

Canadian Council of Forest Ministers

**National Forest Information System
(CCFM-NFIS)**

An Overview

May 2004

Canadian Council of Forest Ministers National Forest Information System (CCFM-NFIS)

An Overview

Introduction

In August 2000 the Canadian Council of Forest Ministers (CCFM) agreed on the need to establish an information infrastructure, called the National Forest Information System (NFIS), to answer on matters relating to sustainable forest management in Canada. The Ministers asked the CCFM-NFIS Steering Committee to direct the development of NFIS, including:

- developing a governance model defining the role and responsibility of each jurisdiction,
- defining the information needed to respond to our sustainable forest management commitments,
- examining opportunities for co-operation and co-ordination with other government and department agencies,
- clarifying the infrastructure of the Internet site, and
- taking into account the investments done by each jurisdiction in the respective inventory programs.

The CCFM-NFIS Steering Committee is charged with the phased implementation of NFIS

NFIS may be visited at <http://nfis.org>.

The NFIS Vision

The National Forest Information System vision is to implement the necessary information technology framework to demonstrate sustainable forest management practices in Canada. The framework is being designed to:

- provide ready access to the most current, consistent and reliable forest resources information,
- provide the transparent integration of information across jurisdictional boundaries,
- provide consistency in reporting thereby avoiding different answers being given to the same question,
- reduce costs through the sharing of information technology, and
- eliminate duplication in reporting, resulting in greater efficiency and reduced costs

It will also significantly enhance the capability of participating parties to:

- present an accurate picture of Canadian forest practices,
- make national and international statements on sustainable forest management practices,
- provide the strategic context for provincial, territorial and federal agencies to easily and reliably address regional, national and international challenges to Canadian forest practices,
- support provincial, territorial and federal commitments to open participation in forest policy to citizens by making available the necessary information for informed debate, and
- enable agencies to better deal with cross provincial, territorial and other jurisdictional issues.

Achieving the NFIS vision requires the development and implementation of both a governance model and technical infrastructure.

The Governance Model

The Steering Committee is in the process of defining a governance structure that is efficient and effective and provides opportunity for government and non-government parties to participate in NFIS.

The need to provide information forms the basis of the Governance model. The model is being structured to support ways and means of enhancing outputs and to facilitate cooperation and coordination where required through a range of mechanisms. (Memorandum of Understanding, harmonization agreements or other appropriate mechanisms).

Under this task, the Steering committee is:

- Further defining the data/information collection required to report on Canada's goal, commitments and progress on sustainable forest management (SFM) across Canada. Reporting will address both the national and international commitments such as: the State of Canada's Forests; the Criteria and Indicators of Sustainable Forest Management; the National Forest Strategy; the Climate Change convention; the national forest ecosystem classification for Canada; protected areas; certification schemes; and, the Biodiversity convention.
- Identifying the information/data available to answer to those information needs;
- Identifying data/information gaps to fully report on those information needs;
- Identifying major issues related to forest information, data collection and dissemination, the link with provinces and make recommendations on how to address these at the policy and technological levels; and
- Proposing options for a governance model defining the role and responsibility of each jurisdiction and other forest community interests for governing and funding the new national forest information system.

Product Output

The Committee is defining the necessary operating policies (i.e. the policies, procedures, guidelines and standards) that are needed to institute an effective governance model. Operating policy options are being developed focusing on making Canada's National Forest Information System work effectively, efficiency and economically.

The Technical Infrastructure

The NFIS technical infrastructure includes the information systems and processes for the Web-based access and integrated delivery of data and information sets held by NFIS partners. The technical infrastructure is made up of the following four distinct components:

- Custodial data sets (the data and information held by the partners) to be made available for access,
- generalized data models which allow diverse data representations to be mapped into a common representation,
- the Web-based data and information access and delivery tools and services, and
- the Web Portal.

Custodial Data Sets

The data and information content to be accessed and served by NFIS is that defined under the CCFM-NFIS mandate and as otherwise identified by the NFIS partners. The custodial agencies determine what data and information sets are made available and hold full access control of these sets.

The identified data and information sets are defined as to location, content, format, access security level and other necessary information relevant to their proper interpretation and use.

Generalized Data Model(s)

Generalized data models allow the seamless representation of information by mapping (or translating) attribute information to a common representation. For example, site index may be expressed as a function of base50 or base100, top height or dominant height and breast height age or germination point age. The seamless mapping or reporting of site index requires that it be brought to a single common base.

The vast majority of data and information that is being served by NFIS has been independently collected by governments, NGOs and other agencies and institutions with different content, attribute definitions, collection procedures, resolution, layout or format and scales and for different purposes. The net consequence of this situation is that a generic natural resources subject matter classification hierarchy must be defined and generalized data models must be built. The NFIS classification hierarchy is being designed based on evolving data models currently under development in participating provincial jurisdictions (e.g., Ontario NRVIS and Nova Scotia's GeoNova). The generalized CCFM-NFIS data model are based on existing data models instantiated in Ontario, British Columbia, Nova Scotia and other provinces and territories, the National Forest Inventory, and others as appropriate

Web-based Access and Delivery Tools and Services

The information infrastructure that is being implemented is made up of a data and information independent tools and Web Map and Web Feature services sets. Tools and services include:

- Distributed Access Control protocols including user profile identification,
- metadata capture and registration,
- Web enabled registry of available data and information on participating warehouses,
- Web enabled registry of derivative products and analytical services available on participating warehouses,
- establishment of operational connectivity to participating territorial, provincial, federal and other appropriate warehouses,
- digital library technology services (capture, navigation and search of journals, reports, gray and other literature, data holdings, etc.) using subject classification hierarchies such as Library of Congress, various ecosystem classifications, taxonomic classifications, etc.,
- capability to extract and download full resolution data from distributed data warehouses,
- provision of common geographic units representing authoritative spatial data layers with well-known geometries and unique and fixed feature identifiers, examples may include

- administrative areas, watersheds, terrestrial ecozones, protected areas and geological provinces
- graphical, chart and tabular report generation,
- selective data synthesis and analysis capabilities,
- statistical summaries including, for example, areas, counts, max-min, means, median, mode, standard deviation, etc.,
- spatial real-time annotation capability,
- real-time 3D visualization, and
- multimedia integration (pictorial, textual, map, tabular).

The NFIS architecture consists of a network of content servers working within a common information and services framework. Open GIS Consortium (OGC) Web Map Technologies (WMT) (<http://www.opengis.org/index.htm>) form the basis for vendor-neutral information interoperability in the NFIS network. The common information and services framework allows NFIS member organizations to attach attributes to the shared representations of the landscape and to carry out independent, off-line analyses and compilations for subsequent Web-based delivery through the common framework.

This distributed architecture allows responsibility for the management of information and definition and implementation of services to reside with the custodian, closest to the data source. This approach ensures that the data are authoritative and current and it also provides the custodial agency with full control of access to the data.

CCFM-NFIS Web Portal

The NFIS Web portal provides entry to national, provincial, territorial and other views of forest resources information. The portal provides the following functionality:

- interface with the distributed access control protocols,
- maintenance of jurisdictional/custodial identity of content,
- support of navigation and search of national, provincial, territorial, industrial and other forest resources content,
- provision of spatial and thematic analysis, and
- portrayal of information.

Figure 2 illustrates the conceptual architecture

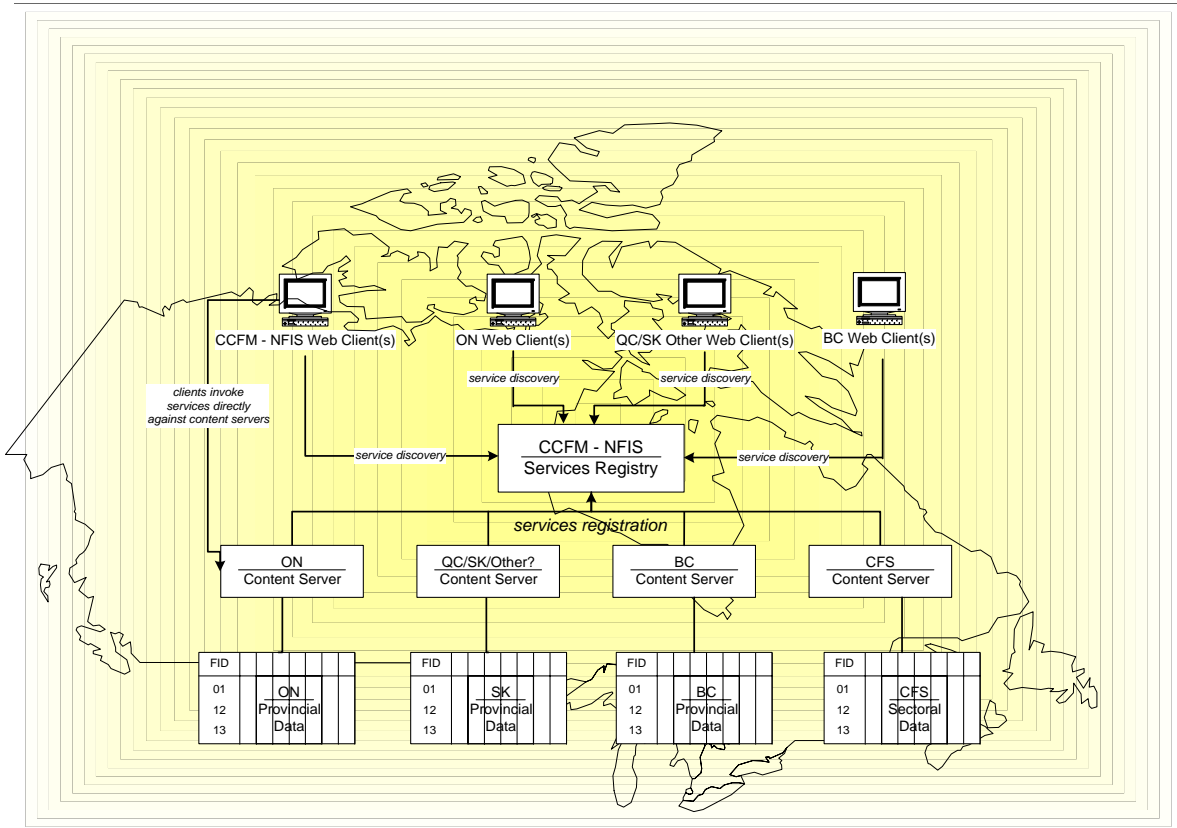


Figure 2. NFIS Conceptual Architecture

CCFM-NFIS Deliverables

The adoption and successful operational implementation of the CCFM-NFIS governance model and technical architecture will allow the Canadian Council of Forest Ministers to:

- 1) Provide Web Portal gateways to, and the delivery mechanism for the portrayal of forest resources spatial and thematic data and information served up by federal, provincial, territorial and other resource management agencies and jurisdictions. The Web Portal will support the registration of data/information sets and services available through participating warehouses, maintain custodial identity and support cross warehouse queries. It will deliver the capability to simplify the finding, analysis and displaying/visualizing of thematic and geospatial forest resources data from any participating government, government agency, industry and NGO.
- 2) Support fully distributed warehouse connectivity through the CCFM-NFIS to federal, provincial, territorial and other agency spatial and thematic forest resources data and information holdings as may be made available. This connectivity will allow Web enabled registry of available products and services by participating warehouses. These services will include loading, discovery, query, representation, transparent merging, integration, extraction, and simple analysis of distributed spatial and thematic data and information.
- 3) Further demonstrate significant advancements in Canada's ability to address global forest issues including matters relating to the sustainable forest management