



Meeting Host



Manaaki Whenua
Landcare Research

Supporting Partner



Land Information
New Zealand
Toitū te whenua

Meeting Sponsors



Ministry for the
Environment
Manatū Mō Te Taiao



US National Water Model

105th OGC Technical Committee

Palmerston North, New Zealand

David R. Maidment

6 December 2017

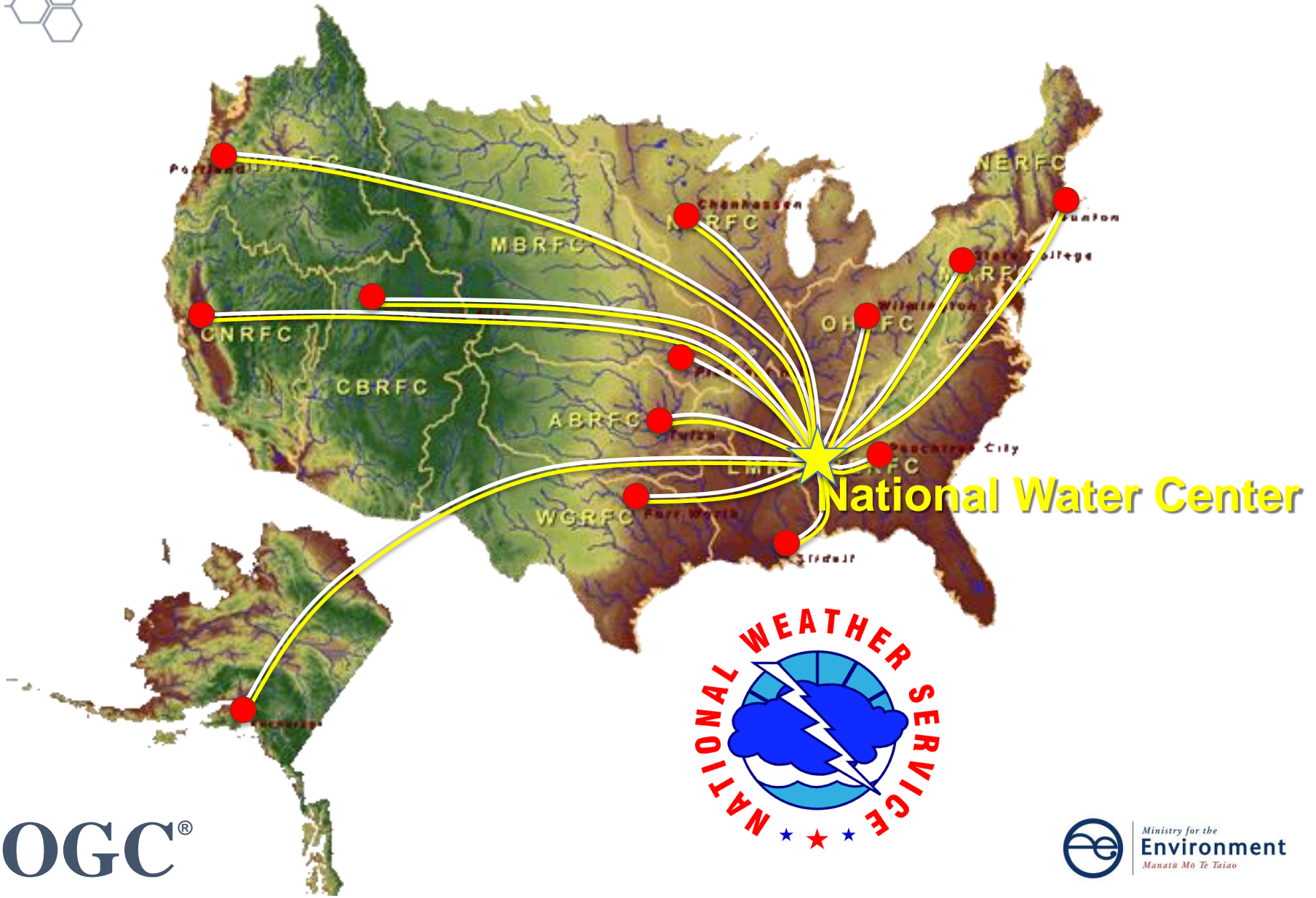
The Opportunity



- New National Water Center established on the Tuscaloosa campus of University of Alabama by the National Weather Service and federal agency partners
- Has a mission to assess hydrology in a new way at the continental scale for the United States



Centralized Water Forecasting



Four water problems to be solved



Too much water



Not enough water



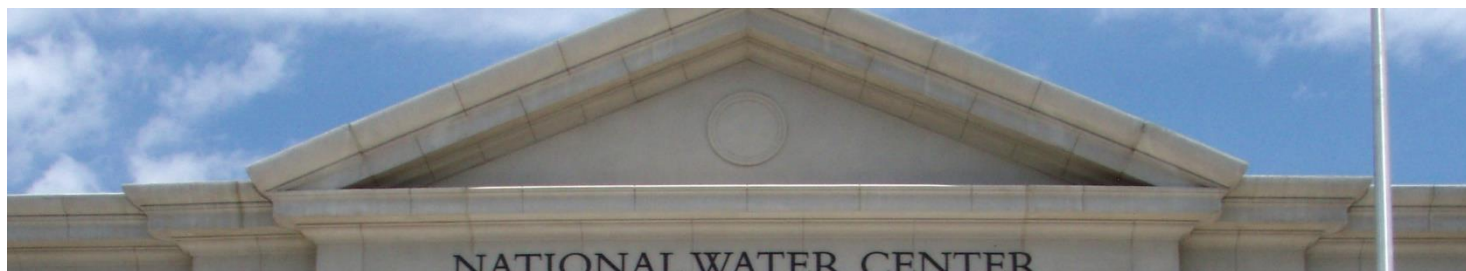
Dirty water



Environmental Issues



Inaugural Meeting at National Water Center



Develop a new flood data, modeling, forecasting and inundation mapping system for the continental United States at high spatial resolution and near real-time in one year



National Water Center Innovators Program



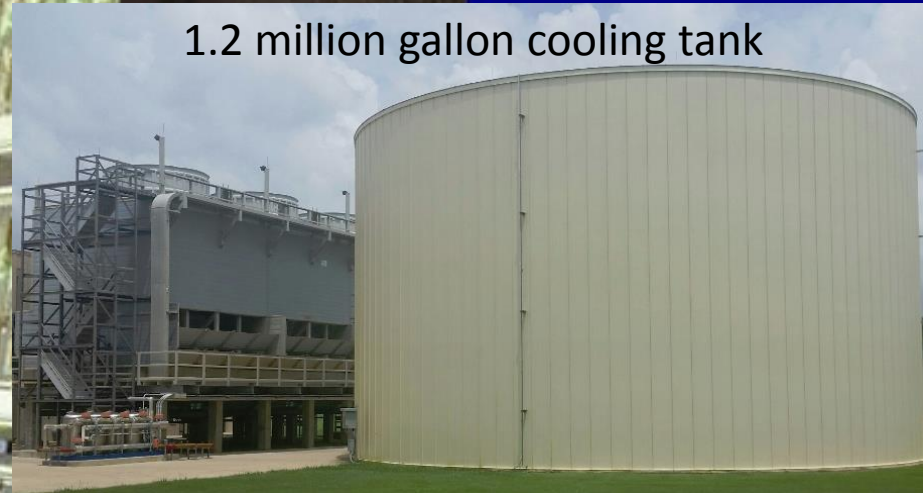
- Partnership between **National Weather Service** and the **academic community**
- Includes **Summer Institutes** for in 2015, 2016, 2017 in which 105 graduate students from 49 universities have participated. Planning for 2018 is underway



Stampede 超级计算机



1.2 million gallon cooling tank

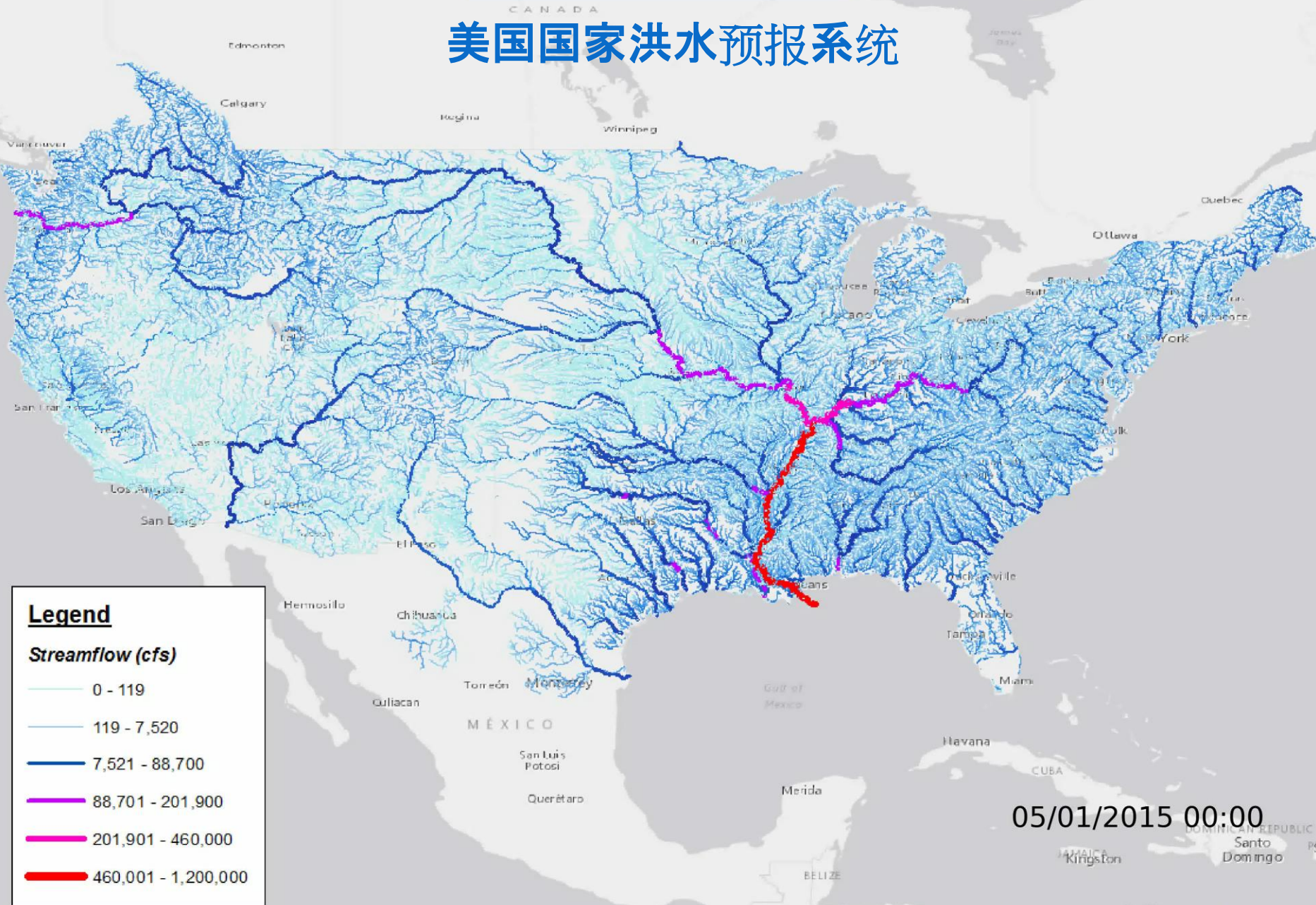


500,000 processors operating in parallel



National Water Model

美国国家洪水预报系统



Legend

Streamflow (cfs)

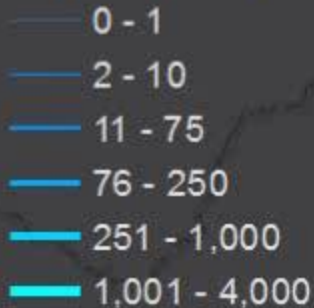
- 0 - 119
- 119 - 7,520
- 7,521 - 88,700
- 88,701 - 201,900
- 201,901 - 460,000
- 460,001 - 1,200,000

05/01/2015 00:00

Water Operations in Brazos Basin

2015-10-20

Streamflow (cms)



Further Steps

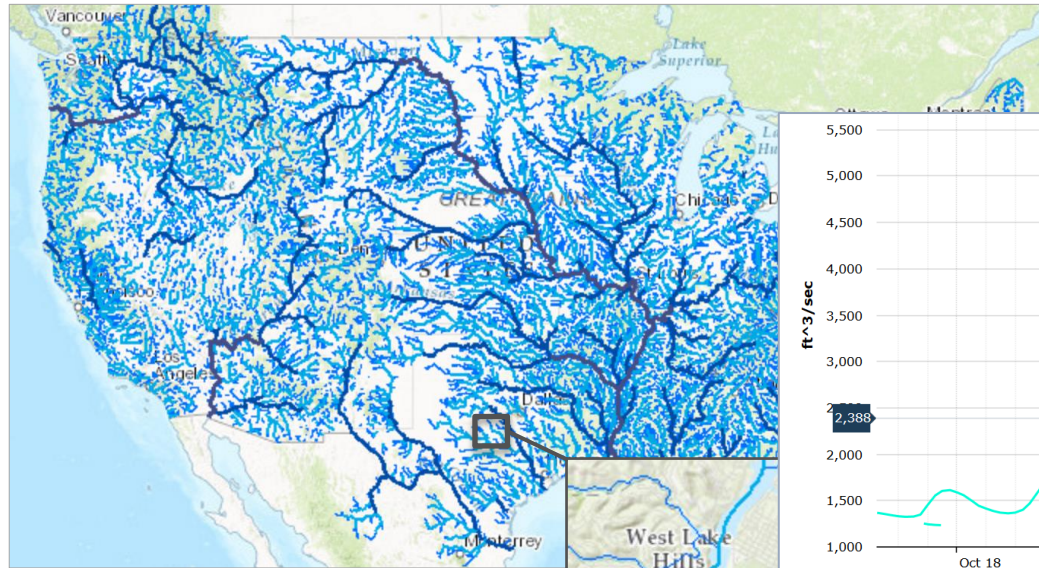


- **Sept – Dec 2015:** NCAR developed an improved version of the model on its Yellowstone Supercomputer in Wyoming
- **Jan 2016 – May 2016:** This model was transferred to the NOAA Weather and Climate Operational Supercomputer System (WCOSS) in Maryland
- **June 2016 – Aug 2016:** Stability Testing at WCOSS
- **August 2016:** National Water Model starts operations at WCOSS
- **April 2017** NWM v 1.1

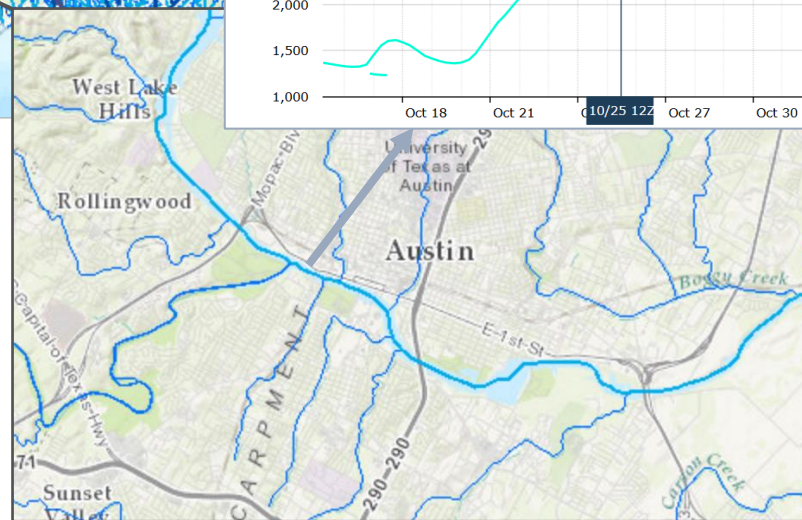
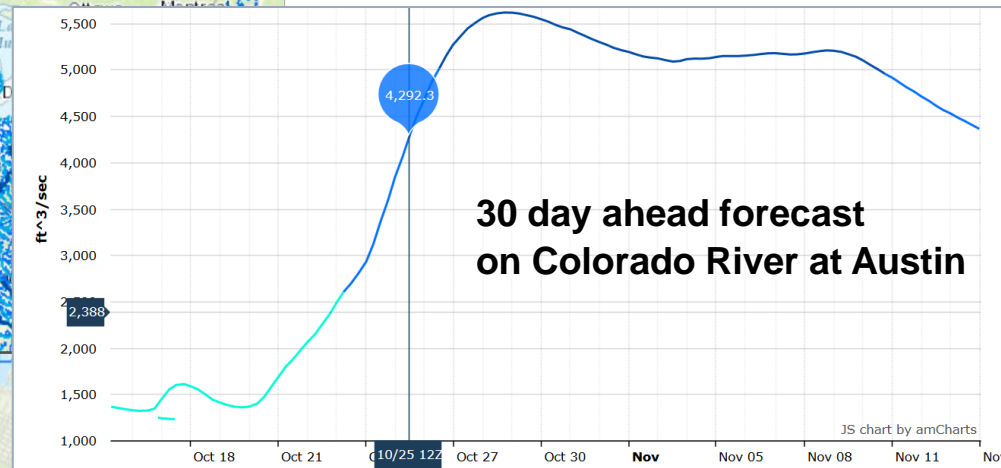
Weather

Water

National Water Model Forecasts

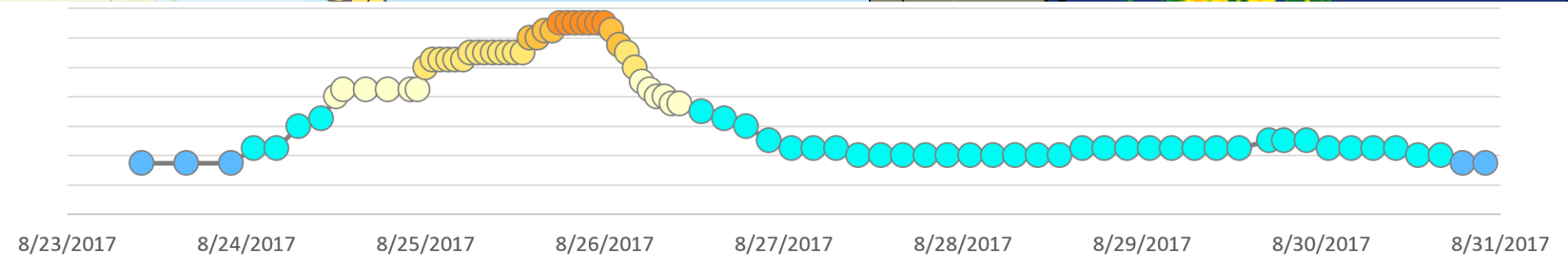
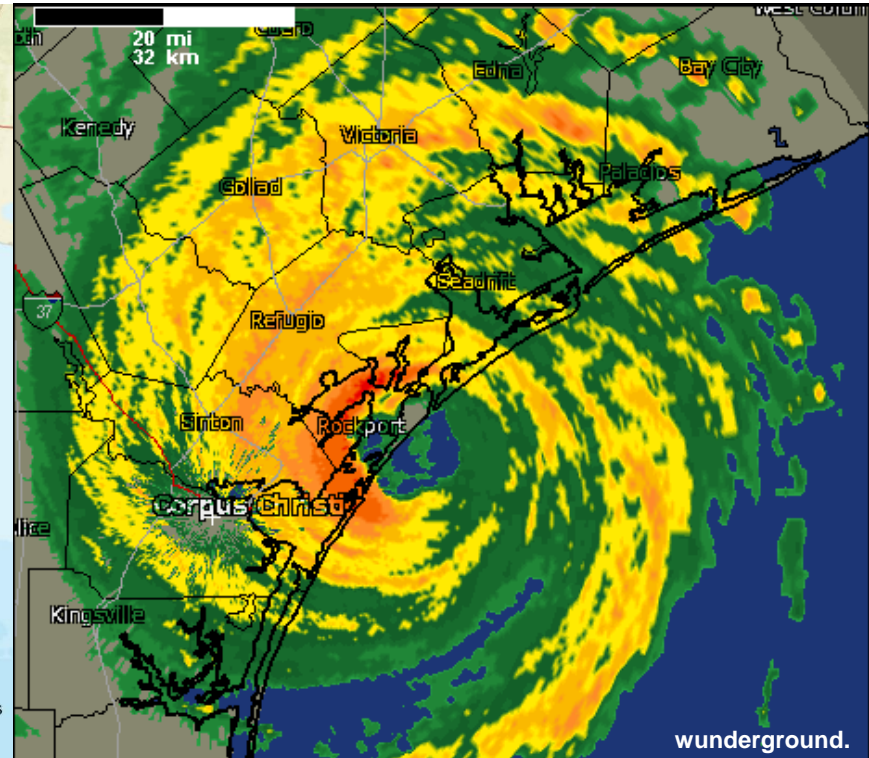
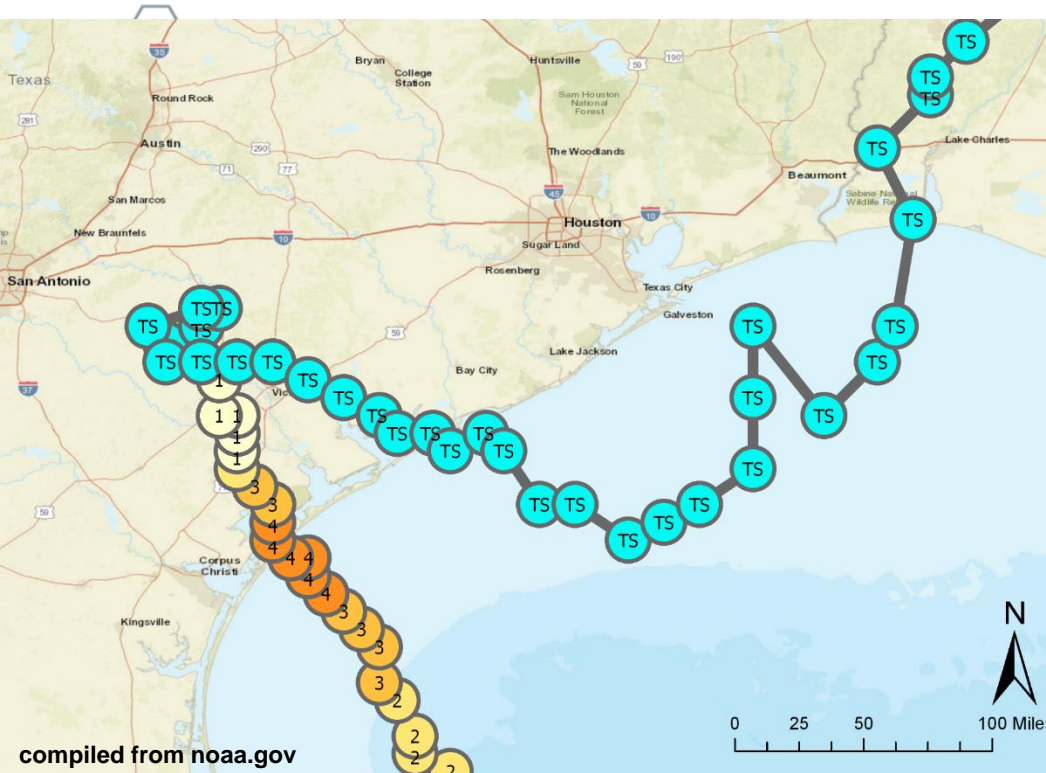


<http://water.noaa.gov/map>



Forecasts available for 2.7 million stream reaches in continental US

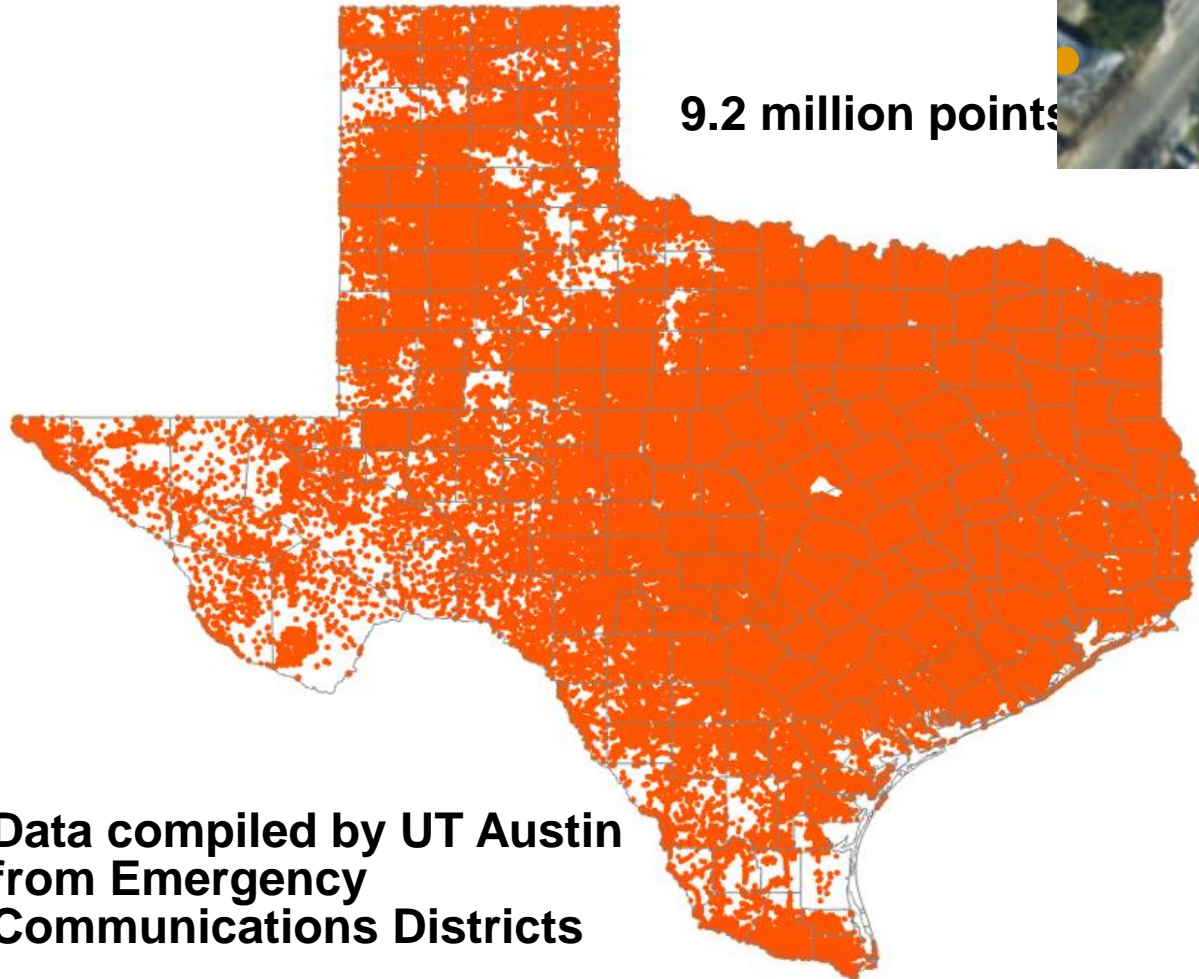
Hurricane Harvey Track





Texas Address Points

9.2 million points



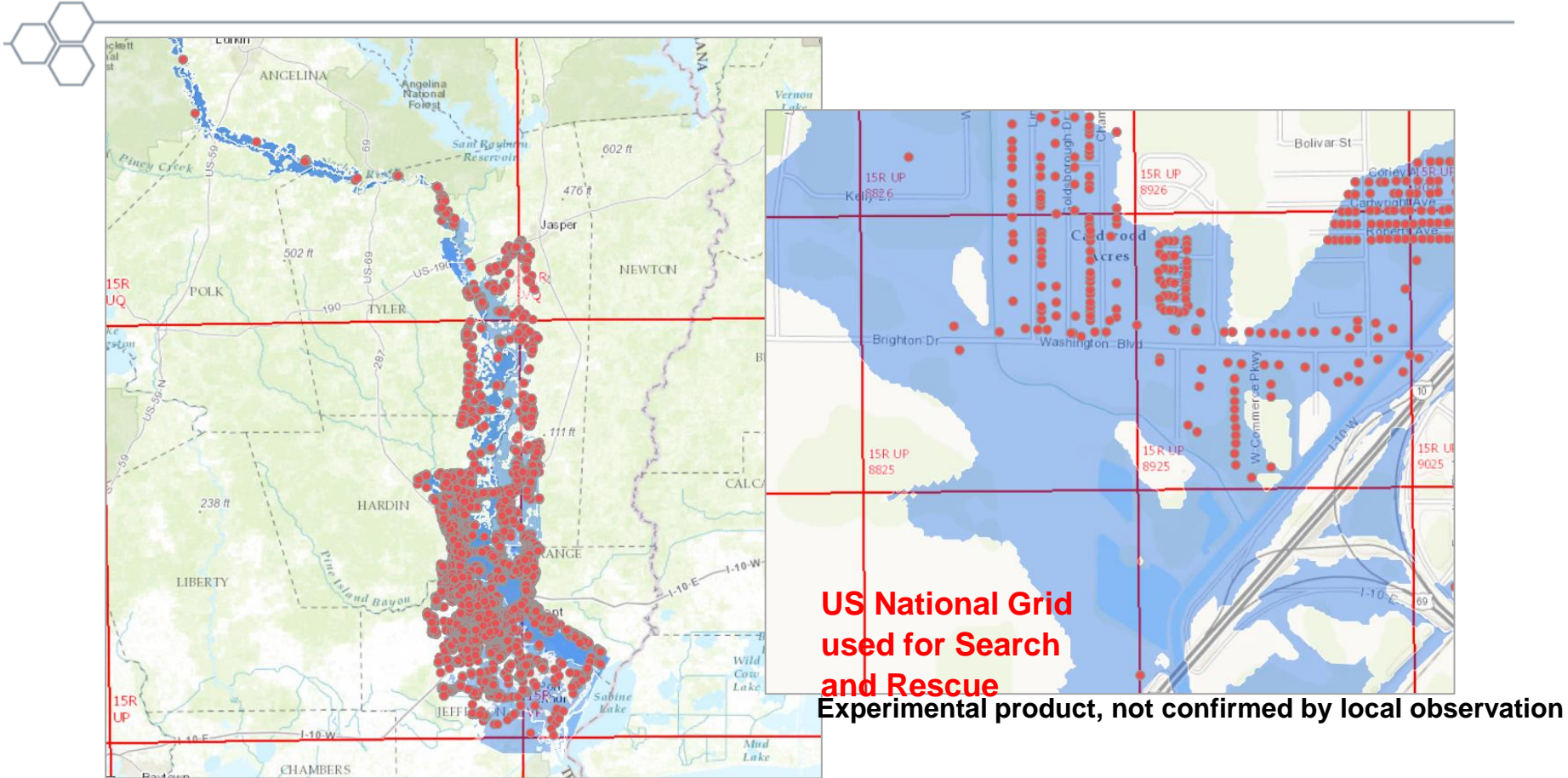
Data compiled by UT Austin
from Emergency
Communications Districts



Point on every building
used for dispatching
emergency response
vehicles by 911 systems



Inundation Maps for Search and Rescue



Observations from the U.S. Geological Survey

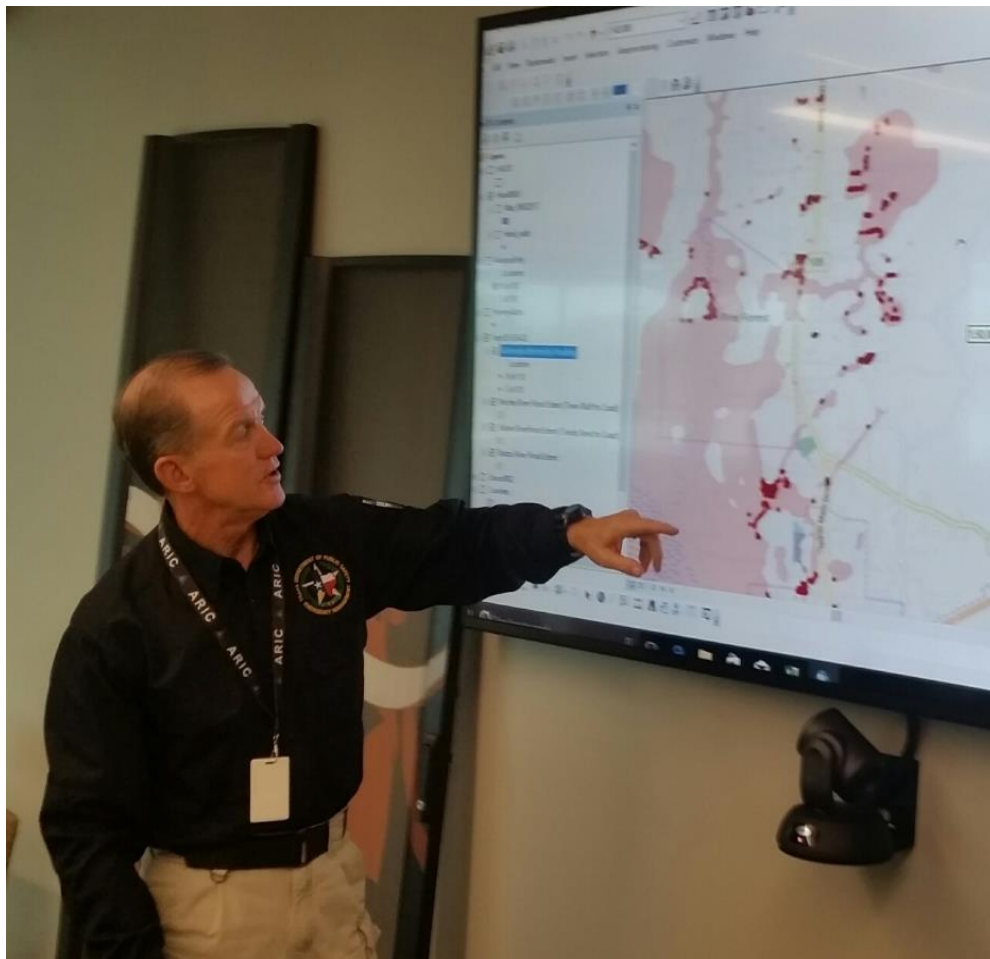
Guidance from NOAA and the National Water Center

Forecasting by NWS West Gulf River Forecast Center

Inundation Mapping by US Army Corps of Engineers

Overlay on Address Points by University of Texas at Austin

Goal: Real-Time Flood Inundation Mapping for Texas at Local Scale



STAMPEDE

SUPERCOMPUTER