

# NESEC NEWS

Published by the Northeast States Emergency Consortium

Wakefield, Massachusetts

Connecticut • Maine • Massachusetts • New Hampshire • New Jersey • New York • Rhode Island • Vermont

Volume 21 Issue 1

[www.nesec.org](http://www.nesec.org)

Spring 2018

## Sediment Core Contains Evidence of The 1755 New England Earthquake



Researchers Emma Howey and Brad Hubeny retrieve a sediment core in 2013  
SSA PHOTO

*From Seismological Society of America March 2018*

LYNN, MA - Signs of a 1755 earthquake that was strong enough to topple steeples and chimneys in Boston can be seen in a sediment core drawn from eastern Massachusetts' Sluice Pond, according to a new report published in *Seismological Research Letters*. Katrin Monecke of Wellesley College and her colleagues were able to identify a layer of light brown organic-rich mud within the core, deposited between 1740 and 1810, as a part of an underwater landslide, possibly unleashed by the 1755 Cape Ann earthquake.

The Cape Ann earthquake is the most damaging historic earthquake in New England. While its epicenter was probably located offshore in the Atlantic, the shaking was felt along the North American eastern seaboard from Nova Scotia to South Carolina. Based on contemporary descriptions of damage from Boston and nearby villages, the shaking has been classified at modified Mercalli intensities of "strong" to "very strong," ((VI-VII) meaning

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## Rhode Island First Storm Ready State in the Nation

CRANSTON, RI - Rhode Island is the first state in the nation to have all municipalities named StormReady by the National Weather Service (NWS).

The Rhode Island Emergency Management Agency, in collaboration with the NWS Forecast Office in Taunton, MA, led an 18-month effort to become a StormReady State. StormReady recognition required that all cities and towns complete a six-point plan to manage severe weather.

NWS Taunton Meteorologist-in-Charge Bob Thompson said, "Although StormReady designation

doesn't keep the storms away, it does signify a community's commitment to be prepared when a storm does threaten and proactively respond for the sake of public safety. There can be no greater calling for government than helping to ensure the safety of its citizens."

Governor Gina Raimondo thanked everyone at EMA and all 39 communities for their hard work and dedication in preparing Rhode Island and setting a national standard, "Preparedness is a full-time job. Thank you to every community in Rhode Island for taking the time to plan ahead and keep Rhode Islanders safe."



# Evidence of The 1755 New England Earthquake

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that it would have caused slight to moderate damage of ordinary structures.

New England is located within a tectonic plate, so “it is not as seismically active as places like California, at an active tectonic plate margin,” said Monecke. “There are zones of weakness mid-plate in New England and you do build up tectonic stress here, you just don’t build it up at the same rate that would occur at a plate boundary.”

With few faults to study, however, researchers like Monecke and her colleagues are looking for signs of seismically-induced landslides or the deformation of soft soils to trace the historic and prehistoric record of earthquakes in the region.

Monecke hopes that the new Sluice Pond core will give seismologists a way “to calibrate the sedimentary record of earthquakes in regional lakes,” she said.

“It is important to see what an earthquake signature looks like in these sediments, so that we can start looking at deeper, older records in the region and then figure out whether 1755-type earthquakes take place for example, every 1000 years, or every 2000 years,” Monecke added.

The researchers chose Sluice Pond to look for signs of the Cape Ann earthquake for a variety of reasons.



**Woodcut showing damage in Boston from 1755 Cape Ann Earthquake.** COURTESY OF JAN KOZAK COLLECTION, NISEE

First, the lake is located within the area of greatest shaking from the 1755 event, “and we know from other studies of lakes that have been carried out elsewhere that you need intensities of approximately VII to cause any deformation within the lake sediments,” Monecke said.

Sluice Pond also has steep sides to its center basin, which would make it susceptible to landsliding or underwater sliding during an earthquake with significant shak-

ing. The deep basin with a depth of close to 65 feet also harbored a relatively undisturbed accumulation of sediments for coring. Through a painstaking analysis of sediment size and composition, pollen and plant material and even industrial contaminants, the research team was able to identify changes in sediment layers over time in the core. The light brown layer deposited at the time of the Cape Ann quake caught their eye, as it contained a coarser mix of sediments and a slightly different mix of plant microfossils.

“These were our main indicators that something had happened in the lake. We saw these near shore sediments and fragments of near-shore vegetation that appear to have been washed into the deep basin,” by strong shaking, said Monecke.

In an interesting twist, land clearing by early settlers from as far back as 1630 may have made the underwater slopes more susceptible to shaking, Monecke said. Sediment washed into the lake from cleared land loads up the underwater slopes and makes them more prone to failure during an earthquake, she noted. For that reason, the sediment signature linked to prehistoric earthquakes may look a little different from that seen with the Cape Ann event, and Monecke and her colleagues are hoping to sample even older layers of New England lakes to continuing building their record of past earthquakes.

The research team is taking a closer look at a more famous New England body of water: Walden Pond. “It got slightly less ground shaking [than Sluice Pond] in 1755, but it might have been affected by a 1638 earthquake in southern New Hampshire,” Monecke explained. “We already have sediment cores from that lake, and now we are unraveling its sedimentary history and trying to get an age model there as well.”

## PAPER AUTHORS:

Katrin Monecke, Daniel J. Brabander, Emma Howey  
Greta Janigian  
Department of Geosciences  
Wellesley College

Francine G. McCarthy, Justin Pentesco  
Department of Earth Sciences  
Brock University

J. Bradford Hubeny, Shelley Kielb  
Department of Geological Sciences  
Salem State University

John E. Ebel  
Weston Observatory  
Boston College  
Weston, Massachusetts 02493 U.S.A.

# AccuWeather Forecasts 2018 Atlantic Hurricane Season to Pack Multiple Powerful Hurricanes

STATE COLLEGE, PA - After a devastating 2017 hurricane season, private AccuWeather forecasters are predicting a near normal to slightly above-normal year with 12 to 15 tropical storms. Of those, 6 to 8 are forecast to become hurricanes and 3 to 5 major hurricanes. "Last year we had 17 tropical storms. This year may not be quite as active, but still probably normal to slightly above normal," AccuWeather Atlantic Hurricane Expert Dan Kottlowski said.

"This season may not [bring] as many impacts, but I'm almost afraid to tell people this because it only takes one big storm to hit you to cause massive damage. If all we had was just another Irma or Harvey, that would be more than enough to cause catastrophic damage for any coastal community. Anywhere else along the coast, everybody should still be vigilant and prepare for a possible direct impact," Kottlowski said.

"You should have a hurricane plan in action. You want

to prepare for the worst case scenario - that's called having a hurricane plan."



## Governor Malloy Announces \$10M in School Security Grants

HARTFORD, CT - Governor Dannel P. Malloy recently announced that the State of Connecticut has approved \$10 million in grants to be used to enhance security infrastructure at 182 schools in 51 towns across the state. The funds were approved under the School Security Grant Program focusing on gun violence prevention, mental health, and school security issues. The program is administered by the Department of Emergency Services and Public Protection. To date under this program, the state has made \$53 million available to over 1,200 schools in three separate rounds of funding.

"We have a moral obligation to provide a safe learning environment for our students," Governor Malloy said. "This most recent round of funding we are announcing today will provide critical resources that allow communities to modernize their school security infrastructure and provide an enhanced level of safety for both students and faculty."

"Public safety will always be a core function of our government, especially when it comes to our children's safety and well being," DESPP Commissioner Dora Schriro said. "Under Governor Malloy's leadership and support, this critical grant program will continue to strengthen our schools by enhancing the security of students and faculty and making our educational systems more resilient statewide."

## Free Multi-Hazard Risk Analysis

WAKEFIELD, MA - NESEC is offering FREE assistance to help local, state organizations and others understand their risk from natural hazards. Using the FEMA program HAZUS -MH, NESEC models impacts of earthquakes, hurricanes and floods in your jurisdiction.

The reports include hazard maps, dollar damage estimates, shelter requirements, debris estimates, critical infrastructure



*Medical Center Flood Inundation Map*

NESEC IMAGE

impact and much more. NESEC has provided hazard risk assessments to the City of Boston, Nashua NH, Ipswich, MA, FEMA Region 1, the State of Maine and others. To request your FREE Hazard Risk Assessment please complete the simple online application at: <http://nsec.org/mapyourriskapply/>

# Earthquakes aren't just a California Problem.

THE NORTHEAST STATES ALSO EXPERIENCE SIGNIFICANT EARTHQUAKES

**2.0 - 2.9** Felt by some, slight shaking like a passing truck

**3.0 - 3.9** Felt by many, can break dishes and windows

**4.0 - 4.9** Felt by all, possible chimney and plaster damage

**5.0 - 5.9** Felt by all, chimneys may fall, building damage depends on quality of construction



## Do you know your risk?

Earthquakes occurring in the Northeast U.S.  
from **January 1975 - October 2017**  
Data Source: Weston Observatory



Visit [nasec.org](http://nasec.org) for information about northeast earthquakes and how we can help Map Your Risk.

## NESEC NEWS

Northeast States Emergency Consortium  
1 West Water Street, Suite 205  
Wakefield, MA 01880  
[www.nasec.org](http://www.nasec.org)

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