

## Flood Hazard Mapping and Levees

Information Relevant to the Chemung Watershed Risk MAP Project

**Flood Insurance Rate Maps (FIRMs):** The Federal Emergency Management Agency (FEMA) develops flood hazard maps delineating areas that are expected to be inundated by flooding that has a 1% probability of occurring in any given year (the so-called 100-year flood). This is called the Special Flood Hazard Area (SFHA).

*“Levee means a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.” (from Code of Federal Regulations, Title 44, Section 59.1)*

**Floodplain Development Requirements:** Any development within the mapped SFHA is subject to locally-enforced floodplain development standards that are intended to protect the project from damage during the 1% probability flood and prevent increased damage to other properties. In New York State, most new buildings in the floodplain (or substantial improvements to existing buildings) are elevated so that the lowest floor is two feet above the modeled flood height. Below this level, flood-resistant design and materials are used and the space cannot be used as finished living space.

**Flood Insurance Requirements:** Flood insurance is required as a prerequisite for receiving a mortgage for a building in the SFHA from any federally regulated lender.

**Flood Insurance Costs:** The cost of insurance premiums is based on the flood zone, date of construction, building type, and building elevation. Rates are generally higher within the mapped SFHA due to the increased risk of flood damage. Buildings that were constructed in the floodplain before the initial FIRM (and thus before floodplain management standards were enacted) may qualify for “grandfathered” pre-FIRM rates. The cost of pre-FIRM policies has increased and is no longer considered “affordable” by many. In addition, Congress has recently eliminated the pre-FIRM subsidy for business properties and for new insurance policies (June 2012). Rates for other floodplain buildings are generally based on the elevation of the lowest floor relative to the modeled height of the 1% probability flood. This can be quite expensive for non-elevated buildings with basements or in areas where the modeled flood depth is high.

**Levees:** Flood control levees and flood walls reduce—but do not eliminate—flood risks in protected areas. Because FIRMS show areas as either in or out of the regulated SFHA, current mapping procedures do not account for the complex nature of flood risks in protected areas. A levee system is either accredited as providing sufficient protection from the 1% probability flood or the protected area is included in the SFHA. When levee-protected areas are included in the SFHA, the construction standards, flood insurance requirements, and flood insurance costs are the same as those applied to mapped floodplains with no levee protection. The program does not include a flood zone that is tailored to the flood risks in areas protected by flood control structures.



*The Corning Area Levee System currently removes protected areas from the regulated floodplain.*

**Chemung Watershed Risk MAP Project:** FEMA is currently developing new flood hazard maps for parts of Chemung, Schuyler, and Steuben Counties, including areas protected by the following levee systems:

- Elmira Area (Southport, Town and City of Elmira)
- Ithaca Road Levee in Horseheads
- Corning Area (Erwin, Painted Post, Riverside, South Corning, and City of Corning)
- Part of the Gang Mills Levee System (Erwin)
- Bath
- Avoca

On the current flood hazard maps, areas protected by these levee systems are not included in the SFHA (regulated floodplain). As part of the Risk MAP project, FEMA will reevaluate the assumption that these levee systems would provide protection from the 1% probability flood. If the levees are not "accredited" by FEMA, then the protected areas would be mapped as regulated floodplain and subject to the construction and insurance requirements of other floodplain areas.

**Levee Certification and Accreditation:** To meet FEMA's criteria for accreditation, the local community or levee owner must provide certified documentation that the levee system meets specified design, operation, and maintenance standards. This documentation must be certified by a Professional Engineer (or a Federal agency). "Certification" of a levee system is not a guarantee that the structure will not fail. It is intended to provide "reasonable assurance" that the system would perform properly in a flood event. If a levee is "certified" and FEMA determines that it has sufficient height, then FEMA can "accredit" the levee system and exclude the protected areas from the regulated floodplain.

**Certification of Levees in the Chemung Watershed:** FEMA does not certify levees. The US Army Corps of Engineers routinely inspects many of the levees in the watershed, but indicates that they lack the authority and funding to conduct the evaluations needed for certification of these levees. The NYS Department of Environmental Conservation (NYS DEC) owns, maintains, and operates many of these levee systems, but is currently not willing to certify any levees in a manner acceptable to FEMA due to potential costs and concerns about liability. At this time, there is not a good estimate of how much it would cost to certify the levee systems in this watershed. If it is determined that collection and analysis of subsurface samples is necessary (geotechnical analysis), then the costs could be quite high. One estimate was "up to \$300,000 per mile." Although this estimate may be high, it could cost millions of dollars to certify the 30 miles of levee that are currently subject to review by FEMA.

**What happens if the levees are not certified?** If the levees are not certified, FEMA would develop maps that include levee-protected areas in the SFHA (regulated floodplain). The mapping procedures for areas protected by non-accredited levees are currently being revised. These new procedures would be used to determine floodplain boundaries and flood elevations in protected areas. However, they are not expected to alter the certification process, so levee-protected areas would be mapped as SFHA and subject to floodplain regulations and insurance requirements.

**Managing Flood Risks in Levee-Protected Areas:** Our region is proactive in recognizing and managing flood risks. NYS DEC and municipalities have conscientiously maintained flood control levees, conducted operational drills, made improvements, and participated in Corps of Engineers inspections (which have never identified significant deficiencies). Levee systems are only part of the region's flood risk management strategy, which also includes a local Flood Warning System (which supplements information from federal sources), effective emergency operations (qualifying all three counties as StormReady), maintenance of flood insurance by property owners, flood-control dams, and stormwater management.

**Unanswered Questions:** Is the levee evaluation and certification process a prudent means of improving safety? If so, how much would it cost? Who can pay for it? How often should it be done? If the levees are not accredited, how would mapping of flood hazard areas on the land side of these levees affect the communities? Are floodplain management requirements appropriate for these areas? Are flood insurance purchase requirements appropriate? Would flood insurance costs correspond to the flood risks in levee-protected areas? What are the most cost-effective strategies for improving flood risk management in areas protected by levees?



*The 1972 Tropical Storm Agnes flood overtopped the floodwall in Elmira and other levees.*