

# **Development and Implementation of OGC Web Services Specifications for Earth Observation Data**

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**Key words:**

## **SUMMARY**

Earth observation (EO) data is the dominant form of geospatial data in term of data volume. Most of EO data are collected by sensors onboard remote-sensing satellites, which provides up-to-date information on the status of the Earth system. Remote sensing data and its derived products are commonly expressed in imagery/grid form. Because of the importance of EO data, many public and private organizations have engaged in collection, management, distribution, and utilizations of EO data. As a result, EO data are very diverse and are archived in data centers around the world. With the improvement of remote sensing and associated technologies, the volume of EO data collected each year has been growing rapidly. How to effectively, wisely, and easily use EO Data from diverse sources is the key geospatial technology issue that has to be solved. To address this issue, in the past several years the Open Geospatial Consortium (OGC) has been developing interoperability specifications for finding, accessing, and processing geospatial data in the Web environment. Through a series of OGC Web Services (OWS) initiatives, OGC has developed a set of geospatial interoperability specifications. As one of OGC members and the major participant of those initiatives, LAITS/GMU has been involved in development of such specifications. With funding from NASA, LAITS has worked on developing prototypic implementations of those OGC specifications for EO data in NASA data environment as the technology demonstration for NASA data systems. The implementations also provide the feedback for OGC to improve the specifications for EO data. This paper discusses the OGC specifications that are most relevant to EO data, the implementation consideration of those specifications in the EO data environment, the lessons learnt from the implementations, and discussion of future development of OGC web-based interoperability technology. It also discusses how to use various OGC specifications to build an open, OGC-compliant, interoperable EO Web services system. The specifications discussed in this paper include Catalog Service for Web (CSW), Web Coverage Services (WCS), Web Map Services (WMS), Web Image Classification Services (WICS), and Web Coordinate Transformation System (WCTS).

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