

## Model Use, Limitations, and Mitigation Measures

**Flood Model Estimates:** The flood models estimate the building percent and dollar damage values for a 1-percent-annual-chance flood event (100-year flood or base flood). The physical building damage assessments communicate flood risk for individual property owners and communities in support of local [hazard mitigation planning](#) and actions. Property owners at flood risk are encouraged to obtain flood insurance through the National Flood Insurance Program (NFIP) to protect from financial loss. In addition, homeowners should adopt mitigation measures that can be used to protect properties from flooding, save money over time, and potentially reduce flood insurance premiums.

**Building Exposure Estimates:** Building replacement values are primarily derived from building appraisal values of the State's centralized Computer-Assisted Mass Appraisal (CAMA) known as the [Integrated Assessment System](#) (IAS). Default first floor heights are derived from basement and foundation assessment information.

**Water Depths:** Flood Water depths are computed for the 1-percent-annual-chance (1 in 100 chance per year) from model-backed engineering software called HEC-RAS or GIS-based software known as Hazus. The base flood heights derived from HEC-RAS are more accurate than Hazus.

**Building Damage Estimates:** Building and content damages are based on FEMA and U.S. Army Corps of Engineers Flood Depth-Damage Curves. Positive and negative water depth-in-structure values indicate flood levels above or below, respectively, the lowest finished floor. FEMA's OpenHazus software program, Flood Structure Assessment Tool (FAST), estimates individual building damage loss for a base flood.

**Model Limitations:** Several factors may affect the building flood loss estimates, including inconclusive water depth models or elevated structures that have much higher first floor heights. Please adjust damage values as necessary based on historical flood data, [construction standards](#), or the best available information.

**Mitigation Measures:** Riverine flood mitigation measures for individual buildings include elevating the structure. Structural elevation is a well-recognized measure for reducing flood risk and often the most effective measure to reduce both flood damage and insurance premiums. For building owners who cannot elevate their structures, mitigation alternatives include property buyouts, wet or dry flood proofing. Flood-prone communities can become more resilient by adopting a [comprehensive floodplain management program](#) that includes regulating new development to higher standards, effective storm water management, and restoring the floodplain to its natural function through open space preservation and green infrastructure. Refer to FEMA's [FloodSmart.gov](#) website for more information.

**Mitigation Benefit-Cost Ratio:** On January 11, 2018 the National Institute of Building Sciences (NIBS) released [Natural Hazard Mitigation Saves: 2017 Interim Report](#), that reported that \$1 spent on mitigation saves society an average of \$6 in future disaster cost for riverine flooding. The overall hazard benefit-cost ratio of \$6 for every \$1 invested, whereby building new structures beyond code requirements and above the 100-year flood elevation yields a \$5:1 benefit; and where federal grants for mitigation measures like buyouts or wet flood proofing of existing structures yields a \$7:1 benefit.

**Community Rating System:** A voluntary program to encourage communities to adopt and implement floodplain management activities that exceed the minimum NFIP standards. [More information](#).

**Contacts:** Contact your [local or state floodplain manager](#) for additional flood-risk information including flood reduction and protection materials. Online resources include FEMA's [FloodSmart.gov](#) website.

