

# The Promise and Benefits of Serverless, Cloud-Based "As a Service" Architectures

Kate Hickey, Vice President of Consulting Services  
NSGIC Midyear | February 27, 2018

# Why do I care?

1. Customers are happier! If we can do things faster and better; Make changes and enhancements easily
2. Development Team is happier; Can focus on the interesting, custom pieces of code
3. Support team is happier; Risks are mitigated and distributed



# Evolution of “Serverless” as Progressive Abstraction

The essence of abstractions is preserving information that is relevant in a given context, and forgetting information that is irrelevant in that context.

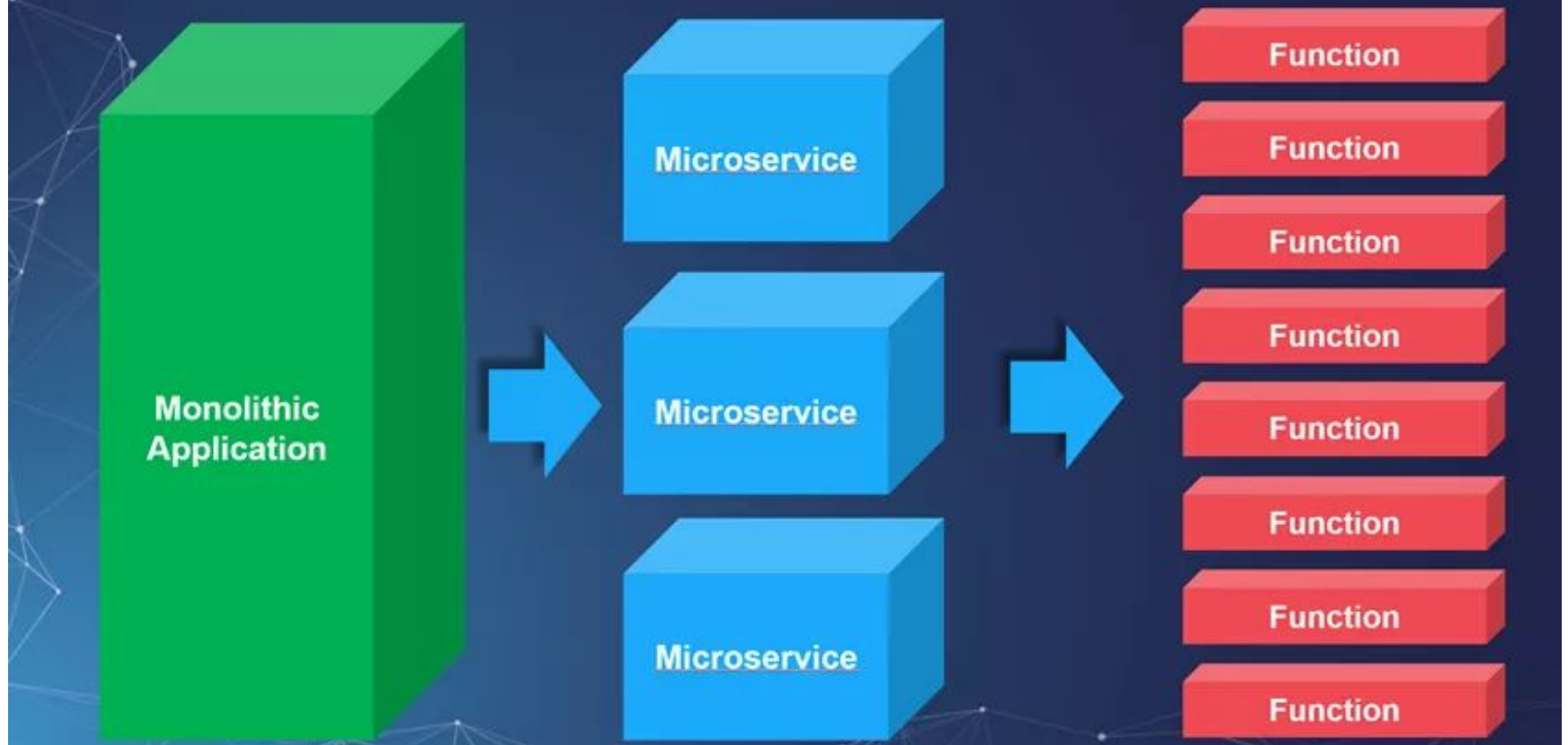
– John V. Guttag



# Evolution as Progressive Abstraction



# Monolithic vs Microservice vs FaaS



*It's not really "serverless" but more "I don't care what a server is". The benefits are not only efficiency in the underlying components but acceleration in the speed at which I can develop new things.*

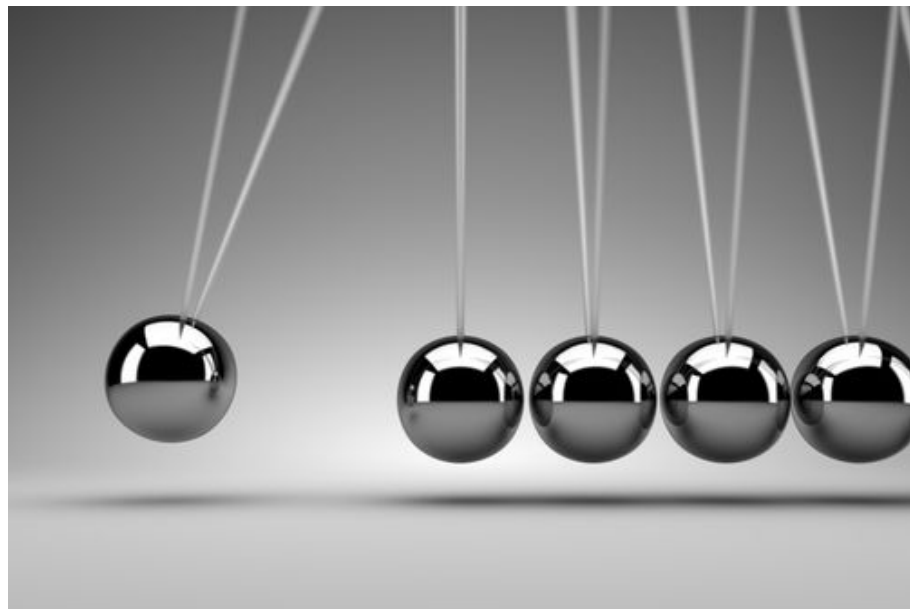
*-<https://hackernoon.com/why-the-fuss-about-serverless-4370b1596da0>*

## Why the Fuss About Serverless?



# Benefits of Functions as a Service

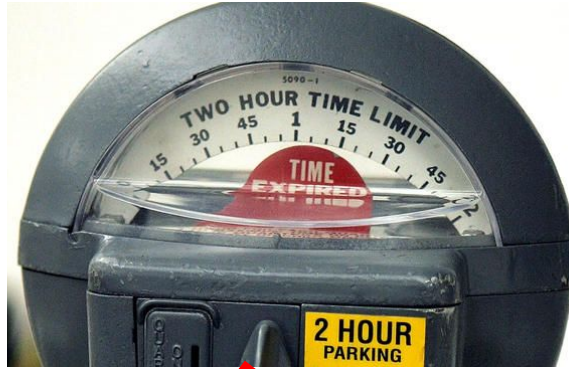
- Server-side, event-triggered, functions
- Outsources deployment, resource allocation, scaling, maintenance, monitoring
- Keeps billing closely coupled to actual use of your systems
- Reduces effort for repetitive, error prone, lower-level technical operations
- Shortens time-to-market of new products and features



# Pay for What You Use; Use What You Need



Vs.

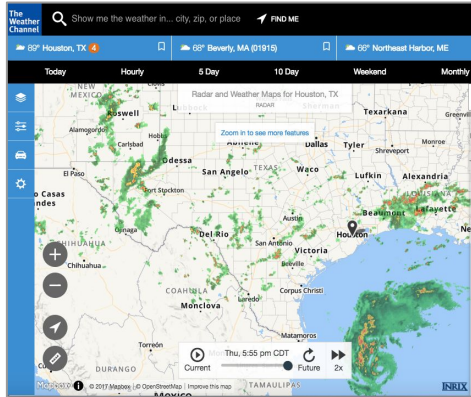




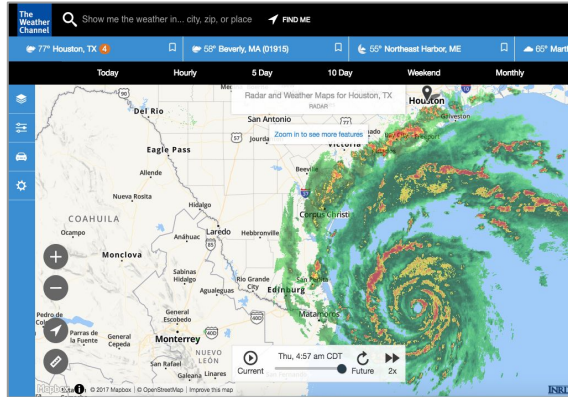
# A Few Stories



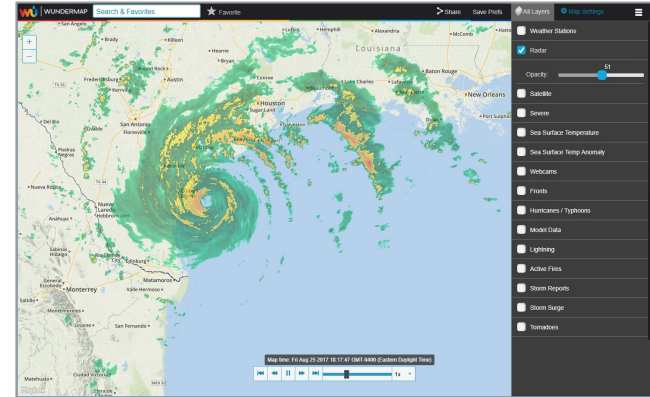
# Natural disasters happen



Thurs, 8/24, 3pm



Fri, 8/25, 6:30am



Fri, 8/25, 6pm

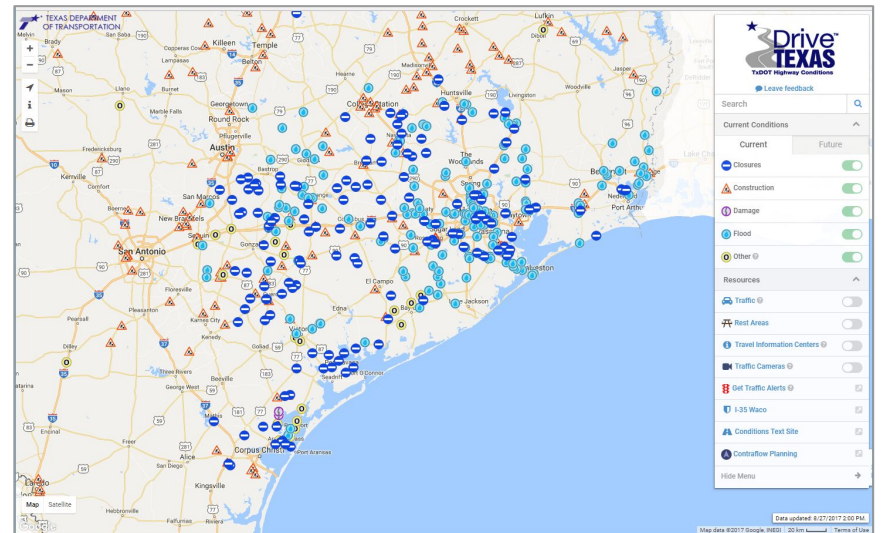
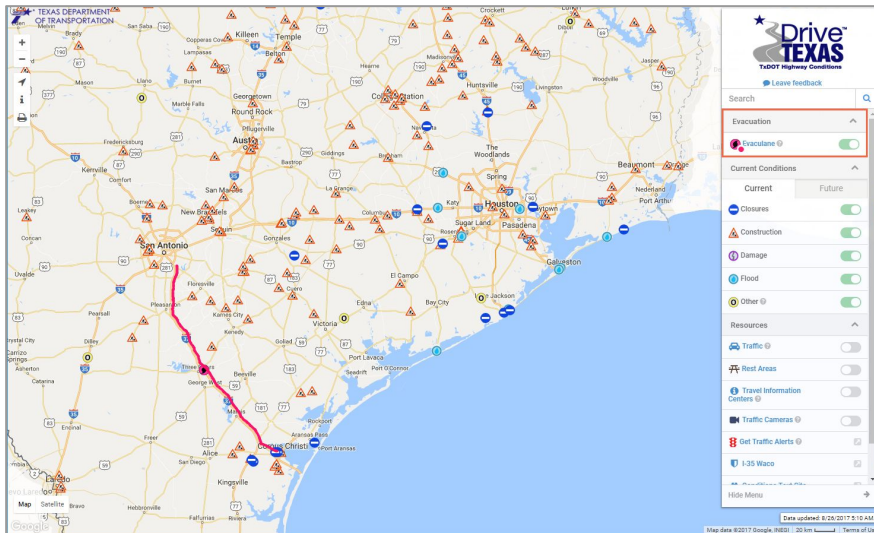


Google Imagery, Houston, Texas, 8/28/17

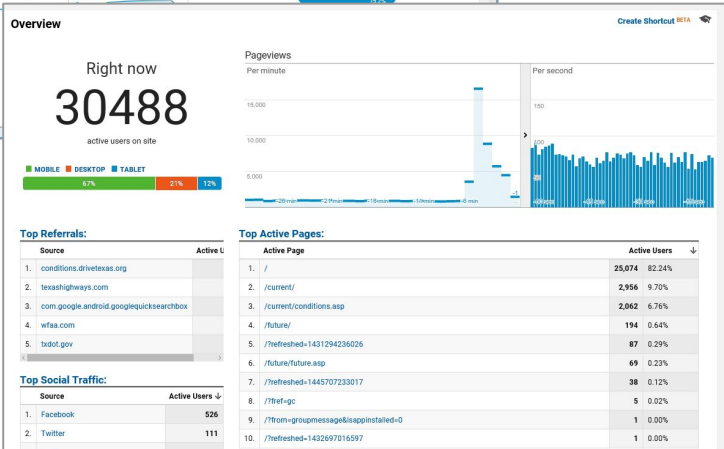
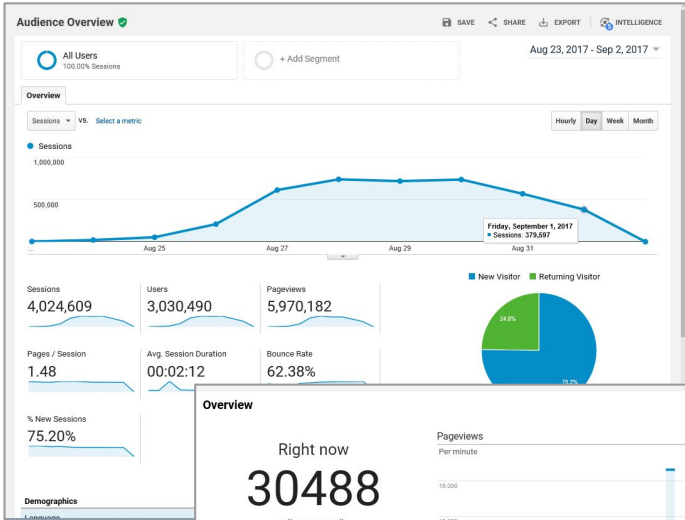
# We had a front row seat for Harvey.

***TxDOT to AppGeo during development 3+ years ago:***

“This application needs to support our worst case scenario which is a category 4 hurricane in the Gulf of Mexico heading towards Houston.”



# The site was exercised thoroughly. And, it passed its tests.



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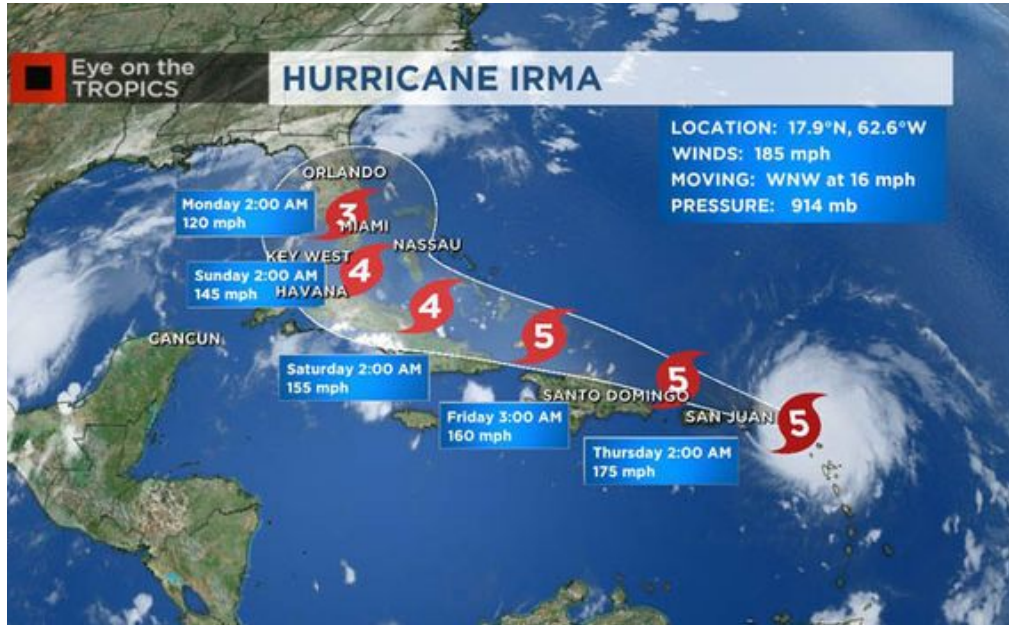
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**BREAKING**  
 HARVEY MAKING ANOTHER LANDFALL  
 ROADS BEGINNING TO REOPEN  
 \$5 DONATIONS 1-800-RED-CROSS \* RED CROSS TEXT 90999 TO DONATE \$10 \* GO

# “\_\_\_\_\_ as a Service” was an intentional, and key ingredient for success

- Serverless architecture
- *Web page/Javascript delivery as a service* via Google **AppEngine**
- *Basemap* and *traffic as a service* via **Google Maps API**
- *Customer data serving as a service* via **MapLarge**
  - Scalable serving of business data maintained in Esri

# Then came Hurricane Irma...



# ...and its devastation


- Greatly impacted the US Virgin Islands
- Not only was every leaf taken off of every plant
- Territory's GIS was taken **off line**



t. John's looking towards Tortola in the BVI

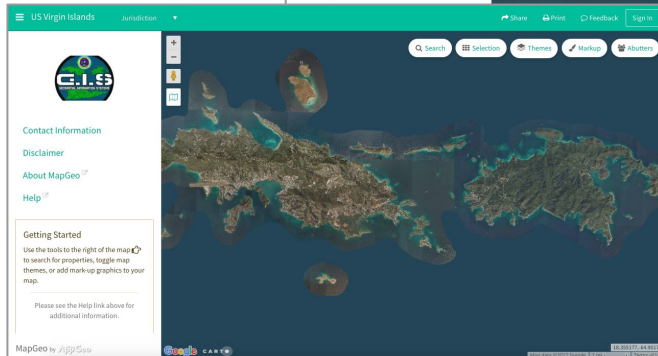
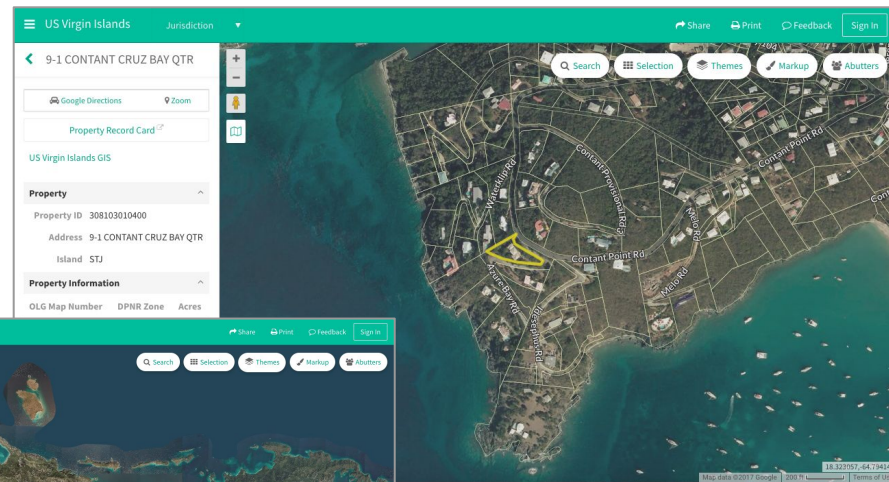


# “ \_\_\_\_\_ as a Service” was a key ingredient for providing assistance

- One of our tasks is providing a hosted parcel viewer:  MapGeo
  - Typical daily use of ~200 visits/day for real estate inquiries

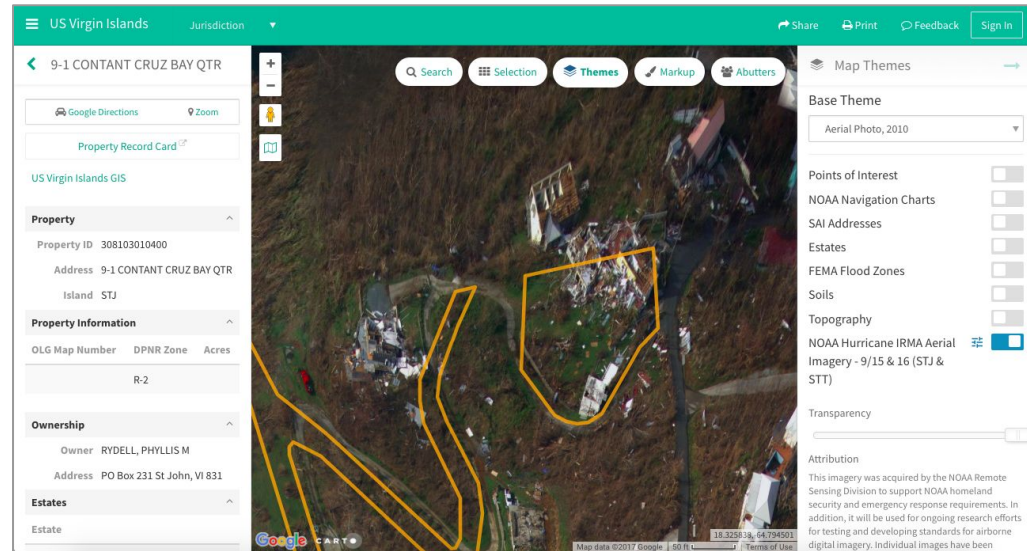
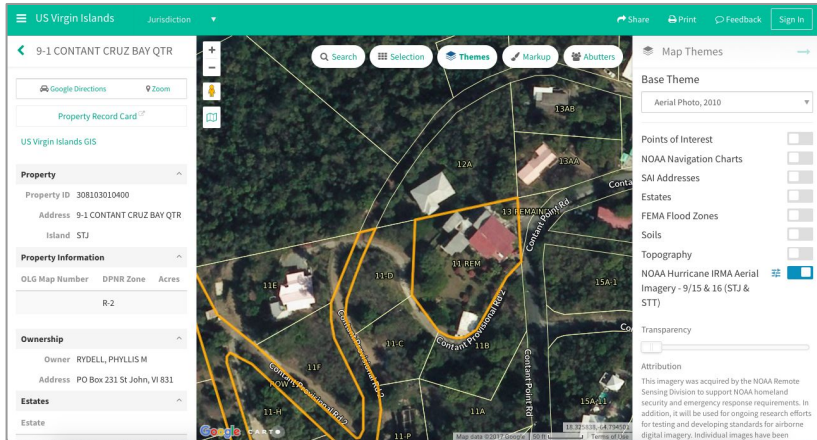
- **Basemap** delivered *as a service* via **Google Maps API**

- Parcel & thematic *data serving* *as a service* via **CARTO**



# “as a Service” was key

- While the Territory’s GIS was down; cloud-based MapGeo remained up
- NOAA delivered post-event *imagery as a service* via **OGC WMTS**
  - Added to MapGeo within 1 hour
- Served ACOE, FEMA, NGO’s doing recovery

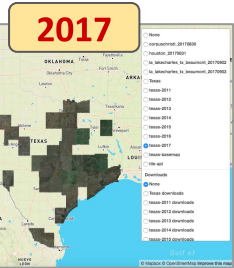
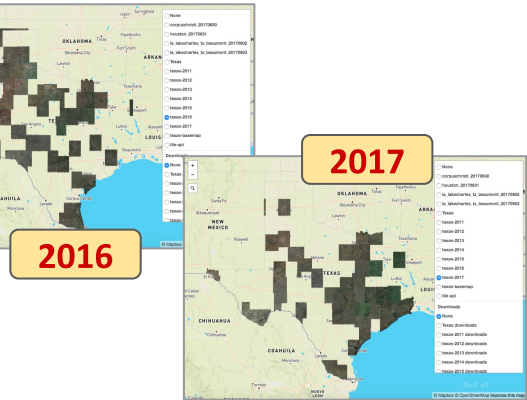
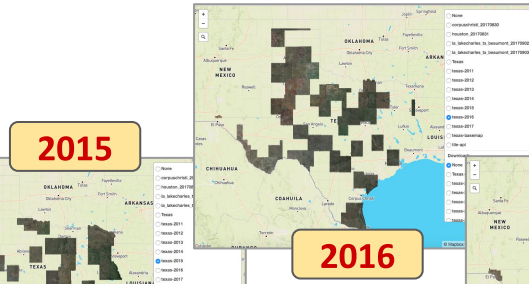
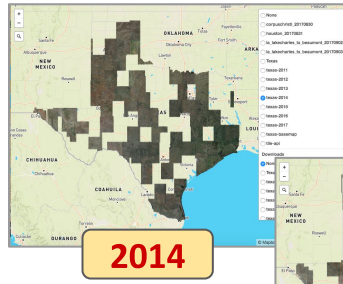
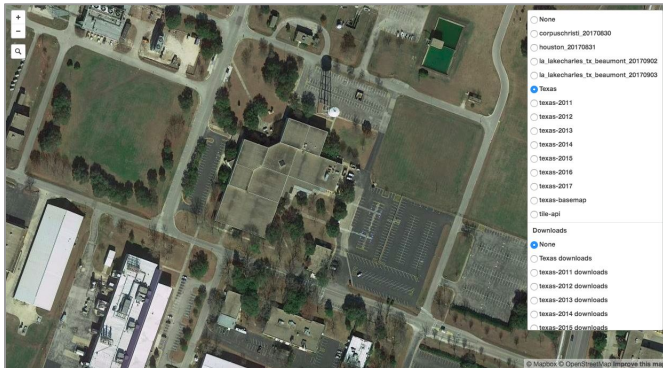


# “           as a Service” is designed for routine times *(but can add extra value in extraordinary times)*

- Proud to work with 7 states to provide Imagery as a Services

-  provides consumable OGC WMS/WMTS web services

- Consumed into Esri, QGIS, Bentley, Autodesk



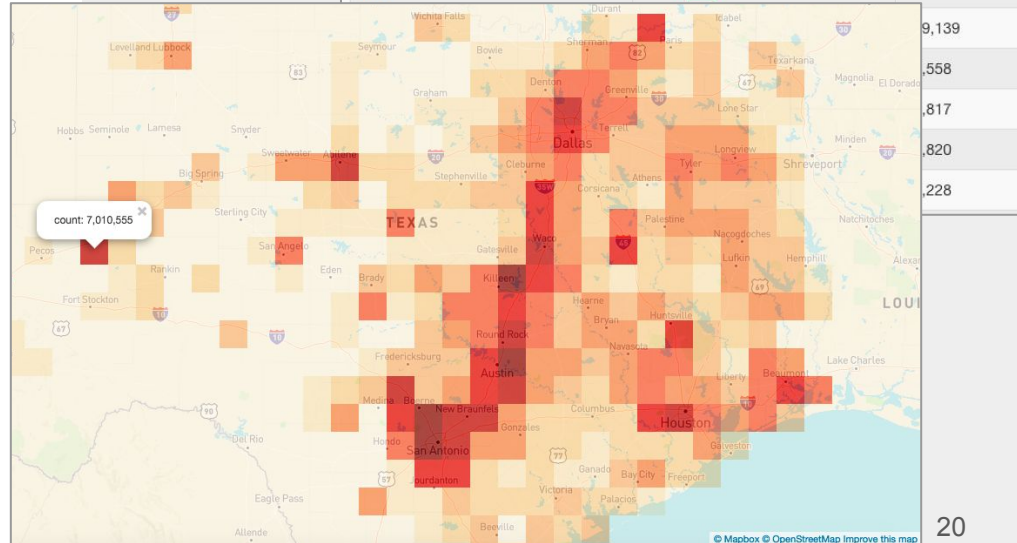
# “ as a Service”

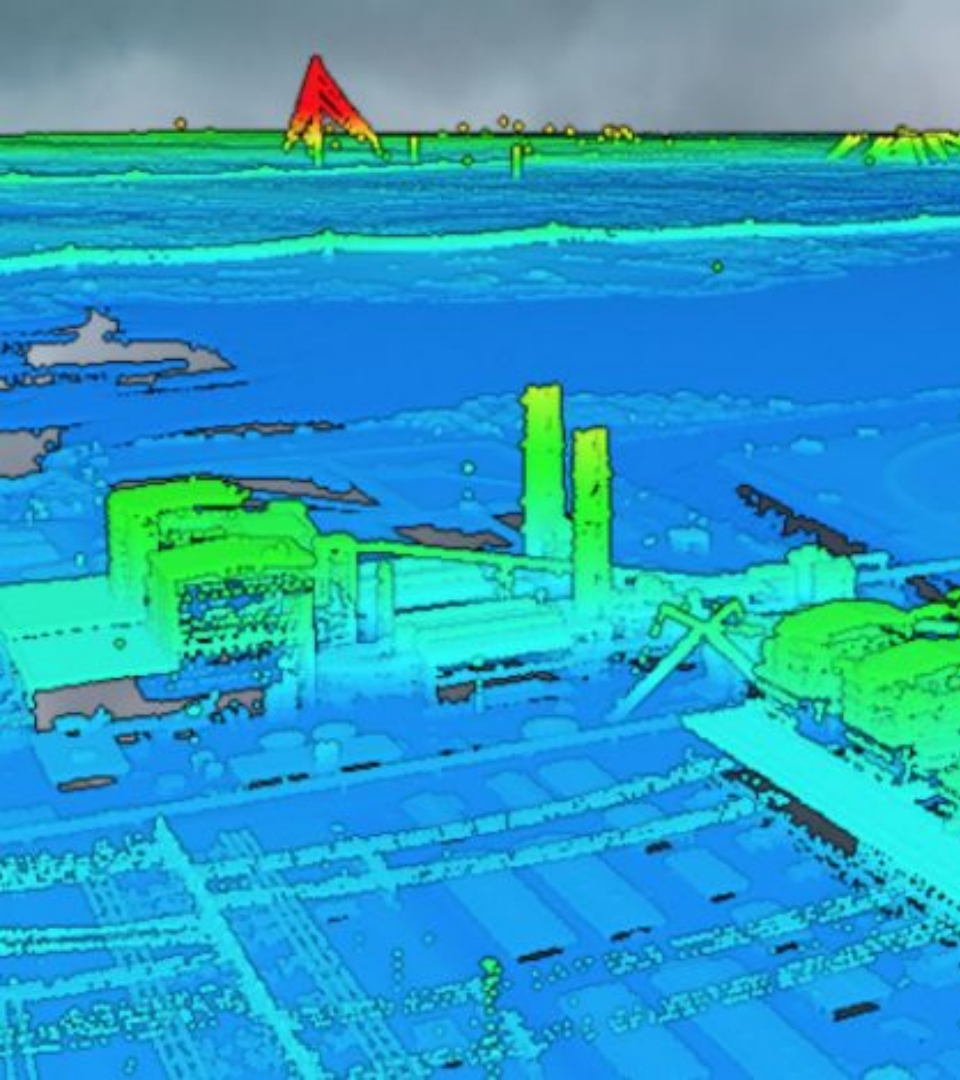
## Approach is key to delivering

## Imagery as a Service

- Low cost data storage via *infrastructure as a service (IaaS)*
- Machine instances via *infrastructure as a service (IaaS)*
- *Big Data as a Service* via Google BigQuery for use statistics

Grouped by Tag▼	↕tag	↕data	↕requests
View Downloads Only	state	1.93 TIB	5,184,258
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Query last ran at 10/25/2017 3:02 PM	local	498.26 GiB	2,056,130
	csec	178.97 GiB	1,611,792
	city	292.87 GiB	1,206,441
	regional	129.18 GiB	721,498
	river authority	86.96 GiB	564,232
	cad	54.84 GiB	490,658
	county	26.04 GiB	208,620
	twdb	71.56 GiB	179,139





- Building on Imagery as a Service Approach to serve LiDAR:
  - Collaboration with Texas (TNRIS) and HoBu
  - Prototype to allow streaming of LiDAR from the Cloud
  - Data visualization & end-user access
  - Cloud based storage

# Take it home...



- The time is now to leverage this rapidly evolving ecosystem
- Pay for scaling up only the functions you need
- Build better apps!  
Performant, transferable, easier to enhance
- Consider “serverless” for delivering your imagery, LiDAR, data



# Thank you.

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