UN International Expert Meeting on Crowdsourced Mapping for Disaster Risk Management & Emergency Response
Vienna, Austria

DATA POLICIES, CAPACITY BUILDING & DISASTER RESPONSE

Dr. Ray A. Williamson & Natassa Antoniou
Secure World Foundation
The Secure World Foundation (SWF) is a private operating foundation dedicated to the secure and sustainable use of space for the benefit of Earth and all its peoples.
What Does the Foundation do?

**Engages** with academics, policy makers, scientists and advocates in the space and international affairs communities to support steps that strengthen global space security.

**Promotes** the development of cooperative and effective uses of space for the protection of the Earth’s environment and human security.

**Acts** as a research body, convener and facilitator to advocate for key space security and other space related topics and to examine their influence on governance and international development.
Basic Facts

• Non-profit operating foundation founded in 2004

• Funding comes from a private endowment

• Offices in Colorado, Washington DC and Brussels

• 4 focus areas: space sustainability, space policy, NEO and HES
OUTLINE

• Space Applications Systems
• International Response to Natural Disasters
• Crowdsourcing
• Community Remote Sensing
• Legal issues/ Data policy
DISASTER MANAGEMENT CYCLE

Source: http://pre-drp.org/about-2/disaster-management-cycle
SPACE APPLICATIONS
SYSTEMS
REMOTE SENSING SYSTEMS
(weather, land, ocean)

• Electro optical – multispectral images
  – Affected by cloud cover
  – Not effective at night
  – Analysis techniques broadly known

• Synthetic Aperture Radar (SAR)
  – Unaffected by cloud cover
  – Analysis tricky; requires special analytic skills
GLOBAL POSITION, NAVIGATION & TIMING (GNSS)

- Global Positioning System (GPS)—U.S.
- GLONASS—RUSSIA
- COMPASS—CHINA
- Galileo (in development)—EUROPE

- Provide accurate positions for map making
- Accurate positions of victims, areas of major destruction, rescue personnel

Source: http://www.asladvancedsys.in/pub-GNSS.shtml
SATELLITE COMMUNICATIONS

- Individual satellite phones
- Base stations connectivity through satellites
- Satellite broadband

INTERNATIONAL RESPONSE TO NATURAL DISASTERS
INTERNATIONAL CHARTER: SPACE & NATURAL DISASTERS (1/2)

• Started: 2000
• Scope: To coordinate satellite data providers’ response to major disasters
• 14 Members: ESA, Argentina, Britain, Canada, China, France, India, Japan, USA, Japan, Brazil, Germany, Korea, EUMETSAT
• Activation: 353 times / 2012: 34 times
• Problems: Timely delivery in smaller disasters and limited budget
ACTIVATION OF THE CHARTER (2/2)

1. Identification that disaster has happened & that the charter can help
2. 24/7 operational activities to respond to request for support quickly
3. Technical competence to handle space data & turn into useful maps
4. Direct link to user/response community who will use the maps
Ocean Storm, State of New York and New Jersey

<table>
<thead>
<tr>
<th>Type of Event</th>
<th>Ocean Storm - Hurricane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location of Event</td>
<td>United States of America - States of New York and New Jersey</td>
</tr>
<tr>
<td>Date of Charter Activation</td>
<td>01 November 2012</td>
</tr>
<tr>
<td>Charter Requestor</td>
<td>USGS on behalf of Federal Emergency Management Agency (FEMA)</td>
</tr>
<tr>
<td>Project Management</td>
<td>Florida Division of Emergency Management</td>
</tr>
</tbody>
</table>

Description of the Event

Hurricane Sandy - the largest Atlantic tropical storm system on record - made landfall just south of Atlantic City, New Jersey, bringing winds up to 90 mph (150 kph), and pushing a massive storm surge onto beaches and shorelines. At least 50 deaths have been reported.

Millions across the Eastern Seaboard are now without power, and even more are struggling with rising floodwater.

Sandy continues northward, now downgraded to a post-tropical cyclone, and those affected are now assessing the damage.

Images and/or Image product Delivered under the Charter will be published here as soon as they become available
## Flood in England

**Type of Event**
- Flood

**Location of Event**
- England, United Kingdom

**Date of Charter Activation**
- 27 November 2012

**Charter Requestor**
- Environment Agency (of England and Wales)

**Project Management**
- Environment Agency (of England and Wales)

### Description of the Event

There has been widespread flooding across a number of regions within England during the last 5 days and the event is still ongoing.

**Environment Agency - BBC News**

Over 900 properties have been flooded and two deaths have been reported. In addition to the flooded properties there has been widespread inundation of agricultural land on floodplains.

Among the affected areas are: Somerset levels, Oxford, Tewkesbury, Darlington to York, Nene Washlands, and Nottingham.

As of **29 November 2012**, there have been 1650 flooded properties in total and one further fatality (3 deaths in total).
UNSPIDER
UNITED NATIONS PLATFORM FOR SPACE-BASED INFORMATION FOR DISASTER MANAGEMENT AND EMERGENCY RESPONSE

• Established by Resolution 61/110 of the General Assembly in 2006 within the U. N. Office of Outer Space Affairs (UNOOSA)

• Provides access to all countries and all relevant international and regional organizations to all types of space-based information and services relevant to disaster management to support the full disaster management cycle, including capacity building
GMES (1/3)

Promoting Cooperative Solutions for Space Sustainability

**USERS**

- Policy makers & Public & Private, commercial

**OBSERVATION**

- Space Infrastructure & in-situ Infrastructure

**Examples provided**

- Farming
- Ice monitoring
- Air quality
- Flood
- Surveillance
- Climate Change
- Land
- Marine
- Atmosphere
- Emergency
- Security
- Climate

**Information services**

- Sustainable information

Source: EC, DG ENTR, GMES unit
GMES (2/3)

GMES Service: Emergency Management Service (EMS)

- The first operational service of the European GMES programme
- Successor to SAFER and linkER activities
- Kick-off per 1 April 2012, for 3 years
- Covers: Floods, Earthquakes, Landslides, Severe Storms, Fires, Technological disasters, Volcanic eruptions, Humanitarian crises, Tsunamis
- Activation: Authorised Users may activate the service by completing the relevant Service Request Form (National Focal Points in EU MS, EC Services (DGs))
Promoting Cooperative Solutions for Space Sustainability

Source: http://www.emergencyresponse.eu/gmes/n-Greece_111.html
RESPONSE SPEED + ACCURACY = CRUCIAL

• Many hours, even days can pass before map products are available
• Problems in getting maps to end users in the impact areas
• We MUST be able to do near real time data acquisition, analysis, and dissemination to end users
FILLING THE GAPS
CROWDSOURCING

• Using the power of the “crowd” to achieve a task quickly and efficiently

• Examples:
  - Rapid processing of satellite data (Haiti, Burma)
  - Classifying galaxies in the Galaxy Zoo project
  - “Fold it” project public input to protein folding
COMMUNITY REMOTE SENSING

• “A new field that combines remote sensing with citizen science, social networks, and crowd-sourcing to enhance the data obtained from traditional sources

• It includes the collection, calibration, analysis, communication, or application of remotely sensed information by these community means
Google Earth forms a convenient platform for CRS inputs
LEGAL ISSUES
THE LEGAL ISSUES BECOME MORE COMPLEX

Spatial Law is the set of legal issues associated with collection and use of spatial data and spatial technology.

Issues include:

• Privacy
• Data Ownership
• National Security
• Data Quality/Liability
• Complexity impacts ability/willingness to share
CRS–POTENTIAL LEGAL ISSUES

• Intellectual Property Rights in Spatial Data
• Spatial products/services frequently include a mixture
  - Terms and restrictions are not always clear or evident
• Wide Variety of Legal Restrictions on Use
• No copyright
  - State and local governments
• Variety of laws regarding use
  - Copying, commercial use, derivative products,
  - Proprietary Sources
CONCLUSIONS

• Increased effort on training
  – Building capacity among ALL communities to carry out their own analysis of satellite data
  – Training to response teams in using space-derived maps
• Much greater international sharing of space-derived data, such as CBERS & Landsat
• Foster use of crowdsourcing and CRS methodologies
  – Develop methods & standards
  – Explore legal aspects of these methods
Promoting Cooperative Solutions for Space Sustainability

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