

Glossary

BFE – This is the computed elevation to which floodwater is anticipated to rise during the base flood. The base flood elevations (BFEs) are shown on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps and on the FEMA flood profiles. The BFE is the National Flood Insurance Program (NFIP) floodplain management requirement for the elevation or flood-proofing of structures. The relationship between the BFE and a structure's elevation determines the flood insurance premium (FEMA 2010b). NFIP regulations require that the lowest floor of a building be elevated above the BFE. The term “lowest floor” includes a basement because all usable portions of a building must be protected from flood damage (Morehouse, O'Brien et al. 2010).

Cloud-computing – This process uses a network of servers to store large data files and memory-intensive software and allows user-access through the use of an Internet web browser.

Collaborative learning – This is an instructional method that emphasizes learner-centered problem-solving teams with a facilitator to guide the discussions.

DSS – A computer-assisted decision support system (DSS) is any decision-making process that solicits input from participants at the beginning of the planning process; adds new data as information becomes available and revisits and reevaluates the decisions made and alternatives available; and makes use of a DSS as a tool to store and integrate data and present

management scenarios and alternatives visually, usually through the use of geographic information systems.

Dynamic model – These are computer models based on dynamic systems theory.

Dynamic systems theory uses continuous, discrete, or a combination of mathematical calculations to describe the spatial and temporal behavior of systems.

Exploratory interviews – In the context of this study, these are interviews conducted prior to data-collection meetings for the purpose of identifying any cultural nuances and/or community-wide experiences that may influence the quality or content of responses received from meeting participants (Paolisso 2010).

Extreme precipitation event – With increased global warming, precipitation is projected to be concentrated into more intense events, with longer periods of low precipitation in between. Therefore, intense and heavy episodic rainfall events with high runoff amounts are interspersed with longer relatively dry periods with increased evapo-transpiration (IPCC 2007).

Federal Emergency Management Agency (FEMA) – FEMA is an agency within the United States Department of Homeland Security that works to support citizens and first responders to build, sustain, and improve the capability to prepare for, protect against, respond to, recover from, and mitigate all hazards.

FEMA Flood Insurance Rate Map (FIRM) – This is the official map of a community on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community. These maps are now available in digital format (DFIRM).

FEMA National Flood Hazard Layer (NFHL) – This is a set of geographic information systems polygons representing the FEMA National Flood Insurance Program's high flood risk zones on the FEMA digital Flood Insurance Risk Maps for a 1% annual chance of flooding.

FEMA National Flood Insurance Program (NFIP) - The NFIP is a Federal program established by Congress to mitigate future flood losses nationwide through community-enforced building and zoning ordinances and to provide access to affordable, federally backed flood insurance protection for property owners. The NFIP is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods. Participation in the NFIP is based on an agreement between local communities and the Federal government that states that if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas, the Federal government will make flood insurance available within the community as a financial protection against flood losses. (FEMA 2011a)

FEMA Region III – This is the mid-Atlantic region that encompasses Washington, D.C., as well as the states of Delaware, Maryland,

Pennsylvania, Virginia and West Virginia. The area is known for equally harsh winters and summers. The coastal areas are susceptible to hurricanes and the western fringes of the region are prone to flooding associated with overflowing river banks during heavy rains and snow melt.

HAZUS - The Multi-hazard Loss Estimation Methodology designed for the Federal Emergency Management Agency by the National Institute of Building Sciences is a series of dynamic models based on Environmental Science Research InstituteTM geographic information systems software. This set of models is designed to predict losses due to major hazards including earthquakes, hurricane winds and flooding for purposes of risk-management planning at the regional level.

Hit – This refers to the geographical point of impact for an extreme precipitation event.

Interactive visualization - This instructional method involves the direct participation by learners in modeling. The interactive aspect of the visualization allows the learner to adapt the visual representation of her/his activity, so it can match their mental representation through awareness, metacognition, self-perception and reflexive learning in order to improve the individual or group understanding of concepts. (Clauzel, Sehaba et al. 2011)

Key informants – these are well-established members of the community knowledgeable in the subject of interest, in this study, flood risk and risk-

reduction options. They are observant, reflective, articulate, and often a bit cynical about their own culture (Bernard 2002).

Metacognition - This refers to a level of thinking that involves active control over the process of thinking that is used in learning situations. It includes planning the way to approach a learning task, monitoring comprehension, and evaluating the progress towards the completion of a task. Similarly, maintaining motivation to see a task to completion is also a metacognitive skill. Students who demonstrate a wide range of metacognitive skills are self-regulated learners who utilize the "right tool for the job" and modify learning strategies and skills based on their awareness of effectiveness. (Hartman 2001)

National GIS software DSS method - This computer-assisted decision support system (DSS) method of communicating flood risk and risk-reduction options uses FEMA HAZUS 2.0 software with a GIS-trained computer expert to adjust the equations to describe local conditions and run the practice-decision scenarios on hardware that meets HAZUS software specifications.

Natural disaster – A natural disaster is a natural phenomenon that has a negative impact on communities. A natural disaster does not exist until people and property are placed in harm's way. At this point a natural process becomes a disaster. The damage that results and the difficulties experienced in recovery are seen as functions of the strength of the agent itself and the proximity of the community to the hit. A working definition of a disaster

is an event that surpasses the ability of an individual or population to control or recover from its consequences. In this study, the “natural disaster” addressed is flooding resulting from extreme precipitation events in the mid-Atlantic region of the United States.

Realistic visualization – This computer-assisted teaching method represents scientific information using virtual reality scenarios. The intent is to add drama to the scenarios while adhering to representation of accurate scientific information. This method is thought to trigger stakeholder awareness of risk, based primarily on emotional response to the images and secondarily on cognitive absorption of the scientific information presented.

Reflexive learning - This is learning that is done "automatically" and is not filtered by the learner's preconceived opinions of the importance or usefulness of the knowledge in future decision-making. Humans, in general, cannot help but learn from their experiences, and are not able to explicitly 'unlearn' something if later it is decided that it is not worth retaining. (Selwy 2005)

Stakeholders – In this study, individuals or a group affected by past and/or potential flooding directly or indirectly through physical injury or illness, loss of life, loss of personal income and/or property, or reduced efficiency in job performance is a stakeholder.

Stakeholder-built DSS method - This computer-assisted decision support system (DSS) method of communicating flood risk and risk-reduction options was developed specifically for testing in this study. The method uses Google Earth™ maps, Google Earth™ applications, such as the Federal Emergency Management Agency National Flood Hazard Layer Keyhole Markup Language zipped file, and Google Earth™ drawing tools with computer-savvy community member(s) running the program on their own personal laptop or tablet computers. In this case, the stakeholders build their own geo-spatial model and learn through realistic interactive visualization.

Tablet computer - A general-purpose computer contained in a single panel. Its distinguishing characteristic is the use of a touch screen as the input device (PCmag.com 2011).

Vulnerability – Vulnerability to a natural disaster is a function of event frequency, event intensity and an individual or community's exposure to the event.