

# Federal Crowdsourcing Webinar Series

## Episode One

# Federal Crowdsourcing and Citizen Science Community of Practice (FedCCS)

**John McLaughlin**

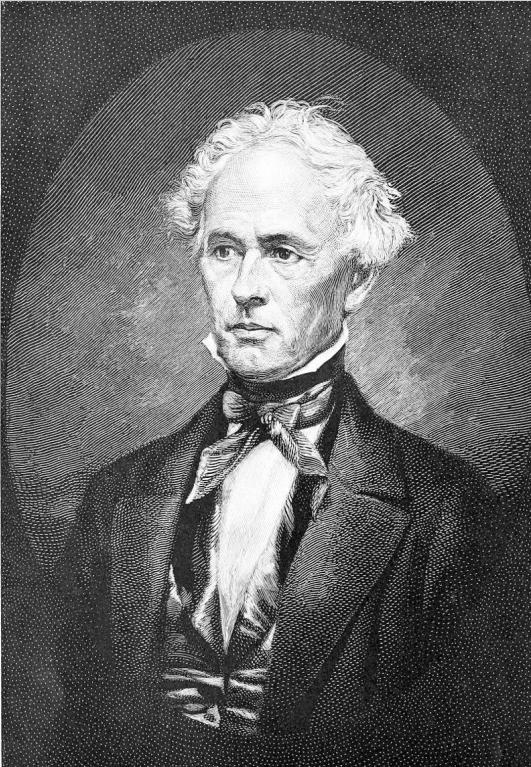
CitizenScience.gov Program Manager  
U.S. General Services Administration

**Sophia B Liu, Ph.D.**

Innovation Specialist, Crowdsourcing and Citizen Science Coordinator  
U.S. Geological Survey  
Co-Chair of FedCCS

# William C. Redfield (1789-1857)...

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- A saddle maker, steamboat captain, and self-taught amateur meteorologist from Middletown, CT
- Noticed something interesting a few months after the New York Hurricane of 1821
- In 1831, he published his observations that trees had fallen northwestward in the eastern part of CT, and southeastward in the western part of the state

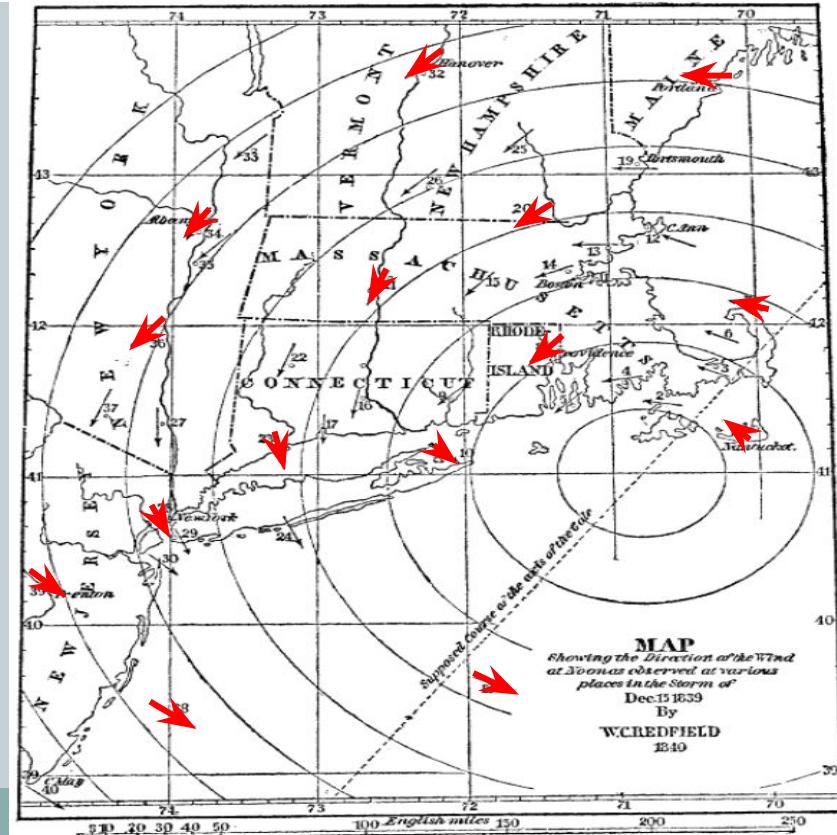
# Harnessed the Power of People

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- During a 1839 storm, Redfield drew from a network of observers that recorded wind direction at noon
- Helped prove existence of cyclonic storms

*Observations on the Storm of December 15, 1839*  
William C. Redfield

*Transactions of the American Philosophical Society,*  
Vol. 8 (1843), pp. 77-82



# Definitions

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## *In Citizen Science...*

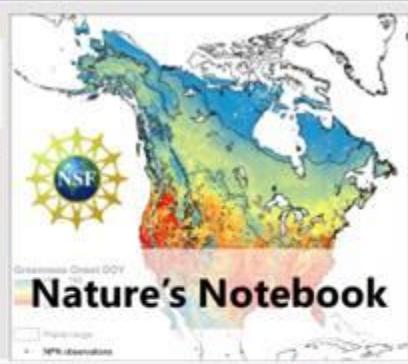
the public participates voluntarily in the scientific process, addressing real-world problems in ways that may include formulating research questions, conducting scientific experiments, collecting and analyzing data, interpreting results, making new discoveries, developing technologies and applications, and solving complex problems.

## *In Crowdsourcing...*

organizations submit an open call for voluntary assistance from a large group of individuals for online, distributed problem solving.

# Tools with Many Applications

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# New Participation Pathways

6

# Identify

Species



Forget-me-nots (Genus *Myosotis*) OBSERVED: 06/06/2016 BY: JASONRGRANT

Needs id

Qu...nbyi ✓ Agree

Hairy Puccoon Lithospermum carolinianum ✓ Agree

Cotinus coggygria ✓ Agree

Arenaria serpyllifolia ✓ Agree

Genus Hypericum ✓ Agree

Prunus laurocerasus ✓ Agree

6 aguilata 71,873

Reviewed Comment Agree Add ID

Map Data Terms of Use

Val-de-Ruz, Neuchâtel, Switzerland

jasonrgrant's identification 3m Agree

Forget-me-nots Genus *Myosotis*

Identifications 391

115,601

104,933

85,323

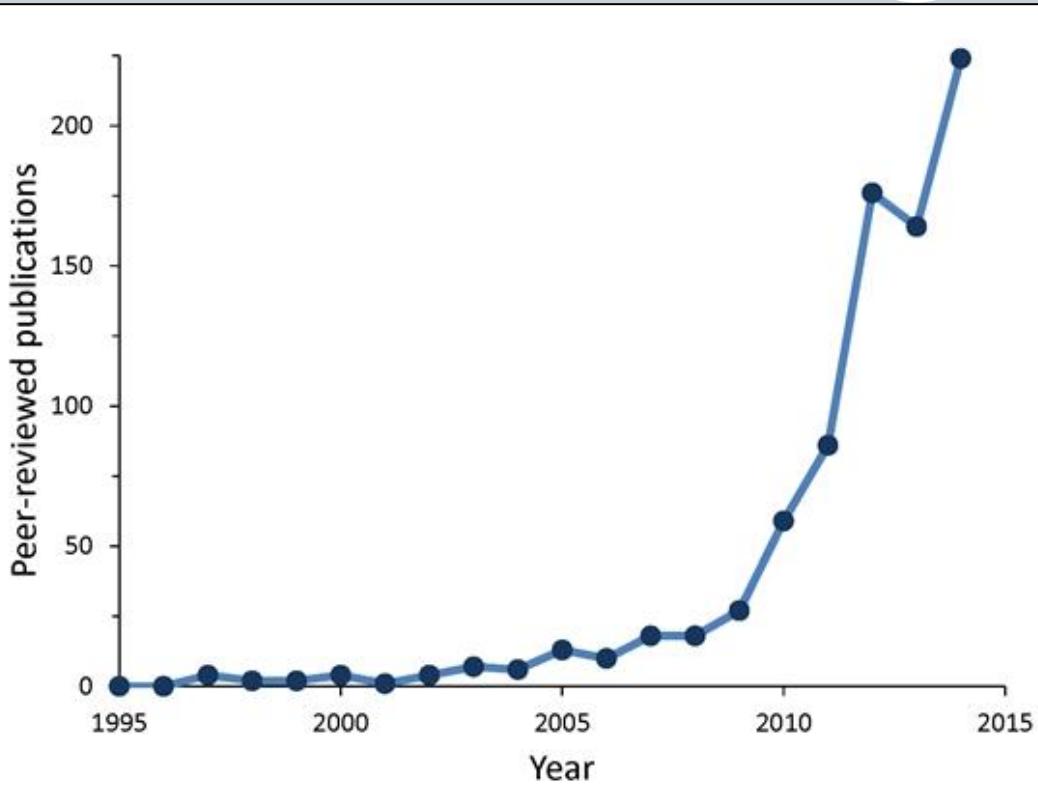
77,023

71,873



# Field is Growing, Rapidly

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*David Hanych, an NSF Program Officer, described the growth in this field as a “coming tsunami”*

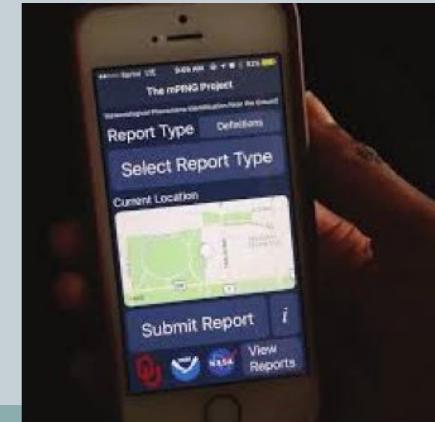
Results for a search of the Web of Science for the keyword “citizen science”

*McKinley et al (2015) Issues in Ecology 19.*

# Citizen Science Can...

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- Enhance scientific research
- Address societal needs
- Provide hands-on learning and increase STEM literacy



# Federal Community of Practice for Crowdsourcing and Citizen Science (FedCCS)

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- Grassroots community open to all federal staff
- Seeks to expand and improve the U.S. government's use of crowdsourcing and citizen science
- Over 370 members from 63 agencies
- Monthly meetings and listserve
- Learn more and join at [CitizenScience.gov](http://CitizenScience.gov)



# Key Milestones

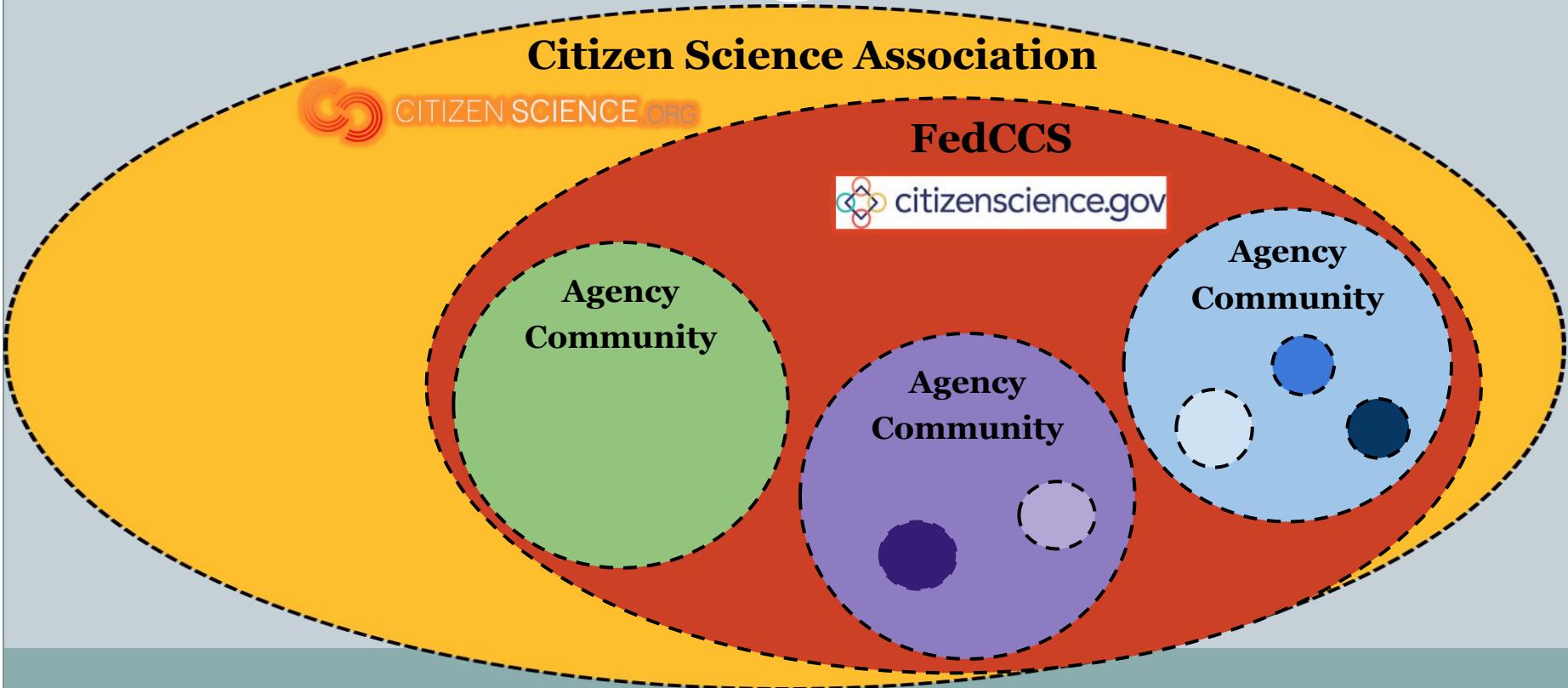
10

- **2013** - New Visions in Citizen Science event at Wilson Center
- **2014** - FedCCS officially established in January
- **2015** - OSTP memo and White House event on Accelerating Citizen Science
- **2016** - CitizenScience.gov site released, and growing!
- **2017** - Citizen Science & Crowdsourcing Act signed into law; Finalist for Harvard Ash Innovation award
- **2018** - Sharing Across Scales event at Wilson Center
- **2019** - First report to Congress on crowdsourcing and citizen science



# Tiered Layers of Communities

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# Report to Congress

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- Required by Crowdsourcing and Citizen Science Act
- White House Office of Science and Technology Policy is finalizing a report on Federal prizes and crowdsourcing and citizen science projects conducted during fiscal years 2017 - 2018
- FedCCS contributed details on over 80 project as well as broader agency practices that support them
- Likely release this Spring 2019

# Now Let's Explore...

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Resources developed by our FedCCS  
community available from CitizenScience.gov



# Usage is Growing

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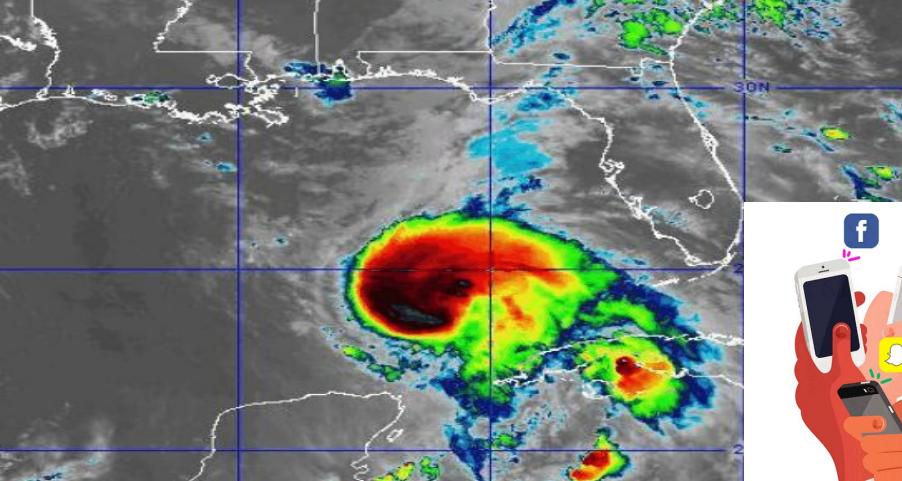
Sessions on CitizenScience.gov Site



# Connect

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- Please follow us on Twitter at @FedCitSci
- We benefit from sharing lessons learned & best practices
- Looking for ways to collaborate with other communities
  - Designate representatives?
  - Ideas for specific partnership opportunities?
- Look forward to meeting more of you and learning about what you do!



# Hazard-related Citizen Science at USGS and Disaster-related Crowdsourcing at FEMA



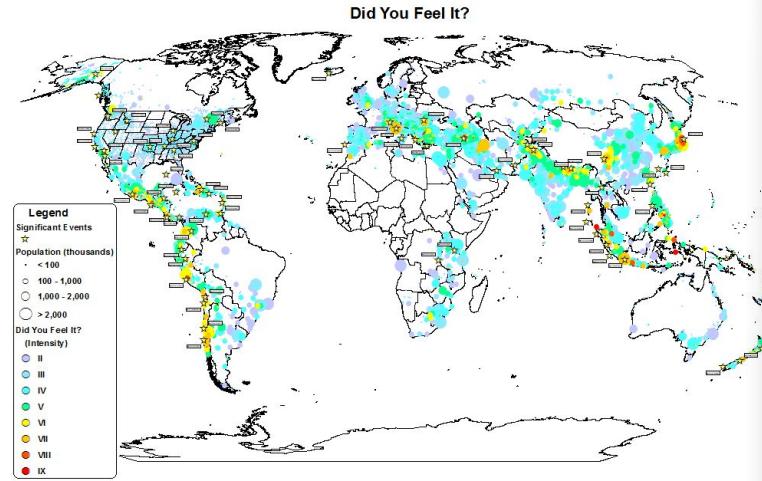
**Sophia B Liu**

Innovation Specialist, Science and Decisions Center, U.S. Geological Survey  
Co-Chair of Federal Community of Practice for Crowdsourcing & Citizen Science (CCS)  
USGS CCS Coordinator and FEMA Crowdsourcing Unit Coordinator

@sophiabliu

# USGS Did You Feel It? (DYFI)

4.5+ million DYFI reports  
since 1999



~ 30 seconds to submit report

**Felt Report** OMB No. 1028-0048 Expires 05/31/2018

Your location when the earthquake occurred

Choose Location

Did pictures on walls move or get knocked askew?

Not specified  
 No  
 Yes, but did not fall  
 Yes, and some fell

Did any furniture or appliances slide, topple over, or become displaced?

Not specified  
 No  
 Yes

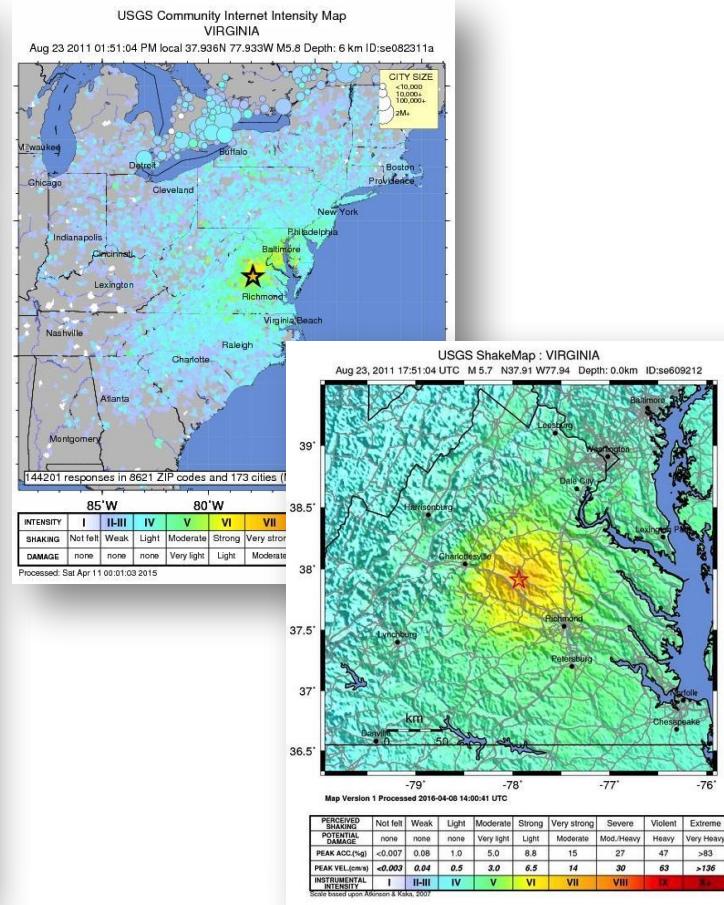
Was a heavy appliance (refrigerator or range) affected?

Not specified  
 No  
 Yes, some contents fell out  
 Yes, shifted by inches  
 Yes, shifted by a foot or more  
 Yes, overturned

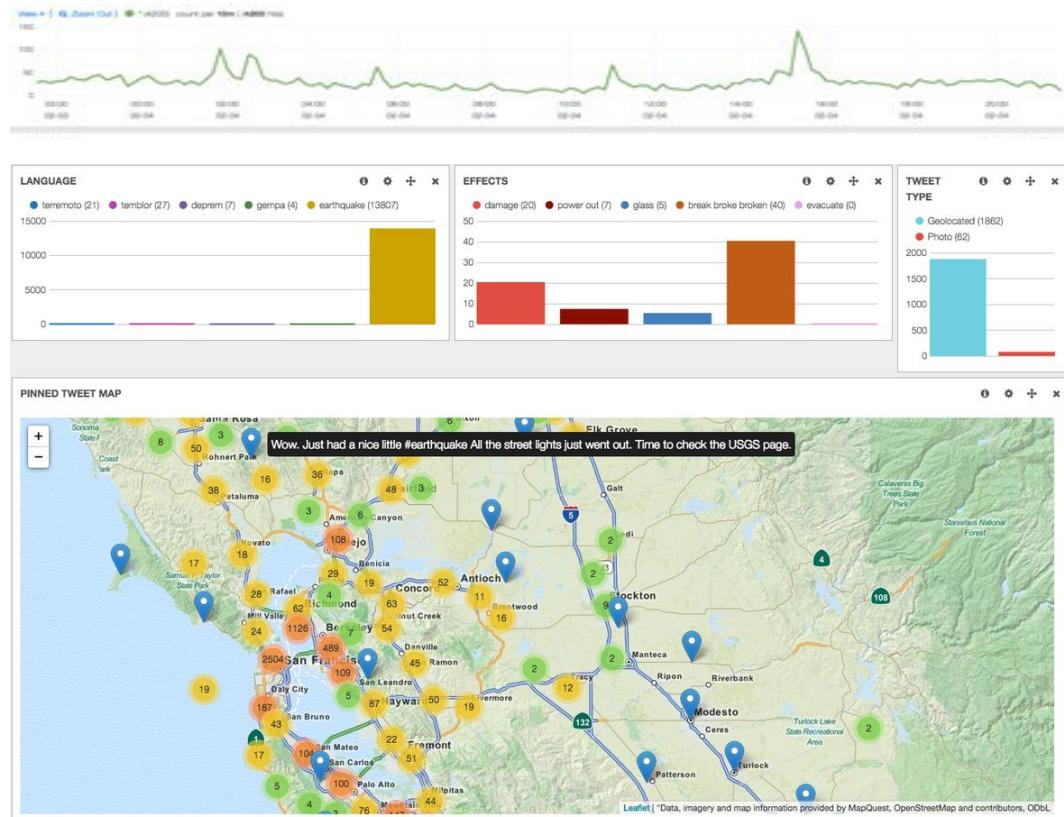
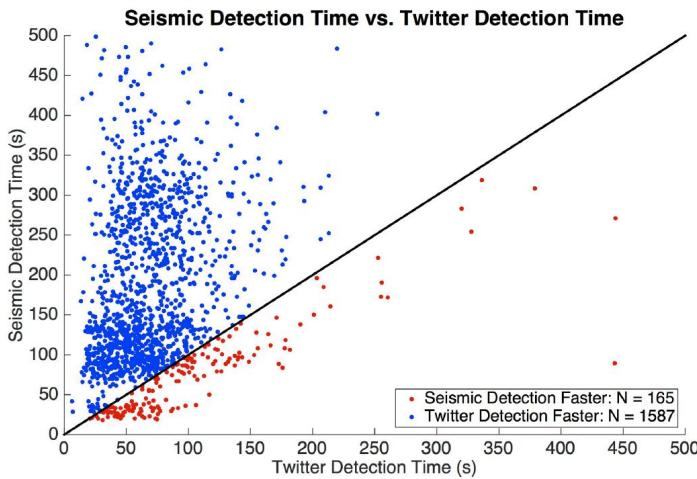
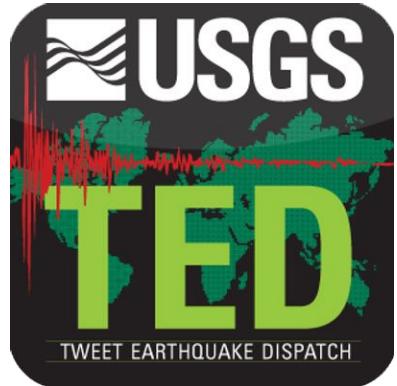
Were free-standing walls or fences damaged?

Not specified  
 No  
 Yes, some were cracked  
 Yes, some partially fell  
 Yes, some fell completely

Submit Cancel



# USGS Tweet Earthquake Dispatch (TED)



# USGS iCoast - Did the Coast Change?

- **Ground truth, validate, and enhance** USGS coastal erosion prediction models
- **Cost effective** way to classify large volumes of photos covering a wide area to enhance coastal hazard research and response to extreme storms
- **Educate the public** about coast vulnerability from extreme storms



**USGS iCoast - Did the Coast Change?**

PRE-STORM: Before Hurricane Sandy  
21 May 2009 at 10:52:22 EDT near Mantoloking, NJ

POST-STORM: After Hurricane Sandy  
05 Nov 2012 at 12:24:09 EST near Mantoloking, NJ

USGS Home Contact USGS Search USGS

Administration Home Classify My iCoast Profile Help About Logout

Lighter Tones via ETM+ © Esri, DigitalGlobe

**TASK 3: SPECIFY CHANGES TO COASTAL LANDFORMS**

What changes do you see in the POST-storm photo for each coastal change process?

Which coastal change process is most dominant in the POST-storm photo? (choose one)

Legend

Probability (%)
0 - 10
10 - 20
20 - 30
30 - 40
40 - 50
50 - 60
60 - 70
70 - 80
80 - 90
90 - 100

Beach Erosion (choose any that apply)  
Less Sand  
Dark Sand  
Dune Scarp

Dune Erosion (choose any that apply)  
Dune Scarp  
Leveled Dune  
Less Vegetation

Overwash (choose any that apply)  
Sand Hand  
Sand on Roads  
Sand in Water  
Sand Vegetation

Inundation (choose any that apply)  
Standing Water  
Dust Vegetation

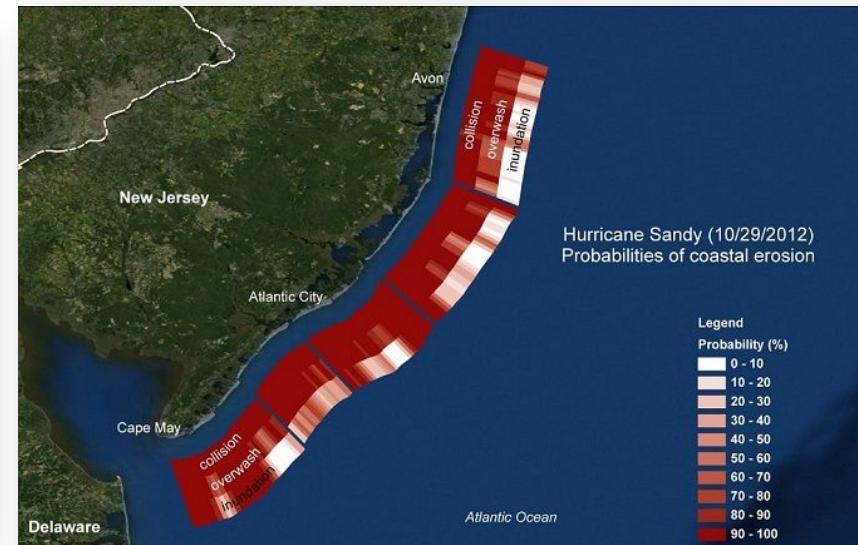
Beach Erosion Dune Erosion  
Breach  
Overwash  
Inundation  
No Change

Avon  
New Jersey  
Atlantic City  
Cape May  
Delaware  
Atlantic Ocean

collision overwash inundation

NEXT TASK

PREVIOUS TASK



# FEMA Crowdsourceing Unit



# FEMA

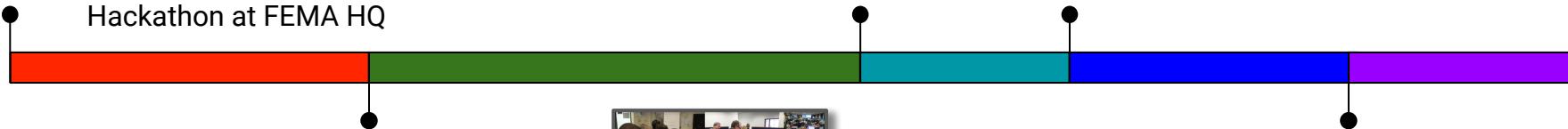


# FEMA Crowdsourcing Unit Activations

## Activation #1 - Hurricane Maria

October 6 - 20, 2017

- 13 Coordination Calls and Reports
- 11 Crowdsourcing Products
- 6 Digital Volunteer Networks
- 5,700+ Volunteers
- 2 Hackathons
  - \* Crowdsourcing Exchange Hackathon at FEMA HQ



## Steady State

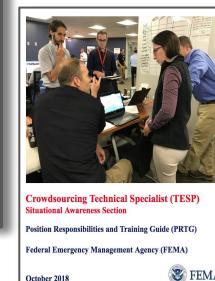
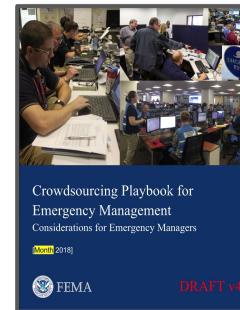
November 2017 - August 2018

- ★ Participated in the **National Level Exercise** (May 3-8, 2018)
- ★ Developed **Crowdsourcing Playbook** for Emergency Management (Version 1)
- ★ Drafted **Crowdsourcing Technical Specialist Position Responsibilities and Training Guide**

## Activation #2 - Hurricane Lane

August 22 - 25, 2018

- 3 Coordination Calls
- 7 Crowdsourcing Products
- 6 Digital Volunteer Networks
- \* Monitored Waze, GasBuddy, RxOpen



## Activation #3 - Hurricane Florence

September 10 - 20, 2018

- 10 Coordination Calls
- 26 Crowdsourcing Roll-Ups
- 16 Crowdsourcing Products
- 8 Digital Volunteer Networks
- 8 Private Sector and other Partners
- \* Partnered with Private Sector thru NBEOC

## Activation #4 - Hurricane Michael

October 8 - 14, 2018

- 7 Coordination Calls
- 11 Crowdsourcing & Social Listening Reports
- 15 Crowdsourcing Products
- 8 Digital Volunteer Networks
- 9 Private Sector and other Partners
- \* Waze & GasBuddy integrated into FEMA GIS dashboards

# Hospital Status Map

<http://bit.ly/SBTF-hospitals>

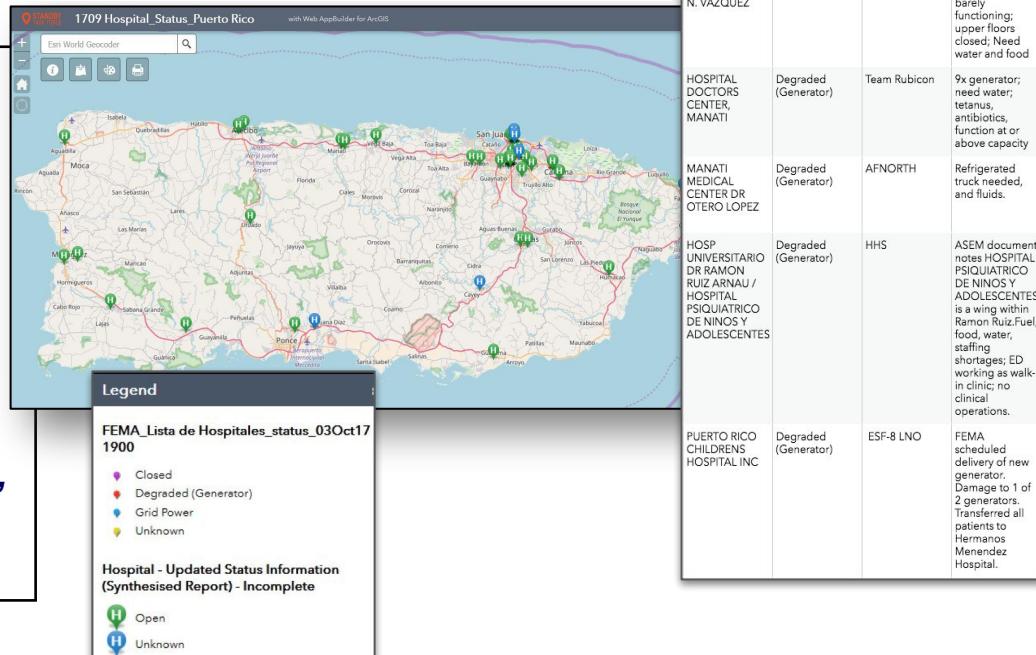


Standby Task Force (SBTF) was formed in 2010 to provide volunteer online digital responses to humanitarian crises.

**Goal: Status of 71 Hospitals in Puerto Rico**

**Outcome: In 36 hours with 55+ volunteers, SBTF updated 33 of 71 hospitals (whereas officials only had 30 of 71 hospitals) and then SBTF had 63 of 71 and 44 other health facilities using social media and other online channels to curate official and unofficial sources.**

***This was used to build hospital resupply plans, support volunteer medical groups, and prioritize resources.***



# Crowdsourcing Civil Air Patrol Imagery Analysis for Damage Assessment



An aerial photograph showing significant damage from Hurricane Irma in Puerto Rico. A large white building with a red roof stands prominently, while nearby buildings have collapsed or sustained major roof damage. Debris and fallen trees are scattered across the landscape. A road runs through the area.

**Mark the Image with Damage Assessments**  
FEMA: Image Analysis Training

Mark Buildings as Affected

Mark Buildings as Minor

Mark Buildings as Major

Mark Buildings as Destroyed

**Remove All Marks on Image**

In General, Impact is shown in Image

In General, No Impact in Images

**Image Info:**  
Event: CAP - Hurricane Irma  
Team: 17-1-5752  
Mission: A0011  
Photo Date: 2017-09-10 09:34:31  
Altitude: 491(m)

**FEMA**

**Civil Air Patrol**  
Like This Page · October 7

Paul Wescott, Ricardo X. Torres, Herman Liboy and 283 others like this.  
72 Shares · 8 Comments

CAP Image Damage Assessment  
IMAGERUPLOADER.GEOPLATFORGI.GOV

October 7 at 5:55pm · Edited

< < Previous Image   Submit   Skip - New Image >

# Puerto Rico Buildings & Roads Base Map

<http://bit.ly/HOT-disasters2017>



Humanitarian  
OpenStreetMap  
Team

[Puerto Rico](#) | [OSM Tasking Manager](#)

#3633 - Hurricane Maria | 2017 - Puerto Rico 2 (Guajataca Dam Area)

Description Instructions Contribute Activity Stats

Puerto Rico was hit by Hurricane Maria (Category 5) on 20 September after hitting Dominica severely.

The American Red Cross has requested building data generation for planning and conducting relief efforts on the island. The Guajataca Dam is at risk of collapse, the area needs to be evaluated.

We are mapping from pre-event imagery to give them an operating picture of the island before the hurricane made impact.

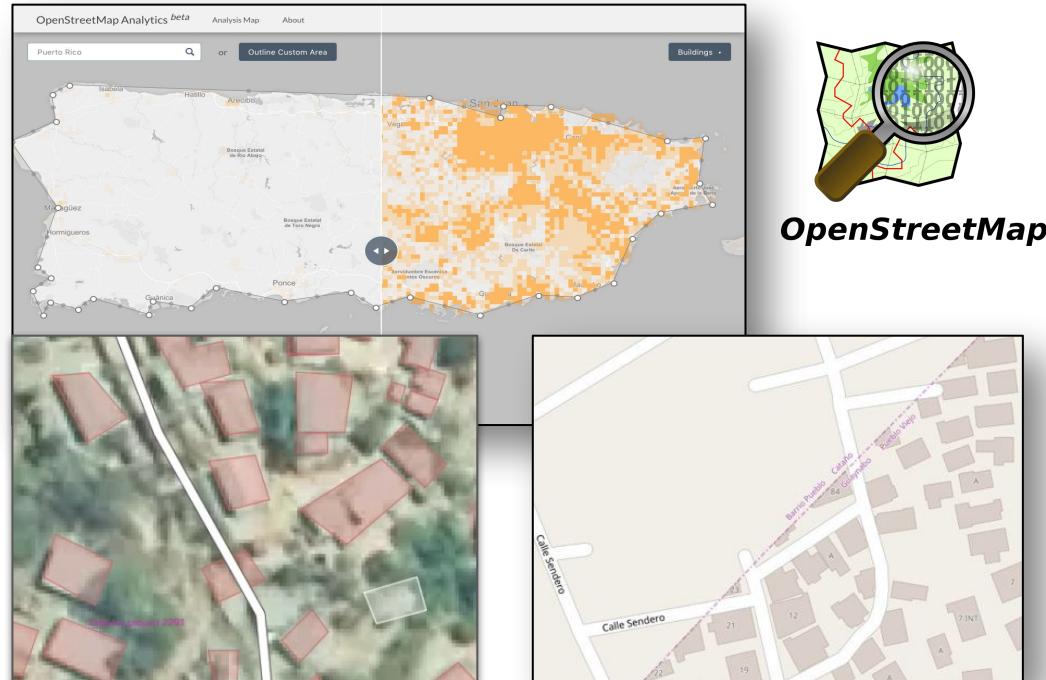
Created by russdaffier · Updated 7 hours ago · Priority: high

Instructions

A map of Puerto Rico with various locations labeled. A specific area in the north-central part of the island is highlighted in green and labeled "Guajataca Dam Area". A legend at the bottom left indicates the status of buildings: "Not worked on (0)", "Invalidated", "Done", and "In progress". A scale bar shows distances up to 20 km. A small inset map of the world is in the top right corner.

**Volunteers: 5,400+, ~300 active daily**  
**Start & End Date: 9/23 - Ongoing**  
**Buildings mapped: 1.4 million buildings**  
**Roads mapped: 45,000+ km**

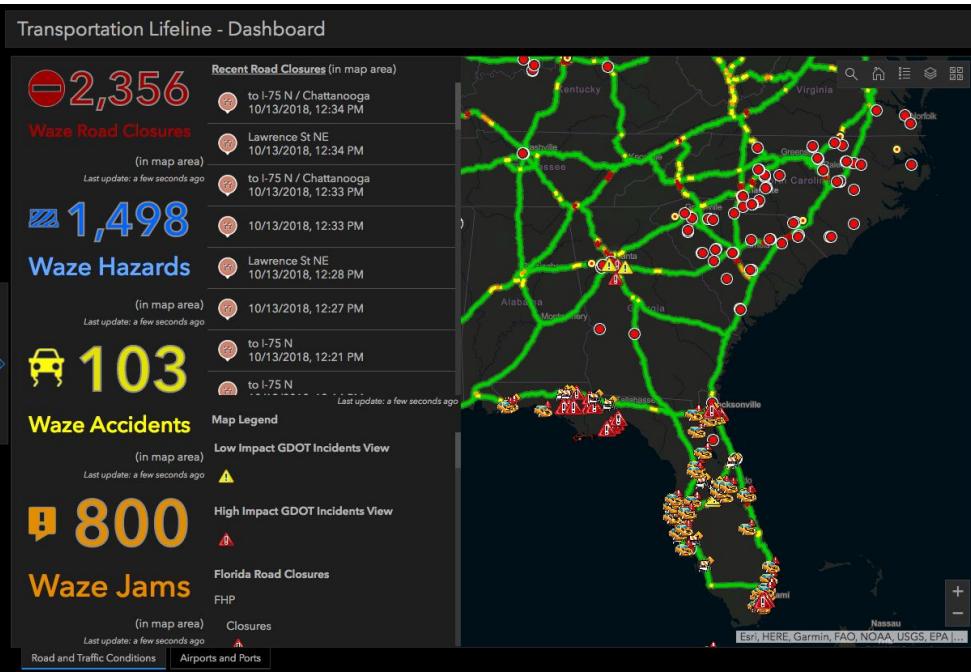
The Humanitarian OpenStreetMap Team (HOT) creates and provides free, up-to-date maps with the help of volunteer mappers during disasters around the world.



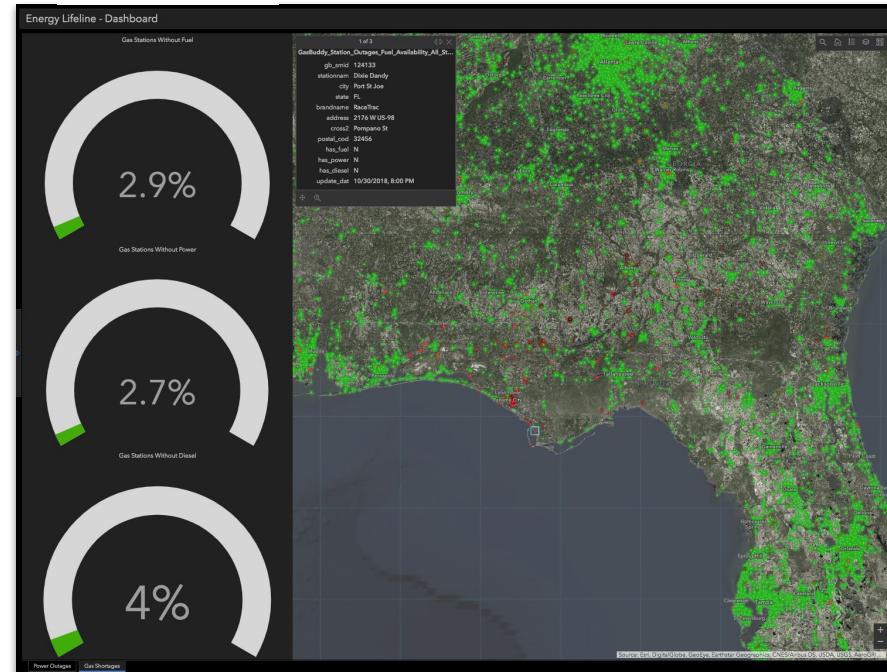
# Crowdsourced Data from Private Sector



USACE integrated Waze data  
into Trafficability Map

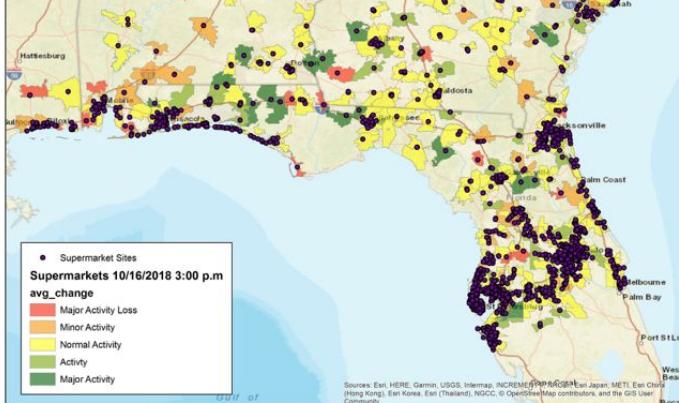
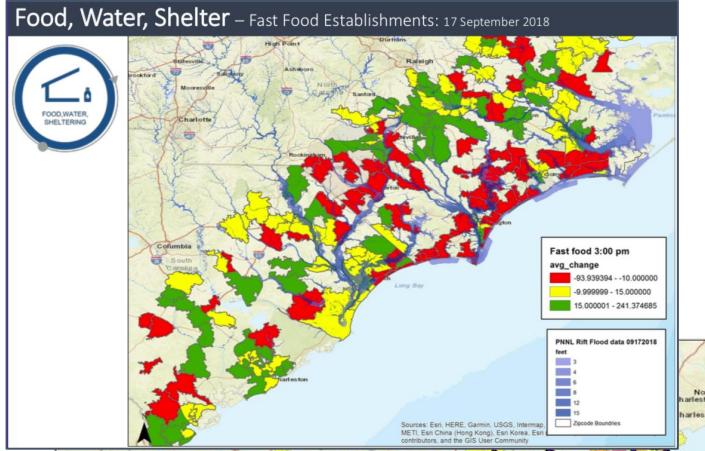
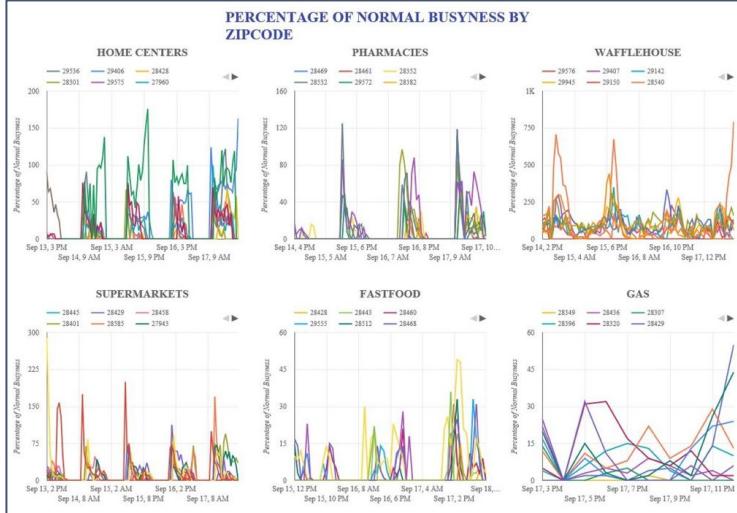
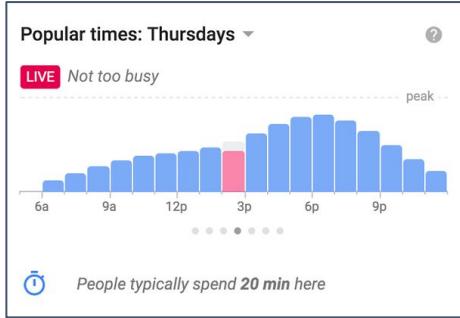
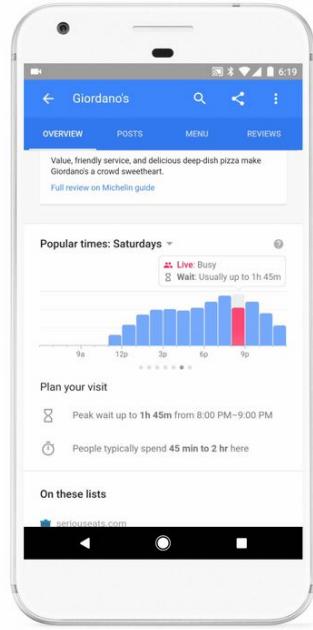


Department of Energy (DOE) integrates GasBuddy data into DOE Situation Reports



# Google Business Data

Impact to commerce indicating businesses that are open or closed with long or no wait times.



# FEMA's Community Lifelines



A sector that provides indispensable services that enable the continuous operation of critical business and government functions, and that would risk human health and safety or national economic security if compromised or not promptly restored

# Crowdsourcing Unit Map Journal - Hurricane Michael

<http://bit.ly/CrowdMichaelJournal>

FEMA Crowdsourcing Unit - Hurricane Michael

FEMA NRCC Crowdsourcing Unit

2018 Hurricanes Crowdsourced Photos

CrowdSource Rescue - Requests and Offers

NAPSG Joint SAR Activity

CEDR Shelters Crowdsourced

C4A MichaelResponse.org

C4A Points of Distribution (POD)

SBTF Medical Facility Status

GasBuddy Fuel Availability & Station Outages

Facebook Disaster Maps - Network Coverage

Waze Alerts - Traffic & Road Conditions

Crisis Cleanup - Recovery Work Orders

**CRISIS CLEANUP**

Public: 800-451-1954, Extended to Nov. 2. Flyers & Info: Download.

## Visualize the Disaster in Real Time

Personal information has been hidden, and the location has been blurred to 400 meters.

**Map** **Satellite**

**Legend**

- Muckout/Flood
- Fire Damage
- Tree/Wind
- Ash Sifting
- Tarp/Roof
- Landslide
- Tornado
- Deferred Maint.
- Debris
- Other/Unknown
- Mold Remed.
- Rejected

**Case #: Z13506**

Name, Address, Phone Number are removed from the public map

Address: Carolina Avenue, Washington, North Carolina 27889

Work Type: Trees

Status: Open, unassigned

© data ©2018 Google, INEGI | Terms of Use

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# **FEMA**

# Questions? Thoughts?

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# Upcoming Webinars in this Series

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- **May 14:** Challenge.gov, General Services Administration
- **June 11:** The Opportunity Project, U.S. Census Bureau
- **July 9:** Open Opportunities, Office of Personnel Management
- **August 13:** History *By the People*, Library of Congress

# Potential Connections to Other Communities

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- **Accessibility:** Improve accessibility of CCS projects
- **APIs:** Making CCS data available as APIs
- **Blockchain:** Applying blockchain concept to CCS
- **Challenges & Prizes:** Incorporating prizes to CCS
- **Game Guild:** Incorporating gaming techniques
- **Gov Customer Experience:** Expanding public experience
- **MobileGov:** Creating mobile CCS projects
- **Multilingual:** Expanding CCS in other languages
- **Open Data:** Leveraging and creating open CCS data
- **OpenGov:** Leveraging open participation techniques
- **Plain Language:** Plain language to describe CCS projects
- **SocialGov:** Leveraging their shared resources
- **Video Production Pros:** Creating CCS videos
- **Virtual / Augmented Reality:** VR/AR CCS projects