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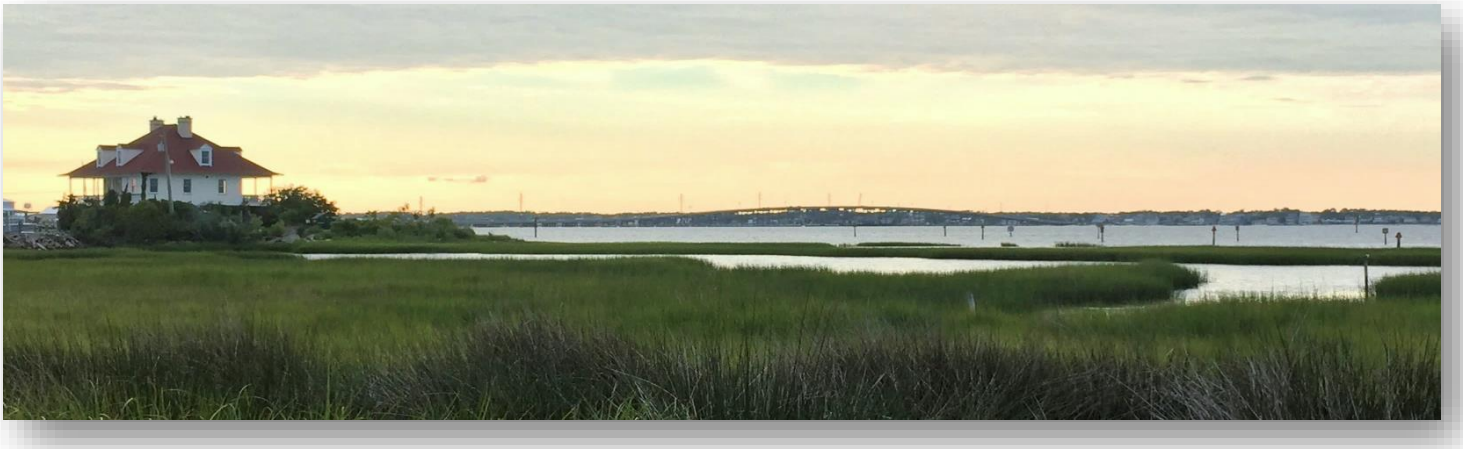
NORTH CAROLINA OFFICE OF RECOVERY AND RESILIENCY

DEPARTMENT OF PUBLIC SAFETY



NATURAL HAZARDS RESILIENCE

A QUICK START GUIDE FOR NORTH CAROLINA COMMUNITIES

North Carolina Office of Recovery and Resiliency,
a division of the North Carolina Department of Public Safety

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Purpose

This Quick Start Guide is intended to help North Carolina communities better plan for natural hazards and changing conditions, including climate change, by incorporating the concepts of *resilience* into the work they already do. Every day, North Carolina communities are deciding what projects to build, what plans to prioritize, what dollars to spend. Harnessing that effort and those resources toward building a more resilient North Carolina benefits us all.

Introduction

Resilience to natural hazards and climate change is key to a prosperous and thriving future for North Carolina. In recent years, the state has survived devastating hurricanes, fought wildfires from the coast to the mountains, and recovered from severe tornadoes. Not only that, drought poses a risk to agriculture and to water supplies, and heat waves threaten people's health from city-dwellers to farm-workers. If communities do not build their resilience now, it will become harder and more expensive to recover in the future. A major 2018 study shows that a dollar invested in hazard mitigation yields six dollars in benefits over time.

> *"Disaster resilience is everyone's business and is a shared responsibility among citizens, the private sector, and government."*
>
> – National Academies of Science

Local officials want to improve the resilience of their communities. But what exactly does advancing resilience look like? This guide will introduce you to the concept of resilience and provide guidance on integrating resilience into the work local officials do every day. You may find that your work in local government is already contributing to resilience in your community. For those communities ready to take the next step, the final section of this guide provides guidance on initiating resilience efforts.

What Is Community Resilience?

Community resilience can mean different things to different people. The U.S. Climate Resilience Toolkit defines resilience as "the capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption." A resilient community is one that can rebound, adjust, and thrive amid changing conditions and challenges. Resilience is more than being able to rebuild after a disaster. It means being able to "bend but not break" or to "bounce forward, rather than bounce back."

When North Carolina experiences a natural disaster, one of the primary goals is to recover *stronger* than before. Resilience reminds us strength comes from many places. Strength comes from the buildings and infrastructure that protect us, but also from the public and private services that support our day-to-day lives. Strength also comes from leadership inside and outside of government, from the health and well-being of residents, and from the condition of the land, air, and water that shape our cities and towns. These ideas are not new; but the concept of resilience reveals their importance to how communities function.

This guide uses three components of resilience—preparedness, connectedness, and adaptability—to show what hazards and climate resilience look like in a community.

Preparedness

To become more resilient, communities need to be prepared for rapid onset events like hurricanes and wildfires as well as chronic stressors like high heat, drought, and sea level rise. In many ways, being prepared is the complement to hazard mitigation, defined as "the effort to reduce loss of life and property by lessening the impact of disasters" (FEMA). Preparedness requires communities to identify, assess, and reduce the impact of hazards on residents and the local built environment. Some of the ways our communities can prepare include: learning about current and future climate risks, building and maintaining appropriate infrastructure and adequate housing stock, sustaining emergency management capacity, promoting and holding insurance policies, guiding infrastructure extension and new development away from risk-prone areas, and making land use decisions that prioritize the safety of all. Beyond historical hazard mitigation strategies, resilience also urges us to approach preparedness in some less traditional ways. Climate resilience requires us to consider longer time horizons when making decisions. For example, a stormwater treatment facility adequate for today's rainfall may be routinely overloaded in 30 years, when rainfall events have intensified and future upstream development has increased runoff.

Building and maintaining adequate housing stock is one example of how communities can become more resilient and prepare for future disasters.

Another way to build resilience through preparedness is by actively considering the failure of one or more systems that serve a community. For example, if an evacuation route is blocked by wildfire, how else will residents be able to leave or stay safely? Resilience requires many layers of protection in place.

Connectedness

Resilient communities rely on their connectedness to get things done in good times and in hard times. This capacity is built on the ability to collaborate across agencies, organizations, and other institutions of civic life. Communities that organize to face disasters, recovery, or climate change also benefit from a greater ability to determine their own futures instead of waiting for external aid, which can take a long time and can come with specific rules and limitations.

Connectedness also means that communities ensure no one is left behind by efforts to prepare for disasters or the uncertainty of the future. A resilient community supports its vulnerable populations, like senior citizens, children, immigrants, people with disabilities, and low-income households. A rule of thumb is that when strategies empower and build the resilience of the most vulnerable populations, the rest of the population benefits, too. For example, emergency shelters accessible to people who use wheelchairs are also accessible to people using strollers and safer for medical rescue staff who need to carry a stretcher. Everyone is better off when no one is left behind.

Adaptability

To become more resilient, communities should have multiple ways to achieve their goals. Resilient communities can be flexible about which approach might work best depending on the circumstances. When faced with a challenge, having more than one option is helpful, and combining those options sometimes yields the best results of all.

Flexible land use management allows for constructed wetlands as a stormwater and flood control measure, an example of local policy that helps build community resilience.

What does this look like? From a flood management perspective, it may mean conserving land to slow runoff and absorb floodwater, instead of relying on levies and dams alone. For transportation, it means offering people multiple ways to get around, by better connecting roads and sidewalks and providing quality transit services. From a social work perspective, it means finding as many sources of support for your client as possible, from family and friends to social services and houses of worship. These are all examples of how a resilient community or system provides options; if one option becomes unavailable, there are always others to fall back on.

A special note about leadership

Resiliency comes from many sources. You do not need to be an elected official or a full-time community leader to help your community become more resilient. One of the most important things you can do to help build resilience is to share your ideas about becoming prepared, connected, adaptable, and

resilient. Resilience champions within a community are much more effective than resilience champions from outside a community who are less likely to know the people and place as well as those who live and work there.

Incorporating Resilience Today

The easiest path to building resilience in a community is to incorporate these components of resilience—**preparedness, connectedness, and adaptability**—into work that is already performed every day. Here are some ideas for steps you can take to build your community's resilience, whether your office already talks about climate change or you are the only person in the building who thinks about natural hazards. You may find that you are already doing a lot to help your community become resilient.

Learn

Understand both how past weather events have impacted your community and the future trends for these events. Assess your community's level of preparedness for past and future risks.

- Find your local or regional hazard mitigation plan and participate in updates to that plan. The easiest way to find your plan is to search the Internet for "[Your town/county name] hazard mitigation plan."
- Find your organization's continuity of operations plan and read it – or advocate for the development of one if your organization does not have one.
- Learn about the current risks and future conditions your community may face. North Carolina will be releasing its own assessment of what we know about future climate conditions in March 2020. Another good source is the National Climate Assessment chapter on the Southeast.
- The North Carolina Flood Risk Information System can help you understand the flood risk of particular properties. Flood.nc.gov provides additional property-specific information about flood hazards, like an estimate of flood insurance rates and potential building-level mitigation measures.
- Learn about how climate change could affect the area you work in, whether it is health, roads, parks, schools, public safety, planning, or any other profession. For example, more extreme

Partnering with nonprofits, faith-based groups, government agencies, councils of government and other organizations gets community members involved in building resilience.

heat waves could impact residential and commercial energy needs. Longer droughts broken by more extreme rainfall events could require greater drinking water storage capacity.

- ❖ Learn about resilience best practices in your area through online research, conferences, industry associations, webinars, connecting with experts, or e-newsletters.
- ❖ Ask about and maintain hazard insurance on public assets you manage. Flood hazard insurance typically has to be purchased separately from all-hazard insurance.
- ❖ Assess water storage capacity for future drought conditions and enhance capacity if needed.

Connect

Strong community connections are critical for resilience. The following suggestions for building connections center on the issues of climate, hazards, and resilience, but relationships built on a shared focus on some other issue will also contribute to resilience. Likewise, there are a variety of messages and languages that might be good ways to reach residents in your community – do not feel limited by the language of climate change.

- ❖ Communicate with the public about hazards and resilience. For example, increase awareness about heat health hazards and encourage residents to check in on one another during heat waves. Educate property owners on landscaping practices that protect against wildfire. Use existing mechanisms for community outreach or create new ones.
- ❖ Participate in the update cycle of your area's Comprehensive Economic Development Strategy, which includes provisions for resilience and makes an area eligible for federal Economic Development Administration funding for infrastructure projects. Typically, these strategies are developed by councils of government, so check with yours to learn more.
- ❖ Participate in the next update cycle of your local or regional hazard mitigation plan.
- ❖ Strengthen connections with other staff members in relevant departments, for example, by setting up a work group to discuss cross-cutting natural hazards or climate change issues.
- ❖ Establish or strengthen relationships with your counterparts in nearby municipalities or counties. Determine whether there are efficiencies or other advantages to greater collaboration. For example, increasing the size of a culvert in one community might be coordinated with culvert upgrades in a downstream community, so flooding does not just transfer from one place to the other. Likewise, two or more communities might collaborate on a project to expand one stormwater retention facility that will reduce flooding in multiple communities.
- ❖ Establish and strengthen relationships with external organizations that may be able to provide technical assistance or funding for improving resilience. For example, set up a meeting with your regional council of government, a statewide nonprofit, a local foundation, or a community college program, even if there is no specific project in mind. These relationships form a basis for working together when opportunities for improving resilience arise.

- Offer educational programs to the public about understanding risk, evacuation zones, and preparation techniques.
- Provide outreach to homeowners and homeowners' associations on steps to reduce personal and community impacts of hazards, like redirecting downspouts away from pavement.

Avoid future suffering

- Discourage or prohibit new development in the floodplain. After a flood, it is easy to identify developments that were permitted in a high-risk location. Identify places that may be at risk of future floods and work toward solutions to limit future infrastructure liability and protect future public safety.
- After a flood, structures with substantial damage (damage that exceeds 50 percent of the value of the home) are typically required to be rebuilt to current code, even if they were originally built under different standards. Sometimes inspectors are reluctant to declare a structure "substantially damaged" because it may create additional work and expense for the owner. But, zoning and building codes exist to protect the health and safety of occupants. A more resilient approach is to help public and private building owners access all recovery resources for which they may be eligible by working with NC Emergency Management, NC Office of Recovery and Resiliency, and FEMA.

Swan Quarter is protected from storm surge by a dike.

- Many pieces of information that affect flooding are not included in floodplain maps, such as stormwater infrastructure. Remember *low risk* is not *no risk*, and anywhere can flood. Look for ways across your community to elevate structures above known past flood levels.
- Find out if your community participates in the Community Rating System, a program that recognizes and encourages community floodplain management activities that exceed the minimum National Flood Insurance Program (NFIP) requirements. Due to the higher standards used in these areas, flood insurance premiums are discounted to reflect the reduced flood risk.
- Encourage all residents located in and near flood risk areas to purchase flood insurance. Structures do not need to be located in the floodplain to get insurance. Sadly, the vast majority of North Carolina homes damaged in recent hurricanes were outside the regulated floodplain.
- Identify how you could do your job if power fails for 72 hours.
- Ensure that you and your family have an adequate disaster supply kit.
- Increase soil stability on publicly owned lands with steep slopes or rainwater runoff through vegetation and limits on grading.

Invest and upgrade wisely

Local governments are entrusted with spending taxpayer dollars. Safeguarding existing and future investments from hazards helps ensure these investments will continue to pay out for years to come.

- Limit new capital projects in high-risk areas. Where risky locations cannot be avoided, minimize risks through actions like elevating structures above the highest known or projected flood levels, designing for excess stormwater capacity, or building to FORTIFIED standards for wind.
- Determine whether access to facilities you run could be cut off by flood, fire, or landslide. Are there any secondary ways to access it? If not, develop one or more.
- Locate future critical infrastructure where it will be easy to access via existing transportation networks and served by utility infrastructure service crews.
- Upgrade the resilience of public facilities by investing in back-up generators.
- Ensure all public facilities have adequate climate control.
- Develop programs to offer climate control equipment (fans or air conditioning) at discount to sensitive populations.
- Consider climate change over the entire predicted lifespan of an asset, like a bridge or a wastewater treatment facility. Design and build – or upgrade – the asset to withstand future conditions.
- Invest in projects that provide multiple benefits. A project that provides flood protection and supports clean drinking water, natural habitats, or outdoor recreation is better than a project that only accomplishes one of these goals.

Plan for resilience by ensuring that there are routes to access infrastructure facilities during and after a disaster.

Integrate

Right now, communities across the state are implementing programs and approving projects that could, with some minor changes, provide more protection to their communities and be more resistant to damage in the event of a hurricane, flood, wildfire, or other natural disaster.

- Include flood hazards into any mapping your community does. At a minimum, this includes adding the FEMA regulatory floodplain maps. Communities may want to consider additional analysis to identify and map areas of potential flood hazard outside of the FEMA floodplains, such as areas around streams that FEMA does not include in regulatory maps.
- Integrate resilience into your land use or comprehensive plan. Land use planning is consistently described as the most effective opportunity to protect your community from hazards.

- Add a consideration of hazards and climate change in your capital improvement plan, to protect your investments from impacts.
- Adopt ordinances that protect and enhance your natural defenses from flooding and landslides, like riparian corridors, wetlands, and vegetation on steep slopes.
- Ask developers who are seeking permits to submit information about the exposure of their site to hazards and the steps that will be taken to mitigate losses.
- Identify climate hazards in your long-range transportation plan and in your Transportation Improvement Program.
- Metropolitan and rural transportation planning organizations can award points to potential projects in the Transportation Improvement Program that reduce stormwater runoff, capture it on site, or otherwise reduce or avoid the effects of hazards.

Launching a Community Resilience Effort

Some communities may want to undertake a more holistic or systematic resilience effort – whether this is a community conversation, a research study, a plan, a project, a policy, or any combination. There are many tools that can help a community, even a very small community, and several State of North Carolina agencies are developing more resources. In particular, the Department of Environmental Quality has a NC Coastal Communities Resilience Guide, which provides valuable insights even for non-coastal communities. In almost every case, establishing a resilience working group is key to establishing a foundation for resilience efforts that are tailored to your locality. For a simple start, you can establish a working group inside your town or county. Or, you can leverage your efforts by creating a regional partnership with other towns and counties, as is common in Florida; or on a watershed basis, like local governments and organizations have done in Iowa.

Town hall meetings are a great way to start community conversations about building resiliency.

Identify a resilience champion

A resilience champion is someone who agrees to coordinate across departments, organizations, businesses, or community members you need to build your community's resilience. No past experience in resilience is required. The most important quality in a resilience champion is a willingness to collaborate and coordinate getting the right people to the table. It could be a local planner, an emergency manager, someone with public works experience, or even an engaged resident who is willing to volunteer.

Build your team

The makeup of your team depends on your community's resilience building goals.

Find local experts. If your community needs a broad resilience effort, look for a cross section of people with expertise in government, nonprofits, and the private sector. Consider partners from local schools, youth groups, cooperative or Sea Grant extension, and communities of faith. If improving resilience in infrastructure is the primary need, look for public works, consultants, developers, farmers, and environmental groups who can identify a portfolio of options from green infrastructure to water and wastewater management. For help building a regional project, reach out to your regional council of government.

Make the team inclusive. Resilience success is best built with diverse perspectives. This means an active effort to invite people who have different needs, experiences, and opinions to the process, and making sure they have a voice at the table. Building resilience is a challenge, so negotiating diverse viewpoints up front makes for solutions everyone can support.

Create a climate for innovation. Look for those in your community with a reputation for creative thinking and out of the box solutions. Take advantage of a diverse team to create an environment where teamwork and innovation will thrive.

Decide what facilitation approach works best for your team. Resilience building requires team members to work together to build new solutions, so look for strategies like breakout groups and facilitated activities. Consider looking to trusted third party facilitators to reduce conflicts, assign tasks, and take ownership of implementing your strategies.

Decide how to engage local leadership. If your goals include local planning, zoning, and policy change, municipal and county leadership – both elected and staff – must be engaged and willing to act. It may be helpful to bring private employers or nonprofit institutions on board for additional support.

Build a common base of understanding

No matter the scope of your resilience efforts, there are some common steps that support success. Here are a few to consider:

Examine risks of the future. A community's experience dealing with past shocks, like a flood or the loss of a key local employer, are valuable sources of information for responding in the future. But the future risks themselves may change. For example, floodwaters in Hurricanes Matthew and Florence rose to levels far above those ever recorded in prior storms. Combined with more development, floods from heavy rain could be much larger than you have experienced before. The resources in this guide can help you pull together a strong fact base about future risks on which to build your efforts.

Explore multiple hazard scenarios. Planning for best case, likely case, and worst case scenarios creates solutions that are more robust to a range of conditions, whether that applies to weather or to the economy. Likewise, consider multiple stressors at the same time. A very wet storm can hit during a flash drought, so your community may need to deal with both dry and extremely wet conditions in the same year. These conditions may then combine to create greater or even new effects, such as increased

erosion and landslides. The multiple scenario, multiple stressor approach is key to identifying those resilience strategies and projects that provide you with the most benefits across a range of potential hazards.

Examine the consequences. Once you have a sense of what the risks are, think about what will happen to populations, assets, or services if these risks become reality. What will happen if ten percent of the housing stock is unlivable? What will happen if a landslide takes out a road? Can your community afford to pay for repairs more often? Think long-term. A new bridge or wastewater treatment plant may have a life of 50 to 75 years. What are the consequences these risks pose over the life of this facility? Given the potential consequences for the community, is the risk acceptable?

Find the opportunities. The goal of most resilience efforts is to find solutions. Creating a range of options and being flexible is one of the key principles of resilience. This kind of adaptability means that if one system fails or one approach is not possible for the community, options remain for reducing risk.

Set goals and objectives that work for your group and your community, even if you do not yet have all the pieces funded. Having visionary goals and specific objectives for resilience in your community lays the foundation for the work you need to reduce risks across your community. Those goals and objectives can help guide the selection of priorities. They can also help you identify steps that are no- or low cost. An example of a low cost action is encouraging residents to keep debris out of drains, ditches, and waterways as part of messaging or communication that already exists.

Engage community stakeholders early and often

Nationally, the resilience plans most successfully implemented are those with broad public input and participation. The people who live, work, play, and invest in your community are the ones who will benefit if resilience efforts are successful. These stakeholders can support resilience efforts– or they can object if the proposed efforts do not match their ideas, values, or vision. Frame your engagement early on:

Identify who should be part of the process.
Ask your team:

- Who will be affected by the processes and actions we propose, or the decisions we make? Who is qualified to represent the views of these groups and facilitate two-way communications?
- Who else will influence or affect the strategies we propose and the decisions we make?
- Who has information, resources, or expertise that could help us?

Community members have perspectives and insight that can be of tremendous value when planning for resilience.

- Who are we missing? What groups or communities have been left out in the past?

Develop an engagement strategy. "Engagement" can mean many different things. Some stakeholders do not have time to attend regular meetings, and larger groups can be unwieldy for discussion or decisions. To gain the benefits of broad participation in the effort, ensure there are multiple ways for people to get involved, and that the working group has a clear sense of why each group should be included or why each engagement strategy should be implemented. This is important for the success of the effort and for building trust among stakeholders and setting shared expectations.

Engage the community through partners. Reach out to local or regional experts, like county public information officers, community groups, or local faith leaders, who know how to get people to the table. The can help with developing an engagement plan, tailoring your message to be meaningful, and determining the best way to communicate with stakeholders. Some of these groups can even help spread information through word of mouth, local announcements, and social media. For deeper, ongoing engagement, invite different stakeholder groups to identify a representative who can serve on the resiliency work group.

Reach out to organizations that want to help with resilience. The North Carolina Office of Recovery and Resiliency and the North Carolina Division of Coastal Management have experts in resilience engagement. Councils of government and the metropolitan or rural planning organizations specialize in thinking about regional-scale problems. Finally, trusted local groups, like North Carolina Cooperative Extension, North Carolina Sea Grant, and environmental or community economic development nonprofits can also be great resources.

Making and implementing decisions

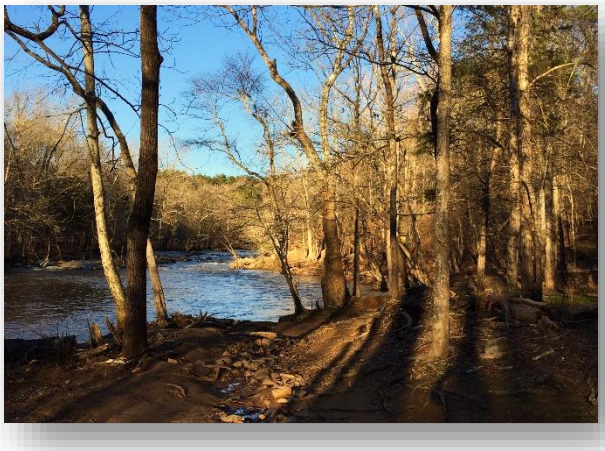
Whatever the community's objectives – to draft a resilience plan, to embed resilience principles in a comprehensive plan, to install green infrastructure, or to start an awareness campaign on buying flood insurance – a well-designed process will help ensure success.

Learn about the best practices relevant to your goals. There are many ways that your group can develop a list of possible implementation strategies. Call an expert, network with colleagues in other areas, reach out to state agencies, attend a conference, watch a webinar, read an online resource, or join a relevant listserv.

Agree on what matters to your efforts. As a team, consider some of the reasons you may end up favoring one strategy over another. For example, your team may think it is important to build local government or nonprofit capacity through your strategies. Serving populations that sometimes get left out, like renters or people with disabilities, may be a priority for your group. For a large project, your team may need to use a benefit-cost analysis that captures future benefits and costs. Other benefits and costs are difficult to quantify, like a sense of place or the ability to help one's neighbor. If you use a quantitative method to evaluate options, build in a consideration of these qualitative or difficult-to-measure human factors as well.

Prioritize. If everything is a priority, then nothing is a priority. If the resilience effort generates multiple options, at some point the group may need to make decisions or recommendations on strategy selection or prioritization. The team may make decisions by voting, building consensus, or using a set of evaluation criteria to score options. You may want to include input from outside your team.

Pursue pathways to implementation early on. Identify early "wins" as those projects or parts of projects that are easy to implement, such as making a small change in local ordinances, coordinating an outreach campaign with local schools, or increasing design standards on a utility upgrade that is already funded. Early wins build support for and confidence in the resilience effort.



Dedicated open space—especially along waterways, such as Eno River State Park—provide multiple benefits to a community as recreation areas, flood zone buffers, and drinking water protection, as well as helping to off-set the effects of climate change.

More complex projects may require outside funding, collaboration, and vision. The community may need to collaborate with several agencies or funders. You may have an idea for a green culvert, but getting it in the ground requires design, engineering, permitting, securing funding, and procurement to install it. A comprehensive plan with resilience at its heart should connect to all the other plans your community uses, like the hazard mitigation plan, downtown development plan, or the stormwater master plan.

On the other hand, it might not be clear how to implement a large or ambitious project, but do not let that stop you from including it in a vision for the future. Support may need to build over months and years.

Establish metrics to understand your progress. Metrics can be quantitative, like an increase in the number of affordable housing units. Metrics can also be qualitative or yes/no, like whether local or county departments regularly meet on resilience topics. Once an indicator is identified, think of how it will be measured, such as through a measurement, a yes/no, or a high/medium/low scale. Have a plan in place for collecting and monitoring that data, and identify who will perform those tasks. Some metrics may be appropriate to use in building public support for projects. Other metrics may make more sense for internal use.

Celebrate successes and milestones. Recognize the efforts the community is taking to become more resilient, whether that means bringing treats to a work group meeting, attracting some media coverage, or an expression of gratitude from a community leader or official.

With the tools in this guide, you can jumpstart a stand-alone community resilience effort, from creating your resilience team to defining your goals and establishing metrics for success. **Together we can build a more resilient North Carolina.**

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