Applying UAS Technology in Disasters

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USGS

USGS Approach to UAS Implementation

Established National UAS Project Office (NUPO) in 2008

- Grass roots effort
- UAS missions with USGS scientists, other DOI bureaus and other agencies
- External contracting for UAS missions
- Research & integration activities
- Training and development of new products and processing capabilities
- UAS subject matter experts

2016

2011

2016

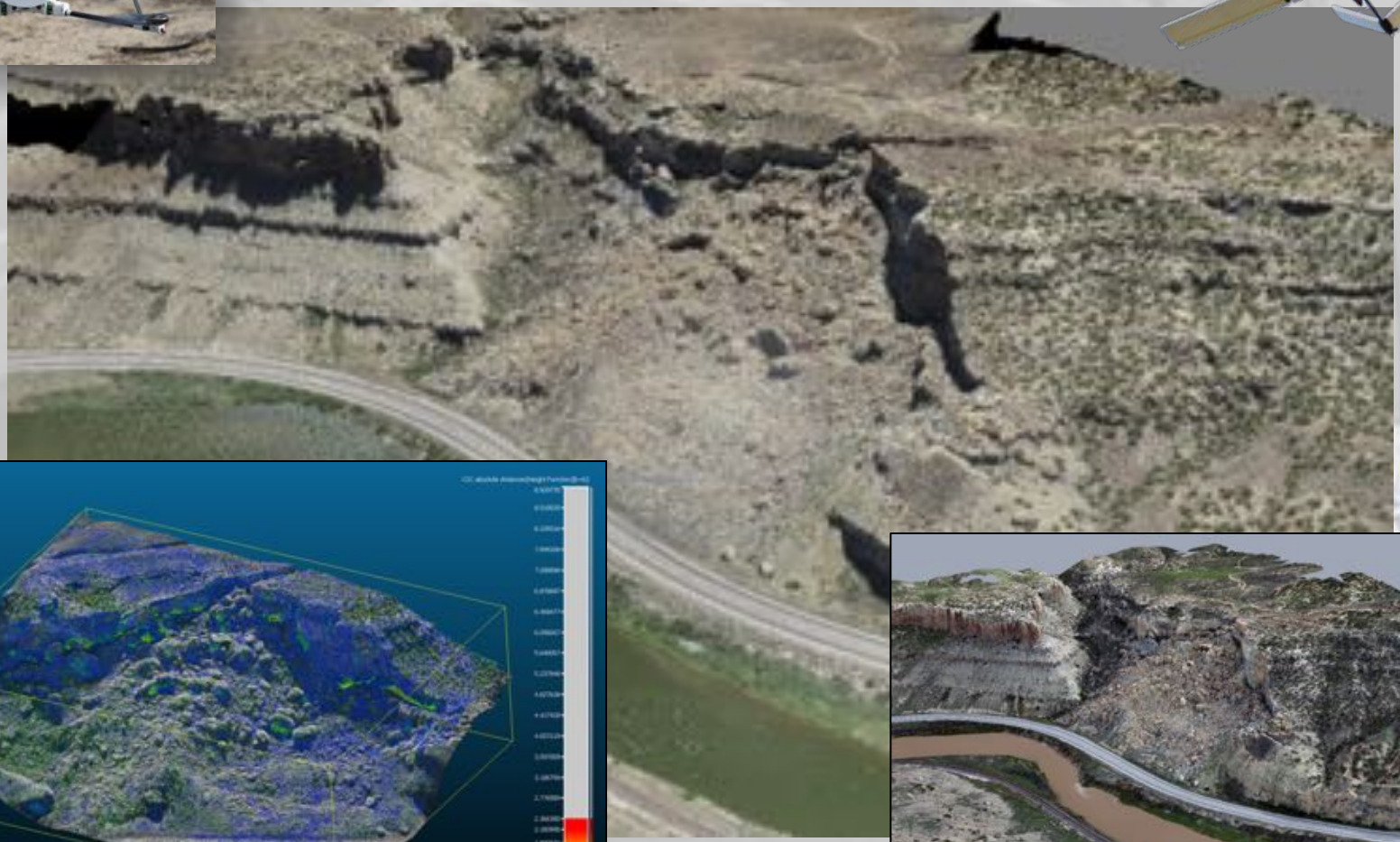
2004

USGS

http://uas.usgs.gov/

DeBeque Canyon Landslide

Western Colorado



Ice Dam Rapid Response

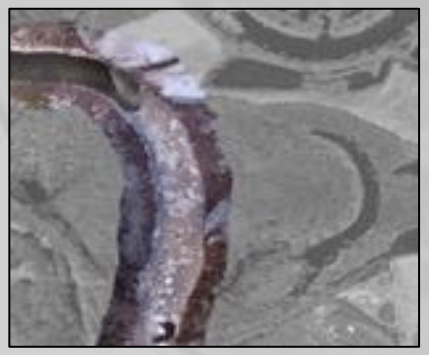
Plymouth, New Hampshire

Union Leader photo

AIRSHARK

DJI Inspire 1
X5 Camera - Prime Lens

Officials meet, assess damage to Plymouth area after ice jam causes NH river to flood

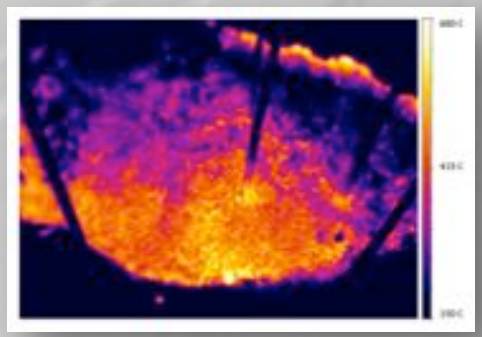


Forest Fire Intensity Effects on Emissions and Particulate Matter
Using an Unmanned Multicopter

USGS Top Story - http://www.usgs.gov/news/igniting-a-new-trend-public-safety

Much remains to be learned about the physics of fire behavior and how fire dynamics relate to emission levels. The health and climate implications of atmospheric particulate matter (PM) and aerosols released by wildfires and prescribed burns are not fully understood.

By combining state-of-the-art UAV's with IR cameras and miniaturized samplers and the analytical capabilities of the USGS this project will address these scientific questions



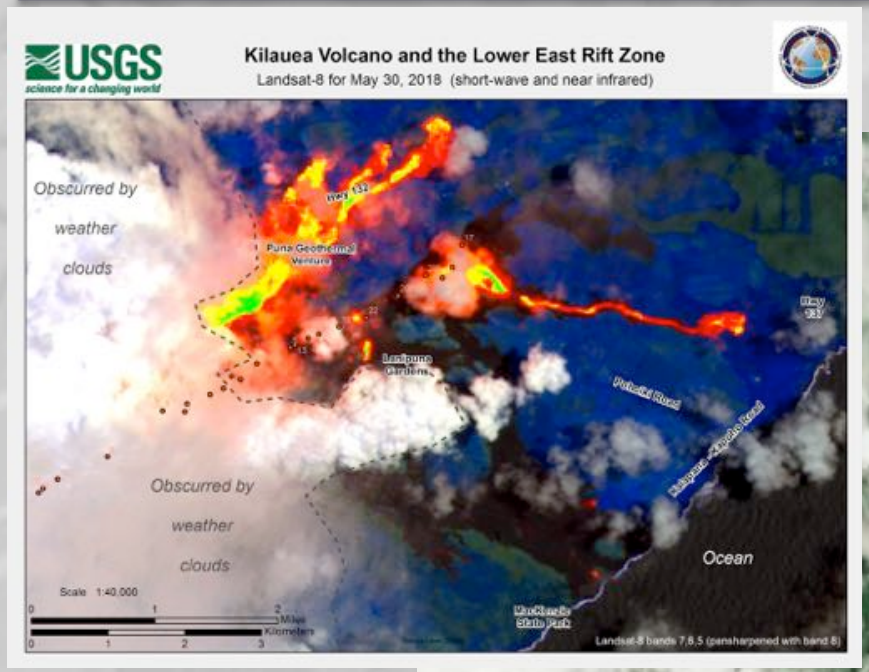
DJI Matrice 100 and S1000 fly fire at Tall Timbers, April 19, 2017, with miniaturized pollutant sampler and TIR camera

Investigators:

- Todd Hoefen, Geoff Plumlee, Jeff Sloan, Bruce Quirk – USGS
- Brain Gullett and William Mitchell – EPA
- Joshua Johnson – Canadian Forest Service
- Johanna Aureli - UDRI

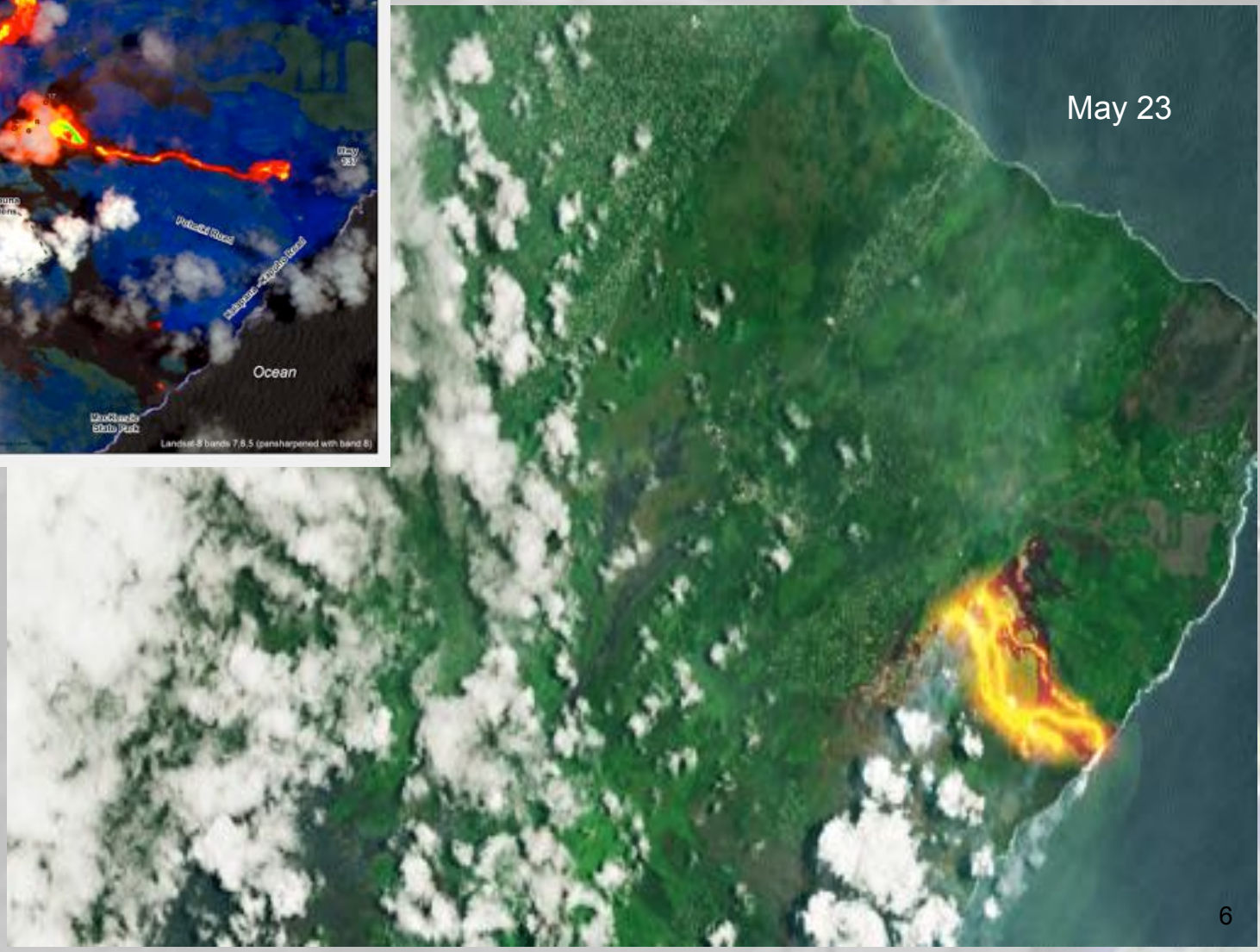
USGS

Kilauea Volcano –Satellite Images



Landsat 8

Sentinel-2



USGS

USGS
science for a changing world


Nanawale Estates
Leilani Estates
16
Google Earth

Summary – Why UAS?

Technology

- Low cost and safer option for repeatable data collection
- Constantly changing – new sensors & concepts
  - Swarms
  - BVLOS
- Provides access to hazardous or inaccessible areas
- Less disturbance to flora and fauna
- Image transient events, rapid response
- Fly under weather (clouds)
- Using science systems for emergency response
- Integrate with other remote sensing and geospatial data sets

Data

- Providing data quickly and producing informational products for situation awareness & science investigations
  - Privacy concerns
  - Data volumes & processing: on-board processing
  - Moving data & products: compression, real-time communications (satellite)
  - Data management & distribution – Hazards Data Distribution System (HDDS)

USGS