

**North American Commission for Environmental  
Cooperation (CEC)**



**The NABIN Portal**

**Architecture  
Version 1.2**

**February 2002**

**Intelec Geomatics Inc.**

## Table of Contents

<b>Figures .....</b>	<b>iii</b>
<b>Document Version Control.....</b>	<b>iv</b>
<b>1. System Overview .....</b>	<b>1</b>
1.1 Purpose of the document.....	1
1.2 Concept.....	1
1.3 Technologies supporting the portal.....	2
1.4 A typical use-case: .....	3
<b>2. Data Structure .....</b>	<b>5</b>
2.1 External Databases.....	5
2.2 Internal Databases .....	5
2.3 Portal Database .....	5
2.4 Metadata .....	5
2.5 Geographic Data .....	7
2.5.1 Formats Standards.....	7
2.6 Document Data .....	7
2.7 Hyperlinks .....	7
<b>3. Definition of Functions .....</b>	<b>8</b>
3.1 System: NABIN Portal.....	9
3.1.1 NABIN Portal Environment .....	9
3.1.2 NABIN Portal Access.....	9
3.2 Sub-system 1000: Distributing Data .....	9
3.2.1 Function 1110: Starting the Application.....	9
3.2.2 Function 1120: Using Basic Mapping Functionality.....	11
3.2.3 Function 1130: Query External Databases .....	12
3.2.4 Function 1140: Refresh Menus (“magic wand”) .....	12
3.2.5 Function 1150: Search Information.....	13
3.2.6 Function 1160: Display Tab Content .....	16
3.2.7 Function 1170: Display Documents.....	16
3.2.8 Function 1180: Use Hyperlinks .....	16
3.2.9 Function 1190: Saving NABIN Portal Query.....	16
3.2.10 Function 1210: Saving NABIN Portal Map Composition.....	17
3.3 Sub-system 2000: Managing NABIN Portal.....	17
3.3.1 Function 2110: Managing System Access .....	17
3.3.2 Function 2120: Managing HTML Labels .....	17
3.3.3 Function 2130: Data Description (metadata).....	17
3.3.4 Function 2140: Managing the Legend .....	18
<b>4. Data Model .....</b>	<b>19</b>
4.1 Nabin_Label Table .....	20
4.2 Nabin_Profile Table .....	20
4.3 Nabin_User Table .....	20
4.4 Nabin_Group Table .....	20



4.5	Nabin_Meta Table .....	20
4.6	Nabin_Keyword Table .....	21
4.7	Nabin_Keyword_Meta Table .....	21
4.8	Nabin_Format Table .....	21
4.9	Nabin_Language Table .....	22
4.10	Nabin_Content_Type Table .....	22
4.11	Nabin_Categories Table .....	22



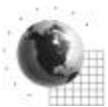
## **Figures**

Figure 1: NABIN Portal General Context.....	2
Figure 2: NABIN Portal Technical Component .....	3
Figure 3: NABIN Portal Data Model .....	19



## Document Version Control

<b>Version</b>	<b>Date</b>	<b>Description</b>
0.1	02-01-09	Preliminary version, for internal review only.
1.0	02-01-17	Version presented to CEC.
1.1	02-01-21	Version following CEC meeting.
1.2	02-02-01	Final version.



# 1. System Overview

## 1.1 Purpose of the document

This document is the formal description of the NABIN portal system. It acts as the detailed plan from which the portal will be implemented, and it is organized in such a way that it supports reasoning about the structural properties of the system.

## 1.2 Concept

The NABIN portal will facilitate the interconnection of different institutions and agencies concerned with biodiversity conservation through North America. There will be links with the Canadian Biodiversity Information Network (CBIN), the US National Biological Information Infrastructure (NBII), the *Comision Nacional para el Conocimiento y Uso de la Biodiversidad* (Conabio), the Inter-American Biodiversity Information Network (IABIN) and the Conservation on Biological Diversity Clearinghouse Mechanism (CHM), Nature Serve, the Yellowstone to Yukon initiative, NOAA, Natural resources Canada, Samarat, CCEA, WHC, DFO and others.

The NABIN portal is a gateway to information and knowledge about biodiversity through North America. With the use of standards, it will provide easy access to information stored in: relational databases, different types of documents (PDF, HTML, etc.), and maps.

### Database data:

- Ecological
- Economical
- Social
- Political/Political
- Stressors
- Taking stock (pollutant database)
- Species
- Threats
- Etc.

### Documents data:

- Reports
- Contacts
- Projects description
- Web sites
- References
- Discussion group
- Calendar
- Documents



- Biodiversity strategy
- Etc.

#### Maps:

- All the information will be geographically referenced.

The particularity of the portal is the geographic-centric view of the information on North America biodiversity conservation. All the information will be referenced on maps. The portal will always offer a clickable map and the surrounding functions will be linked to the cartographic selection.

The portal will offer a way to query outside databases through the use of standard protocols (Z39.50 GEO).

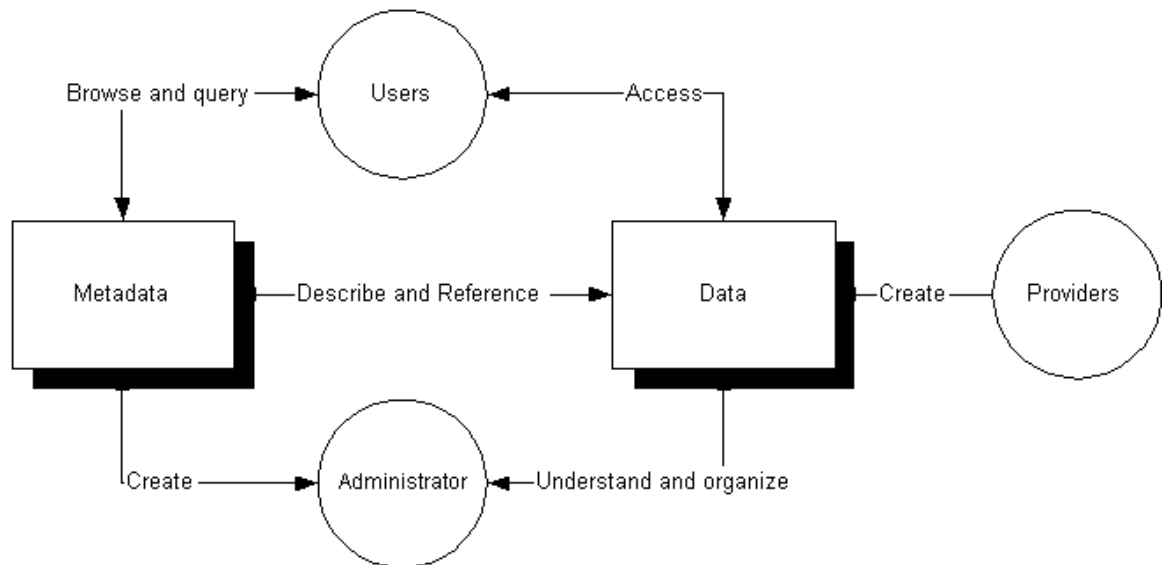


Figure 1: NABIN Portal General Context

### 1.3 Technologies supporting the portal

The technologies supporting the portal are:

- Operating System, Microsoft Windows 2000 server
- Web server (Microsoft Internet Information Services (IIS) 5.0)
- Servlet engine (ServletExec by New Atlanta)
- Internet mapping service (ArcIMS 3.1 by ESRI)
- Database (SQL Server by Microsoft)



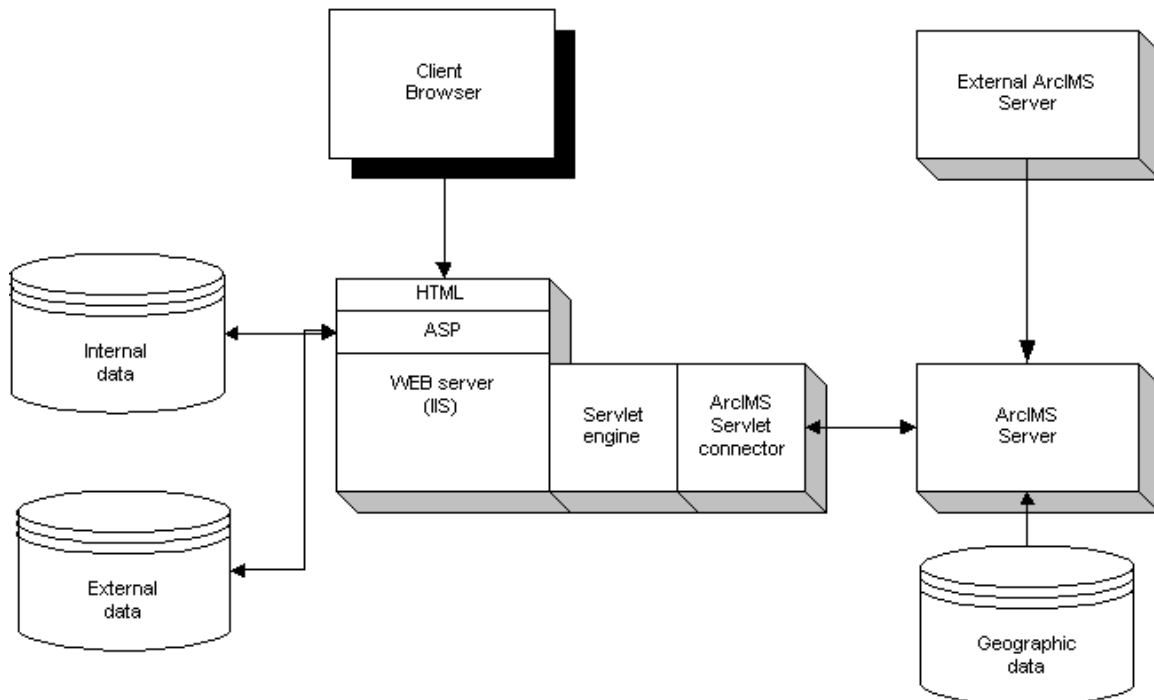


Figure 2: NABIN Portal Technical Component

#### 1.4 A typical use-case:

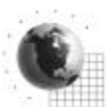
- The user accesses the welcome page of the portal.
- The user explores the North America map (pan, zoom, etc) until he finds the area of interest. ALTERNATIVELY, the user can browse through a list of country/states/etc. and the map automatically point to that location. ALTERNATIVELY, the user can complete a search form.
- The user presses the *refresh* (“magic wand”) button:
  - The portal searches through the database, the objects corresponding to the area previously identified.
  - The portal refreshes the menus (top and left hand side) so that the button labels reflect the number of objects found during the search.
- The user selects an item on the menus:
  - The top menu gives access to different maps, documents, discussion groups, contacts, projects, etc.<sup>1</sup>
    - If the user selects “maps”: the main display area is refreshed with the data selected by the user.

<sup>1</sup> Documents can be sorted by year, title, author name, etc.





- If the user selects other objects, a pop-up window will either open the document (pdf file), or open the hyperlink to the documents.
- The left hand side menu gives access to databases, by query forms.
  - The user completes the query form
  - The portal establishes a connection to the (remote) database
  - The portal retrieves & displays the results.
  - ALTERNATIVELY, the user can enter some data (using forms) to some of the databases
  - *For the demo, it will not be possible to receive the results of queries directly on a map.*



## **2. Data Structure**

### **2.1 External Databases**

The NABIN portal cannot impose its own standard to external collaborators, so there will be a case-by-case process to establish a link between the portal and each external database.

The privileged way to access external databases is the Z39.50 protocol with the GEO profile.

### **2.2 Internal Databases**

Internal databases offer more technical flexibility to establish links. As for external database access, it will be a case-by-case study to establish a link between the portal and the different CEC databases.

The privileged way to access internal databases is the Z39.50 standard, with the GEO profile.

### **2.3 Portal Database**

The NABIN portal has its own database. The main functions of this database are to:

- Store the portal administrative tables (HTML labels so that the portal web pages can easily be translated, user tables to be able to give certain privileges, etc).
- Store the metadata information offered by the portal.

### **2.4 Metadata**

As mentioned above, the portal needs a way to document the information to which the users will have access. The metadata standard that will be used is a subset of the FGDC - Content standard for digital geospatial metadata.

The following fields will be used to describe any information known to the portal:

#### **1.0 Identification Information**

#### 1.2 Description

##### 1.2.1 Abstract

##### 1.2.3 Supplemental Information

#### 1.4 Status

##### 1.4.1 Progress

##### 1.4.2 Maintenance and Update Frequency

#### 1.5 Spatial Domain

##### 1.5.1 Bounding Coordinates

##### 1.5.1.1 West Bounding Coordinate

##### 1.5.1.2 East Bounding Coordinate



- 1.5.1.3 North Bounding Coordinate
- 1.5.1.4 South Bounding Coordinate
- 1.6 Keywords
  - 1.6.1 Theme
    - 1.6.1.2 Theme Keyword
  - 1.6.2 Place
    - 1.6.2.2 Place Keyword
- 1.15 Language<sup>2</sup>
- 1.16 Content type<sup>2</sup>
- 1.17 Category<sup>2</sup>

## **6.0 Distribution Information**

- 6.1 Distributor
- 6.4 Standard Order Process
  - 6.4.2 Digital Form
    - 6.4.2.1 Digital Transfer Information
      - 6.4.2.1.1 Format Name
      - 6.4.2.1.2 Format Version Number
      - 6.4.2.1.4 Format Specification
      - 6.4.2.1.7 Transfer Size
    - 6.4.2.2 Digital Transfer Option
      - 6.4.2.2.1 Online Option
        - 6.4.2.2.1.2 Access Instructions

## **7.0 Metadata Reference Information**

- 7.1 Metadata Date

## **8.0 Citation Information**

- 8.1 Originator
- 8.2 Publication Date
- 8.4 Title
- 8.5 Edition
- 8.8 Publication Information
  - 8.8.1 Publication Place
  - 8.8.2 Publisher
- 8.10 Online Linkage (URL)

## **9.0 Time Period Information**

- 9.3 Range of Dates/Times
  - 9.3.1 Beginning Date
  - 9.3.3 Ending Date

## **10.0 Contact Information**

- 10.1 Contact Person Primary
  - 10.1.1 Contact Person
  - 10.1.2 Contact Organization
- 10.3 Contact Position
- 10.4 Contact Address
  - 10.4.2 Address
  - 10.4.3 City
  - 10.4.4 State or Province
  - 10.4.5 Postal Code
  - 10.4.6 Country

---

<sup>2</sup> Not part of the FGDC metadata standard.



- 10.5 Contact Voice Telephone
- 10.7 Contact Facsimile Telephone
- 10.8 Contact Electronic Mail Address

## **2.5 Geographic Data**

### **2.5.1 Formats Standards**

The geographic portion of the NABIN portal is based on the ArcIMS software, version 3.1, by ESRI. The following formats are supported by ArcIMS:

- Vector data
  - Shapefiles
  - ArcSDE layers
- Raster data
  - ArcSDE raster
  - JPEG
  - TIF
  - GIF
  - BMP
  - MrSID
  - Etc.

Since CEC does not use the ArcSDE software, the shapefile format will be the only vector format supported.

## **2.6 Document Data**

In addition to various cartographic and relational database data, the NABIN portal gives access to a variety of documents formats:

- HTML
- Text
- Adobe acrobat PDF
- Etc.

## **2.7 Hyperlinks**

The portal will also give access to different Web links such as discussion groups and other biodiversity pages. Most of the time, these links will be called inside a pop-up window, because of the lack of space in the main portal layout.



### **3. Definition of Functions**

The NABIN will support the following functions and applications.

**System: NABIN Portal**

**Sub-system 1000: Distributing Data**

- 1110: Starting the Application
- 1120: Using Basic Mapping Functionality
  - 1121: Navigating Graphically
  - 1122: Navigating by menu
  - 1123: View Legend
  - 1124: Consult Map Descriptive Data
- 1130: Query External Databases
  - 1131: Build a Query
  - 1132: Establish the Connection
  - 1133: Execute a Query
  - 1134: Retrieve Query Results
  - 1135: Display Query Results
- 1140: Refresh Menus ("magic wand")
- 1150: Search Information
- 1160: Display Tab Content
- 1170: Display Documents
- 1180: Use Hyperlinks
- 1190: Saving NABIN Portal Query
  - 1191: Saving a Query
  - 1192: Executing a Saved Query
- 1210: Saving NABIN Portal Map Composition
  - 1211: Saving Map Composition
  - 1212: Retrieving Map Composition

**Sub-system 2000: Managing NABIN portal**

- 2110: Managing System Access
- 2120: Managing HTML Labels
- 2130: Describing Data (metadata)
  - 2131: Creating New Object
  - 2132: Modifying object
  - 2133: Deleting Object
  - 2134: Querying Object
- 2140: Managing the Legend



### **3.1 System: NABIN Portal.**

The NABIN portal is composed of two sub-systems:

- Data Distribution
- Management of Portal

The data distribution sub-system includes all the functions that will give user access to the information described inside the portal database.

The management sub-system will be used by the portal administrators to populate and maintain the database.

#### **3.1.1 NABIN Portal Environment**

The portal has one database for both sub-systems. The technology of the database will be Microsoft SQL-server, on Windows 2000 server.

To consult the portal information, there will be a web interface, tightly integrated to ArcIMS.

#### **3.1.2 NABIN Portal Access**

All users will have access to the data distribution sub-system.

Designated administrators will have access to the management sub-system.

### **3.2 Sub-system 1000: Distributing Data**

This sub-system main objective is to give access to the different internal and external data.

This sub-system is web-based and it is using ArcIMS for the geographical portion.

#### **3.2.1 Function 1110: Starting the Application**

This function allows the portal to identify the user and start the ArcIMS HTML client.

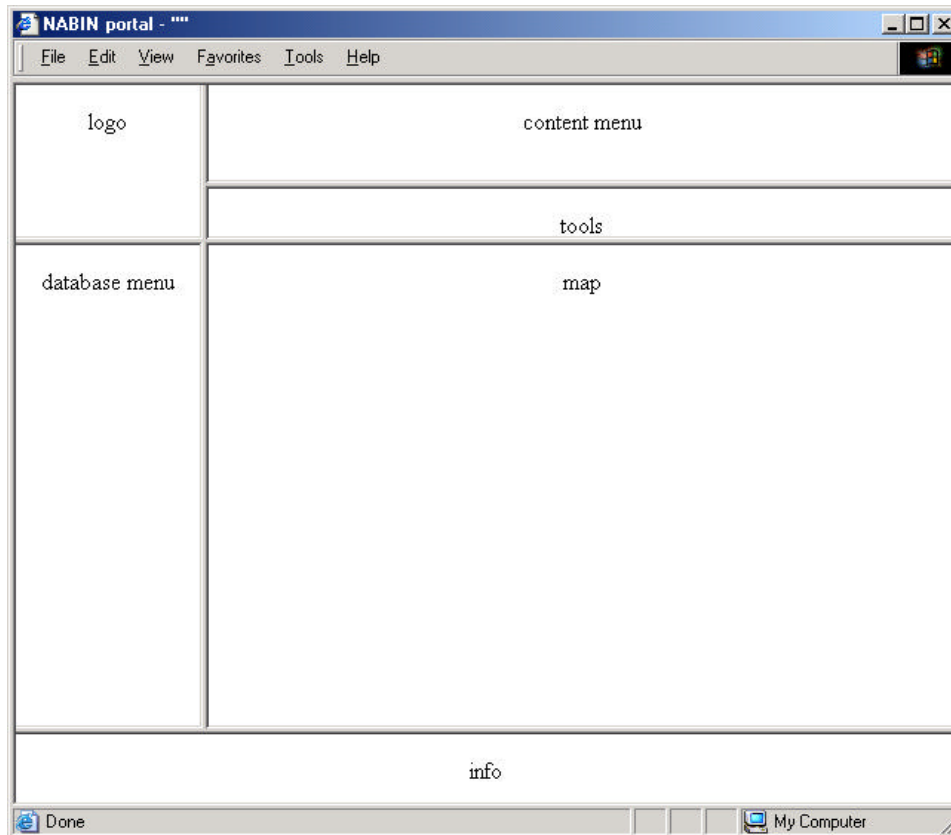
The user must enter a valid username and password, the portal validates the answers by looking in a table inside the RDBMS.

In the case of a valid username/password, the ArcIMS client is started; else an error message is displayed on the screen.

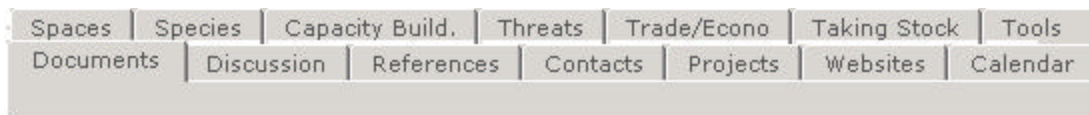
#### ***ArcIMS html client:***

The ArcIMS html client is divided into 5 visible frames:





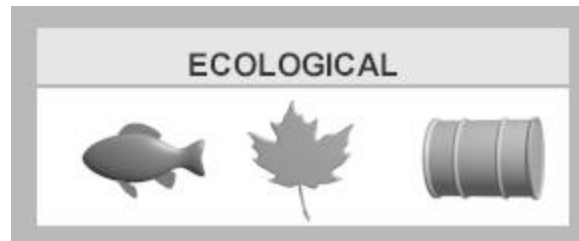
- Logo : NABIN logo.
- Content menu: composed of different tabs is updated by the refresh function. The following tabs are included:



- Spaces: Maps about terrestrial and marine ecoregions, priority regions, priority areas and protected areas.
- Species
- Capacity building
- Threats
- Trade & economy
- Taking stock
- Tools
- Documents
- Discussion: “listserv” archive
- References: documents, articles.



- Contacts: List of reference person.
- Projects: CEC project summary.
- Calendar: CEC events, listed and on calendar.
- Web sites: associated organization's sites.
- Tools: Include the navigation tools (map tools and menus tools) and a search tool.
- Database menu: Will have different internal and external databases links, group by categories and represented by icons:



- Ecologic
- Economic
- Social
- Legal/politic
- Stressors
- Map: The map frame is the main navigation tool, powered by ArcIMS.
- Info: Different information will appear inside the info frame (needed by ArcIMS).

### 3.2.2 Function 1120: Using Basic Mapping Functionality

This function is using out of the box functionalities from ArcIMS, to give the user full control of the area displayed on the map frame.

#### ***Processing unit 1121: Navigating Graphically***

Zoom in, zoom out, pan, full view.

#### ***Processing unit 1122: Navigating by Menu***

Beside the graphical navigation, a more guided navigation tool is offered to the user with the navigation pull down menu. With this menu, the user can drill down from countries (Canada, United States, Mexico) to states or provinces.





**Processing unit 1123: View Legend**

Usually the legend is displayed inside a frame beside the map frame. Since the space is limited, the legend will be displayed inside a pop-up window. The user will be able to choose which maps will be visible or not.

**Processing unit 1124: Consult Map Descriptive Data**

Using the ArcIMS “i” identify button.

**3.2.3 Function 1130: Query External Databases**

All external database queries will be processed through the Z39.50 standard.

**Processing unit 1131: Build a Query**

The portal will build a form based on the database content (the available fields for each known database will be described inside the metadata).

The user will fill the form and submit it to the portal.

The portal will build a query according to the user specification.

**Processing unit 1132: Establish the Connection**

This unit establishes a Z39.50 connection.

**Processing unit 1133: Execute a Query**

This unit sends to query to the database.

**Processing unit 1134: Retrieve Query Results**

This unit retrieves the results of the query.

**Processing unit 1135: Display Query Results**

This final unit displays the results, if any, inside a HTML table. This unit is using a pop-up window.

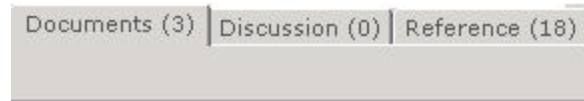
**3.2.4 Function 1140: Refresh Menus (“magic wand”)**

The user starts the «refresh» function.

The portal will:

- Take the geographic extent on the map frame;
- Query the internal database for objects covering the extent;
- Refresh the menus (top et left hand) by specifying the number of objects by tab:





- Refresh the database menu and highlight the database icon where there is information pertinent to the user query.



### 3.2.5 Function 1150: Search Information

The user completes a simple free-text search form and submits it to the portal.

The portal:

- Searches through the internal database for the user input
- Displays the results in a pop-up window.

The NABIN portal internal database search can be of two types:

#### **Free-text keyword search**

The first type is a free-text keyword search through all fields of the database (*à la* Google)



The following fields will be search inside the database:

FGDC Item		Type	Domain
Number	Name		
1.2.1	Abstract	Text	Free text
1.2.3	Supplemental Information	Text	Free text
1.6.1.2	Theme Keyword	Text	Free text
1.6.2.2	Place Keyword	Text	Free text
8.1	Originator	Text	Free text
8.4	Title	Text	Free text

#### **Supervised search**

The second type of internal search is a supervised search. The search criteria are divided in five classes: location, subject, format, time period and language.



Location: There will be 3 ways of defining the location criteria:

1. Pull-down place name



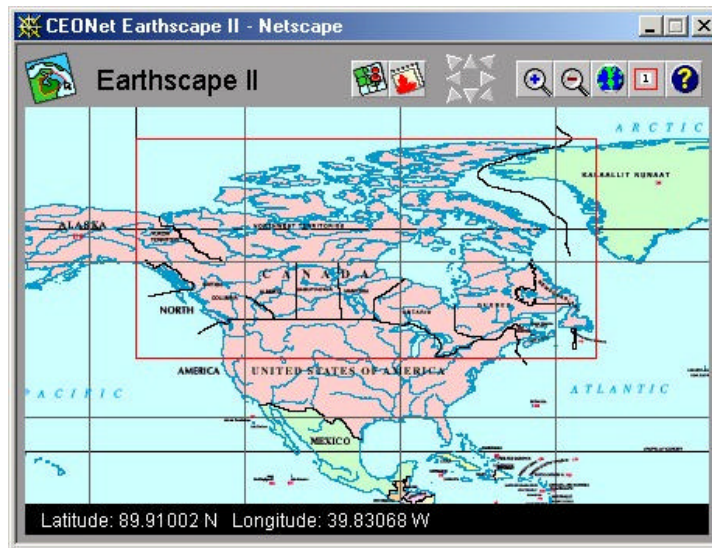
The user chooses a place from the pull-down menu. The menu contains the countries names and provinces or states. The location chosen will populate the exact boundary section.

2. Enter the exact boundary

North	South	East	West
84	42	-52	-141

3. Draw on a map

Will call up a Java applet<sup>3</sup> also populating the exact boundary section.



The fields that will be used for searching the location criteria are:

FGDC Item		Type	Domain
Number	Name		
1.5.1.1	West bounding coordinate	Real	-180.0 <= West Bounding Coordinate < 180.0
1.5.1.2	East bounding coordinate	Real	-180.0 <= East Bounding Coordinate <= 180.0
1.5.1.3	North Bounding Coordinate	Real	-90.0 <= North Bounding Coordinate <= 90.0; North Bounding
1.5.1.4	South Bounding Coordinate	Real	-90.0 <= South Bounding Coordinate <= 90.0; South Bounding Coordinate <= North Bounding Coordinate

<sup>3</sup> Earthscape II, from CEONET web site (<http://ceonet.gc.ca>).



**Subject:** The subject (or keyword) will be specified from a pull-down menu. It is not possible in the “supervised search” to enter free-text keyword.

The list will be in the language specified by the user.

In all, five keywords can be specified. The search will use a boolean AND between keywords.

Select a keyword :  
(Search Method : first keyword **AND** second keyword **AND** ...)

	# Remove
	# Remove
	# Remove
	# Remove
	# Remove

The fields that will be used for searching the subject criteria are:

FGDC Item		Type	Domain
Number	Name		
1.1.6.2	Theme Keyword	Text	From a look-up table (nabin_keyword and nabin_keyword_meta)

**Format:** The format is based on the “format name” field in the metadata table. The user will choose from a pull-down menu.

Format All format types ▾

FGDC Item		Type	Domain
Number	Name		
6.4.2.1.1	Format name	Text	From a look-up table (nabin_format)

**Time period:** User can specify a starting and/or ending date

From 0 ▾  
To 2002 ▾

FGDC Item		Type	Domain
Number	Name		
9.3.1	Beginning date	Number	> 0
9.3.3	Ending date	Number	Enddate > Begindate



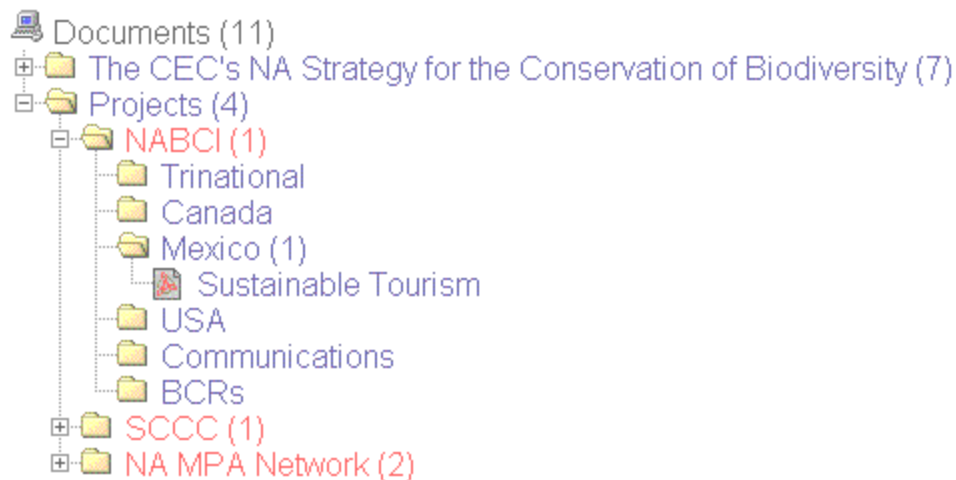
Language: The user can choose from a pull down menu.

Language

FGDC Item		Type	Domain
Number	Name		
1.15	Language	Text	All, Spanish, English, French

### 3.2.6 Function 1160: Display Tab Content

Organizes inside a pop-up window the list of objects corresponding to the geographical area of interest. The organization of each tab content will vary, but the look will be the same:



### 3.2.7 Function 1170: Display Documents

Triggers the acrobat reader plugin to view the pdf file.

### 3.2.8 Function 1180: Use Hyperlinks

Uses a pop-up window to access different links.

### 3.2.9 Function 1190: Saving NABIN Portal Query

This function is giving the user opportunity to store and retrieve a query to the portal. To do this, the portal will use “cookies”.

#### ***Processing unit 1191: Saving a Query***

The query to the portal is build with the help of a form. At the bottom of the form, the user can either execute the query or saving it for later use.



When saving a query, the portal:

- Verify that the user's browser is accepting cookies.
- Stores the query form information inside a cookie.

### ***Processing unit 1192: Executing a Saved Query***

When inside the search form, the user can retrieve the content of a saved query:

- The portal read the content of the saved query inside the cookie.
- The portal refresh the field according to the cookie content
- The user presses the "search" button.

### **3.2.10 Function 1210: Saving NABIN Portal Map Composition**

It is possible for the user to specifies which maps are visible or not and save this list. This is accomplished inside the legend page.

#### ***Processing unit 1211: Saving Map Composition***

Once the user press the save button, the portal will write a cookie the visible themes.

#### ***Processing unit 1212: Retrieving Map Composition***

From the legend page, the user can retrieves his maps list from the content of a cookie and the portal will refresh the map frame accordingly.

## **3.3 Sub-system 2000: Managing NABIN Portal**

These functions are restricted to the administrator(s) of the portal. They are accessed by a different web page.

### **3.3.1 Function 2110: Managing System Access**

Two tables control all accesses: the first one for profiles, the second one for users. The portal will verify the eligibility of the login administrator.

### **3.3.2 Function 2120: Managing HTML Labels**

All labels inside the portal reside inside a table. This way the translation of the HTML pages in different languages is greatly facilitated.

### **3.3.3 Function 2130: Data Description (metadata)**

All the objects recognised by the portal need to be described in a standard manner. The function is dealing with the maintenance of the metadata.



***Processing unit 2131: Create New Object***

The administrator will complete a form inside an HTML page to describe a new object.

The form will be submitted to the portal and stored inside the local database.

***Processing unit 2132: Modify Object***

The administrator can modify an existing object by the mean of an HTML based form.

***Processing unit 2133: Delete Object***

The administrator can select an object and delete its metadata.

***Processing unit 2134: Query Object***

The administrator can search for a particular object and change or delete it.

**3.3.4 Function 2140: Managing the Legend**

The manipulation of the legend is done with the help of ArcAuthor (module of ArcIMS).



## 4. Data Model

This section describes the structure of the tables that will be used by the NABIN portal.

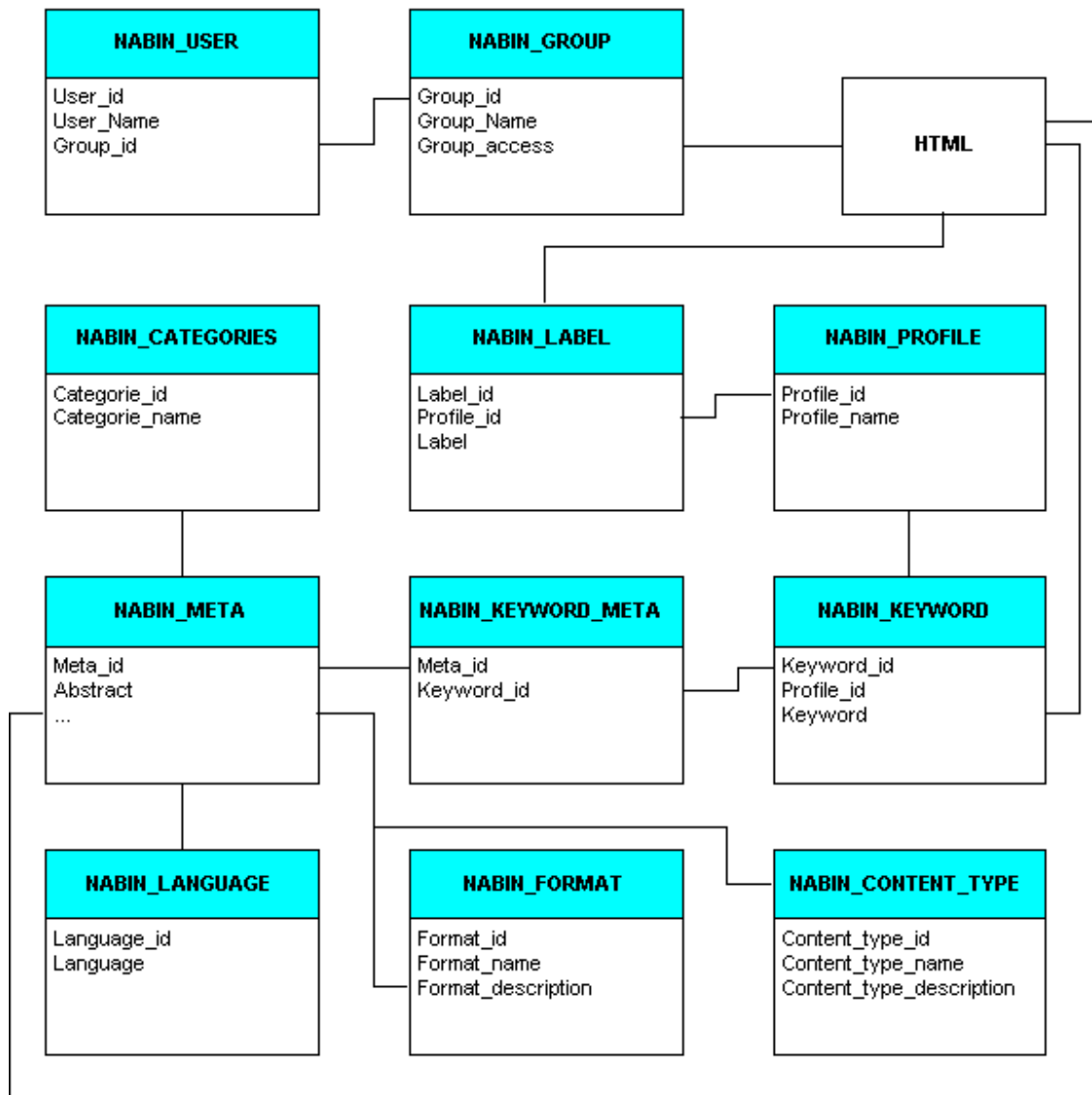


Figure 3: NABIN Portal Data Model





#### 4.1 Nabin\_Label Table

Key	Column	Type	Description
PK	Label_id	Varchar2(12)	Unique identifier
FK1	Profile_id	Number(2,0)	Language profile
	Label	Varchar2(255)	Label

#### 4.2 Nabin\_Profile Table

Key	Column	Type	Description
PK	Profile_id	Number(2,0)	Unique identifier
	Profile_name	Varchar2(15)	Profile name. Domain: "french", "english", "spanish".

#### 4.3 Nabin\_User Table

Key	Column	Type	Description
PK	User_id	Number(2,0)	Unique identifier
	User_name	Varchar2(50)	User name
FK1	Group_id	Number(2,0)	Link to group

#### 4.4 Nabin\_Group Table

Key	Column	Type	Description
PK	Group_id	Number(2,0)	Unique identifier
	Group_name	Varchar2(50)	Group name
	Group_access	Varchar2(15)	Type of access. Domain "read", "write", "query", "admin"

#### 4.5 Nabin\_Meta Table

Key	Column	Type	Description
PK	Meta_id	Number(2,0)	Unique identifier
	Abstract	BLOB	Abstract
	Supplinf	BLOB	Supplemental Information
	Progress	Varchar2(25)	The state of the data set. Domain: "Complete" "In work" "Planned"
	Update	Varchar2(25)	Maintenance and Update Frequency Domain: "Continually" "Daily" "Weekly" "Monthly" "Annually" "Unknown" "As needed" "Irregular" "None planned" free text
	Westbc	Number(4,2)	West Bounding Coordinate Domain: -180.0 <= West Bounding Coordinate < 180.0
	Eastbc	Number(4,2)	East Bounding Coordinate Domain: -180.0 <= West Bounding Coordinate < 180.0
	Northbc	Number(4,2)	North Bounding Coordinate. Domain: -90.0 <= North Bounding Coordinate <= 90.0; North Bounding



			Coordinate >= South Bounding Coordinate
	Southbc	Number(4,2)	South Bounding Coordinate. Domain: -90.0 <= South Bounding Coordinate <= 90.0; South Bounding Coordinate <= North Bounding Coordinate
FK1	Formid	Varchar2(5)	Format Id
	Formvern	Varchar2(10)	Format Version Number
	Formspec	Varchar2(50)	Format Specification
	Transize	Number(4,1)	Transfer Size in megabytes
	Accinstr	Varchar2(255)	Access Instructions
	Metd	Date	Metadata Date
	Origin	Varchar2(255)	Originator
	Pubdate	Varchar2(25)	Publication Date
	Title	Varchar2(255)	Title
	Edition	Varchar2(25)	Edition
	Pubplace	Varchar2(50)	Publication Place
	Publish	Varchar2(255)	Publisher
	Onlink	Varchar2(255)	Online Linkage (URL)
	Begdate	Varchar2(50)	Beginning Date
	Enddate	Varchar2(50)	Ending Date
	Cntper	Varchar2(255)	Contact Person
	Cntorg	Varchar2(255)	Contact Organization
	Cntpos	Varchar2(255)	Contact Position
	Address	Varchar2(255)	Contact Address
	City	Varchar2(100)	City
	State	Varchar2(50)	State or province
	Postal	Varchar2(10)	Postal Code
	Country	Varchar2(50)	Country
	Cntvoice	Varchar2(25)	Contact Voice Telephone
	Cntfax	Varchar2(25)	Contact Facsimile Telephone
	Cntemail	Varchar2(255)	Contact Electronic Mail Address
FK2	Language_id	Number(2,0)	Language id
FK3	Content_type_id	Number(2,0)	Content type id
FK4	Category_id	Number(2,0)	Category Id

#### 4.6 Nabin\_Keyword Table

Key	Column	Type	Description
PK	Keyword_id	Number(2,0)	Unique identifier
FK1	Profile_id	Number(2,0)	Profile id
	Keyword	Varchar2(100)	Keyword

#### 4.7 Nabin\_Keyword\_Meta Table

Key	Column	Type	Description
FK1	Keyword_id	Number(2,0)	Keyword id
FK2	Meta_id	Number(2,0)	Metadata id

#### 4.8 Nabin\_Format Table

Key	Column	Type	Description
PK1	Format_id	Varchar2(5)	Format id



	Format_name	Varchar2(50)	Format name. Domain: "PDF", "TXT", "HTML", etc.
	Format_description	Varchar2(50)	Description

#### 4.9 Nabin\_Language Table

Key	Column	Type	Description
PK1	Language_id	Number(2,0)	Query id
	Language	Varchar2(50)	Language. Domain: "French", "English", "Spanish"

#### 4.10 Nabin\_Content\_Type Table

Key	Column	Type	Description
PK1	Content_type_id	Varchar2(5)	Content id
	Content_type_name	Varchar2(50)	Content name. Domain: "Document", "Database", "Spaces", "Species", "discussion", etc.
	Content_type_description	Varchar2(50)	Description

#### 4.11 Nabin\_Categories Table

Key	Column	Type	Description
PK1	Category_id	Varchar2(5)	Category id
	Category_name	Varchar2(50)	Category Name. Domain: "CEC", "Partners", "External"

