

# The Value of DigitalGlobe High Resolution Imagery in Disaster Risk Management

*Derren Yong*

*Senior Director, North Asia Sales*





# A DigitalGlobe Story: Colorado Flooding Rescue (Sep 2013) (1/2)

- DigitalGlobe is a leading global provider of commercial high-resolution earth imagery products and services, based in Longmont, Colorado, USA
- Heavy rain strike Colorado in Sep 2013, and the flooding left nearly 18,000 homes damaged and more than 11,000 people under evacuation order. Many DigitalGlobe employees were impacted

Colorado USA



Flooded homes in Longmont on Sep 14<sup>th</sup> 2013 (Credit: AP)



A bridge collapsed after flash flooding at the Broomfield/Lafayette border in Colorado on Sep 12<sup>th</sup> (Credit: AP)



# A DigitalGlobe Story: Colorado Flooding Rescue (Sep 2013) (2/2)

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Colorado USA



**DigitalGlobe Activated FirstLook Services to Collect 21,000+ Km2 post flooding images**



**Images helped rescue teams identify bridge collapse and road closure quickly**



*“There were our friends, neighbors, loved ones in harm’s way, and so we were doing everything we could to get imagery”*  
– Andy Dinville, Senior Manager, DigitalGlobe Analytics

# DigitalGlobe Overview





# DigitalGlobe™ at a glance

Over 1,000 employees



Stock symbol:

**DGI**  
**LISTED**  
**NYSE®**

Offices & production facilities worldwide:

Longmont

**AMERICAS**

Herndon

London • Amsterdam

**EMEAR**

Abu Dhabi

**APAC**

Singapore

# 3 Billion Dollar Constellation

Today's Clearest View of the Earth:



# WorldView-3 launch scheduled for 2014

Introducing the 1<sup>st</sup> multi-payload, super-spectral, high-resolution commercial satellite.



## WorldView-3®

WorldView bus:

High-agility platform

Main instrument:

Panchromatic + 8 multispectral bands

Secondary instruments:

8 SWIR bands + 12 atmospheric correction bands

Resolution:

.31 meter, <3.5 m CE90

.31 m





# Almost Full Archive Coverage in China

2012-2013 Archive Coverage in China



Note: Included all DigitalGlobe 5 satellites



# DigitalGlobe Approach to Disaster Risk Management

# Deep Expertise for Disaster Management

## Before Disaster

- Satellite monitoring of ground info and identify risk
- Build elevation models to assess potential disaster risks



## When Disaster Happens...

- Online access to Global Basemap (GBM) to retrieve images of impacted areas in seconds
- Access to other archives for customized solutions



## Disaster Response and Recovery

- Activate FirstLook Services to receive post-disaster images
- Analytics solutions to identify disaster impact and plan rescue efforts





# FirstLook: Be the First to Know!

- Crisis platform provides rapid, web-based imagery of major global events:

1. **Natural Disasters**

Ex: Earthquakes, Fires

2. **Manmade Crises**

Ex: Large accidents, Terrorism

3. **Human Interest**

Ex: World Cup, Olympics

107 Events in 2012

~127 Events in 2013!

**Zhouqu County, Gansu, China  
(After Mudslide, Aug 2010)**



Identify damaged buildings that were surrounded by mudslide

You benefit from insight for emergency planning,  
damage assessment, and recovery.

# FirstLook Asia Coverage

## 29 Events and 44,000 km<sup>2</sup> Collected

August 2012 to August 2013



### Other China Events included:

- Gansu Earthquake: July 22<sup>nd</sup> 2013
- Typhoon Usagi: Sep 23<sup>rd</sup> 2013
- Heavy Rain in Guangyuan: July 22<sup>nd</sup> 2013
- Flood in Sichuan: July 12<sup>th</sup> 2013
- Lushan Earthquake: April 22<sup>nd</sup> 2013



# Earthquake: Gansu, China

## Event Activation: 07.22.2013



### China's Gansu province hit by powerful earthquakes

- BBC News

July 22, 2013 1:24 pm



Image: Reuters News 7.22.2013





# Flood: Chokwe, Mozambique

## Event Activation: 01.22.2013



**Acquired: 06.19.2011**



**Acquired: 01.24.2013**

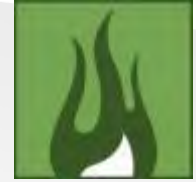


Heavy rains in Mozambique caused the displacement of 55,000 people. The worst affected areas were in the southern Gaza province.



# Fire: Dunalley, Tasmania, Australia

## Event Activation: 01.03.2013



**Acquired: 08.27.2012**



**Acquired: 01.05.2013**



Bushfires burned about 29,000 hectares in southeast Tasmania. In Dunalley, 65 homes and an elementary school were destroyed.

# Tornado: Dallas, Texas, USA

## Event Activation: 04.04.2012



**Acquired: 03.11.2011**



**Acquired: 04.05.2012**



Rescuers searched the Dallas area for anyone trapped after violent tornadoes flattened homes, threw tractor-trailers and sent debris swirling.



# Man-Made: Brazzaville Explosion, Congo; Event Activation: 03.04.2012



**Acquired: 03.10.2010**



**Acquired: 03.15.2012**



A series of large explosions killed at least 200 people in Brazzaville and shattered windows across the Congo river in Kinshasa.

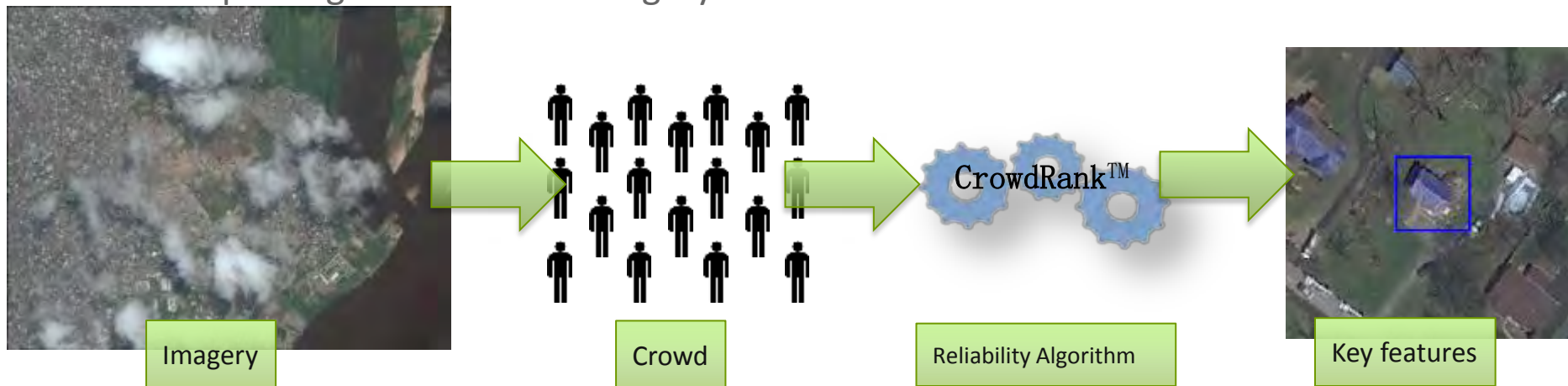


# FirstLook+ leverages Tomnod Crowdsourcing(TCS)

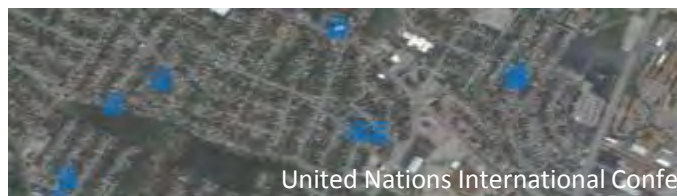
On April 2013 DigitalGlobe announced the acquisition of crowdsourced intelligence pioneer Tomnod ([www.tomod.com](http://www.tomod.com)) based in California

**Solution:** FAST Image insight by leveraging crowdsourcing

**Problem:** Exploiting mountains of imagery



Crowd views small segments of imagery online and identifies key features:



# FirstLook Key Benefits

## Monitor World Events

- › Remain informed and up-to-date on current events around the globe
- 

## Priority Tasking

- › Take precedence in image collection scenarios
- 

## Finished Product

- › Spend less time collecting, processing, and analyzing information
- 

## Fast Flexible Access

- › Online subscription service provides fast, web-based access to pre- and post-event imagery of world disasters
- 

## Notification Service

- › Email and RSS notifications sent for event activations and imagery availability
- 

## Insight Layers

- › Using the crowd to rapidly convert Pixels to Information and Insight
- 

## Market Served

- › Insurance and reinsurance
  - › Local and central governments; safety agencies: police, fire, ambulance, forest services
  - › Defense and homeland security
  - › Multinational and humanitarian agencies
-

# The Analytics Power to Understand and Take Actions for Disaster Management

- Imagery + Analysis = Insight
- Empower better decision making
- Custom solutions for customers

## USA Colorado Flooding 2013

The flood left nearly 18,000 homes damaged, 1,500 homes destroyed and more than 11,000 people under evacuation order. DigitalGlobe activated FirstLook Service and collected more than 21,000 km<sup>2</sup> of imagery and provided them along with actionable information to first responders on the ground like The Red Cross and National Guard.



## Japan Earthquake 2011

In the aftermath of the tsunami, more than 95,000 downloads of imagery and analysis details of the damaged Fukushima Daiichi nuclear power plant were downloaded from our website.

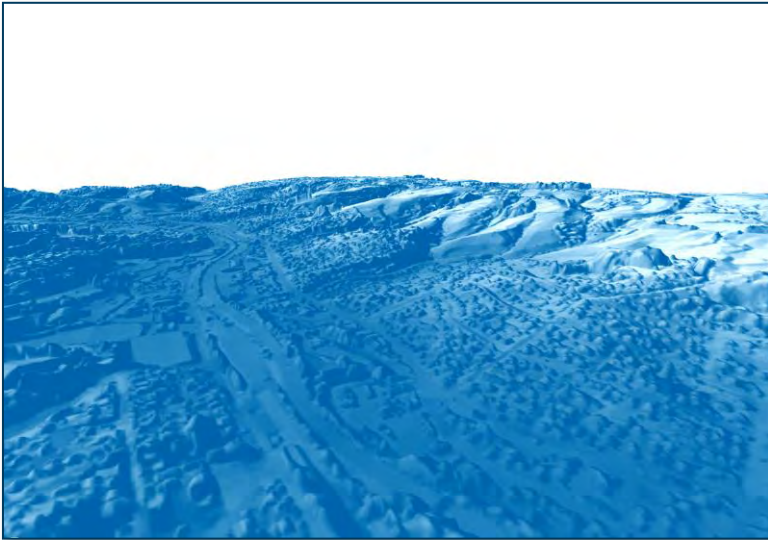




# Digital Elevation Models for Disaster Modeling and Analytics

DSM

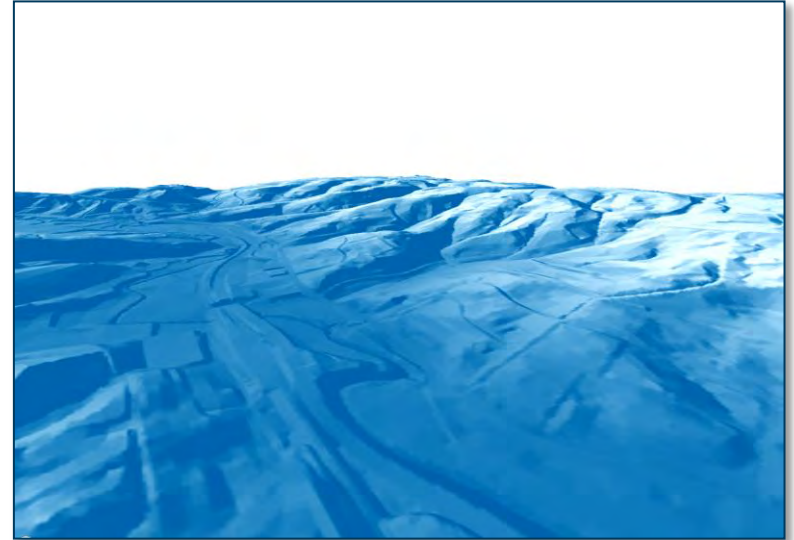
Digital Surface Model



Includes vegetation and buildings

DTM

Digital Terrain Model



Bare earth

# Storm Surge Modeling

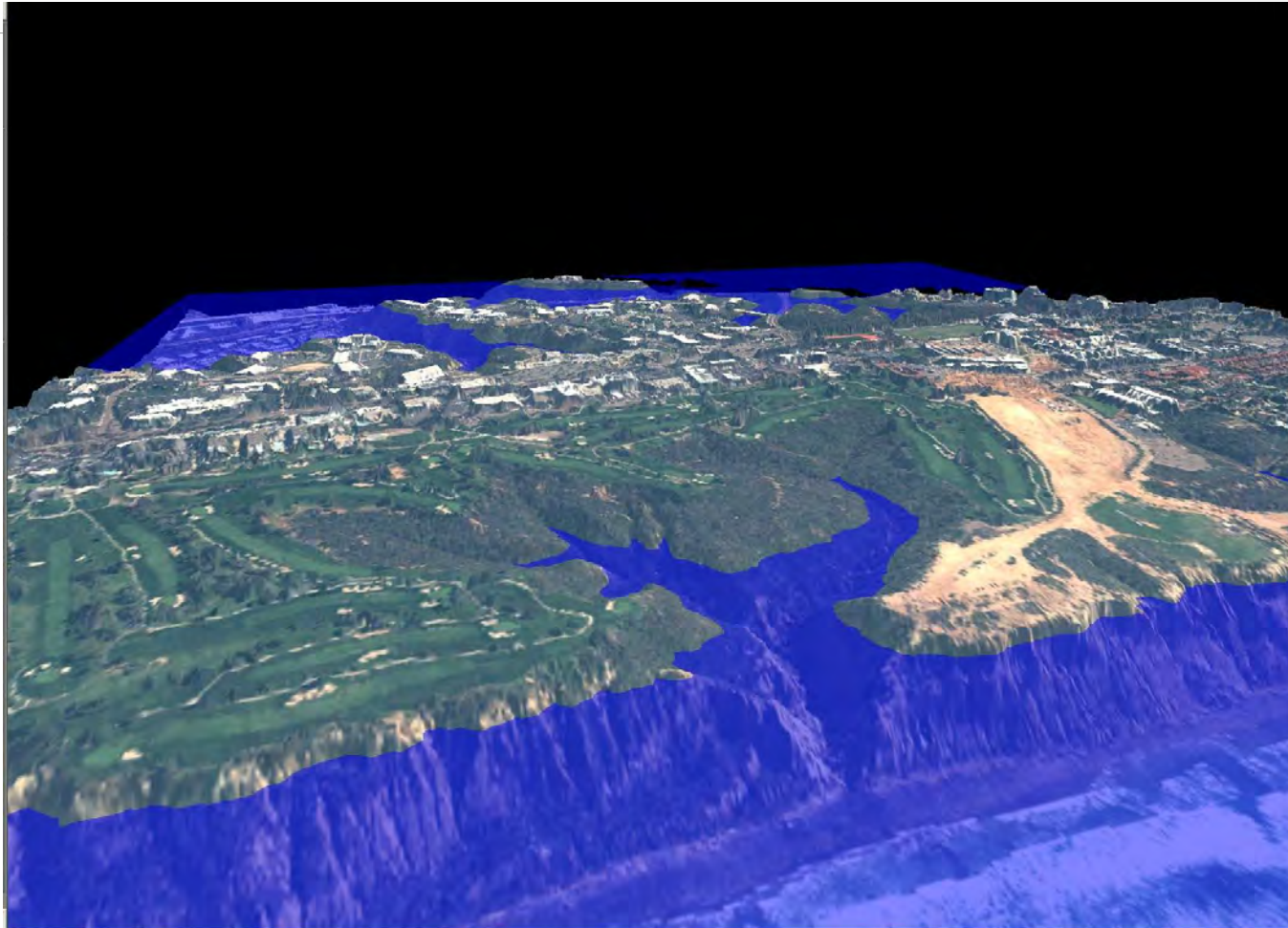


5 Meter Surge

*Using imagery based elevation models to project impact of flooding*



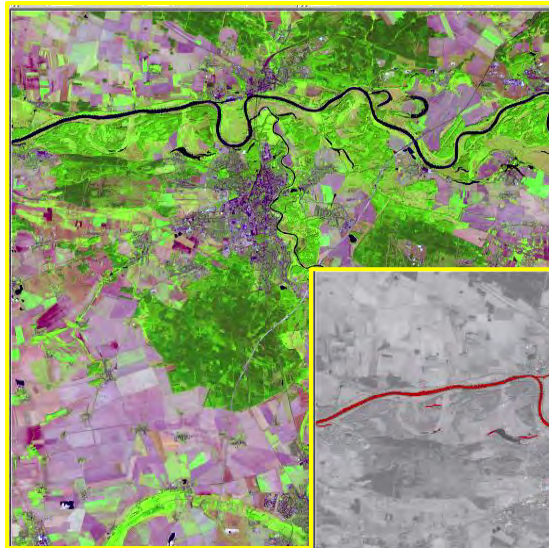
# Modeling Potential Inundated Areas



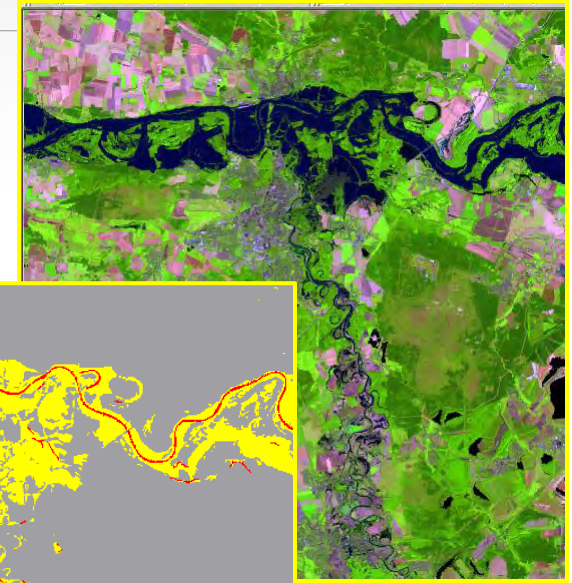
*Potential Impact to San Diego because of Global Warming and Melting of Ice Caps*



# Flood Monitoring & Impact Assessment



Pre-Flood

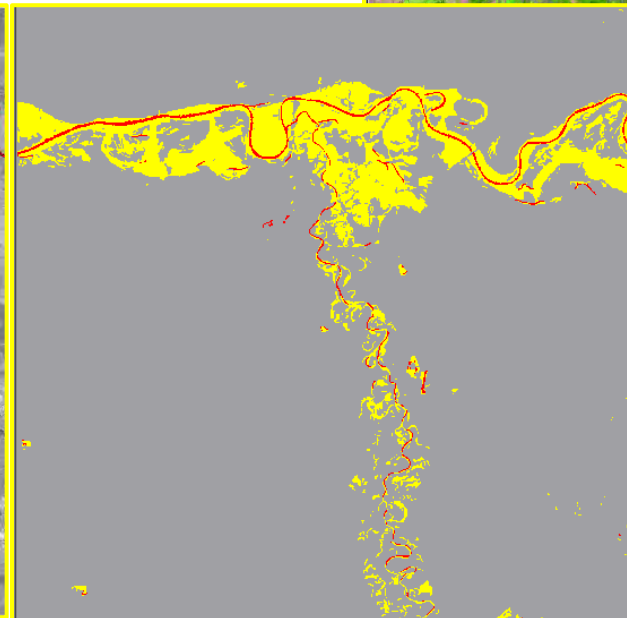


During-Flood



Pre-Flood River Profile

 River Bed



Flooded Areas

 River Bed  
 Flooded Area

*Vegetation and bathymetry analysis can be applied*



[www.digitalglobe.com](http://www.digitalglobe.com)