Evolution of Flood Hazard Identification and Mapping

Sally McConkey P.E., CFM

Illinois State Water Survey
PRAIRIE RESEARCH INSTITUTE

ILLINOIS
ISWS and Flood Mapping Timeline

• 1968 – National Flood Insurance Act initiates nationwide mapping

• 1970s – Hydrology Consultant to Illinois Division of Waterways (now the Illinois Dept. of Natural Resources Office of Water Resources)
  • Supporting the regulation of floodplain development
  • Review discharges. Recommended approval or disapproval
  • Local studies to determine flood elevations

• 1977 – State Repository for floodplain information

• 1983 – Begin using GIS
  • First CD of statewide flood zone GIS data

• 2004 – Map Modernization and IDNR / ISWS & OWR Cooperating Technical Partners (CTP) with Federal Emergency Management Agency

• 2008 – ISWS under Univ. of IL becomes a CTP

• 2010 – Risk MAP program launches & 2010 – ISWS becomes Letter of Map Revision Partner (MT-2 review)

• 2020 – ISWS Celebrates 125-year Anniversary
Getting started
USGS 7.5 minute topographic quadrangle

Rockford North, ILL
1 inch = 2000 feet
Flood Prone Area Maps
Rockford, IL

Kent Creek

Rock River

FLOOD PRONE AREA
Zip-a-tone

for manual map production
French curves
For manual map production
Flood Hazard Boundary Map (FHBM)
a.k.a. Zip-a-tone specials 11X 17 Map Format

City of Rockford, Sept. 20, 1974
Map wheel
For measuring stream length
Engineering scale
for multiple map scales
Planimeter – measure area
HEC 1 and HEC 2 Manuals
Flood Boundary and Floodway Map (FBFM)
City of Rockford, Panel 13, June 18, 1982
2004 Map Modernization and Hello GIS
Rockford, Winnebago County, IL, Panel 261, Sep. 6, 2006
Paper Weight
Sorting Paper FIRM$s
National Flood Hazard Layer

National Flood Hazard Layer (NFHL) Viewer with Web AppBuilder for ArcGIS

Kent Creek, IL, USA

results for North Fork Ke...

FLOODWAY Zone AE

City of Rockford
170723

AREA OF MINIMAL FLOOD HAZARD Zone X

17201C0261E eff. 2/17/2016

USGS The National Map: Orthoimagery. Data refreshed

Illinois State Water Survey | ILLINOIS
Coordinated Needs Management Strategy
https://www.fema.gov/coordinated-needs-management-strategy

VALIDATION_STATUS, STATUS_TYPE
- BEING STUDIED
- VALID, NVUE COMPLIANT
- UNKNOWN, TO BE ASSESSED
- UNVERIFIED, TO BE STUDIED
- ASSESSED

Status Map April 2019
Advanced Flood Hazard Identification and Risk Communication
Depth Grids and Structure Specific Risk Assessments

10% Annual Chance Depth Grid
Depth Grids and Structure Specific Risk Assessments

0.2% Annual Chance Depth Grid
Watershed Scale Flood Risk Modeling
Visualizing Complex Flow
Flood Forecast Inundation Modeling
Scientists to Calculate Flood Risk for Every Home in America

JUNE 13, 2019

World-renowned scientists from Columbia University, Fathom, the Massachusetts Institute of Technology, Rhodium Group, Rutgers University, the University of California—Berkeley, and the University of Bristol have partnered with tech nonprofit First Street Foundation to calculate the past, current, and future flood risk of every property in America. Recent historic flooding in the Midwest, along with multiple hurricanes throughout the 2018 season, destroyed thousands of homes classified as low-risk by the Federal Emergency Management Agency (FEMA). This highlights the need for complete, up-to-date, publicly available flood risk data that takes rising sea levels and increasing atmospheric and sea surface temperatures into account.

While institutional real estate investors and insurers have privately purchased this type of costly information for years, First Street Foundation and its partners will be the first to calculate the data based on peer-reviewed science and release it for free. The research will be easily accessible and understandable through the Foundation’s online database and visualization tools.

What is Catastrophe Modelling?

Peril Frequency and Severity
- EQ shaking intensity
- Wind strength
- Flood depth inundation
- Blast radius

Loss Calculation

Risk Ranking:
- B/10 - Severe
- Most Recent Flood: Nov. 2016
- 2 feet | $149,370 cost
- 30-Year Flood Probability: 76%
- Missed Property Value: $120,560

Vulnerability
- Risk Portfolio Data
- Structure values
- Contents values
- Time Element
- Number of people
- Deductibles / Limits
- Reinsurance

Exposure

What is next?