

SECTION 5 FLOOD HAZARDS

GOAL: Floods happen, so be prepared.

- Prevent loss of life and significantly reduce future damages from floods by mapping flood hazards, regulating use of high hazard areas, mitigating risks for existing development, restoring beneficial floodplain functions, maintaining flood control structures, and enhancing flood warning systems.

CHALLENGE

The Susquehanna-Chemung region is “flood alley.” Flood damage is an ongoing problem, as it has been throughout recorded history. The streams, rivers and lakes are naturally subject to rising and falling water levels, relocation of stream channels, flooding of valley bottoms, and wave action on lake shores. Intense storms of local and regional extent have repeatedly resulted in flooding of low-lying areas throughout the region including the “Finger Lakes Flood” of 1935, Tropical Storm Agnes in 1972, the 2006 Flood in the Susquehanna Basin, and most recently, the Tropical Storm Lee flood in 2011. In addition to these large-scale flood events, the region experiences numerous smaller floods and flash floods almost every year. Unfortunately, many communities are located along waterways (because of flat land and water-based transportation), where the hazard of flooding is an environmental fact of life. The resulting economic and personal costs have been significant.



Washington Street footbridge, Binghamton, June 2006
(courtesy of the City of Binghamton).

After every flood, the tendency has been for residents to rebuild their lives and pray that “this is the last destructive one.” Structural projects have been built in hopes of controlling future flood waters. Municipalities have enacted floodplain management regulations based on National Flood Insurance Program (NFIP) standards. As time passes, people tend to forget about flooding and become complacent. Additional development and filling occurs in flood-prone areas. Deforestation and upland development increase the amount of runoff. Stream channels are allowed to become clogged with debris. Wetlands are filled and new ones not created. People forget that these actions all increase the risk of future flood damage. In short, residents of the watershed continue to grossly underestimate the destructive powers of their rivers, streams, and lakes. If future flood damages are to be reduced, flood mitigation measures will need to be incorporated into many different programs in a manner that outlives the all-too-short memories of area residents.

Although floods are natural phenomena that cannot be prevented, their effects are amplified by human activities. Loss of life, property damage, and mental anguish can be reduced by applying corrective and preventive measures.

“Floods are ‘acts of God,’ but flood losses are largely acts of man.”
- Gilbert F. White

RECOMMENDATIONS

The following recommendations encompass a broad array of actions at the local, regional, state, and federal levels that can reduce the vulnerability of the Susquehanna-Chemung region to flood damages. Recommendations in other sections of this Action Plan also support this goal, particularly those for Streams and Rivers (Section 4) and Runoff (Section 6).

Flood Hazard Mapping: Maps should accurately depict and communicate varying levels of flood hazard.

5a. Advocate for FEMA to develop updated and accurate Flood Insurance Rate Maps (FIRMs) for the entire watershed and additional products (such as depth grids that can be used in flood mitigation planning) for high risk areas. In order to develop high quality mapping products that are embraced by local communities, FEMA must communicate with local officials, the press, and other stakeholders throughout the mapping process. This requires allocation of local staff resources, as well as coordination by FEMA. (Eight counties currently have preliminary or final digital FIRMs.)

Long-range target: Updated mapping for the entire watershed, with new flood studies where warranted and active engagement of local partners in the mapping process.

Measure: Number of counties with updated flood hazard mapping.

5b. Identify priority stream and river reaches for improved flood hazard mapping and promote flood studies for these areas.

Immediate action: Evaluate flood “hot spots” that have sustained severe or repeated flood damage. Request and review the Validation Process Documentation developed by FEMA for recent mapping projects. Use this information to identify areas where improved flood hazard mapping is needed and communicate these mapping needs to FEMA.

Immediate action: Conduct post-flood evaluations and collect time-stamped high water mark data for validating hydraulic modeling and flood inundation mapping.

5-year target: Seek funding for a validation study to review and validate the engineering analyses on which the effective FIRMs are based and communicate mapping needs to FEMA.

Long-range target: Conduct restudies and revise FIRMs for priority areas.

Measure: Number of counties with initial or engineering evaluation of mapping needs. Number of invalid stream miles restudied for revised FIRMS.

5c. Refine the Flash Flood Potential Index developed by the National Weather Service (NWS) and disseminate maps showing the potential for flash flooding based on land characteristics.

Immediate action: Post existing maps on the internet. Update as resources permit.

Measure: Number of counties for which maps are available.

Floodplain Management: Vigorously enforce existing regulations and promote higher standards.

5d. Train local building officials, planning boards, and elected officials on flood hazards, risk reduction strategies, implementation of floodplain development regulations, post-flood reconstruction, and how to address flood hazards during planning board review. All municipal Floodplain Administrators should either have floodplain management training or have a means for obtaining assistance from a Certified Floodplain Manager for all floodplain development permits (through shared service agreements or county/regional floodplain administration).

Immediate action: Facilitate floodplain management training for Local Floodplain Administrators with continuing education credits. This training is generally provided by NYS DEC, but can also be taught by other qualified instructors. There is a clear need for training related to post-disaster code enforcement (mutual aid during the response/recovery, substantial damage determinations, etc.).

Immediate action: Deliver training to municipal boards (planning boards, zoning boards of appeals, and elected officials) to provide familiarity with basic floodplain management requirements. County or

regional capacity and staff time are needed to deliver this training to local governments throughout the watershed and repeat as personnel change.

Immediate action: Provide each county planning department with floodplain management resources for use and dissemination (such as presentations and the fact sheets developed by STC⁷). Develop additional floodplain management fact sheets about gas drilling, substantial damage requirements, historical structures, and other topics.

Measure: Number of trainings conducted. Number of counties distributing reference materials. Number of new reference materials.

- 5e. Targeting flood-prone municipalities that effectively enforce existing floodplain development standards, provide recommendations and sample language for: (1) local enactment of higher standards for floodplain development, (2) increased implementation of No Adverse Impact approaches, (3) improved integration of flood risk reduction into comprehensive plans, (4) strategies for identifying and protecting high value floodplains and erosion hazard areas, and (5) ways to discourage or prohibit floodplain development. Priority areas for improved floodplain management strategies include floodplains delineated on FEMA maps, areas with high flash flood potential (based on Flash Flood Potential Index maps), erosion hazard areas, and areas that have previously flooded.

5-year target: Provide sample language and other resources to county planning departments for distribution to appropriate municipalities. Provide implementation assistance as needed.

Measure: Number of counties and municipalities receiving information.

Flood Mitigation: Protect or relocate existing flood-prone development.

- 5f. Secure funding (from FEMA's mitigation grant programs or other sources) to implement the specific mitigation projects identified in county hazard mitigation plans and to periodically update those plans.

Immediate action: Update county plans every five years, as required by FEMA. Provide training in Hazus, a tool developed by FEMA for estimating potential losses from natural hazards, which can be used in the assessment step of the mitigation planning process.

Immediate action: Provide training on the FEMA mitigation grant programs including project identification and development, benefit-cost analysis, and the application process.

Long-range target: Implement hazard mitigation plan recommendations as resources permit.

Measure: Number of plans updated. Number of training sessions. Number of mitigation projects implemented.

- 5g. Train local building officials and the construction industry on floodproofing techniques for retrofitting existing flood-prone development (building elevation, protecting utilities, flood damage resistant material, sewer backup protection, etc.). Trained personnel provide owners of flood-prone development with information and technical assistance, particularly after flood events. (A 3-hour course and reference materials⁸ have been developed by Chemung County and STC.)

Immediate action: Conduct training in a variety of locations (enabling increased outreach to property owners).

Long-range target: Provide technical floodproofing assistance (and financial assistance if possible) to owners of flood-prone buildings. This is a high priority immediately after floods before rebuilding starts.

Measure: Number of training sessions. Number of municipalities providing information and technical assistance to property owners.

⁷ Floodplain management fact sheets and forms are available from STC at: www.stcplanning.org/index.asp?pagelD=108

⁸ Floodproofing information sheets and other resources are available from STC at: www.stcplanning.org/index.asp?pagelD=107

- 5h. Promote overhauling of the National Flood Insurance Program (by Congress), so that the program more effectively prevents flood damage and flood insurance becomes a more desirable tool for financial protection against flood losses. Of particular concern is the cost of insurance in levee-protected areas. Train insurance, mortgage, and real estate professionals on the National Flood Insurance Program. Encourage owners of flood-prone property to have insurance coverage for flood damage.

Immediate action: Provide local letters and other support for improved federal flood insurance policy. This can build on the NFIP policy paper developed by the NYS Floodplain and Stormwater Managers Association (NYSFSMA, 2011).

Immediate action: Conduct flood insurance training. Provide counties and municipalities with public education materials.

Measure: Number of letters or other expressions of support for changes to federal policy. Number of training sessions. Number of counties and municipalities receiving public education materials.

- 5i. Increase municipal participation in the Community Rating System (CRS; to reduce the cost of flood insurance and increase local resilience to flood damage) and improve ratings for the 14 municipalities that currently participate by: (1) promoting a more streamlined program to alleviate administrative burdens on municipalities, (2) providing increased technical support, (3) implementing county-level activities, and (3) forming a NYS CRS Users Group.

Immediate action: Establish a CRS Users Group to facilitate training, information sharing, and promotion of program improvements.

Long-range target: Provide technical support to existing and new CRS communities.

Measure: Number of Users Group meetings/workshops. Number of CRS communities and number of those with classification of 8 or better.

Beneficial Functions of Floodplains and Drainage Systems: Enhance the effectiveness of floodplains to store and slow flood waters without damage to development.

- 5j. Train local public works officials on the value of riparian buffers, beneficial floodplain functions, and maintenance procedures for roadside ditches, drainage structures, stormwater systems, streams, and other drainageways. (Roadway and Roadside Drainage training is provided by Cornell Local Roads Program. Delaware County developed and conducts post-flood emergency stream training. A booklet about stream maintenance was prepared by NYS Office of Emergency Management.) Provide sample language for a drainage system maintenance plan and record keeping format that qualify for CRS credit.

Immediate action: Conduct training sessions in varied locations.

5-year target: Provide sample drainage system maintenance plan to counties, CRS municipalities, and others.

Measure: Number of training sessions. Number of counties and municipalities that receive sample plans.

- 5k. Develop public education materials to discourage stream dumping and storage of floatable materials near streams and drainageways. Disseminate examples of stream dumping regulations that qualify for CRS credit (several examples exist).

5-year target: Provide resources to CRS municipalities and others.

Measure: Number of municipalities that receive information.

- 5l. Identify river and stream reaches with debris, gravel piles or berms along the banks (not engineered flood control levees) and encourage property owners to remove these obstructions and restore floodplain

functions. Municipalities and SWCDs can distribute Stream Processes Guide (Chemung Co. SWCD, 2006) when interacting with property owners.

Long-range target: Inventory problem sites and periodically contact property owners. Provide assistance with removal of streamside berms and other obstructions.

Measure: Number of obstructions identified and number removed.

Structural Projects: Maintain the safety and reliability of existing flood damage reduction structures and dams built for other purposes. Although non-structural flood mitigation measures are preferred, opportunities also exist for new small-scale structural projects.

5m. Seek FEMA recognition of the level of protection provided by well-maintained flood control levees (engineered structures), particularly those that meet FEMA's freeboard requirements (Corning area, Elmira area, Hornell area, and Villages of Avoca, Bath, Canisteo, Lisle, Nichols, and Whitney Point).

Immediate and long-range target: Each levee that meets FEMA freeboard requirements is certified prior to the release of final FIRMs and the protection is shown on the maps.

Measure: Number of levees certified.



Levee patrol training, Elmira (courtesy of NYS DEC).

5n. Secure funding to assess the condition of engineered levees with unknown status and remediate deficiencies of levees that fail to meet safety standards or have inadequate freeboard for 100-year flood protection. Evaluate and/or remediate: Ithaca Road levee in Horseheads, Big Creek levee in North Hornell, and Owego Creek levee in Owego. Increase the flood protection level: Addison, Binghamton, Johnson City, Owego, and Vestal.

Immediate and long-range target: Each levee is assessed, remediated, and certified prior to the release of final FIRMs and the protection is shown on the maps.

Measure: Number of levees assessed, remediated, and certified.

5o. Develop an inventory of levees and other structural flood control projects with information about location, ownership, project status, FEMA accreditation, etc. (SRBC has assembled some of this information.)

5-year target: Validate existing information and complete the inventory.

Measure: Number of flood control projects inventoried.

5p. Promote improved state and federal policies regarding levees, including flood hazard mapping in areas with levees (including levee certification and accreditation), insurance rating in protected areas, liability, levee safety programs, and recommendations of the National Committee on Levee Safety (2009).

Immediate action: Local letters and other support for improved policies.

Measure: Number of letters or other expressions of support.

5q. Routinely inspect and maintain all dams. Educate private dam owners about NYS dam safety requirements. Provide technical and financial assistance to dam owners with the inspection and maintenance requirements.

5-year target: Expand and enhance the assistance that is currently provided by SWCDs, county emergency managers, and NYS DEC to ensure compliance with NYS dam safety requirements.

Measure: Number of dam owners assisted.

- 5r. Develop and maintain Emergency Action Plans for all high hazard dams (those that pose significant risk to life and property if they fail), including those located upstream in Pennsylvania. County Emergency Management Offices should participate in development of emergency plans.

5-year target: Full compliance with NYS dam safety requirements.

Measure: Number of emergency action plans.

- 5s. Identify and evaluate opportunities to alleviate flooding problems using structural projects that do not impair the benefits of existing floodplain functions (such as small impoundments, high flow channels, wetland creation, etc.). Seek implementation funding for cost-effective projects. (Ongoing assessments include USACE reconnaissance study in Susquehanna Basin and Sidney Center study.)

Long-range target: Potential projects identified in county hazard mitigation plans and implemented as resources permit.

Measure: Number of projects implemented.

Flood Forecast and Warning: Timely warnings are communicated effectively to the public and emergency responders.

- 5t. Protect federally operated precipitation and river gauges from the repeated threats of budget cuts and expand existing data collection and data processing capabilities as warranted.

Immediate action: Local letters and other support for permanent funding of the gauge network (including ongoing efforts by the Susquehanna Flood Forecast & Warning System, NYS Floodplain and Stormwater Managers Association, Environmental Emergency Services, and others).

Measure: Number of letters and other expressions of support.

- 5u. Expand the IFLOWS network of precipitation and stream gauges (which supplements the federal gauge system) and ensure ongoing maintenance of the existing gauges. (Existing IFLOWS gauges are located in Allegany, Steuben, Chemung, Broome, Chenango, and Schoharie Counties and upstream in Tioga County, PA. Sidney Center Central High School operates seven stations.)

5-year target: Broome County system fully functional.

Long-range target: Identify local partners and install additional gauges as resources permit.

Measure: New local partners and gauges.

- 5v. Promote effective utilization of existing flood inundation maps (which indicate areas inundated by various river levels) by increasing the availability of this information and providing periodic training in its use. Develop additional maps for priority damage locations. (SRBC has recently developed maps for some reaches of the Susquehanna and Chenango Rivers. Older maps exist in other areas.)⁹

Immediate action: Conduct training for emergency personnel and local officials on use of inundation maps for flood planning and response.

Long-range target: Secure resources to develop inundation maps in conjunction with updating of FEMA flood hazard maps.

Measure: Number of training sessions. Number of new inundation maps.

- 5w. Support implementation of the strategic plan for the Susquehanna Flood Forecast and Warning System (SFFWS), including recommendations developed following the June 2006 Flood. (The SFFWS is an interagency partnership working to increase lead-time of flood warnings and improve forecast accuracy.) It is critical that funding for the SFFWS be maintained. Local support and participation are needed to expand the river ice monitoring network, promote awareness of forecast services, etc.

⁹ Maps can be viewed on the Susquehanna Inundation Mapping Viewer: <http://maps.srbc.net/simv/>

Immediate action: Local letters and other support as needed to reinstate funding for the SFFWS and to facilitate system maintenance and enhancements.

Immediate action: Recruit ice observers and conduct ice monitor training.

Measure: Number of letters of support. Number of ice monitor training sessions.

- 5x. Review and improve emergency operations plans for counties, municipalities, and facilities to enhance the effectiveness of transportation (including emergency traffic routes), communication, public notification, and other emergency procedures before, during, and after floods.

Immediate action: County Emergency Management Offices, municipalities, and facility operators periodically review and update emergency plans, with particular attention to shortcomings identified during exercises or flood events.

Measure: Number of plans reviewed.

- 5y. Develop a strategy to improve flood warning dissemination to the public through multiple paths. Promote use of NOAA Weather Radios and NY Alert. Evaluate implementation of reverse 911 call systems. (Seven counties and three communities participate in the NWS “StormReady” program.)

Immediate action: NWS and county Emergency Management Offices periodically review the effectiveness of warning dissemination procedures and revise as warranted.

Measure: Number of StormReady counties and communities.

Public Education: The public understands that floodplains are not suitable sites for human development. Those who choose to occupy flood-prone areas are responsible for the consequences of those decisions. Understanding flood risk is essential for cost effectively mitigating flood risks.

- 5z. Develop a regional flood risk communication strategy that identifies key messages and multiple dissemination methods to engage individual citizens, non-profit organizations, business, industry, and local governments in more effective flood risk reduction. Program should: (1) increase the awareness of flood risks, (2) educate about the benefits of preserving and restoring floodplain functions, (3) facilitate improved preparedness (floodproofing measures, family emergency plans, etc.), (4) promote safety during and after floods, and (5) capitalize on teachable moments such as flood events and flood hazard mapping projects. This education effort should be implemented by schools, environmental education centers, government entities, and others. Target audiences include: property buyers, owners of existing flood-prone development, developers, students, motorists, and the general public. (Utilize existing programs and resources, such as: NWS “Turn Around; Don’t Drown” Campaign, FEMA FloodSmart, SFFWS website,¹⁰ STC educational materials, Stream Processes Guide, Chemung County home buyer’s brochure, county Conservation Field Days, local news media, etc.)

5-year target: Develop a strategy and begin implementation of a regional flood education program.

Measure: Number of counties with a strategy. Number of public education programs.

- 5aa. Expand the use of strategically located signs that inform the public about flood hazards (such as “Flood Zone Regulations in Effect” in Schoharie County; 2006 flood depths in Tioga County; and NWS “Turn Around; Don’t Drown” signs).

5-year target: Secure funding to purchase needed signs and educate elected officials about the positive value of this information.

Measure: Number of flood-related signage projects.



Courtesy of Tioga County Flood Mitigation Task Force.

¹⁰ Susquehanna Flood Forecast and Warning System website: www.susquehannafloodforecasting.org