WHITE PAPER

The need for a Metadata Standard for Global Geodesy

Prepared by

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Introduction

We live in an era when the geodetic community is being called upon to provide data, products and services in support of a broad sphere of Earth System Sciences. We are also seeing the ubiquitous uptake across society of accurate and reliable Positioning, Navigation and Timing (PNT) information. In order to service these user demands our geodetic data and the associated metadata need to be discoverable, authoritive and interoperable. The continual increase in the volume and complexity of data means we also need to generate, transfer and use data and metadata via a machine readable form. In order to achieve these stated goals it is clear that the time has come to develop a XML based standard for geodesy. It is also clear that despite the huge impact of geodesy on society, geodetic data is a small subset of spatial data, and an even smaller subset of Earth observation data. Therefore any efforts by the geodetic community to create a metadata standard should align closely with existing initiatives in these larger communities.

Problem

No standard is currently in use which allows discoverability of our data and products from world data centres or search engines. Nor do we have a machine readable standard which allows for the efficient and automated transfer of geodetic data and metadata between data custodians and users. This restricts the usability of our information. It also reduces our capability to maintain accurate databases, access and retrieve information, reliably integrate data from multiple sources and provide users with the authoritative data they need.

Some existing standards are available which assist with basic information retrieval or the transfer of a limited set of geodetic metadata, however there is an obvious need for a new standard covering the sharing and collation of large amounts of geodetic data and metadata captured and stored by any number of custodians in a range of different database types using proprietary software.

Solution

The geodetic community requires a standard which makes geodetic data and metadata:

- discoverable and interoperable,
- easily transferable via web services, and
- based on internationally recognised data exchange methods.

Efforts in Australia and New Zealand to create the Geodesy Markup Language (GeodesyML) fulfil the above requirements, and therefore offer a possible model for adoption. GeodesyML is a proposed Application Schema of the existing Geography Markup Language (GML) which is an ISO Standard (19136:2007). Being an Application Schema simply means GeodesyML extends GML using GML specifications to meet the specific needs of the geodetic community.

There are myriad benefits to adopting a model like GeodesyML including:

- Global unification of standards for encoding geodetic data and metadata
- Data and metadata can be readily exchanged across the Internet using existing web services
- Far greater interoperability and adoption by the international geospatial community than that which would be achieved using custom data models
- Almost all proprietary and open-source software vendors (ESRI, MapInfo, Integraph, APOLLO, FME, QGIS, GeoServer) and database technology providers (Oracle, Microsoft SQL Server, ArcSDE, PostGIS, DB2) support GML and many standard application schemas. By supporting GML, vendors adhere to the adoption of new application schemas in their update cycle
- Ready adoption within tablet and smart phone technologies
- Being modular, extensible and flexible enough to be adaptable to organisational / business requirements
- Support for time-dependent data and metadata, in readiness for concurrent development in other ISO/TC211 standards

Conclusion

GGOS, representing the global geodetic community, has identified the need for a geodetic data and metadata transfer standard. GeodesyML is an example of the type of model that can be developed for the transfer of geodetic data and metadata, built on the well-established and deeply engrained GML standard. GeodesyML has been designed to improve data discoverability and support information exchange within and between geodetic organisations (e.g. Network managers, Data Centres, Analysis centres, Product centres etc.) and users of geodetic products and services.

Download

GeodesyML V0.2 is available for review and can be downloaded from (https://icsm.govspace.gov.au/egeodesy/geodesyml-0-2-beta-gml-application-schema/). For further information or to provide feedback, please contact Nicholas Brown (nicholas.brown@ga.gov.au).