What is the FGDC?

- 32-member Federal interagency committee that promotes the coordinated development, use, sharing, and dissemination of geospatial data on a national basis.

- **Chaired by the Secretary of the Interior and Vice-Chaired by the OMB Deputy Director for Management, or designees.**

- Facilitates coordination between agencies, governments, academia, industry and professional organizations in developing geographic information and technology via a National Strategy.

- Promotes the efficient, transparent, accountable, and effective use of geospatial information in supporting mission needs and meeting national requirements.

- **Primary Authorities**:

  - OMB Circular A-16 (and A-16 Supplemental Guidance)

  - E-Government Act of 2002, Section 216

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Towards shared geospatial knowledge and services....

Planning the Next Generation GeoPlatform

- FGDC planning process to determine scope & requirements for next version of GeoPlatform
- GeoPlatform support contract recompete in 2019
- Planning workshops with FGDC Exec Committee, Coordination Group & NGDA Theme Leads
- Key themes:
  - Assess the current state and value of the GeoPlatform
  - Identify current and future capabilities & requirements
  - Develop a shared commitment to address problems, mitigate threats, and leverage strengths and opportunities
  - Identify ideas and actions for moving forward
- Next steps – seek feedback from non-Federal partners

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Towards shared geospatial knowledge and services....

GeoPlatform Supports NSDI National Priorities

- Supports national partnerships for the development, sharing and use of critical national assets
  - A seamless gateway to access and exploit national geospatial assets
  - Tools for intergovernmental collaboration through rich community experiences

- Enhances management and use of the national portfolio in a consistent and robust manner
  - Management and accessibility of consistently documented geospatial data and services across the geospatial community – e.g. States data records are harvested through NSGIC into GeoPlatform
  - Robust reliability and utility monitoring and reporting of ALL geospatial resources

- Supports Administration Priorities
  - Reorganizing Government
  - Infrastructure Investments
  - Border Security

- Implements recommendations by the Government Accountability Office (GAO) in support of improved data sharing, collaborative investment, and improving data discovery and access services for users – e.g. Geospatial Marketplace, NGDA dataset and theme reporting dashboards, NGDA Data Theme strategic and implementation plans

GeoPlatform's Key Differentiators

- A **unified national portfolio solution** for integrating and exploiting the nation's ecosystem of diverse geospatial resources

  - Across federal, state, local, tribal and non-government organizations

  - Embraces **all** technology platforms; knowledge, tools, and expertise can be shared with many other stakeholders

  - Open—open standards taking open data to the next level

- A robust, consistent way of managing geospatial assets and assessing performance and reliability across the nation's geospatial ecosystem

- The tools for quickly standing up cross-agency communities with dynamic services and content to answer questions that cross organizational boundaries

- Managed hosting services for geospatial assets – Reducing costs and improving performance

  - FEMA and Army Corp Production GIS environments

  - Multiple Bureau's using our shared service (NPS,BLM,USGS,BOR, OSMRE)

GeoPlatform Capabilities

- <u>Search</u>—search the database for GIS data, layers, services, and maps. GeoPlatform pulls in GIS from data.gov and has additional maps added by federal agencies.   <u>ckan.geoplatform.gov</u>

- <u>Map Manager</u>—organize and view the most relevant maps for a specific project. <u>maps.geoplatform.gov/maps</u>

- <u>Performance Dashboard</u>—view the maturity level of datasets and see dataset ratings with a grade and a reliability level. <u>dashboard.geoplatform.gov</u>

- <u>Marketplace</u>—search the listings to determine whether a potential partner is already trying to acquire the same data. <u>marketplace.geoplatform.gov</u>

- <u>Object Editor</u>—create, augment, and link datasets, services, layers, organizations, contacts, concepts (e.g., themes, keywords, and controlled vocabularies), maps and galleries as a portfolio of GeoPlatform business objects.

Towards shared geospatial knowledge and services....

Additional Capabilities

- Cloud Hosting—secure enclave in the cloud to host GIS applications, data and services using either ESRI or OpenGIS suites. geoplatform.gov/cloud-hosting-services

  - Maintenance and operation of the AWS servers is included in the contract, and the amount of storage space and computing available is flexible to accommodate increased use during events.

  - GeoPlatform cloud hosting is secure--up to FISMA level moderate.

- Communities—dedicated space to collaborate among agencies and work together to solve common problems. geoplatform.gov/communities-agencies

  - Each agency or data provider can log into the community hosted by GeoPlatform, and there they can see and share each others' data and maps.

  - Community members can combine data and create new maps online together.

  - All community pages use WordPress, an easy-to use and update back-end.

Lots of data out there! Here's a small sample...

- **A-16 National Geospatial Data Assets (NGDA)**
  - **177** datasets

- **Data.gov**
  - **123,703** geospatial datasets and (and **32+** services)

- **EPA Environmental Data Gateway (EDG)**
  - **3,034** items

- **NOAA GEO-IDE UAF ERDDAP**
  - **8,985** datasets

- **NOAA CSW** (https://data.noaa.gov/csw?
  REQUEST=GetCapabilities&SERVICE=CSW)
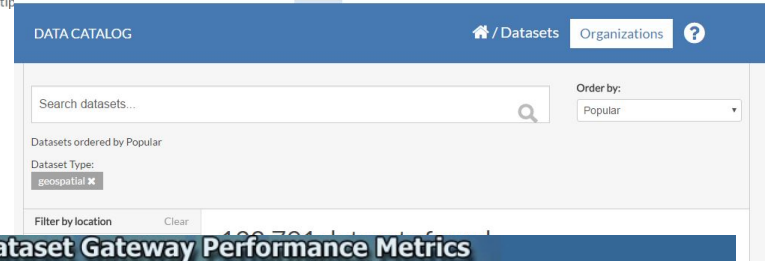 - **45,654** datasets (and **65** services)

- **ArcGIS Online** (**1,789,273+** maps,
  678,262+ services)
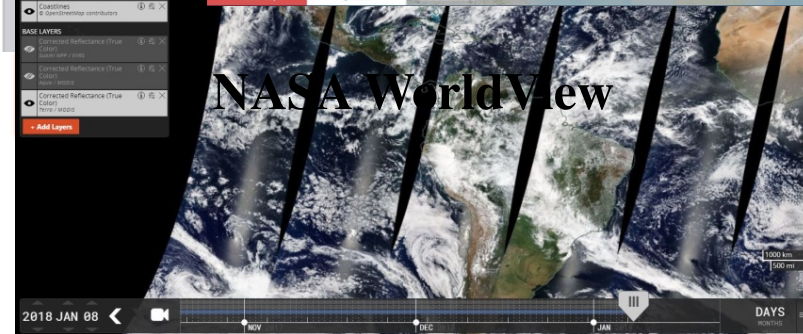 - GeoPlatform.gov on AGOL: (**681** Web Maps,
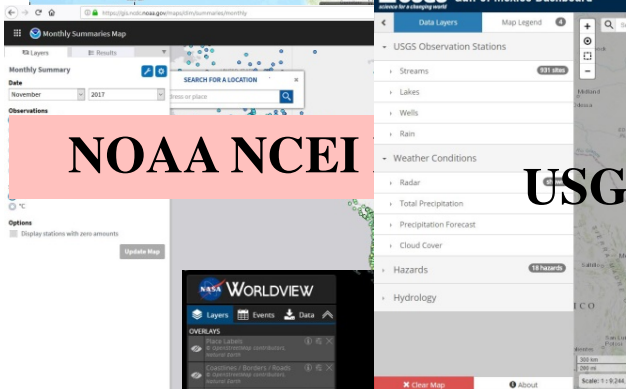   **644** Services)

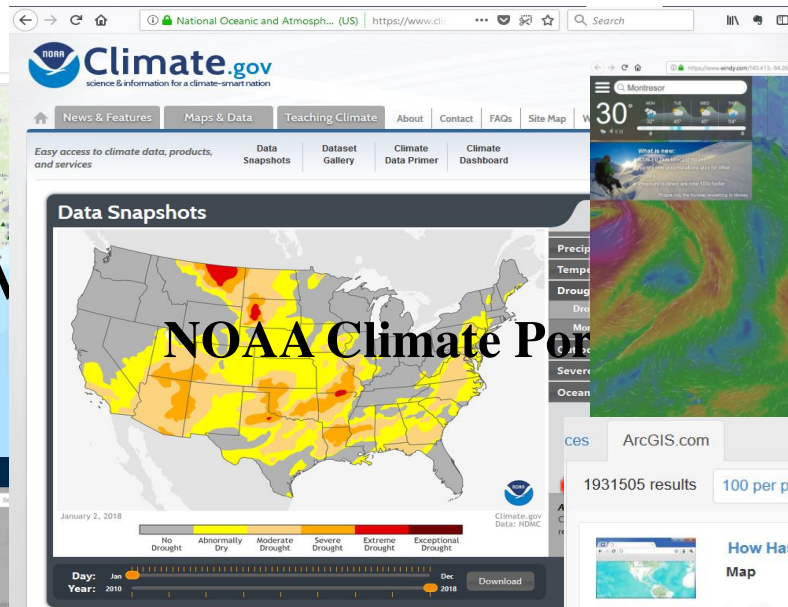**GEOPLATFORM.gov**

Towards shared geospatial knowledge and services....

Lots of Web Maps and Map Apps too

USGS Flood Inundation M...

NOAA Climate Por...

Windy.com

NOAA NCEI

USGS Gulf Dashboard

ArcGIS Online
(~2Million Web Maps)

NASA WorldView

EPA EnviroFacts

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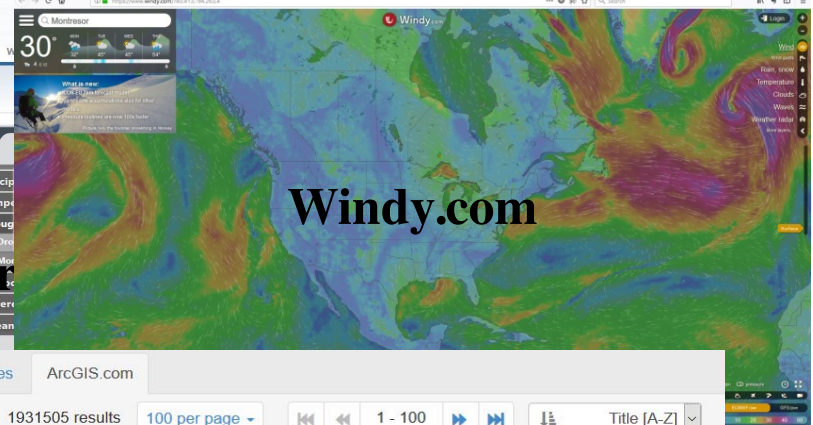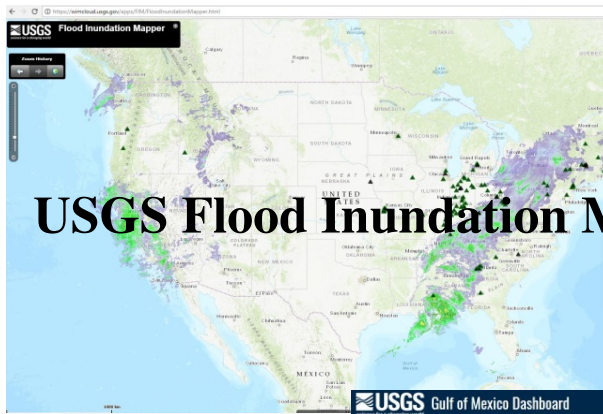
Web Maps and Layers are...

- An information-rich and efficient means to communicate ideas, concepts, situations, and phenomenon
  - Good maps are dense but easily understood… they tell a story. They're valuable.

- Deep… information in layers is backed by a very complex set of human activities and interactions (often unknown and unappreciated) required to produce them:
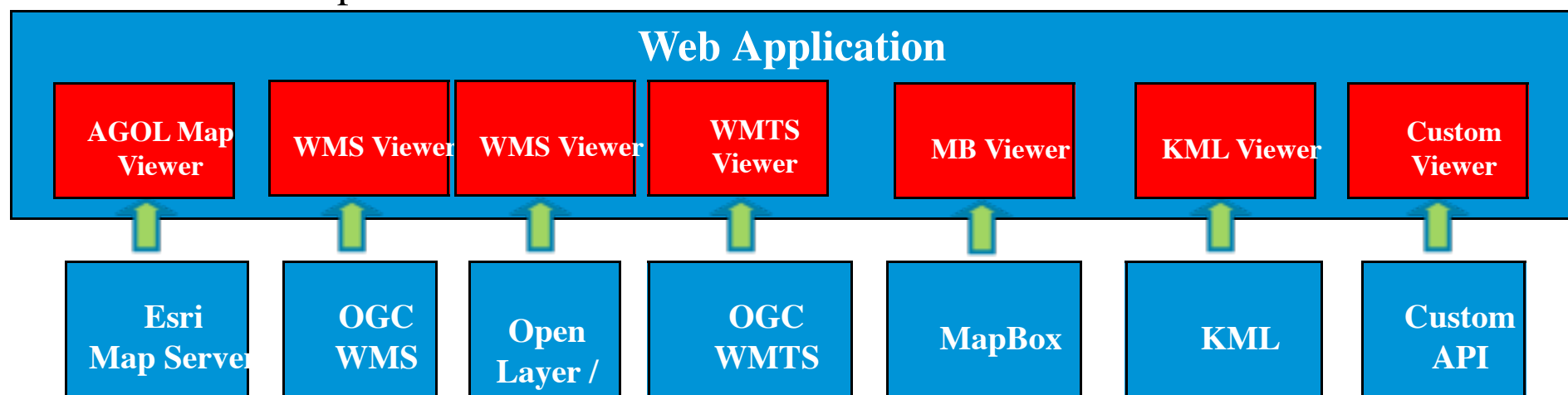 - observation and measurement systems (sensors, surveys, samples)
  - data management and processing
  - data analysis
  - product finishing

- Disjoint and scattered… hard to find, inconsistently documented, hard to make sense of, and not Open
  - They are "on" the Web, but not linked "in" the Web

Today's Closed and Disparate Map and Layer Problem

1. Can't find relevant layers and maps
2. Duplicated information (download a dataset)
3. Can't determine fit-for-use, provenance, lineage
4. Can't consistently portray / style layers for presentation

Web Application

| AGOL Map Viewer | WMS Viewer | WMS Viewer | WMTS Viewer | MB Viewer | KML Viewer | Custom Viewer |

| Esri Map Server | OGC WMS | Open Layer / | OGC WMTS | MapBox | KML | Custom API |

. Different map and layer representations
. No consistent metadata for layers /maps
. Different APIs
. No semantic grounding of concepts

1. No linking of concepts and resources
2. No standard portrayal models
3. Proprietary (not open-standard) = Vendor Lockin

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So what? Enterprise Search...
Connecting user-needs to data and services

FFUSE - Find, Fix, Understand, Share, and Exploit!

(5) *Doing things with Maps, Layers, Services, and Datasets*

(4) Advanced Search and Analysis

(3) Link into Knowledge Graphs for Navigation and Reasoning

(2) Ground to Semantic Concepts (from Taxonomies)

(1) Describe Datasets and Services for Machine-Consumption

"Quickly find the right resource for my need"

"Let me build and share my Open Map"

"Let me add to my community gallery"

"How are my assets performing?"

With improved...
- **Reliability**
- **Precision**
- **Performance**
- **QoS**
- **Consistency**

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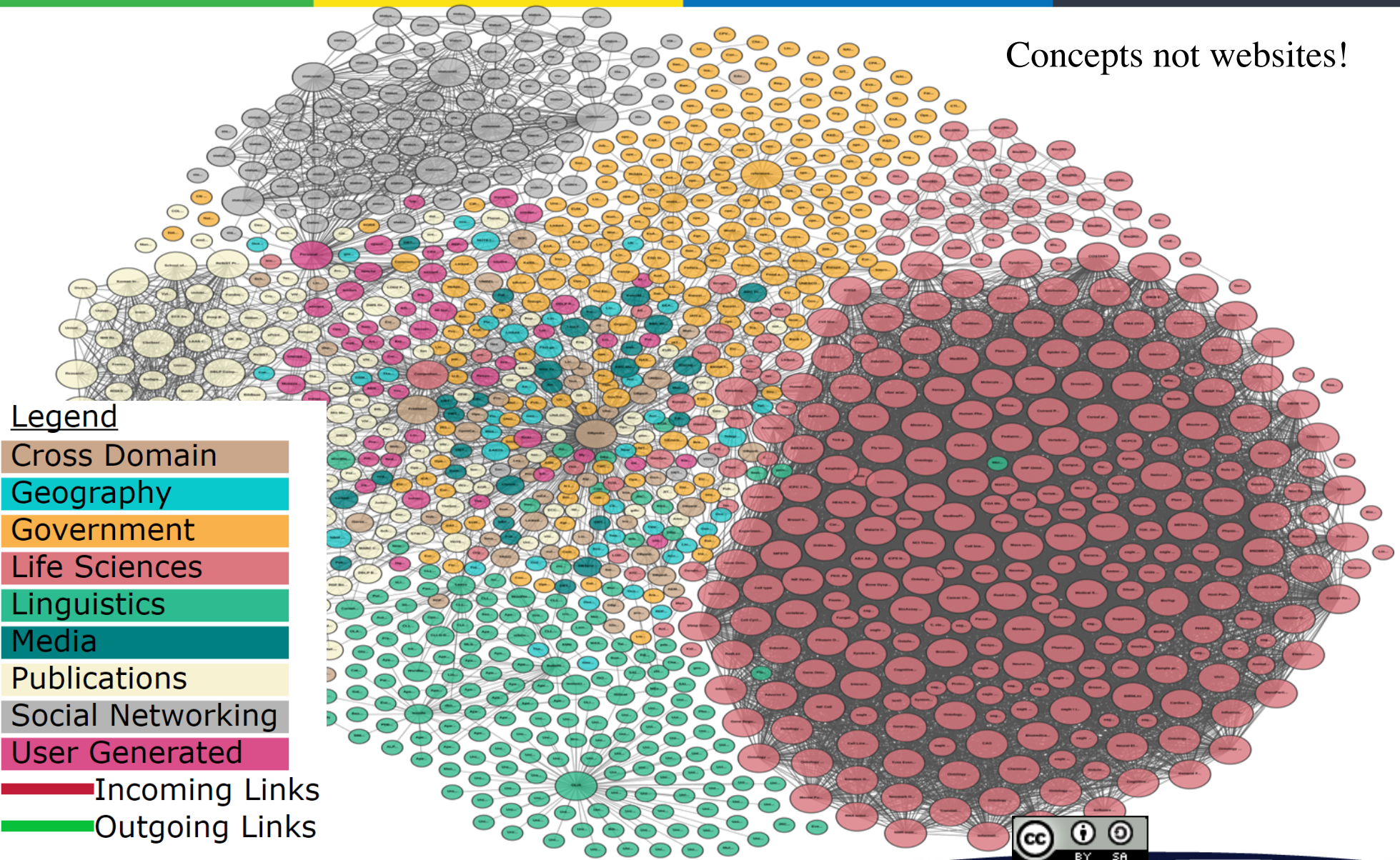
Towards shared geospatial knowledge and services....

GeoPlatform Open Map & Open Layer

A thin veneer of information around existing Web Maps and Layers so they are…

- Categorized and enriched with additional descriptive information for interoperable identification and cataloging
    - Ready access to ever-increasing volume and variety of data across the government enterprise

- Linked to other related resources for improved context, search, navigation, exploration, and discovery
    - Find the right (relevant) information at the time when it is needed

- Grounded to controlled vocabularies for unambiguous meaning and understanding by humans _and machines_
    - Improve trust and understanding of the data
    - Enable automation

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Towards shared geospatial knowledge and services….

Key Concept: LOD & The Semantic Web

Concepts not websites!

Legend
- Cross Domain
- Geography
- Government
- Life Sciences
- Linguistics
- Media
- Publications
- Social Networking
- User Generated
- Incoming Links
- Outgoing Links

"Linking Open Data cloud diagram 2017, by Andrejs Abele, John P. McCrae, Paul Buitelaar, Anja Jentzsch and Richard Cyganiak. http://lod-cloud.net/"

spatial knowledge and services....

Key Concept: 5★ Linked Open Data (LOD)

Towards a world of **_unambiguous, semantically-grounded linked data_** that adds rich context and meaning to shared data…. The last rung in the interoperability ladder.

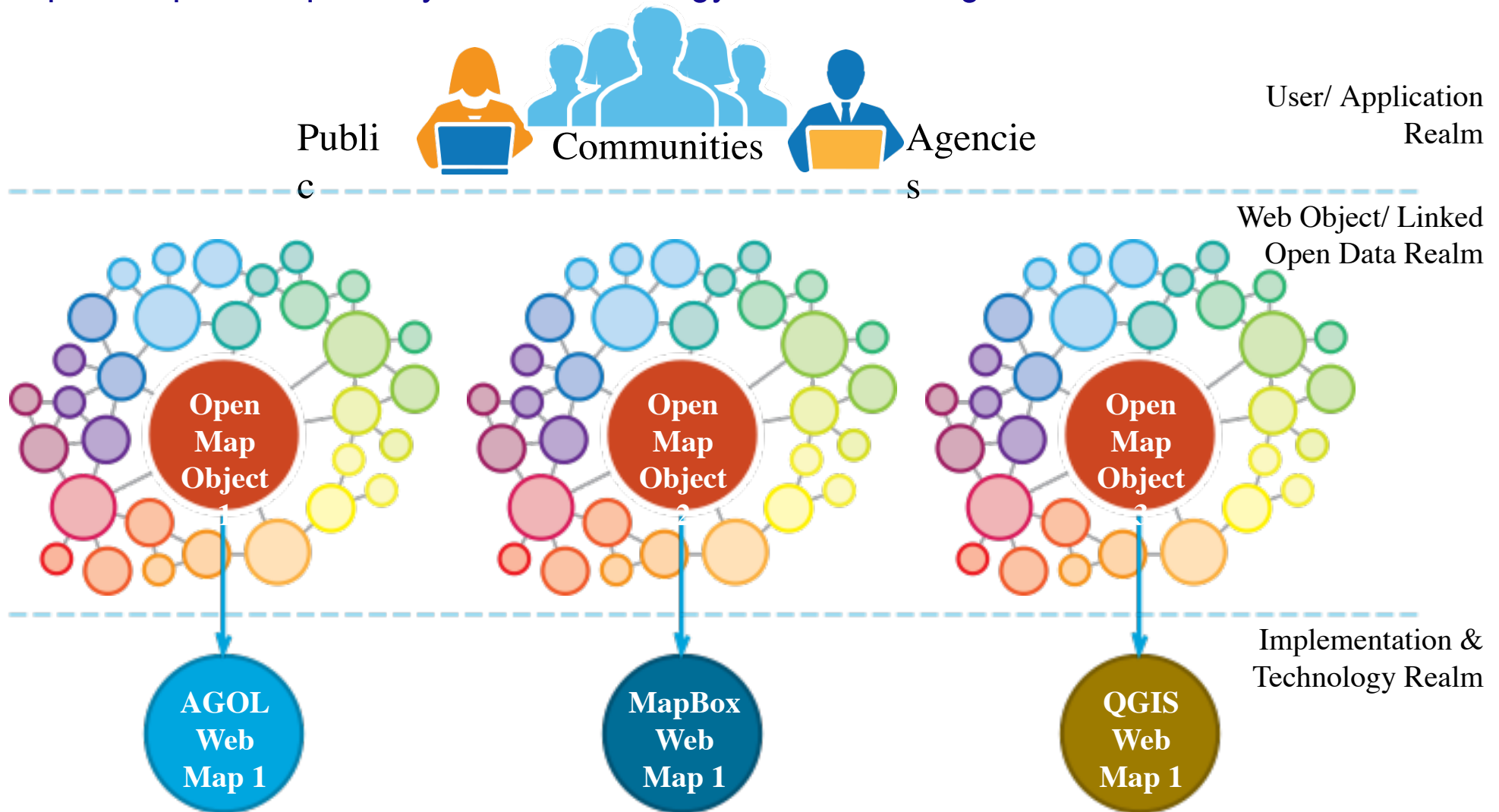| Level of Openness	Description	Benefits
★	**Make your stuff available on the Web (whatever format) under an open license**	**OK**. It's great to have the data accessible on the Web under an open license (such as PDDL, ODC-by or CC0), however, the data is locked-up in a document. Other than writing a custom scraper, it's hard to get the data out of the document.
★★	**Make it available as structured data (e.g., Excel instead of image scan of a table)**	**Splendid!** The data is accessible on the Web in a structured way (that is, machine-readable), however, the data is still locked-up in a document. To get the data out of the document you depend on proprietary software.
★★★	**_Use non-proprietary formats (e.g., CSV instead of Excel)_**	**Excellent!** The data is not only available via the Web but now everyone can use the data easily. On the other hand, it's still data on the Web and not data in the Web.
★★★★	**_Use URIs to denote things, so that people can point at your stuff_**	**Wonderful!** Now it's data **_in the Web_**. The (most important) data items have a URI and can be shared on the Web. A native way to represent the data is using RDF, however other formats such as Atom can be converted/mapped, if required.
★★★★★	**_Link your data to other data to provide context_**	**Brilliant!** Now it's data **_in the Web, linked to_** other data. Both the consumer and the publisher benefit from the network effect.

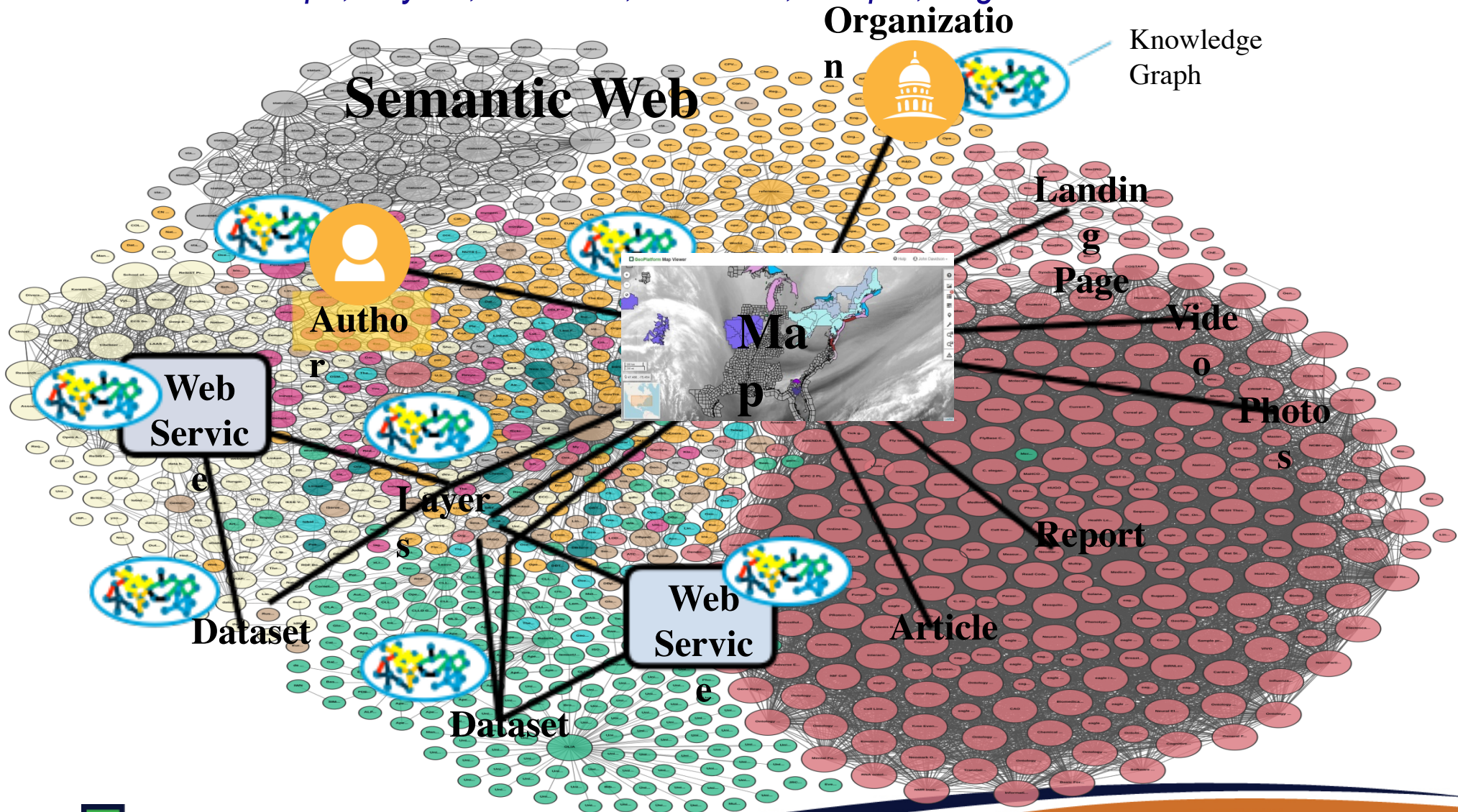Tim Berners-Lee, the inventor of the Web and Linked Data initiator, suggested this 5 star deployment scheme for Open Data.

Towards shared geospatial knowledge and services….

Doesn't matter whose Web Map or Layer...

Open Map and Open Layer are technology and vendor agnostic

Public   Communities   Agencies

User/ Application Realm

Web Object/ Linked Open Data Realm

Open Map Object 1

Open Map Object 2

Open Map Object 3

Implementation & Technology Realm

AGOL Web Map 1

MapBox Web Map 1

QGIS Web Map 1

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Towards shared geospatial knowledge and services....

Linked Maps and Layers *in the Web*

A Network of Maps, Layers, Services, Datasets, People, Organizations…

Semantic Web

Organization

Knowledge Graph

Author

Web Service

Layers

Dataset

Web Service

Dataset

Article

Report

Landing Page

Video

Photos

Map
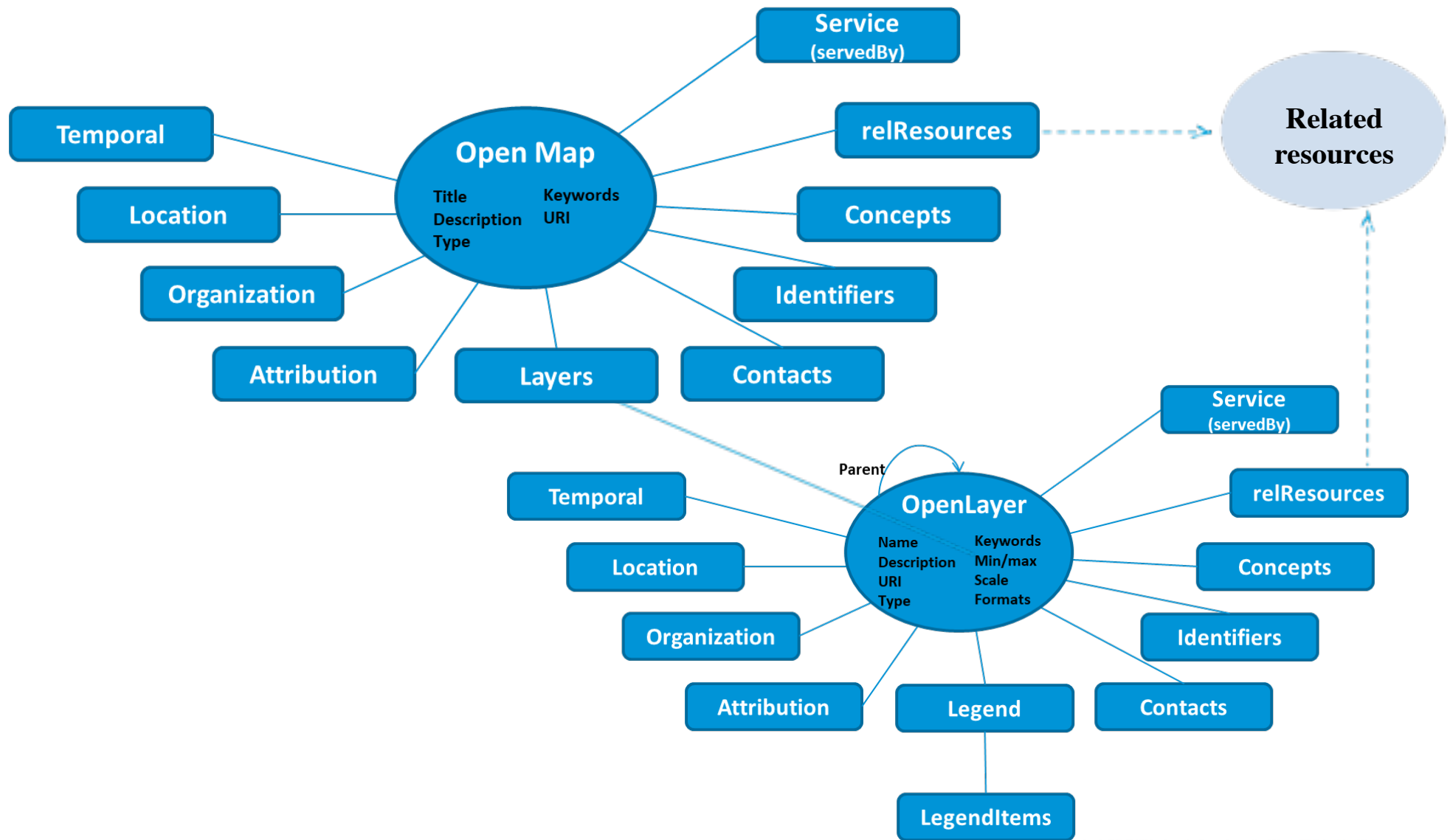
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Towards shared geospatial knowledge and services….

<#>

Common purpose, distinct vocabularies

Unified Knowledge Graph links domains to purpose, scope, and fit-for-use

Purpose: Save Lives, Protect Property

Trust and relevance

Completeness, accuracy, timeliness

Operator: How deep? Is it safe?

Decision-maker: Where and when?

Analyst: Rainfall runoff

Producer: Sensor characteristics
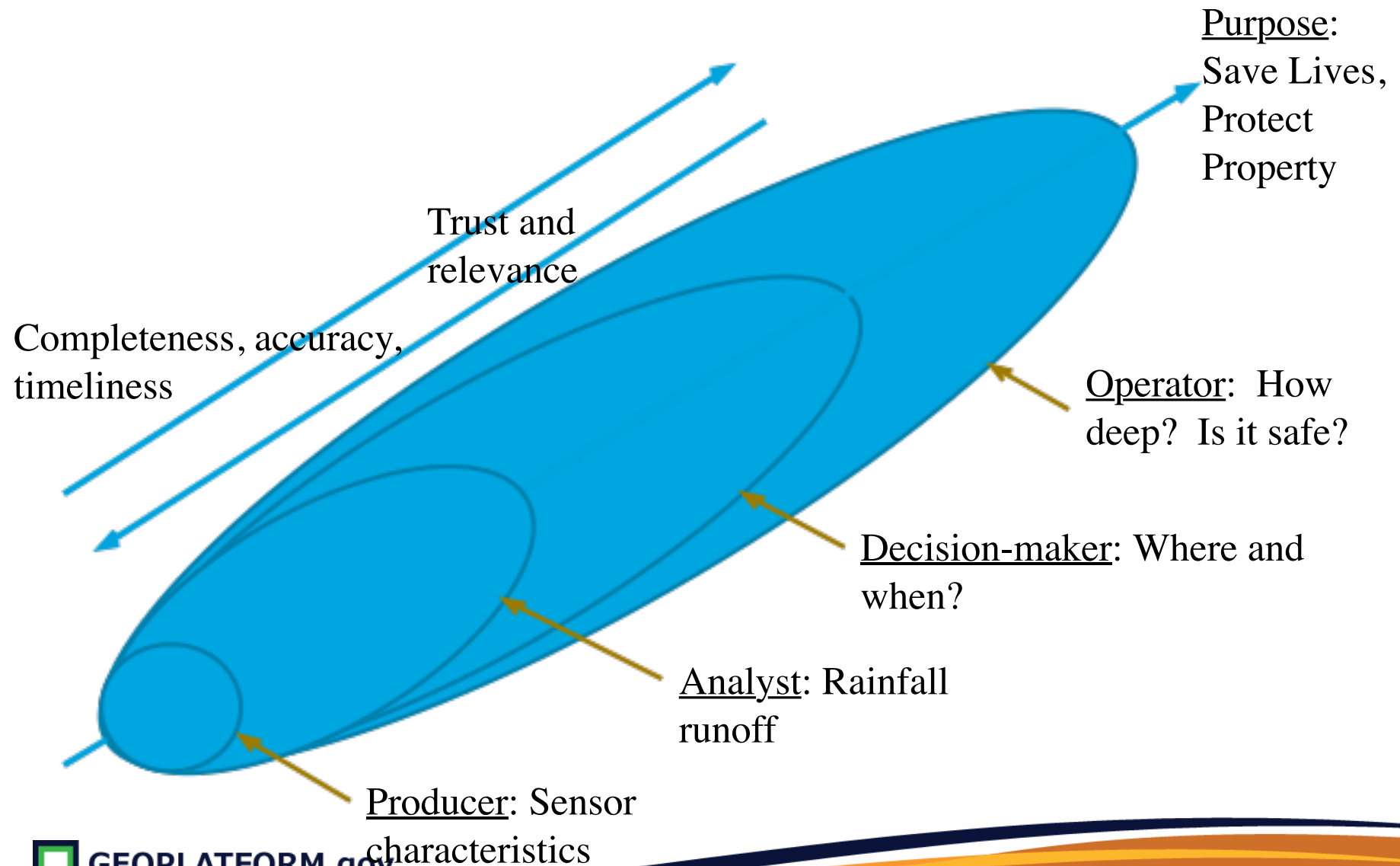
Open Map & Open Layer: Web Object Model (Linked Open Data)
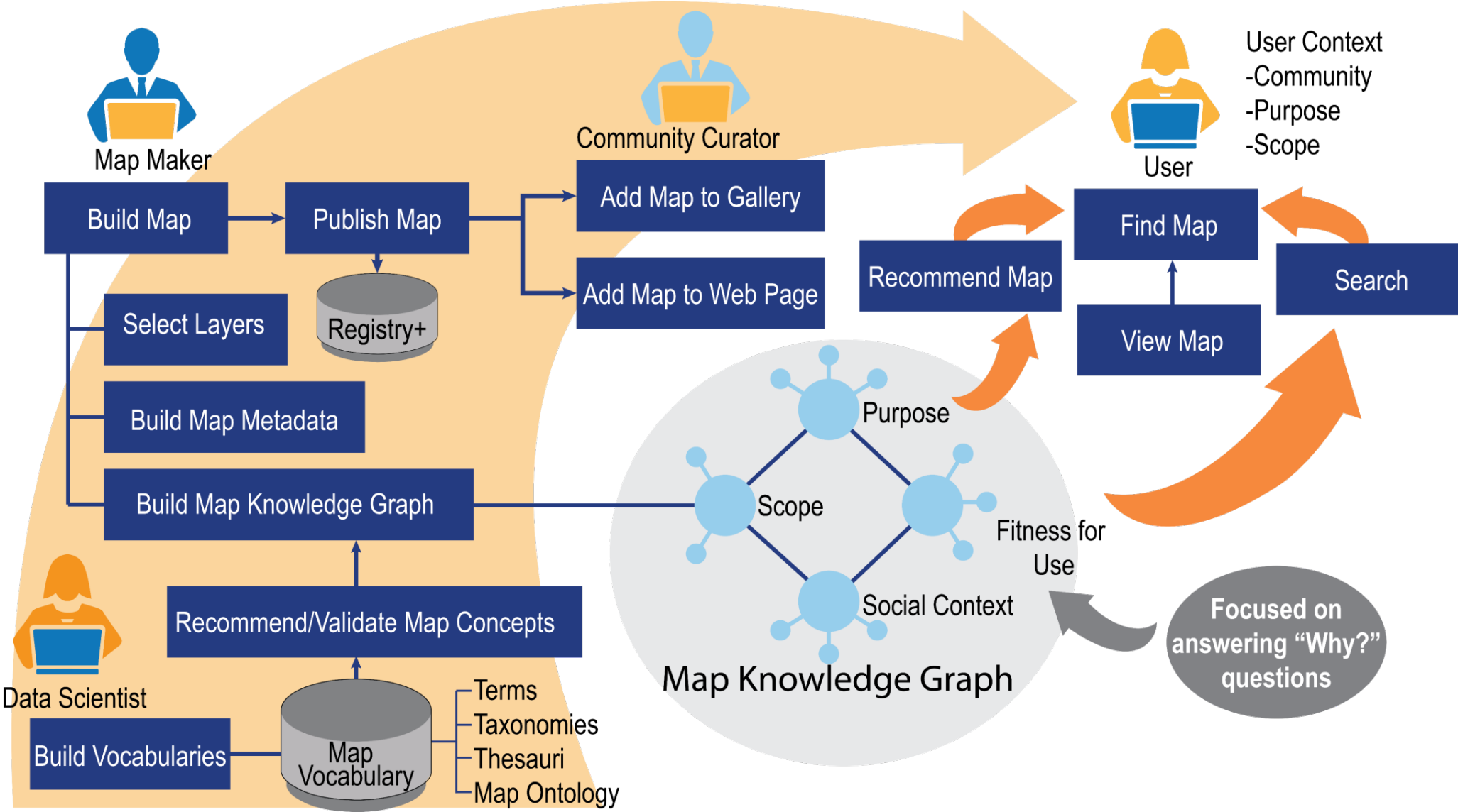
Moving beyond catalogs....

- Opportunities to collaborate or expand our collaboration?
  - HIFLD
  - Data Registries
  - Hosting
  - Event Driven Communities of interest
  - National Address Database

Thank You

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Director Information Management Technology Division

Office of the Chief Information Officer

Office of the Secretary

US Department of the Interior

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