

Recent Progress in Geo Standardization

RDA 4th Plenary

2014-sep-22, Amsterdam, The Netherlands

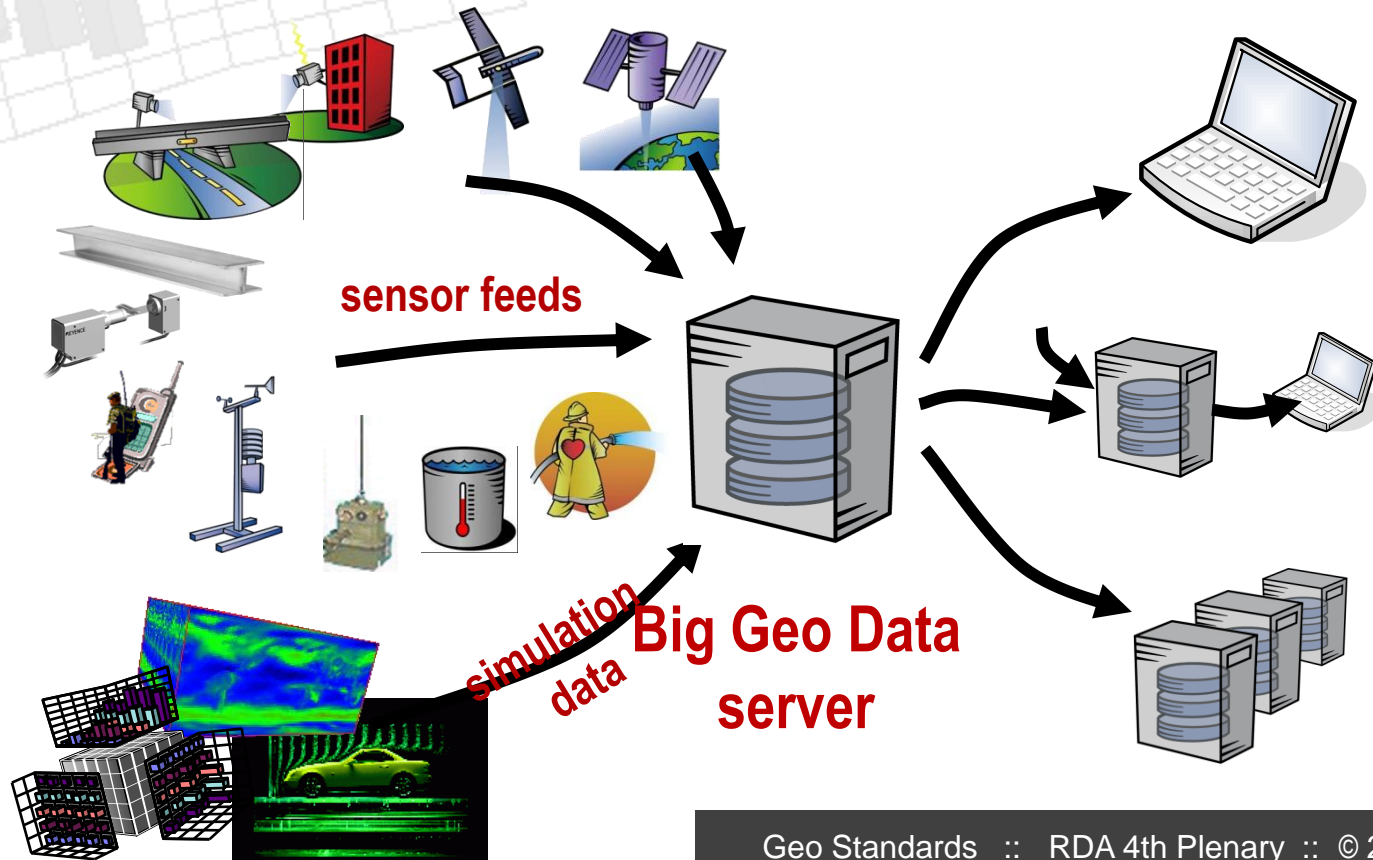
Peter Baumann

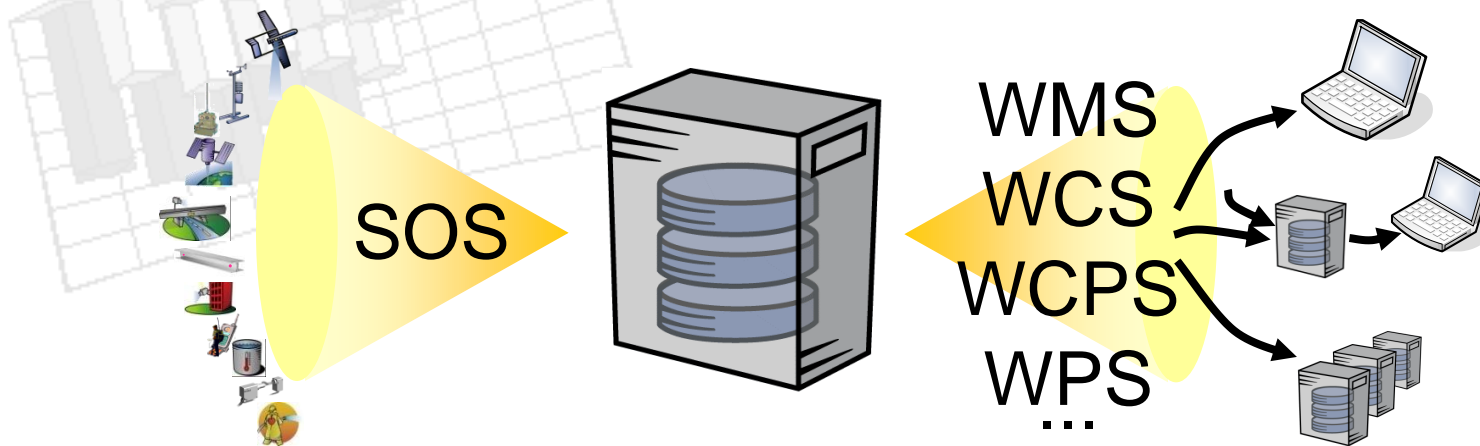
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Coverages: s/t grids, point clouds, meshes

- = *Sensor, Image, Simulation, Statistics data*
 - ISO 19123 (abstract) + OGC GMLCOV (implementation model)

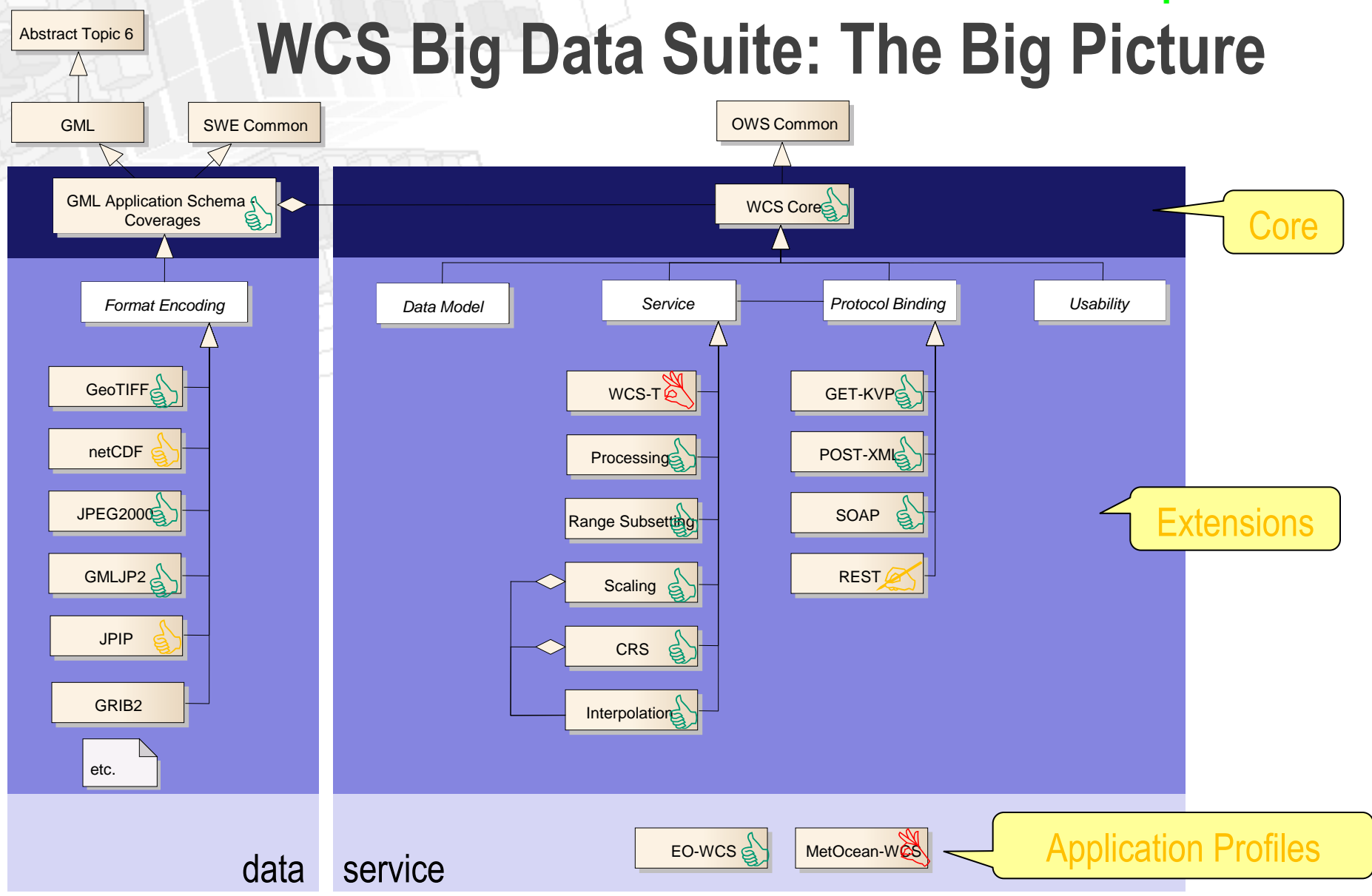




SWE, SOS: upstream
sensor data capturing

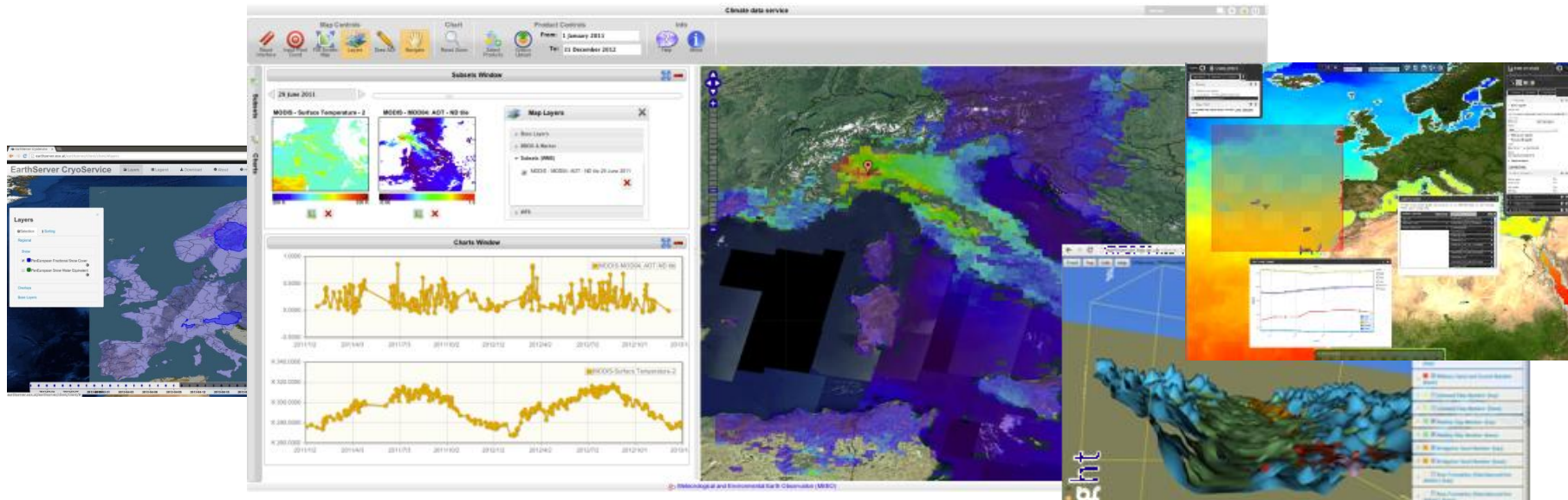
W*S: downstream
download, processing, visualization

WCS Big Data Suite: The Big Picture



WCS & WCPS: Practice Proven

- from simple data **access** to agile **analytics** on spatio-temporal sensor, image, simulation, & statistics data
- **130+ TB** databases, 2D, 3D x/y/z & x/y/t, 4D x/y/z/t **timeseries**
- single query distributed to **1,000+ cloud nodes**

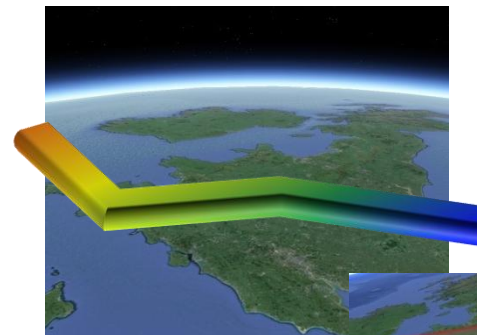
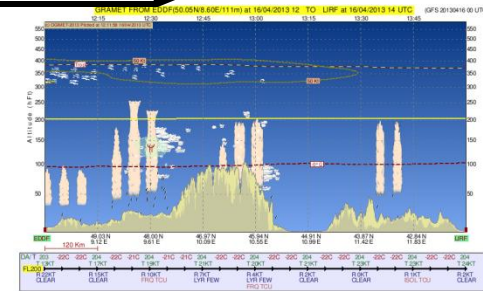
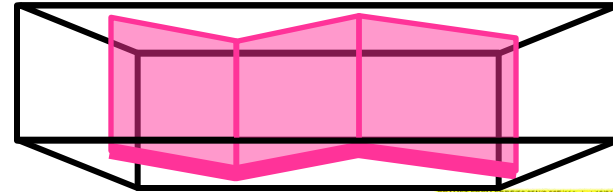


Recent Progress: OGC

- OGC Name Type Specification – Time & Index CRSs
 - homogenize space & time, define time semantics
- OGC 12-108 "OGC® GML Application Schema - Coverages - JPEG2000 Coverage Encoding Extension" → adoption vote
 - Extending encoding schemes for coverages
- OGC 13-057 "OGC® WCS Extension – Transaction 2.0" as a Discussion Paper adopted as Discussion Paper
 - IS once fully implemented & test suite
 - *InsertCoverage*, *DeleteCoverage*, *UpdateCoverage* allows clients to modify a server's offerings by adding, deleting, and updating coverages, respectively
- MetOcean-WCS progressing
 - See next

MetOcean-WCS

- OGC WCS Application Profile
 - MetOcean [OGC 14-052]
- Weather, ocean data cubes
 - = 4D x/y/z timeseries + groupings
 - curtain queries, corridor queries
 - = polygon clipping
 - Central use case: weather forecast extraction along flight path
- Implemented by UK MetOffice
- Discussion:
 - Regrouping: 1 → 2 conf'classes
 - Renaming: „WeatherCube“ → „ClimateCube“



Recent Progress: INSPIRE

- Earlier: INSPIRE coverage model harmonized with OGC GMLCOV
- Now (Oct 2014): Mapping of INSPIRE Coverage Download Services to OGC WCS

Recent Progress: ISO

- Coverage data & services going ISO
 - GMLCOV, WCS Core, POST/XML binding → ISO TC211
 - Interoperability & sustainability of coverage data & service implementations
- In future: revision of ISO 19123
 - = abstract coverage model;
GMLCOV = concrete implementation model
 - Wanted by both ISO & OGC

Recent Progress: ISO Array SQL

- **ISO 9075 Part 15: SQL/MDA**
 - resolved by ISO SQL WG in June 2014

- **n-D arrays as attributes**

```
create table LandsatScenes(
  id: integer not null, acquired: date,
  scene: row( band1: integer, ..., band7: integer ) array [ 0:4999,0:4999 ] )
```

- **declarative array operations**

```
select id, encode(scene.band1-scene.band2)/(scene.nband1+scene.band2), „image/tiff“ )
from LandsatScenes
where acquired between „1990-06-01“ and „1990-06-30“ and
  avg( scene.band3-scene.band4)/(scene.band3+scene.band4)) > 0
```

Information technology — Database languages — SQL —

Part 15:
Multi-Dimensional Arrays (SQL/MDA)

Technologies de l'information — Langages de base de données — SQL —
Partie 15: Tableaux multi-dimensionnels (SQL/MDA)

Document type: Technical Report
Document subtype: Technical Report (TR)
Document stage: (3) CD under Consideration
Document language: English

Edited by: Jim Melton (Ed.) and Peter Baumann (Associate Ed.)

What Users Really Want

- "Given me all of the images in this geographic area in this this time span that are at least 80% cloud free have been radiometrically corrected and are from these satellites and then pass those images into a workflow to perform functions x,y,z"
 - Carl Reed

- "Find images taken by the SEVIRI satellite on August 25, 2007 which contain fire hotspots in areas which have been classified as forests according to CORINE Land Cover, and are located within 2km from an archaeological site in the Peloponnese."
 - INSPIRE related