

### Building, validating, and improving a standards framework

### Scott Simmons Executive Director Standards Program, OGC



### Outline

• Review of OGC standards used in disaster response

- How OGC standards are exercised
  - Real world
  - Interoperability testbeds and experiments
- How exercise feedback drives requirements
- How to accelerate the tempo



# OGC standards used in disaster management





### **Urban Resilience with Coastal Inundation**

**Coastal Inundation as a result of Sea-Level Rise – 2025 Projection** 



**Climate and Human Security:** 

- Social unrest with displaced population due to climate change
- Integrating spatial and non-spatial models of human geography
- OGC Web Processing Service (WPS) for model interoperability



### **OGC Web Services in action**



### Location Enabling SMS Messaging: OGC Open GeoSMS

- Significant potential for many applications
- Characteristics
  - Multilingual
  - Multi-device
  - Harmonized with many existing applications
  - Incorporates relevant ISO standards
- Adopted in 2011



Emergency Real-time Alert or Update

 Approved as a standard by the International Telecommunications Union

### Advancing Mobility - OGC GeoPackage

- The OGC GeoPackage standard is a universal file format for geodata.
  - open, standards-based, application and platform independent, and self-describing.
  - -Works on any desktop or mobile OS
  - -For use in a connected / disconnected environment
- GeoPackage the modern alternative to formats like GeoTIFF, SDTS and vendor specific
- Experience it here: <u>http://www.ogcnetwork.net/geopackage</u>





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Slide source: Steve Liang, Univ. Calgary

### Emergency and Disaster Management Domain Working Group

 Forum for uniting communities of users including government agencies, industry, research organizations, non-governmental organizations and others. Promotes dialog, collaboration and innovation concerning interoperability and standards harmonization within the EDM community.



# Exercise of standards Real world



### Deepwater Horizon – Gulf of Mexico, April 2010



BP Deepwater Horizon Oil Sill, Incident Specific Preparedness Review (ISPR), Final Report January 2011

### **GIS/Mapping and Common Operating Picture**





- Produce a <u>Recommended Practice</u> for GIS/Mapping
  - Support of Oil Spill response using of GIS technology
  - Geo-information in a "Common Operating Picture" for management of the response
  - Published as OGC 15-037
- IOGP and IPIECA chose OGC to lead an open process to develop a recommended practice based on open standards
- The OGC Interoperability Program
  - An essential part of OGC's fast, effective, inclusive user-driven process to develop, evolve, test, demonstrate and promote OGC Standards.



### **Oil Spill Response Common Operational Picture**





(Source: IPIECA)



Sendai Airport - By Roberto Devido

Haramachi, Minami-soma, Fukushima, Japan – By Jun Teramoto



**Geospatial Information Authority of Japan** 

### **OGC Moving Features Encoding Standard**

- "Moving features" data describes such things as vehicles, pedestrians, airplanes and ships.
  - This is Big Data high volume, high velocity
- CSV and XML encodings of ISO 19141





## OGC®



### Haiti earthquake: field guide to building types



News.yahoo.com/nphotos/Most-Viewed-Photos

**OGC**<sup>®</sup>

# Poorly reinforced



http://www.latimes.com/news/nation-andworld/la-fg-haiti-earthquakepictures,0,5859695.photogallery

#### **Poorly reinforced**



http://www.aeromental.net/2010/01/19/haiti-70-earthquake-2010-extreme-photos-a-week-later-200000-dead/



## Catalog and parameterize in CityGML

- A geospatial catalog of building types can be derived
  - Easier in some places than others
    Haiti is not
    - one of the easy places

**OGC**<sup>®</sup>



### Model







### In case you missed it...



# Poorly-reinforced poured concrete building simulation





Exercise of standards

# **Interoperability Program**



### Interoperability innovation laboratory







### OGC Testbed 11 Threads & Tasks

### Urban Climate Resilience (UCR)

- Climate/Big Data processing - WPS
- Hi-Res Flood Model
- JSON/GeoJSON
- WFS-T with REST
- GeoPackage, GeoSync
- Georeferenceable
   Grid Harmonization
- And more...

#### Cross-Community Interoperability (CCI)

- REST and SOAP
- JSON/GeoJSON
- Semantic Broker: Social Media, Linked Data, GeoSPARQL
- SPARQL for Symbology
- Compliance
- And more...

### • NOTAM, AFX

Aviation

- WFS Data Broker
- Semantics and Rules (SBVR)
- Validate: AIXM and D-NOTAM
- D-NOTAM Enrichment Service
- And more...

#### Geo4NIEM and Security

- NIEM V3.0 IEPD Geoprocessing Round-Trip
- NIEM Tagging, Enhancements
- NIEM-GML Processing
- Security: Identification Authorization, Access
- And more...



### Geospatial prediction, analysis and anticipation

### Predictive Models with Simple Interfaces

OGC Web Processing — Service (WPS)



### Assess situation on ground Check predictions





# Transaction Social Media Analysis WPS





# Getting feedback to the OGC



### Continuous cycle



### OGC's Programs for Advancing Interoperability

- **Interoperability Program** a global, innovative, hands-on rapid prototyping and testing program designed to unite users and industry in accelerating interface development and validation, and the delivery of interoperability to the market.
- **Standards Program** Consensus standards process similar to other Industry consortia (World Wide Web Consortium, OMA etc.).
- **Compliance Program** allows organizations that implement an OGC standard to test their implementations with the mandatory elements of that standard
- Communications and Outreach Programeducation and training, encourage take up of OGC specifications, business development, communications programs.





## **Accelerate!**



### Geospatial User Feedback for data



### Capture of quality and usefulness

User Quality Model

 User feedback Ratings (5-star) Usage reports 'Soft knowledge' from producers ISO 19115-1 and -3 CHARM

Modified from GUF SWG, Joan Masó

### Quality of Service for data provision

- The goal: Enable client software, QoS monitoring tools, geoportals & catalogs to auto-discover the expected QoS level of the services
- Potential approach: OWS Monitoring API
  - A standardized way to access service metrics data from any OGC
     Web Service to enable plug & play centralized SDI monitoring
    - Generic heath check (up/down)
    - Technical remote monitoring (computing resources, connections, etc.)
    - Recent usage statistics (request rate, number of successful / failed requests)
  - Recommend a limited set of existing & well-known authentication/authorization mechanisms to be used
- New activity proposed for OGC

### Standards Incubator to expedite new ideas

### Standards Incubator

- Purpose: setting for members to build and evaluate innovative draft standards in a process that mimics the RFC process, but does NOT result in an official OGC Standard
- Goal: to make OGC more nimble and responsive to evolving technology
- Note: this setting is intended to have no overhead and be minimal on formal process and NOT to replace the more substantial RFC process or Interoperability Experiments



