

Purpose

This Response and Recovery (R&R) Dam Response Operations Matrix was primarily developed for stakeholder outreach, and as a reference for emergency or disaster dam-related response or recovery operations in North Carolina. This matrix can also be used elsewhere in Federal Emergency Management Agency (FEMA) Region IV or throughout the country, but only if appropriately adapted to reflect state- and county-specific information. The R&R Matrix shares information about key stakeholders and organizations that have the authority, key knowledge, or responsibilities related to dams and how they can assist prior to, during, and after a dam-related emergency or disaster event. The information presented in this matrix is general in nature and intentionally lacks specific contact information which is often subject to change.

Audience

The intended audience for this matrix includes key federal, state, local, tribal, private sector, and nonprofit entities; the audience also includes dam safety professionals or those with dam-related responsibilities or special skills. The matrix is a useful reference for dam owners, dam operators, and citizens living near reservoirs and dams.

Dam Owner Roles and Responsibility

Dams are owned and operated by individuals, private and public organizations, and various levels of government (e.g., federal, state, local, tribal). Federally owned and regulated dams are subject to the laws, regulations, and guidelines of the owner agency. The responsibility for operating and maintaining a safe dam rests with the owner. When an incident (or threat of an incident) happens at a dam, the dam owner's role is to implement the Emergency Action Plan and communicate with all necessary stakeholders to initiate and facilitate the implementation of their responsibilities.

How to Use the Response and Recovery Matrix

The intended audience should use the R&R Matrix to understand what organizational authorities exist, and how these organizations can help with dam-related response and recovery efforts, to provide organizations with information about various resources, and to facilitate interagency coordination. Acronyms are defined on pages 11 and 12.

R&R Matrix for North Carolina

The R&R Matrix for North Carolina is on the following pages, organized in alphabetical order within four sector tables: federal, state, local, and private.

Table 1: Response and Recovery Matrix for North Carolina – National and Federal

National or Federal Entity	Authority / Responsibility Relating to Dams	How Entity Can Help with Dam Incidents	Phone/Email / Website
Eastern Band of Cherokee Indians (EBCI)	The EBCI is a sovereign nation. As of 2017, there is only one dam on ECBI land. It is privately owned and regulated by the state.	The EBCI has relationships with the U.S. federal government and the North Carolina state government and fulfills similar roles as a state and/or local government would if an event occurs. It coordinates with other stakeholders and addresses dam incidents affecting EBCI land. See also State and Local Government in this matrix.	Phone: (828) 497-7000 https://ebci.com/
Federal Emergency Management Agency (FEMA) - National Dam Safety Program (NDSP)	As the lead federal agency for the NDSP, FEMA is responsible for coordinating efforts to secure the safety of dams throughout the U.S. The NDSP makes federal funds available to the states, which are primarily responsible for protecting the public from dam failures of non-federal dams, and pursuing initiatives that enhance the safety of dams posing the greatest risk to people and property. The NDSP, which encourages individual and community responsibility for dam safety, is a partnership of the states, federal agencies, and other stakeholders.	FEMA works with its partners to develop technologies to help improve dam safety. FEMA also provides financial assistance to state dam safety programs under the Water Resources Reform and Development Act of 2014. The NDSP supports states through State Assistance Grants, training, research, and public safety and awareness. FEMA coordinates partnerships through two federal organizations: the National Dam Safety Review Board (NDSRB) and the Interagency Committee on Dam Safety (ICODS).	Fact Sheet: https://www.fema.gov/media-library/assets/documents/5865 https://www.fema.gov/national-dam-safety-program
FEMA - National Response Coordination Center (NRCC)	The NRCC is a multiagency center that coordinates the overall federal support for major incidents and emergencies. The NRCC coordinates with the affected FEMA Region(s) and provides resources and policy guidance in support of the incident. NRCC staff consists of FEMA personnel, appropriate Emergency Support Functions from various federal agencies, and other appropriate personnel/agencies. The staff provides emergency management coordination, planning, and resource deployment. The NRCC collects and disseminates disaster information as it builds and maintains situational awareness.	The NRCC can request information from the Regional Response Coordination Center (RRCC) relating to dams and may also provide information or resources and support to the RRCC for dam-related emergencies and disaster efforts. Example: The NRCC coordinated with Region IV RRCC regarding dams of concern and dam breaches after Hurricane Matthew. Information obtained was included in briefs that are shared with senior leaders in FEMA, Department of Homeland Security (DHS), other federal agencies, and the White House.	Fact Sheet: https://www.fema.gov/media-library-data/1440617086835-f6489d2de59dddeba8bebc9b4d419009/NRCC_July_2015.pdf
FEMA Region IV - Dam Safety	Region IV Dam Safety acts in several capacities, as follows: 1) Liaisons between FEMA and federal, state, local, and private partners to identify and assess high-risk dams and to work with partners to develop community and regional preparedness, response, recovery, and mitigation strategies for those risks. 2) Coordinates dam risk mitigation multi-hazard planning, exercise planning and execution, and emergency operation planning and activities. 3) Works with FEMA Directorates and with federal, state, local, and private partners to develop dam risk communication and public awareness strategies. 4) Provides subject matter expertise in the FEMA RRCC and/or Joint Field Office during dam-related emergencies and disasters.	Region IV Dam Safety provides information to and coordinates with multiple organizations on dam safety, and helps identify where data gaps might exist. Because of its broad coordination with stakeholders, Region IV Dam Safety is in an excellent position to provide outreach, awareness, and resources to help organizations become more resilient to dam failures and their consequences.	Main number: 770-220-5200 https://www.fema.gov/region-iv-al-fl-ga-ky-ms-nc-sc-tn https://www.fema.gov/region-iv-about-us
FEMA Region IV - Incident Management Assistance Team (IMAT)	IMATs are made up of emergency management professionals who deploy on a moment's notice, when requested by the state, to anywhere in the Region or the country to support emergency response efforts. IMATs generally consist of 10 members with expertise in operations, logistics, planning, and recovery. The teams provide a federal presence to facilitate the management of the national response to catastrophic incidents.	The FEMA Region IV IMAT can coordinate with a wide range of organizations, as needed, to help support states or tribes during a federally declared emergency or disaster. They can mission assign other federal agencies or work through contracts to provide critical and timely support for urgent dam-related actions. IMATs rapidly deploy to an incident and work with partners across jurisdictions to support the affected state or territory. They will also help identify ways federal assistance can be used to best support response and recovery efforts during planning or for preparedness activities prior to an event.	https://www.fema.gov/incident-management-assistance-teams

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FEMA Region IV - National Preparedness	FEMA Region IV - National Preparedness oversees the coordination and development strategies necessary to prepare for all hazards within the Region. It is responsible for coordinating with the Region IV states on their Threat and Hazard Identification and Risk Assessment (THIRA) and State Preparedness Reports as well as then developing a Regional THIRA.	<p>FEMA Region IV - National Preparedness coordinates with its eight state national preparedness counterparts during their annual Training and Exercise Planning Workshops (TEPW). Exercise and training officers from Region IV and the states come together during the TEPW and have the opportunity to discuss key dam-related items of interest, training opportunities that can be carried out by the states, and dam-related scenario exercises or supplemental activities for other existing exercises that can be carried out in future workshops. After-action reports and corrective action programs resulting from these exercises are used to improve future response/recovery capabilities.</p> <p>Each state has a unique portfolio of dams that either reside in their state, or can potentially impact their state from another. States are encouraged to consider dam scenarios in the development of their THIRA.</p> <p>When State dam systems fail, the impact can overwhelm that State's capability to respond effectively and comprehensively. Consequently, States are encouraged, but not required, to include a dam scenario in their THIRA portfolios.</p> <p>FEMA Region IV - National Preparedness assists each state in evaluating and assessing the state's highest priority scenarios. The lack of a dam failure scenario in a THIRA does not indicate low priority, but more likely a lack of staff -hours to fully develop the scenario as currently prioritized.</p>	https://www.fema.gov/region-iv-about-us
FEMA Region IV - Public Assistance (PA)	Public Assistance (PA) is FEMA's largest grant program providing funds to assist communities responding to and recovering from major disasters or emergencies declared by the President. The program provides emergency assistance to save lives and protect property, and assists with permanently restoring community infrastructure affected by a federally declared incident.	FEMA processes PA grant funding according to the type of work an applicant undertakes. To be considered eligible, the work must be required as a result of the declared incident, be located in the declared area, be the legal responsibility of the applicant, and be undertaken at a reasonable cost. Eligible activities may include dam-related emergency work or permanent work (See linked Fact Sheet for more information about emergency and permanent work).	<p>Fact Sheet: https://www.fema.gov/media-library-data/1497559657642-a01f6ee60e25394fa9a25cae2fd289d5/PublicAssistanceFactSheetJune2017.pdf</p> <p>https://www.fema.gov/public-assistance-local-state-tribal-and-non-profit</p>
FEMA Region IV - Response	FEMA Region IV - Response coordinates federal emergency management response operations, response planning, logistics programs, and integration of federal, state, local, and tribal disaster programs for the eight states within Region IV.	Region IV - Response can help coordinate with many different organizations and include or incorporate dam-related information into various plans they help to develop or review, thereby ultimately improving the effectiveness of those plans as they relate to dam safety.	https://www.fema.gov/region-iv-about-us
FEMA Region IV Regional - Response Coordination Center (RRCC)	<p>FEMA's RRCCs operate within each of the 10 FEMA Regional offices in the nation. The RRCCs provide response and recovery support to each of the states and tribal governments within their respective regions.</p> <p>The Region IV RRCC functions as the interface between the North Carolina and tribal governments and the FEMA NRCC, maintaining situational awareness and executing mission objectives until a Joint Field Office opens.</p>	<p>The RRCC provides federal support for activities responding to federally declared disaster response. Additionally, it coordinates personnel and resource deployments to support disaster operations and prioritizes interagency allocation of resources.</p> <p>Example: The RRCC provided subject matter experts on dams and dam breaches after Hurricane Matthew and coordinated with each of the state dam safety programs in the impacted area. The Region IV RRCC also coordinated with FEMA's NRCC; U.S. Army Corps of Engineers (USACE); DHS-IP (Infrastructure Protection); FEMA Infrastructure; the FEMA Region IV Dam Safety liaison to the North Carolina Emergency Operations Center (EOC), University of Mississippi National Center for Computational Hydroscience and Engineering (UM-NCCHE); the Region IV GIS Resource Center, Planning, External Affairs; U.S. Department of Transportation; and other entities concerning possible dam issues following Hurricane Matthew. The RRCC submitted daily situation reports to WebEOC, a web-based emergency operations center used by federal, state, and local governments.</p>	<p>Fact Sheet: https://www.fema.gov/media-library-data/1440617086850-f6489d2de59dddeba8bebc9b4d419009/RRCC_July_2015_508.pdf</p>

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Federal Energy Regulatory Commission (FERC)	<p>FERC licenses and inspects private, municipal, and state hydroelectric projects. Approximately 3,036 dams are in the program. FERC regulates 17 hydroelectric dams in North Carolina through licenses issued to utility companies and municipalities. FERC does not own any dams.</p> <p>FERC publishes "Engineering Guidelines for the Evaluation of Hydropower Projects," which guides its engineering staff and licensees in evaluating dam safety.</p> <p>FERC has a dam safety program and provides guidance on Emergency Action Planning and exercises, coordination with emergency management, and inundation maps.</p>	<p>During and following floods, FERC staff visit dams in its program to determine the extent of damage, if any, and direct any necessary studies or remedial measures the licensee must undertake.</p> <p>FERC monitors and evaluates seismic research in geographic areas where there are concerns about possible seismic activity. This information is applied in investigating and performing structural analyses of hydroelectric projects in these potentially affected areas.</p> <p>FERC also requires licensees to prepare Emergency Action Plans (EAPs) and conducts training sessions on how to develop and test those plans.</p>	<p>Atlanta Regional Office: https://www.ferc.gov/contact-us/tel-num/regional/atlanta.asp https://www.ferc.gov/ https://www.ferc.gov/industries/hydropower/gen-info/regulation/dam-safety.asp</p>
Interagency Committee on Dam Safety (ICODS)	<p>ICODS is comprised of representatives from several federal agencies involved with dams and serves as the permanent forum for coordinating federal activities in dam safety and security. ICODS advises FEMA in setting national dam safety priorities.</p>	<p>ICODS is a federal agency advisory board to FEMA that has expertise, guidance, and resources that can help in developing federal strategies, policies, or procedures for improving response and recovery to dam-related incidents.</p>	<p>https://www.fema.gov/national-dam-safety-review-board-and-interagency-committee-dam-safety</p>
Integrated Public Alert & Warning System (IPAWS)	<p>IPAWS has no authority or responsibility specifically related to dams, but provides information helpful for response activities. IPAWS is the nation's alert and warning infrastructure.</p> <p>IPAWS provides public safety officials and federal, state, local, tribal, and territorial alerting authorities with an effective way to alert and warn the public about serious emergencies using the Emergency Alert System (EAS), Wireless Emergency Alerts (WEA), the National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other public alerting systems from a single interface.</p>	<p>IPAWS can be used to alert the public during a dam incident.</p>	<p>https://www.fema.gov/integrated-public-alert-warning-system https://www.fema.gov/media-library/assets/documents/117152</p>
Mine Safety and Health Administration (MSHA) - Dam Safety Program	<p>MSHA's Dam Safety Program regulates the safety of the numerous dams constructed and operated by the mining industry. MSHA does not own any dams.</p> <p>MSHA also publishes dam safety standards and technical guidance and conducts training in dam safety.</p>	<p>MSHA reviews and approves engineering design plans, inspects dams, and investigates construction and operation issues for dams operated by the mining industry.</p> <p>MSHA's primary concern is the safety of miners, but they also check for possible releases that would affect areas beyond the mine site.</p>	<p>https://arlweb.msha.gov/DamSafety/DamSafety.asp https://arlweb.msha.gov/DamSafety/DamSafetyTechGuidance.asp https://arlweb.msha.gov/TRAINING/2015coursecatalog.pdf</p>
National Dam Safety Review Board (NDSRB)	<p>The NDSRB, comprised of federal, state, and private sector partners, advises FEMA's Administrator in setting national dam safety priorities and assesses the effects of national policy issues affecting dam safety. The NDSRB also helps monitor performance of state dam safety programs.</p>	<p>The NDSRB is an advisory board that can help FEMA by providing expertise, guidance, and resources to develop strategies, policies, or procedures for improving response and recovery for dam-related incidents.</p>	<p>https://www.fema.gov/national-dam-safety-review-board-and-interagency-committee-dam-safety</p>
National Oceanic and Atmospheric Administration (NOAA) - National Weather Service (NWS)	<p>The NWS has no authority or responsibility specifically related to dams, but provides information helpful for planning and response activities.</p> <p>NOAA's NWS provides weather, water, and climate data. It also provides forecasts, watches, and warnings to help protect life and property and enhance the national economy.</p>	<p>The NWS provides technical advice and weather forecasts. NWS can issue dam-specific flood watches and warnings to inform the public, emergency management entities, and other cooperating agencies that flooding is possible, in progress, imminent, or highly likely.</p>	<p>http://www.weather.gov/rah/ http://www.wpc.ncep.noaa.gov/qpf/qpf2.shtml https://water.weather.gov/ahps/about/about.php http://www.wpc.ncep.noaa.gov/qpf/qpf2.shtml</p>

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NOAA - Southeast River Forecast Center (SERFC)	<p>The SERFC has no authority or responsibility specifically related to dams, but provides information helpful for planning and response activities.</p> <p>NOAA's SERFC uses research and instrumentation to provide daily weather forecasts, severe storm warnings, and climate monitoring. The SERFC is responsible for producing river forecasts for all rivers that drain into the Atlantic Ocean along the coasts of North Carolina, South Carolina, Georgia, and Florida, as well as the rivers that drain into the Gulf of Mexico from Mobile Bay to the southernmost tip of Florida.</p>	<p>The SERFC provides a wide variety of hydro-meteorological information, such as hydrographs and forecasting for river gauges in North Carolina, daily river gauge summaries and forecasts, and results from dam breach modeling tools, such as DSS-WISE Lite.</p> <p>The SERFC also coordinates with agencies such as USACE, U.S. Geological Survey (USGS), and FEMA.</p>	<p>http://www.noaa.gov/ http://www.regions.noaa.gov/secar/index.php/highlights/regional-facility-highlight-southeast-river-forecast-center/</p>
Small Business Administration (SBA)	<p>The SBA has no authority or responsibility specifically related to dams, but can help in recovery.</p> <p>Created in 1953 as an independent agency of the federal government, the SBA aids, counsels, assists, and protects the interests of small business concerns in order to preserve free competitive enterprise and to maintain and strengthen the overall economy of our nation.</p>	<p>The SBA can provide loans to repair privately owned dams that experienced disaster-related damage.</p>	<p>Fact Sheet for Hurricane Matthew in NC: http://www.sbtcd.org/hurricanemathew/pdf/SBA_Loan_Fact_Sheet.pdf https://www.sba.gov/</p>
Tennessee Valley Authority (TVA)	<p>The TVA owns, operates, and regulates its own dams. There are seven TVA-operated dams in NC.</p>	<p>TVA responds to incidents at its own dams. TVA provides state emergency management agencies, local governments, and others (as needed) with dam EAPs and dam breach inundation maps for their dams, as well as dam safety EAP tabletop exercises for each dam, per TVA's exercise schedule.</p> <p>TVA holds EAP exercises at their dams and they invite affected stakeholders to attend; as part of the exercises, TVA shows various inundation maps for potentially impacted areas. The exercises are intended to help stakeholders improve their own EAPs and risk awareness communication, as well as help improve communication and planning with stakeholders in preparation for a potential future incident, if one were to occur at one of their dams.</p>	<p>https://www.tva.com/About-TVA/TVA-in-North-Carolina https://www.tva.gov/Energy/Our-Power-System/Hydroelectric/Fontana-Reservoir</p>
U.S. Army Corps of Engineers South Atlantic Division (USACE SAD)	<p>The USACE SAD is a division of USACE that owns and self regulates its own dams throughout the nation. The USACE maintains the National Inventory of Dams for the country.</p> <p>The USACE SAD is one of nine divisions overseeing military and water resources design, construction, and operations in the U.S. and throughout the world. The USACE SAD has five districts located in Wilmington, NC; Charleston, SC; Savannah, GA; Jacksonville, FL; and Mobile, AL.</p> <p>The USACE SAD designs, builds, and operates dams, waterways, buildings, recreational, and other facilities throughout the region. The USACE SAD operates and maintains more than 6,000 miles of federal navigable channel and 29 major harbors in its region.</p>	<p>The USACE SAD can provide engineering- and dam-related support to other U.S. Army-owned and operated dams.</p> <p>Example: During a heavy rainfall event in South Carolina in October 2015, USACE was mission assigned by Region IV RRCC to fly drone missions during which video of key sites, including Beaver Dam, Forest Lake Dam, Lake Katherine Dam, and Spring Lake Dam was obtained. (FEMA 2015a, Section 5.1.4.1).</p>	<p>U.S. Army Corps of Engineers, South Atlantic Division (USACE SAD) Public Affairs: 404-562-5011 http://www.sad.usace.army.mil/ National Inventory of Dams: http://nid.usace.army.mil/cm_apex/f?p=838:12 http://www.usace.army.mil/Locations.aspx</p>
U.S. Army Corps of Engineers Wilmington District (USACE SAW)	<p>The USACE SAW is one of the five districts in USACE SAD. Refer also to USACE SAD.</p>	<p>USACE SAW can provide expertise across a wide range of disciplines related to dams, including engineering, architecture, design, construction, hydropower, recreation management, hydrology and environmental stewardship. The USACE SAW supports and serves the federal interests of our country by developing and facilitating innovative and effective solutions that meet engineering, environmental, and emergency management needs for North Carolina, the U.S. Army, and the nation.</p>	<p>U.S. Army Corps of Engineers, Wilmington District (USACE SAW) Public Affairs: 910-251-4625/4626 http://www.saw.usace.army.mil/</p>

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U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS)	<p>The USDA NRCS has assisted communities in North Carolina with the construction of 98 dams since 1954.</p> <p>NRCS also administers the Watershed Rehabilitation Program and the Emergency Watershed Protection Program.</p> <p>NRCS publishes engineering handbooks and technical supplements, including dam safety guidance. NRCS also publishes EAP guidelines and a fillable form template for EAPs.</p>	<p>The 2014 Farm Bill allocated \$250 million for watershed rehabilitation and planning to help project sponsors rehabilitate aging dams that are reaching the end of their 50-year design lives.</p> <p>USDA NRCS recently launched DamWatch, a new web-based application that provides real-time monitoring of rainfall, snowmelt, stream flow, and seismic events that could pose potential threats to dam safety.</p>	<p>https://www.nrcs.usda.gov/wps/portal/nrcs/main/nc/contact/state/ https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_064805.pdf https://directives.sc.egov.usda.gov/viewerFS.aspx?hid=41061 https://directives.sc.egov.usda.gov/viewerFS.aspx?hid=21519 https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/programs/landscape/wr/?cid=nrcs143_008448 https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/ https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/newsroom/releases/?cid=NRCSEPRD366417.</p>
USDA Farm Service Agency Emergency Conservation Program (USDA FSA ECP)	<p>The USDA FSA ECP has no authority or responsibility specifically related to dams, but can help in recovery activities.</p>	<p>The FSA ECP can assist with repairs to damaged dams that support agriculture activities.</p> <p>The USDA FSA ECP helps farmers and ranchers repair damage to farmlands caused by natural disasters and put in place methods for water conservation during severe drought by providing funding and assistance.</p>	<p>https://www.fsa.usda.gov/programs-and-services/conservation-programs/emergency-conservation/index</p>
U.S. Department of Homeland Security (DHS), Office of Infrastructure Protection (IP), Dams Sector- Specific Agency (SSA)	<p>The DHS authority and responsibility related to critical infrastructure is outlined within the National Infrastructure Protection Plan. The Dams Sector-Specific Plan provides the overall strategic direction for the Sector.</p> <p>The Dams SSA coordinates with other DHS/IP and DHS regional offices to determine and manage any response or recovery efforts.</p>	<p>The Dam SSA, under unique circumstances, has the capability to deploy dam subject matter experts to North Carolina during incidents. The Dams Sector has interdependencies with other sectors, including Communications, Energy, Food and Agriculture, Transportation Systems, and Water, and DHS is capable of coordinating among these Sectors as needed.</p> <p>The Dam SSA maintains the Homeland Security Information Network – Critical Infrastructure (HSIN-CI) Dams Portal, which is an information-sharing platform that provides situational awareness and allows Sector partners to access and disseminate sensitive, but unclassified, information among federal, state, and local agencies, as well as private sector entities.</p>	<p>https://www.dhs.gov/dams-sector https://www.dhs.gov/hsin-dams-portal e-mail: dams@hq.dhs.gov</p>
U.S. Department of Housing and Urban Development (HUD)	<p>HUD has no authority or responsibility specifically related to dams, but can help in recovery activities.</p> <p>HUD's mission is to create strong, sustainable, and inclusive communities and quality affordable homes for all.</p>	<p>HUD's Community Development Block Grant - Disaster Recovery (CDBG-DR) Program can provide grants to support a wide variety of activities, including housing redevelopment, business assistance, and infrastructure repair.</p> <p>While this program is not specifically targeted at dams, it can be used to assist communities impacted by dam-related flooding to become more resilient to future, similar events. For more information, see the <i>Sources of Federal Grant Funds for Dams and Downstream Structures in South Carolina</i>, FEMA DR-4241-SC in the references section. Many of the sources listed in this reference are also available to North Carolina.</p>	<p>Fact Sheet: https://www.hudexchange.info/onecpd/assets/File/The-Community-Development-Block-Grant-Program-Fact-Sheet.pdf https://portal.hud.gov/hudportal/HUD?src=/states/north_carolina</p>

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U.S. Geological Survey (USGS) South Atlantic Water Science Center (SAWSC)	USGS SAWSC has no authority or responsibility specifically related to dams, but provides information helpful for planning, responding, and recovering from dam incidents. USGS SAWSC coordinates with partners to provide information on streamflow, water quality, water-use, and groundwater data, and conduct hydrologic investigations and research projects.	The USGS provides support, real-time field measurements, and daily reporting of water heights in direct support of federal response operations. Advance support provided by USGS can include the installation of water level and wave height sensors and barometric pressure transducers before a storm makes landfall. Post-landfall support can include retrieving transducers; collecting high water marks (HWMs) near transducers to verify and calibrate data; taking field measurements of flood water heights; flagging HWMs and collecting evidence of flooding for flood-impacted areas and communities; and locating and recording the latitude, longitude, and elevation of HWMs to FEMA and USGS standards.	South Atlantic Water Science Center - Raleigh Phone: (919) 571-4000 dc_nc@usgs.gov https://nc.water.usgs.gov/
U.S. Nuclear Regulatory Commission (NRC) Region II	NRC does not own any dams. While the NRC's authority is limited to nuclear power plants and other civilian uses of nuclear material, dams play a role in what the NRC regulates. The NRC works with dam owners to protect nuclear plants from dam risks. The NRC participates in ICODS and works regularly with FERC to inspect water retention structures related to nuclear power plants.	NRC can participate in EAP and Emergency Operations Plan (EOP) planning, exercises, inspections, and repair of dams as they relate to nuclear power plants in North Carolina.	https://www.nrc.gov/info-finder/region-state/north-carolina.html

Table 2: Response and Recovery Matrix for North Carolina – State

State Entity	Authority / Responsibility Relating to Dam Safety	How They Can Help Relating to Dam Incidents	Phone/Email / Website
North Carolina Department of Public Safety (NC DPS) – Division of Emergency Management	The NC DPS Division of Emergency Management operates the North Carolina EOC. The Division of Emergency Management operates under a modified Incident Command System. During an event, all evacuations, Regional Coordination Centers, County Deployment Teams, and most response and recovery efforts fall under the State Emergency Response Team (SERT) Operations Section.	When local government resources are exhausted or a needed capability does not exist during an event, the local government can call the NC EOC for assistance. NC DPS uses North Carolina's State Preparedness and Resource Tracking Application (NCSPARTA) for disaster and emergency management operations. NCSPARTA is used not only to help coordinate information and resources, but also to help track costs incurred from internal and external sources throughout an event, beginning at the state EOC activation phase using the NCSPARTA Finance-Incident Expenditure board.	Phone: (919) 825-2500 Phone: (800) 858-0368 https://www.ncdps.gov/Emergency-Management/EM-Community/Directories/Counties https://www.ncdps.gov/Emergency-Management/EM-Community/Plans-Guides https://www.ncdps.gov/
NC DPS – Emergency Management, Risk Management Section (NCEM-RM)	NCEM-RM runs programs that provide current, accurate information for North Carolina communities and property owners to make sound siting and design decisions when rebuilding after flooding disasters, when building new structures and infrastructure, and when retrofitting existing structures. Two of the dam-related programs run by NCEM-RM are the NC Floodplain Mapping Program (NCFMP) and the NC Flood Inundation Mapping Alert Network (NC FIMAN). NCFMP conducts flood hazard analyses and produces updated, digital Flood Insurance Rate Maps. NC FIMAN program provides rain and stage gage data, flood inundation maps, flooding maps, and alerts in real-time to support risk-based decisions regarding flooding.	NCEM-RM support includes providing supplemental geospatial information and analyses such as sharing LiDAR data terrain datasets and performing dam breach modeling. NCEM-RM supplies detailed dam breach information to NC DPS, including digital copies of inundation mapping from North Carolina dam EAPs, where available. NCEM-RM provides a dam safety supporting role to NC Department of Environmental Quality (NC DEQ) Division of Energy, Mineral, and Land Resources (DEMLR), which is the lead agency for dam safety for the SERT.	https://rmp.nc.gov/portal/ http://www.ncfloodmaps.com/ https://fiman.nc.gov/fiman/ http://fris.nc.gov/fris/

Table 2: Response and Recovery Matrix for North Carolina – State

State Entity	Authority / Responsibility Relating to Dam Safety	How They Can Help Relating to Dam Incidents	Phone/Email / Website
North Carolina Department of Health and Human Services, Division of Public Health (NC DHHS DPH)	The NC DHHS DPH has no authority or responsibility specifically related to dams, but has the responsibility of protecting public health in disaster situations such as disease epidemics, chemical and radiological releases, severe weather, and natural disasters.	The NC DHHS DPH provides both local support and expertise to public health officials across the state.	http://publichealth.nc.gov/
North Carolina National Guard (NCNG)	<p>The NCNG has no authority or responsibility specifically related to dams, but has responsibilities related to disaster response.</p> <p>The National Guard is an element of the U.S. military; one of their purposes is to respond to domestic emergencies. Each state has its own National Guard.</p> <p>The NCNG can be activated by the Governor for a state-related mission, or be activated by the President of the United States for a federal government mission to respond to emergencies or disasters.</p>	<p>The NCNG's Always Ready-Ready Team deploys military capabilities in support of state and/or national authorities.</p> <p>Example: The NCNG helped local fire departments evacuate the population in dam breach inundation zones after Hurricane Matthew. It also helped place sand bags, at the direction of NC DEQ DEMLR, in order to reduce erosion and scour at damaged dams.</p>	http://nc.ng.mil/Pages/default.aspx
North Carolina Department of Environmental Quality, Division of Energy, Mineral, and Land Resources, Dam Safety (NC DEQ DEMLR)	<p>The NC DEQ DEMLR administers North Carolina's State Dam Safety Program and provides oversight for more than 3,000 dams statewide. The NC DEQ DEMLR strives to prevent property damage, personal injury, and loss of life from dam failures.</p> <p>The NC DEQ DEMLR participates in annual dam safety inspections and keeps records of EAPs and safety information for each regulated dam.</p>	<p>The NC DEQ DEMLR performs pre-event risk reduction actions, including: inspecting dams with known drainage or structural issues documented in a Notice of Deficiency (NOD), reviewing existing hydrologic and hydraulic studies on dams with NODs to develop a priority list of concerns before hazard events, and requiring dam owners to drain reservoirs until deficiencies are remedied.</p> <p>During a dam incident, the NC DEQ DEMLR can perform dam inspections, support dam operators in determining emergency levels, and approve remedial actions. The NC DEQ DEMLR serves as the lead entity for dam safety in the SERT.</p> <p>Example: Following the activation of the NC EOC in response to Hurricane Matthew, NC DEQ DEMLR personnel were deployed as liaisons to the EOC. As a pre-event risk reduction action, the NC DEQ DEMLR called owners of dams with known drainage or structural issues to discuss actions needed for the incoming hurricane. NC DEQ DEMLR staff also coordinated emergency response actions to reduce the risk of breach at damaged dams with other state agencies, FEMA, DHS-IP, and others.</p>	<p>Dam Emergency Contact: 1-800-858-0368 or 919-707-9220</p> <p>https://deq.nc.gov/about/divisions/energy-mineral-land-resources/energy-mineral-land-permits/dam-safety</p> <p>https://deq.nc.gov/</p>
North Carolina Department of Transportation Division of Highways (NCDOT)	<p>The NCDOT has no authority or responsibility specifically related to dams, but has responsibilities related to roads that are impacted by dams.</p> <p>The NCDOT coordinates transportation resources and oversees the assessment and reconstruction of the transportation infrastructure; clears all debris from state-maintained roadways; repairs damaged roads, bridges, and culverts; and maintains the NCDOT web page to show the latest update on road openings and closings.</p>	<p>The NCDOT is responsible for dispatching personnel when roadways become unsafe. During an emergency in which roadways unexpectedly become unsafe, local law enforcement should be notified immediately so they can implement the appropriate public safety measures. They will contact NCDOT to dispatch necessary personnel.</p> <p>The NCDOT also assists with mass evacuation plans on state roads when activated (for example, the NCDOT I-40 Reversal Plan).</p>	https://www.ncdot.gov/
North Carolina Department of Public Instruction (NC DPI)	The NC DPI has no authority or responsibility specifically related to dams, but has responsibilities related to disaster response, specifically that of providing sheltering and support for mass care.	In a disaster event, schools are often used as temporary shelters.	http://www.dpi.state.nc.us/

Table 2: Response and Recovery Matrix for North Carolina – State

State Entity	Authority / Responsibility Relating to Dam Safety	How They Can Help Relating to Dam Incidents	Phone/Email / Website
North Carolina Mutual Aid System (NC DPS)	The Mutual Aid System, which operates as part of the NC DPS, is a voluntary agreement among North Carolina municipalities to share resources during a disaster. All 100 counties, the Eastern Band of Cherokee Indians, and nearly three-fourths of the 650 municipalities in North Carolina have signed the Mutual Aid Agreement.	The Mutual Aid Agreement can be activated to support emergency and disaster response and recovery.	Contact NCEM Exercise Officer: (919) 825-2772 ncmutualaid@ncdps.gov
North Carolina State Highway Patrol (NC DPS)	The State Highway Patrol has no authority or responsibility specifically related to dams, but has responsibilities related to disaster response. The State Highway Patrol, part of NC DPS, provides security and law enforcement as needed or in support of state and local requests, requirements, and coordination.	The State Highway Patrol can help facilitate mass evacuations or help provide or augment security and law enforcement at the state and local level, as coordinated through state and local EOPs, and as requested through the state and local EOCs.	https://www.ncdps.gov/Our-Organization/Law-Enforcement/State-Highway-Patrol/Troop-Offices
North Carolina Department of Justice (NCDOJ) - State Police Department	The State Police Department has no authority or responsibility specifically related to dams, but has responsibilities related to disaster response.	Police departments provide security and law enforcement and can help or be heavily involved with evacuations, depending upon their role as determined in the state and local EOP and evacuation plans.	http://ncja.ncdoj.gov/Criminal-Justice-Links/NC-Police-Departments.aspx

Table 3: Response and Recovery Matrix for North Carolina – Local

Local Entity	Authority / Responsibility Relating to Dams	How They Can Help Relating to Dam Incidents	Phone/Email / Website
County Sheriff	County sheriff departments have no authority or responsibility specifically related to dams, but may support disaster response. County sheriffs are responsible for providing security for the courts; the service of civil process; enforcing federal, state, and local laws; aiding other law enforcement agencies in areas of mutual interest; and assisting other emergency service agencies to protect the lives and property of citizens and visitors.	County sheriffs can participate in the development of EOPs, including dam-specific annexes to EOPs. They may also participate in EOP activation and may be able to help with evacuations at a local level. The Sherriff's Department can help with mass evacuations or help provide or augment security and law enforcement at the local level, as planned in the EOP or as coordinated through the local EOC. If additional security or law enforcement is needed, local sheriff departments can request additional support through their appropriate law enforcement channel or through the local EOC. Such support may be coordinated through the state EOC or through mutual aid agreements, as needed.	http://ncsheriffs.org/sheriffs
Local Emergency Management	Local emergency management departments have no authority or responsibility specifically related to dams, but have responsibilities related to disaster response. Local emergency management staff can facilitate emergency preparedness planning for a community, working with local departments, support agencies, municipalities, the military, businesses and industry as well as citizens to identify specific responsibilities before, during, and after major emergencies. This is accomplished by identifying the community's hazards, identifying resources and capabilities, conducting preparedness briefs, and developing and exercising emergency operations plans, including dam-specific annexes to the local EOP.	During an emergency, local emergency management staffs the EOC as needed to provide leadership and coordination to respond to various requests for assistance. Local emergency management departments operate the local EOC and help coordinate local efforts amongst numerous government, non-profit, key business, or other organizations as needed to effectively respond to an emergency, disaster, or incident. Local emergency management helps request additional resources through the state EOC or through mutual aid agreements as might be needed in carrying out their EOP in response operations. Local emergency management departments can provide training and educational programs for emergency response agencies, business and industry, and the general public. These programs can cover such topics as hazardous materials response, search operations, incident command, radiological events, mitigation, or recovery operations.	

Table 3: Response and Recovery Matrix for North Carolina – Local

Local Entity	Authority / Responsibility Relating to Dams	How They Can Help Relating to Dam Incidents	Phone/Email / Website
Local Government Engineering Capability	<p>Local engineering departments have no authority or responsibility specifically related to dams, but have responsibilities related to disaster recovery.</p> <p>Local communities are organized in many different ways related to how they employ engineers and in which departments they are located.</p>	<p>Local government engineers might be able to help support emergency remedial actions for dams during incidents. Engineers working for local governments may also be able to help local leadership better understand risks, vulnerabilities, and consequence assessments of dams, thereby helping to improve various plans used by locals for dam incidents. The EOP should coordinate in advance, with local government engineering resources to best utilize their skillsets during an emergency, disaster or incident.</p>	
Local Fire Department	<p>Local fire departments have no authority or responsibility specifically related to dams, but have responsibilities related to disaster response.</p> <p>Local fire departments respond to emergencies including fires, medical emergencies, vehicle accidents, hazardous materials incidents, and technical rescues. Additionally, they often provide outreach and education.</p>	<p>Local fire departments can often help with evacuations at a local level. Support can be requested based on a pre-arranged emergency management assistance compact or through local memorandums of understanding by other organizations to help with their evacuations.</p> <p>Local fire departments are often well versed and trained in the Incident Command System (ICS) and often act as Incident Commanders for a wide variety of incidents.</p>	<p>http://www.carolinasfirepage.com/members/nc_ctys.html</p>
Local Planning Department	<p>Local planning departments have no authority or responsibilities specifically related to dams, but have responsibilities related to disaster planning and risk reduction.</p> <p>Local planning departments coordinate mitigation plans and planned development to reduce risks associated with dams.</p>	<p>Local planning departments have community information that is critical for understanding the consequences and vulnerabilities from a potential dam failure. This information should be shared with local agencies that oversee local zoning, development, mitigation, and emergency management plans; these agencies in turn provide important information to those who need to take action to help reduce risks associated with dam failures.</p>	
Local Police Department	<p>Local police departments have no authority or responsibility specifically related to dams, but may support disaster response.</p> <p>Local police are responsible for enforcing federal, state, and local laws; aiding other law enforcement agencies in areas of mutual interest; and assisting other emergency service agencies to protect the lives and property of citizens and visitors.</p>	<p>Local police can participate in the development of EOPs, including dam-specific annexes to EOPs. They may also participate in EOP activation and usually help with evacuations at a local level. Local police can help with mass evacuations or help provide or augment security and law enforcement at the local level, as planned in the EOP or as coordinated through the local EOC.</p> <p>If additional security or law enforcement is needed, local police departments can request additional support through their appropriate law enforcement channel or through the local EOC. Such support may be coordinated through the state EOC or through mutual aid agreements, as needed.</p>	
Local Radio/TV Stations	<p>Local radio and TV stations have no authority or responsibility specifically related to dams, but can support disaster response.</p> <p>Many local radio, television, and cable stations are part of the North Carolina Emergency Alert System that sends out key information during emergencies such as dam incidents.</p>	<p>Local radio and television stations provide coverage and up-to-date information on developing situations and emergency notifications. Local media can distribute important information and key messaging provided by the state and local EOCs to help get it out to the public as quickly as possible.</p>	<p>http://www.nws.noaa.gov/nwr/Maps/PHP/NC.php http://www.weather.gov/rah/nwr#stations https://www.ncdps.gov/Emergency-Management/Emergency-Communications</p>

Table 4: Response and Recovery Matrix for North Carolina – Private Entities and Non-Governmental Organizations

Private Entity/Non-Governmental Organization	Type of Entity	How They Can Help Relating to Dam Incidents	Phone/Email / Website
Association of State Dam Safety Officials (ASDSO)	ASDSO is a national non-profit organization serving state dam safety programs and the broader dam safety community, which includes federal dam safety professionals, dam owners and operators, engineering consultants, emergency managers, manufacturers, suppliers, academia, contractors, and others interested in improving dam safety.	ASDSO promotes dam safety awareness and provides resources and contacts related to dams in North Carolina. ASDSO supports the state dam safety program by promoting innovative approaches to funding dam rehabilitation at the state and federal levels; increasing public awareness of the role of dams in society, the risks they present, and the importance of dam safety and preparedness; and advocating for laws, policies, and government programs that serve to improve the safety of dams and reduce the risk to the public.	http://damsafety.org/north-carolina
American Red Cross – North Carolina	The American Red Cross is a nationwide humanitarian organization.	The American Red Cross helps by providing emergency assistance and disaster relief including emergency food and shelter.	http://www.redcross.org/nc/camp-lejeune http://www.redcross.org/local/eastern-north-carolina http://www.redcross.org/nc/fort-bragg http://www.redcross.org/local/north-carolina/western-north-carolina
Salvation Army – North Carolina	The Salvation Army is a nationwide religious organization. It is the evangelical part of the Universal Christian Church.	The Salvation Army operates 7,546 centers in communities across the U.S. Programs and can aid by providing disaster relief and food distribution.	https://www.salvationarmycarolinas.org/
North Carolina Emergency Management Association (NCEMA)	The NCEMA is a professional organization for emergency managers in North Carolina.	Each year, NCEMA hosts spring and fall conferences during which participants share best practices related to emergency management and build relationships with their peers. Its members strive for the constant improvement of standards, practices, and effectiveness of emergency management activities in North Carolina. The members collect and disseminate helpful information concerning matters related to emergency management and coordinate communications among federal, state, and local emergency management partners.	http://www.ncema.net/
American Planning Association (APA) – North Carolina Chapter	The APA is a nationwide professional organization for planners.	The North Carolina chapter of the APA can provide contact information for North Carolina planners. Professional planners may be able to help with outreach and training in North Carolina for developing plans incorporating dams for community planning, zoning or others for improving community resilience or reducing vulnerabilities from dams that can help inform preparedness, mitigation, operations, EOPs or other plans.	http://apa-nc.org/
North Carolina Association of Floodplain Managers (NCAFPM)	The NCAFPM is a nonprofit organization consisting of planners, engineers, land surveyors, building inspectors, zoning officials, community officials, emergency management coordinators, private sector individuals, and companies with an interest in floodplain management and the National Flood Insurance Program.	The NCAFPM can provide outreach and education about floodplain management and facilitate cooperation and exchange of information among various related private organizations; individuals; and federal state, and local, agencies.	http://www.ncafpm.org/
American Society of Civil Engineers (ASCE) - North Carolina Section	The ASCE is a nationwide professional organization for engineers.	The North Carolina Section of the ASCE can provide contact information for North Carolina engineers.	http://www.ascenc.org/
State-Licensed Engineers (dam, structural, geotechnical, water resources)	Not applicable.	Engineers licensed in North Carolina can provide engineering services.	https://www.membersbase.com/ncbels/search

Table 4: Response and Recovery Matrix for North Carolina – Private Entities and Non-Governmental Organizations

Private Entity/Non-Governmental Organization	Type of Entity	How They Can Help Relating to Dam Incidents	Phone/Email / Website
State-Licensed Surveyors	Not applicable.	Surveyors licensed in North Carolina can provide surveying services.	https://www.membersbase.com/ncbels/search
Local Geographic Information System (GIS) Specialists	Not applicable.	Local GIS specialists in North Carolina can provide technical services assisting with inundation and evacuation mapping for dams.	-
Civil Air Patrol, North Carolina Wing (NCWG CAP)	The Civil Air Patrol (a U.S. Air Force Auxiliary) is a nationwide, volunteer public service organization that carries out emergency service missions. North Carolina is served by the NCWG CAP.	The NCWG CAP can help with disaster response efforts such as aerial dam assessment and monitoring, data gathering for damage assessments, and search and rescue missions for small- or large-scale events. Local emergency managers needing Civil Air Patrol support can make their request through the state EOC watch center or online via their Web-Based Emergency Operations Center (WebEOC) system (called North Carolina's State Preparedness and Resource Tracking Application [NCSPARTA]). FEMA often mission assigns CAP to perform aerial damage assessments to help with disaster operations.	https://www.ncwgcap.org/ https://www.ncwgcap.org/index.cfm?fuseaction=page.display&pageid=53
Community Emergency Response Teams (CERT)	The CERT program trains volunteers in basic disaster response skills. The program is part of Citizen Corps, a citizen program coordinated by the federal government.	The CERT program trains citizens on disaster response and recovery skills designed to assist when public safety resources are otherwise unavailable during a disaster.	https://www.fema.gov/community-emergency-response-teams

Acronyms

APA	American Planning Association
ASCE	American Society of Civil Engineers
ASDSO	Association of State Dam Safety Officials
CDBG-DR	Community Development Block Grant - Disaster Recovery
CERT	Community Emergency Response Teams
DHS	U.S. Department of Homeland Security
EAP	Emergency Action Plan
EAS	Emergency Alert System
EBCI	Eastern Band of Cherokee Indians
ECP	Emergency Conservation Program (USDA FSA)
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
FEMA	Federal Emergency Management Agency (DHS)
FERC	Federal Energy Regulatory Commission
FIMAN	Flood Inundation Mapping Alert Network
FSA	Farm Service Agency (USDA)
GIS	Geographic Information System
HSIN-CI	Homeland Security Information Network – Critical Infrastructure
HWM	High Water Mark
ICODS	Interagency Committee on Dam Safety
ICS	Incident Command System
IMAT	Incident Management Assistance Team (FEMA)
IP	Office of Infrastructure Protection (DHS)
IPAWS	Integrated Public Alert and Warning System
LiDAR	Light Detection and Ranging
MSHA	Mine Safety and Health Administration (U.S. Department of Labor)
NC DEMLR	North Carolina Division of Energy, Mineral, and Land Resources
NC DEQ	North Carolina Department of Environmental Quality
NC DHHS DPH	North Carolina Department of Health and Human Services, Division of Public Health
NC DPI	North Carolina Department of Public Instruction
NC DPS	North Carolina Department of Public Safety
NCAFPM	North Carolina Association of Floodplain Managers
NCDOJ	North Carolina Department of Justice

NCDOT	North Carolina Department of Transportation
NCEMA	North Carolina Emergency Management Association
NCEM-RM	North Carolina Emergency Management, Risk Management Section (NC DPS)
NCFMP	North Carolina Floodplain Mapping Program
NCNG	North Carolina National Guard
NCSPARTA	North Carolina's State Preparedness and Resource Tracking Application
NCWG CAP	Civil Air Patrol, North Carolina Wing
NDSP	National Dam Safety Program
NDSRB	National Dam Safety Review Board
NOAA	National Oceanic and Atmospheric Administration (U.S. Department of Commerce)
NOD	Notice of Deficiency
NRCC	National Response Coordination Center
NRCS	Natural Resources Conservation Service (U.S. Department of Agriculture)
NWS	National Weather Service (NOAA)
PA	Public Assistance (FEMA)
R&R	Response and Recovery (FEMA)
RRCC	Regional Response Coordination Center (FEMA)
SAWSC	South Atlantic Water Science Center (USGS)
SBA	Small Business Administration
SERFC	Southeast River Forecast Center (NOAA)
SERT	State Emergency Response Team
SSA	Sector- Specific Agency (DHS)
TEPW	Training and Exercise Planning Workshops (FEMA Region IV)
THIRA	Threat, Hazard Identification and Risk Assessment
TVA	Tennessee Valley Authority
U.S. HUD	U.S. Department of Housing and Urban Development
U.S. NRC	U.S. Nuclear Regulatory Commission
USACE	U.S. Army Corps of Engineers
USACE SAD	U.S. Army Corps of Engineers, South Atlantic Division
USACE SAW	U.S. Army Corps of Engineers, Wilmington District (USACE SAD)
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
WEA	Wireless Emergency Alerts
WebEOC	web-based emergency operations center

Resources

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