



Urban Flooding

*A report of the ASFPM Foundation's
Gilbert F. White Flood Policy Forum*

ASFPM Webinar Series

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ASFPM Foundation

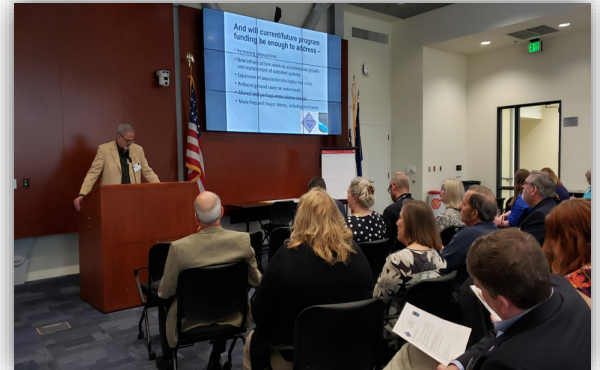
- Independent, charitable arm of ASFPM
- Funds scholarships
 - Student Paper Competition
 - Future Leaders Scholar (\$25K/Year for 2 years)
 - <https://www.youtube.com/watch?v=KcPq1p16984>





ASFPM Foundation...we:

- Fund events important to the floodplain management community
 - Larry Larson Speaker Series
 - State Symposia



ASFPM Foundation...we:

- Fund Projects
 - NAI support and toolkits
 - Best Practices & Case Studies Tool Kit
 - Elected Officials Guide
 - Rocky Mountain Environmental Challenge
 - Joint Wetland Managers and Floodplain Managers flood risk mapping
 - Many others!



The Gilbert F. White Forum

- Signature Foundation event
- Named After Gilbert F. White
- Forward looking by design
- Assembly of 100 invited participants experts in their fields
- Report to capture the engagement of participants at the event
- Includes recommendations and the Urban Flooding “path forward”

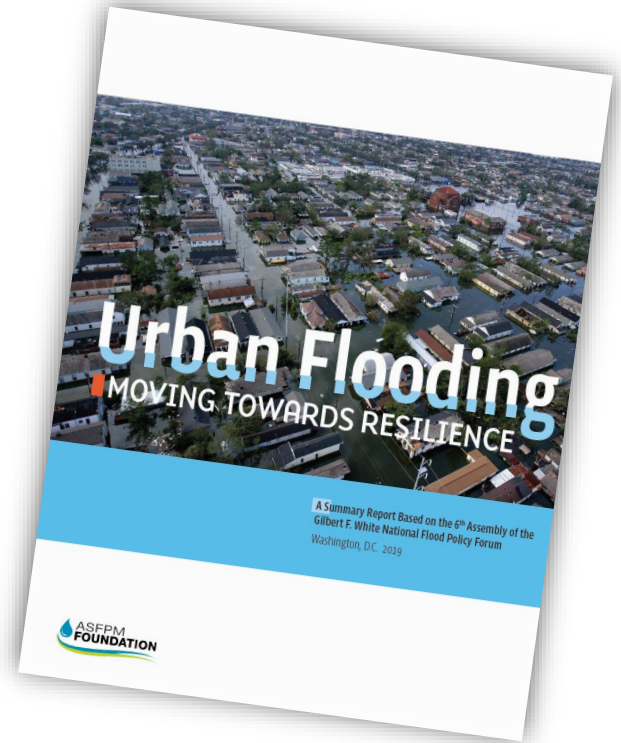




Why This Topic

- Climactic projections
- Observational trends
- Recognition of dramatic change in risk profile
- View of Practitioners
 - Third Report
 - National Academy of Sciences
 - Texas A&M and University of Maryland

Game Changer!



Major Findings

- Flooding is flooding irrespective of source
- It is chronic AND extreme
- The risk to the Nation is concentrated in metro areas, but we can not ignore lesser populated urban-like areas
- Socially vulnerable populations add to the complexity
- the public health implications are profound

THE CHALLENGE OF URBAN FLOODING

What do we mean by "urban" flooding?

Urban flooding, put simply, is flooding that occurs in a densely populated area. Whatever the specific cause(s) of inundation—cloudburst, hurricane, groundwater seepage, river overflow, infrastructure failure—stormwater systems are overwhelmed, and water accumulates in the paved-over, built up urban environment with nowhere to go.

An individual urban flooding event may be a heavy rain rather than a disaster. But even a minor flood has major effects, particularly in low- to middle-income neighborhoods.

Chronic or extreme, disruptive or catastrophic, the flooding is particularly problematic because it affects a dense interconnected web of people, homes, businesses, jobs, civic institutions and the lifelines that support them. There was a time when much flooding could be dealt with through "retreat"—preserving natural functions, moving buildings out of harm's way. Now, for many urban zones, retreat is no longer possible. You can't just move Chicago. Urban flooding demands solutions that span a wide spectrum of technical, social, economic and cultural domains.

Infrastructure under stress

Inadequate, aging or deteriorating dams, levees, aqueducts, water treatment systems and the various elements of the stormwater infrastructure or "sewershed" create particular problems for urban areas.

Urban areas have grown. Water control infrastructure has not. In older cities, some stormwater infrastructure dates back centuries, and most stormwater, water supply and wastewater systems were designed decades ago. The rainfall calculations and design standards no longer fit today's hydrology, or the ever more complex human ecosystem that expands out from the historic core. Systems are undersized and overworked.

Heavier rainfall and higher tides further add to system stress. The Northeast and Midwest, in particular, are experiencing more days with heavy rainfall. Nine of the top 10 years for extreme one-day precipitation have come since 1990. (EPA 2017). Tidal events are increasing in frequency, pushing seawater into drainage systems and causing pump failures.

Deferred maintenance is contributing to system failure. Adding injury to insult, many stormwater systems have been poorly maintained over the years. Drain blockage, pipe collapse, or restrictions in capacity can cause urban flooding.

What do we mean by "urban" flooding?

Grade assigned to the nation's wastewater and stormwater systems in an American Society of Civil Engineers 2017 Infrastructure report card.

\$ 171 BILLION Capital investment needs for wastewater conveyance and treatment facilities, combined sewer overflow correction and stormwater management over a 20-year period

\$ TRILLIONS Total estimated reconstruction and maintenance costs across dams, levees, aqueducts, sewers, and water and wastewater treatment systems

(Source: Fourth National Climate Assessment, 2018, Ch. 3 p 7 and p. 10)



When storm waves overwhelm pipes and sewers, water seeks other paths. Sandbags are a final line of defense.



Floodwaters are a health hazard. The water itself can be toxic.

Major Findings

- Solutions must be locally driven
- This problem touches essentially every cabinet level agency
- This will require an adjustment in the insurance paradigm
- The 1 percent annual chance standard for larger floods is too low in urban areas
- Urban flooding is more multi-disciplinary and stakeholder driven

Responding to the challenge

The 2019 Gilbert F. White Policy Forum examined both the problem and ways to move towards resilience through policy and programming.

Urban flooding remains primarily a local issue. Forum participants shared multiple examples of innovative and successful efforts, neighborhood level to watershed-wide. You'll find case examples throughout the report.

State and federal governments and the private sector have important roles to play. Local action alone is not enough. Resilience requires coordinated action across multiple domains and multiple levels of government. The Forum's suggestions for policy changes and new partnerships guided the report's organization and recommendations.

“Resilience: The capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt and grow no matter what kinds of chronic stresses and acute shocks they experience.”

(Source: 2008ResilientCities.org)

“Resilience: The ability to anticipate, prepare for and adapt to changing conditions; and withstand, respond to and recover from disruptions. Principles of resilience are summarized as Prepare, Absorb, Recover and Adapt (PARA).”

(Source: USACE ECB 2018-01)



CASE EXAMPLE

Turning vacant lots into stormwater lots to manage runoff



The New Orleans Redevelopment Authority (NORA) is finding new uses for abandoned properties it manages within the urban core. A series of detention basins now accept runoff from neighborhood streets. Each lot manages an average of 34,000 gallons of runoff water, while serving as green space and reducing localized flooding.

(Source: Dana Brown Associates)



Synthesis of Recommendations

Make having a clear picture of urban flood risk and impacts a local to national priority.

Collect, visualize and share data locally; enable information gathering through grants; share data; conduct research to better understand changes in precipitation and public health impacts; develop a national assessment of urban flooding.

Prioritize local and regional coordination to find comprehensive solutions for flooding and rainwater.

Create special task forces and watershed level coalitions to deal with problems; develop partnerships with the private sector; provide association, state, and federal support for such efforts.

Enable and incentivize dedicated authorities for stormwater management.

Explore local or regional authorities; provide state level legislation, if needed, to overcome barriers to their formation; offer federal training.

Refresh the Unified National Program for Floodplain Management.

Bring together agencies and stakeholders; address urban flooding and stormwater issues; develop a plan and deliver on it.

Consider inclusiveness, social equity and public health impacts in valuing projects.

Include representatives of vulnerable populations in planning; place value on social benefits in justifying funding; move beyond over-reliance on property-based cost-benefit calculations; make the business case from a broad city- and region-wide perspective.

Consider climate change and urban flood realities in setting standards.

For urban areas, institute stronger standards that exceed the 100-year flood standard for critical infrastructure; also recognize that much urban flooding occurs outside of federally designated Special Flood Hazard Areas; develop long-term goals for resilience based on social, cultural, economic and technical considerations.

Take the long view.

At the local to regional level, develop a vision and long-term goals for resilience, taking into account anticipated changes in climate, population, urbanization and land use, as well as social, cultural, economic and technical considerations.

Take advantage of financing options and insure against financial risk.

Look at a mix of options to enable adaptation and lessen flood risk; educate the public about the realities of flood risk; broaden insurance coverage.

Jump-start needed change with an Urban Flooding Summit and tools for communities.

Bring together the major organizations dealing with the issues and opportunities, together with key stakeholders, to set the agenda for change; as a first step, explore a multi-partner approach to leadership in planning and conducting the summit and provide tools and support for community efforts.

Don't wait; begin today.

Don't wait for disaster to act; own the problem at the community level; educate the public; break down the siloes; start now to move towards resilience.

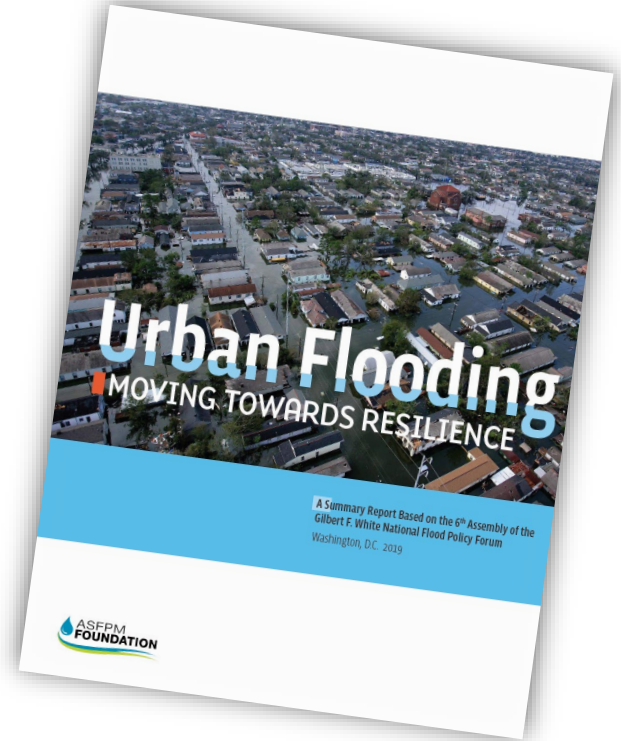
Early Areas of Focus

- National Assessment
- Refresh the Unified National Program for Floodplain Management
- Urban Flood Summit – “*Flooding In the Urban Environment*”
- Urban Flooding Toolkit



The Report

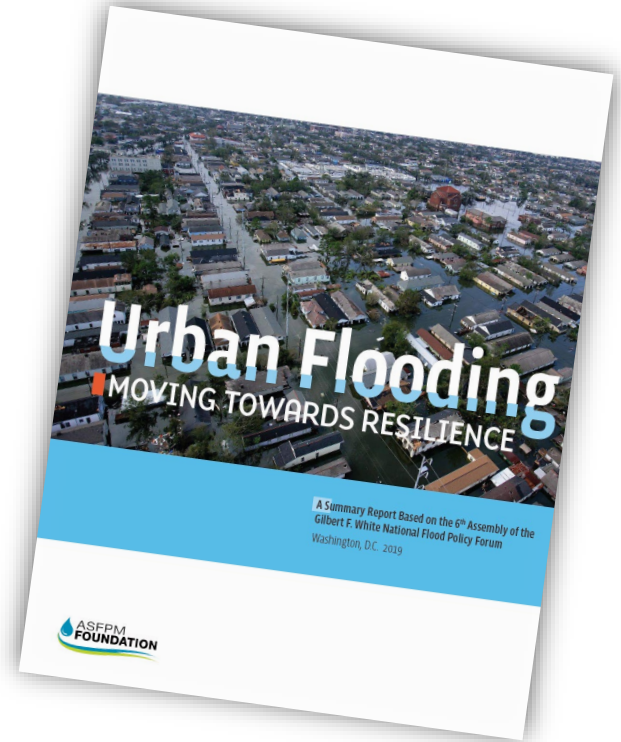
- Released early February 2020
- Digital copies available on ASFPM Foundation Website:
<http://www.asfpmfoundation.org/ace-images/UrbanFloodingReport.pdf>
- Limited number of print copies available
- Follow Foundation on Twitter @ASFPMfoundation for announcement of Urban Flooding next steps



What You Can Do

- Read the report
<http://j.mp/ASFPMUrbanFloodingReport>
- Share the report
- Join the discussion
- Follow/promote the Urban Flooding Report findings on social media
- Tell us your ideas and experiences
- Give a presentation

“We want to hear from you!”



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