

PREDICTING LOSSES: UPSTATE NY APPLICATION

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Putting HAZUS to the Test

How well does HAZUS predict loss? The M5 earthquake at Ausable Forks in Upstate New York, on April 20, 2002, provided an opportunity to compare actual losses in the region with HAZUS predictions. A preliminary validation of the HAZUS model was conducted by the New York State Emergency Management Office (SEMO), using the Ausable Forks earthquake as a test case. First, we input earthquake scenario data in HAZUS, mirroring the Ausable Forks event.¹ Then we compared the “direct economic losses to buildings” sustained from this event with HAZUS-estimated losses.

Actual Losses

Actual losses from the Ausable Forks earthquake, including damage to lifelines, were in excess of \$8 million. Of this figure, approximately \$5.85 million were attributed to structural and non-structural building elements. This estimate includes \$3.85 million

to residential structures² and \$2 million to non-residential structures.³ Most of the damage was to building foundations and chimneys. Very little damage to building “contents” was reported.

Predicted Losses

Simulating the same earthquake, HAZUS predicted that the structural and non-structural losses for this event would be \$4.53 million, just \$1.32 million less than the \$5.85 million estimated actual damage. This is a generally acceptable level of error; in fact, it may have been even less if more detailed soil maps had been used. Additionally, HAZUS estimated that there would be \$3.8 million in “contents” losses and \$32,000 in inventory loss. In actuality, very little “contents” damage was reported; however, if a comparable earthquake had occurred downstate in the New York City metro area, then the predicted “contents” losses might apply.

How Well Does HAZUS Predict Loss?

The results suggest that HAZUS did well in its estimates and that there is good agreement between actual losses and predicted consequences.

¹ 5.0 Mw; depth 11Km; Project 97East Coast attenuation function; soil type B used over the entire six-county study region (Essex, Clinton, Warren, Franklin, Hamilton, Washington).

² Derived from FEMA’s “Individual Assistance” (IA) disaster assistance program, which paid out \$2.85 million in grant monies, as of July 2002, to repair residences. In addition to accounting for individuals not applying for assistance and non-discovery of damages, an additional \$1 million was factored to the IA grant monies to arrive at the figure of \$3.85 million in damages to residential structures.

³ As the “Public Assistance” category of disaster aid was not included in the Presidential Disaster Declaration for the Ausable Forks earthquake (FEMA-1415-DR-NY), comprehensive damage figures on publicly owned buildings were not documented through a disaster assistance process. A rough damage estimate of \$2 million for publicly owned and other non-residential structures was collected during the damage assessment.