BACKGROUND
Data collected from dams after disasters can be used to evaluate the effectiveness of design and construction techniques; provide valuable insight into dam performance during flood conditions; and provide useful information for improving preparedness, mitigation, response, or recovery actions pertaining to the dams.

Emergency managers are also increasingly using data analysis, visualization, and reporting for measuring the effectiveness of mitigation and response/recovery efforts, thereby combining defensible analysis and methods with clear metrics to guide future pre-event preparedness measures.

DATA COLLECTION

The best time to collect data is immediately after the event, if possible, before repairs have begun or weather degradation occurs.

Examples of Actions Taken

After Hurricane Matthew, breached dams were inspected by state dam regulators, dam owners and operators, and their engineers and engineering consultants, or were assessed by various dam safety professionals. Data were collected during in-person inspections and assessments and documented with inspection and assessment reports and photographs. The types of data collected included the dimensions of the breach, high water marks in the inundated areas, and the elevation of the reservoir. In addition, visual inspections were conducted to determine the state of slopes and slope protection, vegetation on the dam, animal activity, erosion and seepage, debris blockage at gates, and appurtenant structures.
BENEFITS OF POST-EVENT DATA COLLECTION FOR DAMS

Post-event data collection provides additional insight to the dam’s design, condition, performance, and effects on downstream assets by:

- Verifying inundation models
- Updating/refining dam breach parameters
- Comparing observed width and depth of breaches to equation-based estimates
- Evaluating failure mode(s)
- Refining failure/breach analyses for developing Emergency Action Plan inundation mapping
- Obtaining water depths at the inundated areas of failed dams
- Using lessons learned to prepare for the next event
- Obtaining high water marks to help determine water surface elevations at the upstream and downstream faces or left and right abutments of breached or overtopped dams

Post-event data are especially critical for risk assessment. To be better prepared for a dam safety incident, stakeholders can improve their understanding of potential consequences of an incident, including an unplanned large reservoir storage release or failure scenario for a particular dam and the probability for a given event scenario (e.g., mechanical failure; inoperative gate or valve; trash rack or inlet clogging) at that specific dam. With this information, dam owners can develop dam-specific plans and establish memorandums of agreement so they are better prepared to respond to emergency incidents. In addition, communities can include this information in mitigation plans, land use plans, a dam-specific annex to their Emergency Operations Plan, or other documents as needed.

Dam regulators, owners, or stakeholders can also get an improved understanding of the inflows/outflows or flood events that caused failures or overtoppings to help determine hydrologic trends over time, risks, and vulnerabilities as well as to help determine adequacy of regulations, guidance, and operations.
REFERENCES AND RESOURCES

References

Resources

Useful Websites


North Carolina Department of Public Safety, Emergency Management: https://www.ncdps.gov/our-organization/emergency-management

South Carolina Emergency Management Division: http://www.scemd.org South Carolina Hurricane Matthew-Related Updates on Dams: http://www.scdhec.gov/HomeAndEnvironment/DisasterPreparedness/FloodUpdates/Matt hewDamBreaches

South Carolina Records on Breached Dams: http://www.scdhec.gov/HomeAndEnvironment/DisasterPreparedness/FloodUpdates/Faile dDamReports

Other Fact Sheets in this Dam Safety Series
Fact Sheet 1: Use of Emerging Technologies
Fact Sheet 2: Notification Methods
Fact Sheet 3: Benefits of Pre-Event Exercises and Training
Fact Sheet 4: Proactive Actions