GeoWS: Making Services and Data Consistent

GeoWS: A pattern for web service structure
GeoCSV - a data format that is human readable, easy to build client for, but can have simple extensions for more rigorous data definitions
URL Builder - refine and recognize importance of tool to promote access to web service
Evaluate Swagger Specifications (now Open API Initiative) - explore utility as an alternative to WADL for web service description and documentation
Evaluate Swagger-UI - a web application which leverages Swagger Specification to view service documentation and build URLs

by funded partners
- used existing tools
- uses existing infrastructure and service framework

for unfunded collaborators

Unfunded Collaborators

Global Geodynamics Project (GGP)
NCEI - National Centers for Environmental Information
Waterlevel
Tides & meteorological satellite image (DMSP) data
InterMAGNet - consortium of magnetic observatories
OOI - Ocean Observatory Initiative - Seismic data
StraboSpot - Structural Geo. & Tect. - U. of Kansas

Examples of by funded partners
- Used existing tools
- Uses existing infrastructure and service framework
- Standardized query parameters
- Directly supports integration with brokers
- Modified or extended existing resources
- Added resources to host proxy services and metadata storage

Lessons Learned
Creating proxy services or modifying existing services can be fast and efficient if native service output format match desired discovery pattern.
IRIS’s component Web Service Shell enables a repeatable, cost effect way to quickly add web services.
However, a native service with no metadata and/or having poor match of native API to desired API (i.e. discovery, data retrieval APIs, etc.)
- Creates long term need for additional infrastructure resources
- Creates long term need for curation efforts to harvest metadata, report errors when found, etc.
IRIS can add unfunded collaborator services and extend these concepts to other providers if additional resources are available

Examples of unfunded collaborators
- NCEI - National Centers for Environmental Information
- Waterlevel
- Tides & meteorological satellite image (DMSP) data
- InterMAGNet - consortium of magnetic observatories
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- StraboSpot - Structural Geo. & Tect. - U. of Kansas
- WOVOdat - A database of volcanic unrest data from World Organization of Volcano Observatories

Definitions
GeoWS Service - a service which has
- RESTlike interface
- standardized space, time, format query parameters
- standardized error response
- offer GeoCSV as an output format when possible
URL builder - Web application which documents and creates URLs based on respective user selections
GeoCSV output data format - is CSV format with a small set of optional keywords, e.g. field_units, field_type, etc. and a few keywords from Climate and Forecast Conventions like title, comment, etc.

EarthCube Architecture Alignment
GeoWS services use standardized query parameters
GeoWS services are loosely coupled

An example cross-domain query for ground displacement understandable to other earth scientist like seismologist

Ground Displacements:

URL Builder - Lessons Learned
Storing service descriptions in Swagger Specification JSON standard is relatively easy,
Swagger Specification is adequate for services with simple hierarchical parameter relations, but it becomes less usable for more complex interrelated parameters
Swagger-ui presents documentation and enables URL builder with respect level of effort for services with moderate text output only, large text streams or binary output is not handled successfully without code modification
Custom web development is recommended for best users experience for more complex service descriptions

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2016 All Hands Meeting

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