

# Chapter XXII

## Geospatial Image Metadata Catalog Services

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### **ABSTRACT**

*Three public geospatial image catalog services, FGDC Clearinghouse, NASA ECHO and GMU CSISS CSW, were reviewed, considering the following aspects: metadata generation, metadata ingestion, catalog service conceptual schema, query protocols and system distribution. This review results show how it is becoming possible to query metadata holdings through public, standard Web-based query interfaces. It also show that the catalog service providers still must define a catalog service schema that meets their particular needs.*

## **1. INTRODUCTION**

As earth observation continues worldwide, large volumes of remotely sensed data on the Earth's climate and environment have been collected and archived. In order to maintain the data archives efficiently and to facilitate discovery by users of desired data in the holdings, each data provider normally maintains a digital metadata catalog. Some online catalogs provide services to users for searching the catalog and discovering the data they need through a well-established Application Programming Interface (API). Such services are called Catalog Services. The information in the catalog is the searchable metadata that describe individual data entries in the archives. Currently most Catalog Services are provided through Web-based interfaces.

This chapter analyses three open catalog service systems. It reviews the metadata standards, catalog service conceptual schemas and protocols, and the components of catalog service specifications.

## **2. REVIEW OF GEOSPATIAL IMAGE CATALOG SERVICES**

### **2.1 Pilot Catalog Service Systems**

The Federal Geographic Data Committee (FGDC) Clearinghouse is a virtual collection of digital spatial data distributed over many servers in the United States and abroad. The primary intention of the Clearinghouse is to provide discovery services for digital data, allowing users to evaluate its quality through metadata. Most metadata provide information on how to acquire the data; in many cases, links to the data or an order form are available online.

The NASA Earth Observing System ClearingHouse (ECHO) is a clearinghouse of spatial and temporal metadata that enables the science community to exchange data and information.

ECHO technology can provide metadata discovery services and serve as an order broker for clients and data partners. All the NASA Distributed Active Archive Centers (DAACs), as data providers, generate and ingest metadata information into ECHO.

The Open Geospatial Consortium (OGC) has promoted standardization and interoperability among the geospatial communities. In catalogue service aspect, OGC has defined the Catalog Service implementation standard (OpenGIS, 2004) and published two recommendation papers (OpenGIS, 2005a; OpenGIS 2005b). The George Mason University (GMU) CSISS Catalog service for Web (CSW) system is an OGC-compliant catalog service, which demonstrates how the earth science community can publish geospatial resources by searching pre-registered spatial and temporal metadata information. In particular, the GMU CSISS CSW catalog service is based on the OpenGIS implementation standard, and the ebRIM application profile (OpenGIS, 2005). It provides users with an open and standard means to access more than 15 Terabytes global Landsat datasets.

### **2.2 Conceptual System Architecture**

Since these geospatial catalog services address similar needs, it is not surprising that they have almost the same conceptual system architecture, as shown in Figure 1.

From the point of view of metadata circulation, a catalog service usually consists of three components: metadata generation and ingestion, a conceptual schema for catalog service, and a query interface for catalog service.

Metadata generation and ingestion is always based on applicable metadata standards, such as the Dublin Core (DCMI, 2003), Geographic information – Metadata (19115) from International Organization for Standard (ISO, 2003), Content Standard for Digital Geospatial Metadata (CSDGM) from Federal Geographic Data Com-

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