



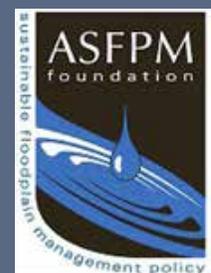
# Illinois Flood Risk Symposium

## Urban Flood Risk

Chicago, IL  
February 2015



[Illinoisfloods.org](http://Illinoisfloods.org)



[asfpmfoundation.org](http://asfpmfoundation.org)

Photo credit: Center for Neighborhood Technology

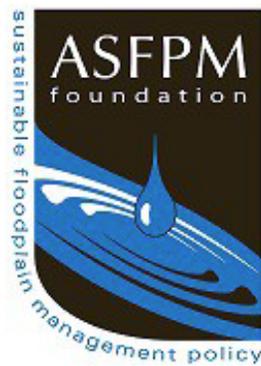
Illinois Flood Risk Symposium Report

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*DePaul Center, Chicago, Illinois*

*February 10, 2015*

*Hosted by*





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## Executive Summary

The Illinois Association for Stormwater and Floodplain Management with the Association of State Floodplain Managers Foundation hosted a one day symposium to address flood risk in Illinois. The topic of the Symposium was urban flooding, which has been highlighted by recent Illinois Urban Flooding Awareness legislation. Significant flood damages are occurring on many properties in urban areas outside of the designated floodplain. This flooding is not communicated or mitigated as part of the National Flood Insurance Program. Local floodplain managers from Chicago and downstate Illinois, state and federal officials, urban planners, insurance and realtor representatives, hydrologists, hydraulic engineers and experts in key topics participated in the Symposium to discuss urban flooding issues, including policy improvement and reduction of damages. The 80 Symposium attendees included a diverse representation of professionals led in a "think tank" type discussion of three topics: how to identify urban flood risk, how to reduce urban flood risk and how to pay for urban flood risk reduction. This report provides an overview of the discussion, captures consensus of these professionals with respect to key urban flooding topics, and identifies recommended actions toward addressing urban flooding issues.

The group reached a consensus that urban flooding has a number of causes and creates significant impacts on Illinois communities. Homes, businesses and infrastructure are impacted by urban flooding throughout the State. The Symposium provided an opportunity to highlight efforts being made by some municipal and county agencies to address urban flood impacts, however limited funding and technical resources for both problem identification and flood damage reduction measures was a theme raised by all participants.

A summary of the discussion topics, consensus items and proposed action items are provided in this report. There is consensus that urban flooding and flood impacts need to be more fully defined and identified. The proposed action items call for the examination and dissemination of "best practices" for infrastructure, new development and redevelopment. Education of Illinois residents and property owners about urban flooding, incentive programs and additional local government funding approaches are recommended.



## Host Partnership and Purpose

This State of Illinois Flood Risk Symposium was affiliated with the Association of State Floodplain Managers (ASFPM) Foundation's Gilbert F. White National Flood Policy Forum, where groups of selected national and international experts and leaders met to discuss the topic of flood risk, establish priorities for improving policy and program implementation, and to formulate recommendations and directions for the future. The ASFPM Foundation supports development of similar state-level programs designed to establish meaningful indicators of local-level flood risk management progress. The ASFPM Foundation's desired objective of the symposium was that discussion of local and regional issues by a diverse representation of host-state floodplain management professionals would result in the identification of methods and activities to reduce flood risk to people and property, and to better inform decision-makers and stakeholders on how to measure and identify risk and resources. The ASFPM Foundation presentation, which served as an introduction for the Symposium, is included in Appendix A of this report.

The Illinois Association for Floodplain and Stormwater Management (IAFSM) applied to host the symposium in order to address urban flooding issues highlighted by recent Illinois Urban Flooding Awareness legislation. Sponsored by Illinois Senator Steans and Illinois Representative Cassidy and signed into law on August 3, 2014 the Act requires that the Illinois Department of Natural Resources (IDNR), in consultation with numerous partners, prepare and submit to the General Assembly and the Governor a report that: 1. reviews and evaluates the latest information, research, laws, regulations, policies, procedures, and institutional knowledge on urban flooding and 2. provides recommendations for measures that could reduce urban flooding. This Symposium was intended to help develop and record institutional knowledge on urban flooding for inclusion in the IDNR's report to the Illinois General Assembly in 2015. Focal topics of the Symposium included: how to identify urban flood risks, how to reduce urban flood risk, and how to pay for urban flood risk reduction. Inclusion of the symposium findings in the Urban Flood Awareness Report will help the General Assembly, the Governor, and the general public to better understand the scope of the urban flood problem in Illinois and could lead to new programs and funding to address the growing issues associated with urban flooding.

## Agenda

- 7:30 am Registration and Coffee (continental breakfast provided)
- 8:00 am Welcome and Self Introduction – Loren Wobig, IAFSM Chair/Matt Koch, ASFPM)
- 9:00 am Introduction to the day (Matt Koch/Doug Plasencia, ASFPM)
- 9:30 am Setting the Stage for Urban Flood Awareness (introduction – Matt Koch)  
Hal Sprague, Center for Neighborhood Technology – What is Urban Flooding?  
Honorable Heather Steans, Illinois State Senate District 7 –The purpose and role of the Urban Flooding Awareness Act  
Honorable Kelly Cassidy, Illinois State House District 14 –How will the Urban Flooding Awareness Act Report be handled in the Illinois General Assembly?
- 10:30 am Introduction of Topics, Groups, Charge to Participants, and Logistics – Matt Koch
- 10:30 am Break
- 10:45 am Facilitated Breakout sessions (led by Jeff Sparrow, Brad Anderson, Matt Koch)
- 12:00 pm Break for box lunch
- 2:10 pm Break
- 2:25 pm Reconvene in General Assembly and Group Picture (facilitator – Matt Koch)
- 2:30 pm Group Breakout Reports
- 4:00 pm Action Plan and Wrap Up (Loren Wobig/Matt Koch)
- 4:15 pm Closing Remarks (Doug Plasencia)
- 4:30 pm Adjourn



## Urban Flooding

To support the symposium discussion, the following definition of urban flooding was prepared by the Urban Flooding Awareness Act Technical Advisors and provided to attendees.

The Urban Flooding Awareness Act defines urban flooding as “the inundation of property in a built environment, particularly in more densely populated areas, caused by rainfall overwhelming the capacity of drainage systems, such as storm sewers. ‘Urban flooding’ does not include flooding in undeveloped or agricultural areas. ‘Urban flooding’ includes (i) situations in which stormwater enters buildings through windows, doors, or other openings, (ii) water backup through sewer pipes, showers, toilets, sinks, and floor drains, (iii) seepage through walls and floors, and (iv) the accumulation of water on property or public rights-of-way.” Urban flooding is stormwater flooding in an urban environment.

Urban flooding is characterized by its repetitive, costly and systemic impacts on communities, regardless of whether or not these communities are located within formally designated floodplains or near any body of water. In an urban environment, any of the issues described below can independently or in combination cause urban flooding, impacting vital infrastructure with increasing consequences in more densely populated areas.

Mitigation of these impacts requires an understanding of the root causes. These may include:

### High groundwater/ saturated soils

- Basements located in saturated, poorly drained soils are likely to experience seepage.

### Aging and Inadequate Storm Sewers

- Combined sewer capacity exceeded: Older areas of communities may have combined sanitary and storm sewers, which can be overwhelmed during precipitation events.
- Storm sewer capacity is exceeded: Storm sewers are designed to convey specified precipitation events that, if exceeded, will result in water ponding in streets, yards, public right of ways and potentially entering structures through lowest openings.
- Storm sewers that cannot drain due to flooded open channel receptors: During major precipitation events impacting a larger geographic area, receiving rivers and streams may rise to a depth which prevents the discharge from storm sewer outlets, even to the extent of backflow through the sewer system.
- Lack of overland flow routes and detention in older areas

### Out of bank flow from rivers, streams, and lakes

- Overbank flooding is a natural process that occurs when rivers, streams, and lakes flow outside of their banks. In an urban setting, this natural process can be exacerbated by development pressures, leading to frequent and chronic flooding.

### Impervious surfaces

- As more land is converted to urban and suburban areas, the amount of surface area available for water infiltration into the soils decreases.

### Inadequate site drainage

- In an urban setting, overland water paths may not be provided or can be obstructed by development, causing localized drainage problems that lead to flooding.

Hal Sprague, with the Center for Neighborhood Technology (CNT), provided an overview of the urban flooding issues in Chicago and the work that CNT completed, leading the way for the resulting Urban Flooding Awareness Act. Appendix A includes the presentation slides. CNT completed surveys of communities and outreach to individual homeowners in the Chicago area documenting the impact of urban flooding. Findings of their research indicate that the majority of flood losses were outside of the regulatory (FEMA) floodplain. Contributing factors to urban flooding include observed changes in heavy precipitation, increased development and aging infrastructure. The results are more flooded basements, more combined sewer overflow, and more frequently flooded streets.



Figure 1: Harlem & Irving Park, April 2013, (WGNTV)



Figure 2: Lake Zurich basement, June 2013 (Chicago Tribune, Dan Waters)

## Legislative Perspective

Honorable Kelly Cassidy (Illinois House District 14) and Honorable Heather Steans (Illinois Senate District 7), sponsors of the Urban Flooding Awareness Act, spoke to the purpose of the bill and how they would continue to encourage legislative action to support urban flood reduction. Legislators need to understand the gaps in policy that homeowners face when they experience significant losses and the true costs of urban flooding. The bill requires a report that reviews and evaluates the available knowledge, policy and practice concerning urban flooding. Hon. Cassidy and Hon. Steans emphasized the need for the report to inform legislators on the causes and cost of urban flooding and provide institutional knowledge and research-based recommendations on how to best address the issue. Hon. Cassidy and Hon. Steans thanked the audience for participating in the Symposium as part of the process to capture both the impact of urban flooding on communities and individuals in Illinois and best practices occurring throughout Illinois. Both Representative Cassidy and Senator Steans are prepared to champion the report and work to ensure the issue gets the attention it requires.

## Facilitated Discussion Notes

### How to Identify Urban Flood Risk

Moderator: Matt Koch

Scribe: Brad Winters

Presenter: Paul Osman

### Summary

It is necessary to communicate to the public urban flood risk to reduce urban flood damages and support mitigation strategies. When buyers are unaware of the risk they do not take appropriate mitigation actions and suffer significant losses. The current Flood Disclosure requirement is not resulting in informed property buyers, and there is a gap concerning flood risk disclosure for rental properties.

Mapping urban flood risk is a technical challenge due to the many causes of urban flooding, the data required for analysis and the rate at which urban flood risk changes. In addition to technical consideration, it is anticipated there will be a negative public and political response regarding the potential impact on property values. Mapping urban flood risk areas for regulation in a method similar to the National Flood Insurance Rate maps is not feasible. Identification of urban flood risk should be completed at a structure level and more rigorous home inspections should be evaluated as a method to communicate urban flood risk.

Mapping of urban flood areas for community evaluation should remain at a local level and not become an unfunded mandate. Local communitywide regulations appear to be the most efficient way to address urban flooding. Best practices should be developed to encourage regulation for re-development and infill areas, and it is the community's responsibility and liability to inform the public concerning urban flood risk.

## Notes

### Q1 – Do you agree with the definition of urban flooding presented in the UFAA legislation?

#### Discussion:

- The use of urban to define flooding does not provide clarity on the “type” of flooding, who has responsibility to address the flooding, or the damage or impact of the flooding. It is not clear how urban flooding is different from non-riverine flooding or flooding due to manmade causes. Some professionals do not consider seepage or sewer back up to be flooding, while others do. Since the term includes flooding due to a wide variety of cause and impact, a hierarchy of flooding types should be considered and who is responsible should be addressed. The definition should be refined.
- The definition of urban also impacts the analysis of the existing problem for the Urban Flooding Awareness Act Report and should be clearly defined for the report.
- Language concerning urban flood risk should emphasize that we can reduce the risk of flooding, but we cannot solve the problem.

#### Consensus:

- IAFSM recommend the Urban Flooding Awareness Act authors should consider clarifying the definition of urban flooding as indicated above.

### Q2 – What level of flood risk is acceptable? How frequent? How severe?

#### Discussion:

- Prioritizing types of flooding was discussed as a method to evaluate acceptable flood risk, but it is the results of flooding that define the risk. Basement flooding is often minimized in the level of flood risk. However, basement flooding can cause basement renters to lose everything or impact the entire structure if utilities are in the basement.
- Acceptable flood risk should be related to damages, emergency services and critical facilities. For example, flooded roads may be the designated overland flow path, but emergency services to an area are still required.
- Urban flooding damages do not correlate as readily as riverine flooding to flood frequency and may be better defined based on damages or depth of flooding.

### Q3 – Should urban flood risk areas be mapped? What are the ramifications of such mapping?

#### Discussion:

- Concerns with urban flood risk mapping:
  - People are more scared of property devaluation by being mapped as having flood risk than of flooding damages. For this reason, it is politically challenging.
  - Since the risk for flooding is unique for each structure, the maps would have to be excruciatingly detailed or ineffectively broad.
  - Mapping could be based on the hydraulic grade line if storm sewer analysis was completed. This would provide a technical basis for identifying risk. However, completing this engineering analysis is expensive and keeping an engineering analysis updated would be difficult.

- Only certain types of urban flooding could be identified with engineering analysis. Other urban flood risk is based on specific structure issues.
- Urban flood mapping by communities for their use seems the most appropriate. However, the ethical, political and legal responsibility for the community to communicate known risk comes into question.
- Value in mapping urban flood risk.
  - Current flood disclosure laws are not effectively informing people of known flood risk associated with a property. When buyers are unaware of the risk they do not take appropriate mitigation actions and suffer significant losses.
  - There are currently no statewide requirements to notify renters of basement flood risk. Renters often cannot get insurance to assist with recovering from a flood event.
  - Communities cannot evaluate capital improvement projects without knowledge of the causes and damage urban flooding is causing.

Consensus:

- Mapping of urban flood areas for regulation is not feasible.

**Q3b – What are some common means to document the local extent of urban flood risk? (for communities and planning purposes)**

Discussion:

- Many communities document general local knowledge and history of complaints from property owners to evaluate flooding concerns. This information is often for the community's planning purposes and not provided to the public.
- Local efforts to map known flooding issues may be damped by concerns over liability, impact to property values, and responsibility to fix the issue.
- Mosquito abatement districts have a list of standing water areas which may indicate locations without appropriate overland flow paths.

Consensus:

- Mapping of urban flood areas for community evaluation should remain at a local level, and not become an unfunded mandate.

**Q3c – What technologies are useful for identifying urban flood risk?**

Discussion:

- Sewer hydraulic analysis could be completed to identify urban flooding issues due to storm or combined sewer system constriction or limitations. However, the engineering analysis is expensive and data intensive.
- A detailed Geographic Information System (GIS) based sewer map recording where sewer systems are in place and details concerning the size and maintenance would serve as a planning tool for determining action.
- Documentation of property owner complaints as well as general historical knowledge can be mapped to identify local areas with urban flooding concerns.

- Insurance claim data can be used as an indicator of flooding, and will be completed for the Urban Flooding Awareness Report. However, this information is not available to communities due to privacy rights.
- Documentation, analysis and mapping of many urban flood risk indicators can be completed with GIS and become a planning tool identifying risk. Examples include high water marks, residential requests and complaints, land use or impervious area mapping, sewer mapping, and soil type maps.
- Cloud based mobile applications could be utilized by local residents to document flooding through geographically referenced photographs.
- The Urban Flooding Awareness Report could serve to recommend best practices for communities to identify zones in urban areas with low to high flood risk and how that information can be utilized.

Consensus:

- Local communitywide regulation is the most efficient way to address urban flooding.

#### **Q4 – Should urban flood risk areas be regulated (no basements, minimum floor elevations)?**

Discussion:

- Regulation of areas with a high risk for urban flooding would require reliable identification of “high risk.”
- Regulations of specific urban flood risk areas would encounter local resistance.
- Communitywide regulation of new construction connecting to an existing system that has capacity concerns would mitigate urban flood damages without mapping specific high risk areas. Ottawa, Addison and Tinley Park all require overhead sewer with new construction and/or substantial improvements.
- A statewide building code could require overhead sewers for new construction in areas with combined sewer, but there is substantial resistance to a statewide building code. The existing state plumbing code could be modified easier.

#### **Q5 – Is there a meaningful correlation between urban flood problems and mapped soil types?**

Discussion:

- Yes, but its value as an indicator is limited due to contributing factors such as ground cover type and frozen conditions. Impervious area plays a more important role for runoff in urban areas, but soil data is more critical to limitations of green infrastructure.

#### **Q6 – Older areas versus newer areas – are recently developed areas flooding?**

Discussion:

- Older areas are often seeing more flooding due to a combination of factors. If the infrastructure in older areas has not been improved, the old sewer systems that were often designed for a 2 year event rather than current standard of a 10 year event will cause more flooding than if they have been upgraded. Further, the intensity of rainfall, the amount of new development and increased impervious area has all resulted in more urban flooding.

## Q7 – How do we assess damages/costs from urban flooding (wet basements versus flooded septic systems or ruined landscaping)?

Discussion:

- Assessing cost of damages caused by urban flooding is necessary to support a positive benefit/cost ratio for mitigation projects. Economic impacts should be included when determining the cost of urban flooding. USACE and IEMA have developed methods and damage depth curves for this purpose.
- One way to assess damages is to prioritize types of flood damages. This provides local governments a way to determine their post disaster funding priorities.
- The legislative perspective is important to keep in mind when evaluating the state perspective of urban flooding. High income areas may result in higher cost benefit ratios, however economic impact and creating a positive business environment is also valued.

### How to Reduce Urban Flood Risk

Moderator: Brad Anderson

Scribe: Shauna Urlacher, Dan Gambill

Presenter: Mary Cave

### Summary

Urban flooding is a local problem requiring local knowledge and solutions. The issue of appropriate level of government for mitigating urban flood losses varies based on the geographic region and the level of urbanization. Communities generally have the local knowledge and framework to address the issue, but are lacking funding and technical expertise. Unfunded mandates are a concern.

New development areas must comply with current regulations and, therefore, have fewer instances of urban flooding. Low impact development, properly sized stormwater management and conveyance systems are used in these areas. Older areas can benefit from adding green infrastructure to the existing gray infrastructure. The standards for gray infrastructure design, such as sewer relief and detention, which have proven successful in new development areas, are impractical for retrofitting urban areas. Instead, incorporating green infrastructure and reducing risk as indicated by damage should be the goal in areas of high flood risk. There is a need to address design criteria and guidelines for re-development and a need to incorporate green infrastructure in design standards.

Successful flood risk reduction at the property level has been achieved through a combination of property drainage system education for property owners and cost-share programs. Successful measures enacted at the community level include limiting development and impervious areas to limit runoff or completing buyouts in strategic areas to reduce runoff or provide space to mitigate current urban flooding issues.

## Notes

### **Q1 – What factors determine the appropriate level of government for managing stormwater? (what are the pros, cons of countywide stormwater management?)**

#### Discussion:

- The issue of appropriate level of government for managing stormwater varies based on the geographic region and the level of urbanization. Generally, downstate local governments do not want statewide regulations. However, in the Chicagoland and other very urban areas, county guidance and regulation have been welcome to assist smaller urban communities technically, with enforcement and promotion of consistent minimum policies.
- Urban flooding is a local problem requiring local knowledge and solutions. Communities seem more agreeable to support but not regulation from counties or state government. Unfunded mandates are a concern.
- Urban flood regulation for new development is already addressed with a local stormwater ordinance. It is the management and mitigation of existing areas with high urban flood risk that are not being addressed.
- The current system is not working. Communities generally have the local knowledge and framework to address the issue but are lacking funding and technical expertise. Specifically, there are small communities surrounding Chicago that are struggling.

### **Q2 – Are the current stormwater design criteria still sufficient? What should change?**

#### Discussion:

- Stormwater management design criteria are a tradeoff between investment and acceptable damage and should remain local.
- Rainfall being used for design standards should be updated. The State analysis, Bulletin 70, is becoming dated. While the NOAA analysis uses an extended history of record, rain gage data collected at O'Hare Airport continues to set records.
- New development design standards are being used in Illinois but there is a need to address design criteria and guidelines for re-development and a need to incorporate green infrastructure in design standards.
- A balance of grey and green infrastructure is needed to address urban flooding. More data is needed to understand the performance of green infrastructure facilities. Maintenance should also be addressed in design criteria.

#### Actions:

- Support development of model stormwater ordinance with design standards or best practices for evaluation of existing facilities, re-development that includes green infrastructure and maintenance issues.

### **Q2b – Should urban stormwater systems be able to convey and or store a 1% chance storm event?**

#### Discussion:

- The current common design standards for new development to manage the 1% storm are appropriate. Existing systems are conveying something closer to the 5 year storm. It is important to know current capacity of systems in areas with urban flooding issues and be able to communicate the resulting risk to homeowners.
- In urbanized areas, retrofitting to convey infrequent storms is expensive and impractical. Instead, incorporating green infrastructure and reducing risk as indicated by damage should be the goal.

#### Actions:

- Provide best practices to communicate urban flood risk to the public.
- Support redevelopment design standards that support practical solutions for reducing urban flood risk, if the new development standard is not achievable.

### **Q3 – What is the role of green infrastructure measures in conventional flood control projects?**

#### Discussion:

- There is a role for green infrastructure in flood control improvements, and it should be evaluated as part of the solution. Green infrastructure is an engineering option to augment grey infrastructure and becomes an important part of the equation when addressing urban flooding areas.
- There is a need for more information on the impact of local variables on green infrastructure effectiveness and maintenance.
- Green infrastructure should be implemented if possible when redoing other infrastructure.
- Low impact development should be evaluated whenever possible in areas with high risk of urban flooding. It is easier to reduce impervious area when compared to green infrastructure design.

#### Actions:

- Support evaluation and summarize performance-based criteria for green infrastructure for the purpose of rainfall runoff reduction.
- Encourage incentives to incorporate green infrastructure and low impact development at a state or local level.

### **Q3b – What is the long term effectiveness of green infrastructure and stormwater BMP measures in flood reduction?**

#### Discussion:

- Long term data on effectiveness of green infrastructure was unknown by the group but believed to be associated with maintenance issues.
- The responsibility of green infrastructure maintenance often falls on homeowner associations or owners. Ordinances are used in Urbana to create a special taxing district if the owner no longer provides support so the city can maintain the drainage as necessary.
- There are green infrastructure methods that do not require maintenance, such as stormwater trees.
- Green infrastructure maintenance can be handled the same way as other grey infrastructure stormwater management.

Actions:

- Keep updated on the long term effectiveness of green infrastructure projects as it becomes available.
- Support communication of best practices for green infrastructure maintenance and responsibility including collection of fees or taxes and easement rights.

**Q4 – What measures have proven successful? What measures have not worked?**

Discussion:

- Education of property owners about their property drainage system combined with cost-share programs has successfully reduced property damage due to urban flooding issues.
- Successful measures include limiting development and impervious areas to limit runoff or completing buyouts in strategic areas to reduce runoff or provide space to mitigate current urban flooding issues.
- A holistic approach to green and gray infrastructure is a successful method to reduce urban flood damages. Gray infrastructure measures such as sewer relief and detention have proven successful.
- Pre-disaster mitigation funding has been shown to reduce flood losses at a 4 to 1 ratio when compared with post-disaster mitigation. The same concept should be applied to urban flood reduction.

**Q5 – Should urban flood risk areas be regulated (no basements, minimum floor elevations)?**

Discussion:

- Urban flood risk varies at each structure making it difficult to regulate areas.
- Urban flood risk should be regulated but would be politically challenging and would impact property values.
- Instead, we should focus on public education and possibly incorporate flood risk information and evaluation into home inspections.

Actions:

- Contact professional home inspection organizations to start conversation about communicating flood risk during home inspections

**Q6 – What level of flood risk is acceptable? How frequent? How severe?**

Discussion:

- Acceptable urban flood risk must be made at a local/personal level and based on cost-benefit for the responsible party. Each community evaluated acceptable flood risk differently based on cost-benefit analysis.
- Improvements need to be made to the communication of flood risk and the loss associated with flooding to determine what is acceptable. People are more afraid of the flood insurance than the flooding.
- Addressing flood risk is less economical during re-development and for urban infill, so the acceptable level of risk is higher than during new development.

- Identifying acceptable flood risk can also be evaluated at the watershed scale. Reducing flooding upstream can result in increased risk downstream based on the mitigation method.

### **Q6b – Do we trade basement flooding for greater overland and street flooding?**

Discussion:

- Overland flooding should be considered as an option to relieve basement flooding. However, street flooding may also result in flooding of vehicles and the total flood risk should be considered.
- To reduce urban flood damage in basements, strategic green infrastructure projects and flood-proofing for specific structures should also be considered.
- Available funding to property owners is critical to solving basement flooding issues.

### **How to Pay for Urban Flood Risk Reduction**

Moderator: Jeff Sparrow

Scribe: Glenn Heistand

Presenter: Scott Cofoid

### **Summary**

Many communities report that adequate stormwater management funding is difficult to establish and maintain as part of their general budget. Some communities are using alternate funding options for stormwater management projects. Sales tax, flat fees, stormwater utilities, and special service areas were all indicated as alternative funding methods used by communities to fund stormwater management projects. Efficiency, cost savings, and increased return on investment can be leveraged by coordinating and planning stormwater management projects with other planned capital infrastructure projects. Thus, certain mobilization, demolition, and material expenses can be shared, resulting in cost savings for the stormwater management project. Federal and state grant programs can encourage sporadic and disjointed projects and planning instead of encouraging comprehensive long-term projects and planning, which are facilitated by reliable, steady sources of funding.

Stormwater utilities, which charge fees for services (stormwater conveyance) provided by the community, not only present a steady and reliable financial solution, but also have the benefit of bringing greater awareness and education to the stakeholders who pay the fees. Because the expense is usually buried in the general budget, many people do not realize that a stormwater service is being provided by the community or that it costs money to maintain and improve services. It is easy for people to take for granted the underground infrastructure and conveyance systems that they cannot see. Once implemented, the stormwater utility fee also increases expectations from residents for stormwater services provided. Stormwater utilities can also incentivize commercial properties to mitigate stormwater runoff from their property. State requirements for stormwater funding or other incentives could be utilized to encourage communities to enact utility fees and overcome local political barriers that may be holding them back. Best practices in setting fees and addressing known political impediments should be accessed. IAFSM and the Urban Flooding Awareness Report should suggest that the Illinois General Assembly explicitly grant non-home rule communities and counties the power to establish stormwater utilities.

## Notes

### **Q1 – What funding measures have proven successful? (in the UFAA survey, communities noted overhead sewer cost share programs are very successful)**

#### Discussion:

- Sales tax, flat fees, stormwater utilities, and special service areas were all indicated as methods that communities had utilized.
- Regulations require an upfront cost from developers to invest in stormwater management, which is a more efficient way to address stormwater issues.
- Incorporating urban flood risk reduction measures into planned capital infrastructure projects leverages allocated funding for multiple uses.
- Stormwater utilities present a financial solution and have the benefit of raising awareness and education among stakeholders. Once implemented, the stormwater utility fee also increases expectations from residents for stormwater services being provided. State requirements for funding or other community incentives could be utilized to encourage communities to establish stormwater utilities and overcome local political barriers. However, there is concern at the administrative level that existing stormwater utility fees in Illinois are currently set too low, only covering stormwater management program current costs, and not reflecting the true financial need for future capital improvement projects.
- Federal and state grant programs can discourage a comprehensive approach toward planning and funding stormwater management by incentivizing communities to make projects fit the constraints of the grants instead of the constraints that make the most sense for the community

#### Action:

- Support assessment of stormwater utility programs with training and documentation of best practices.
- Review grant funding opportunities to evaluate how to encourage and prioritize their use to support innovative practices or for planning and assessment efforts that result in stronger and more self-reliant communities.

### **Q1b – What are good methods to encourage Private-Public Partnerships (insurance industry, developers, health departments, realtors, etc.)**

#### Discussion:

- HUD has great success in using a tax credit program to bring in the private market. How could something similar be used in stormwater management to get credits for new projects or to retrofit projects for stormwater issues?
- Other PPP involvement could be outside of monetary funding, such as political pressure. The seat belt and automotive industry is an example. The technology for seat belts and air bags was pushed by the insurance industry.
- Planning was indicated as a critical component toward outreach and communication to gain support. Identification of community goals is required to identify common goals with other organizations and entities in private sector.

- Stormwater utilities provide potential for incentives to encourage private companies to mitigate stormwater runoff. However, it was unclear if there were current communities in Illinois that saw runoff reduction due to stormwater utility incentives. Downers Grove indicated that, while the monthly fees for large businesses could be substantial, the property owners seemed to prefer to pay the fee, instead of making onsite physical improvements.
- Performance-based contracts could be used to encourage public-private partnerships.

Action:

- Assess successful stormwater utility examples in Illinois and surrounding states to evaluate best practices for encouraging public-private partnerships.

**Q2 – What are the impediments to establishing a stormwater utility in communities with urban flooding?**

Discussion:

- Major impediments included political will and churches or other not-for-profit organizations with large amounts of impervious surfaces.
- Proper planning of the implementation of a stormwater utility fee could address some of the concerns of churches and other tax exempt organizations. For example, if fees are phased in so that non-profits are included at final phase of fee assessment, funds from the initial phases could be used to provide grants to non-profits for the purpose of reducing their runoff and reducing their bill based on the community incentive program.
- Downers Grove exempted tax-exempt properties from paying the stormwater utility fee.
- Bloomington reported that the SWU was accepted based on outreach that focused on the service provided.
- Education and outreach are key components to enacting a stormwater utility fee. Outreach should be framed in terms of public and economic interest. The mayor does not want their town to be the town that floods. Another example is emphasizing how enacting a stormwater utility fee will enable the community to fix existing stormwater problems and then shift focus on other critical issues in the community.
- The state could support creation of SWU by providing benefits for communities with SWU. A comparison was drawn based on the requirement that the state pass a law to require a legal drinking age of 21 to receive full Federal Highway Authority funding. Benefits could include reduced amount of cost share for the community for some state grants, or reduced state review times on permits or grant applications.
- The State could also require communities to enact stormwater utilities. The State of Maryland has done this; however, the current governor is campaigning to appeal the new law.

Action:

- Evaluate successful stormwater utility examples in Illinois and surrounding states to make recommendations to plan for known political impediments.

**Q2b – Should the General Assembly explicitly grant non-home rule communities the power to establish stormwater utility fees? Statutory authority for all government categories (cities/towns/sewer districts, watershed districts)?**

Discussion:

- Municipalities, home rule and non-home rule, already have the power to create stormwater utilities. Counties do not. The exceptions, based on specific legislation, are DuPage and Peoria Counties.
- There was a consensus that the state should give counties authority, but also discussion on how it will be necessary to address concerns about duplication of fees in municipalities. To address this, any legislation will need to incorporate appropriate language to ensure counties only have power to charge SWU where they are providing stormwater services.
- Currently, in counties with stormwater utilities, an executive board requires a 50/50 balance of county and municipal members to balance actions.
- Approximately twenty counties in Illinois have MS4 requirements but cannot create SWU.
- It was generally agreed that other entities, such as drainage districts, do not need to be included in such legislation. Intergovernmental agreements would be appropriate.

Actions:

- IAFSM and Urban Flooding Awareness Report should suggest the General Assembly explicitly grant counties and non-home rule communities the power to establish stormwater utilities.

**Q3 – Is it economical for insurance companies to invest in urban flood risk reduction measures to reduce claims?**

Discussion:

- Insurance companies are for-profit organizations. While reducing flooding may reduce some financial losses for the insurance company, it is the overall balance of policies and losses that would provide financial incentive for the insurance industry to consider incentivizing owner actions to lower property flood risk with reduced premiums, or funding research into lowering urban flood risk. The insurance representatives were skeptical that there would be incentive for the insurance industry to make changes at a national level and suggested that other industries may be more appropriate. The comparison to the insurance industry's support of seat belts is not relevant due to the difference in scale.
- One way to approach changing behavior is underwriting (requiring use of specific action/technology to be eligible for insurance coverage).
- The Insurance Institute for Business and Home Safety was noted as an appropriate partner for education, outreach and developing practices to reduce urban flooding.

Action:

- Reach out to the Insurance Institute for Business and Home Safety to evaluate coordination and cooperation opportunities.

### **Q3b – Should Insurance cover urban flood risk?**

#### Discussion:

- There are gaps in flood insurance coverage that are not well known. The NFIP does not cover all losses caused by many urban flooding issues, and the insurance is not actuarial. Basic NFIP coverage includes the building, and separate personal property and content coverage can also be purchased. NFIP basement coverage is limited to equipment essential to the building unless content coverage is also purchased. Seepage and sewer backup is only covered by NFIP if it is caused by a flood impacting two or more structures or two or more acres.
- Insurance reform options, such as mandatory purchase of flood insurance for homes below ground level in the floodplain or incorporation of flood coverage in all home policies, were discussed. These options were considered very limited due to political will.
- Identification of known urban flood risk is necessary to implement regulations requiring insurance for homes in high risk areas. Mapping similar to the FIRM is not considered feasible for urban flooding.
- Property owners and renters must have a general understanding of their flood risk, urban and riverine, and understand the insurance options that are available to evaluate appropriate mitigation options.
- Gaps also exist in notification of historical flooding problems and known flood risk. The state-required flood disclosure law is not comprehensive enough and does not address notification of flooding history to basement renters who may not be able to purchase appropriate coverage. What is the community/engineer responsibility to communicate known flood risk? Can communities be required to provide any information known about a property via a FOIA?
- Flood insurance should be required if a property receives government assistance. Recipients of Federal Disaster Assistance are required to carry flood insurance on the flooded building. If the requirement is not met, the individual is not eligible for future financial assistance.
- There is a need for regulation of disclosure of flood risk for rental agreements.

#### Actions:

- Education on urban flood issues, identifying urban flood risk, and insurance options is necessary.
- Support legislation, local or state, to require flood risk communication when transferring property and in rental agreements.

### **Q4 – What level of government is best suited to deal with funding efforts to reduce urban flood risk?**

#### Discussion:

- All levels are appropriate for different efforts. The appropriate level of funding needs to be based on what is in the public interest.
- Preventative measures are the most efficient way to reduce flood risk and funding of these measures.
- Local knowledge is required to determine need and administer the funding, but a state program, such as the state revolving fund, would bring in financial support required to result in action.
- In large disasters, federal assistance is just as appropriate for urban flooding as riverine flooding.

- Focus should be on leveraging existing funding by identifying stakeholders and projects that can be leveraged for multiple benefits such as transportation and school renovation capital improvements. Policy changes should be made to encourage and enable this type of collaboration which results in urban flood mitigation by including new aspects into existing projects.
- Rather than mandating a specific level of government, marketplace incentives and disincentives should be utilized. State or local tax breaks for mitigation efforts like pervious pavement or “sin tax” on impervious pavement could be considered.

**Q4b – Are government funds / subsidies appropriate for reducing urban flood risk?**

Discussion:

- Subsidies and government funds are currently used to reduce urban flood risk using stormwater utilities and tax breaks at a local level.
- NFIP has incentivized the wrong kind of behavior with the current pre-FIRM structure insurance rates. These subsidized insurance rates misrepresent the flood risk and market influences.
- Government funding should have appropriate cost-benefit ratio that incorporates indirect costs and benefits to society such as loss of life, mental health issues, and homelessness. These real costs are often unaccounted for in standard benefit-cost analysis completed for capital improvement projects.

**Q5 – What level of flood risk is acceptable? How frequent? How severe?**

Discussion:

- Getting flooded is like being assaulted.
- Flood risk is a personal determination, similar to healthcare. Lower risk is tolerated by those who can afford insurance.
- To facilitate determination of acceptable risk, we need to communicate known flood risk. Everyone is in a floodplain and has some risk, especially with respect to urban flooding.

## Summary of Consensus Items

- Local communitywide regulation is the most efficient way to address urban flooding.
- Mapping of urban flood areas for community evaluation should remain at a local level and not become an unfunded mandate.
- Mapping of urban flood areas for regulation is not feasible.
- IAFSM should recommend that the Urban Flooding Awareness Act authors consider clarifying the definition of urban flooding as indicated above.

## Summary of Proposed Action Items

- Contact professional home inspection organizations to start conversation about communicating flood risk during home inspections.
- Keep updated on the long term effectiveness of green infrastructure projects as it becomes available.
- Support communication of best practices for green infrastructure maintenance and responsibility including collection of fees or taxes and easement rights.
- Support evaluation and summarize performance-based criteria for green infrastructure for the purpose of rainfall runoff reduction.
- Encourage incentives to incorporate green infrastructure and low impact development at a state or local level.
- Provide best practices to communicate urban flood risk to the public.
- Support redevelopment design standards that support practical solutions for reducing urban flood risk, if the new development standard is not achievable.
- Support development of model stormwater ordinance with design standards or best practices for evaluation of existing facilities, re-development that includes green infrastructure and maintenance issues.
- Reach out to the Insurance Institute for Business and Home Safety to evaluate coordination and cooperation opportunities.
- IAFSM and Urban Flooding Awareness report should suggest the General Assembly explicitly grant counties and non-home rule communities the power to establish stormwater utility fees.
- Assess successful stormwater utility examples in Illinois to make recommendations to plan for known political impediments and to evaluate best practices for encouraging public private partnerships.
- Encourage education on urban flood issues, identifying urban flood risk, and insurance.
- Support legislation, local or state, to require flood risk communication when transferring property and in rental agreements.
- Support community's assessment of stormwater utility programs with training and documentation of best practices.
- Review grant funding opportunities to evaluate how to encourage and prioritize their use to support innovative practices or for planning and assessment efforts that result in stronger and more self-reliant communities.

## Attendees

### Planning team:

Matthew Koch, PE, CFM, AECOM

Loren Wobig, PE, CFM, Chair IAFSM, Illinois Department of Natural Resources, Office of Water Resources (IDNR-OWR)

Amanda Flegel, PE, CFM, Interorganizational Chair IAFSM, Illinois State Water Survey (ISWS)

Diane Brown, Outreach and Events managers ASFPM

### Speakers:

Loren Wobig, PE, CFM, Chair IAFSM, IDNR-OWR

Doug Plasensia, PE, CFM, ASFPM Foundation President

Hal Sprague, Center for Neighborhood Technology

Honorable Kelly Cassidy, Illinois House District 14

Honorable Heather Steans, Illinois Senate District 7

### Breakout Teams:

Glenn Heistand, PE, CFM, Illinois State Water Survey

Jeffery Sparrow, PE, CFM, Michael Baker

Scott Cofoid, CFM, ISO Community Hazard Mitigation

Shauna Urlacher, PE, CFM, CPESC, Smith Lasalle

Bradley Anderson, PE, CFM, Anderson Consulting Engineers

Dan Gambill, PE, CFM, Illinois State Water Survey

Mary Cave, PE, CFM, City of Decatur

Matthew Koch, PE, CFM, AECOM

Brad Winters, PE, CFM, IDNR-OWR

Paul Osman, CFM, IDNR-OWR

### Additional Support:

Sarah Harbaugh, IAFSM Executive Secretary

Sarah Hunn, PE, CFM, DuPage County

Jennifer Maercklein, PE, CFM, V3 Companies

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Loren Wobig IDNR - Water Resources loren.wobig@illinois.gov		

## Recommended Reading Materials

Title	Description	Online location
Rain Ready website	The Rain Ready website, a Center for Neighborhood Technology (CNT) initiative, includes fact sheets and recommendations to homeowners, cities and towns and states to find solutions to urban flooding.	<a href="http://rainready.org/">http://rainready.org/</a>
The Prevalence and Cost of Urban Flooding	A case study of urban flooding in Cook County by the Center for Neighborhood Technology.	<a href="http://www.cnt.org/media/CNT_PrevalenceAndCostOfUrbanFlooding20141.pdf">http://www.cnt.org/media/CNT_PrevalenceAndCostOfUrbanFlooding20141.pdf</a>
Urban Stormwater Management in the United States	An assessment of stormwater issues and regulation by the National Academies.	<a href="http://dels.nas.edu/resources/static-assets/materials-based-on-reports/reports-in-brief/stormwater_discharge_final.pdf">http://dels.nas.edu/resources/static-assets/materials-based-on-reports/reports-in-brief/stormwater_discharge_final.pdf</a>
Funding Stormwater Programs	General information on types of stormwater funding options summarized by the EPA.	<a href="http://water.epa.gov/infrastructure/greeninfrastructure/upload/FundingStormwater.pdf">http://water.epa.gov/infrastructure/greeninfrastructure/upload/FundingStormwater.pdf</a>
Value of Stormwater Utilities for Local Governments in the Chicago Region	The Chicago Metropolitan Agency for Planning CMAP report provides information on the benefits of a stormwater utility and details for communities considering this option.	<a href="http://www.cmap.illinois.gov/documents/10180/11674/stormwater_utilities_for_local_govts.pdf/866a64a4-ef11-47ce-b4ec-2293686d4a70">http://www.cmap.illinois.gov/documents/10180/11674/stormwater_utilities_for_local_govts.pdf/866a64a4-ef11-47ce-b4ec-2293686d4a70</a>
Environmental Protection Agency, Green Infrastructure website	Website includes basic information as well as case studies in Illinois and economics of green infrastructure.	<a href="http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm">http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm</a>
Upgrade your Infrastructure, Green Infrastructure Portfolio Standard	The report outlines a planning process for communities to set long term goals to achieve measured progress in addressing stormwater issues.	<a href="http://www.cnt.org/media/CNT_UpgradeYourInfrastructure.pdf">http://www.cnt.org/media/CNT_UpgradeYourInfrastructure.pdf</a>

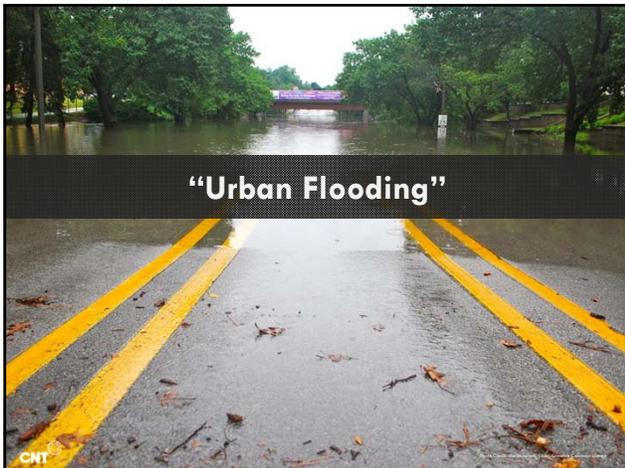
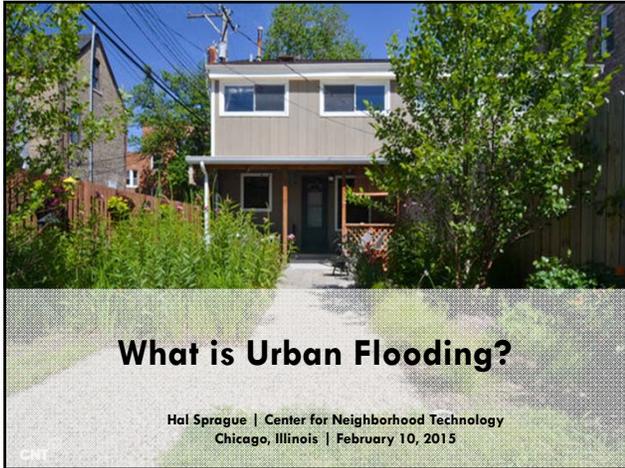
## Appendix A – Symposium Presentations

Center for Neighborhood Technology Presentation: “What is Urban Flooding?”  
by Hal Sprague

ASFPM Foundation Presentation: “Illinois Urban Flood Risk Symposium”  
by Doug Plasencia

# WHAT IS URBAN FLOODING?

by Hal Sprague, Center for Neighborhood Technology



### Survey of Great Lakes cities

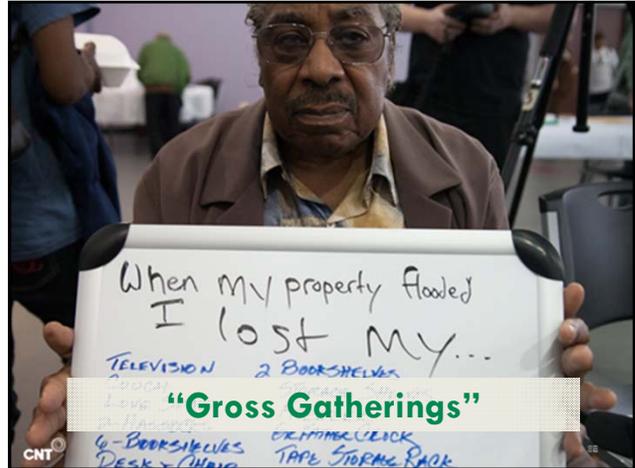
- 30 of the most populous cities in the Great Lakes region responded
- 20 Million residents represented
- 100% receive flooding complaints
- 80% characterize them as 'medium' to 'large' in number
- 47% have no flood mitigation plan
- Lack of definition of the problem

CNT

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## Qualitative interviews

- Personal interviews with residents in Chicago area
- Private problem, impacts on health and mental well-being, lost time, financial losses, apparent randomness



## Study: Prevalence and Cost

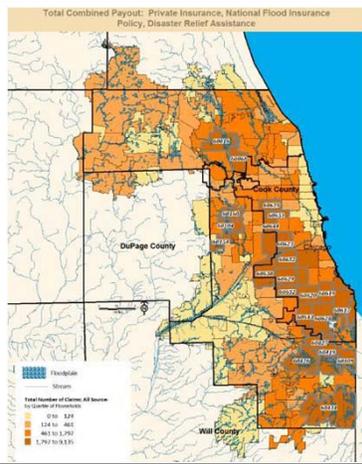
- Flood damage **claims paid out**, Cook County, IL
- Sources: private insurance, FEMA (NFIP, disaster relief, public assistance), Small Business Administration
- 2007 – 2011, aggregated by zip code



## Major Findings:

1. Claims in 97% of zip codes (900 sq.mi.; 130 communities)
2. Average pay-out > \$4,000
3. Low income areas suffered most
4. Impacts included impaired health, property loss, lost time and wages
5. Most suffered repetitive losses
6. Remedial measures did not solve the problem
7. Majority of claims outside floodplain

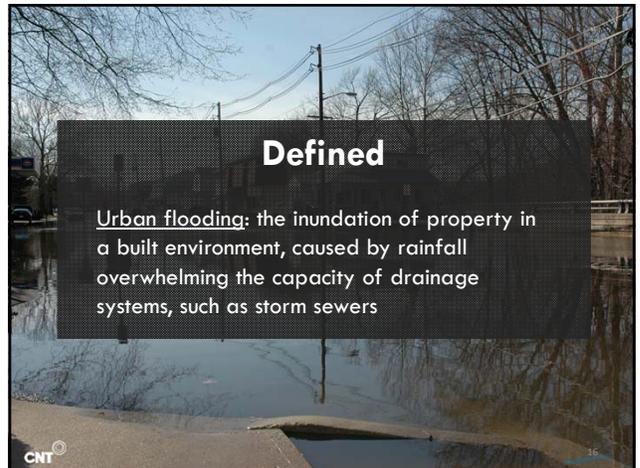
Majority of claims outside any designated floodplain

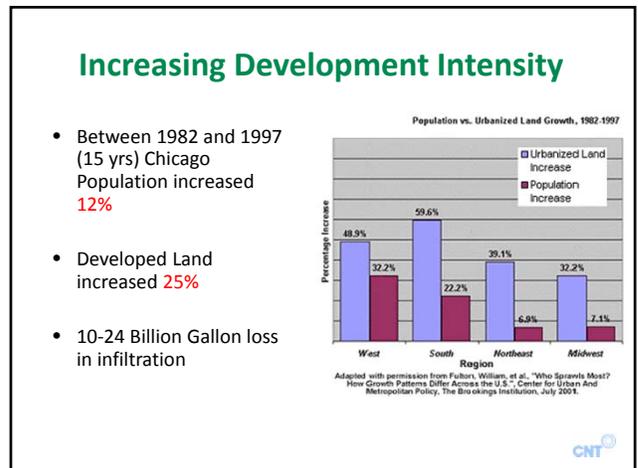
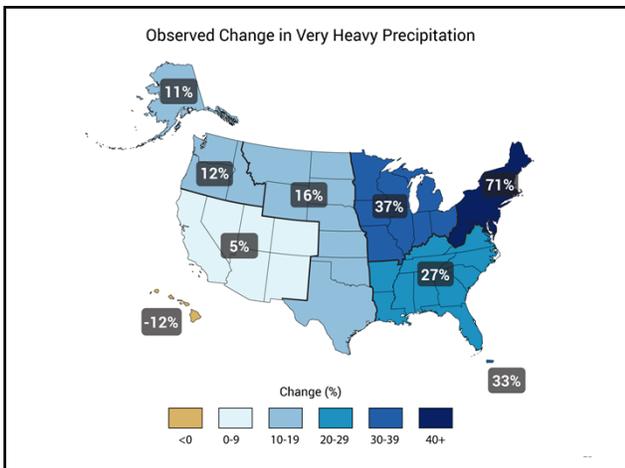


### Flooding in major U.S. cities

Flash flooding warnings: imminent or in-progress, from 2007 to 2011, in the counties of major U.S. cities







## Aging Infrastructure



CNT

CNT

## Some of the Problems



CSO Pollution



Flooded Basements



Flooded Streets



Eroded Streams

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## Property analyses (Wetrofit)

**Buildings:** foundation cracks, mold growth, moisture or seepage, water damage, standing water, high water marks, plumbing & building sewer, obstructed/collapsed building sewer, roots in pipes or catch basin

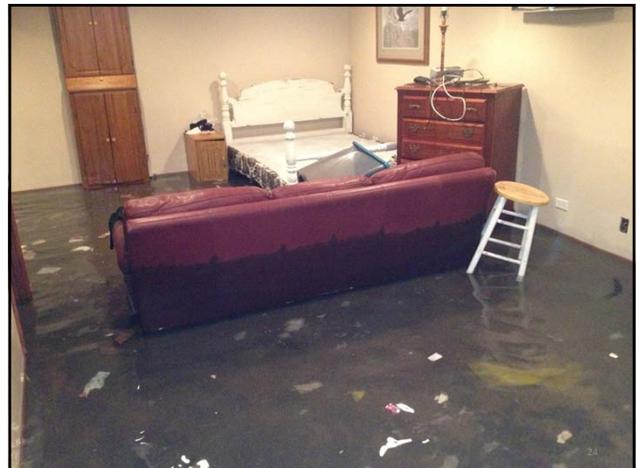
**Landscapes:** ponding, blocked gutters, poor drainage, low spot, excess soil, high water table, hillside, trees/shrubs over building sewer

**Neighborhoods:** street flooding reported, neighbor flooding reported, obstructed catch basin, poor alley drainage, permeable alley, recent street repair, etc.



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### State-wide Study

- Define and describe “urban flooding” state wide
- Risk evaluation mechanisms
- Mitigation solutions
- Funding strategies

**Urban  
Flooding  
Awareness  
Act**

CNT

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# ILLINOIS URBAN FLOOD RISK SYMPOSIUM

by Doug Plasencia, ASFPM Foundation



## A message from our attorney

*By attending this Illinois State Symposium it is possible that you may be photographed and or electronically recorded during this event. Accordingly you hereby consent to the use and distribution of your name and likeness for instructional or promotional purposes without compensation by or liability to IAFSM and the ASFPM Foundation.*



## Illinois Urban Flood Risk Symposium

**Doug Plasencia**  
*Michael Baker International*  
**Foundation President**



## Overview

The **MISSION** of the ASFPM Foundation is to promote public policy through select strategic initiatives and serve as an incubator for long-term policy development that promotes sustainable floodplain and watershed management.

## Facts

Founded in 1996

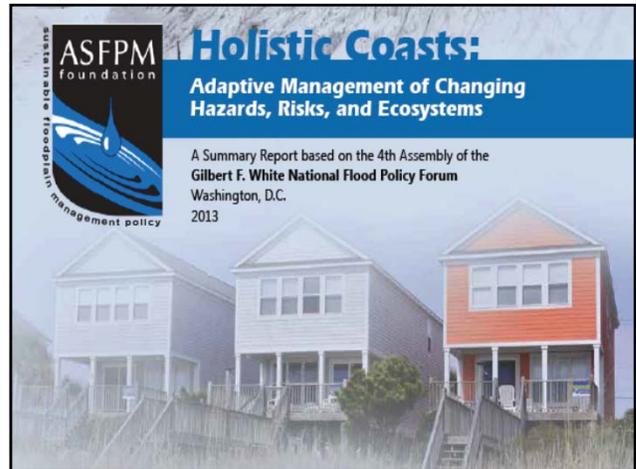
*Separate Corporate Body with its own Board of Trustees and Bylaws.*

501(c)(3) Tax Exempt Non-Profit Foundation

*Seeks to help ASFPM meet its Goals*

## Where the Money Goes

- The Gilbert F. White National Flood Policy Forum 
- College Scholarships 
- No Adverse Impact (NAI) 
- "National Flood Programs in Review" Report 
- FloodManager Interactive Simulator 



## Where the Money Goes

### State Symposia

- Indiana
- Colorado
- Texas
- Georgia
- Florida
- Illinois
- Arizona

## Why State Symposia?

- 2010 Flood Risk Forum Recommendation
- Federal Policy is important but.....

*.....Flood Mitigation is primarily local*

### Foundation Objectives

- Facilitate and be a catalyst for policy debate State by State
- Inform National policy with this debate
- Create a lasting policy initiative and ethic

### Contemplation #1

URBAN FLOOD RISK MANAGEMENT

*Value Proposition*

- Who Benefits?
- Who Pays?
- Why is this important to Illinois future?

### Contemplation #2

- Climate Change

### Contemplation #3

URBAN FLOOD RISK MANAGEMENT

*QUALITY of LIFE*

- Flooding
- Open space and habitat
- Economic viability

### Contemplation #4

- How will IAFSM as an organization and you as individuals make a difference?

## Appendix B – Original Breakout Group Notes

The original breakout group notes are available as separate files in the digital copy of the report.