RésEau Information Architecture and Technical Requirements

Introduction

Purpose

The purpose of this document is to identify approaches for the publishing of geospatial data / information and web services of activities encompassed by Environment Canada and its partners/stakeholders. This document shall act as a framework for ResEau activities to implement methods for information dissemination over the Internet.

This document is targeted at developers and architects for review and comment.

References

Canadian Geospatial Data Infrastructure Architecture Working Group, CGDI Architecture Description, Version 1.0, December 2001, <http://www.cgdi.gc.ca/english/publications/reports/tvip/tvip.html>

Canadian Geospatial Data Infrastructure Architecture Working Group, CGDI Target Vision, Version 1.0, March 2001, <http://www.cgdi.gc.ca/english/publications/reports/tvip/tvip.html>

Nebert, D., Developing Spatial Data Infrastructures: The SDI Cookbook, Version 1.1, May 2001 <http://www.gsdi.org/pubs/cookbook/index.html>

Open Geospatial Consortium, The OpenGIS Abstract Specification, Version 4, 1999, <http://www.opengeospatial.org/techno/abstract.htm>

Open Geospatial Consortium, OpenGIS Reference Model, Version 0.1.2, 2003, <http://www.opengeospatial.org/info/orm/>

World Wide Web Consortium, Hypertext Transfer Protocol – HTTP/1.1, June 1999, <http://www.w3.org/Protocols/rfc2616/rfc2616.html>

World Wide Web Consortium, eXtensible Markup Language (XML), October 2000, <http://www.w3.org/TR/REC-xml>

URLs of Interest

GeoConnections / Canadian Geospatial Data Infrastructure (CGDI)	http://www.geoconnections.org/
Canadian Information Systems for the Environment	http://www.cise-scie.ca/
CGDI Development Network	http://cgdi-dev.geoconnections.org/
CGDI Endorsed Specifications	http://www.geoconnections.org/CGDI.cfm/fuseaction/devNetwork.endspecs/gcs.cfm
National Aeronautics and Space Administration (NASA) Global Change Master Directory (GCMD)	http://gcmd.nasa.gov/
Federal Geographic Data Committee (FGDC)	http://www.fgdc.gov/

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FGDC Biological Profile	http://www.fgdc.gov/standards/documents/standards/biodata/biodatap.txt
Open Geospatial Consortium (OGC)	http://www.opengeospatial.org/
OGC Network	http://www.ogcnetwork.net/
OGC Adopted Specifications	http://www.opengeospatial.org/specs/?page=specs
International Organization for Standardization (ISO), Technical Committee 211, Geographic information/Geomatics	http://www. isotc211.org/
World Wide Web Consortium (W3C)	http://www.wc3.org/

Overview

Background

RésEau

RésEau is a Government On-Line (GOL) demonstration initiative that focuses on water information. RésEau supports clean, safe, and secure water for all Canadians and ecosystems. Specifically, RésEau establishes partnerships and projects to demonstrate the sharing, discovery, access, and use of water information over the Internet.

The initiative is led by Environment Canada in partnership with Natural Resources Canada and Health Canada and will deliver in March 2006. Its user-driven focus targets information for a wide range of generalists and specialists, from high school-level youth to water resource managers.

Scientific integrity is a key pillar of RésEau starting with credible water quality, quantity and use data. Standards and specifications adopted by Open Geospatial Consortium and endorsed by the Canadian Geospatial Data Infrastructure are the essential foundation of RésEau projects and information architecture.

An interactive Web portal will form the dynamic focal point of RésEau. The portal will include data, interpreted information, tools, and services to facilitate the interconnection of water information from distributed sources to promote a greater understanding of complex water issues for enhanced decision making.

RésEau is a key step in providing Canadians with timely access to credible water information, data, and tools.

Canadian Geospatial Data Infrastructure

The Canadian Geospatial Data Infrastructure (CGDI) is the technology, standards, access systems and protocols necessary to harmonize all of Canada's geospatial data bases, and make them available on the internet. Geospatial databases include:

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topographic maps, air photos, satellite images, nautical and aeronautical charts, census and electoral areas, forestry, soil, marine and biodiversity inventories. CGDI is facilitated by GeoConnections. The Inter Agency Committee on Geomatics (IACG) steering committee has agreed that federal agencies will use common technical standards and infrastructure following recommendations made by the IACG Working Group members, with the task of implementing CGDI standards within a two-year timeframe where reasonable, with costs to be absorbed by data custodian.

The CGDI utilizes the GeoConnections Discovery Portal as the clearinghouse / discovery mechanism for discovery of geospatial information holdings. The GDP is accessible both through an XML application interface, as well as a portal human machine interface.

Geospatial Data / Information and Web Services Vision

1. The Vision adheres to endorsed specifications of the Canadian Geospatial Data Infrastructure (CGDI -- http://www.cgdi.ca/). Endorsed specifications of the CGDI can be found at: http://www.geoconnections.org/CGDI.cfm/fuseaction/devNetwork.endspecs/gcs.cfm

2. The Vision recognizes and endorses the adopted specifications of the Open Geospatial Consortium (OGC -- http://www.opengeospatial.org/). Adopted specifications of the OGC can be found at: http://www.opengeospatial.org/specs/?page=specs

3. The Vision supports multi-vendor interoperability of software and tools, adhering to CGDI and / or OGC approaches. Conforming and implementing software products can be found at: http://www.opengeospatial.org/resources/?page=products

4. Where applicable, projects and activities supported and endorsed by the Vision shall adhere to endorsed approaches for interoperability in the context of discovery, visualization and access. This will enable sharing of information within the Department, as well as integrating between and with other information communities.

Technical and Architectural Requirements

1 Metadata

1.1 Geospatial collection and product level metadata shall adhere to the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata (CSDGM)

1.2 Biological collection and product level metadata shall adhere to the National Biological Information Infrastructure (NBII) biological extension profile of FGDC CSDGM

1.3 Collection level metadata shall be published to the GeoConnections Discovery Portal

1.4 Collection level metadata, when delivering data via OGC Web Services, shall be accessible from the OGC Web Service metadata constructs

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2 Station Descriptions

2.1 Station level metadata shall be published using OGC SensorML, version 1.0.30, using the ResEau SensorML template

2.2 Collections of station level metadata shall be published using the ResEau format for listing station list nodes as per http://devgeo.cciw.ca/schemas/ec/stationList/1.0.0/stationList.xsd

2.3 Station data / observations shall be made accessible via OGC Sensor Observation Service (SOS), or OGC Web Feature Service, version 1.0.0

3 Publishing

3.1 Collection level metadata (for non-Web Services data) shall be published to the GeoConnections Discovery Portal

3.2. Product level metadata shall (if applicable) shall be published using OGC Web Services or z39.50 protocol

3.3 Web Services shall published to the GeoConnections Discovery Portal, or the ResEau catalog

4 Visualization

4.1 Data shall be published supporting the OGC Web Map Service (WMS) Implementation Specification, version 1.1.1

4.1.1 OGC:WMS services shall support the OGC Styled Layer Descriptor Implementation (SLD) Specification, version 1.0.0

4.2 Web mapping applications shall support the OGC Web Map Context Documents (WMC) Implementation Specification, version 1.0.0

4.3 Data symbolization and styling shall be implemented using OGC SLD, version 1.0.0

5 Access (Where Applicable)

5.1 Data shall be published supporting the OGC Web Feature Service

(WFS) Implementation Specification, version 1.0.0 and OGC Geography Markup Language

(GML), acceptable versions between 2.0.0 – 3.1.1)

5.1.1 OGC WFS services shall support OGC Filter Encoding Implementation Specification, version 1.0.0

5.2 Data provided for online download shall be available through metadata linkages in OGC Web Service metadata

6 Other Web Services

6.1 Data shall be published through a Web Services framework (REST, XML-RPC, XML over HTTP, SOAP, WSDL), where OGC approaches are deemed not suitable