



The NHWC Transmission

June 2018

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Low-cost sensors can improve flood management

Sara Friedman, Government Computer News (reprinted with permission)

Jun 07, 2018

When it comes to flood management, many cities depend on sensors to provide real-time insights that can give officials some warning so they can close roads and mitigate other flood-related risks. The



Department of Homeland Security's Flood Awareness Apex program is working with the Charlotte-Mecklenburg Storm Water Services and the Kentucky Division of Water to install low-cost flood sensors as part of scalable network to track and monitor water conditions.

Over the next year, DHS S&T will be installing 75 sensors at 25 locations to monitor flooding in both Mecklenburg County and Elizabethtown, Ky. The low-cost devices will give the communities an alternative to the sensors provided by U.S. Geological Survey, which are expensive to install and engineer for specific needs. The Apex program is working with Progeny Systems' internet-of-things sensors that can monitor, detect and report situational data to operations centers; Physical Optics Corp.'s wireless mesh digital radio network that connects the submersible sensors; and Evigia Systems' sensor analytics solutions.

As a utility provider, Charlotte-Mecklenburg Storm Water Services has a relatively mature flood sensor network that gives it real-time insights from a network of stream and rain gauges purchased under a cooperative agreement with USGS. It supports the Flood Information and Notification System (FINS), which sends out approximately 70 alerts a year based on modeling from flood maps.

The antennas on the FINS sensors send alerts to repeaters that transmit the information to the Charlotte-Mecklenburg Storm Water Services. The sensor data is analyzed and, if the flooding reaches certain thresholds, notifications are sent to responders like the Charlotte Fire Department.

"We are able to anticipate [problems] based on the amount of rain that we get," Tim Trautman, program manager of the Charlotte-Mecklenburg Storm Water Services Engineering and Mitigation Program, told GCN. "The system that we've built with the [USGS] gauges needs to work in real time, so we can get the right people out to respond to road closures."



In the first year of Charlotte-Mecklenburg Storm Water Services project, officials want to see how the low-cost sensors compare to the USGS stream and rain gauges monitoring the same locations. The following year, depending on the accuracy of the new sensors, the utility will move the sensors to additional locations such as ditches or underneath bridges. The third year of the program will be devoted to inundation mapping and experimentation with different forms of communication, such as sending phone alerts to drivers who are traveling near flooded areas.

“We want to be able to produce real-time maps where you overlay buildings and other data with department resources such as boats, people and manpower,” Trautman said. “We’re hoping that if we double the number of sensors, then we will have more data on creek levels and be able to produce real-time inundation mapping in a robust way.”

The Kentucky Division of Water decided to specifically focus on a pilot in Elizabethtown

because of its interest in exploring what happens when a dam fails. Elizabethtown has piezometers that track pressure exerted on the Freeman Lake Dam that were installed when the reservoir was built 17 years ago.

“We are specifically looking into dam failure modes and have prioritized them through an assessment of the different types of warning systems,” said Carey Johnson, environmental scientist consultant in the Kentucky Division of Water.

The low-cost sensors could measure the volume and velocity of the water that exists in current systems, which serves as a good indication of when failures such as overtopping and erosion could occur.

Through the Apex program the agencies can collaborate and share insights. They are also working with the [Lower Colorado River Authority](#) in Austin, Texas, which started partnering with DHS in 2016 on its flood sensor program. 🌐

JUNE 17-20, 2019

13TH BIENNIAL TRAINING CONFERENCE & EXPOSITION

Observe, Disseminate, Respond: The Triple Crown

**THE GALT HOUSE HOTEL
LOUISVILLE, KENTUCKY**



**NHWC
CONFERENCE
LOUISVILLE • 2019**

Save the date for our 2019 Conference, which will be held June 17-20, 2019 at the Galt House in Louisville, Kentucky.

Why Attend the 2019 NHWC Conference?

- ★ **MEET** other hydrologic professionals hailing from across the U.S. and beyond.
- ★ **SHARE** your experiences and the advances you have been working on.
- ★ **LEARN** from industry experts in a wide range of keynote presentations and technical sessions.
- ★ **RECEIVE** Continuing Education Credits for Certified Floodplain Managers
- ★ **TALK** to the “best in our industry”.
- ★ **ENJOY** all Louisville, Kentucky has to offer.

The NHWC 2019 Conference features four days of training workshops, plenary and lunch speakers, exhibitions, and technical presentations designed to advance the state-of-the-art in hydrologic warning and to provide opportunities for networking.

The Conference Planning Committee is working through all facets of the conference, including agenda design, attendee registration, social activities, and exhibitors. Watch for the first Conference Newsletter next month – it will include all the latest conference information so you can begin planning.

If you have any questions, please contact Brad Heilwagen, 2019 NHWC Conference Chair at: nhwc2019conference@hydrologicwarning.org

More Conference Highlights

Training: Several scheduled workshops will include implementation of the latest technology and instruments, as well as an introduction to some of the newest products and innovations.

Networking: The NHCW hospitality suite, exhibit hall, and planned social gatherings, as well as the many restaurants and lounges in the hotel and nearby, will provide multiple opportunities to make professional connections by sharing best practices, success stories, and solutions to hydrologic warning issues.

Golf Outing: Our Monday afternoon golf outing is confirmed at the Covered Bridge Golf Course, co-designed by golf legend Fuzzy Zoeller and famous course designer Clyde Johnson. Golfers will play 18 holes of the gently rolling course, nestled at the foot of Southern Indiana's famous Floyd Knobs.

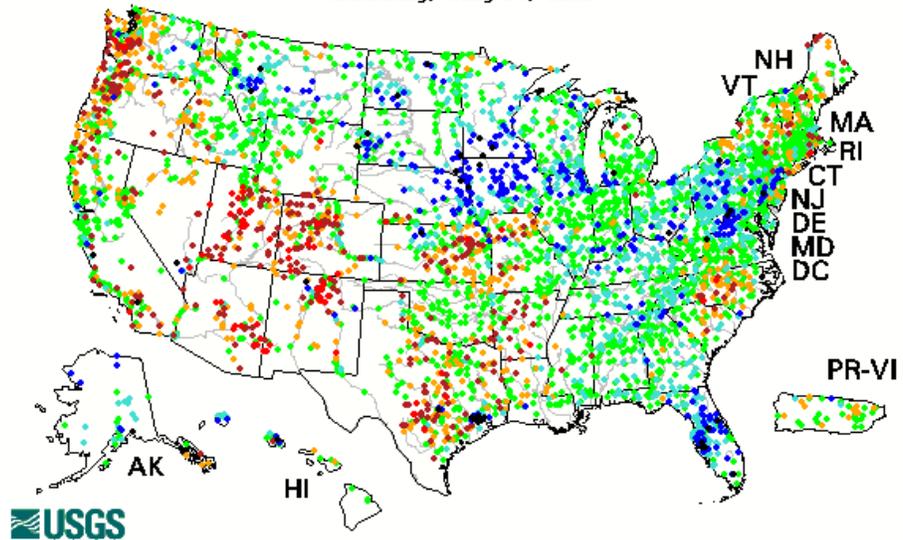
Riverboat Cruise: During our Tuesday night dinner and networking event, conference registrants and guests will be able to "See Louisville by really seeing Louisville" during a two-hour Ohio River cruise aboard the Bell of Louisville, a historic steamboat originally built in 1914.

Training Sessions: The conference program will be organized around topics including:

- Communicating Risk
- Multi-channel communications
- Crowdsourced Data
- Community Rating System
- Drought Adaptation
- New Technologies
- Inundation Mapping
- Federal Initiatives

Hydrologic Conditions in the United States Through July 3, 2018

Wednesday, July 04, 2018

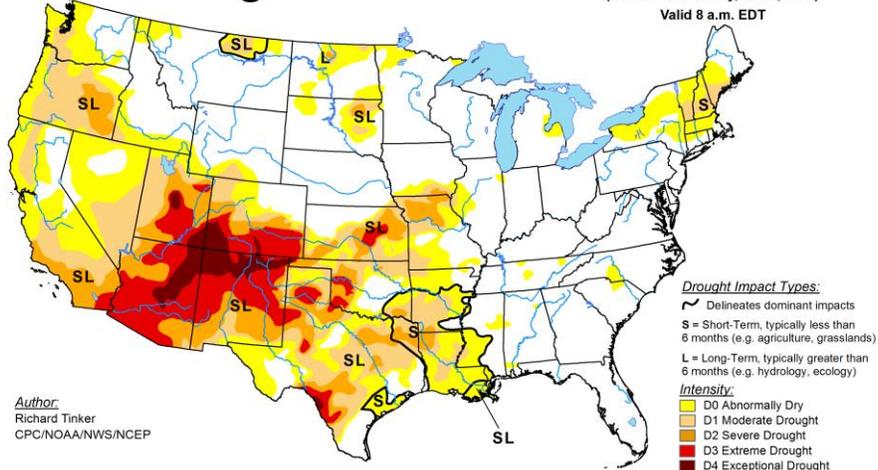


Explanation - Percentile classes						
●	●	●	●	●	●	●
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High

Latest stream flow conditions in the United States. (courtesy USGS)

U.S. Drought Monitor

July 3, 2018
(Released Thursday, Jul. 5, 2018)
Valid 8 a.m. EDT



Author:
Richard Tinker
CPC/NOAA/NWS/NCEP

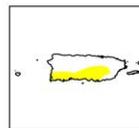
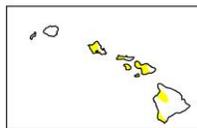
Drought Impact Types:

- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



<http://droughtmonitor.unl.edu/>

Latest drought conditions in the United States.
(courtesy National Drought Mitigation Center)

July Newsletter Articles Focus: Hydrology

The NHC is requesting articles that focus on hydrology - the science behind the work we do.

Please consider preparing a short article about new methods, research, or discoveries in hydrology or a recent significant hydrologic event.

Submit your article to:

editor@hydrologicwarning.org

July 17th is the deadline for inclusion in the July issue.

Future Newsletter Articles Focus

To give you more time to prepare articles, below is the article focus schedule for the next four months:

Jul - Hydrology

Aug - Hazard

**Communication &
Public Awareness**

Sep - Modeling/Analysis

Oct - Data Collection

NHWC Calendar

June 17-20, 2019 – The NHWC 13th Biennial Training Conference and Exposition, Louisville, Kentucky

General Interest Calendar

July 10-12, 2018 – [National Association of Flood & Stormwater Management Agencies \(NAFSMA\) 40th Anniversary Annual Meeting](#), Santa Fe, NM

September 9-13, 2018 – [ASDSO Dam Safety 2018](#), Seattle, Washington

(See the [event calendar](#) on the NHC website for more information.)

Parting Shot

Not just a pretty picture...



Cluff Ranch Reservoir, Arizona – June 29, 2018

These images were captured remotely on June 29th, 2018 by a fixed, time lapse IP camera installed by the Arizona Game and Fish Department for observing real-time conditions at Cluff Ranch Reservoir near Safford, Arizona. This is one of 4 installed this year as a pilot project to test the viability of using low-cost IP enabled game cameras to support the department's flood warning and dam safety programs.

Brian Iserman, JE Fuller Hydrology, Inc.

National Hydrologic Warning Council

*Providing Timely, Quality Hydrologic Information to Protect Lives,
Property, and the Environment*

<http://www.hydrologicwarning.org>