OGC Standards Update

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Orlando

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OGC®
Making location count.

OGC'S INTEREST

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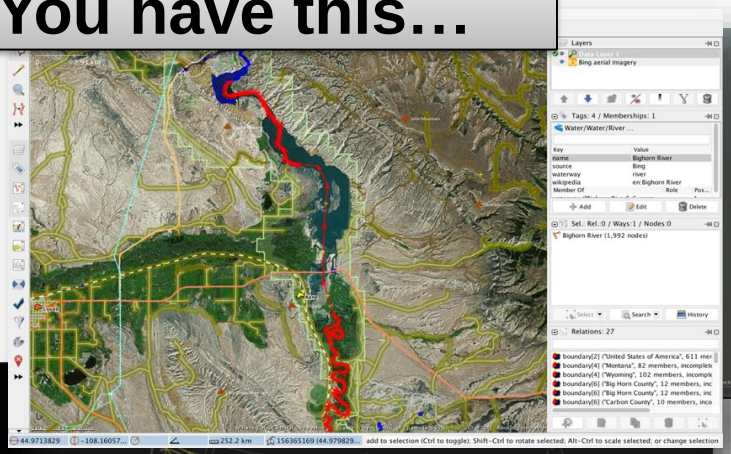
It's simple

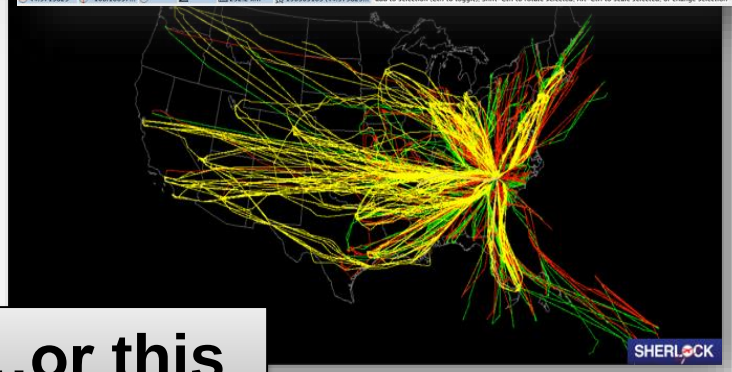
You have this…



…or this

…and you need to make this...

Courtesy CAE



…or this

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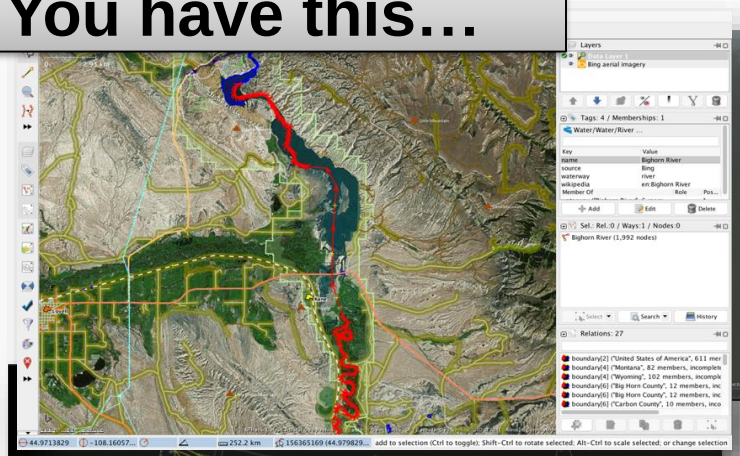
It's not so simple

You have this…



…or this

…or this

…and then push changes

…and you need to make this...

Courtesy CAE

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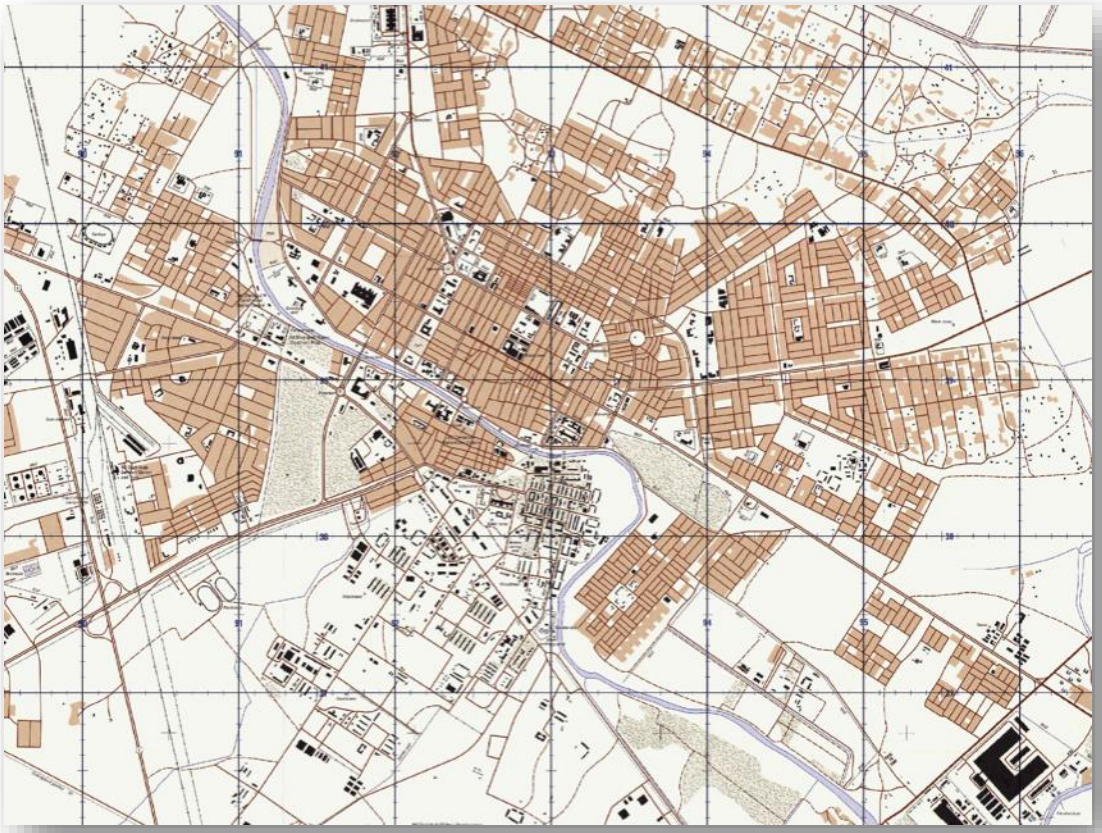
It's valuable

Geospatial data should be discoverable, accessible, and reusable for many purposes without multiple format changes



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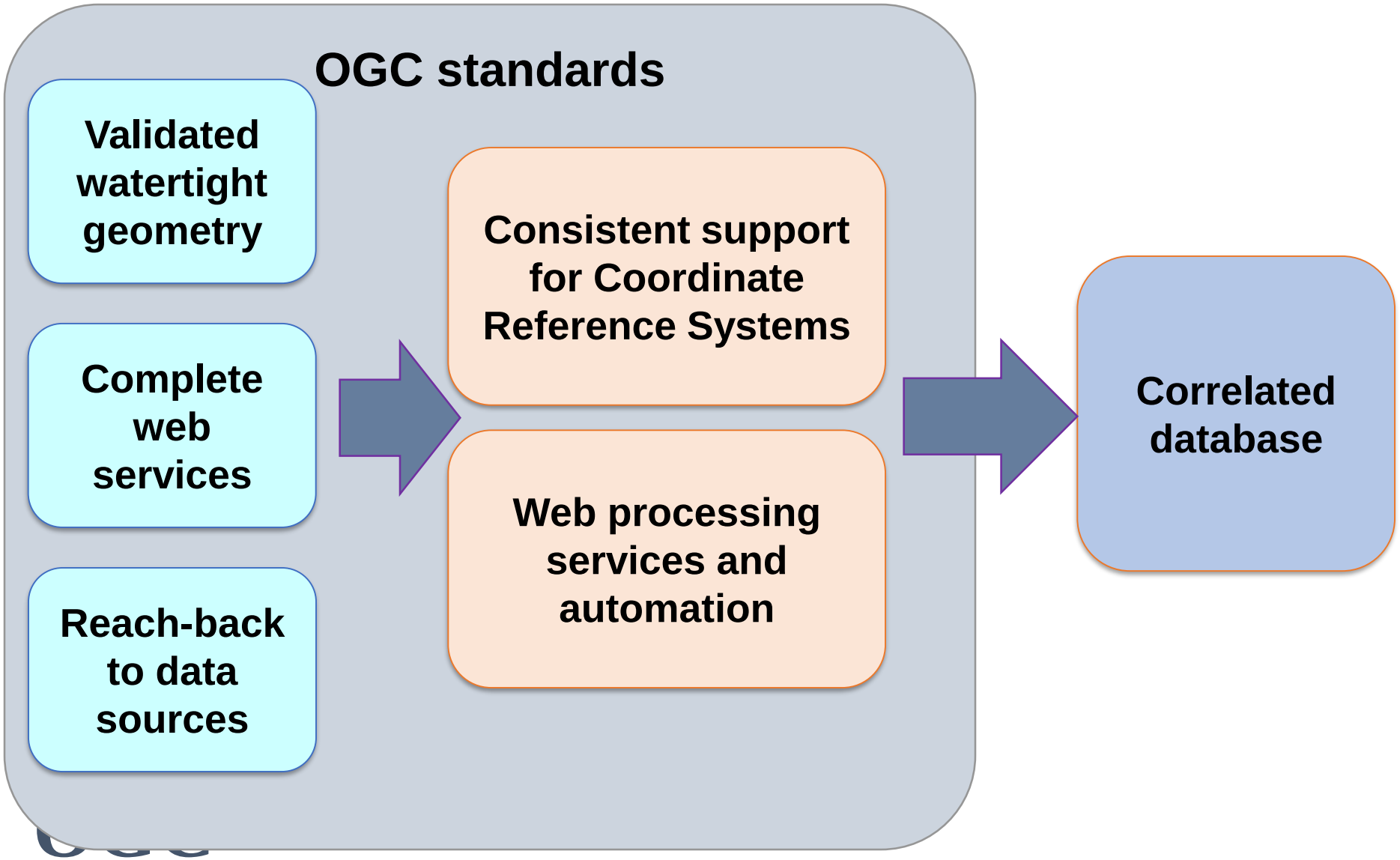
Facilitate compilation



RELEVANT STANDARDS

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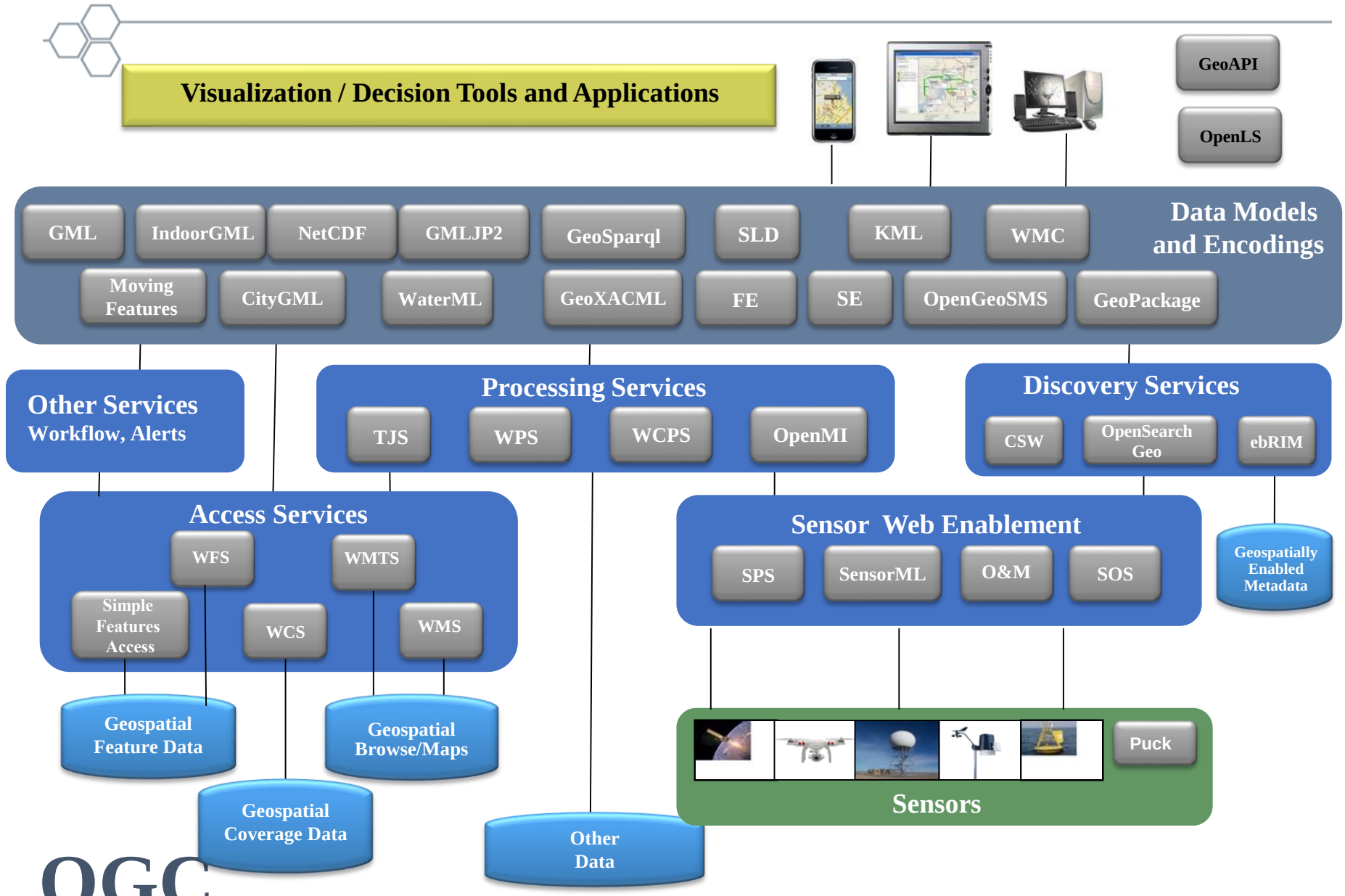
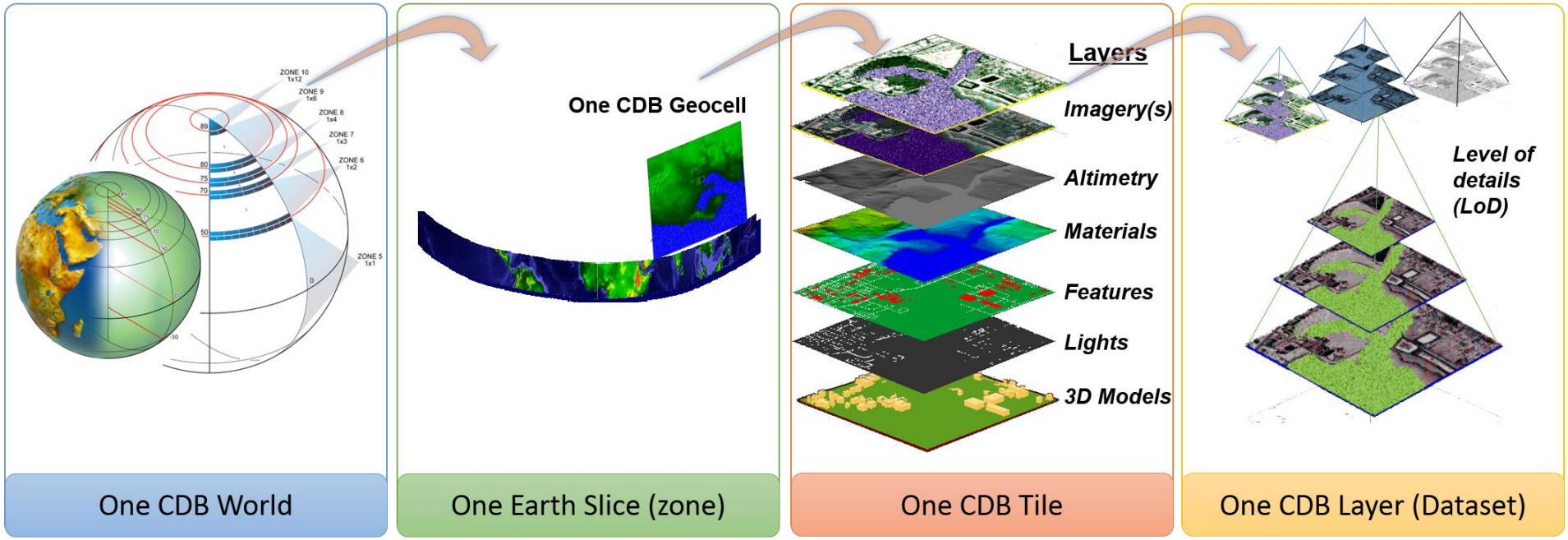
OGC Services Architecture



CDB

- The CDB standard relies on three important means to organize the data:
  - Tiles – organization of data by location
  - Layers – organization of data by type
  - Levels of Detail (LOD) – organization of data by detail
- Tile size and location are specified by CDB
- The amount of data per LOD is specified by CDB
- The data layers are specified by CDB (can be extended)



CityGML - 3D Urban Models

- Urban Planning / Operations
- Emergency Mgt / Response
- Public Safety
- Transportation / Routing / Logistics
- Indoor navigation
- Retail Site analysis
- Sustainable / Green Communities
- City Services Management
- Noise abatement
- Telecommunications placement
- Many other uses…

Source; Thomas Kolbe, Berlin TU

Source: GTA Geoinformatik GmbH, www.gta-geo.de

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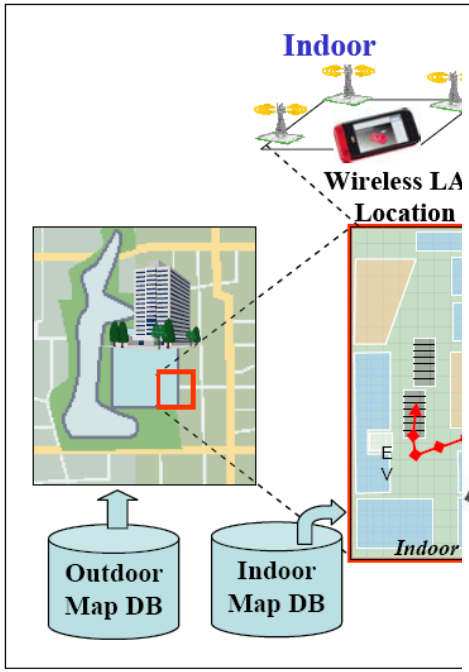
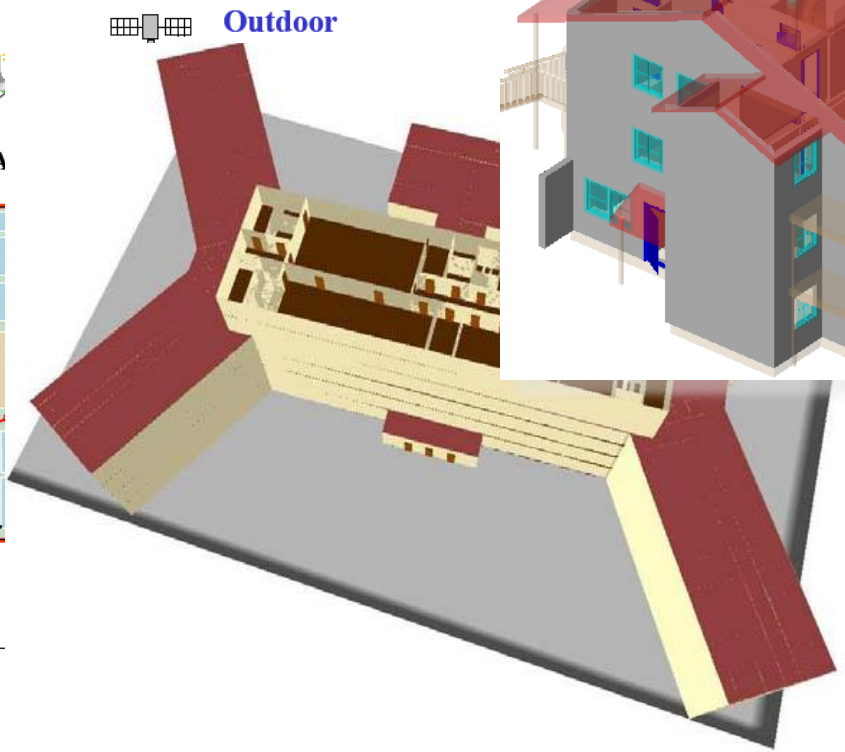
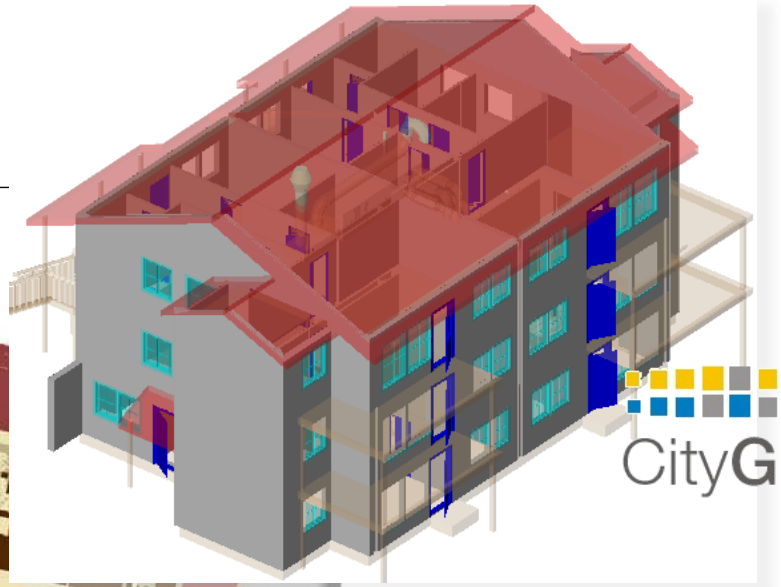
Integrated Outdoor / Indoor location/navigation

- IndoorGML Approved Sept 2014







OGC IndoorGML

http://www.opengeospatial.org/projects/groups/indoorgmlswg

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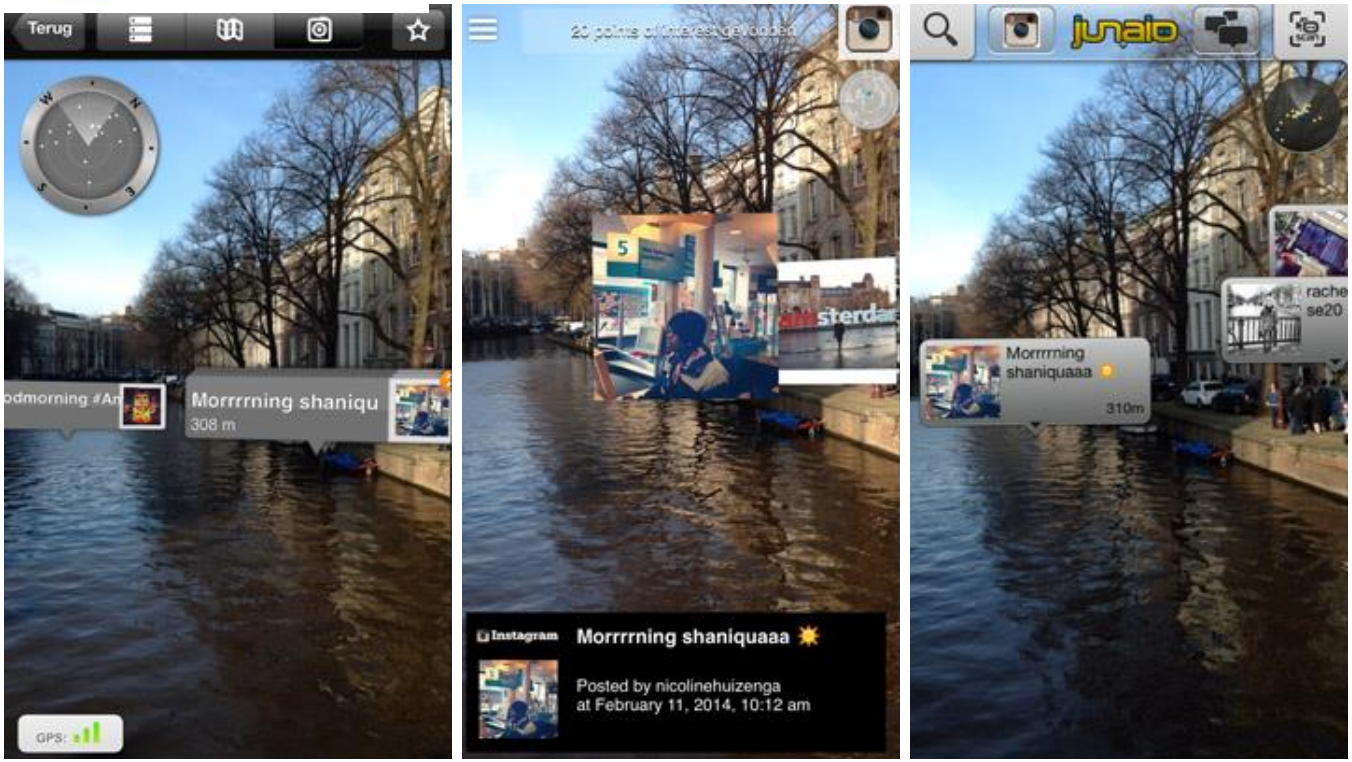
ARML 2.0: 1st open, multi-vendor Augmented Reality implementation

wikitude + layar + junaio = **>50 Million users**



Instagram AR Experience viewed in Wikitude, Layar and Junaio browsers respectively

AR content encoded in OGC ARML 2.0 standard

Organized by AR Standards

Community Demonstrated at Mobile World Congress 2014

http://www.opengeospatial.org/pressroom/pressreleases/1967

http://www.wired.com/beyond_the_beyond/2014/02/augmented-reality-interoperability-demo/

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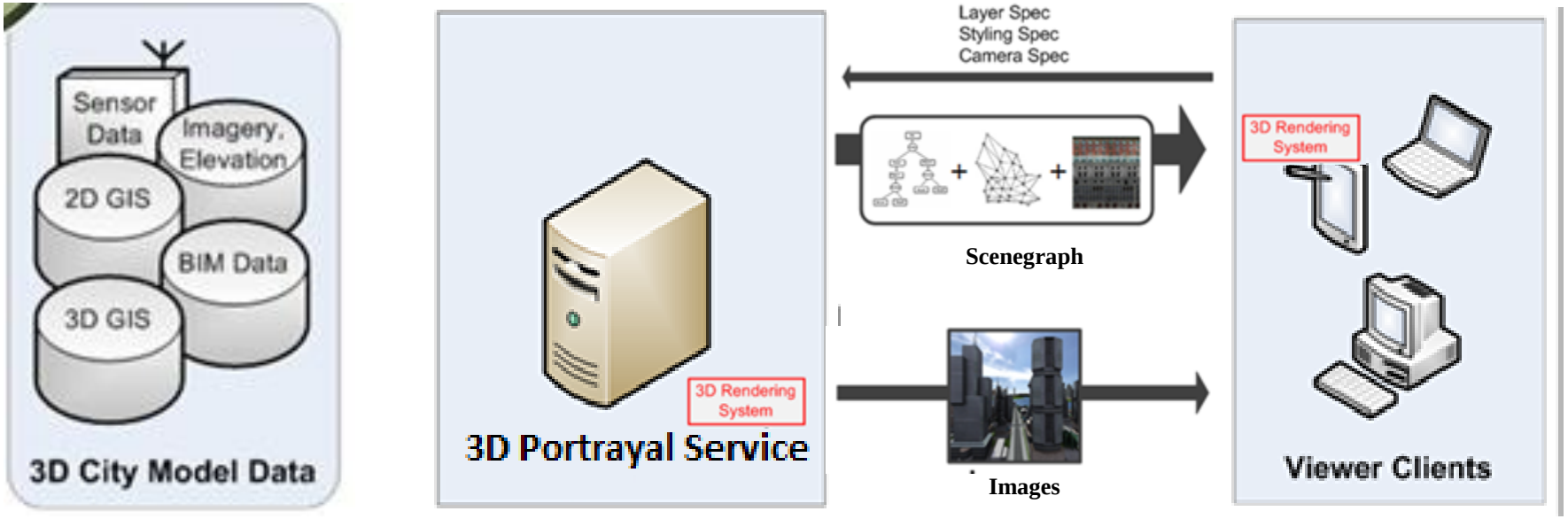
3DPS: delivery of data or representation

Thick client, delivery of 3D content



Thin client, delivery of queryable images

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GeoPackage
universal geodata file format

- GeoPackage is a universal file format for geodata.
  - open, standards-based, application and platform independent, and self-describing.
  - Works on any desktop or mobile OS
  - ***Connected / limited / disconnected environment use***

- GeoPackage - the modern alternative to formats like GeoTIFF, SDTS and vendor specific

- *Experience it here:* *http://www.ogcnetwork.net/geopackage*

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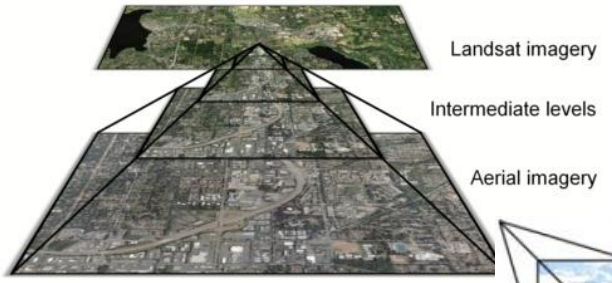
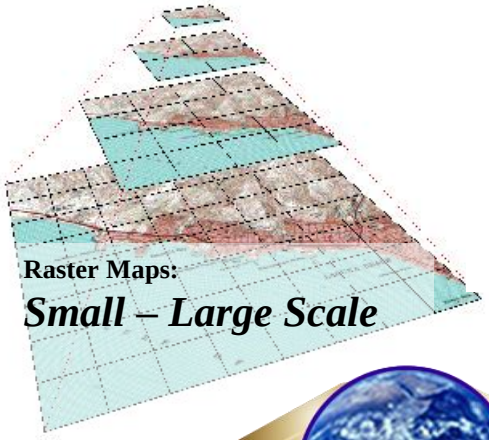
GeoPackage:
Raster Maps, Images and Feature Data in One File



Imagery

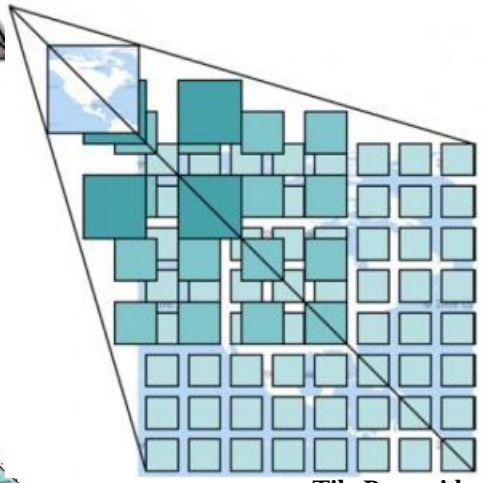
Low – High Resolution

Feature Data



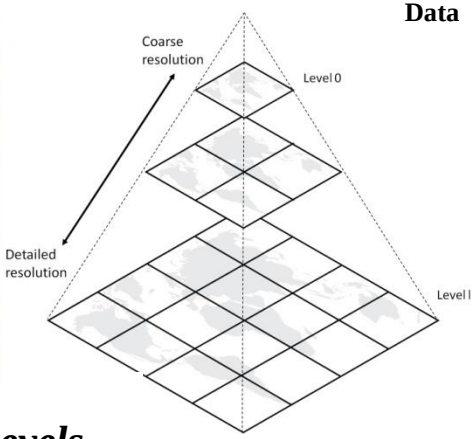
Raster Maps:

Small – Large Scale



Tile Pyramids

24 zoom levels



Single File Sqlite Database

containing all data for direct-use on mobile platforms & handheld devices

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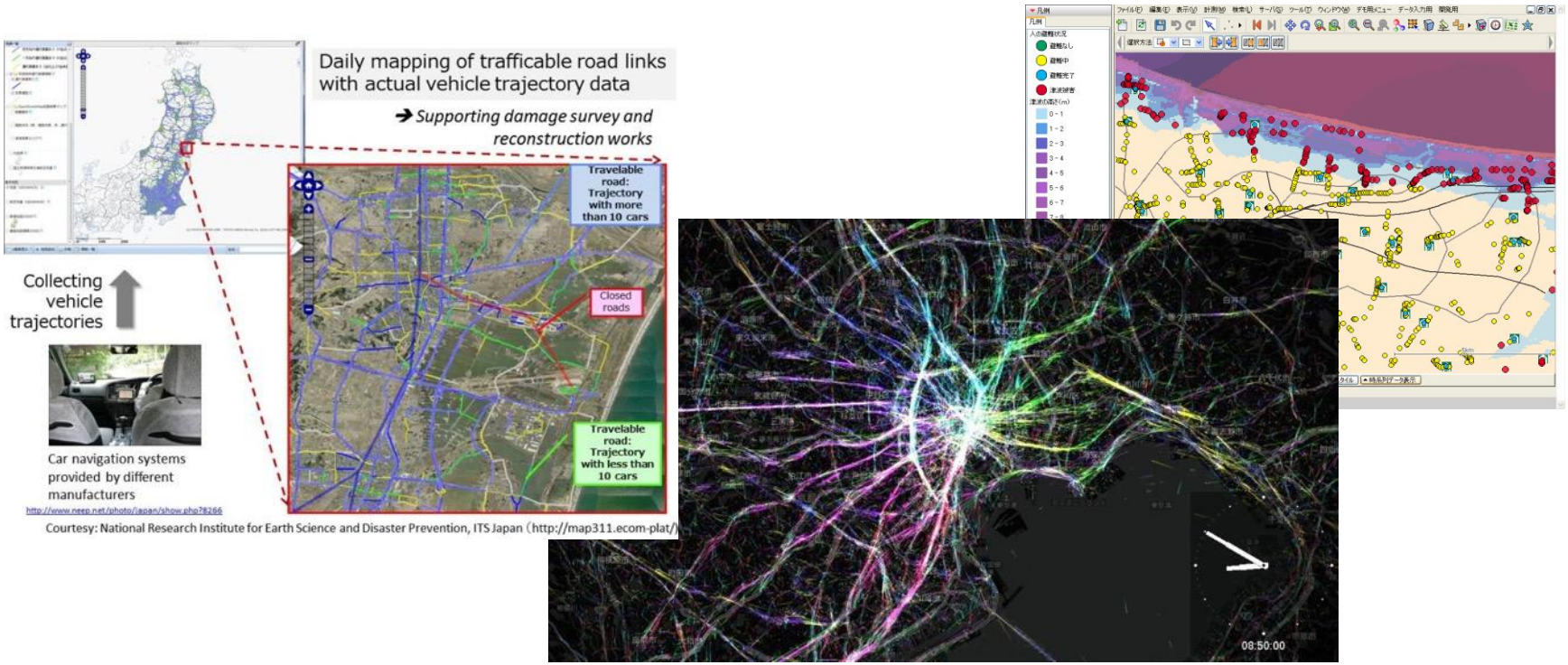
OGC Moving Features Encoding Standard

- "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



RECENT STANDARDS ACTIVITIES

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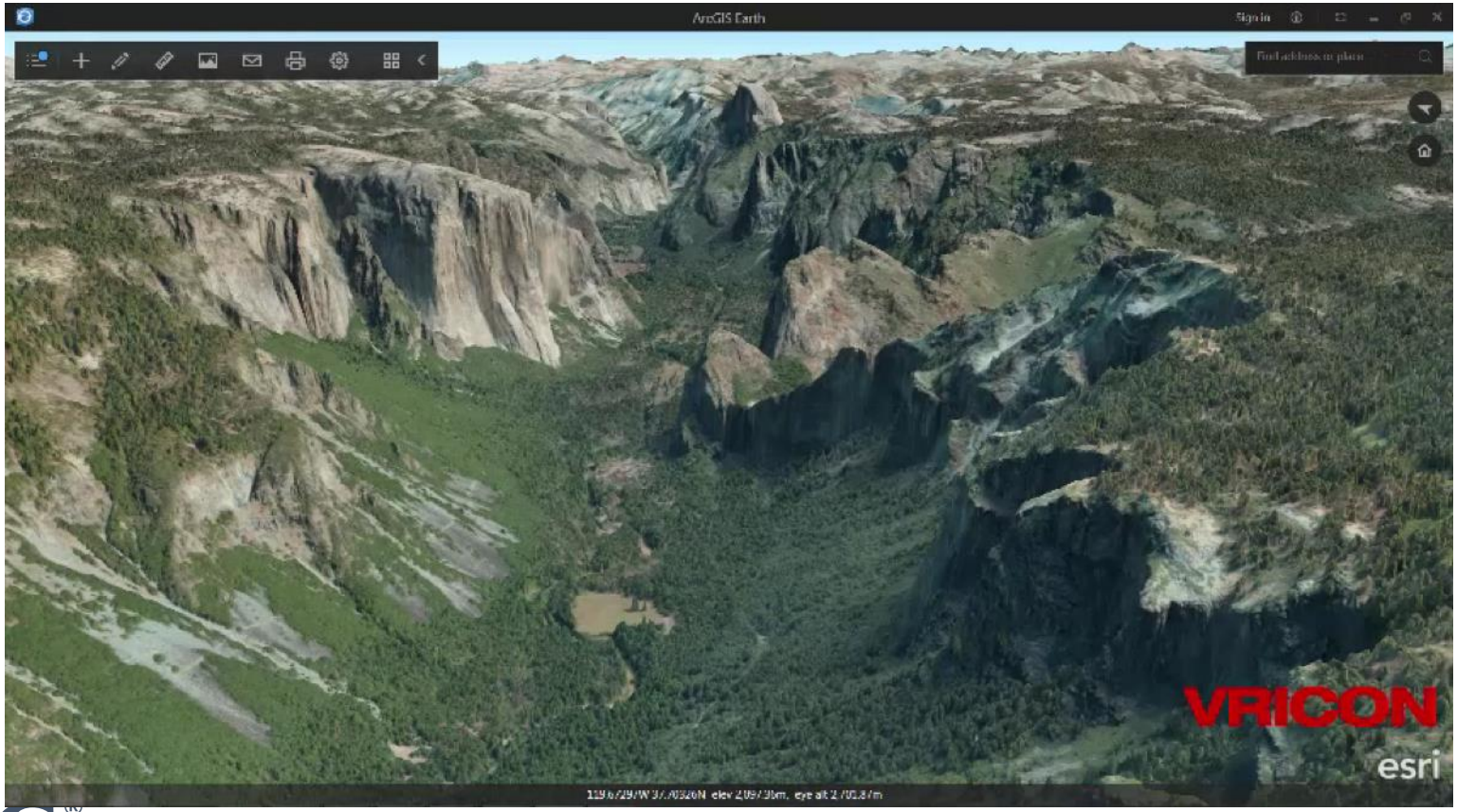
Indexed 3D Scene Layer (i3S)

OGC Community Standard

- Developed by Esri
- Implemented by Esri, Vricon, Bentley, Cyclomedia by 2016
- Adopted as an **OGC Community standard**



Source: Vricon

i3S streaming

Geospatial Data Types

Layer Type *(example)*	Features with Identity	Attributes
3D Object	Yes	Yes
Integrated Mesh	No	Triangle Attributes (planned)
Point	Yes	Yes
Pointcloud	No	Vertex Attributes
Line	Yes	Yes
Polygon	Yes	Yes

Render in Planar and Geocentric modes

Vertical frame of reference

- **>Ellipsoidal (elevation/height with respect to a reference ellipsoid) or**
- **>Orthometric (elevation/height with respect to a reference geoid/gravity surface)**

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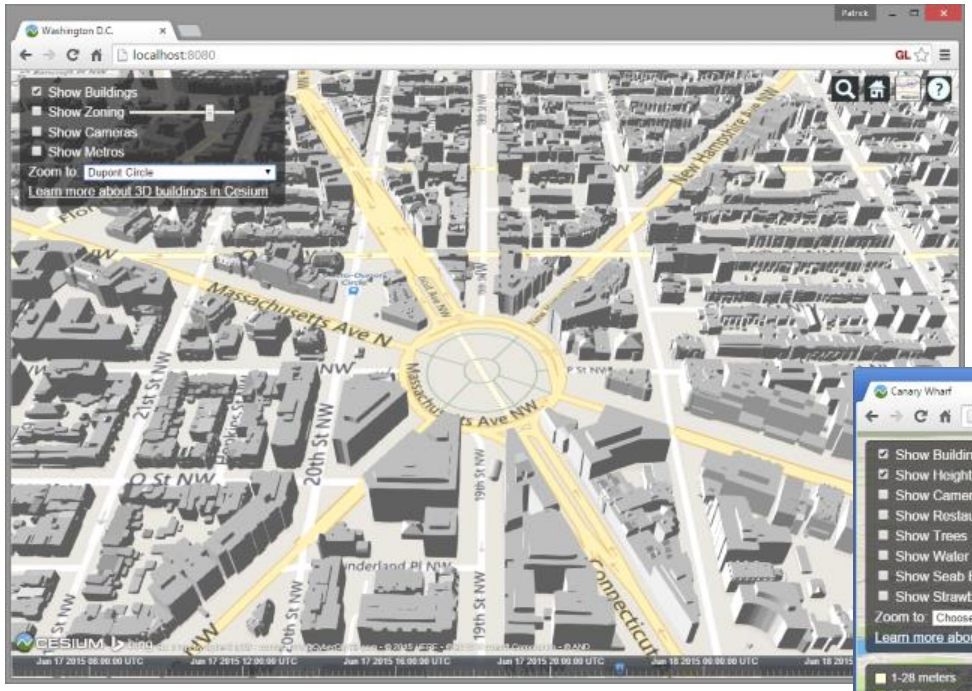
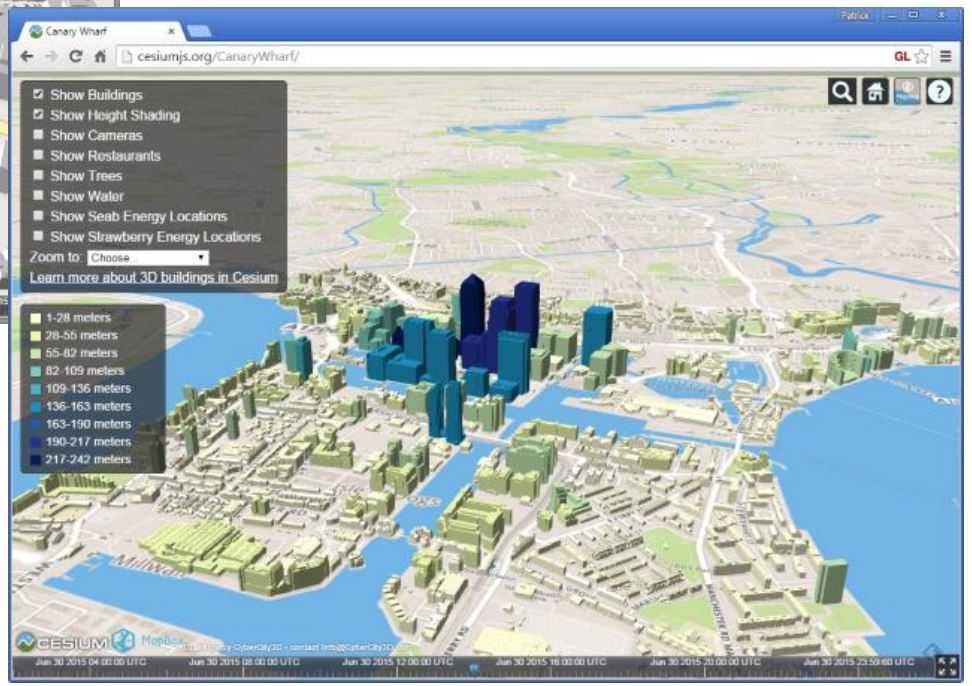
Cesium 3DTiles



- **In approval process as OGC Community standard**
- **Stream 100K+ buildings**
- **Mouse over highlight**
- **Per-building attributes**
  - **Display**
  - **Style**
- **Combine with terrain, imagery, and vector data**



.csv / .dae

New OGC Community Standard Submission

- Presagis is introducing **OpenFlight** as a new Community standard Work Item for consideration by OGC

- Community standard
  - Endorsement by OGC membership of a widely-implemented specification developed outside of OGC
  - Part of the OGC standards baseline
  - Carries the full weight of an OGC standard
  - At time of approval, the specification is frozen and published by OGC; the originating body can continue development of their own version, if desired
  - Examples: GeoRSS, Indexed 3D Scene Layers (I3S), LAS 1.4

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Joint AR Standards Advancement

- W3C and OGC together are looking to run a Pilot to address a range of AR interoperability challenges
- Pilot is intended to:
  - Advance or propose W3C and OGC standards related to Augmented Reality.
  - Provide models, interfaces, and an architecture that will enable seamless integration of ‘real world’, geospatial, and web data.
  - Be run as an Initiative of the OGC Innovation Program, co-branded with W3C

Distributed Simulation and Gaming

- Functioning as an ad hoc OGC Working Group
- In consideration by members as a new Domain Working Group
- Led by Modeling and Simulation industry experts

Refs:
OGC Domain Working Groups: http://www.opengeospatial.org/projects/groups/wg
OGC Standards Working Groups: http://www.opengeospatial.org/projects/groups/swg
OGC Standards: http://www.opengeospatial.org/docs/is

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