Geophysical Research Abstracts
Vol. 13, EGU2011-13479, 2011
EGU General Assembly 2011

Management of Data Models in Multidisciplinary Applications

Rob Atkinson
CSIRO, Land and Water, Australia (rob.atkinson@csiro.au)

Earth systems science is fundamentally cross-disciplinary, and increasingly this requires sharing and exchange of data across discipline boundaries. Standardised conceptual models and encodings offer the potential of modeling cross-domain interoperability contracts between systems: an information model for a cross-domain application can draw on components from each contributing domain.
This is only possible if the domain models are themselves designed to be used in this way – they must separate out core concepts into relatively tightly scoped "modules" so that cross-domain applications can include only the parts that are strictly relevant, otherwise the situation arises that any change in content or scope of the entire domain may affect any cross-domain applications. This in turn makes it hard for either the cross-domain or specific domain models to be reliably and efficiently managed, as the impact of any change may be hard to assess.
The impact of this reusable modularity is a need to maintain dependencies within each model, so that any given module can be easily used through identification of any components it depends on. Unfortunately, modelling environments provide weak support for these principles. A novel model registry capability is described which addresses these shortcomings. Issues of governance and provenance metadata management are discussed. Further application of the model registry to manage related model-derived artefacts, such as GML schemas derived from ISO application schemas, is demonstrated.
These approaches provide a basis for future cross-domain model development and provide design goals for domain model development to support cross-domain applications.