


BLUE CHAM
Institut de recherche pour le développement


GEOSPATIAL Cloud Computing hub Qähnelö™

Early response





VANUATU PAM CYCLONE

Geospatial Cloud Computing & Big Data



DigitalGlobe

Rémi Andreoli
Director Space Applications – BLUECHAM SAS


VANUATU EMERGENCY 03 2015

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International WEB services connection

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GIS / RS Users conference, Suva, Fiji Nov.




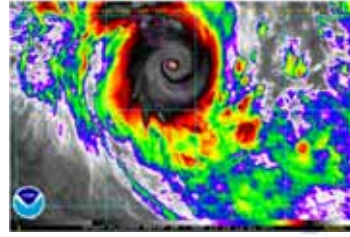
Cyclone PAM hit Vanuatu

- **March 6, 2015** Tropical Disturbance 11F (FMS)
- **March 12, 2015** National Disaster Management Office in Vanuatu activated all emergency operation centres
- **March 13, 2015 (Early)** reached its peak one-minute sustained winds of 270 km/h (Cat 5)
- **March 13, 2015 1:00 am** The NDMO issues the red alert for Shefa, Penama, Sanma, Malampa, and Port Vila.
- **March 13, 2015 In the morning** Communication loss between New Caledonia and Vanuatu
- **March 13, 2015 In the evening** Pam hit Port Vila
- **March 14, 2015 5:00 am** Pam hit Tanna island
- **March 14, 2015 11:00 am** Pam leave Vanuatu

One of the most intense cyclone in the South Pacific Basin

- 188 000 people have been impacted
- Catastrophic damage on Erromango, Tanna, Efate, Mataso
- Communication and power facilities destroyed
- 11 deaths in Vanuatu





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BLUE CHAM ■ **Early response**

During the early phases of a crisis, the **first** information is the **best** information

First need is to « **see** » the ground

Timeline events:

- March 12, 2015 NDMO activated all emergency centers
- March 13, 2015 1:00 am NDMO issues the red alert for Port Vila
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BLUE CHAM ■ **Early response: satellite acquisitions**

- **March 13, 2015 8:00 am:**
 - First calls between New Caledonian government, Geohazard department of Vanuatu and Bluecham
 - Acquisition anticipation with DigitalGlobe
- **Strong relationship between** DigitalGlobe BLUE CHAM

Anticipation

Timeline events:

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BLUE CHAM Crisis response: Geospatial Big Data & Cloud computing

- Data acquisitions :**
 - March 14, 2015: First images (Port Vila)
 - March 15, 2015: Erromango, Efate, Tanna
 - March 17, 2015: Main impacted islands observed
 - Acquisitions continued in March and April 2015
 - + All the reference images acquired before PAM
- Issues:**
 - Huge amount of data (Terabytes)
 - Satellite data in appropriate format to end users
 - Appropriate hardware to exploit data
 - Near Real Time data acquisition, analysis and dissemination to end users

Timeline:

- March 12, 2015: NDMO activated all emergency centers
- March 13, 2015 1:00 am: NDMO issues the red alert for Port Vila
- March 13, 2015 in the evening: Pam hit Port Vila
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Labels: Anticipation, First image

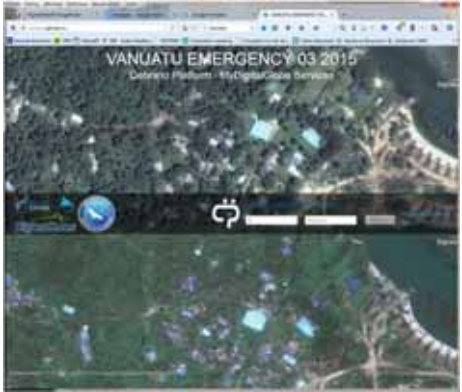
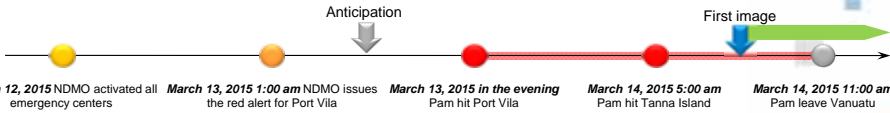
Logos: BLUE CHAM, DigitalGlobe

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BLUE CHAM ■ **Cloud computing boosts Geospatial Big Data**

- Qēhnelö hub : Geospatial Cloud Computing**
 - Web-based solution 
 - Connection to Geospatial Big Data in streaming
 - DigitalGlobe FirstLook™
 - DigitalGlobe GlobalBaseMap™
 - Connection to remote databases
 - SPC
 - UNOSAT satellite imagery for all
 - JRC EUROPEAN COMMISSION
 - Set of dedicated tools (Visualize, Analyse, Decide)

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BLUE CHAM ■ **Qēhnelö™ hub set up : 6 hours**

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Qēhnelö™ platform loading
Vanuatu platform. © Copyright Bluecham SAS 2015

IN ONLY 6 HOURS

Data security activation



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BLUE CHAM Qëhnelö™ hub : set of turnkey tools

The screenshot displays a complex software interface with multiple windows. A central window features a globe with the text 'VISUALIZE' and 'DECIDE'. Other windows show satellite imagery, data tables, and various toolbars. The interface is designed for geographic information system (GIS) operations and data analysis.

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BLUE CHAM Catastrophic Damages

Qëhnelö Q-eGIS

The screenshot shows a 3D visualization of a landscape, likely a coastal area, with significant damage. The terrain is rendered in shades of brown and tan, indicating destruction or erosion. The interface includes a toolbar on the left and a 'DigitalGlobe FirstLook' logo in the bottom right corner.

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BLUE CHAM ■ Catastrophic Damages

ehnelo Q-eGIS



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BLUE CHAM ■ Rapid assessment of Airfields

EXOGENEOUS DATA SPC SOPAC - SUVA
SECURITE CIVILE NOUVELLE-CALEDONIE



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BLUE CHAM ■ **Rapid Mapping tools** DigitalGlobe

SECURITE CIVILE NOUVELLE-CALEDONIE



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BLUE CHAM ■ **VISUALIZE**

BEFORE – AFTER COMPARISON



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BLUE CHAM ■ Catastrophic Damages

ehnelö BEFORE – AFTER COMPARISON




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BLUE CHAM ■ Impacts analysis

ehnelö Q-ACE **ehnelö** Remote databases

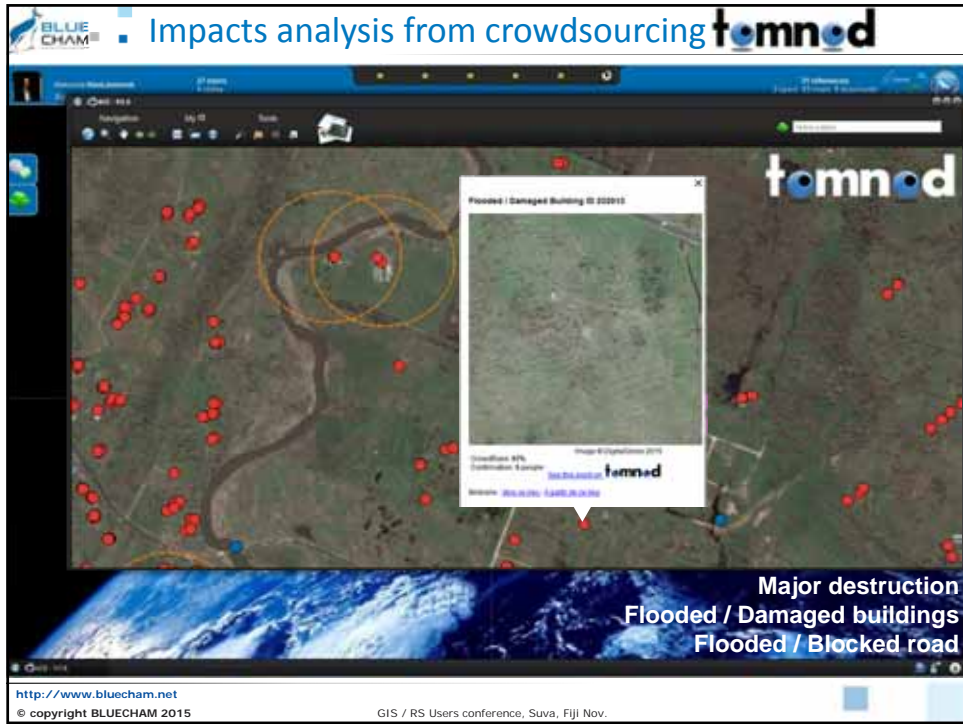


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UNOSAT satellite imagery for all

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BLUE CHAM ■ Impacts analysis from crowdsourcing **tomnod**

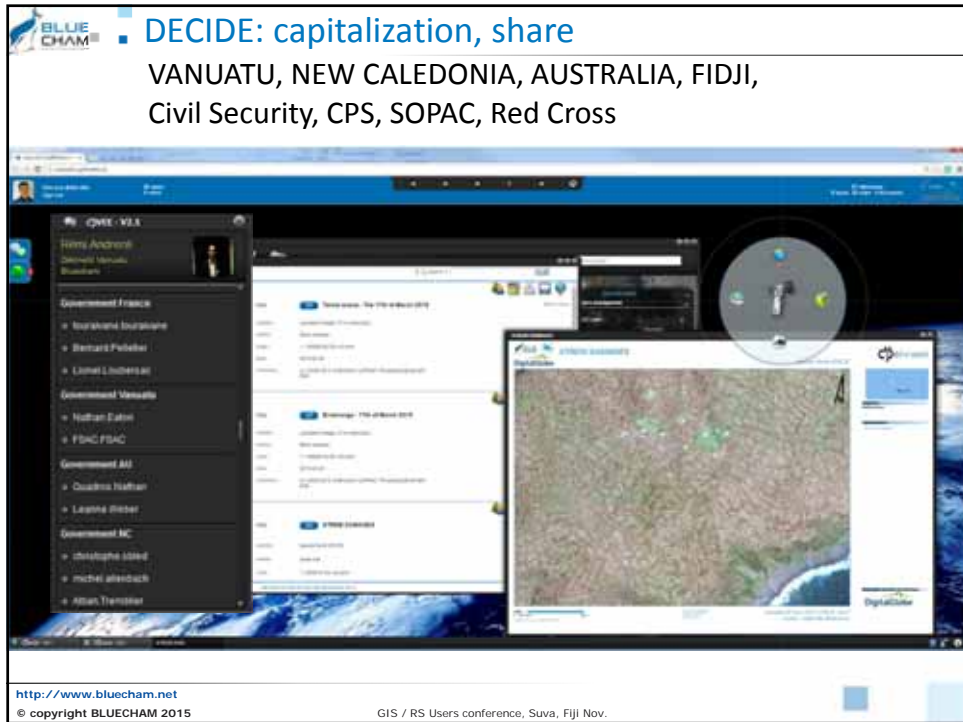


Major destruction
Flooded / Damaged buildings
Flooded / Blocked road

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BLUE CHAM ■ **DECIDE: capitalization, share**
VANUATU, NEW CALEDONIA, AUSTRALIA, FIDJI,
Civil Security, CPS, SOPAC, Red Cross



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Cloud computing boosts Geospatial Big Data

- Hub: Geospatial Cloud Computing**
 - Web-based solution
 - Connection to Geospatial Big Data in streaming
 - FirstLook™
 - GlobalBaseMap™
 - Connection to remote databases
 -
 - Set of dedicated tools (Visualize, Analyse, Decide)
- Issues:**
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Labels on timeline: Anticipation (arrow pointing to March 13 evening), First image (arrow pointing to March 14 5:00 am)

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Gain of Cloud Computing & Geospatial Big Data



Average Disaster Charter response
SERTIT & CNES CIRC database
(2000 - 2009)

Anticipation	-
T_0 : the event	-
Constellation tasking	$T_0 + 1$ day
First image of the event	$T_0 + 3$ days
First information delivered to end users	$T_0 + 4.5$ days

Further improvements:

Anticipation with end users

- Faster access to FirstLook (**less than $T_0 + 2$ days**)
- Users trained to use tools and data


Integrate crowdsourcing (Tomnod)

- From the early phases of the crisis to reconstruction phases
- Inform and train users on the capabilities of crowdsourcing

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End user feedbacks



Ces documents, d'une précision stupéfiante, ont permis de préparer les scénarios d'interventions de l'unité de la sécurité civile de la Nouvelle Calédonie qui allait être amenée à intégrer le détachement « France » sur le terrain, après la validation des autorités du Vanuatu.

« The amazing precision of the data »

« used to prepare the Civil Security intervention on the field »

« allows a fast, comprehensive and wide observation of damages ... »

« ... to prioritize fields actions »

- 1. France
- 2. Australie
- 3. Nouvelle Calédonie
- 4. Vanuatu
- 5. Nouvelle Zélande
- 6. France

27 authorized users worldwide

The first week

255 connections to Qvee


231 connections to Q-eSIG

118 access to map library

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 **THANK YOU FOR YOUR ATTENTION**



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Qehnelo™ platform loading
Vanuatu platform, © Copyright Bluecham SAS 2015

Data security activation

VANUATU EMERGENCY 03 2015
Qehnelo Platform - MyDigitalGlobe Service

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