

UncertWeb O&M Profile

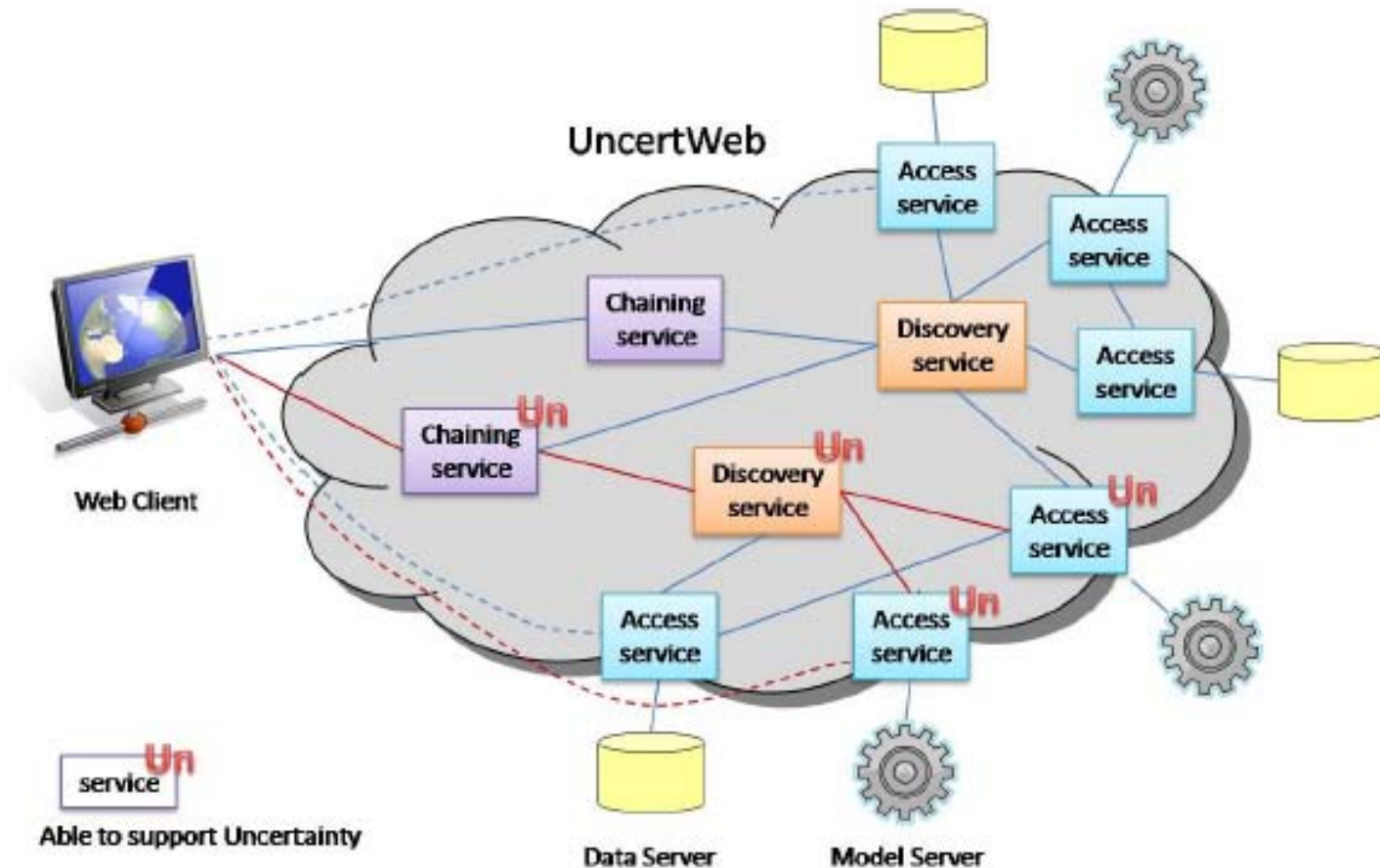
OGC TC Meeting, Bonn, 01/03/2011

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Dan Cornford



UncertWeb - Overview

„Creating the Uncertainty-enabled Model Web“



UncertWeb Scenarios

- Habitat assessment and modelling
- Land-use response to climatic and economic change modelling
- Air quality environmental services
- Modelling individual activity patterns

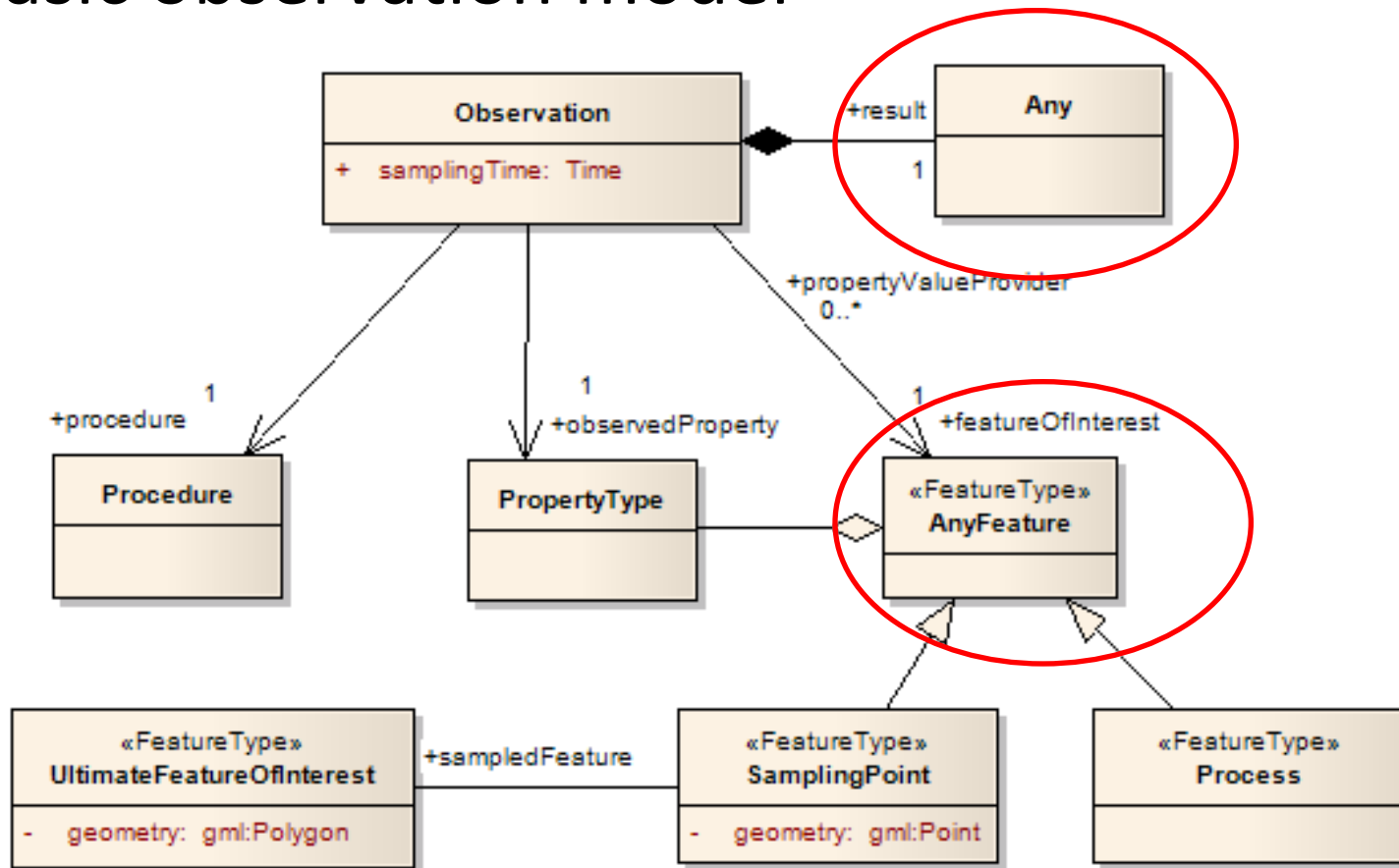


UncertWeb Facts

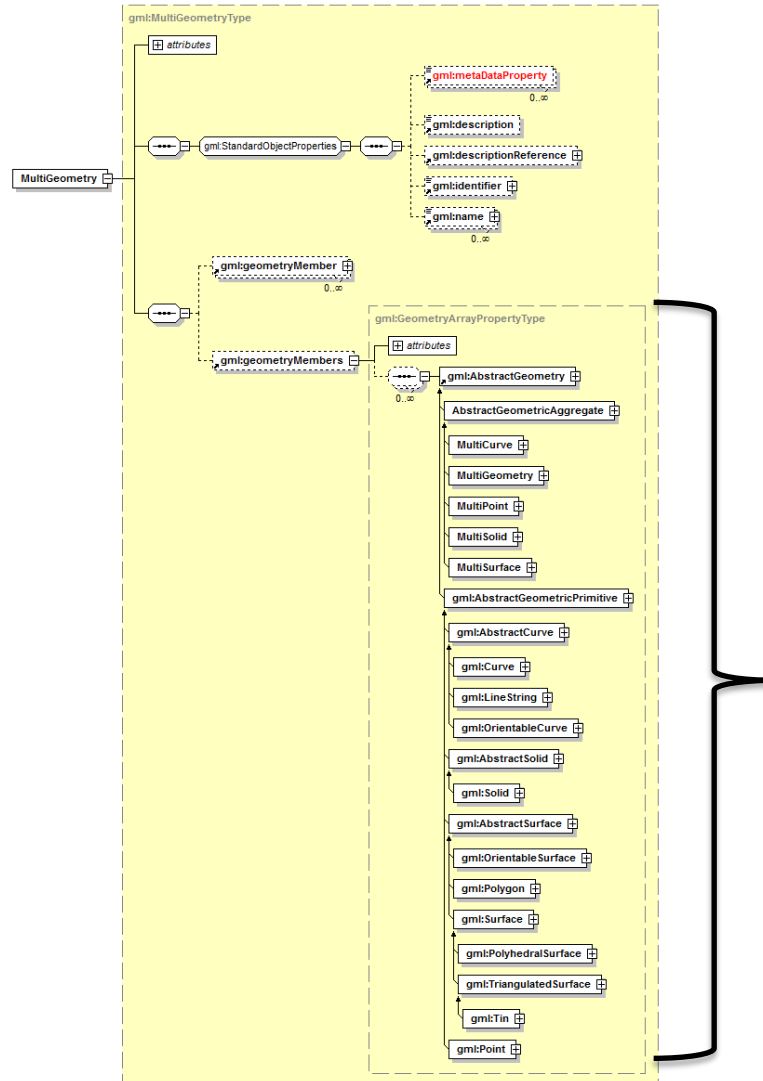
- EC funded project
- Feb 2010 – Jan 2013
- 8 Partners
 - [Aston University](#) (UK)
 - [Italian National Research Council](#) (CNR, Italy)
 - [Food and Environment Research Agency](#) (FERA, UK)
 - [Joint Research Centre](#) (JRC, Italy)
 - [Norwegian Institute for Air Research](#) (NILU, Norway)
 - [Eindhoven University of Technology](#) (TUE, Netherlands)
 - [University of Muenster](#) (IfGI, Germany)
 - [Wageningen University](#) (WU, Netherlands)

Why Profiling?

- Basic observation model

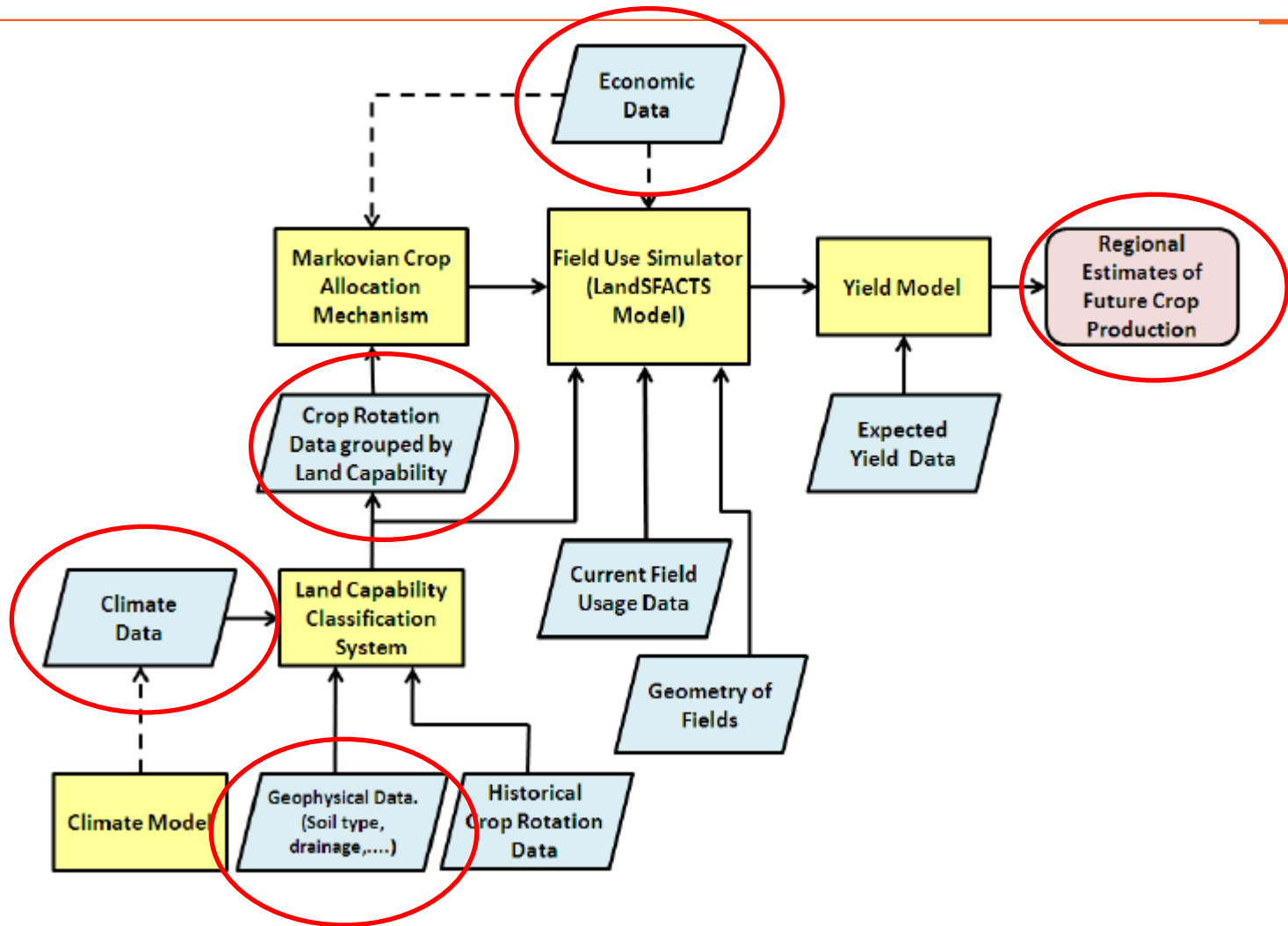


Why Profiling?



Different possibilities for encoding geometries

O&M in UncertWeb



UncertWeb O&M Profile

Goal:

„Ease the service and client development by providing a common profile AND a common API implementing the profile.“

UncertWeb O&M 2.0 Profile

- Used in different Use Cases → not domain specific
- Restricts featuresOfInterest to SamplingFeature
- Restricts to certain result types according to O&M XML implementation specification
- Restricts supported geometries (GML Profile)
- Uncertainty encoded as UncertML either as result or resultQuality

Uncertainty Markup Language (UncertML)

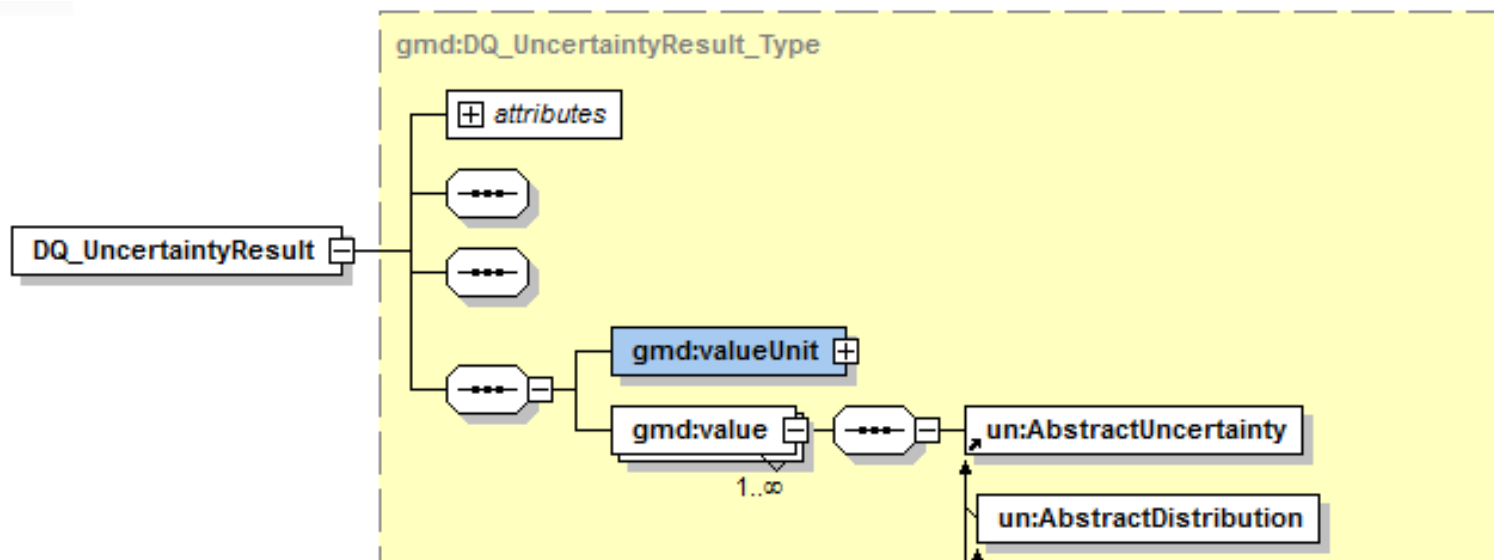
- Discussion Paper at OGC (OGC 08-122r2)
- Currently version 2.0 developed by Aston University
- Data Model for Uncertainties + different encodings (XML, JSON)
- JAVA API in place
- www.uncertml.org

GML Profile

- Spatial Geometries
 - Point
 - LineString
 - Polygon
 - Grid
- Multigeometries
 - Collection for each of the geometries defined above (e.g. Multipoint, MultiLineString, etc.)
- Temporal Geometries:
 - TimeInstant, TimePeriod
- Uncertainty Property Type (using UncertML)

ISO 19139 Extension

- Extends DQ_QuantitativeResult with DQ_UncertaintyResult
- Used for resultQuality in O&M



O&M Profile - restrictions

- Spatial restrictions
 - to SamplingFeature as defined in O&M
 - Geometries of SamplingFeatures as defined in GML Profile
- Temporal Restrictions
 - TimeInstant and TimePeriod according to GML profile
- Uncertainty in observations

O&M Profile - Supported Observation Subtypes

- Measurement
- BooleanObservation
- DiscreteNumericObservation
- TextObservation
- CategoryObservation
- UncertaintyObservation
- ReferenceObservation

O&M Profile - Collections

- Collection for each observation subtype
 - MeasurementCollection
 - BooleanObservationCollection
 - ...

Uncertainty in Observations?

- Two options:
 - Observations with uncertainty results → result of the observation is an uncertainty value
 - resultQuality of Observations using ISO 19139 extension with DQ_UncertaintyResult type → result is usually an average, resultQuality element can provide additional uncertainty information
- Support of xlink to link observations to external uncertainty

O&M Profiles JAVA API

- Lightweight Java implementation
 - POJOs for the observations
 - Extends Java Topology Suite for GML profile
- Provides Encoders/Decoders for
 - XML
 - (JSON)
- SHP2OM Converter project can be used to convert ESRI's shapefiles into O&M profile

Documentation

- <https://wiki.aston.ac.uk/foswiki/bin/view/UncertWeb/OandMProfiles>

OandMProfiles < UncertWeb < Aston Wiki - Mozilla Firefox

https://wiki.aston.ac.uk/foswiki/bin/view/UncertWeb/OandMProfiles

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What is a profile?

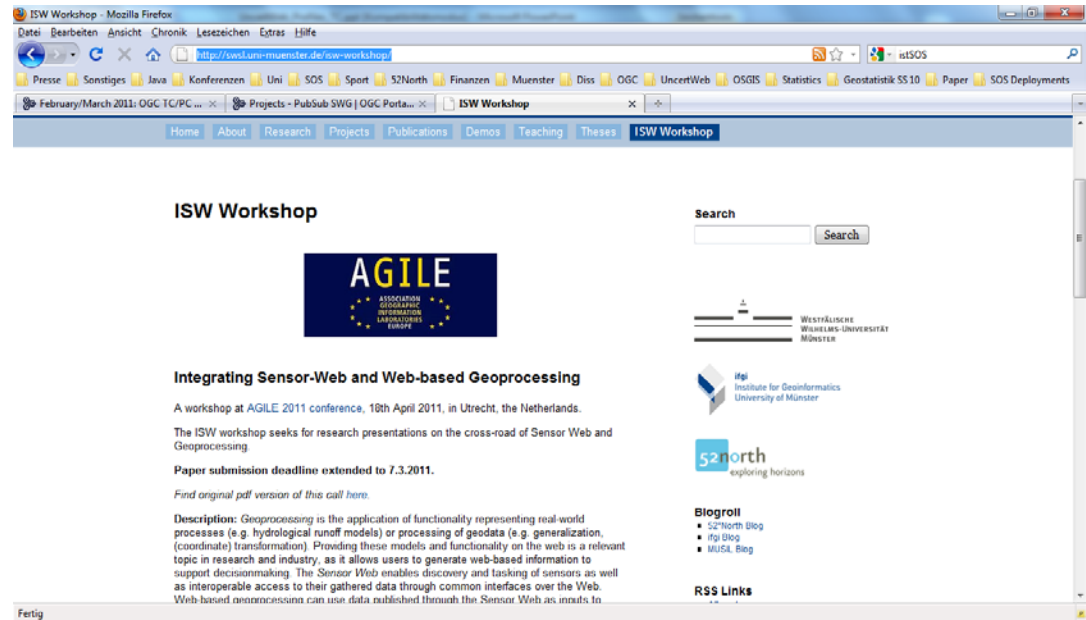
A profile is defined as a "specification or standard consisting of a set of references to one or more base standards and/or other profiles, and the identification of any chosen conformance test classes, conforming subsets, options and parameters of those base standards, or profiles necessary to accomplish a particular function" (see [OGC 08-131r3](#)). In other words, a profile restricts the different options of a base standard to be suitable for a certain application purpose. An implementation which is conformant to a certain profile is always also conformant to the base standard referenced in a profile.

What's next?

- JSON Encoding
- uSOS
 - How to describe environmental models? →
SensorML
- Integration with NetCDF
- Lightweight SOS Profile

ISW Workshop

- Integrating Sensor Web and Web-based Processing
- Utrecht (NL)
- 18th April
- CFP Deadline March 7th



- <http://swsl.uni-muenster.de/isw-workshop/>

More information...

uncert | web

www.uncertweb.org

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- SVN of JAVA API:
 - <https://svn.52north.org/svn/geostatistics/main/uncertweb/profiles-api>
- SVN of SHP2OM converter:
 - <https://svn.52north.org/svn/geostatistics/main/uncertweb/shp2om-converter/shape-om-converter>
- UncertML: www.uncertml.org