is no loss of quality with the PNG format. Unfortunately, some computers cannot open the files directly due to the large size of the PNG format. To combat this problem, one option is to convert the maps to PDF using Adobe Acrobat or some other PDF converter program. Once the file has been converted to PDF, the zoom function can be used to create a clear image of the basemap imagery, which makes it easier than the paper map to identify structures.

A second option for overcoming the large size of the PNG files is to use the FIRMette tool available on the Map Service Center (MSC) website http://msc.fema.gov. In fact, this tool can be used to make a FIRMette of any map in FEMA's online inventory. A FIRMette is a small piece of the whole that is clipped from FEMA's full size map. The final product will include the small map area that the user has selected, a scale bar, and title information that references the original map. The recently released third version of the FIRMette Desktop tool works to produce FIRMettes from the PNG files. For those who prefer to work offline, the FIRMette Desktop tool also has the ability to make a FIRMette directly on the local desktop. Both the MSC website and FIRMette Desktop program include search options by address or latitude and longitude coordinates and can create a PDF version of the product. The FIRMette can be used for floodplain management, flood insurance, and enforcement of mandatory flood insurance purchase requirements. Another nice feature of the FIRMette Desktop is the ability to view Letters of Map Change (LOMC) for the particular panel being viewed directly in the side bar. However, to view LOMCs and use the search tools on the FIRMette Desktop program the computer must be connected to the Internet.

Another great use of the FIRMette Desktop Tool is to set up a computer for public use to easily view the flood risk data. By putting these tools and data on a publicly available computer, the information will be available to those people who are directly affected by flood risk who would not otherwise have access to this information. It would be useful in this situation to also make the PDF files available and linked to a clearly laid out index sheet. Also, be sure to have the Flood Insurance Study and LOMCs available as well. I recommend loading the FIRMette Desktop Tool and the files on the computer to increase speed and functionality of FIRMette creation.

An additional use of the FIRMette Desktop Tool is to include a print of a FIRMette with all Floodplain Development Permit paperwork. It is important to keep good documentation of in/out determinations because maps may change over time. If there are questions regarding the permit and/or flood insurance in the future it will pay off to have documentation of the flood risk information in place at the time of construction.

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As each county receives finalized digital maps through Map Modernization, each community's Floodplain Administrator (FPA) will receive a set of maps along with a CD set containing the PNG files. However, if a community would like to receive the Geographic Information System (GIS) shapefiles they must be separately ordered or downloaded from the Map Service Center. These data are free of charge to community officials. Shapefiles are a GIS file that stores geospatial shapes and their attribute information. To view these shapefiles, a GIS software package must be installed on the user's computer. This software is available through the Map Service Center. These data can be used in planning and effective management of the special flood hazard areas.

FAQs about Letter of Map Amendment

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

What is a Letter of Map Amendment?

FEMA produces Flood Insurance Rate Maps (FIRM) with the most accurate topographic data available to delineate floodplain boundaries. However, due to scale or topographic data limitations land and/or structures are sometimes inadvertently shown in the special flood hazard area when they should not be. To accommodate this mapping limitation, FEMA has a process in place where property owners can apply for a Letter of Map Amendment (LOMA) to legally amend the FIRM. A LOMA will be issued when the applicant has sufficiently demonstrated that the lowest adjacent natural grade (LAG) is at or above the Base Flood Elevation (BFE). When a LOMA is issued by FEMA for a property or structure, the flood zone has been legally altered to reflect the better data included with the application. This change legally alters the mandatory flood insurance purchase requirement as well as the application of the locally adopted Flood Damage Reduction Regulations.

What forms are used to apply for a LOMA?

The most commonly used form used to apply for a LOMA is the MT-EZ. This form is exclusively available for use when considering a single structure or parcel of land. The elevation information required for a LOMA submission depends on whether the application is intended for a structure or simply a parcel of land. For removal of a structure, the LOMA must include the lowest adjacent grade directly next to the structure. For removal of a lot without a structure, the lowest elevation of the entire parcel is required. To view the MT-EZ application see: http://www.fema.gov/library/viewRecord.do?id=2328

The MT-1 form can also be used to apply for a LOMA and is typically used for removal of multiple structures all within one application package. The elevation information required for the MT-1 for is the same as the MT-EZ. However, if an elevation certificate has been completed it can substituted for the elevation information in the MT-1 form. To view the MT-1 form please see FEMA's website at the following address: http://www.fema.gov/library/viewRecord.do?id=1492 Please note that there are instructions available for download on this webpage as well as the MT-1 form.

How do I determine a base flood elevation (BFE) in an approximate A Zone?

In an AE Zone, the exact BFE should be determined using the flood profile found within the Flood Insurance Study rather than the BFE as shown on the FIRM, which is rounded to the nearest whole foot. The exact BFE should be provided by the Professional Surveyor that the property owner has hired to document the LAG. There are some areas on the FIRM that are called approximate A Zones that represent special flood hazard area but do not include a BFE in the Flood Insurance Study. When applying for a LOMA in one of these areas, the LAG elevation still must be provided by a Professional Surveyor; however, since the BFE is not readily available it may not be documented by the surveyor. In this situa-

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tion, the property owner should contact Federal, State or local governmental agencies to determine if any BFEs have already been developed. Such agencies include the U.S. Army Corps of Engineers, the U.S. Geological Survey, Ohio Department of Natural Resources or local planning/zoning department.

If a BFE has not already been developed by any of these entities then there may be a few other options. The reference document FEMA 265, *Managing Floodplain Development in Approximate Zone A Areas, A guide for Obtaining and Developing Base Flood Elevations* suggests developing a BFE by detailed methods, which requires engineering analysis or developing an approximate BFE by simplified methods. The simplified method involves superimposing approximate Zone A floodplain boundaries onto a topographic map. The BFE can be estimated by where the floodplain boundaries cross the contours. However, this method is assumed to be as accurate as one-half of the contour interval.

Another option is available for property owners whose property falls within an area that has an updated approximate Zone A. Many counties with a FIRM recently updated through FEMA's Map Modernization project will have an approximate Zone A model that can be obtained from FEMA's Map Service Center. http://msc.fema.gov By using these models, approximate BFEs can be obtained and used for LOMA applications.

What if a BFE cannot be determined?
If a LOMA is simply submitted to FEMA without identifying a BFE, the application will be returned with a request to determine a BFE. To avoid the LOMA application being returned in this way, include documentation that all governmental agencies have been contacted and all other avenues have been explored to develop a BFE without success. In this situation, FEMA should develop a conservative BFE that will be compared to the documented LAG provided by the applicant to either approve or deny the LOMA application.

Seven Steps to Successful Floodplain Development Permitting

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

Understanding your floodplain management permitting responsibilities is integral to implementing an effective and comprehensive regulatory program. By adhering to the following steps, your community can standardize and streamline your floodplain development permitting process to achieve compliant floodplain management.

STEP 1: Identify the proposed development Each community must have a method of identifying ALL development proposed within the Special Flood Hazard Area (SFHA) and ensuring it is reviewed for compliance with the locally adopted floodplain management regulations.

Remember to regulate nonstructural development (*i.e.* mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials), agricultural development (Agricultural Development is NOT EXEMPT from floodplain management regulations), or channel modifications in approximate A zones (Any proposed modification of a watercourse delineated as an approximate A Zone, must first be evaluated to ensure that carrying capacity is maintained.)

STEP 2: Determine Whether a Floodplain Development Permit is Needed The floodplain development permit application and site plans are used to determine the proposed development's location on the

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Flood Insurance Rate Map (FIRM). Site plans must be drawn to scale and include the location of the proposed development, distances to landmarks, property lines, proposed or existing structures, watercourses, SFHA and floodway boundaries, Base Flood Elevations (BFE), existing and proposed ground elevations, proposed building elevations (lowest floor, including basement), and existing and proposed roads.

Depending on its location, determining whether the proposed development is in the SFHA can be challenging. Compare the information submitted by the applicant with the data provided on the FIRM and in the Flood Insurance Study (FIS). (Remember that proposed development on the border or just outside the SFHA may still be considered "IN" the floodplain. If the proposed development site is outside the SFHA boundary, the floodplain regulations do not apply UNLESS the site adjoining the SFHA and surveyed ground elevations are BELOW the BFE.)

Out or In: *If the development is determined to be OUT of the floodplain*, there is no need to continue the floodplain development permitting process. Keep the documentation already acquired, record the "out of floodplain" determination and retain all information in files. *If the development is determined to be IN the floodplain,* then continue with floodplain development permit review process.

STEP 3: Application Review Ascertain whether the floodplain development permit application is complete. If not, provide clear instructions on what is needed to continue processing the application. Upon completion, use the FIRM and FIS to determine the BFE as well as the proposed development's location respective to the floodplain fringe and floodway.

Along with the completed floodplain development permit application, review the accompanying documentation to determine whether the development meets locally adopted floodplain management criteria. (Residential development must have it's lowest floor elevated to or above BFE. Nonresidential development may have its lowest floor elevated OR dry floodproofed to or above BFE.) It is also necessary to identify any required Federal, State, or Local permits and review special certifications and analyses. If the proposed development is located in the floodway, results from the impact analysis must show that any encroachment causes **NO** additional increases to flood heights during the occurrence of the base flood discharge.

STEP 4: Approve or Deny the Permit After reviewing all the permit documentation, the Floodplain Administrator must decide to approve or deny the floodplain development permit application. If the plans and documents demonstrate the proposed development will be built in compliance with the floodplain regulations, then the permit may be approved and development may begin. If the proposed development does not comply with local floodplain management standards, the application must be denied.

STEP 5: Perform Inspections During Construction It is important to ensure that development is constructed according to the specifications of the floodplain development permit and sited as proposed on the plans. Through site inspections, verify that the utilities and other building elements have been located above BFE and that flow-through openings have been constructed properly (*i.e.* correct number, size, and location). Ensure that interior slab or grade (for solid foundation perimeter walls) is at or above exterior grade.

STEP 6: Acquire a Completed Elevation or Floodproofing Certificate For development that has been elevated, as-built certification should be acquired as soon as the structure's foundation is constructed. Obtaining as-built certification to verify the structure's lowest floor elevation at this time enables early detection of noncompliance and easier remedy. Similarly, floodproofing certification must be acquired to verify the appropriate application of dry floodproofing.

STEP 7: Provide a Certificate of Occupancy Some communities require that a new building cannot be used or occupied without a Certificate of Occupancy. If the development's compliance has been verified through inspection and review of as-built or floodproofing certification, issuance of a Certificate of Occupancy would be appropriate where carrying capacity is maintained.)

The Antediluvian

Ohio's Floodplain Management Newsletter

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Columbus, Ohio 43229

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The Antediluvian is produced by the Division of Soil and Water Resources and is supported by funding through a FEMA Cooperative Agreement as part of the Community Assistance Program—State Support Services Element of the National Flood Insurance Program. The contents do not necessarily reflect the views and policies of the federal government.

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