Standard on Geospatial Data

1. Effective date

1.1 This standard will take effect on June 1, 2009. Departments will have until May 31, 2014 to fully implement section 6.1 of this standard.

1.2 This version of the standard incorporates updates effective April 1, 2012.

2. Application

2.1 This standard applies to departments as defined in section 2 of the *Financial Administration Act*, unless excluded by specific acts, regulations or Orders in Council.

2.2 In this standard, any reference to all or part of national or international standards or specifications shall be construed as a reference to the most recent version of those standards or specifications, as well as any officially issued corrigendum. Any change to referenced national or international standards or specifications that affect this standard shall be implemented no later than one year after the effective date of the change.

2.3 Section 7.1 and the provisions in section 6.3.1 and 6.3.2 relating to the role of the Treasury Board Secretariat in monitoring compliance and directing consequences for non-compliance do not apply with respect to

the Office of the Auditor General, the Office of the Privacy Commissioner, the Office of the Information Commissioner, the Office of the Chief Electoral Officer, the Office of the Commissioner of Lobbying, the Office of the Commissioner of Official Languages and the Office of the Public Sector Integrity Commissioner. The deputy heads of these organizations are solely responsible for monitoring and ensuring compliance with the standard within their organizations, as well as for responding to cases of non-compliance in accordance with any Treasury Board instruments providing principles and guidance on the management of compliance.

3. Context

3.1 Geospatial data is defined as data with implicit or explicit reference to a location relative to the Earth. This standard establishes the information infrastructure to support the discovery and use of geospatial information and to enable information sharing among departments, with other jurisdictions, and with the private sector.

3.2 Geospatial data important to social, economic and cultural well-being is produced or used by federal departments, the provinces, territories, and others. This includes mapping products to support activities such as search and rescue, geospatial intelligence, and fire fighting. Standardization is essential in this context. It allows data from one source to be easily used with those from another source to create a richer and more useful product. The Standard on Geospatial Data adopts measures that have been endorsed by federal departments, provincial and territorial governments, as well as by academic and private sector participants in the Canadian Geospatial Data Infrastructure.

3.3 This standard will allow departments to share data and maximize utility of existing mapping and related products. Departments will also be able to exploit commercially available tools and software in common use around to world to discover, access and use geospatial data. This will result in significant efficiencies in the sharing and use of public sector mapping products. More broadly, it will support departments' mandated programs and services, allowing them to address and respond to economic, environmental and societal challenges more effectively.

3.4 This standard is issued under the authority of section 7 of the Financial Administration Act by the Secretary of the Treasury Board pursuant to Section 3.4 of the *Policy on Information Management* and section 3.5 of the *Policy on the Management of Information Technology*.

3.5 This standard is to be read in conjunction with the *Policy on Information Management*, and the *Policy on the Management of Information Technology*.

4. Definitions

4.1 Definitions to be used in the interpretation of this standard are attached in Appendix A.

5. Standard statement

5.1 Objective

5.1.1 The objective of this standard is to support stewardship and interoperability of information by ensuring that departments access, use and share geospatial data efficiently and effectively to support program and service delivery.

5.2 Expected Results

5.2.1 Geospatial data is shared within and across departments to the greatest extent possible.

5.2.2 Programs and services are able to access and use geospatial data efficiently and effectively.

6. Requirements

6.1 Managers and functional specialists responsible for creating or using geospatial data or for systems that use geospatial data are responsible for:

6.1.1 Applying ISO19115 Geographic information – Metadata according to the conditions outlined in Appendix B.

6.1.2 Applying all of the elements of ISO 19128 Geographic information – Web Map Server Interface according to the conditions outlined in Appendix C.

6.1.3 Applying the North American Profile of ISO19115 Geographic information - Metadata (NAP - Metadata), according to the conditions outlined in Appendix D.

6.2 The departmental CIO or equivalent is responsible for:

6.2.1 Ensuring that software and systems acquired by departments in order to create, edit, generate, parse, harvest, extract, index, browse, or display and visualize metadata, maps or pictorial views of geospatial data comply with the requirements of 6.1.1, 6.1.2 and 6.1.3 or are modifiable to comply with these requirements.

6.3 Monitoring and reporting requirements are as follows:

6.3.1 IM Senior Officials are responsible for supporting their deputy head by overseeing the implementation and monitoring of this standard in their departments, bringing to the deputy head's attention any significant difficulties, gaps in performance or compliance issues and developing proposals to address them, and reporting significant performance or compliance issues to the Chief Information Officer Branch of Treasury Board of Canada Secretariat.

6.3.2 The Treasury Board of Canada Secretariat will monitor compliance with all aspects of this standard and the achievement of expected results in a variety of ways, including but not limited to assessments under the *Management Accountability Framework*, examinations of Treasury Board submissions, Departmental Performance Reports, results of audits, evaluations, and studies.

6.3.3 Treasury Board of Canada Secretariat will review this standard and its effectiveness at the five-year mark from the effective date of the standard (or earlier if warranted).

7. Consequences

7.1.1 Consequences of non-compliance can include informal follow-ups and requests from Treasury Board Secretariat, external audits, or formal direction on corrective measures.

8. Roles and responsibilities of government organizations

Note: This section identifies other departments that have a role in the standard. In and of itself, this section does not confer an authority.

8.1 Treasury Board Secretariat

8.1.1 The Treasury Board Secretariat provides interpretive advice and guidance on this standard.

8.2 Natural Resources Canada

As a department with subject matter expertise in geospatial standards, Natural Resources Canada:

8.2.1 may provide subject matter expertise and advice on the application of this standard, in conjunction with the Inter-Agency Committee on Geomatics or other departments as appropriate.

8.2.2 may provide subject matter expertise and advice in the review of this standard and on compliance issues, in conjunction with the Inter-Agency Committee on Geomatics or other departments as appropriate.

9. References

9.1 Relevant Legislation

- *Access to Information Act*
- *Canada Evidence Act*
- *Copyright Act*
- *Library and Archives of Canada Act*
- *Official Languages Act*
- *Personal Information Protection and Electronic Documents Act (Part 2)*
- *Privacy Act*
- *Security of Information Act*
- *Statistics Act*

9.2 Related Policy Instruments and Publications

- *Policy on Access to Information*
- *Common Services Policy*
- *Communications Policy*
- *Directive on Information Management Roles and Responsibilities*
- *Directive on the Management of Information Technology*
- *Directive on Recordkeeping*
- *Policy on Evaluation*
- *Government Security Policy*
- *Policy on the Duty to Accommodate Persons with Disabilities in the Federal Public Service*
- *Policy on Internal Audit*
- *Policy on Language of Work*
- *Policy on Service* (not yet approved)
- *Policy on the Use of Official Languages for Communications with and Services to the Public*
- *Policy on Privacy Protection*

9.3 Related External Standards and Specifications

- North American Profile of ISO 19115 – Geographic information – Metadata (NAP – Metadata). Canadian General Standards Board, Committee on Geomatics.
- ISO639-2, Codes for the representation of names of languages - Part 2: alpha-3 code (International standardization Organization).
- ISO3166-1, Codes for the representation of names of countries and their subdivisions - Part 1: Country codes (International standardization Organization).

- ISO/TS19101 Geographic information – Reference model (International standardization Organization).
- ISO/TS19103 Geographic information - Conceptual schema language (International standardization Organization).
- ISO19106 Geographic Information – Profiles (International standardization Organization).
- ISO/FDIS19111 Geographic information – Spatial referencing by coordinates (International standardization Organization).
- ISO19118 Geographic information – Encoding (International standardization Organization).
- ISO19119 Geographic information – Services (International standardization Organization).
- ISO19119 DAM 1 Geographic information – Services (International standardization Organization).
- ISO/TS19127 Geographic information – Geodetic codes and parameters (International standardization Organization).
- ISO/DIS19132 Geographic information – Location Based Services - Reference model (International standardization Organization).
- ISO19135 Geographic information – Procedures for item registration (International standardization Organization).
- ISO/DIS19136 Geographic information – Geography markup language (International standardization Organization).
- ISO/TS19139 Geographic information – Metadata - XML schema implementation (International standardization Organization).
- Open geospatial Consortium. OpenGIS® Web Services Common Specification, OGC 05-008.

10. Enquiries

Please direct enquiries about this standard to your department's headquarters. For interpretation of this standard, departmental headquarters should contact:

Office of the Chief Information Officer
Treasury Board of Canada Secretariat
Ottawa ON K1A 0R5
E-mail: dppn@tbs-sct.gc.ca

Copies of standards, specifications, or related information may be obtained from the sources:

Standards Council of Canada
270 Albert Street, Suite 200
Ottawa ON K1P 6N7
Phone: 613-238-3222
Fax: 613-569-7808
Web: http://www.scc.ca/home
https://int.scc.ca/forums/gc/dispatch.cgi (this site restricts access to Government of Canada employees only)

International Organization for Standardization:
http://www.iso.org/iso/en/ISOOnline.frontpage

Appendix A: Definitions

Canadian Geospatial Data Infrastructure CGDI (*infrastructure canadienne de données géospatiales*)
An infrastructure comprised of the developments of the federal, provincial, territorial and private sector partners who are creating the technology,

standards, access systems and protocols necessary to harmonize all of Canada's geospatial databases, and make them available on the Internet. (Source: GeoConnections, Glossary & Acronyms.)

clearinghouse (*centre d'échange*)

A distributed network of geospatial data producers, managers, and users linked electronically. A clearinghouse incorporates the data discovery and distribution components of a spatial data infrastructure for a community of distributed data providers who publish collections of metadata that describe their map and data resources within their areas of responsibility, documenting data quality, characteristics, and accessibility. Each metadata collection, known as a clearinghouse node, is hosted by an organization to publicize the availability of data (Source: United States Federal Geographic Data Committee)

dataset (*ensemble de données numériques*)

an identifiable collection of data. (Source: ISO 19115:2003)

dataset series (*série d'ensembles de données numériques*)

a collection of datasets sharing the same product specification (Source: ISO 19115:2003)

functional specialist (*spécialiste fonctionnel*)

an employee who carries out roles and responsibilities that require function-specific knowledge, skills and attributes in a specific area. For the purposes of this standard, the functional specialists responsible implementing this standards are those who create or use geospatial data or who are responsible for systems that use geospatial data. They may include those working in scientific domains, real property, IM, IT, and others.

geographic information (*information géographique*)

information concerning phenomena implicitly or explicitly associated with a location relative to the Earth. (Source: ISO 19101)

metadata (*métadonnées*)

structured data about data used to aid the identification, description, location or use of information resources. (Source: Government On-line Metadata Standard)

pictorial view (*format image*)

a portrayal of geographic information as a digital image file suitable for display on a computer screen (Source: ISO 19128:2005, definition of map, p. v)

Web Map Service WMS (*service de cartographie Web*)

an Internet-based service that allows clients to display maps and/or images with a geographic component and whose raw spatial data files reside on one or more remote WMS servers. The WMS conforms to the OpenGIS Web Map Server Interface specification (GeoConnections, Glossary & Acronyms)

Appendix B: Implementation Conditions for ISO 19115

ISO 19115 provides a comprehensive set of metadata terms and definitions that describe digital geospatial data and outlines the characteristic properties of the data to be recorded, as well as the values each property should have.

The following conditions apply to the implementation of ISO 19115.

1. This specification applies to the creation of metadata for digital geographic datasets, dataset series, geographic features and feature properties, and for clearinghouse activities. Affected departments are those that produce, use or consume digital geospatial data.
2. Its application is not mandatory for geospatial data that has been retired from use or archived, or for externally acquired data which does not undergo further departmental modification. When

acquiring geospatial data, departments shall specify a preference for datasets which include metadata compliant to this standard.

3. Compliance requires that core and extended metadata related to existing in-use and new geospatial data and applications be in conformance to ISO 19115.
4. Conformance requires that all mandatory elements are implemented according to the standard and all optional elements, to the extent that they are implemented, also conform to the standard.
5. Specific technical compliance requirements are specified in ISO 19115 Clause 6 (Requirements) and Annexes A (Metadata schemas) and B (Data dictionary for geographic metadata). User-defined metadata shall be defined and provided as specified in Annex C (Metadata extensions and profiles). Any metadata claiming compliance shall pass the requirements described in the abstract test suite presented in Annex D (Abstract test suite) of ISO 19115.

Appendix C: Implementation Conditions for ISO 19128

ISO 19128 defines protocols to provide interoperable, uniform access by Hyper Text Mark-up Language (HTML) clients to maps rendered by map servers on the Internet. Software complying with ISO 19128 enables the automatic overlay in ordinary Web browsers of map images obtained from multiple map servers, regardless of map scale, projection, earth coordinate system, storage format, or vendor solution.

The following conditions apply to the implementation of ISO 19128.

1. ISO 19128 applies to in-use and new geospatial data that is to be exposed as pictorial view via the World Wide Web using Web Map Service technologies (WMS).

2. Compliance requires that any department deploying a WMS to present geospatial data as a pictorial view on the Web must use a WMS that conforms to all of the elements of ISO 19128. Some departments may produce geospatial data with no intent to make it accessible through WMS, in which case conformance to ISO 19128 is not necessary.
3. Specific technical compliance requirements describe two classes, a basic WMS and a query-able WMS. Each has two subclasses, one for clients and the other for servers. Compliance requires that both a basic and a query-able WMS shall satisfy the requirements in Annex A (Conformance tests) in the ISO 19128 standard, and guidelines described within the Open Geospatial Consortium Compliance and Interoperability testing program.

Appendix D: Implementation Conditions for NAP - Metadata

The North American Profile of ISO 19115 - Geographic information - Metadata (NAP - Metadata), published by the Canadian General Standards Board, identifies the geospatial metadata that are needed for North America to describe geospatial data, including dataset and dataset series, and related Web services. It supports the interoperability of geospatial information, providing a common framework for the description and representation of geospatial metadata. In addition, this Profile provides a mechanism to support cultural and linguistic adaptability by enabling representation of free text in multiple languages and by introducing the NAP Metadata Register describing metadata in multiple languages. It outlines the characteristic properties of the data to be recorded, as well as the values each property should have, to ensure that metadata elements

are encoded in a clear and consistent manner. The best practices included in the Profile will help to enhance NAP metadata, to support data management, discovery, distribution, application and archive within and beyond their organization.

The following conditions apply to the implementation of NAP:

1. The NAP - Metadata applies to the creation of metadata for digital North American- based datasets, dataset series, and metadata registers. Affected departments are those that produce, distribute, use or consume digital geospatial data.
2. Compliance requires that core and extended metadata related to existing in-use and new geospatial data and applications shall conform to the NAP - Metadata specifications.
3. Conformance requires that all mandatory elements are implemented according to the NAP - Metadata and all optional elements, to the extent that they are implemented, also conform.
4. Specific technical compliance requirements are specified in NAP - Metadata Clause 6 (Metadata Content) and Clause 7 (Cultural and Linguistic Adaptability), and Annexes A (Data Types) and B (Metadata Schemas).
5. Any metadata documents implementing the NAP - Metadata shall be considered in conformance by following the rules stated in Clauses 6 and 7, Annexes A and B, and by meeting the tests presented in Annex C (Conformance Clauses).

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