

Discover, Visualise, and Access Geomatics Data and Services; current Concepts and Technology

Cameron Wilson

cameron.wilson@ccrs.nrcan.gc.ca

Objectives

- Information on selected Canadian and International geomatics *Discovery*, *Visualisation (Evaluation)* and *Access* initiatives.
- Importance of distributed discovery and services.
- Increase linkages between the bibliographic and geomatics communities.

Agenda

1. Background
2. Discover geomatics data via CEONet
 - Re-Useable Components
3. Distributed visualisation - OGC
4. Access - GeoGratis / USGS
5. Chaining services
6. Build further linkages between the bibliographic and geomatics communities

1. Background

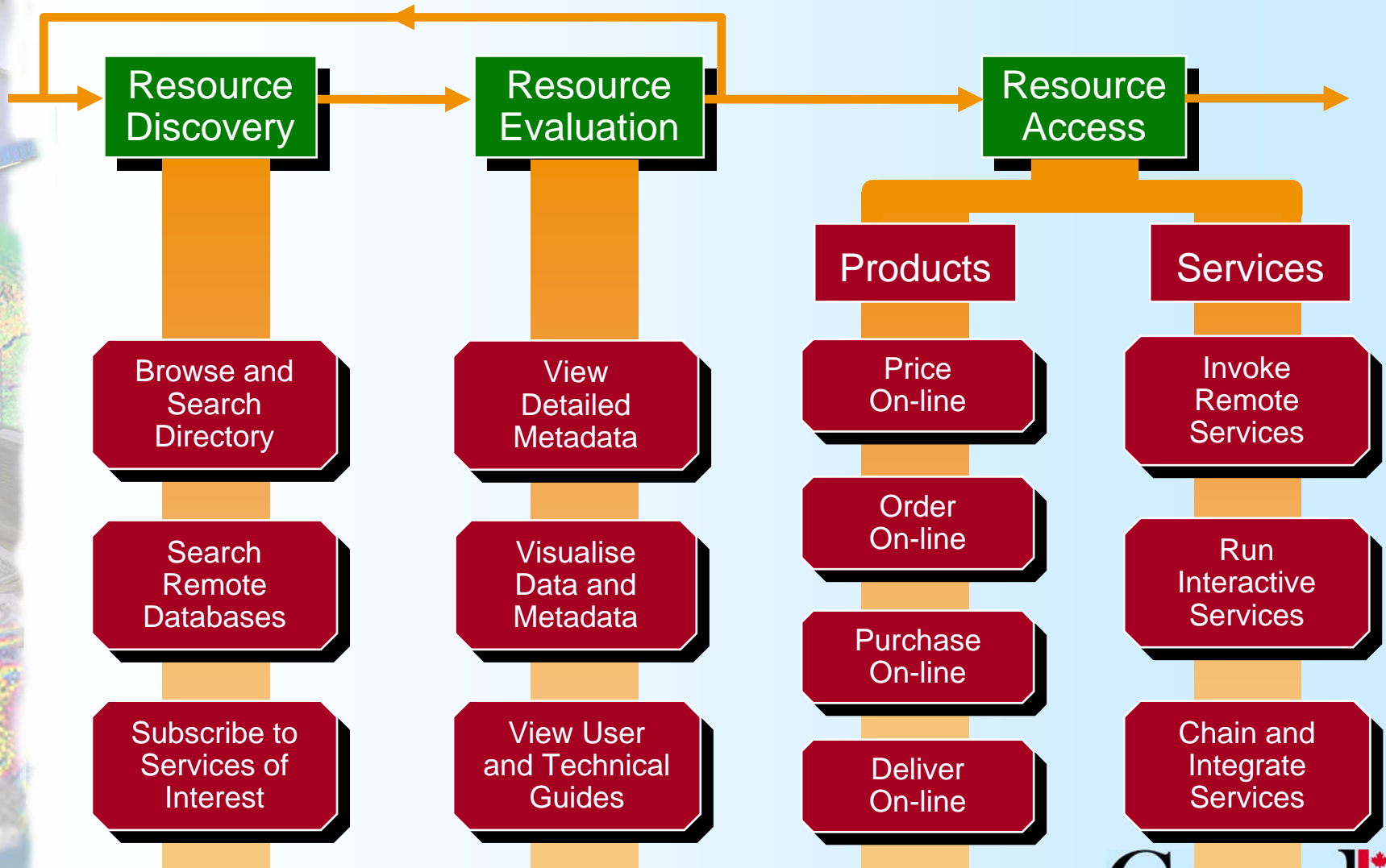
Spatial data infrastructure programs and their respective national and international initiatives are based on distributed architecture and open standards.

Metadata based discovery, web based visualisation and access are well documented and should be referenced when defining requirements and system architecture.

1. Background

- The library community has developed over many years cataloguing specifications and protocols. Emphasis on geographic content is not of primary importance and spatial extent is typically based on points or place name.
- The volume of digital geographic data is incomprehensible (10^{24}) from satellite imagery, airphotos, maps and data warehouses.
- Software tools exist that enable cross walks between these communities.

1. User Paradigm



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1. Concept Implementations

Concept	Client		
	Discover	Visualise	Access
Service	CEONet IDN LIO-ED NIN NASA EOSDIS CEO INFEO FGDC Clearinghouse	National Atlas of Canada	GeoGratis
Technology & Protocols	FGDC/GEO Profile Simple search MetaManager Geoscope Percipio ISO TC211	MapObjects MapGuide OGC Web Mapping (picture case)	OGC Simple Features OGDII FME GeoGateway CubeStor Percipio


2. Discovery - CEONet

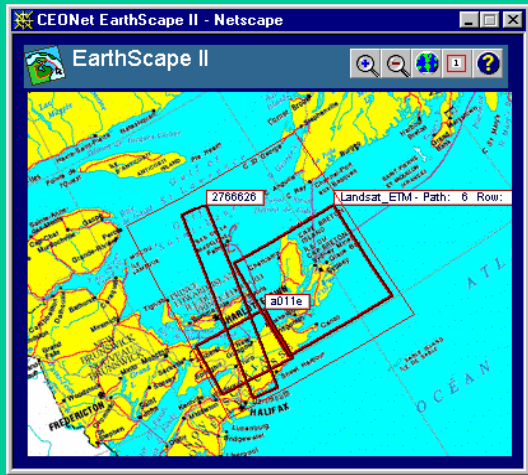
- Discovery, evaluation and access to Canadian and International geospatial data and services.
- Includes distinct services and tools for both consumers and suppliers.
- Allows suppliers to participate at many levels, complementing their online services.
- Key discovery and access component of Canadian Geospatial Data Infrastructure and contributor to Global Spatial Data Infrastructure.

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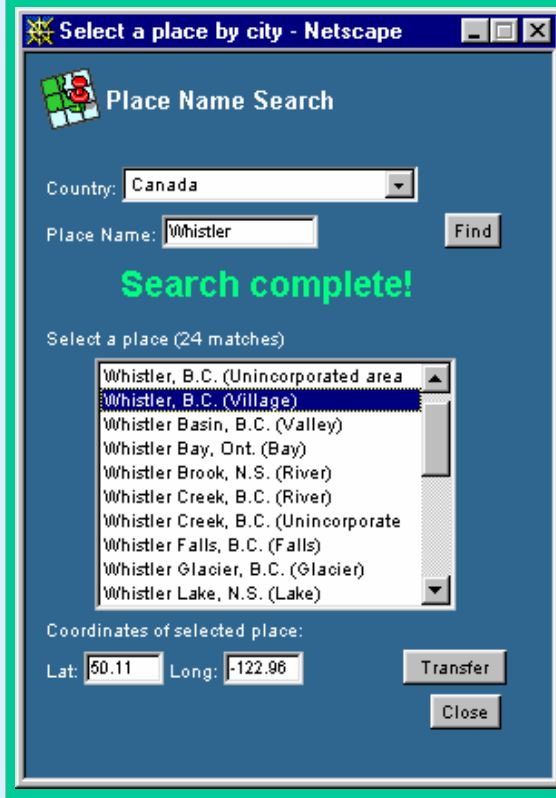
2. Freely Re-usable Components


 Earthscape II: Java-based map viewer client



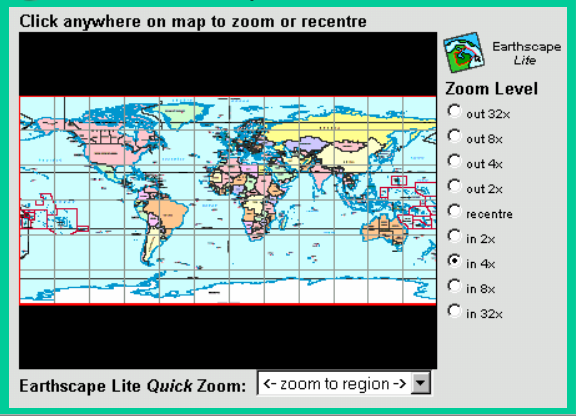
RUCs
provide for geospatial coordinate specification and map footprint display


 Place Name Look-up

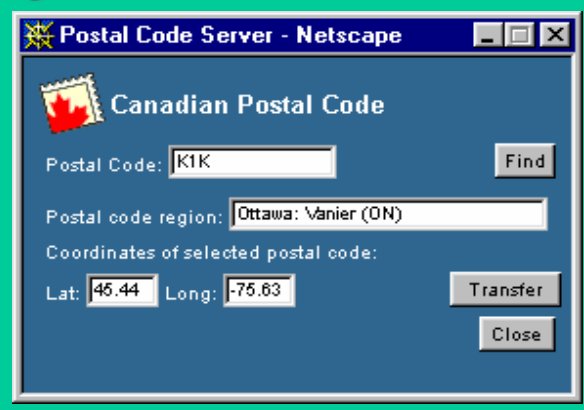


 Earthscape Lite: HTML-based map viewer client

Click anywhere on map to zoom or recentre



 Postal Code Look-up



2. Participating agencies

INTERNATIONAL

USA - NSDI

- FGDC Clearinghouse (in development)
- [CEONet Technology installation](#)

UK - Ordnance Survey

- NGDF (in discussion)
- [CEONet Technology installation](#)

China - BRSI

- Ground station
- [Earthscape](#)

USA - OrbView 3/4

- Ground station
- [Earthscape II](#)

FEDERAL

CCRS, NRCan

- CEONet
- [CEONet Technology installation](#)

J2-GEO, DND

- GEONet
- [CEONet Technology installation](#)

GSC Pacific, NRCan

- [CORDLink](#)
- [WebAPI](#)

Pacific Forestry Centre, NRCan

- National Forestry Information System (NFIS)
- [WebAPI](#)

CCRS, NRCan

- National Atlas of Canada
- [WebAPI](#)

Geomatics Canada, NRCan

- Land Information Network for Canada
- [Earthscape](#), [WebAPI](#)

Earth Sciences Information Centre, NRCan

- Products web page (in discussion)
- [WebAPI](#), [Earthscape Lite/II](#)

ResSources Project, NRCan

- Discovery Engine (in development)
- [Product Directory GEO target](#)

Environment Canada

- Environmental Monitoring and Assessment Network (EMAN)
- [Product Directory GEO target](#)

National Energy Board

- Oil and Gas Operations
- [Discussions on EarthscapeII & WebAPI](#)

Knowledge Branch, Environment Canada

- Community Information Access Network (in development by Intelec / CrossDraw)
- [WebAPI](#), [Earthscape Lite](#)

CCRS, NRCan

- CCRS Earth Observation Catalogue (CEOCat)
- [Earthscape \(soon to be II\)](#)

GSC Atlantic, NRCan

- Canadian MARine Geoscience Information Network (CMARGIN)
- [Earthscape](#)

PROVINCIAL

Alberta Provincial Government

- [EDGE](#)
- [CEONet Technology installation](#)

COMMERCIAL

Intelec & CrossDraw

- IAN - GeoInnovations project involving several partners
- [WebAPI](#), [Earthscape Lite](#)

Hauts Monts Research

- Air Photo Inventory (in development)
- [Discussions Earthscape II & WebAPI](#)

Hegy GeoTechnologies

- Mobile Office GIS Windows Application
- [WebAPI](#)

Compusult Ltd

- MetaManager configuration and testing page
- [Earthscape](#)

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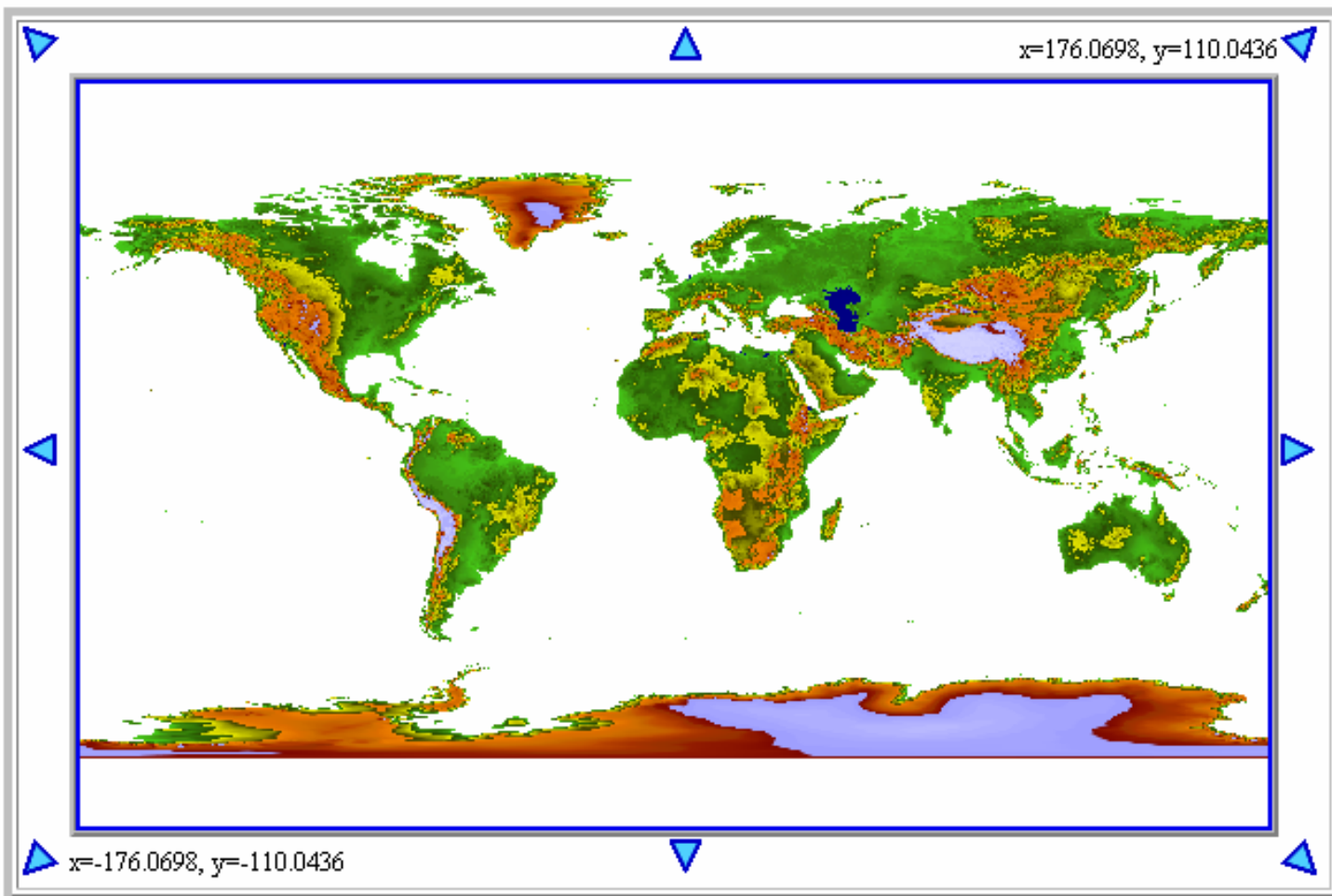
3. Visualisation or Evaluation

- Proprietary
 - Many technically independent solutions - including the National Atlas's of Canada and the U.S. Atlas (e.g. ESRI, MapGuide, MapInfo)
- Open GIS Consortium (www.opengis.org)
 - developing standards to catalogue, view and query maps based on distributed servers and published specifications. (e.g. DataWarehouse)

3. Data Warehouse Characteristics

<http://ceoware.ccrs.nrcan.gc.ca/>

- Published interface specifications
- Distributed data / servers
- Catalogue of servers
- Cascading Servers
- Aggregation
- Projection (lat/long)
- Metadata
- Multi-dimensional
 - multispectral
 - temporal
- RDBMS (Oracle)
- Seamless
- CubeWerx - CubeStor
- ESRI - SDE



 Natural Resources
Canada
Ressources naturelles
Canada
Canada Centre for Remote Sensing
Data Warehouse Prototype

[Help](#)

Legend:

GTOPO30:CCRS

Details

Reset

zoom in zoom out recenter query on: (none)

Data Stores: CCRS

Themes: AVHRR

Layers: AVHRR:CCRS

Selected Layers:

GTOPO30:CCRS

Up

Down

Remove

4. Access

- File based access
 - GeoGratis (<http://geogratis.gc.ca>)
 - USGS Eros Data Centre
- Warehouse based access
- Services
 - Accessed from Discovery via metadata drivers
 - Extraction via format conversion and re-projection services (FME, PCI)

5. Service Chaining or Workflow

“The user will expect the capability to define a complex sequence of processing to be applied to the data, data mining operations that reduce a vast bulk of data to small, concentrated and informative objects; also to specify where the data comes from and where computing operations are executed. It should be possible to initiate this on a personal machine and scheduled execution on chains of superdata and supercomputing resources.”

5. Service chaining objectives

- Abstract framework for development
- Enable interoperable data services
- Development of a service catalogue
- Separate data and service instances
- Enable one data service on another's data
- Advertise and discover services
- Independence of OS and language
- Scalable for enterprise or global deployment

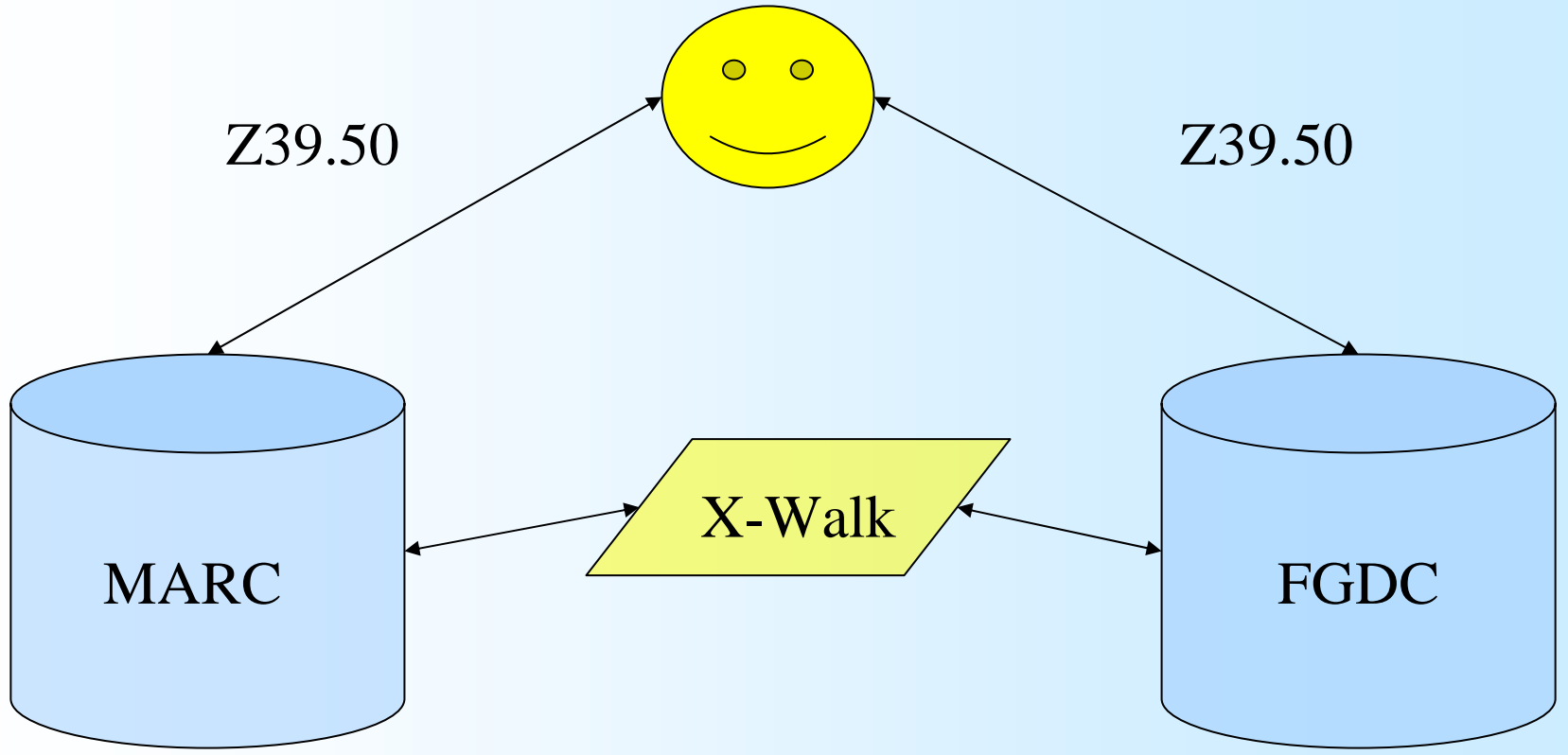
5. Service Chaining or Workflow

- References:
 - ISO TC 211 (<http://www.statkart.no/isotc211>)
 - Committee on Earth Observation Satellites (<http://www.ceos.org>)
 - European - US Joint Workshop on Large Scientific Databases (<http://www.cacr.caltech.edu/euus/>)

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6. Build linkages between metadata, data and services!



Key Points to Leave With

- Metadata, data and services require distributed design and invocation based on a variety of published specifications and standards. Avoid building islands of applications or repositories.
- Consider enhanced linkages between the bibliographic and geomatics worlds.

Cameron Wilson

Natural Resources Canada
Canada Centre for Remote Sensing
615 Booth Street, room 650
Ottawa, ON
Canada K1A 0E9
613-996-6377

Email: cameron.wilson@ccrs.nrcan.gc.ca

