Current Geocoding Situation at GDACS

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GDACS stands for: Global Disaster Alert and Coordination System

Near real-time alerts about natural disasters around the world and tools to facilitate response coordination, including media monitoring, map catalogues and Virtual On-Site Operations Coordination Centre

Disasters are classified in three classes:
- **Green**: very low likelihood of humanitarian disaster
- **Orange**: potential humanitarian disaster
- **Red**: very high likelihood of humanitarian disaster

Alert levels are automatically selected and continuously updated by a computer program based on the available information and will not be modified manually.
Current Geocoding Situation at GDACS

System for international disaster response community

- Complimentary with existing information systems
- Information gap in the initial response phase

• Partnerships
  - United Nations OCHA, UNOSAT, JLS, WFP, UNEP, HABITAT
  - Scientific organisations
    - Earthquakes: US, Italian, European, German, Russian seismological institutes
    - Tropical cyclones: Pacific Disaster Centre
    - Floods: Dartmouth Flood Observatory, NASA
    - Volcanic eruptions: Smithsonian Global Volcanism Program
    - Tsunamis: Pacific Tsunami Warning Centre, NOAA, UNESCO

Data Sources
http://www.gdacs.org/sources.asp
Current Geocoding Situation at GDACS

- Magnitude: 7.9M (very strong)
  - Depth: 10km (shallow)
  - Several strong aftershocks

- Location
  - 94km from Chengdu
    - 9.7 million people within 100km
    - 30 million people within 200km
  - Mountainous area
    - landslides, hydro-dams

GDACS system (times relative to event)
- 13min  Detection of earthquake through USGS
- 14min  GDACS Red Alert
- 14min  GDACS report published on-line
- 14min  Email alert sent to 4500 users
- 19min  SMS alert sent to 2700 users
- 53min  Fax alert sent to 100 users
  all automatic

Operational since 2002 (experimental since 1994)

Status Events
Green: 30341
Orange: 509
Red: 82
Grand total: 30935

~1h  GDACS Virtual OSOCC topic created
1h20  UNDAC Alert Message
9h   Media reports >1000 killed
1st day  1st IFRC Situation Report
2nd day  First OCHA Situation Report
18 May  First satellite based damage map

Fatalities in the news
Tropical Cyclones
Calculating buffers and applying models to get an estimate of probable impact

- Track data from 2003 to now -> 655 storms
- Since 2007, wind buffers -> 431 storms

Floods
Current version provides reports and impact models.

- JRC contracted DFO Dartmouth Flood Observatory in 2008 to provide data and services.
Volcanoes

Current version provides reports derived from the Global Volcanism Program weekly RSS feed.

We currently work on monitoring volcanic ash dispersal.
After the 2004 Tsunami in Banda Aceh, Indonesia, JRC decided to include Tsunami models for a quick evaluation of the possible impact of a Tsunami as a consequence of an earthquake.

Risk analysis

- Risk = Hazard \times Population \times Vulnerability
  - Hazard = 0 then Risk = 0
  - Population = 0 then Risk = 0
  - Vulnerability = 0 then Risk = 0

Impact analysis is similar

- Impact = Event magnitude \times Population in affected area \times Vulnerability

Models usually based on neighbourhood and buffer analysis

- Validation requires external data
- Optimization is done on past disasters
Current Geocoding Situation at GDACS
Examples of Outputs

Problem I

How do we associate single measurements with specific disasters?

Need for algorithms for each disaster type.
Problem II

How do we identify disasters across various databases, institutions, companies?

Database A
  Disaster ID: 1
  Disaster ID: 4

Database B
  Disaster ID: 1
  Disaster ID: 2
  Disaster ID: 3
  Disaster ID: 4

Glidenumber.net

Web application to create, register and manage globally common unique ID codes for disasters.

JRC recently committed a module, which enables automatic creation of numbers.

Work to do: Come up with algorithms that reliably detect duplicates and "aftershocks" for each disaster type.
Examples of Outputs

Scraping SWE (SOS) → MS SQL Server Sensor Data Volcanoes Cyclones Flood Earthquake ...... → Evaluation

MS SQL Server ArcGIS Server → Models Java Grid

WPS (52N) ← Alert

Example of Outputs

Thank you!
Examples of Outputs

Services connected to disasters

- Data and geo data
- Catalog services
- Geolocation services
- Gazetteer
- Symbology/Terminology
- etc.