

Developing a Sensitive Sites and Infrastructure Protocol (SSIP) for Great Lakes Municipalities

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Great Lakes & St. Lawrence Cities Initiative

2015 Annual Meeting and Conference

Sarnia, Ontario

June 18, 2015

GLISA



AECOM



The SSIP

Financial support from the Great Lakes Integrated Sciences and Assessments (GLISA) at the University of Michigan

An expedited methodology for municipalities to identify and protecting their sensitive sites and infrastructure in advance of extreme weather:

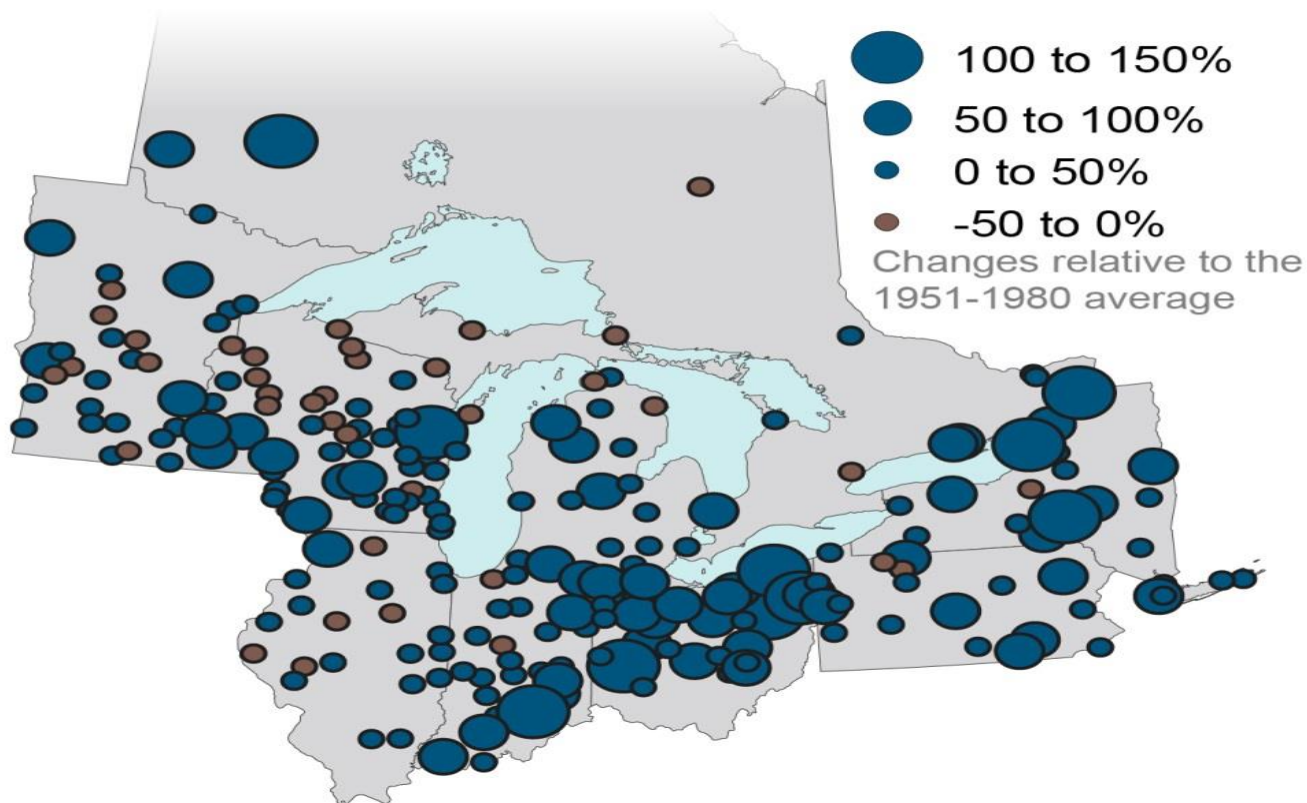
- 1) identification of at-risk areas susceptible to the adverse impacts of extreme storm events – desktop review (e.g., FEMA flood maps)
- 2) identification of sensitive sites and critical infrastructure within the at-risk areas – all sites and infrastructure have some vulnerability
- 3) development and application of a Risk Matrix characterizing the susceptibility of sensitive sites and critical infrastructure to extreme storm events –self assessment for city officials
- 4) formulation and prioritization of protection and response measures that include both structural and non-structural approaches – input from Gary

Future Risk and Impacts

- Extreme Weather events increased over the last five to ten years – they can occur quickly and with little warning
- Flood events of 2007 & 2008 in Gary and northern Indiana
- The impacts include:
 - Flooding of roads, trains, homes and businesses
 - Flooding of public buildings and equipment
 - Crippling of key community assets like wastewater treatment plants
 - Severe winter storms crippling transportation systems
 - Loss of power
 - Risks to health and safety

Future Projections

Percent Change in Days per Year
Exceeding 1.25" of Precipitation from 1951-2012



What Does This Mean? – Extreme Weather Scenarios

- **More frequent flash flooding – not necessarily just in the mapped flood plain**
- **Increased pressure on flood control systems due to more frequent flood events**
- **The 100-year flood could become the 25-year flood**
- **More wind storms, severe winter storms, and extreme heat events**

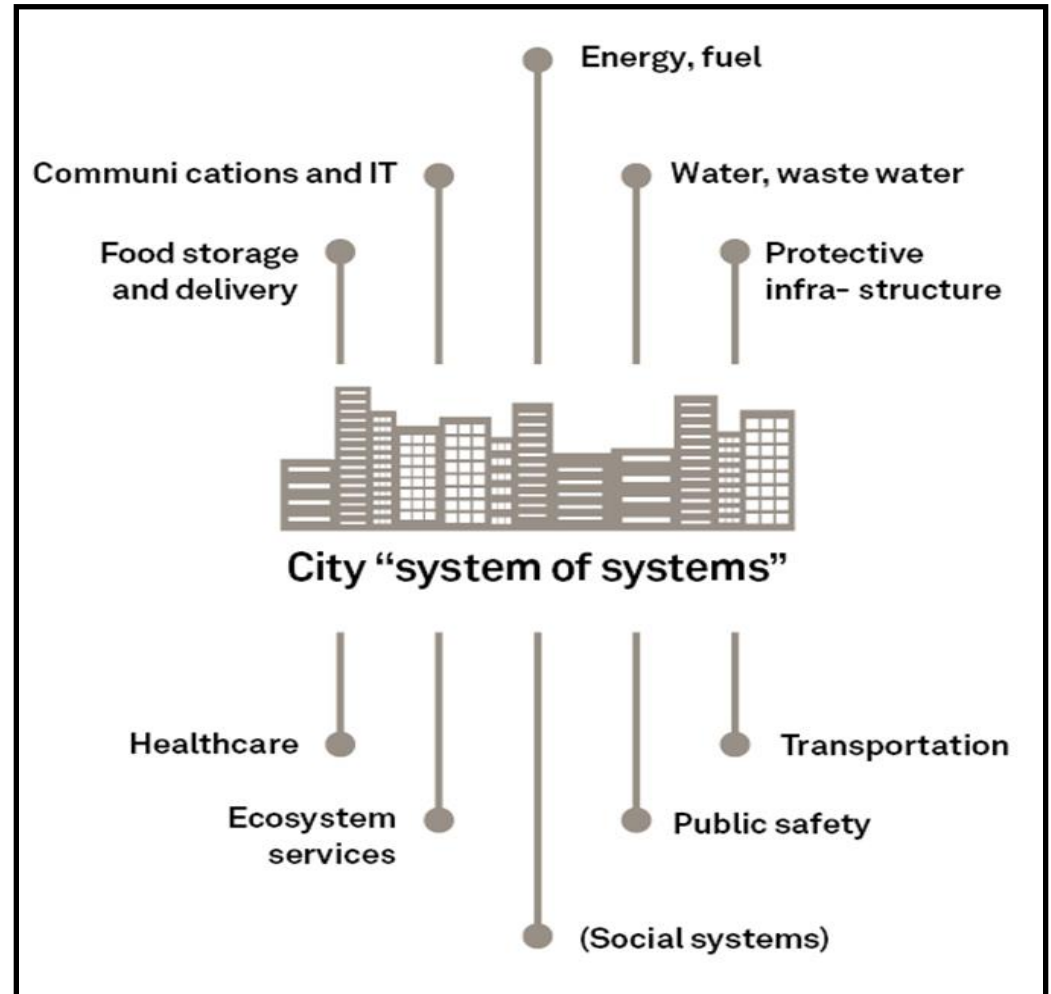
A city is a system of systems...

Multiple connections and interaction

Because each system will have different owners and stakeholders, resilience is a multi-organizational endeavor.

Focus on whole community assets

- Critical infrastructure
- Sensitive sites



How can the SSIP help?

3 – Tier Approach / 3 Lines of Defense

1. Larger community measures
 - Green Infrastructure
 - Levee Protection
2. Site-specific facility measures
3. Emergency Preparedness and Response

SSIP Guide

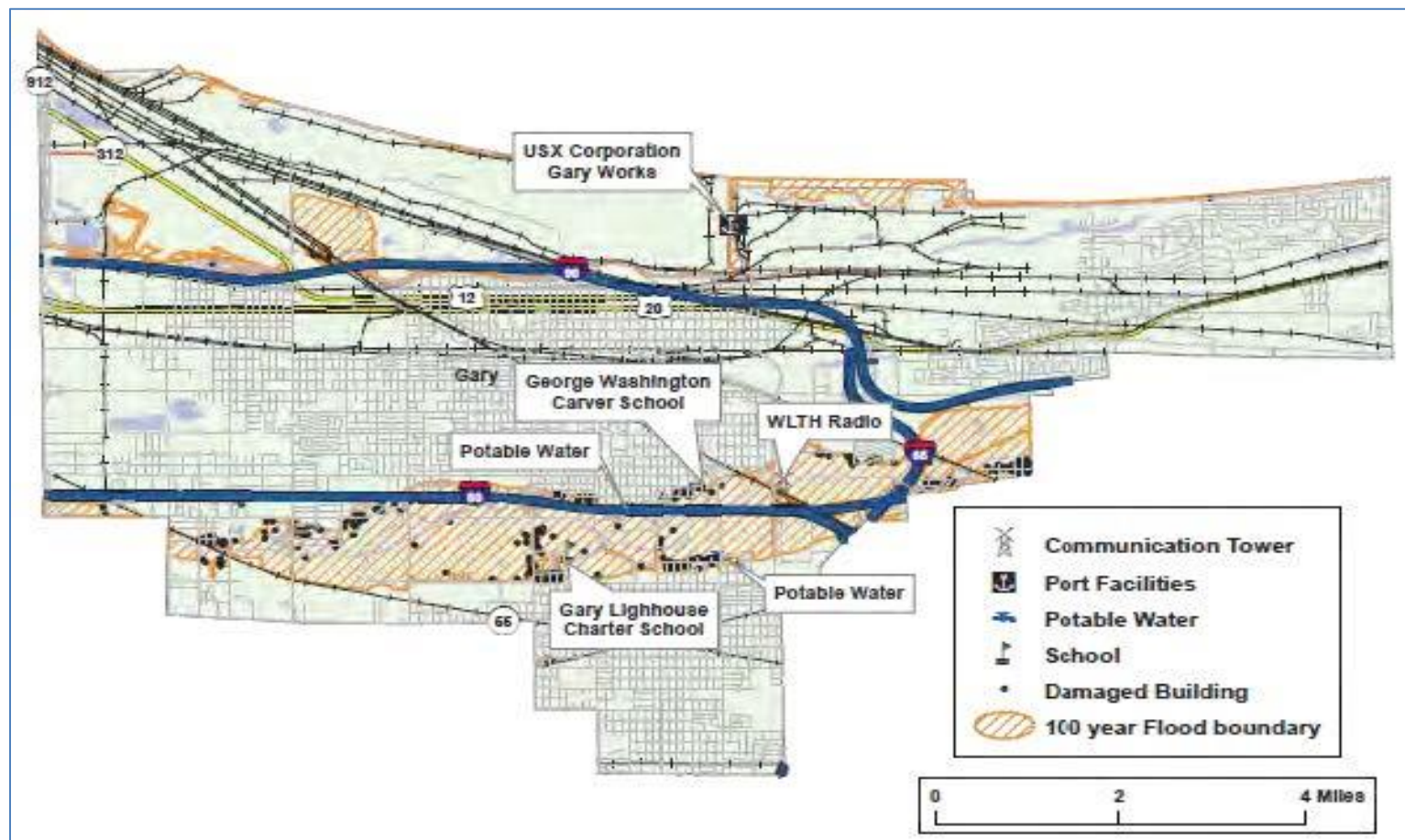
- Desktop review of risk
- Risk Matrix
 - City officials' input, advice, feedback
 - Risk Matrix addresses #2 and #3 directly and overall recommendations address all three
- Overall recommendations to address #1

Pilot City – Gary, Indiana

Two objectives

1. Using SSIP guide and matrix, generate short-term and long-term action recommendations for Gary to address sensitive sites and infrastructure in climate change preparedness planning
2. Learn from Gary pilot experience and feedback to refine SSIP

Desktop Review



Risk Matrix

- Risk matrix - gathers information and seeks input/advice on mitigation action from those directly responsible for operation, maintenance of key city infrastructure, facilities
 - Site Assessment
 - Any facility is potentially vulnerable
- Helps drives a two-tiered Approach (short-term and long-term) for the three lines of defense
 - Overall community (e.g., green infrastructure)
 - Protect individual sites
 - Emergency response

Risk Matrix

Six Parts

- A. General Site Information**
- B. Identify Risk Areas (Geographic –specific)**
- C. Identify Risk From Other Hazards**
- D. Immediate Hazard Event Response Capability**
- E. Site-specific Flood Risk Components**
- F. Risk To Sensitive Sites**
- G. Long Term Mitigation**

Project Next Steps

- Gary staff to complete matrix, including confidential site assessment & provide advice on mitigation recommendations in key operational areas in Gary
- Recruit Cities Initiative member cities to participate on a SSIP working group and hold a technical workshop for working group members on application of SSIP in September 2015
- SSIP Team to complete Gary pilot, share assessment and recommendations with City of Gary, October 2015
- Cities Initiative to share completed SSIP guide with Cities Initiative members, hold final webinar, October 2015

For more information

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