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HDWG Groundwater IE Update

HDWG Workshop
Ispra, Italy
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16 March 2010
Overview

OGC-WMO Hydrology Domain Working Group
GroundWater Interoperability Experiment (GW IE)

- GW IE Description
- Interim Results: Dec 2009
- Interim Results: Mar 2010
- Interim Lessons Learned
- Demo
GW IE Context

- **GW is a significant source of water for humans**

- **Ground/water feature and observation data**
  - **distributed**: many data providers (~1000 in Canada alone)
  - **heterogeneous**: structure and content (e.g. level, flow, quality)
  - **massive instances**: millions of wells (features/sensors) & time series (observ.)
  - **massive schema**: thousands of properties (e.g. for quality)
  - **few standard services**: very few OGC gr/water services

- **Existing schema standards for water**
  - WaterML (USA), GroundwaterML (CAN), WTDF (AU), WQX (USA), O&M,…
  - consolidation in WaterML 2 via OGC HDWG

- **Relevant OGC Web service standards**
  - SOS, WFS, WMS, CSW
Sensor & well locations

GIN

USGS
• **Objectives**
  – Advance design of WaterML2 re: GW data
  – Advance fit of OGC services with WaterML2 and GW data
  – Advance US-CAN cross-border GW data exchange

• **Timeline**
  – Dec 2009 to Dec 2010

• **Participants**
  – US (USGS, SDSC/CUAHSI, NCSA/ISWA, 34North)
  – CAN (GSC, UCalgary)
  – AU (CSIRO)
  – EU (Kisters)

• **Use-case**
  – View, query, download: water wells & levels at US-CAN border
• **WaterML2**  
  – WaterML2 alpha schema tested & coordinated with GWML

• **OGC Services**  
  – GSC: static water levels and wells (SOS, WFS, WMS)  
  – USGS: dynamic water levels and well locations (SOS, WMS)

• **Clients**  
  – GSC client implemented

• **Demo**  
  – presented at OGC TC Dec 2009, AGU Annual meeting 2009

• **Remaining Issues**  
  – WaterML2 schema: feature-of-interest and geometry  
  – Services: SOS for massive networks, CSW for sensor discovery  
  – Implementation: more clients, more data
• **WaterML2**  
  – more analysis resulting in design recommendations

• **OGC Services**  
  – USGS: water wells (WFS)  
  – NCSA/ISWA: dynamic water levels—in progress

• **Clients**  
  – 34North client implemented

• **Demo**  
  – to be presented at HDWG workshop 16 Mar 2010, Ispra

• **Next Steps**  
  – implement WaterML2 beta by June 2010  
  – refine/add services and clients by June 2010  
  – wrap-up Dec 2010 at OGC TC Sydney, AU
Interim Results: Mar 2010

USGS WFS well service

34North client
Lessons Learned

• The model – (1) Data Providers, (2) Schema & Services Design and (3) Client Development is good.
• Coordinating North America, Europe and Australia telecon leaves few good time options
• Knowledge of the IE process and rules critical for assembly phase
• Cross-border test case is interesting and politically useful but not mandatory for evolving requirements, prototyping, testing and validation
• Need proper coverage of integration use cases implemented in test clients to validate IE
• In GW IE, using an existing and well specified client makes for very effective IE feedback
Lessons Learned

• Quarterly milestones appropriate and necessary
• Monthly scoping calls work but need to be carefully managed
• Informal & direct technical exchange between monthly scoping calls mandatory
• Still need efficient process to communicate out to SWGs
• Testing of other areas of OGC stack equally important to IE and HydroWG (besides WaterML2 and SOS) (i.e. GWML via WFS, WMS getFeatureInfo)
• Custom SOS servers mandatory for testing the evolving standard(s)
More info

- **HDWG / WaterML 2**
  - http://external.opengis.org/twiki_public/bin/view/HydrologyDWG

- **HDWG GW IE wiki**
  - http://external.opengis.org/twiki_public/bin/view/HydrologyDWG/GroundwaterInteroperabilityExperiment

- **GWML**

Demo