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The OGC CF-netCDF specification: towards a common data model for feature, coverage and specimen data

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The OGC netCDF encoding supports electronic encoding of geospatial data, that is, digital geospatial information representing space and time-varying phenomena.
In December 2012, the CF-netCDF Data Model Extension Standard (document OGC 11-165r2) was approved a new OGC standard. This standard specifies the CF-netCDF data model extension introducing the extra semantics required to capture and formalize the metadata describing multi-dimensional gridded and multi-point data. These data geometry types are used to encode datasets acquired following the three main acquisition strategies for geospatial information: (i) coverage-based (e.g. satellite observations); (ii) feature-based (e.g. GIS layers); (iii) specimen measurements (e.g. sensor observations).
The OGC CF-netCDF standard extends the OGC netCDF data model (document OGC 10-090r3) conforming to the Climate and Forecast (CF) conventions. The purpose of these conventions is to require conforming datasets to contain sufficient metadata that they are self-describing in the sense that each variable in the file has an associated description of what it represents, including physical units if appropriate, and that each value can be located in space (relative to earth-based coordinates) and time. This enables users of data from different sources to decide which quantities are comparable, and facilitates building applications with powerful extraction, regridding, and display capabilities.
The OGC CF-netCDF specification is based on the netCDF (network Common Data Form) ver. 3.0 file format using the CF (Climate and Forecast) conventions ver. 1.6.
In respect to the netCDF data model, the CF-netCDF extension introduces the following convention packages:
• General conventions;
• Variables and Standard attributes;
• Dimensions and Dimensional Variables conventions;
• Coordinate Variables and Coordinate Types conventions;
• Coordinate Systems convention;
• Discrete Sampling Geometries.
Of particular interest are the last conventions: in fact, they introduce the metadata useful to describe geometries like: multi-dimensional array, ragged array; point; feature and feature collection. These allow the encoding in netCDF of the following dataset types:
• Point and station data;
• Time series;
• Vertical profiles and trajectories;
• Time Series Profile;
• Trajectory Profile.
The presentation will discuss the modularity structure of the standard (including the data model mapping onto ISO 19123), its applicability for advancing the data access interfaces (e.g. OGC WxS), and the future work.