CLIMATE RESILIENCE

Barrier islands in Florida protect the coastline and infrastructure from flooding; the Seven50 Prosperity Plan, a HUD Regional Planning grant project, focused on climate resilience

PREPARING COMMUNITIES FOR THE RISKS AND OPPORTUNITIES OF A CHANGING CLIMATE

Natural disasters are occurring more frequently and are increasingly severe. All levels of government, individual households, and businesses are shouldering the high cost of disaster recovery. Communities are looking for new ways to become more resilient to these changes and challenges.

Planning for severe weather and other climate changes increases the safety of neighborhoods and improves a community's ability to recover quickly after an event, reducing losses and costs. While disasters are expensive for everyone, they have the most devastating effects on low- and moderate-income families and households without the personal resources to bounce back. Resilience is the result of careful planning efforts rooted in an awareness of community assets and vulnerabilities. Natural hazards and climate change do not recognize political boundaries. Inter-jurisdictional collaboration and regional planning are essential to becoming resilient to a changing climate.

A critical component of HUD's mission for the past 50 years has been to support planning and urban development efforts that expand opportunity for Americans. The Sustainable Communities Initiative (SCI) grants awarded in 2010 and 2011 constitute HUD's most comprehensive community and regional planning effort in decades. HUD's SCI awarded funding to 143 communities through Regional Planning Grants and Community Challenge Planning Grants, serving forty percent of U.S. residents. HUD's $250 million investment opened the door to hundreds of millions of dollars of public and private investment and engaged more than 3,300 core partner groups nationwide.

HUD is committed to helping communities recover from natural disasters and be more resilient to future shocks and stresses. Most recently, in 2014, HUD launched the $1 billion National Disaster Resilience Competition in order to expand opportunities for eligible states and jurisdictions to employ innovative approaches to resilience and recovery.

WHAT IS...?

CLIMATE RESILIENCE	The ability to prepare for and adapt to changing conditions; and to withstand, respond to, and recover rapidly from disruptions
HAZARD MITIGATION	Taking action before the next disaster to reduce human and financial consequences later
CLIMATE ADAPTATION	Adjusting natural or human systems in a changing environment that reduces negative effects and takes advantage of opportunities

BY THE NUMBERS

70%	Increase in rainfall during heaviest storm events in the Northeastern U.S. region (1958-2010)
37%	Reduction in average stream flows in major Southwestern rivers and basins since 2001
$1	Spent on mitigation saves an average of $4 in recovery costs following a natural disaster
$43 BILLION	In CDBG-Disaster Recovery funds administered by HUD to states and localities to assist with recovery between 2005-2013

Office of Economic Resilience
Office of Community Planning and Development
U.S. Department of Housing and Urban Development

STRATEGIES FOR CLIMATE RESILIENCE

HUD SCI Grantees have employed the following strategies to enhance their capacity to withstand and recover from natural disasters. The path to resilience is a progression of steps, though communities can tailor their approach depending on local needs and resources.

IDENTIFY LEADERSHIP, STAKEHOLDERS, AND DATA SOURCES

CONDUCT RESILIENCE ASSESSMENT

DEVELOP GOALS BASED ON ASSESSMENT

CREATE A RESILIENCE PLAN

IMPLEMENT RESILIENCE PLAN AND MONITOR PROGRESS

SCI GRANTEE **CASE STUDIES**

BUILDING PLANNING AND INVESTMENT AROUND RESILIENCE GOALS

Gulf Regional Planning Commission | Plan for Opportunity: Gulf Coast Sustainable Communities

During the initial stages of their regional planning process, the Mississippi Gulf Coast Sustainable Communities Initiative realized they were missing a crucial component: *resilience.* Much of the region lies within the 100-year floodplain, and rising sea levels will only increase the number of people at risk for significant loss during a major storm event. In Mississippi, homeowners have the fourth-highest insurance premiums in the country. Since Hurricane Katrina, wind insurance premiums have increased 90%, and many families struggle to maintain housing affordability with this added cost burden.

The project team expanded their consortium to help inform a series of resilience assessments. A Resilience Committee comprised of representatives from vulnerable communities evaluated the resilience of five regional systems that would be affected by major climate events: housing, transportation, economic development/workforce, water, and food. These resilience assessments identified the greatest threats and vulnerabilities of each system.

The resulting resilience strategies addressed potential challenges and identified responsible parties, an action timeframe, and indicators to measure progress. One strategy was the integration of hazard mitigation plans into local comprehensive plans. As the guiding instrument for land use planning and public investments, comprehensive plans play a role in reducing risk associated with developing in hazard areas. By linking the two planning processes, both yield stronger outcomes and ensure complementary objectives and actions.

Jurisdictions were also encouraged to join the Community Rating System (CRS) run by the National Flood Insurance Program. The CRS rates communities based on their floodplain management and disaster preparedness, using these ratings to determine discounts in flood insurance premium rates. Well-rated communities are not only more resilient to natural disasters, but also save on insurance costs.

Collaborative efforts by groups like the Mississippi Alabama Sea Grant Consortium and the Southern Mississippi Planning and Development District have facilitated the participation of local governments, resulting in three new jurisdictions joining the CRS and seven existing members improving their ratings, lowering flood insurance costs for residents and businesses.

The Gulf Coast learned the value of assessing all vulnerabilities and risks that could potentially disrupt essential regional systems, and the importance of having the right stakeholders at the table to develop a comprehensive plan for resilience.

Learn more at: http://www.gulfcoastplan.org/

A comprehensive resilience approach along Mississippi's Gulf Coast will protect vulnerable local economies, businesses, and residents

INSTITUTIONALIZING CLIMATE MITIGATION AND ADAPTATION

State of Rhode Island | RhodeMap RI

The State of Rhode Island has the highest ratio of shoreline per capita in the United States, leaving it highly vulnerable to sea level rise. In 2014, a state-level Climate Change Coordinating Council was established to lead the development of comprehensive resilience strategies.

Rhode Island completed a number of vulnerability assessments that will be used to set priorities for state and local planning. To help municipalities incorporate assessments into local comprehensive plans, the State released preliminary guidance based on a pilot adaptation project and is developing a Comprehensive Planning Guidance Handbook. The Rhode Island Coastal Resources Center also released a guide to help coastal businesses mitigate the effects of climate change.

Rhode Island set a state precedent with the inclusion of climate resilience in their recently released Economic Development Plan, created with the support of their SCI grant. The plan called for an evaluation of the economic opportunities created by climate change in addition to the risks. Technology accelerators, green infrastructure job training programs, and product research and development are a few potential niches identified. By looking at the economic opportunities of a changing environment, Rhode Island is getting ahead of the curve to anticipate products and tools that will soon be in demand as many more places adapt to climate change.

Learn more at: http://www.planning.ri.gov/statewideplanning/sustainable/ndex.php

WORKING ACROSS JURISDICTIONS TO COMBAT CLIMATE CHANGE

South Florida Regional Planning Council | Seven50

The **Southeast Florida Regional Partnership** used its Seven50: Southeast Florida Prosperity Plan (Prosperity Plan) to frame regional priorities along six themes including Climate and Energy Resilience. The Prosperity Plan builds on the work of the Southeast Florida Regional Climate Change Compact, created by four consortium partners in early 2010, and suggests adaptation and mitigation strategies to create more resilient communities, environment, and economy.

Resilience approaches are needed to confront very real threats: after just one foot of sea level rise, 65% of schools and 71% of emergency shelters in Monroe County would be below sea level; a 3-foot rise (standard in vulnerability assessments), $31 billion of real estate and public investments in Miami-Dade, Broward, Palm Beach, and Monroe Counties would be inundated.

The Prosperity Plan considers a variety of water management systems, engineering practices, and natural barriers. Mitigation strategies include green building techniques, renewable energy and energy-efficient design, and other activities to reduce the region's contributions to greenhouse gases and climate change.

Learn more at: http://seven50report.org/

PLANNING AND PARTNERING BEFORE DISASTERS OCCUR

Regional Plan Association | NY-CT Sustainable Communities

When Hurricane Sandy hit in 2012, many communities were unprepared for the physical and social disruptions that resulted. The planning efforts of the New York-Connecticut Sustainable Communities Consortium proved vital to the region's recovery, integrating established, pre-storm relationships with forward-looking resilience actions. Fortunately, the Consortium completed two climate resilience studies less than a month before Sandy's landfall. Those were critical to helping the city respond quickly and strategically to the widespread damage.

The Urban Waterfront Adaptive Strategies Study identified approaches to make urban coastal areas more resilient to the hazards of sea level rise. Designing for Flood Risk focused on preparing buildings to withstand coastal flooding. These two studies informed and guided disaster-affected areas to rebuild with climate resilient strategies in mind and ensured that community-led planning work was integrated into recovery efforts.

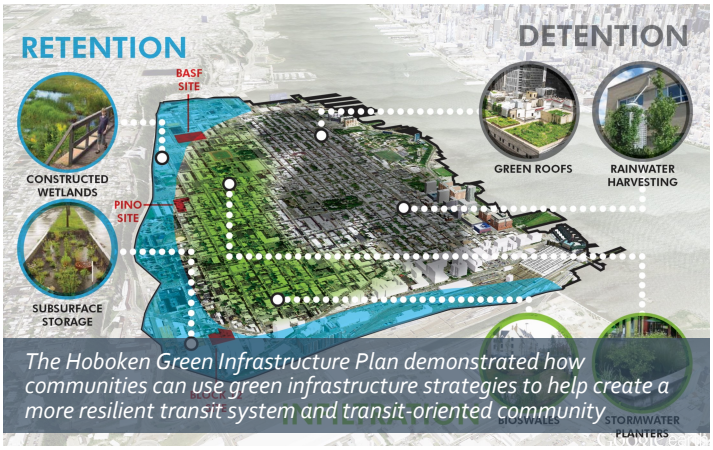
Learn more at: www.sustainablenyct.org/

USING GREEN INFRASTRUCTURE TO BUILD RESILIENCE

Rutgers: State University of NJ | Together North Jersey

Together North Jersey used part of their HUD SCI grant to fund a series of Local Demonstration Projects including the award-winning Hoboken Green Infrastructure Strategic Plan. The City of Hoboken is home to a disproportionate quantity of subsidized and low-income housing, and the City's most vulnerable populations are concentrated in the most flood-prone areas. This project provided a green infrastructure framework to improve the resilience of Hoboken's transit system and the surrounding communities resulting in a cost-effective approach to green and grey infrastructure to improve local stormwater management. The Hoboken Plan received the 2014 Outstanding Plan Award from the American Planning Association-New Jersey chapter.

Learn more at: http://togethernorthjersey.com/ and see HUD's Green Infrastructure Report for more info on SCI projects that planned for green infrastructure.

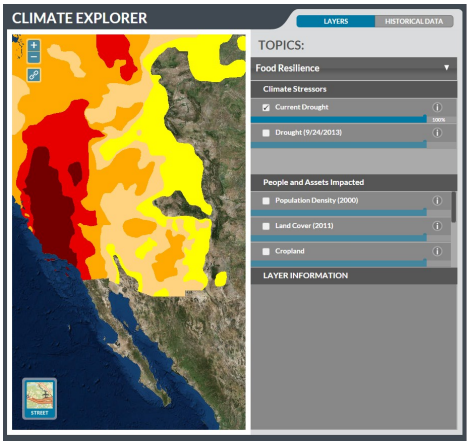


The Hoboken Green Infrastructure Plan demonstrated how communities can use green infrastructure strategies to help create a more resilient transit system and transit-oriented community.

TOOLS FOR CLIMATE RESILIENCE

FEDERAL TOOLS: The following tools were developed by federal agencies.

U.S. CLIMATE CHANGE TOOLKIT



The U.S. Climate Resilience Toolkit was created in 2014 by a partnership of federal agencies and organizations led by the National Oceanic and Atmospheric Administration (NOAA) in response to the President's Climate Action Plan and Executive Order to prepare the nation for the impacts of climate change. It is useful for communities at any stage of planning and provides a wealth of resources, such as a 5-step resilience guide, a free climate science tool library, case studies, data, and training courses.

The Climate Explorer is an interactive visualization application developed for the U.S. Climate Resilience Toolkit that maps a variety of climate stressors as well as people and assets affected by potential hazards. The Toolkit provides a map to find experts at NOAA, USDA, Department of the Interior, and State Climatologist Offices and is intended for citizens, resource managers, planners, tribal leaders, businesses, and policymakers.

The toolkit can be accessed here:
https://toolkit.climate.gov/

HUD AND OTHER FEDERAL RESOURCES

HUD Climate Resilience Portal:
Planning and preparing for natural hazards when undertaking HUD-funded activities. www.hudexchange.info/manage-a-program/community-resilience

FEMA Mitigation Planning:
Resources to plan, prepare, and mitigate before, during, and after natural disasters. https://www.fema.gov/hazard-mitigation-planning-resources

HUD National Disaster Resilience Competition:
Supports innovative local resilience projects for eligible communities experiencing federally declared disasters in 2011, 2012, and 2013. https://www.hudexchange.info/programs/cdbg-dr/resilient-recovery/

National Climate Assessment:
Federal advisory committee with expert analysis of climate change effects. http://nca2014.globalchange.gov/

LOCAL TOOLS: The following tools were developed by HUD SCI grantee communities.

EAST CENTRAL VERMONT BUYOUT PROGRAM

Following flooding from Tropical Storm Irene in 2011, Two Rivers-Ottauquechee Regional Commission, East Central Vermont's SCI grant consortium lead, assisted with the buyout of 108 sites with funding from FEMA and HUD CDBG-DR. The changing climate also has prompted the region to consider economic development strategies that pivot from snow and ice dependent activities to new opportunities in a warmer climate.

Voluntary buyout (property acquisition) programs can be a cost-effective tool for hazard mitigation. Buyouts relocate residents out of harm's way, allow owners to receive fair compensation for properties, and increase natural flood storage. Under the SCI grant, the East Central region in Vermont is pursuing a buyout program as an adaptation strategy for reducing losses from flooding identified in their final regional plan. Ultimately, this approach could frame a state level buyout program.

The FEMA Guide to Buyouts can be accessed here:
www.fema.gov/application-development-process/hazard-mitigation-assistance-property-acquisition-buyouts

GROWASHINGTON-AROOSTOOK STORM SURGE MODELING IN MAINE

As part of the GROWashington-Aroostook regional plan developed under a HUD SCI grant, the Washington County Council of Governments (WCCOG) and the University of Maine at Marchias (UMM) produced five climate vulnerability assessments (CVAs) that model storm surge scenarios, provide adaptation options, and identify vulnerable populations and infrastructure to assist first responders.

WCCOG and UMM also developed an online mapping tool to serve the county's 44 rural communities. Many smaller communities do not have the budget to support advanced mapping software and this user-friendly tool is accessible to anyone with an Internet connection, with no special training or software required. This tool was awarded the 2014 Project of the Year by the Northern New England Chapter of the American Planning Association.

This tool can be accessed here:
www.gro-wa.org/