Standards in Action: The Canadian Geospatial Data Infrastructure (CGDI)
Presentation Outline

• Overview of SDIs
• Overview of Canada’s particular standards-based approach to SDI
• The future of GeoConnections and the Canadian Geospatial Data Infrastructure
• Future challenges for Standards in Action
With the advent of digital cartographic technologies and the Internet, mapmaking has been democratized…
...our ability to correlate social, economic and environmental phenomena to geography is unprecedented;

Linking air quality and health care capacity

Air Quality Monitoring Station 03, August 15 2002

Population per square kilometre 2001, NB Health Regions
however, coordination is needed to realize this potential.
Spatial Data Infrastructures

- A worldwide enterprise, SDIs are being developed in over 100 countries;
- Using the Internet, they harness the power of geomatics by enabling sharing of interoperable spatially correlated data;
- Now evolving from centralized warehouses to fully distributed networks which means…
- Demand for standards is now increasing
Defining Spatial Data Infrastructure

**Definition:**
an integrated, on-line mechanism to deliver geospatial data and services and information for applications, better business and policy decision-making, and value-added commercial activities.

**Components:**
collection of people, policies, networked databases and enabling technologies and services
Essential characteristics of any SDI

Components must be...

1. Standardized
2. Networked together
3. Customized for easy 3rd-party access
A Canadian Perspective

Canada’s approach recognizes:

- our nation’s political realities where decision-making, and the information needed to support it, is distributed across a confederated structure;
- Private industry is best suited to develop the components in a model partnership with governments;
- A single ‘backbone’, properly constructed, can support many applications.
GeoConnections: A confederated approach

GeoConnections:
A $60 million federal/provincial/territorial initiative launched in 1999 to build the Canadian Geospatial Data Infrastructure (CGDI) by 2004

Objectives:
1. Increase the amount of geospatial data, information and services available on-line
2. Ease data integration issues through the use of data standards
3. Promote the development of innovative standards-based infrastructure technologies through private sector partnerships
4. Simplify the conditions for geospatial data use and resale
After Phase I: The Backbone is Built

- **Established the Canadian Geospatial Data Infrastructure (CGDI):** Through partnerships with industry, developed elements of the operational infrastructure such as advanced standards-based technologies and applications that increase access, sharing and use of geographic data.

- **Strengthened Federal-Provincial-Territorial collaboration:** Negotiated first ever Ministerial Canadian Geomatics Accord with Canadian provinces and territories; achieved common agreement and policy approach on partnership principles and to licensing data to remove policy barriers to data sharing; provides mechanism for future conversations around standards;

- **Created foundational, standardized data framework**
  Facilitated the provision of seamless, up-to-date and maintained GeoBase framework data at no cost to users.
...Successful Partnerships

- **Leveraging investments and develop partnerships**: The federal government has benefited from a $170M program based on its $60M investment through **cost-sharing partnerships** with industry, academia and provinces/territories, and non-governmental agencies.

- **Growing an innovative geomatics industry**: advancing innovation and growth of the high-tech geomatics sector through partnerships on standards-based Internet-applications and advanced technology development (70% of funds expended with industry = $42M)
GeoConnections Discovery Portal

Find...
- Data
  - Maps, satellite images, data publications and other geospatial data provided by Canadian and international organizations.
- Web Services
  - Discover or advertise web services and related data that conform to CGDI-endorsed standards and specifications.
- Organizations
  - Canadian and international organizations that provide geospatial data, services and expertise.
- Services and Resources
  - Software, hardware, tools, portals, specifications, professional services, ...
  - Developer resources: toolkits, servers, clients, APIs, specifications, ...
  - Also see the CGDI Guide in PDF (4.6 MB) or HTML.

Add or Update...
- Add or Update YOUR content
- Read about the benefits of adding your content
- Update/Create your supplier profile

Free Tools...
- API Guide for the Discovery Portal
- Put maps into your web site using our free developer tools.

Map of the Week
- RadarSat Mosaic of Canada

On Line Free Data supplied by Canadian organizations
- LandSat 7 ETM Data:
  - North American Archive
  - Global Data Catalogue

What's New RSS XML
- Important Message For Users Of Compositional Metamanager Product
- Discovery Portal Downtime
- Release Notice v3.2
GeoBase Themes

GeoBase – standardized framework data, maintained in partnership, and accessible at no cost to users and without redistribution restrictions.
GeoBase Portal
SDI - where standards fit in ...

Standards

ISO/TC 211 Standards In Action Workshop
Montreal, Quebec

ISO/TR 19122 - Qualifications and certification of personnel

ISO 19107 - Spatial schema
ISO 19108 - Temporal schema
ISO 19110 - Feature cataloguing methodology
ISO 19111 - Spatial referencing by coordinates
ISO 19112 - Spatial referencing by geographic identifiers
ISO 19113 - Quality principles
ISO 19114 - Quality evaluation procedures
ISO 19115 – Metadata (GeoConnections endorsed standard)

FGDC – Content Standard for Geospatial Metadata (idem)
ISO/TR 19121 - Imagery and gridded data
ISO 19123 - Schema for coverage geometry and functions
ISO 19127 - Geodetic codes and parameters
ISO 19129 - Imagery, gridded and coverage data framework
ISO 19130 - Sensor and data model for imagery and gridded data
ISO 19131 - Data product specification (in Geobase)
ISO 19138 – Data quality measures
ISO 19139 – Metadata – Implementation Specification
ISO/TC 211 Standards In Action Workshop
Montreal, Quebec

ISO 19117 – Portrayal; ISO 19118 – Encoding; ISO 19119 – Services
ISO 19125-1 - Simple feature access – Common architecture
ISO 19125-2 – SFA – SQL option
ISO 19128 - Web Map Server Interface (GeoConnections endorsed Std)
ISO 19142 – Web Feature Server (GeoConnections endorsed Std)
OGC® Context XML Document (GeoConnections endorsed Std)
OGC® Styled Layer Descriptor (GeoConnections endorsed Std)
OGC® Catalog specification (GeoConnections endorsed Std)
ISO 19136 – Geography Markup Language (GeoConnections endorsed Std)

ISO 19101 – Reference model.

OGC® Reference Model
ISO 19104 – Terminology
ISO 19105 – Conformance and testing
ISO 19106 – Profiles
ISO 19135 – Procedures for items registration

SDI - where standards fit in ...

Access and services
ISO 19101 – Reference model.

OGC® Reference Model
ISO 19104 – Terminology
ISO 19105 – Conformance and testing
ISO 19106 – Profiles
ISO 19135 – Procedures for items registration
Standards in Action

Standards-based technologies used in 2004 to
- Allocate resources effectively while fighting forest fires in British Columbia;
- Track the spread of West Nile Virus across Canada;
- Streamline Canada’s regulatory Environmental Assessment process;
- Facilitate Aboriginal land-use planning processes in Kativik region, Quebec.
Current status and future opportunities

• GeoConnections Renewed in our 2005 Federal Budget for $CAD60 million through 2010

• Renewed Program launched by Minister in June 2005

• Ramping up through user needs assessment and national consultations
Opportunities

• Operating and expanding CGDI to new user communities – adaptation and adoption

• Focusing on key government priorities (public health, public safety, environment/sustainable development, Aboriginal issues)

• Identify early majority catalysts who can champion operational solutions
Shift to User-Driven CGDI

- USERS & DECISION-MAKERS
- COORDINATION
- INFRASTRUCTURE TECHNOLOGY & APPLICATIONS
- DATA & INFORMATION CONTENT

ISO/TC 211 Standards In Action Workshop
Montreal, Quebec
CGDI: A single backbone

Access

Technology & Innovation

Policy

Frameworks

Standards

Int’l-Fed-Prov Partnerships

Int’l-Fed-Prov Partnerships

Disease Surveillance

Environmental Indicators

Climate change modelling

Aboriginal Land Claims

National Atlas

Population Health Trends

Sustainable Community Planning

Disaster Management

Emergency Response

Population Health Trends

Sustainable Community Planning

Disaster Management

Canada

ISO/TC 211 Standards In Action Workshop
Montreal, Quebec
Stakeholders, National & International

- ISO/TC 211
  - OGC
    - member
    - liaison
  - CAC/TC 211
    - Standard Council of Canada
      - Membership
        - Harmonized
    - IACG
      - Federal Standards
        - Federal/Territorial Govt
        - Provinces
        - Municipalities
        - Private Industry
        - Academia
        - NGOs
Realities

• GeoConnections’ future emphasis will be on users in priority areas across Canada;
• Our identification of needs for standards, our work on standards and our adoption of them will have to be responsive to these distributed realities;
• We have a real challenge in responding to thematic needs for support of new standards to support more differentiated capabilities (e.g. for customized metadata profiles)
In Closing…

• Canada first began developing geographic information standards for its own use over 20 years ago.

• GeoConnections has supported the International Organization for Standardization ISO/TC 211 work on Geographic Information/Geomatics, and the Open Geospatial Consortium-OGC in order to build a common base to allow for the compatible support, interoperability and convergence of many sources of geographic data, for the CGDI.

• ISO/TC 211 standards and OGC specifications have reached a level of maturity and GeoConnections remains committed to endorsing/implementing these standards and specifications within the CGDI.

• Our future successes to implementing standards in action will rely on supporting more and more specific application communities – a lot more standards work ahead!
GeoConnections Secretariat

...Building the Canadian Geospatial Data Infrastructure...

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