RESULTS of the

COINAtlantic SEARCH UTILITY (2008-09)

THIRD PARTY REVIEW

Prepared for: Atlantic Coastal Zone Information Steering Committee

Prepared by: Watershed Technologies

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EXECUTIVE SUMMARY

This report is a summary of the results of a third party review of a web-based Search Utility developed by COINAtlantic of the Atlantic Coastal Zone Information Steering Committee (ACZISC). The purpose of the review is to evaluate the effectiveness of the Search Utility and to solicit feedback from end users on how the application can be improved.

The COINAtlantic Search Utility, which is an interface to GeoConnections GeoPortal search engine and metadata repository, facilitates the search and discovery of data, literature and applications. The key principles of the utility include: client or user driven development; ease of use; use of existing metadata catalogs, applications, and services; data 'closest to source'; and sustainability.

Seven individuals, representing a cross section of government, non-government organizations and academia throughout Atlantic Canada, volunteered to participate in the review. The participants had 2 tasks: 1) document a common business case where access to coastal or marine data is critical to fulfilling their organization's mandate and 2) evaluate the utility to determine its effectiveness in supporting the business case. The reviewers were also asked to rate the content (data and metadata) and the website's interface design.

The respondents provided four examples of use case scenarios which included impact assessments of industrial or commercial developments on terrestrial and marine environments; site selection for receiver stations for a marine acoustic telemetry program; and resource use conflict resolution. Overall, the consensus is the COINAtlantic Search Utility can be an effective tool to support coastal and marine management activities, however, limited online data detracts from its usefulness at this point. The strengths of the utility include good response rates, advanced search options; multiple save options, link to the Canadian Geographic Names database for locating places, including marine features; and ability to copy and paste a WMS address into the "Add a Layer" function.

The evaluation form provided the reviewers an opportunity to rank from 1 to 10 (10 = excellent) various aspects of the Search Utility. The assessment contained 5 sections with 22 criteria in total. The overall score for the COINAtlantic Search Utility was 72%, with the home page and map function receiving the highest marks (79 and 77, respectively). The search function and help received nearly the same scores (69 and 68) with the metadata component receiving 60, the lowest score.

Although COINAtlantic's Search Utility relies on the data and metadata content provided by others agencies, it could play a key role in this area by facilitating dialog about data issues among the COINAtlantic network members and by lobbying agencies to make more data available online or to improve their current offerings. The COINAtlantic website could also provide a forum for capturing and forwarding end user feedback on data and metadata content.

The reviewers also made suggestions for future enhancements of the COINAtlantic Search Utility, including:

- The Search Utility should have a name to avoid confusion with COINAtlantic the organization
- COINAtlantic's multiple web presences (HTML website, Plone, Facebook) could be streamlined and organized so one site is the primary point of contact and source of information
- The application should be stabilized; it currently produces errors, unexpected results, or hangs
- Presentation of the search results could be improved by using with smaller fonts and using expandable/collapsible groups
- The user documentation should be expanded to cover all aspects of the utility; a help page and info buttons added to the search utility.
- The map section could be improved by using more detailed base maps and adding some additional features including:
  - Newfoundland's provincial web mapping service (MapsNL) in the list of standard WMS servers
  - Layer symbology in the legend
  - Scale text
  - Zoom to Extent of Layer tool
  - Identify tool
  - Ability to changing projection
  - Predefined map views for common use scenarios

INTRODUCTION

This report is a summary of the results of a third party review of the 2008-09 COINAtlantic Search Utility project. COINAtlantic is an initiative of the Atlantic Coastal Zone Information Steering Committee (ACZISC) to develop, implement, and sustain a network of data providers and users that will support secure access to data, information, and applications for decision-making by coastal and ocean managers and users of coastal and ocean space and resources. COINAtlantic's network of ocean and coastal managers identified a number of challenges preventing them from deriving maximum benefit from existing geographic data. The top issues included:

- Unable to find "authoritative" data
- Difficulty selecting appropriate layers from the numerous available data sources
- Data is not easy to understand, access or use

In 2008, GeoConnections provided funding to the ACZISC and the COINAtlantic team to begin a project to address some of these issues, specifically the development of a web-based Search Utility. The purpose of this review is to evaluate the effectiveness of the Search Utility and to solicit feedback from end users on how the application can be improved.

Overview of the COINAtlantic Search Utility

The concept of the COINAtlantic Search Utility (CSU) was further refined during three user needs workshops in Halifax, Fredericton, and St. John's. It was agreed the COINAtlantic project should not build an application to address specific management issues, but rather the team should develop a tool that will allow the end user to search, discover and access data. Using data discovered in the COINAtlantic Search Utility, the end users could then build the applications to support specific coastal and ocean management needs.

The following statements summarize the requirements and guiding principles of the COINAtlantic Search Utility:

- Development of the CSU would be client or user driven.
- The CSU must be easy to use. It must be automated and intelligent to facilitate data selection.
- The CSU must build on existing initiatives, metadata catalogs, applications, and data services. COINAtlantic would not store or house any data.
- The CSU should search for authoritative and definitive data 'closest to source'.
- The CSU would not be a refined web mapping engine; it would only have basic map functions to help users determine the appropriateness of the data.
- The CSU must be sustainable.

A link to the COINAtlantic Search Utility can be found on the COINAtlantic website http://coinatlantic.ca/, along with help documents and an instruction video. COINAtlantic also has a Facebook site where end users share tips and ideas (http://www.facebook.com/group.php?gid=11502385069).

METHODOLOGY

The basis of the 2008-09 COINAtlantic Search Utility (CSU) review is feedback from the end user community. End users were asked to evaluate the utility to determine its effectiveness in supporting coastal or ocean management. The review focused on the usability of the utility and the content (data and metadata) returned by the utility. The website's interface design was also included in the review, but not the underlying technical architecture and website construction (programming), although user comments may relate to these aspects of the search utility. Project communications, NGO capacity building and other components of the 2008-09 COINAtlantic project were also excluded.

The goals of the review were to:

1. Document specific business scenarios where data discovery and access are critical to supporting coastal or ocean management;
2. Determine the effectiveness of the current version of COINAtlantic's search utility to find, access and integrate web-based data and information;
3. Determine the usability of published data and metadata; and
4. Solicit end user feedback on the future of COINAtlantic, such as improvements, enhancements, and sustainability.

The ACZISC Secretariat asked seven organizations, representing a cross section of Atlantic Canada's federal and provincial governments, NGO's and academia, to participate in the review. Each organization documented a common business case where access to coastal or marine data is critical to fulfilling the organization's mandate. A template MS Word document (Appendix A) was provided to ensure consistent information was gathered, including a description of the scenario, the frequency of occurrence, the data that ideally used as input, the data that is typically used due to discovery or access issues, and the approximate effort required to fulfill the data requirements.

The use scenario set the context for the organization's review of COINAtlantic's Search Utility. End users then completed an evaluation form (Appendix B) to rate various aspects of the search application including functionality, ease of use, performance and content. The evaluation form also offered the end user an opportunity to record specific suggestions for improvements or enhancements.

In addition, the review included an onsite visit to answer questions, provide training or assistance, and discuss the reviewers' responses in more detail. The onsite visit also provided an opportunity to solicit more general feedback such as COINAtlantic's overall strengths, weaknesses, suggested improvements, priorities for future development, and its importance to the organization.

This report, which is a compilation of the use scenarios and end user ratings and suggestions, represents the final step in the 2008-09 COINAtlantic Search Utility review. Upon acceptance of this final report, the findings will be presented to the COINAtlantic Management Committee.

PARTICIPANTS

The COINAtlantic Search Utility evaluators represent a cross section of government, non-government organizations and academia throughout Atlantic Canada. The ACZISC and the COINAtlantic team wish to thank the following individuals and organizations for their time and thoughtful reviews and comments of the COINAtlantic Search Utility:

- Andrew Lush, Hunter-Clyde Watershed Group, PEI
- Tim Vickers and Graeme Steward-Robertson, ACAP Saint John, NB
- Patrick Shea and Bobbi Smith, NL Dept of Fisheries and Aquaculture
- Bill Carter, Smart Bay, NL
- James Boxall, GIS Centre and Map Collection, Dalhousie University, NS
- Bob Branton, Ocean Tracking Network, NS
- Scott Coffen-Smout, Oceans and Coastal Management Division, Canada Fisheries and Oceans, NS

USE CASE SCENARIOS

Four of the seven participants documented a common business scenario where access to coastal or marine data is critical to fulfilling the organization's mandate. Their responses illustrate how COINAtlantic's Search Utility can be used in the search and discovery of data in support coastal and ocean management issues.

Use Scenario 1 – ACAP Saint John

Background: The Atlantic Coastal Action Program (ACAP) was created from the Federal Government's Green Plan of 1990. ACAP Saint John was started in 1991 as one of thirteen environmental "hotspots" in Atlantic Canada that could benefit from a community based approach to managing their aquatic environment. While Environment Canada provides project based funding and organizational support, each multi-stakeholder group is allowed to set their own objectives, choose the means by which to achieve those objectives and establish their own timetable for action. ACAP Saint John was formed to find community solutions to local problems.

Scenario: A major industrial proponent has announced their intentions to develop a new heavy-industry project in the City of Saint John. The area in question is located within a coastal drainage basin and data is required to assist ACAP Saint John in determining the impact of the development on environmental issues such as wetland degradation or fish passage.

Frequency: Bi-monthly

Effort: Often just a few hours, but could take many times longer depending on the depth of study required.

Data Currently Used as Input:

Data or Application	Source	Format	Paper or Digital
Wetlands	Service NB	GIS Layer	Digital
Wetlands	DNRE	Map	Paper
Streams	Service NB	GIS Layer	Digital
Lakes	Service NB	GIS Layer	Digital
Coast	Service NB	GIS Layer	Digital
Elevations		GIS Layer	Digital
Orthophotos	City of Saint John	Raster Layer	Digital

Other Desirable Data if Available:

Data or Application	Source	Preferred Format	Paper or Digital
Depth to Water table	DNRE	GIS Layer	Digital
Wetlands	DNRE	GIS Layer	Digital
LIDAR	City of Saint John	GIS Layer	Digital
Sea level rise predictive models	IPCC	GIS Layer	Digital

Use Scenario 2 – Ocean Tracking Network

Background: The Ocean Tracking Network, headquartered at Dalhousie University, unites marine scientists from 14 ocean regions around the world, into a comprehensive examination of marine life and ocean conditions as affected by climate change. Through OTN, thousands of marine animals around the world — from fish to birds to polar bears — will be tracked using acoustic telemetry technology. At the same time, we will be building a record of climate change — data that can be analyzed and then applied. OTN data will lead to a global standard for ocean management in a way never before possible.

Scenario: Given start and end points of a line or a list of proposed locations, we work with OTN scientist and technicians to plan deployment of acoustic receivers on the ocean floor. So far we have done this to completion at Halifax and Perth Australia and are now working to extend the Halifax line and put new lines at the Cabot Strait, Grave Harbor Alaska and Gibraltar Straits. We have so far created maps, bathymetry profiles and summary data tables and have also experimented with view shed modeling. We generally use free mappers: R, GeoMapApp, GoogleEarth and ArcExplorer. We sometimes but rarely have used ArcGIS.

Frequency: Approximately 8 per year; between now and 2013, ~30 deployments are planned

Effort: Many days; we are not GIS experts and this is not yet a standard process.

Data Currently Used as Input:

Data or Application	Source	Format	Paper or Digital
Receiver positions	OTN researchers	Spreadsheet	Digital
Nautical Charts	DFO partner	PDF	Both
Multibeam Grid	DFO partner	PDF	Digital
Fishing Activity	DFO partner	PDF	Digital
Ocean Currents	bluefin.mar.dfo-mpo.gc.ca	WMS	Digital
Undersea Cables	bluefin.mar.dfo-mpo.gc.ca	WMS	Digital
Bathymetry Contour	bluefin.mar.dfo-mpo.gc.ca	WMS	Digital
Bathymetry Grid	GeoMapApp	Grid	Digital
Rivers	Atlas of Canada*	WMS	Digital
Multibeam Imagery	Geological Survey of Canada*	WMS	Digital

Other Desirable Data if Available:

Data or Application	Source	Preferred Format	Paper or Digital
Multibeam Grid	Geological Survey of Canada	Grid	Digital
Bathymetry Grid	Geological Survey of Canada	Grid	Digital

Use Scenario 3 – NL Dept of Fisheries and Aquaculture

Background: The Newfoundland Department of Fisheries and Aquaculture is responsible for the promotion, development and regulation of aquaculture; licensing of fish processing operations and enforcement of quality standards; fisheries development and marketing support and engage in fishing policy and planning activities.

Sustainable Fisheries and Oceans Policy Division – Participate in resource assessment and fish management processes of DFO; analyze biological and scientific information related to management and development of the fishery; FRCC; NAFO; Oceans Policy and Governance; analysis and directing of marine environment issues.

Scenario: Environmental Assessments: Look at existing aquaculture sites and potential aquaculture sites, sewage outfalls and location of processing plants.

Frequency: Weekly

Effort:

Data Currently Used as Input:

Data or Application	Source	Format	Paper or Digital
Aquaculture sites	Aqua GIS	GIS layers	Digital
Aquaculture sites	Seafood year in review	Report	Both
Processing Plants	Seafood year in review	Report	Both
Fish Landings	DFO Quota Reports	Reports	Both

Other Desirable Data if Available:

Data or Application	Source	Preferred Format	Paper or Digital
MPA Boundaries			
CMA Boundaries			
LOMA Boundaries			
Sewage outfalls			
EBSA's			
NMCA's			
AOI's			
NAFO divisions			

Use Scenario 4 – DFO OCMD Maritimes Regions

Background: OCMD is responsible for implementing programs that advance Part II of the *Oceans Act:* integrated management and marine protected areas. The Integrated Management Section manages and participates in IM projects for the Eastern Scotian Shelf (ESSIM), Bras d'Or Lakes (CEPI), and Southwest New Brunswick (SWNB MRP). It is also undertaking strategic planning in support of IM within the broader Bay of Fundy/Gulf of Maine and coastal regions. Each IM project is at a different stage of development, and the section is working on implementation tools that will contribute to the advancement of all projects. The ESSIM initiative is pursuing marine industry action planning and marine spatial planning for the ESSIM area.

The Protected Areas and Conservation Planning Section manages the Gully MPA, Musquash Estuary MPA, and coordinates the Coral Conservation Plan for the Maritimes Region. It also undertakes strategic planning in support of MPA network design and the identification of areas of interest for subsequent MPAs in the region. Other projects managed by the section support conservation and protection of species at risk, such as the North Atlantic right whale and the northern bottlenose whale. The section is working on tools that will contribute to the advancement of its conservation projects. This includes the exploration of analytical tools for conservation planning (e.g., Marxan and GIS) and tools for implementing conservation objectives, such as spatial and temporal fisheries closures under the *Fisheries Act*, incentive programs, and education and awareness programs.

Scenario: We often require ecological and socio-economic data for analysis, problem solving and conflict resolution for issues such as the following scenarios:

1. Offshore seismic data for marine mammal interactions and in relation to existing MPAs.
2. Fisheries data for assessing proposed submarine cable/pipeline route interactions.
3. Deep-sea coral distribution data for human use interactions.
4. Seabed geology layers for planning and habitat management/ marine conservation.
5. Commercial vessel tracks in relation to distribution of SARA species at risk and MPAs.
6. Potential aggregate (sand and gravel) mining potential to assess user conflicts.
7. Wind and wave data to assess user conflicts for potential ocean renewable energy

Frequency:

Effort: Varies; ~ 1 hr to 1 day

Data Currently Used as Input:

Data or Application	Source	Format	Paper or Digital
Seismic	CNSOPB	GIS layer	Digital
Fisheries	DFO Virtual Data Centre	Spreadsheet/Database	Digital
Coral data	DFO	Spreadsheet/Database	Digital
Geology	NRCan	GIS layer	Digital
AIS ship data	Dalhousie Taggart Lab	Spreadsheet/Database	Digital
Aggregate	NRCan	GIS layer	Digital
Wind/ Wave	DFO / Environment Can	Spreadsheet/Database	Digital

Other Desirable Data if Available:

Data or Application	Source	Preferred Format	Paper or Digital
Socio-economic data by offshore marine zone by industrial sector		GIS layer Spreadsheet/Database	Digital

END USER RATINGS

The reviewers rated the COINAtlantic Search Utility using the evaluation form found in Appendix B. The form contained 5 sections representing the main components of the search utility:

- Home Page
- Search Function
- Map Function
- Metadata
- Help

Each section contained 3 - 6 criteria which evaluators rated from 1 through 10, with 10 being excellent. There were 22 criteria in total to be rated.

Six of the seven evaluators completed the evaluation form. Table 1 below summarizes the ratings of the 5 sections of the search utility. A respondent's ratings were omitted from the summary below if they did not rate all the criteria within a given section. Similarly, the overall score is based on 4 respondents who entered a rating for all 22 criteria. Table 2 provides more details of the ratings, presenting the results for each of the 22 criteria.

Table 1. Summary of the ratings for each section or component of the 2008-09 COINAtlantic Search Utility.

Component	No Respondents	Min	Max	Average	Max Pts	Score (%)
Home Page	6	15	39	31.5	40	79
Search Function	5	41	43	41.6	60	69
Map Function	5	25	46	38.4	50	77
Metadata	5	0	32	23.8	40	60
Help	3	16	28	20.3	30	68
OVERALL SCORE	**4**	**150**	**179**	**158.0**	**220**	**72**

Table 2. Summary of the section and individual criteria ratings used to evaluate the 2008-09 COINAtlantic Search Utility.

Criteria	No Responses	Min	Max	Average	Max Pts	Score (%)
HOME PAGE						
Is the website easy to find	6	8	10	9.7	10	
Home page content	6	4	10	7.8	10	
Design of the home page	6	1	9	6.8	10	
Ease of Use	6	2	10	7.2	10	
Subtotal	**6**	**15**	**39**	**31.5**	**40**	**79**
SEARCH FUNCTION						
Ability to enter relevant search information	6	3	8	6.0	10	
Presentation of results	6	4	10	7.2	10	
Results suitable to user needs	5	3	8	6.4	10	
Response time to return results	6	5	10	8.5	10	
Ease of Use	6	5	10	7.5	10	
Overall effectiveness of the search	5	5	7	5.6	10	
Subtotal	**5**	**41**	**43**	**41.6**	**60**	**69**
MAP FUNCTION						
Layer presentation	6	5	10	7.8	10	
Legend presentation	6	4	10	7.2	10	
Time to render map	5	5	10	8.2	10	
Ease of use	6	5	10	7.7	10	
Overall effectiveness of the map	6	5	9	6.8	10	
Subtotal	**5**	**25**	**46**	**38.4**	**50**	**77**
METADATA						
Clarity of content	5	0	9	6.4	10	
Sufficient detail	5	0	8	5.8	10	
Ease of use	5	0	8	5.8	10	
Overall effectiveness of the map	5	0	8	5.8	10	
Subtotal	**5**	**0**	**32**	**23.8**	**40**	**60**
HELP						
Help video	5	1	10	6.0	10	
User manual document	6	5	10	7.8	10	
Website Help	4	6	10	7.8	10	
Subtotal	**3**	**16**	**28**	**20.3**	**30**	**68**
OVERALL SCORE	**4**	**150**	**179**	**158.0**	**220**	**72**

SUGGESTIONS FOR IMPROVEMENTS

The evaluation form also requested end user comments and suggestions to improve the COINAtlantic Search Utility. Listed below are the comments submitted by the respondents through the evaluation form or during the onsite visit.

Home Page

Could use additional information in the home page, and a quick Google search for related keywords did not provide COINAtlantic as a highly-ranked result – this may be something to work on.

Map at bottom of the page is unnecessarily large. The map image shows features that are not available in the Search Utility. Clicking map to start application is not intuitive and seems a waste of time.

The font type is a little hard to read.

Change fonts

Needs a style of its own; looks open source and shouldn't

Too "government" style

Search Function

The search function was surprisingly responsive, but suffered from several hangs and error callbacks. When it did work however, the results were easy to follow though visual reinforcement of results was weak.

It's not clear what 'Layer Search Results' and 'Service Search Results' means.

The Search function seems to do a logical 'or' on the search terms entered. It should do a logical 'and' instead.

Selecting 'add to map' brings up the WMS window, which sometimes stays at 'Request in Progress'. Perhaps there should be a timeout of some kind.

Need to guess keywords

Would like to limit results to WMS layer only

Difficult to find layers within service

There was not much available that I was looking for (Eastport, Gilbert Bay MPA's, LOMA boundary, CMA boundaries, location of Smart Bay in Placentia Bay) in data layers.

Results need to be presented in smaller fonts and akin to standard citations.

The search engine should rank the results.

Map Function

Map presentation was relatively speedy and easy to use, however the exporting options could be improved and offer more direct access to data sets or better vector outputs.

Layer names are often not that meaningful, I know why, but perhaps the COINAtlantic user community could be given the ability to enter meaningful names that other users can then see.

The base coastline layer is way too crude to be able to locate your location.

It would be good to be able to overlay our own layers, like you can in Google Earth.

Other projections should be available, for instance in PEI we work in PEI Double Stereographic, which is in metres. The Lat/Long display should then be in metres too.

There could be some predetermined workspaces set up, such as 'Coastal erosion PEI', that open a set of WMS layers that are likely to be useful for a particular type of user.

Need Zoom to Extent of Layer

Need shortcut for Copying desired layer(s) into local application

Does not permit many options for symbology changes

Move to new group to review – not in our sector, e.g. students and non-ocean tech developers

Must meet the "10/10" rule – 10 year old (or 55 year old) can use it in 10 minutes

Adding graphics, like lines or points, would be useful.

Metadata

All new items appear to have no meaningful discovery metadata

List available data layers that can be used with the COINAtlantic map

Sources of good metadata: UCONN MAGIC, MEGIS (Maine), MASS GIS

Fields to display – Library of Congress rules

See FGDC crosswalk

Missing or broad bounding box coordinates cause the search engine to return entries that are outside the Atlantic region.

Data Content

Some datasets, like multibeam data, have a very small coverage area and are not obvious when viewed at a regional scale. Perhaps, there is an alternate means of displaying data at different scales.

Help

Help documents were well done, as was the manual, however the hosting of the help video on a social networking site was a disappointment and unprofessional.

Help video could be longer

The help is confusing. It is a mass of information all over the place. It could be reorganized into sections such as 'how to', 'what the buttons do', 'tips on searching for data', ' glossary of coastal/ocean terms' and so on.

Need instruction for Copying 'get capability' string into external application

Create a manual with more photo's/activities for potential users. Only "Help" I could access was Syntax help.

Text in Syntax Help needs editing for English.

Exact Phrase

To search for an exact phrase, surrounded the terms double quotes. E.g. **"natural resources"** retrieves entries containing the exact phrase.

Did not load layer from the layer list, only observed a pink box, no vectors. No help box appeared to help solve the 'add map layer' problems noted above – this could be a useful addition.

Data Content

While GeoNova is a tremendous resource for Nova Scotians, the breadth of datasets available to New Brunswick users is severely lacking by comparison, and as such COINAtlantic should strive to make better use of existing datasets from said province (for example; data from the Aquatic Data Warehouse).

PEI layers, although there, can't be added to the map. Provincial Governments should see that allowing WMS to serve up their data is not giving the data away, but in fact it will result in an increased demand for the data.

Having spent quite some time trawling provincial (land based) systems looking for the correct maps, I believe that improving the metadata is crucial. If you don't know what search terms to use and you can't refine your search, you will give up.

Additional data layers:

- Coastal management areas in NL
- MPA's, EBSA's, NMCA's
- LOMA Boundaries
- Oil fields offshore Atlantic Canada
- Socio-economic data by offshore marine/maritime zone by ocean industry sector
- EST, SeaState, MODIS, RADARSAT, RADAR / IR + Visible ? Weather
- Coast Guard Vessel Traffic
-

Check IODE (UN) layers, Woods Hole, Monteray Bay

Link to UN website

PROBLEMS OR ERRORS ENCOUNTERED

Below is a list of problems or errors reported by the evaluators or encountered during the onsite visits.

- The search function suffered from several hangs and error callbacks.
- The 'Quickview' search hung up the system when searching for Charlottetown and St. John's.
- Selecting 'add to map' brings up the WMS window, which sometimes stays at 'Request in Progress'.
- Instructional video did not run.
- The following layers did not load from the layer list; only observed a pink box:

  Currents for the Western Atlantic
  Ocean Temperature
  Progressive Vector Diagram (PVD) for Western Atlantic
  Sea Surface Elevation
  Western Atlantic Bathymetric Grid
  Western Atlantic Salinity Model Output

- Removing all of the map layers produces an error message.

BENEFITS

All of the COINAtlantic Search Utility reviewers agreed the COINAtlantic Search Utility could benefit their organizations for the search and discovery of data, with visualization of the data being the greatest benefit. Other strengths of the site include:

- good response rate for searches
- relatively fast map rendering,
- advanced search options helps define or limit the search results
- measure tool was useful for determining proximity
- ability to copy a WMS address from another source and paste into "Add a Layer" dialog box
- multiple save options – link, image and geotiff
- Quickview includes marine features
- ability to move layers to alter drawing sequence

Four of the respondents cited the following benefits of the COINAtlantic Search Utility to their respective organizations:

ACAP Saint John: While the search utility does seem of value to ACAP Saint John, and has been initially well executed, until proof of concept and an outlook on the sustainability of the project are established, it will be difficult to make COINAtlantic an integral part of our regular operations. Also of concern from ACAP Saint John's perspective is the lack of localized spatial data for New Brunswick, which will also limit the usefulness of this new resource for us as an organization.

Hunter-Clyde Watershed Group: I can see that the search utility will, as the metadata improves, become an invaluable tool for identifying relevant maps. The map-based interface is a good way to quickly see the geographic coverage of a particular data set.

NL Dept of Fisheries and Aquaculture: Able to create maps for backgrounders and reports. Good for presentations to emphasize a particular issue.

DFO OCMD Maritimes Region: The benefits of COINAtlantic to DFO OCMD would be in terms of access to WMS data via the GDP. COINAtlantic could not substitute for already developed, in-house decision-support tools and databases that we use day-to-day for ocean management/conflict resolution/user interactions and user/environment interactions, for example, ArcGIS, DFO's Virtual Data Centre, and the PAL Surveillance Information Server. However, COINAtlantic will have direct benefits to the broader ICOM community in Atlantic Canada.

RECOMMENDATIONS

One of the goals of this review was to solicit end user feedback on future improvements and enhancements of the COINAtlantic Search Utility. The following recommendations are based on the evaluation form responses and onsite discussions. While there are many recommendations, these suggestions should not be interpreted as criticism of the work done, but rather an opportunity to build on the momentum that has been set in motion by the COINAtlantic initiative. It should also be noted that some reviewer suggestions may be excluded from the recommendations if they were considered outside the scope and mandate of the COINAtlantic Search Utility.

Separate Identities for the Technology and the Network of People

COINAtlantic is described as both a network of people and organizations who are data providers and users, as well as technology to support this network of coastal and ocean managers and resource users. With the development of the Search Utility, COINAtlantic, the organization, now has a custom product with the same name. This can be confusing; for instance, consider the communication problems if ESRI calling its GIS software ESRI and not ArcGIS.

It is recommended COINAtlantic represent the network of people while custom technologies, such as the Search Utility, be given their own separate identities to avoid further confusion. In addition, the Search Utility needs a fact sheet or product description which clearly states what the utility is and is not, and a description of the underlying technology. That is, end users need to understand the utility relies solely on the GeoConnections search engine, its metadata repository (plus linked repositories), and the data providers who: 1) make their data/information available on the web following CGDI standards, and 2) register their data with GeoConnections metadata repository or make their repositories searchable by GeoConnections.

This description of the Search Utility should also identify who the target market is. It is doubtful the utility will be used by the public unless specific views are customized for their general interest.

Focused COINAtlantic's Web Presence

COINAtlantic web presence includes four distinct technologies: HTML website; open source web mapping application; Plone open source content management system; and Facebook. Each of these technologies all have value, but the current set up is disconnected and somewhat disorganized. The COINAtlantic website is the starting point for the Search Utility and will be the end user's first impression of COINAtlantic and the search utility. COINAtlantic users are accustomed to using professional looking sites that have a consistent look and feel. Launching into the Plone site from the COINAtlantic HTML website is disjointed because the two websites look so different. In addition, there is duplication which is confusing. Publications are found on both the HTML website and the Plone site. Similarly, user feedback and comments are captured at both the Facebook and Phone sites.

A more professional presence is recommended along with a more streamlined and organized approach to the multiple web technologies. COINAtlantic's web presence should be more focused, using one site as the primary source of information or focal point; users should be able find everything at one site. Plone and Facebook can be useful tools; however, managing the duplication should be addressed.

If Plone continues to be part of the technology makeup, its content and setup should be reorganized into a more logical structure with out of date documents moved into an archive section.

It should also be noted there are mixed feelings regarding Facebook; not all COINAtlantic end users wish to be part of the online social network. Again, transferring the valuable information from Facebook to the main website will be critical so users are not required to find relevant content on Facebook.

Stabilize the Application

The COINAtlantic Search Utility is unstable, with bugs or errors occurring. Correcting these issues should be a priority. See the previous section on "Problems or Errors Encountered". In addition, COINAtlantic should develop a disaster recovery program which would include a redundant server.

Improved Presentation of Search Results

End users are satisfied with the response of the search utility, but not the presentation of the results. Presenting the search results has 3 constraints: 1) there are 3 types or categories of results being returned; 2) the search engine often returns a large number of results which cannot be displayed on a single screen; and 3) there must be sufficient metadata displayed in a limited amount of space for the user to determine the item's relevance.

End users did not understand why the results are presented in three categories or even the meaning of the three categories: Layer Search Results, Service Search Results, and Data Search Results. The Quick Start tutorial or instructional video did not explain the categories. It is recommended the Layer and Service categories be combine, the categories have meaningful names, and described in the help support.

Smaller fonts would economize the limited space for presenting long result lists, plus abstracts could be limited to a fixed number of words. Collapsible/expandable categories would allow users to limit the list to their interests, web mapping services only for instance.

Some users had difficulty determining the appropriate keyword to find data of interest. Perhaps GeoConnections upgraded search engine will improve the ranking of search results; alternatively, COINAtlantic could consider maintaining a list of recommended keywords or URLs to commonly used data sets within the region. In the case of Newfoundland for instance, the province has a web mapping service server, however the service URL not registered with GeoConnections; therefore "Add to Map" is not displayed.

Improvements to Map Component

Some users found the Search Utility's base map too crude to accurately identify their area of interest. Many websites utilize map caching to provide good quality base maps at all scales with the map detail increasing or decreasing as the user zooms in and out.

The primary use of the Search Utility for many users is to investigate data sources for input to in house applications. Therefore, a means of displaying copying and pasting a layer's WMS URL would be very beneficial.

A major improvement for Newfoundland would be the addition of MapsNL in the list of WMS servers in the Add a Layer dialog.

Other enhancements recommended by the end users include:

- Legend should show the layer's symbology instead of an icon which is often blank,
- Zoom to Extent of Layer tool,
- Identify tool to get feature attributes,
- Map scale displayed as text as proper layer display is often scale dependent, and
- Ability to change the projection of the map window to match a specific province. This customization would also change the coordinate display to match the end user's provincial standard (e.g. change from decimal degrees to meters).

A final recommendation is to have predetermined map views for users to select from; these predefined views would have a map composition that typically meets the needs of a common use case scenario. These could be created by end users, vetted by COINAtlantic, and published as a map option.

Metadata and Data Content

Most of the reviewers did not understand the Search Utility relies solely on the GeoConnections search engine, its metadata repository, and the data providers who register their data and metadata with GeoConnections. While data providers must submit FGDC formatted metadata, there are no quality standards for the content. For instance, some entries do not have abstracts.

There are also no standards or minimal requirements for naming layers within web mapping services. Many end users had difficulty finding an appropriate layer within a web mapping service due to long lists and/or cryptic layer names. Most were not aware of the Ctrl-F (Find) feature that was noted in the "Tips for Advanced Users".

Some end users were disappointed there is limited or no data for their geographic area of interest.

As previously stated, COINAtlantic cannot control the GeoConnections' search engine's abilities, the metadata or the data content, however, it could play a key role in this area by facilitating dialog among the network members and by lobbying agencies to make more data available online. The COINAtlantic website could provide a forum for capturing and forwarding end user feedback on data and metadata content. One reviewer even suggested ranking or scoring metadata content into A, B, C… classes.

Another unique suggestion is to add a bibliography section to the Search Utility to display citations for all layers currently being displayed on map. These citations should be downloadable with the map.

Better Help

Help and user documentation is currently scattered throughout the HTML website, Plone and Facebook, but none exists on the Search Utility page except for search syntax help. For instance, COINAtlantic's home page has a direct link to a 2 page Quick Start tutorial (PDF), an indirect link to a demonstration video (.avi) through the Plone site, plus a link to additional information on the Plone site which lists many documents including a disclaimer, a link to the demonstration video via Facebook, the demonstration video in .avi format, the quick start tutorial, and tips for advanced users. In addition, the NGO Capacity Building team prepared training materials which would be useful to first time users but there were no links to these materials.

A consolidation of the tutorial, advanced tips and training materials into a single document and/or web page with direct links from the COINAtlantic home page and from the Search Utility would be useful to the end user. In addition, the Help and user documentation should be more thorough, covering all aspects of the search utility. Links to the Facebook instructional video should be carefully placed to respect end users who do not wish to create a Facebook account.

Finally, technical terms should be replaced with more user friendly text and/or include info buttons to display explanations of terms.

APPENDIX A

Template for Documenting Use Scenario for the COINAtlantic Search Utility

SEARCH UTILITY REVIEW

USE SCENARIO

This is a template for documenting a scenario within your organization where access to coastal and marine data is critical to your organization. The use scenario will be used later to set the context for your organization's review of 2008-09 COINAtlantic's Search Utility.

Date	
Organization	
Briefly describe your organization, its purpose or mandate:	
Describe a common scenario where coastal or marine data is required for a management decision:	
How often does this scenario occur (select one): Daily Weekly Bi-Weekly Monthly Bi-Monthly Bi-Annually Annually Other	

List the types of data / information currently used as input:			
Data or Application	Source	Format (Report, Spreadsheet or Database, Map, GIS Layer)	Paper or Digital
Additional data / information that would be used as input if available:			
Data or Application	Source	Preferred Format (Report, Spreadsheet or Database, Map, GIS Layer)	Paper or Digital
Amount of effort typically required to fulfill the data requirements (hours):			

APPENDIX B

COINAtlantic Evaluation Form

SEARCH UTILITY REVIEW

EVALUATION FORM

The purpose of this evaluation is to determine the effectiveness of the COINAtlantic Search Utility in supporting coastal or ocean management. This evaluation provides an opportunity for end users to rate on a scale of 1-10 various aspects of the online utility. End users are also encouraged to provide specific recommendations to improve or enhance the product.

The evaluation form contains the following sections:

- Home Page
- Search Function
- Map Function
- Metadata
- Help
- Data Content
- Benefits to Organization

Please review the COINAtlantic tool and data products as they relate to your organization's previously documented use scenario.

A link to the COINAtlantic Search Utility can be found on the COINAtlantic website http://coinatlantic.ca/, along with help documents and an instruction video. COINAtlantic also has a Facebook site where end users share tips and ideas (http://www.facebook.com/group.php?gid=11502385069).

ORGANIZATION	

Please rate the following using a 1 -10 scale (1 is terrible, 5 is OK, 10 is excellent or N/A if not applicable):

HOME PAGE

Criteria	Rating (1 – 10 or N/A)
Is the website easy to find	
Home page content	
Design of the home page – layout, appropriate font sizes, crisp text	
Ease of Use	
Provide specific suggestions for improvements or enhancements:	

SEARCH FUNCTION

Criteria	Rating (1 – 10 or N/A)
Ability to enter relevant search information	
Presentation of results e.g. easy to read	
Results suitable to user needs	
Response time to return results	
Ease of Use	
Overall effectiveness of the search – did you find what you were looking for in a timely manner	
Provide specific suggestions for improvements or enhancements:	

MAP FUNCTION

Criteria	Rating (1 – 10 or N/A)
Layer presentation	
Legend presentation	
Time to render map	
Ease of use	
Overall effectiveness of the map	
Provide specific suggestions for improvements or enhancements:	

METADATA

Criteria	Rating (1 – 10 or N/A)
Clarity of content	
Sufficient detail	
Ease of use	
Overall effectiveness of the map	
Provide specific suggestions for improvements or enhancements:	

HELP

Criteria	Rating (1 – 10 or N/A)
Help video	
User manual document	
Website Help	
Provide specific suggestions for improvements or enhancements:	

DATA CONTENT

The following data sets were published by various COINAtlantic partners during the 2008-09 project. Please rate the usability of each layer as it relates to the for your organization's use scenario.

Layer or Web Mapping Service (WMS)	Rating (1 – 10 or N/A)
COINAtlantic Proof of Concept for a Marine Cadastre Service	
Currents for the Western Atlantic	
Ocean Temperature	
Progressive Vector Diagram (PVD) for Western Atlantic	
Sea Surface Elevation	
Western Atlantic Bathymetric Grid	
Western Atlantic Salinity Model Output	

Some keywords to enter in the Search Utility to find some of the above layers and others:

multibeam - NRCan library of multibeam bathymetry
bathymetry- CHS bathymetric grid for Atlantic Canada
GeoNova - 1:10,000 topographic database for Nova Scotia
MapsNL- Newfoundland and Labrador road network
oceanographic - currents, ocean temperature, salinity for the Western Atlantic
sea elevation - sea surface elevation for the Western Atlantic
PVD - progressive vector diagram for the Western Atlantic
ESSIM - boundary area for the Eastern Scotian Shelf Integrated Management area

Other Layers or Web Mapping Service (WMS)	Rating (1 – 10 or N/A)

Suggest other types of data that should be made available on the web or you could not find:

BENEFITS TO ORGANIZATION

Describe the benefits of the COINAtlantic Search Utility: