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The Resilience Roundup highlights CIRCA's presence in the news, provides links to recent local/state/national news articles related to resilience and adaptation, and announces upcoming events and seminars.



## Resilience Roundup

October 14, 2015

*A service of the Connecticut Institute for Resilience and Climate Adaptation (CIRCA)*

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- **October 1, 2015** - *How Climate Change Is Intensifying Hurricane Joaquin*, Huffington Post
- **September 29, 2015** - *The Marshall Islands 'Will Go Under' If The Paris Climate Talks Fail*, Foreign Minister Says, Huffington Post
- **September 29, 2015**, *New flood projections for New York: Can the city prepare for rising seas?*, CS Monitor
- **September 28, 2015** - *King tide sets stage for climate talks in South Florida*, Miami Herald

### Announcements

- **October 21, 2015** - Connecticut Association of Flood Managers 2nd Annual Conference. ([Registration Open](#))
- **November 15, 2015** - Next review date for CIRCA Matching Funds Program. Up to \$100,000 available. For more information go to <http://circa.uconn.edu/funds.htm>
- **November 19, 2015** - Rockfall Foundation Environmental Grants Applications Due
- **November 20, 2015** - [Notice of Funding Availability](#) from CT Dept. of Housing CDBG-DR Tranche 2, *Planning funds to address improved resiliency to Infrastructure and Public Facilities in Fairfield, New Haven, New London and Middlesex Counties*. Applications due November 20, 2015
- **December 1- 2, 2015** - [Registration Now Open](#). Living Shorelines: 1st National Technology Transfer Meeting and Regional Workshops, Hartford, CT. Sponsored by CIRCA and Restore America's Estuaries

## CIRCA in the News

### [October 9, 2015 - CT's repeat flood damage dilemma: move out or rebuild?, CT Mirror](#)

When storm Sandy dumped nine feet of water in Laurie Robinson's house in Milford three years ago, the repairs were barely finished from the six feet of water Tropical Storm Irene had dumped 14 months earlier.

"Brand new kitchen," she said on an early fall day that felt and looked more like July. "I was finished for two months."

Now her kitchen sits 15½ feet up at the end of 19 steps it also now takes to get to Robinson's front door. The house at the end of Cooper Avenue offers a better view than the old ground-level one did of Long Island Sound one long block away, as well as of neighboring Silver Sands State Park and the surrounding salt marsh.

It also offers Robinson a sense of safety. Which is why even after the two major floods and their accompanying damage, not to mention a previous flood from a nor'easter in December 1992, Robinson never considered leaving.

"No," she said immediately and emphatically to the question. "I like it here."

She has a lot of company.

Throughout Connecticut, thousands of homes have suffered what Robinson, and most of her Cooper Avenue neighbors have suffered: repetitive loss, as the Federal Emergency Management Agency calls it, from flooding.

Many, like Robinson, have rebuilt multiple times. Many have elevated their homes because they want to or have to. Robinson went a step further, tearing down her old house and building a new one. And many, also like Robinson, have used government funds from an alphabet soup of federal programs and agencies to do some, if not all, of the work.

But shoreline and climate experts, public officials and others have grown increasingly critical of such programs, including the National Flood Insurance and Hazard Mitigation Grant Programs, arguing that they encourage rebuilding in places that have already shown themselves to be flood-prone and are likely to become more so due to climate change and its associated sea level rise.

And so those same people are starting to question using public funds to rebuild repetitive loss properties over and over. The worry is that despite all the money poured in, any number of these coastal areas may become uninhabitable in the not-too-distant future anyway, leaving homes like Robinson's and her neighbors literally high and dry, but in the water permanently.

"Then I'd make my garage a boat ramp," she said, not exactly joking. "I'm 62 years old. I don't foresee that happening in my lifetime. That would be my daughter and I don't see it happening in her lifetime either. I could hope anyway."

The gnarly question is whether the time has come to more regularly consider a more drastic response: not rebuilding. Some wonder if the better use for public dollars would be for buyouts, thereby abandoning shoreline development to nature.

Rebuilding was always the pledge, said Joe MacDougald. He runs the Center for Energy and Environmental Law at the University of Connecticut School of Law, and works with CIRCA, the Connecticut Institute for Resilience and Climate Adaptation. He's also held multiple municipal government positions in Madison, including finance and planning and zoning. "With every storm - 'We will rebuild.' Well the answer is 'weee'IIIIII - you'll rebuild. Which parts?'"

"How are you the zoning commission that turns to the next rebuild after you've approved four on the street and says 'no?' That's everything."

But buyouts in Connecticut have been glaringly unpopular - chosen by an infinitesimal fraction of property-owners who have suffered repetitive losses. ([continued](#))

## Local & State News Clips

### [October 8, 2015 - New Jersey goes to court to seize beach lots for dunes, CTpost](#)

Making good on a long-delayed threat that was reiterated last week by Gov. Chris Christie, New Jersey went to court Thursday to seize 87 publicly owned beach parcels to be used for a protective dune system that a South Jersey shore town and its residents bitterly oppose.

The state attorney general's office and the Department of Environmental Protection acted less than a week after Christie called Margate "among the most selfish people in the state of New Jersey" for refusing to allow the dunes to be built.

The town, just south of Atlantic City, says its wooden bulkheads are sufficient to protect against ocean flooding, and that most of the damage from Superstorm Sandy in 2012 came from the bay on the other side of town.

In order for the U.S. Army Corps of Engineers' dune project to begin, 10 private lots still need to be acquired in Margate, which are not part of Thursday's court action.

"As evidenced in the damage from last week's nor'easter and from Superstorm Sandy, all of our beaches along the Jersey Shore require maximum protection from storm surges," DEP Commissioner Bob Martin said. "The refusal of remaining holdouts along the New Jersey coastline to provide easements has forced us to seek condemnation of portions of their properties so we don't further delay these critical Army Corps projects that will protect lives and property."

Martin said Margate's refusal to allow the dune project endangers not only its own residents, but those to the north and south as well.

"We are very disappointed that the elected officials in Margate are forcing the state to protect their own citizens through the courts, as well as the citizens of Longport and Ventnor," he said. "We will continue to be very aggressive in using eminent domain as a tool to obtain the easements we need from those who continue to delay our efforts to safeguard our coast." Margate Business Administrator Richard Deaney said the state offered only \$29,000 for the land, which was rejected.

"We've always been ready to negotiate with them, not just about the money, which is all they

seem to want to talk about, but about what we consider to be an arbitrary, one-size-fits-all project," he said. "We want to negotiate this and not just fight in court."

Shortly after Sandy devastated the coast three years ago, Christie vowed to build dunes along the state's entire 127-mile coastline. But property owners in several towns fought back, with some saying they did not want to lose ocean views, while others object to giving up a portion of their private property for a public purpose.

Some oceanfront property owners in Bay Head, where the greatest number of holdouts remain (123), have paid to place huge boulders under the sand at their own expense. Private beach clubs in Toms River and Point Pleasant Beach are also holding out, with the popular Jenkinson's Boardwalk suing in federal court to block the work, as Margate did as well.

The state has secured more than 90 percent of the 4,279 easements needed for the project. But 366 easements, held by 239 property owners, remain to be acquired.

"We appreciate that many property owners - mindful of the ravages of Superstorm Sandy - have unselfishly donated easements for the greater good, but some continue to hold out," said Acting Attorney General John J. Hoffman. "Our message is that we remain committed to acquiring all of the easements we need as expeditiously as possible."

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### [October 8, 2015 - South Carolina residents rush to higher ground as 14 dams fail, Hartford Courant](#)

Days after a record torrent of rain flooded parts of South Carolina, Cedric Williams found himself once again watching water flow like a river through his frontyard. For the second time in two days, he rushed to pack up his family's belongings.

"It's heart wrenching - I never imagined a flood like this here, in the middle of the state," said Williams, 34, an elementary school teacher, who sought shelter Wednesday at a high school east of Columbia, after a release from nearby Beaver Creek Dam. "The sheriff just warned me that if the house isn't fully flooded yet, it soon will be."

Early Wednesday, officials had urged residents near Beaver Creek Dam to immediately seek shelter and move to higher ground.

A few hours later, Richland County Sheriff Leon Lott said the situation had been stabilized and residents were allowed to return home. But the flood emergency throughout many parts of the state is not over.

With 14 dam failures statewide and 62 more in danger of failing after historic rains pushed capacity beyond limits, much attention has turned to dam safety.

Most of the water damage in the Midlands has taken place along the Gills Creek watershed, a 70-mile-long network of streams, ponds and lakes that weaves through the cities of Columbia, Forest Acres and Arcadia Lakes, as well as the U.S. Army's Ft. Jackson.

Beginning in the early 1900s, many small earthen dams were built mainly by landowners along the network to create recreational lakes. Through the decades, neighborhoods have been developed around the scenic lakes, creating storm water runoff problems, according to the Gills Creek Watershed Assn.

Throughout much of the forested lands of South Carolina, there are more than 2,400 state-regulated dams, most of which are earthen dams on private property. Of those, 180 are deemed high-hazard potential, said Mark Ogden, project manager with the Assn. of State Dam Safety Officials, a nonprofit organization.

When unprecedented rain struck over the weekend - with Hurricane Joaquin-fueled storms dropping as much as 20 inches of water in some areas - many of the dams were strained

beyond capacity.

Some experts said Wednesday that more rigorous dam inspection and oversight would have eased the flood danger. Going forward, residents need to be better prepared to evacuate in severe weather, officials need to move quicker to decide whether controlled water releases are needed to prevent breaches and dams need to be more rigorously monitored, said James H. Knapp, a professor of Earth and Ocean Sciences at the University of South Carolina.

"The failure of dams has been the major part of the issues on this side of town," said Knapp, who lives in an area adjacent to Gills Creek, where many upscale homes were submerged. "This has taken most people completely by surprise - there just wasn't a full appreciation of the vulnerability of these dams before this rain."

Knapp said he did not understand why people living downstream of the dams had not been warned of potential breaches in advance of the heavy rainfall.

South Carolina is behind other states across the country when it comes to dam safety, Ogden said. In 2014, the state reported performing only 63% of its scheduled inspections for the 180 high hazard dams.

"There are certainly areas that South Carolina could improve or take a look at what they could do," Ogden said. "The state is scheduled to inspect dams at least once every two years. You would expect 100% compliance for high hazard potential dams, but they have fallen far short of that. These are good people doing the best job they can, but they could use additional resources."

At a news conference, however, South Carolina Gov. Nikki Haley pushed back against criticism that the state had not done enough to prepare dams before the storms.

"One dam failure is too many, but in a situation like this we are extremely grateful for where we are today," Haley said, praising emergency responders for working throughout the night to mitigate the damage. "This is a thousand year flood and we have thousands of dams in our state ... 62 we are watching and 13 have failed. When we have floods of this magnitude, it's really amazing that we have not had more."

Noting that the danger was still not over, with potential evacuations in seven more counties as the rain trickled down to lower parts of the state, Haley added: "There's plenty of time to analyze this after."

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### [October 7, 2015 - Round 2: Downstream South Carolina towns brace for flooding. The Day New London](#)

GEORGETOWN, S.C. - Along South Carolina's coast, residents were preparing for a second round of flooding as rivers swollen from days of devastating rains make their way toward the Atlantic.

Residents near a dam in Richland County were told to evacuate Wednesday morning, with authorities saying the dam could breach at any time.

Crews worked overnight to try to stabilize the Beaver Dam after a sinkhole formed nearby, pumping water out of the pond to relieve pressure on the dam.

In Georgetown, one of America's oldest cities, Scott Youngblood was putting more sandbags Tuesday by the door of the Augustus & Carolina furniture store on Front Street, the popular tourist attraction that runs along the Sampit River.

Each day since last weekend's storm - which sent more than a foot of water washing down the street - water at high tide has lapped against those sandbags. Residents are concerned there may be more flooding on the Black and Waccamaw rivers - two waterways cited as worrisome

by Gov. Nikki Haley. Both drain into Georgetown County.

The Waccamaw was expected to crest at 5 feet above flood stage in Conway, in Horry County, on Thursday. The Black crested Tuesday upstream at Kingstree at about 10 feet above flood stage, breaking a record, town officials said.

Youngblood hopes things won't be as bad this time as earlier in the week.

"We're hanging our hat on that we're not going to have that combination of tide and rain and such," he said. "We had so much rain but the primary thing we were experiencing was the water table coming up through the bottom bubbling up from beneath the flooring. We had quite a bit of damage."

Tom and Christine Doran, retired teachers who recently moved to a riverfront apartment in Georgetown, were moving their belongings out Tuesday after battling tides and rain for four days.

"The first flooding was Saturday afternoon and we kept ahead of that with a wet vac and we thought, 'We've got this,'" Tom Doran said. "Then it just started coming in from all sides. It was just too high. Every afternoon with the high tide it floods up to 5 inches."

After taking an aerial tour of damaged areas on Tuesday, Haley said that while the sunshine was a good sign, the state still needs to be cautious.

"We are going to be extremely careful. We are watching this minute by minute," she said. She said evacuations may be needed toward the coast because of rivers swollen from the storm, which has killed 15 in South Carolina and also claimed two lives in North Carolina.

Rescue crews were searching Wednesday morning for two people who went missing in Lower Richland County when their pickup truck entered flood water. Sheriff's deputies told local news outlets they were called out at around 3 a.m. Wednesday to a road that had been closed for several days after being washed out.

The driver of the pickup drove around barricades that had been set up to block traffic, authorities said. Three people managed to get out safely but told emergency crews two others did not. In Effingham, about 80 miles east of Columbia, the Lynches River was about 5 feet above flood stage Tuesday. Scott Goodwin, his wife and their two dogs left their home on the river's bank on Saturday afternoon, concerned the day's intense rain would flood their gravel road and leave them marooned. The water on the road was already up to the bumpers of their pickup trucks as they left, said Goodwin, 44, who works as a welder.

Goodwin said they packed clothes to stay a couple of days with his wife's parents, never expecting the river could rise as much as it has. It will be at least this weekend before the road clears enough for them to be able to reach their home. Goodwin is resigned to the possibility that the home and their belongings are a total loss, but comforted by the knowledge they have the maximum amount of flood insurance.

Haley said it was too soon to estimate the damage statewide, which she said could be "any amount of dollars." The Republican governor quickly got a federal disaster declaration from President Barack Obama, freeing up money and resources.

Distributing safe drinking water was a challenge. In the region around Columbia, as many as 40,000 homes lacked water, although some service was restored Tuesday. Mayor Steve Benjamin said 375,000 water customers will likely have to boil their water before drinking or cooking for "quite some time."

The power grid was returning to normal after nearly 30,000 customers lost electricity. Roads and bridges were taking longer to restore: Some 200 engineers were inspecting more than 470 spots that remained closed Tuesday, including parts of Interstate 95. As of late Tuesday, that number had dropped to 436, the South Carolina Department of Transportation said in a news release. South Carolina was soaked by what experts at the National Oceanic and Atmospheric Administration called a "fire hose" of tropical moisture spun off by Hurricane Joaquin, which mostly missed the East Coast.

Authorities have made hundreds of water rescues since then, lifting people and animals to safety. About 800 people were in two dozen shelters, but the governor expects that number to rise.

The Black River reached 10 feet above flood stage in Kingstree, breaking a 1973 record by more than 3 feet, according to Town Manager Dan Wells, who found himself involved in a porcine rescue mission Tuesday.

After a wild hog fell into the rushing river and slammed into the town bridge, Wells and a colleague shot the exhausted porker with a stun gun, trussed its legs with duct tape and pulled it into a pickup truck to be released in a nearby forest.

"It wasn't on my list of things to do today, I can tell you that," said Wells.

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### [September 29, 2015 - Old Saybrook Prepares for Storm, NBC](#)

There are already some preparations being made along Connecticut's shoreline in the event that a strong storm moves in that direction in the coming days. On Tuesday evening, the Old Saybrook Fire Department was busy preparing for the emergency calls that may come in if the weather takes a turn for the worse.

What was supposed to be a typical night of training, turned into an impromptu storm preparation session.

"It's uncertain what the forecast is going to be but we are going to be ready for it," said Fire Chief Jay Rankin, who knows that the weather can get very rough on the shoreline. "In this town, we deal with substantial flooding," said Rankin. "And due to the fact that we haven't had rain in so long, we know that the ground isn't going to impact the water."

During 'Superstorm' Sandy in 2012, Old Saybrook dealt with flooding, fires and stranded residents, which provided the ultimate real-life lesson about the importance of preparation. On Tuesday, dozens of the department's firefighters tested just about every piece of equipment they have to make sure they are prepared no matter what the weather situation may be.

"We're running all the saws, running all the pumps. We're going through every trauma kit," said Chief Rankin.

Rankin said that residents in Old Saybrook and beyond should be thinking about preparing as well, by picking up food, water, batteries and other supplies that might be needed if a storm packing a punch moves through.

"We're always at the ready. We always have our equipment ready," said Chief Rankin. "That's how the fire department operates."

In addition to closely monitoring the forecast, the Old Saybrook Fire department is also planning for potentially adjusting its staffing levels to be able to respond if and when they do have to deal with rough weather.

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### [September 29, 2015 - Study: Sea level rise increasing major storms off New Jersey, CTpost](#)

MANTOLOKING, N.J. (AP) - A new study looking back over 1,000 years finds the flooding risk along the New York and New Jersey coasts increased greatly after industrialization, and major storms that once might have occurred every 500 years could soon happen every 25 years or so. The study by Penn State, Rutgers, Princeton, and Tufts universities, and Massachusetts Institute of Technology, finds that flood heights have risen nearly 4 feet since the year 850, largely because of a sea level rise. The study advocates better risk management strategies to cope with storms.

It was released a month before the third anniversary of Superstorm Sandy, which devastated the coasts of New York and New Jersey.

"A storm that occurred once in seven generations is now occurring twice in a generation," said Benjamin Horton of Rutgers, one of six lead researchers involved in the study. "What we do know is that as sea level rise accelerates into the future, we are going to have more frequent flooding."

The study was published Monday in the Proceedings of the National Academy of Sciences journal.

Adam Sobel, an atmospheric scientist at Columbia University and author of the book "Storm Surge" about Superstorm Sandy, said this study, like many others before it, leaves little doubt that sea level rise will be more rapid than it has before.

"This is just one more good study adding certainty to what we know already, which is that coastal cities around the world - including New York, but we're not the only one, nor the worst - are in trouble," he said. "This makes the direction of change certain: We are at increasing risk for Sandy-like disasters here in New York City and in many other places as well."

The study does not explicitly state that the changes are due to human activity but implies it "by the timeframes," Horton said. The researchers wanted to compare recent decades to the period before the Industrial Revolution.

"The climate community knows the conditions were different in the last 30 years than they were in the last 1,000," he said.

The researchers said that in a changing climate, future inundation of the United States' Atlantic coast will depend on storm surges during tropical cyclones and the rising sea levels on which those surges occur. However, the record of tropical cyclones in the North Atlantic basin is too short to draw meaningful conclusions, from 1851 to the present.

To reconstruct sea levels for earlier periods, the research team used microfossils, called foraminifera, that were preserved in sediment cores from coastal salt marshes in Cape May Court House and Galloway, New Jersey. The ages of these cores were estimated using radiocarbon dating and other techniques.

"Every inch deeper in a core takes you further back in time," Horton said. "We can stretch this technique back hundreds of years and thousands of years."

The study went as far back as the year 850. It found that changes in tropical cyclone characteristics have led to increases in the extremes of the types of storms that create the largest storm surges for New York and New Jersey.

The next phase of the research, led by Andra Reed, a doctoral candidate at Penn State, will use the data gathered to predict sea levels and hurricane activity and when major storms like Superstorm Sandy might strike.

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### [September 26, 2015 - Hurricane Gloria hit Connecticut 30 years ago causing \\$60 million in damage. New Haven Register](#)

Before Superstorm Sandy and Tropical Storm Irene, there was Hurricane Gloria.

Thirty years ago Sunday, Gloria hit Connecticut as a Category 2 hurricane, causing damage estimated at \$60 million. Gloria was the worst hurricane to hit Connecticut since 1938.

The storm had an impact all across Connecticut with peak power outage levels for more than 700,000 customers of the state's two largest utilities, The United Illuminating Co. and Connecticut Light & Power, according to New Haven Register reports at the time. For some

Connecticut residents, it would be a week or more before electric service was restored.

At least 101 state-maintained roads were reported at least partly closed because of fallen trees and power lines caused by the storm. Four communities - Enfield, Westfield, Torrington and Middletown - had their wastewater treatment systems damaged by the heavy rains from the fast moving storm.

But it was the state's coastal communities that were hit the hardest.

"It devastated Milford," said Ralph Andersen, manager of transmission and substation engineering for The United Illuminating Co. "Route 1 looked like war zone."

The force of Gloria's wind took boats and the docks to which they were tied to on one side of Milford Harbor and tossed them to the other side. Owners spent the day trying to retrieve them and several were lost.

Al Mascaro, who is currently a manager of transportation for Eversource Energy, had been at work for three weeks as a design engineer at CL&P when Gloria hit Connecticut. CL&P was a subsidiary of Northeast Utilities, which earlier this year changed its name to Eversource Energy. "The damage was really extensive," Mascaro said. "The quantity of wires and poles that were down was a really humbling experience."

Andersen was already a seasoned veteran at UI when Gloria hit, having started work at the utility a decade earlier. He was working as an operations engineer for UI in 1985.

With winds predicted to hit 130 miles an hour during the height of the storm, Andersen said most of the repair crews and their line trucks were taken off the roads.

"The only thing that we were responding to was emergency calls from police and fire," he said. From his vantage point at a UI transmissions facility, Andersen watched devices that were monitoring the utility's transmission network.

"The system began to trip (shutdown in order to prevent more serious damage), starting in Bridgeport and eventually all the way to New Haven," Andersen said.

The worst part of the storm was over in about two hours, which surprised Mascaro. "I remember the eye (of the hurricane) passing through and there was no back side of the eye," he said. "But there was a level of humidity that I had never felt before."

When UI repair crews emerged from where they had been sheltering during the peak of the storm, they were shocked at the amount of damage that Gloria had caused.

"It was devastating," Andersen said. "We sent patrols out to survey the damage and because of all the trees, it took a long time because there were so many trees across the roads. Woodbridge was pretty well hit because of that."

At the time, UI had a facility on Skiff Street in Hamden and repair trucks there illustrated the power of Gloria. The trucks were covered in salt water carried inland from Long Island Sound, Andersen said.

The amount of sea salt carried inland also hampered repair efforts for UI because crews had to take special safety precautions.

"Salt acts a conductor," said Ed Crowder, a current spokesman for utility. "All of a sudden, the portion of the line that you've isolated from the rest of the network is no longer isolated because the lines are covered with salt."

Techniques used to assess damage and dispatch repair crews for both UI and CL&P were a lot different 30 years ago than they are today.

"There were no computers," Andersen said. "Everything was printed out on paper."

CL&P's Mascaro, who was assigned to work in North Stonington with crews brought in from Canadian power giant Hydro Quebec, agreed.

"We didn't have the level of sophistication at the time to monitor the system," he said. "One of the things that is really striking was the communications at that time. If you needed a map, you had to drive back to one of the work centers set up for the storm and get maps that were on paper. Today, we have computers in our trucks that we could call up those maps on."

## National News Clips

### [October 6, 2015 - S.C. flood is 6th 1,000-year rain since 2010, USA Today](#)

The biblical flooding in South Carolina is at least the sixth so-called 1-in-1,000 year rain event in the U.S. since 2010, a trend that may be linked to factors ranging from the natural, such as a strong El Niño, to the man-made, namely climate change.

So many "1-in-1,000 year" rainfalls is unprecedented, said meteorologist Steve Bowen of Aon Benfield, a global reinsurance firm. "We have certainly had our fair share in the United States in recent years, and any increasing trend in these type of rainfall events is highly concerning," Bowen said.

A "1-in-1,000 year event" means that there's a 1 in 1,000 (or 0.1% chance) of it happening in any given year in a given location, the National Oceanic and Atmospheric Administration (NOAA) said.

In addition to this weekend's floods in South Carolina, which killed at least nine people, the other 1-in-1,000-year rain events include the Tennessee floods in May 2010, the Mid-Atlantic, Northeast and New England drenching during Hurricane Irene in 2011, the Colorado floods in 2013, the deluge in Baltimore in August 2014, and the flooding earlier this year in Nebraska, according to Bowen.

Scientists say there could be a connection between these floods and man-made climate change.

Research has confirmed that our warming climate is making intense short-term rains even heavier in many parts of the U.S. and the world, as warmer temperatures allow more moisture to evaporate from oceans and flow into rain-making storm systems, according to Weather Underground meteorologist Bob Henson.

A study earlier this year from Climate Central reported that 40 of the 48 contiguous states have recorded an uptick in heavy rain events in the past several decades (though South Carolina was not one of the 40).

The National Climate Assessment, a federal report from 2014, also found that a warming atmosphere would bring about more extreme rainfall events. (continued)

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### [October 5, 2015 - What the historic South Carolina floods can - and can't - tell us about climate change, Washington Post](#)

In 2013, after some controversy, South Carolina's Department of Natural Resources released a report on risks the state could face due to climate change. One of those risks? "A predicted result of climate change is the increase in intense storm events causing greater water inputs in shorter periods of time, affecting flood frequency and duration," the report noted.

Now, with an unfathomable amount of flooding hitting the state, it's easy to wonder if this is precisely the sort of event that South Carolina's scientists had in mind. After all, as our very own Capital Weather Gang has noted, this isn't merely a 1 in 1,000 year event for rainfall totals -

in some locations the amount of rainfall "blows NOAA's 1,000-year events scale out of the water." And some have already suggested a "probable" climate change connection.

That said, climate scientists debate constantly about how and when to link extreme events to climate change, and the questions involved are anything but simple. Indeed, a recent essay in the journal *Science* issued a warning about such connections, noting that "even if it is certain that anthropogenic climate change has caused the frequency of European heat waves to double...the odds that this summer's European heat wave was caused by anthropogenic climate change are only even."

In the long term, climate scientists perform statistical studies to calculate whether they can say that a given event was made more likely to occur in a warming climate than in a climate that was not influenced by greenhouse gas emissions. This takes time to perform and requires large numbers of computer model simulations. So we can't consult such a source yet.

In the absence of such studies, then, what can we say about the South Carolina floods in a climate context? At least three things:

1. In general, more extreme rainfall events are a predicted consequence of a warming climate. A warmer atmosphere is capable of holding more water vapor - and thus, more rain (or snow, for that matter) is expected in the most extreme precipitation events. And indeed, that's just what has been happening in the United States, according to the 2014 National Climate Assessment: [\[To see map follow link for full article\]](#)

Thus, you can certainly say for the South Carolina floods - as you can for the 2013 Boulder, Colo., floods, and the Texas and Oklahoma floods earlier this year - that they are consistent with what we would expect in a warming world.

"As the world warms, more water evaporates from the ocean, as well as lakes and rivers," says Katharine Hayhoe, a climate scientist from Texas Tech University. "That means that, when a hurricane or a storm system comes along, there is on average more water vapor available for it to pick up and dump on us than there would have been 50 or 100 years ago."

However, some scientists are cautious about going beyond this relatively basic point and engaging in actual, causal attribution of the event.

"The peer review literature certainly suggests changes in the top 1 percent intense rain events, but I think that it would be speculative to conclude this event is caused by climate change, though I am open to the possibility there could be a link," says J. Marshall Shepherd, director of the program in atmospheric sciences at the University of Georgia.

"We do know that storm water management systems may not be engineered for this century's rainstorms," Shepherd adds.

2. The complicated connection to Hurricane Joaquin.

The reason things get complicated is that the rains over South Carolina are a very complex meteorological event with multiple causes, including Hurricane Joaquin (the rains tapped some of its tropical moisture) but also numerous other factors. "At least eight key elements conspired to create a highly efficient, small-scale rain machine centered on South Carolina," writes Jeff Halverson at Capital Weather Gang.

Still, some scientists think the tropical moisture - partly linked to Joaquin - was key, and moreover, that its presence is tied to warm sea temperatures that, in turn, may have a climate connection.

Here's how climate scientist Michael Mann of Penn State University puts it:

This is yet another example, like Sandy, or Irene, of weather on "steroids," another case where climate change worsened the effects of an already extreme meteorological event. In this case, we're seeing once-in-a-thousand year flooding along the South Carolina coastline as a consequence of the extreme supply of moisture streaming in from hurricane Joaquin. Joaquin

intensified over record warm sea surface temperatures in the tropical Atlantic, which both allowed it to intensify rapidly despite adverse wind shear, and which provided it with unusually high levels of moisture - moisture which is now being turned into record rainfall.

Indeed, Mann adds: "There is an exponential relationship between sea surface temperature and the amount of moisture in the atmosphere above it. So record warm temperatures means record amounts of moisture."

Adds Jennifer Francis, a climate scientist at Rutgers University who has argued that the melting of the Arctic is changing the nature of the northern hemisphere jet stream, which shapes weather patterns:

Recent heavy rains in the Carolinas over the weekend resulted from a deep, slow-moving front that tapped into a wealth of tropical moisture from the Atlantic Ocean. Sea-surface temperatures across the tropical Atlantic and along the U.S. eastern seaboard have been running well above normal....which provided extra evaporation and energy to fuel the frontal system. The entire weather pattern was slow-moving because of blocking high pressure over the N. Atlantic. Is there a connection to climate change? Very possibly, as heavy precipitation events like this one have increased in frequency, particularly in eastern North America. Warming oceans contribute to globally increasing water vapor content in the atmosphere. There is also evidence that very large waves in the jet stream, like the one that caused the slow frontal motion, are also occurring more frequently, perhaps in response to the rapidly warming Arctic. While these topics are still a focus of active research, this flooding event in the Carolinas bears all the hallmarks of expectations for a warming - and moistening - atmosphere.

3. In the end, it's about how much you stress the thermodynamics.

In a recent paper, the much cited climate researcher Kevin Trenberth of the National Center for Atmospheric Research tried to change the paradigm for how we think about the link between climate change and individual weather events - in effect, shifting the burden of proof more onto those who deny such a connection (and away from those who assert one).

Writing with his colleague John Fasullo and Theodore Shepherd, Trenberth argued that while it's hard to blame a changing climate for particular atmospheric dynamics - the atmospheric "steering" currents that first held Joaquin in in the Bahamas for an extended period, and then sent it out to sea, say - it is clear that the thermodynamic environment has changed for all storm events, because there is more available heat and moisture.

Or as the authors put it:

The climate is changing: we have a new normal. The environment in which all weather events occur is not what it used to be. All storms, without exception, are different. Even if most of them look just like the ones we used to have, they are not the same....We argue that under such conditions it is better for event attribution to focus not on the synoptic event, but rather on the influences of the changed large-scale thermodynamic environment on the extremes and temperatures and moisture associated with the event.

Trenberth therefore argued that events like Superstorm Sandy, 2013's Hurricane Haiyan and the devastating Boulder floods all had a climate change component to them. It seems reasonable to assume that the same argument would apply here. But on the other hand, that doesn't mean Trenberth has won over all of his colleagues yet.

So in sum: The floods were not "caused" by climate change, and the exact meteorological circumstances that caused them to occur are complex. However, the idea that extreme rains are worsening due to climate change is well established - and the rain in this particular event was likely worsened by thermodynamic factors that are tough to separate from a changing climate.

And several scientists are willing to say precisely that.

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[October 5, 2015 - 2015 Has Been A Year Of Record-Breaking U.S. Weather Events, Huffington Post](https://www.huffpost.com/entry/2015-10-05-2015-has-been-a-year-of-record-breaking-u-s-weather-events)

Catastrophic flooding in South Carolina since last week shattered state rainfall records and shocked longtime residents and officials, who said they've never seen rain so powerful. But it's hardly the first extreme, record-breaking weather event in the U.S. this year.

Floods, hurricanes, wildfires and other extreme events are becoming more frequent and more intense because of climate change, experts warn, and that's never been more apparent than in 2015.

Here's a look at some of the record-breaking weather-related events that have hit the U.S. this year.

### **California snowpack at all-time recorded low**

In April, drought-stricken California witnessed a snowpack with virtually no snow and set an all-time recorded low in the Sierra Nevada mountains. At just 6 percent of the long-term average for that time of year, the snowpack measure shattered the previous low of 25 percent set in 1977 and again in 2014. Gov. Jerry Brown, pictured above with Frank Gehrke, chief of snow surveys for the California Department of Water Resources, announced that same day that there would be mandatory, statewide water cutbacks for the first time in history.

Record-breaking Boston snow didn't melt until July.

Boston recorded its all-time snowiest year, with 110.6 inches between July 1, 2014, and June 30, 2015. In what grew to be an ominous reminder of how miserable the winter was, the once 75-foot-high, trash-covered "snow farm," where plows corralled the ice, didn't melt until July 14. You could even follow the snow pile on Twitter.

### **Record-breaking heat scorches the U.S.**

Multiple states have broken heat records as 2015 shapes up to be the hottest year on record. Florida recorded its hottest March to May, while California -- seen above with tourists in Death Valley this summer -- Idaho, Oregon, Utah and Washington all logged their hottest Junes.

### **Wettest month ever recorded leads to extreme flooding**

May was the all-time wettest month ever recorded in the contiguous United States in 121 years of NOAA's record-keeping. The total rainfall of 4.36 inches was 1.45 inches above average. Nowhere was the wet weather more extreme than in Texas and Oklahoma, where precipitation totaled more than twice the long-term average. Flooding claimed 23 lives and forced people like the above Houston couple to navigate roadways by boat.

In September, extreme flash floods along the Utah and Arizona border claimed 20 lives, making it the deadliest flood in Utah state history and one of the deadliest weather events of the year.

### **The U.S. gets its earliest tropical storm in 60 years.**

Tropical Storm Ana became the second-earliest tropical or subtropical storm to make landfall in the U.S. when it hit South Carolina on May 10. The only tropical storm to make a landfall earlier than that was in Florida in February 1952. While Ana didn't break the record, meteorologists at The Weather Channel noted that there has been an increasing frequency of tropical storms hitting before June 1 in the last decade.

### **California wildfires break spending records**

The catastrophic Butte Fire and Valley Fire that started in Northern California last month were so intense that the U.S. Forest Service broke its record for spending in a single week, \$243 million. The high cost of fighting the simultaneous wildfires prompted the Obama administration to direct \$250 million toward the efforts.

### [October 3, 2015 - Alaska Seeks Federal Money to Move a Village Threatened by Climate Change, Associated Press](#)

ANCHORAGE - One of the most eroded Native Alaskan villages on the state's coast is being considered as a possible national model for moving entire communities whose futures are threatened by natural disasters escalated by climate change.

The state is hoping to kick-start an exodus from the village of Newtok, about 500 miles west of Anchorage, through a national competition for states and local governments vying for a slice of nearly \$1 billion in grants to be awarded by the federal Department of Housing and Urban Development. The agency's National Disaster Resilience Competition is being promoted as an effort to address climate change and extreme weather.

If successful, Alaska officials are proposing that \$62.6 million of the money be used for relocation costs, including money for infrastructure and to allow 62 families from Newtok to establish new homes at a site on higher ground nine miles away. In the draft proposal publicly released Friday, state officials are also seeking a total of \$162.4 million for three other vulnerable villages - Emmonak, Galena and Teller - that storms have extensively damaged in recent years.

But officials acknowledge that competing for the funding, which went unused by victims of Hurricane Sandy, will not be easy. Alaska is among 40 finalists for the money, including New Orleans. But Alaska officials are hopeful.

"We think we have a very compelling story to tell," said Sally Russell Cox, a state planner who worked on the competition entry.

The release of Alaska's proposal opened a public comment period before the final contest submission is due to the department on Oct. 27.

President Obama, in a recent three-day visit to the state, focused almost entirely on climate change and how temperatures are rising faster in Alaska than anywhere else, already threatening entire communities.

Newtok is the only one of Alaska's several threatened communities that has begun a physical move. The Yup'ik Eskimo community of about 380 shepherded various multiagency projects, including the construction of several homes and the beginning of an evacuation community center, which would be completed with nearly \$5.5 million sought through the competition. The raging Ninglick River is taking over as much as 75 feet of riverbank a year, and is steadily inching toward homes. Melting permafrost is sinking, knocking homes and village boardwalks out of alignment.

Villagers say they are living on borrowed time, and they are lobbying for funding wherever they can find it. Newtok's relocation coordinator, Romy Cadiente, was in Washington last month to meet with officials, including members of Alaska's congressional delegation or their representatives.

The village is also trying to obtain money for some homes for the new site through the Federal Emergency Management Agency.

"We're trying to really focus on how to get this village out of there," Ms. Cadiente said in an interview Wednesday. "That shore is not going to grow back."

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### [October 1, 2015 - How Climate Change Is Intensifying Hurricane Joaquin, Huffington Post](#)

As the East Coast prepares for a possible Hurricane Joaquin landfall, experts warn that its intensity and potential for destruction are exacerbated by climate change.

Joaquin, which strengthened into a dangerous Category 4 hurricane on Thursday and battered

sparsely populated Bahamian islands, will strengthen in the next 12 to 24 hours, the National Hurricane Center reported. Its current path has it nearing North Carolina and Virginia on Sunday or Monday, but mid-Atlantic and Northeast states will experience minor to moderate flooding over the weekend regardless of whether the hurricane makes landfall.

Joaquin's quickly progressing strength can be tied to unprecedented sea surface temperatures in the hurricane's vicinity, Michael Mann, director of the Earth System Science Center at Pennsylvania State University, told The Huffington Post.

"Joaquin has been traveling over a record-warm ocean surface and undoubtedly that has contributed to its rapid intensification," he said. "In a very basic sense, warmer ocean surface temperatures mean there is more energy available to strengthen these storms. So we expect more intense hurricanes in general in a warmer world."

A map from the National Oceanic and Atmospheric Administration shows the temperatures in Joaquin's path at a "record warmest."

Climate Nexus, an organization dedicated to clean energy solutions, warned that because oceans expand as they absorb heat, that gives Joaquin "a higher platform from which to run up onto land" and increases the threat of severe flooding. The sea level in the New York Harbor, it noted, has risen nearly a foot over the last century.

"There is not uncertainty about sea level rise," RAND researcher Jordan Fischbach told Time in August. "As we get more sea level rise, these large storm events will with certainty damage ... assets and people."

Because a warmer atmosphere holds more moisture in the air, Climate Nexus noted, hurricanes are loaded with more potential for destructive rainfall.

Kevin Trenberth, a senior scientist with the National Center for Atmospheric Research, explained the phenomenon last month while discussing recent flooding in Utah and Arizona.

"When the right weather system comes along," he told HuffPost, "that weather system can be thought of as a device for reaching out – quite a ways at times – and grabbing the available moisture and bringing it in and dumping it down."

Mann warned it's likely we'll be seeing more hurricanes of Joaquin's strength.

"Based on our work, climate change is already leading to both more intense and larger hurricanes than before," he said. "That translates to more frequent Sandy-like storm surges for New York and elsewhere."

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### [September 29, 2015 - The Marshall Islands 'Will Go Under' If The Paris Climate Talks Fail, Foreign Minister Says, Huffington Post](#)

The Marshall Islands, a network of small islands in the South Pacific, is one of the countries most at risk of the dangers of climate change. The roughly 50,000 people who call the Marshalls home are facing rising sea levels, increasingly violent storms, drought and flooding.

Last year, an especially high tide inundated several of the islands, including Majuro, the largest and most populous. Parts of the island were under water. Hundreds of people had to flee their houses. The president said later that his people "stand to lose everything."

In November, world leaders will meet in Paris for a conference on climate change. This week, in a joint interview with The WorldPost and Al Jazeera America, Tony de Brum, the foreign minister of the Marshall Islands, discussed global warming and his goals for the Paris talks.

Christiana Figueres, the U.N. climate chief, recently said that no matter what countries pledge in Paris, we'll still be on track for a 3-degree rise in global temperatures. What is your reaction to

that?

We want to keep everything under 2 degrees -- under 1.5 degrees, if possible. We want the world to keep that as a goal. For us, anything more than that is not an option. It means that the islands will go under. For the Marshalls, for 39 atolls in the Federated States of Micronesia, for three atolls in Palau, for Maldives, for Tokelau -- anything over 2 degrees is catastrophic.

That is why we've been insisting that the language be kept -- the language we agreed to many years ago -- of 1.5 to 2 degrees of global warming. And that there be a five year cycle of negotiations so that people can ratchet up their commitments and respond to science and technology on a much quicker basis.

If you wait too long and, for example, set a ten-year plan in 2020, we'd return to the negotiating table in 15 years. That's too much time -- too long for small vulnerable islands. It would reach a point where there are more irreversible consequences of climate change than there are solvable ones. Adaptation and dealing with the impacts of climate change become a lot more expensive. We need to do something about it now.

And we're also insisting that the Green Climate Fund be fully funded (\$100 billion in place) so that vulnerable countries have assurances and confidence that there is a way out of this.

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### [September 29, 2015 - New flood projections for New York: Can the city prepare for rising seas?, CS Monitor](#)

As ice caps melt into the oceans, climate change might leave many low-ground metropolises submerged.

But it's not just rising seas that could put New York City underwater. The Big Apple could face a repeat of hurricane Sandy flooding, according to researchers at Pennsylvania State University. A storm surge like the one that forced its way past the barricades in its path, swamping roadways and flooding subway tunnels during the 2012 superstorm could happen again, the researchers say.

"In the pre-anthropogenic era, the return period for a storm producing a surge of 2.81 meters (9 feet) or greater like Sandy at the Battery would have been about 3,000 years," Andra Reed, study author and graduate student in meteorology at Penn State, said in a university release. "We found that, in the anthropogenic era, the return period for this same storm surge height has been reduced to about 130 years."

Storm surges occur when winds and atmospheric pressure from a large storm churn seas up higher than normal resulting in inland flooding. But the storm's power isn't the most influential factor in storm surges. The size of the storm, the tide, and sea level all contribute.

"Sea level is rising because of climate change," said Michael Mann, meteorologist at Penn State. "But climate change also appears to be leading to larger and more intense tropical storms."

There were seawalls in place to hold back such a storm surge off Manhattan, but the water flooded over the barrier into Battery Park on the southern tip of the island.

The Federal Emergency Management Agency (FEMA) issued a revised floodplain map following the 2012 storm. This new map is a fresh look, as the last one was made in 1983 by the agency. This new map generously expands the flood zone of the region, perhaps too generously according to some.

Almost doubling the number of buildings contained in the floodplain, the map also increases the number of potentially affected residents by 83 percent. This brings the marked area to 400,000 residents and 71,500 structures.

The city has called FEMA's map is overcautious, according to an August article in the Wall

Street Journal. Officials had their own study done, showing a significantly smaller floodplain. It may be devastating to live through flooding like many did in 2012, but for the city it comes down to economics.

When an area is dubbed a floodplain, certain protective measures must be put in place. However, some of those fall on the homeowners in the form of higher insurance costs. New York is appealing FEMA's map with those costs in mind, but officials are still wary of the risks.

"It was necessary for the city to do it, to try to keep that affordability for homeowners," Donovan Richards, a City Council member who represents parts of Queens, told the Journal. "But we also have to be cautious, and not shrink the map to the extent that if another storm comes, these homeowners would not have been in the flood zone."

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### [September 28, 2015 - King tide sets stage for climate talks in South Florida, Miami Herald](#)

As if on cue, a king tide powered by a supermoon flooded parts of South Florida Sunday and Monday, setting a soggy stage for international forums aimed at drawing attention to the perils of climate change.

In downtown Miami, about 1,200 people gathered to train for a climate corps led by former Vice President Al Gore, who drew mainstream attention to the issue in his 2006 Academy Award-winning documentary *An Inconvenient Truth*. For nearly three hours, Gore walked a crowd that included participants from 80 countries through his now-famous slide show, rebooted with a decade's worth of new science and data supporting the dire consequences of a warming planet. Across Biscayne Bay, where climate change has made Miami Beach ground zero for rising seas, the French Embassy hosted another panel in advance of a U.N. summit in Paris in November.

"The scientists have long since told us we have to change," Gore told the packed room at the Hyatt Regency overlooking the Miami River. "But now Mother Nature is saying it with water in the streets in this city."

Though Gore largely avoided politics, he accused the state's power companies of standing in the way of solar power and took a subtle jab at Gov. Rick Scott, whose environmental regulatory agency has tended to avoid using the term "climate change" in official documents. Scott has denied reports that he banned the phrase.

"Miami has an enormous amount at risk," Gore said as he showed pictures of sunny-day flooding in South Florida during a 2013 king tide. "I just wonder how the governor watches this and says, 'I don't notice anything. Do you notice anything?' Not to make an ad hominem comment, but I'm genuinely curious."

This year's king tide coincided with a Sunday supermoon that put the moon closest to the earth in its oblong orbit, fueling higher than expected tides. A second king tide was forecast for about 9 p.m. Monday, followed by a second round just after 10 a.m. and 10 p.m. Tuesday and 11 a.m. and 11 p.m. Wednesday.

The seasonal high tides, which scientists say have been inching up with rising sea levels, put Indian Creek Drive underwater for part of the day. Flooding was also reported in Fort Lauderdale, Hollywood and farther north in the Hillsboro and Deerfield Beach areas, said Jennifer Jurado, director of Broward County's division of Environmental Planning and Community Resilience.

Around Miami Beach in areas where new pumps kicked on as part of a \$200 million plan to keep the city dry, no flooding occurred, the city reported. The city has touted its approach as a model for other coastal communities that will inevitably be dealing with increased flooding. (continued)

## Announcements

### [October 21, 2015 - Registration Open. Connecticut Association of Flood Managers 2nd Annual Conference](#)

Where: Water's Edge Resort and Spa, 1525 Boston Post Road, Westbrook, CT 06498  
Time: 8:00 A.M. to 5:00 P.M.

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### [November 15, 2015 - Next review date for CIRCA Matching Funds Program. Up to \\$100,000 available. For more information go to <http://circa.uconn.edu/funds.htm>](#)

The CIRCA Executive Steering Committee is excited to announce its fourth round of funding under the Matching Funds Program - up to \$100,000 is available. CIRCA will consider requests from Connecticut municipalities, institutions, universities, foundations, and other non-governmental organizations for matching funds for projects that address the mission of the Institute. To be funded, a successful Matching Funds request must have a commitment of primary funding within 6 months of the CIRCA award announcement, or have received a waiver from the CIRCA Executive Steering Committee. CIRCA Matching Funds will provide up to 25% of the primary funder's contribution other than municipal or State of Connecticut funds to enhance the likely success of project proposals that advance CIRCA research and implementation priorities. In evaluating proposals preference will be given to those that leverage independent funding awarded through a competitive process.

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### [November 19, 2015 - Rockfall Foundation Grants Program](#)

The Rockfall Foundation invites representatives of non-profit organizations, municipalities, and schools to apply for grants for projects that contribute to the general environmental education of the public, promote environmental planning, contribute to the preservation of the Connecticut River watershed, or fund an internship with a non-profit organization for an environmental project. For the 2015-2016 Grant Cycle, Rockfall will entertain grant applications for amounts ranging from \$500 to \$15,000. Proposals must have ties to Middlesex County in order to be considered. This includes projects or programs based in Middlesex County as well as applicants based in Middlesex County. Proposals that focus on the Connecticut River corridor or Long Island Sound will also be considered as long as there is a demonstrated impact on Middlesex County. Special consideration will be given to projects that impact youth (preschool through college) or are multi-generational.

The FY2015-16 guidelines and application form, as well as additional information about The Rockfall Foundation, are available on the Rockfall website: [www.rockfallfoundation.org](http://www.rockfallfoundation.org). The application deadline is 12:00 noon, Thursday, November 19, 2015; grant awards will be announced and funds distributed early in 2016.

An informal workshop where potential applicants can ask questions and discuss their ideas will be held Wednesday, September 16 from 5:00 to 6:00 p.m. at the deKoven House Community Center, 27 Washington Street, Middletown. Anyone with questions or who would like to RSVP for the workshop should contact Tony Marino, Interim Executive Director, [attmarino@rockfallfoundation.org](mailto:attmarino@rockfallfoundation.org) or 860-347-0340.

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### [November 20, 2015 - Notice of Funding Availability from CT Dept. of Housing CDBG-DR Tranche 2, Planning funds to address improved resiliency to Infrastructure and Public Facilities in Fairfield, New Haven, New London and Middlesex Counties. Applications due November 20, 2015](#)

State of Connecticut  
Department of Housing  
NOTICE OF FUNDING AVAILABILITY  
Community Development Block Grant- Disaster Recovery- Tranche 2  
Planning funds to address improved resiliency to Infrastructure and Public Facilities in Fairfield,  
New Haven, New London and Middlesex Counties

**Deadline for Submission of Application: November 20, 2015**

This Notice of Funding Availability (this "NOFA") is directed to eligible applicants seeking assistance for planning activities associated with improved resiliency of infrastructure and public facilities within eligible counties under the Community Development Block Grant Disaster Recovery ("CDBG-DR") Program.

**A. Goal of this NOFA:**

The goal of this NOFA is to provide funding for necessary planning/preconstruction expenses related to the hardening of infrastructure and public facilities in Superstorm Sandy eligible counties. The State of Connecticut Department of Housing ("DOH") intends to provide assistance which will lead to added resiliency and mitigate future damage in a manner that supports energy conservation, efficiency and environmental stability.

**B. Eligible Applicants:**

Applicants eligible for consideration under this NOFA include state agencies, units of local government and local councils of government (e.g. regional planning agencies).

**C. Eligible Activities:**

Eligible activities include the following:

- Research to develop strategies to address the health and safety of homeless individuals and families and other vulnerable populations;
- Plans to address foreseeable mitigation and resiliency projects, particularly as they relate to critical infrastructure;
- Plans to avoid fuel shortages during disasters;
- Plans to address coastline resiliency;
- Research to develop strategies for creating off-the-grid public facilities, homes and commercial businesses;
- Plans to address resiliency/mitigation of potable water or waste water systems; or
- Plans to address resiliency/mitigation of roads and drainage systems.

**D. Funding Amount:**

The amount of funding to be made available under this NOFA is approximately \$4,000,000. The minimum amount of funding that can be applied for is \$100,000. There is no maximum amount.

**[READ MORE](#)**

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**[December 1- 2, 2015 - Registration Now Open! Living Shorelines: Sound Science, Innovative Approaches, Connected Community 1st National Technology Transfer Meeting and Regional Workshops](#)**

When: December 1-2 2015

Where: Hilton Hartford Hartford, CT

Restore America's Estuaries, in partnership with the Connecticut Institute for Resilience and Climate Adaptation, is pleased to announce a first-of-its-kind living shorelines event! This Summit - Living Shorelines: Sound Science, Innovative Approaches, Connected Community - will feature nationally-relevant issues and discussions along with region-specific workshops.

Whether you call them "soft shorelines," "living shorelines," "soft armoring," or "soft stabilization projects," you belong at this gathering!

Follow on twitter @LSSummit2015

Contact Jeff Benoit - [jbenoit@estuaries.org](mailto:jbenoit@estuaries.org)

Any Questions? Contact Suzanne Simon - [ssimon@estuaries.org](mailto:ssimon@estuaries.org)



The *Resilience Roundup* highlights CIRCA's presence in the news, provides links to recent local/state/national news articles related to resilience and adaptation, and announces upcoming events and seminars.

The Connecticut Institute for Resilience and Climate Adaptation's (CIRCA) mission is to increase the resilience and sustainability of vulnerable communities along Connecticut's coast and inland waterways to the growing impacts of climate change and extreme weather on the natural, built, and human environment. The institute is located at the University of Connecticut's Avery Point campus and includes faculty from across the university. CIRCA is a partnership between UConn and the Connecticut Department of Energy and Environmental Protection (CT DEEP).

[circa.uconn.edu](http://circa.uconn.edu)

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