# METADATA FOR THE OREGON COAST GEOSPATIAL CLEARINGHOUSE: CONCEPT, IMPLEMENTATION, AND MAINTENANCE

By

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A RESEARCH PAPER

Submitted to

THE DEPARTMENT OF GEOSCIENCES

OREGON STATE UNIVERSITY

In partial fulfillment of the
Requirements for the
Degree of

MASTER OF SCIENCE

GEOGRAPHY PROGRAM

December 2000

Directed by
Dr. Dawn J. Wright

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## Acknowledgments

First and foremost, I would like to express my sincere appreciation and gratitude to Dr. Dawn J. Wright, my major professor. She provided never-ending support, guidance, and patience throughout my graduate career. I was able to take advantage of many opportunities because of her persistence and encouragement. Thank you so much for all of your help along the way.

I would also like to thank my committee members, Dr. Charles Rosenfeld and Dr. Jon Kimerling. Dr. Charles Rosenfeld has provided additional support through classroom instruction and has encouraged my interest in coastal activities. I am also thankful to Dr. Jon Kimerling for being available for sudden consultation and for providing continual technical support. I appreciate your cheerfulness and willingness to listen and assist when needed.

I also am eternally grateful for my family and friends who provide the backbone for my success. Mom and Dad, I couldn't have completed my graduate degree without your undeniable love and support. You believed in me and instilled in me the work ethic that is needed to make it this far. To all of my friends, thank you. You play the many roles of tension reliever, sympathizer, and listener. Thank you all for your patience and friendship.

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# METADATA FOR THE OREGON COAST GEOSPATIAL CLEARINGHOUSE: CONCEPT, IMPLEMENTATION, AND MAINTENANCE

Abstract: Geographical data and information are virtually unlimited in their quantity and are oftentimes scattered throughout a multitude of locations and stored in various formats on a wide variety of platforms. The Oregon Coast Geospatial Clearinghouse (OCGC) is a web-based central repository for metadata (data about data) corresponding to collected data for the Oregon Coastal Zone. The OCGC is a collaborative effort between multiple agencies in order to raise awareness about what data exist and to encourage cooperation for sharing and distributing available data. The clearinghouse is designed to enable easy access and usage for any person wanting or needing to obtain geospatial data or metadata for the Oregon coast. Metadata creation, and development and maintenance of the OCGC are discussed in this paper. One major objective of the project was to increase the visibility and utility of the clearinghouse by contacting potential participants and asking for their contributions of data and metadata. A second goal was to develop methods for assisting these agencies in contributing metadata, through the use of existing metadata-generating tools. Two metadata tools were explored and evaluated: a free, public-domain ArcView metadata collector extension developed by the NOAA Coastal Services Center and a commercial software application called the Spatial Metadata Management System (SMMS). The third and most important objective of the project was to create a template for an abstracted form of metadata, that, while FGDC-compliant, would not be as lenghty or cumbersome as the full FGDC content standard. Finally, recommendations for the future of the OCGC are discussed.

## 1. INTRODUCTION

Geographical data and information are virtually unlimited in their quantity. Continual investigation and research have probed into topics such as what geographic data and information teach us about how the natural environment and humans interact, what impacts humans have on the environment, and how the natural environment may best be observed and protected for future use. With the

advancement of technology, the collection of data has been made simpler and the accuracy with which data can be compiled has increased dramatically. Although the amount of data that exists today is enormous, ironically it will continue to grow as technology continues to improve, probably at rates too rapid for humans to keep up with.

With such a massive amount of information, most of which is publicly available and accessible at little or no cost, the issues of how and where to acquire specific data, and research related to it, remain daunting and confusing. Data and other research observations are scattered throughout a multitude of locations and stored in various formats on a wide variety of platforms. Presently, a researcher has to contact universities, federal, state, city, and local government agencies as well as locations in the private sector in order to gain access to the wealth of information available.

Tremendous value may be found in cooperatively sharing and merging data and related information. One tool that has emerged through modern technology and has become indispensable as a means of making geographic data accessible is the Internet. The Internet enables the collaborative communication among multiple parties across various networks to share and distribute their data and information. "Sharing of geographic information is important because the more it is shared, the more it is used, and the greater becomes society's ability to evaluate and address the wide range of pressing problems to which such information may be applied" (Onsrud et al., 1995).

In 1998 the Federal Geographic Data Committee (FGDC) provided funding to the Department of Geosciences at Oregon State University to enlist the collaboration of various organizations for the distribution and sharing of spatial information via the Internet. The collaboration is in the form of the Oregon Coast Geospatial Clearinghouse (OCGC; http://buccaneer.geo.orst.edu; Ward, 2000; Wright et al., 2000), a web-based gateway for the collection and organization of geographical information for the Oregon coastal zone, and an official node of the National Spatial Data Infrastructure (NSDI, defined in Section 3). This clearinghouse is intended to encourage and enable organizations to cooperatively share spatial information primarily in the form of metadata. Metadata, in short, is a text document that describes the data content of a particular data set. It will be discussed more fully below in Section 4.

## 2. OBJECTIVES

In order to enhance the compilation and development of metadata for the OCGC, there were three main objectives for the author's Master project. Initially, the OCGC received encouraging support from various agencies that might be potential contributors to the clearinghouse. One objective of the author's project was to contact the possible participants and ask for their contributions of data and metadata. A second goal was to develop methods for assisting these agencies in contributing metadata, through the use of existing metadata-generating tools. Two metadata tools were explored and evaluated: a *free*, *public-domain* ArcView metadata collector

extension developed by the NOAA Coastal Services Center and a *commercial* software application called Spatial Metadata Management System (SMMS). These two tools are discussed more fully in Section 5. The purpose for the comparison of these tools was to assess how they might be used to increase the ease and efficiency with which metadata records might be created for the OCGC. The third and most important objective for this project was to create an abstracted form of metadata. A full, FGDC-compliant metadata document is long and difficult to read, as described in Section 4.3. The necessity for creating an abstracted version of the complete record is to bring to the forefront the most important information in a concise and easy-to-follow form. If the most useful elements are readily available, it makes it easier for any user to identify and understand the metadata and corresponding data.

## 3. BACKGROUND

### 3.1 FGDC

The FGDC was originally organized in 1990 under the Office of Management and Budget (OMB) Circular A-16 of the United States Government to act as an interagency committee that would promote the distribution, collaboration, and sharing of spatial data throughout the nation. The objective of the OMB Circular was to encourage the "development of a national digital spatial information resource, with the involvement of Federal, State, and local governments and the private sector" (http://www.whitehouse.gov/OMB/circulars/a016/a016.html). The FGDC is a coordinating body that builds partnerships between various organizations, thus

enabling communication between producers and users of spatial data, and the transfer of this information based on federally stipulated criteria and standards. The national resource for spatial information developed into the NSDI.

### 3.2 NSDI

The NSDI was established under the Executive Order 12906 in April 1994 by President Clinton. The singular purpose of the NSDI is to coordinate geographic data acquisition and access and is defined as "the technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data" (http://www.fgdc.gov/nsdi/nsdi.html). Most of this coordination was intended to occur through electronic networks distributed through the National Geospatial Data Clearinghouse (NGDC) within the NSDI.

### 3.3 OCGC

As previously stated, the OCGC was funded by the FGDC through the NSDI in 1998. The clearinghouse is designed to be a central access point that will be easily usable by any person wanting or needing to obtain geographic information on the Oregon coast. The OCGC is a searchable Internet web page (Figure 1) as well as a searchable NSDI node through the NGDC (http://clearinghouse3.fgdc.gov/). Specific data sets pertaining to the Oregon coastal zone will be found by searching the metadata records that correspond to collected natural resource geographic data.

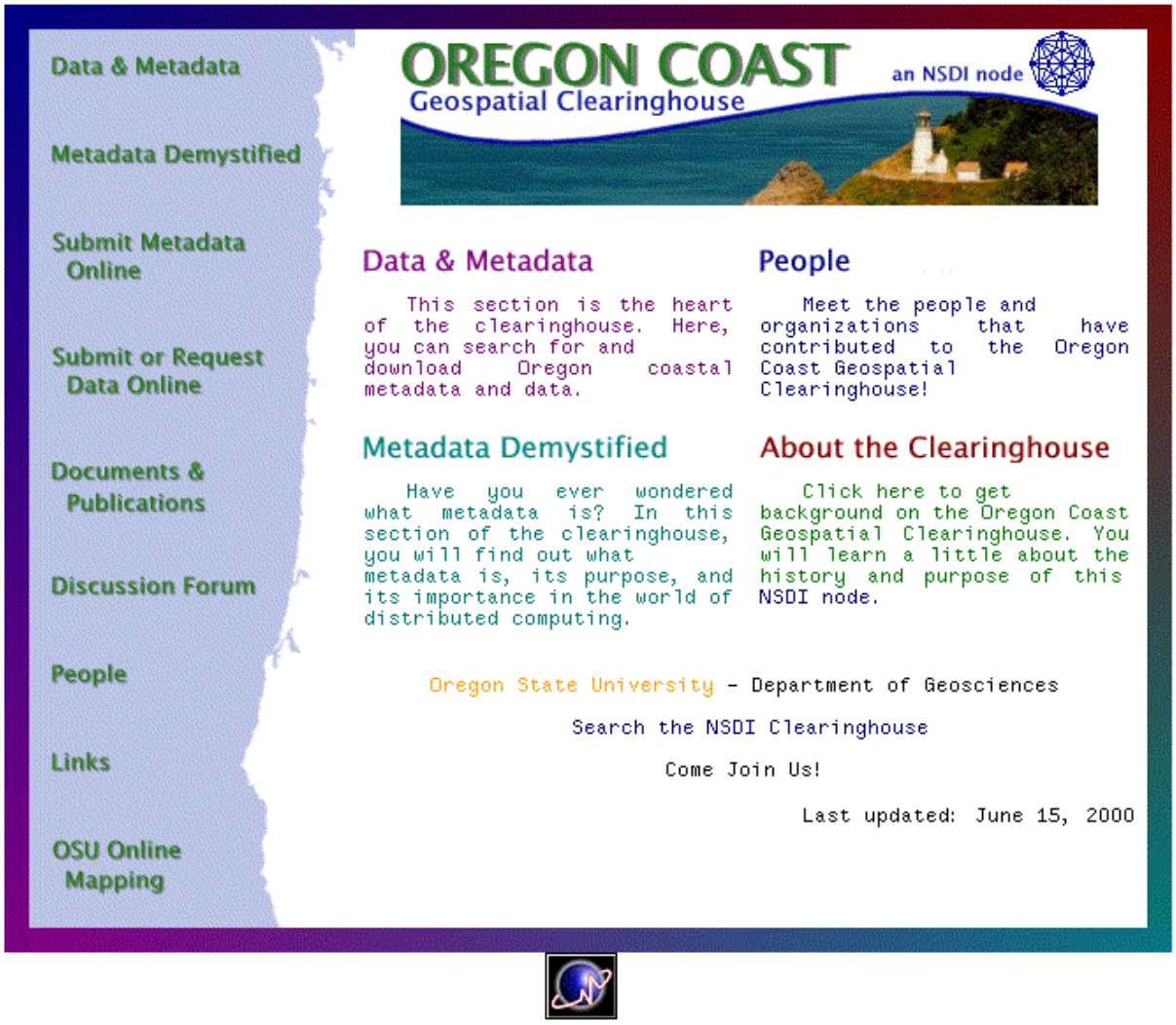



Figure 1: Oregon Coast Geospatial Clearinghouse (OCGC) home page (http://buccaneer.geo.orst.edu/).

The OCGC is a local contributor to the NGDC and is designed to facilitate relationships and communication between organizations in Oregon that already have existing data, that are in the process of producing data sets, or are in need of acquiring data pertaining to the Oregon coast. It is hoped that this will lead to further cooperation between federal, state, local government agencies, research

universities, and the public and private sectors by helping to identify cross-organizational issues that pertain to the coastal areas, as well as to serve as a tool for further integration of coastal management.

### 3.4 The Oregon Coastal Zone

The Oregon coastal zone is defined for the purposes of this report as extending from the crest of the Coast Range to three miles offshore, which is the edge of the Territorial Sea (Figure 2). Oregon's coast is of primary interest because of its diversity and wealth of natural resources. It is one of the most rugged and scenic coastlines in the United States. Endangered species reside within the coastal zone, migratory ocean mammals swim near the shoreline, and the influences of the Pacific Ocean create a very dynamic and fluctuating environment. Therefore, Oregon's coast is of great interest to planners, developers, tourists, environmentalists, political leaders and the general public alike.

Fishing, water-based commerce, mineral drilling, and coastal tourism are just a few of the economic benefits received from the coast, yet they also threaten the natural resources and ecosystems. However, because much of the economy of coastal communities relies on the resources available in the local area, it is essential that coastal managers, political leaders, and resource users have access to information about the status of their surroundings and be able to predict future issues and concerns. Predictions can lead to measures for better protection and

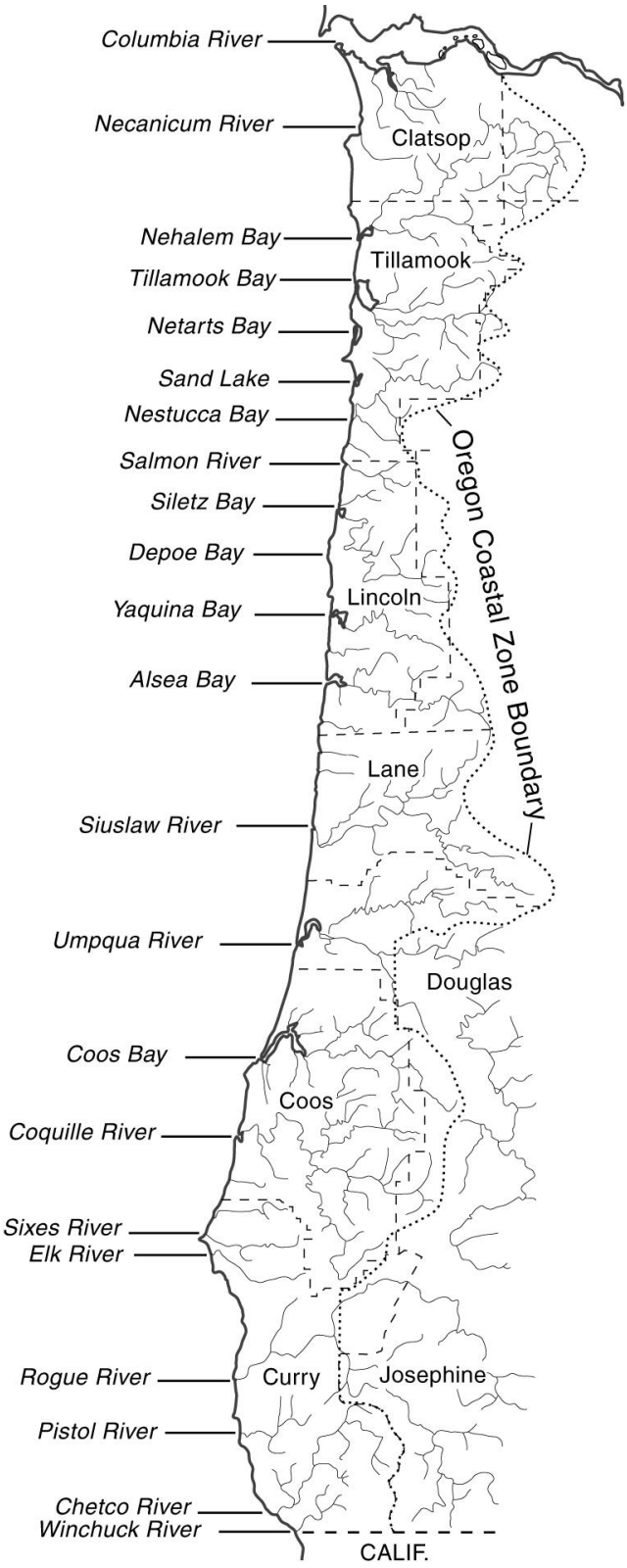



Figure 2: Oregon Coastal Zone (Coast Map provided courtesy of Jim Good, Oregon State University).

preservation of natural resources and more integrated management practices. It is crucial that information about uses of coastlines is available and accessible to government and non-governmental entities. Therefore, design and implementation of a central and efficient repository such as the web-based OCGC to accommodate data exchange is an important service.

## 4. METADATA

### 4.1 What is Metadata?

Metadata are standardized forms for describing a particular data set and its corresponding source information by explaining in text format the subject matter, how, where, when, why, and by whom the data were collected, and the accuracy, quality, and program format of the data. The content standard for metadata stipulated by the FGDC is designed to enable people to access the information quickly and decide for themselves which data set best fulfills their needs by comparing different sources. The records are meant to guide users through databases in such a way that they may better understand the content and meaning of the information. All of the metadata records in the OCGC have been formatted to meet the FGDC Content Standard.

The concept of metadata has been around for as long as people have been collecting and gathering information. Archives of old records can be found dating back centuries. These records contain such information as what was observed, the purpose of the observations, when they were completed, and by whom. But as many

archives grow in their wealth of knowledge and the use of electronically recorded information becomes more widely accepted, computer cataloguing has expanded. The actual term "metadata" came into use in the early 1980's initially within the computer industry and referred to ways of documenting, describing, and cataloguing information contained within databases. Digital data and metadata have become commonplace allowing for more accurate and more robust data sets and their corresponding descriptive metadata records. As mentioned previously, metadata are the text 'photocopy' of the data set. The readable text documents enable data users to navigate through multiple data layers and data sets so that they may decide which piece or pieces of data are best suited for their specific needs.

### 4.2 Why is metadata important?

Industries and agencies face the serious problem of how to manage a high quantity of a variety of digital information. There is a growing demand for a more efficient structuring of information system management and production. The most abundant means for efficiently displaying and distributing data is to design and implement metadatabases to capture the content and specific application uses for large amounts of data. Metadata are a means of cataloguing data warehouses without which the knowledge of what data are available and the possibilities for multiple uses ceases to exist. "A good set of metadata creates the potential for faster and better decision-making because users don't have to hunt by hand for the data they need" (Stedman, 1999). A lack of knowledge about what data exist within a

single organization or across multiple agencies may result in a duplication of expense and effort to recreate data that already exist. Therefore, it is absolutely necessary to produce metadata that correspond to all existing data as well as complete metadata along side all future acquired data. The documentation simply facilitates a more efficient, appropriate, and productive use of the data. Data that do not have corresponding metadata records are usually difficult to locate and access. Oftentimes data sets alone are confusing and hard to interpret, but with accompanying metadata records, data sets may be accessed, compared, and understood more efficiently.

### 4.3 Metadata for Geospatial Data

Recently the FGDC developed a national content standard for collecting and inputting *geospatial* metadata. President Clinton's Executive Order mentioned above stated that by January 1995, all agencies will document newly created geospatial data using the standards (http://www.fgdc.gov/publications/documents/geninfo/execord.html). Metadata itself helps to answer the question of "what is where" but metadata standards tell us how to describe what is where in a systematic way with a common set of terms and definitions. The format was designed to describe in a consistent manner what is available, how to find and access data sets, and what data sets would meet specific user needs.

The Content Standard for Digital Geospatial Metadata outlined by the FGDC is an extensive standard comprised of ten different sections. Over three hundred

individual Data Elements make up the ten sections and fall into one of three categories: mandatory, mandatory if applicable, or optional. Sections one through seven comprise the actual metadata record while sections eight, nine, and ten are special sections that are defined individually because of the importance of their content, but are used as sub-sections within sections one through seven. The basic layout for the Content Standard is shown in Figure 3, and a full metadata record template is provided in Appendix A. As seen from the basic layout, only sections one and seven are absolutely mandatory. All of the other sections are mandatory if applicable. A brief description of the ten sections follows.

Section 1: Identification Information – This section contains basic information about the data set such as the citation information (Section 8), an abstracted description and purpose, the time period of the data (Section 9), status of the data in terms of completeness, the coordinates of the data set, contact information (Section 10), key words that can be used to search for the data, and constraints on how to use or access the data.

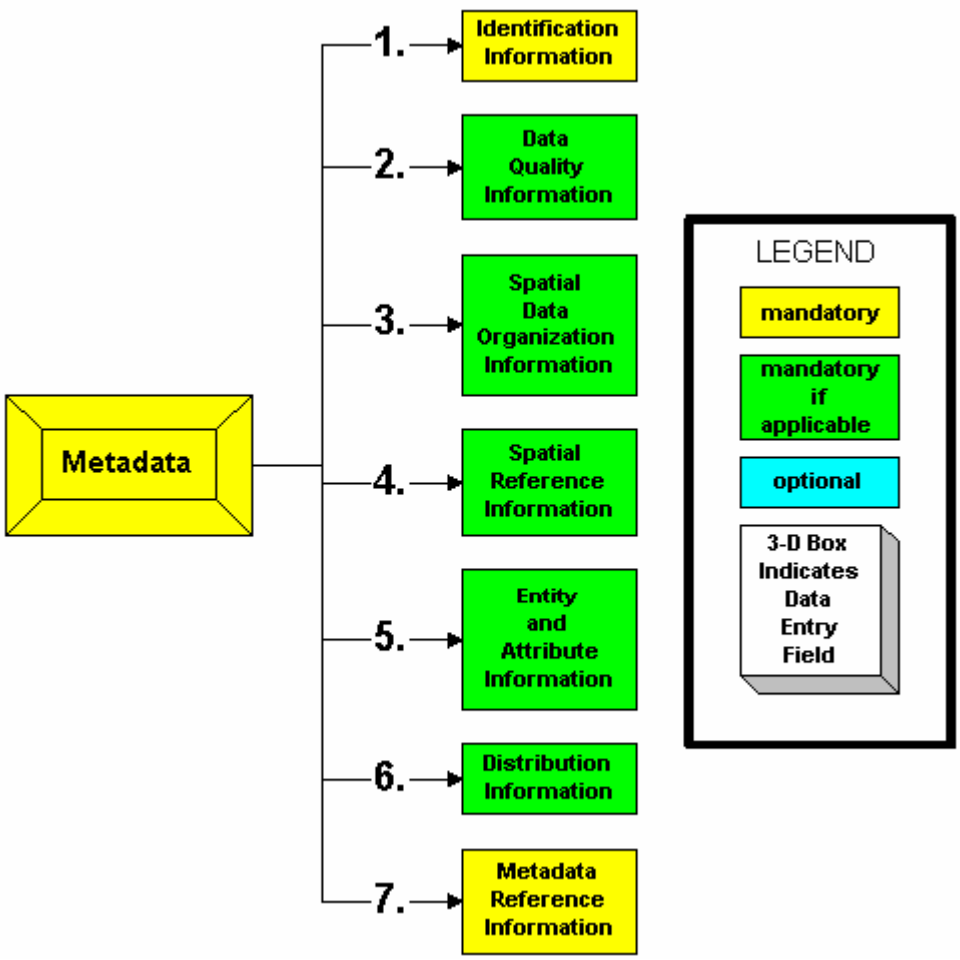



Figure 3: The Basic Layout of The Content Standard for Digital Geospatial Metadata Published by the FGDC (http://www.fgdc.gov/metadata/csdgm).

Section 2: Data Quality Information – This section provides a general statement on the quality of the data set by briefly describing the accuracy, consistency, and completeness of the data.

Section 3: Spatial Data Organization Information – This section describes the spatial information in the data set by explaining the location, geographical features, and the means by which these features are represented such as points, lines, or grids.

Section 4: Spatial Reference Information – This section describes the reference frame for the data such as the map projection, longitude, latitude, and coordinate system of the data.

Section 5: Entity and Attribute Information – This section provides a detailed description of the content and attributes of the data.

Section 6: Distribution Information – This section suggests how the data may be acquired and provides information about the distributor.

Section 7: Metadata Reference Information – This section includes information about the metadata record itself, where it came from, and who is responsible for its creation.

Again, sections eight, nine, and ten appear recurrently throughout the rest of the metadata record. For a more thorough description of the FGDC metadata standard, please refer to the actual Content Standard for Digital Geospatial Metadata published by the NSDI.

## 5. IMPLEMENTATION

### 5.1 Processing and Web Linkage of Existing Metadata

The OCGC was initially intended to serve as a searchable repository for metadata on already existing geographic data for the Oregon coast. The Pacific Northwest Coastal Ecosystem Regional Study (PNCERS), Tillamook Coastal Watershed Resource Center (TCWRC), Ecotrust, and the State Service Center for GIS were the original collaborators with OSU on the FGDC grant to create the OCGC.

Shortly after the initial web interface was designed, a sixth group, Dynamic Estuary Management Information System (DEMIS) for the Coos Bay region, donated a CD-ROM containing already existing metadata records. All of these web linkages can be accessed by entering the Data and Metadata section of the OCGC web site (Figure 4).

Once the initial metadata were contributed, the most important task was to make sure that all of the metadata were compliant with the FGDC Content Standard. For the metadata records that were already compliant, a simple tool was used to copy the record from a single text format to HTML and SGML formats that would be readable for the web page. HTML stands for HyperText Markup Language and is a newer version of SGML that stands for Standard Generalized Markup Language. SGML is a much larger, more difficult language to work with. It describes a standardized general structure for a web-based document. HTML is another computer markup language that is easier to use and allows more control over the presentation seen on the computer screen. A markup language is simply a computer programming language that uses identifying tags to mark when a change occurs within a document. The tool used to create the HTML and SGML formats is called a metadata parser (mp) and runs on the Unix Solaris platform that houses the server for the OCGC web site (http://geology.usgs.gov/tools/metadata/tools/doc/mp.html). The metadata parser is a compiler that edits the metadata text, creates HTML and SGML documents, and saves them in a designated folder. Once

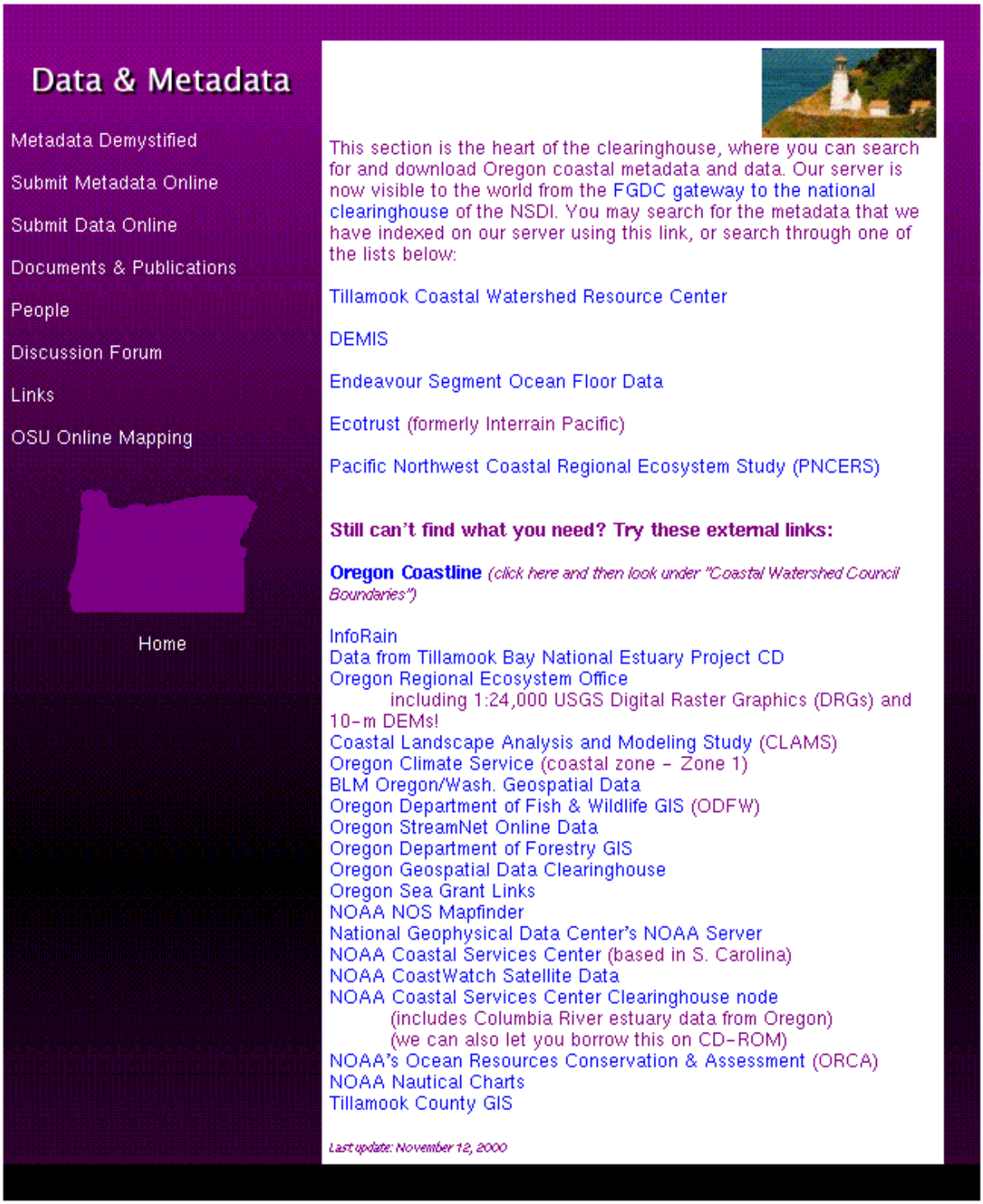
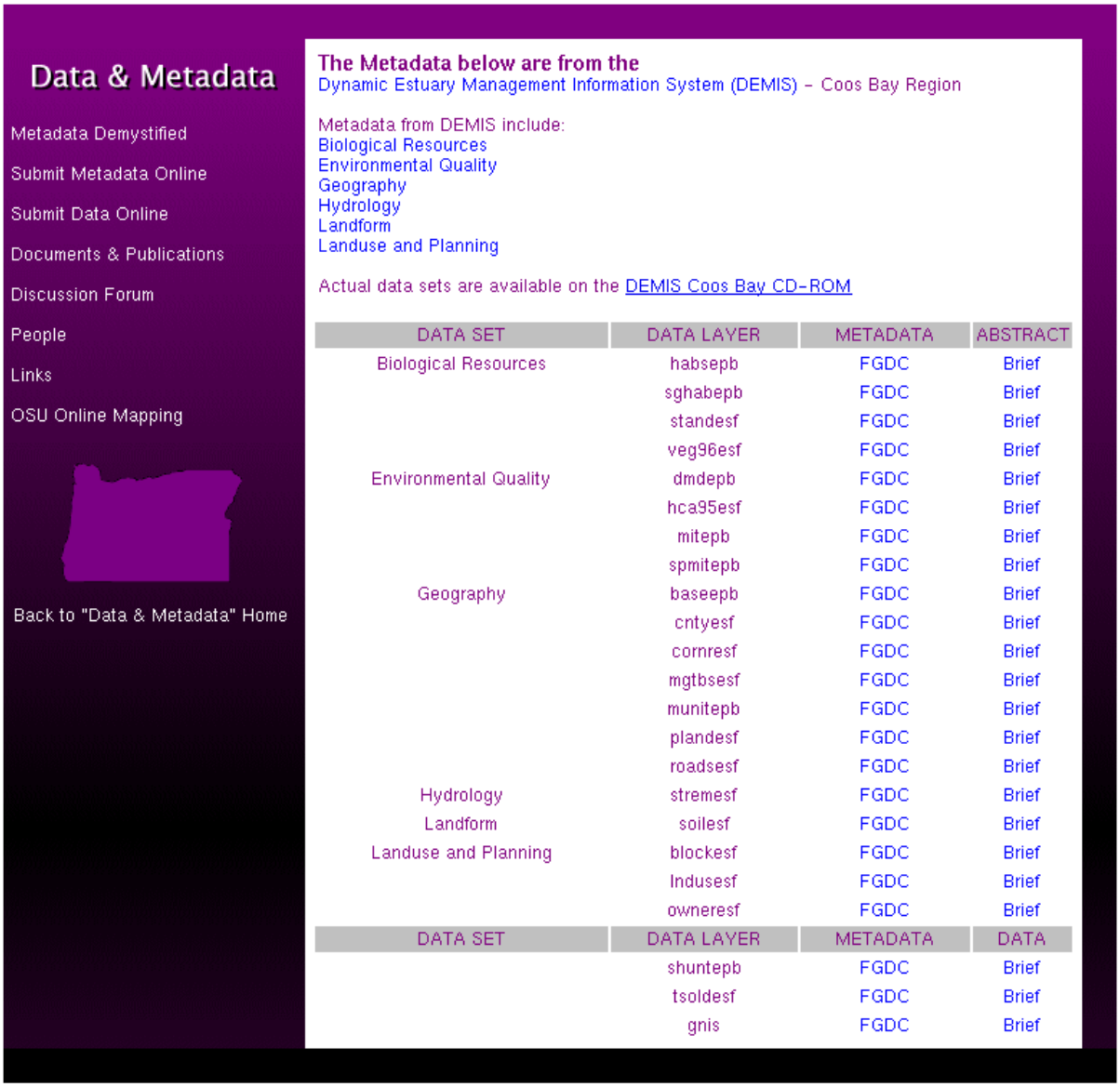



Figure 4: The Data and Metadata page of the OCGC web site (http://buccaneer.geo.orst.edu/data/).

the various formats are saved, the original HTML template that was created to produce the OCGC web page needs to be edited in such a way that the links are added and uploaded onto the web site. After this series of steps has been completed, the FGDC compliant metadata records are accessible from the Data and Metadata page (Figure 4). One can then simply click on the organization that is of interest to see the complete list of metadata available (Figure 5).

This series of steps, however, only creates a link to the FGDC metadata on the OCGC web site. Since the clearinghouse is also a node on the NSDI, the metadata need to be indexed within a metadata server in order for it to be searchable through various clearinghouse gateways. The OCGC uses the FGDC's Isite Server, which is accessible on the FGDC web site (http://www.fgdc.gov/clearinghouse/tutorials/getisite.html). Isite is a crucial tool needed to help efficiently index the metadata so that the clearinghouse will be linked to the NGDC, thus becoming a searchable node. Isite also only recognizes FGDC compliant metadata in HTML and SGML formats. For the metadata to be indexable and searchable as a node, the OCGC had to comply with the FGDC metadata standards. For further details and a better understanding of the step-by-step process used to create a metadata record in HTML and SGML formats, link it to the web page, and index it to the NGDC, a short guide is available in Appendix B.




| DATA SET | DATA LAYER | METADATA | ABSTRACT |
|---|---|---|---|
| Biological Resources | habsepb | FGDC | Brief |
| | sghabepb | FGDC | Brief |
| | standesf | FGDC | Brief |
| | veg96esf | FGDC | Brief |
| Environmental Quality | dmdepb | FGDC | Brief |
| | hca95esf | FGDC | Brief |
| | mitepb | FGDC | Brief |
| | spmitepb | FGDC | Brief |
| Geography | baseepb | FGDC | Brief |
| | cntyesf | FGDC | Brief |
| | cornresf | FGDC | Brief |
| | mgtbsesf | FGDC | Brief |
| | munitepb | FGDC | Brief |
| | plandesf | FGDC | Brief |
| | roadsesf | FGDC | Brief |
| Hydrology | stremesf | FGDC | Brief |
| Landform | soilesf | FGDC | Brief |
| Landuse and Planning | blockesf | FGDC | Brief |
| | lndusesf | FGDC | Brief |
| | owneresf | FGDC | Brief |
| DATA SET | DATA LAYER | METADATA | DATA |
| | shuntepb | FGDC | Brief |
| | tsoldesf | FGDC | Brief |
| | gnis | FGDC | Brief |

Figure 5: The complete list of metadata available for DEMIS (http://buccaneer.geo.orst.edu/data/demis_data.html).

## 5.2 Metadata Creation Tools

Most of the time, however, metadata are not compliant with the FGDC standard. The standard is very comprehensive, and it is often time consuming to fill out the entire content standard, so different organizations create short forms that

require the entry of only a few Data Elements. These short forms are usually beneficial to organizations because the amount of time it takes to fill out the metadata record is much less, yet they are still documenting their data sets. The OCGC, however, in keeping with standards for the NSDI, allows only FGDC-compliant metadata. Non-compliant metadata must therefore be formatted into FGDC-compliant form. This conversion is more difficult than simply using the metadata parsing tool. Oftentimes additional tools are needed to make the metadata FGDC-compliant, but also more readable for users who will not necessarily be using the NGDC to search for metadata. For the metadata conversion in this Master's project, two main tools were used: a public-domain metadata collector extension for ArcView, and a commercial product called Spatial Metadata Management System (SMMS).

The ArcView extension was created by the NOAA Coastal Services Center (Figure 6) and aides in the creation of FGDC compliant metadata records only from within an ArcView project. The data must first be opened in ArcView and then the metadata creation tool pulls pieces of information from existing ArcView shapefiles such as coordinate system, map projection, specific geographical features, and attribute information. The extracted information is saved in a file that can be edited so that the rest of the metadata record can be typed in manually. This tool can save time when creating a metadata record because of its ability to absorb information directly from the data within ArcView. Many times, however, the specific data

coverages or files are not available in ArcView format and other software packages must be used to create FGDC compliant metadata records.

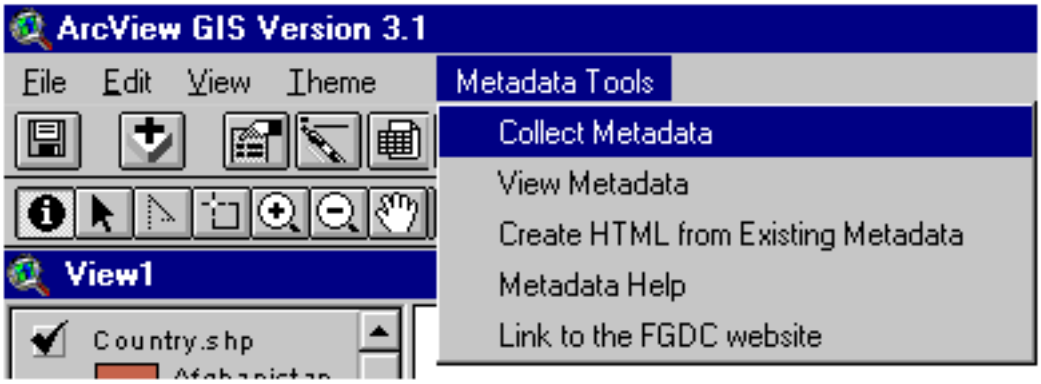



Figure 6: Example interface from the NOAA Coastal Service Center's metadata collector tool, an ArcView extension (http://www.csc.noaa.gov/metadata/text/download.html).

A commercial software package was used most frequently when creating OCGC metadata as part of this project. SMMS is a metadata collector tool originally created by EnableTech but is now produced and distributed by RTSeUSA (Figure 7). The software enforces the FGDC standard and aides in the creation and editing of records quite easily with Microsoft Access tables (Goodchild, 2000). SMMS lets the user choose between creating an actual metadata record or a template. The benefit of creating a template is that new templates can be created from existing or new metadata information. If several data sets have duplicate information, the template stores everything that has been put into the record so that the same information may be used multiple times. This ability to reuse information reduces the time it takes to develop metadata records and allows multiple people access to already created metadata. From the metadata template, it is a quick adjustment to create the actual

metadata record, and the information on the template remains in existence for future use. Using the SMMS software package was immensely convenient and simple for creating the FGDC compliant metadata for the OCGC when data sets were not available. Most of the time data were not provided with the organization's metadata and SMMS was an easy tool to use for converting non-compliant metadata into compliant metadata.

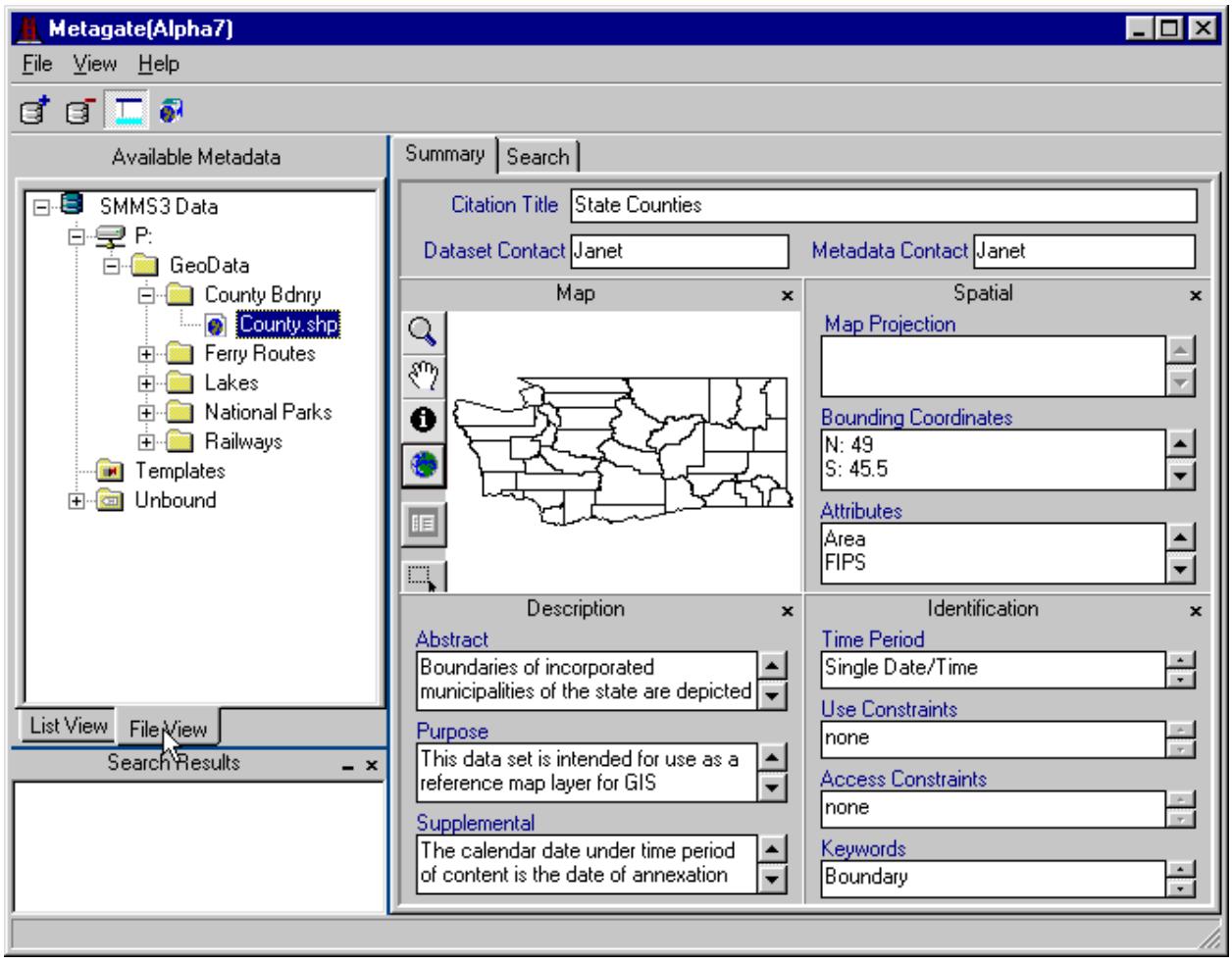



Figure 7: Example interface from the current version of SMMS (http://www.rtseusa.com/pagetemplate/1Column.asp?pageid=263).

5.3 Additional Contributors to the OCGC

Once full metadata records were completed and linked to the OCGC web page, the next need for the clearinghouse was to contact additional organizations that might want to contribute coastal metadata and data to the OCGC. These organizations varied from federal, state, and local governmental agencies to private enterprises and parties. During the summer of 1999, over thirty organizations were contacted. Information was provided about the OCGC and a commitment to action to cooperatively share data was requested if the organization expressed interest in the project. Networking to inform agencies of the clearinghouse, and to find out who was willing to cooperate was a major step in the success of the OCGC. A comprehensive list of the various agencies that were contacted can be found in Appendix C.

After the initial contact with the organizations was made, the next step was to identify and describe what data sets actually existed and who would contribute what specifically to the web site. Many organizations expressed interest in the project and were willing to share their data, however, one main obstacle hindered the progress of the OCGC. Although it is the era of the computer and the Internet, technology appears to increase faster than people's ability to keep up with it and use it to its full potential. Many of the agencies contacted had substantial amounts of data in archives, yet much of the information remains in paper form or not digitized. The OCGC, being an Internet web page, relies on digital data and focuses on sharing data through computer platforms. Data that remain in paper form are not accessible or

useful to this project and many organizations expressed the regret that a lack of time and money will prevent them from converting their data into digital form for many years.

### 5.4 Abstracted Metadata

The FGDC Content Standard is so complex and comprehensive that people who compile data sets usually do not want to take the time to create FGDC compliant metadata. Further, the mere mention of the term "metadata" can generate negative feelings and condescending remarks. To overcome these difficulties, a very helpful concept that is not yet a standard practice among agencies that compile metadata is the creation of abstracted metadata. It is possible to develop a short form that highlights the immediately pertinent information that is needed to see if a data set is applicable to an individual need. Since only section one and seven are absolutely mandatory for FGDC compliant metadata, an abstracted metadata record can be created in such a way that it contains a limited number of Data Elements, but remains FGDC compliant. Creating an abstracted template for a short metadata record was the last addition to the OCGC web site (Figure 8).


| | |
|---|---|
| Data Layer | habsepb |
| Data Title | The Oregon Estary Plan Book |
| Data Originator | Robert Cortright, Jeffrey Weber, Robert Bailey |
| Publisher | Oregon DLCD |
| Publication Place | Salem, Oregon |
| Publication Date | 1987 |
| Abstract | This coverage represents estuary habitats defined by Oregon Fish and Wildlife |
| Purpose | This coverage is part of a larger data set which comprises the Oregon Estuary Plan Book in digital format. |
| Beginning Date of Content | Unknown |
| Ending Date of Content | Unknown |
| Progress | NA |
| Update Frequency | NA |
| Access Constraints | NA |
| Use Constraints | NA |
| West Bounding Coordinate | -124.35859941 |
| East Bounding Coordinate | -124.12212495 |
| North Bounding Coordinate | 43.48188642 |
| South Bounding Coordinate | 43.25093979 |
| Location | The Coos Bay estuary as defined in the Oregon Estuary Plan Book |
| Scale | 1: 12,000 |
| Map Projection | Lambert Conformal Conic |
| Spatial Reference Method | Vector |
| Contact Person/Organization | Oregon State Service Center for Geographic Information Systems |
| Contact Street Address | 155 Cottage St. NE |
| Contact City, State, Zip Code | Salem, OR 97310 USA |
| Contact Telephone Number | (503) 378-2166 |
| Contact E-mail Address | data@sscgis.state.or.us |
| Metadata Date | 07-14-1997 |

Figure 8: An abstracted metadata record for the data layer *habsepb*.

Since coastal areas are so dynamic and fluctuate so quickly, there are specific Data Elements that are necessary to have for any data and metadata pertaining to coasts. Identifying the exact location where the data set originated is essential to

understanding the data. With the coast zone so dynamic, data sets are often created at large scales in order to capture the fine details within the given area; therefore, knowledge of the scale of the data is also necessary. Understanding the map projection of the data set is another helpful element. If the user knows the map projection, then the accuracy and spatial distortion of the data may be better understood. Due to the continuously changing state of the coastline, it is also imperative to know how often the data are updated and maintained. Many geographical features erode or change shape due to weather variability, and most natural resources are not stagnant. Migration, climate fluctuation, and other variable influences lead to an ever-changing coastal environment. So, it is necessary to frequently update coastal data, and as a user it is helpful to know if and how often the data set is maintained. The completeness, or progress, of the data set is another helpful Data Element. If the data are only partially complete, it is difficult to use the information for making a detailed analysis. Missing information may lead to inadequate or inaccurate conclusions. The last Data Element that is relevant to coastlines and is not contained within sections one and seven of the FGDC Content Standard is the spatial reference method. The spatial reference method indicates how the data were captured. Points, lines, polygons (areas), and grids can represent different features. If a user is interested is a specific type of feature such as the distribution of a given type of tree, the trees would normally be represented by a series of points. But if the data coverage in question represents tree distribution by area, then the information gained from the data set will be very different. Therefore,

it is of great importance to understand what method is used to reference the spatial information.

The abstracted metadata for the OCGC can be accessed through the same web page as the full FGDC compliant metadata (Figure 8). The abstracted form of the metadata appears under the abstract heading. When the word 'Brief' is clicked on, the actual short form will appear. The template used to create the abstract web page is the same template used for the Data and Metadata page in an attempt to maintain consistency throughout the web site. A copy of the actual HTML code used to produce the abstracted metadata page is in Appendix D. Below is a list of the twenty-eight Data Elements used in the abstracted metadata, the section number in the FGDC metadata standard where the Data Elements belong, and a brief description when needed.

Data Layer (1.1) – the name given to the data set by the originator
Data Title (1.1) – the actual descriptive title of the data set
Data Originator (1.1) – who created the data set
Publisher (1.1) – who published the data set
Publication Place (1.1) – where the data set was published or released
Publication Date (1.1) – when the data set was made available
Abstract (1.2.1) – a brief description of the data set
Purpose (1.2.2) – the reasons behind the development of the data set
Beginning Date of Content (1.3) – when the data collection began
Ending Date of Content (1.3) – when the data collection stopped
Progress (1.4.1) – completeness of the data set
Update Frequency (1.4.2) – how often the data set is maintained
Access Constraints (1.7) – issues concerned with the access of the data set
Use Constraints (1.8) – restrictions or disclaimers for the use of the data set
West Bounding Coordinate (1.5.1.1)
East Bounding Coordinate (1.5.1.2)
North Bounding Coordinate (1.5.1.3)

South Bounding Coordinate (1.5.1.4)
Location (1.2.3) – the specific location of the data set
Scale (2.5.1.2)
Map Projection (4.1.2.1) – the map projection of the data set
Spatial Reference Method (3.2) – Point, Vector (line, polygon), or Raster (grid)
Contact Person or Organization (1.9) – contact for the data set
Contact Street Address (1.9)
Contact City, State, Zip Code (1.9)
Contact Telephone Number (1.9)
Contact E-mail Address (1.9)
Metadata Date (7.1) – the date the metadata was created

## 6. FUTURE UPDATE AND MAINTENANCE OF THE OCGC

Since the focus of the OCGC is to collect and store metadata associated with data sets pertaining to the Oregon coast, it is desirable to have a metadata-entry tool as an additional feature of the web site. This tool would enable any organization that wanted to contribute data and metadata to the clearinghouse to create and automatically link its metadata to the web site. The conceptual design for this metadata entry tool is still in development, in collaboration with computer scientists at the Northwest Alliance for Computational Science and Engineering (NACSE, http://www.nacse.org). OCGC project developers will supply FGDC compliant metadata knowledge and NACSE will provide the computer programmers and engineers to design and implement the tool. The tool will provide an on-line form consisting of a series of questions about the data followed by blank spaces where the user may enter the information. Once the form is completed, it would automatically

be converted to FGDC compliant metadata and linked to the Data and Metadata web page of the OCGC site.

Another concern for the future of the clearinghouse is the formidable length of the FGDC metadata standard. Scientists, researchers, politicians, and the public alike understand the importance of documenting data and also comprehend the necessity of having a standardized way in which to create that documentation. However, a recurring problem that arose when adding metadata to the clearinghouse was that very little of it was compliant with the FGDC standard. Organizations do not allocate the money and time needed to create and input metadata. Even with tools such as SMMS and ArcView metadata collector, metadata entry is still a time consuming task. An additional complication has been that if agencies create a short, or abstracted, form of metadata, it usually does not follow the FGDC guidelines. So the question remains, "How does the clearinghouse encourage metadata creation that is FGDC compliant?" The partnership with NACSE will hopefully evolve so that the on-line metadata entry tool is created and added to the OCGC in a way that is straightforward and easy to use. This should encourage agencies to submit their metadata on-line simply and efficiently.

Another issue that may complicate metadata creation in the future is the effort of the FGDC to move from a metadata content standard within the United States to an International Organization for Standardization (ISO). The ISO will be even longer, more complex, and more comprehensive than the FGDC standard. The goal of the ISO is to create a consistent approach to establishing a set of standards that

will accommodate "information concerning objects or phenomena that are directly or indirectly associated with a location relative to the Earth" (http://www.statkart.no/isotc211/scope.htm). This goal will promote the widest possible standard for collecting information. As the metadata standard continues to grow in scope and complexity, it continues to discourage compliance. If individual organizations do not have the resources to create FGDC compliant metadata, they will most likely be even less convinced to comply with the ISO. There have been discussions about the complexity of the ISO and a need to create a user-friendly, shorter document; however, the framework remains conceptual and is still in preliminary draft form (http://www.statkart.no/isotc211/scope.htm).

The OCGC will also need to be continually maintained and updated. As agencies become more digitally oriented and as technology improves, the Internet will be even more of an information super highway than it is today. More organizations will be willing and able to contribute to the clearinghouse. As has already been discovered in the initial creation of the OCGC, adding links to other organizations and additional data can create further confusion as links change and organizations alter their URLs. It will be a full time job to continually check URLs and make sure they link to the correct web pages and information. Also, as the metadata entry tool becomes more of a reality, agencies will have questions on the correct use of the tool and the FGDC standard. Metadata training will need to be available for those not yet familiar with metadata or those just beginning to create their own records. In order to ensure that URL links remain active and to work with

organizations that want to contribute to the clearinghouse, a position will need to be created for continual maintenance and assistance.

Lastly, one of the original goals of the OCGC was to create links within the FGDC metadata records to the Internet sites where users can download the actual data sets. Due to time limitations faced in the project and the fact that many data sets are not readily available, the metadata on the OCGC web site do not yet connect fully to corresponding data. This will be left for future work along with continual URL maintenance. It is necessary to understand that, like the Oregon coastline itself, the OCGC web site is dynamic. Because of the nature of digital information, the continual improvements in technology, and the growth of the Internet, it is also understood that the clearinghouse will continue to evolve and expand. The initial implementation of the OCGC has made much data and metadata pertaining to the Oregon coast available on the Internet, and fortunately the project will continue to grow.

**References**

Goodchild, M. F. 2000. Manage Your Metadata. *Geo info Systems*. 10:5, 43-45.

Griffin, S., and Wason, T. 1997. The Year of Metadata. *Educom Review*. 32:6, 56-59.

Medyckyj-Scott, D., Newman, I., Ruggles, C., and Walker, D., eds. 1991. *Metadata in the Geosciences*. Loughborough, UK: Group D Publications LTD.

Milstead, J., and Feldman, S. 1999. Metadata. *Online*. 23:1, 24-31.

Milstead, J., and Feldman, S. 1999. Metadata Projects and Standards. *Online*. 23:1, 32-41.

Morgenthal, J. P., and Walmsley, P. 2000. Mining for Metadata. *Software Magazine*. 20:1, 30-35.

Onsrud, H. J., and Rushton, G., eds. 1995. *Sharing Geographic Information*. New Brunswick, New Jersey: Center for Urban Policy Research.

Phillips, J. T. 1995. Metadata – Information About Electronic Records. *Records Management Quarterly*. 29:4, 52-58.

Sheth, A., and Klas, W., eds. 1998. *Multimedia Data Management: Using Metadata to Integrate and Apply Digital Media*. New York: McGraw-Hill.

Stedman, C. 1999. Metadata: Hot Trends and Technologies in Brief. *Computerworld*. 33:42, 74.

Ward, B. 2000. *The Implementation of Two Distributed Databases of Water-Related Information*. Unpublished Master of Science Research Paper. Department of Geosciences, Oregon State University.

Wright, D., Duvall, G., and Ward, B. 2000. Metadata Matters: A National Geospatial Clearinghouse for the Oregon Coast. *Proceedings of The Coastal Society 17th International Conference (TCS 17)*: Portland, Oregon, July 2000.

Wright, D., McMurray, G., Breslow, S., Guyton, J., Stark, A., Allen, S., Barnett, S., and Doak, S. 1998. A National Geospatial Clearinghouse For The Oregon Coast. *Oregon Coast FGDC Proposal – Oregon State University*. http://buccaneer.geo.orst.edu/fgdc/.

## Electronic References

*Content Standard for Digital Geospatial Metadata*, 1998.
http://www.fgdc.gov/metadata/csdgm.

*Executive Order 12906*, 1994.
http://www.fgdc.gov/publications/documents/geninfo/execord.html.

*Isite Metadata Server Software*, FGDC, 2000.
http://www.fgdc.gov/clearinghouse/tutorials/getisite.html.

*ISO/TC 211 Geographic Information/Geomatics*, 2000.
http://www.statkart.no/isotc211/scope.htm.

*Metadata Parser*, USGS, 2000.
http://geology.usgs.gov/tools/metadata/tools/doc/mp.html.

*National Geospatial Data Clearinghouse: Search for Geographic Data,* 2000.
http://clearinghouse3.fgdc.gov.

*National Spatial Data Infrastructure*, 2000.
http://www.fgdc.gov/nsdi/nsdi.html.

*NOAA Coastal Services Center Metadata Collector Tool*, 2000.
http://www.csc.noaa.gov/metadata/text/download.html.

*Northwest Alliance for Computational Science and Engineering,* 2000.
http://www.nacse.org/.

*Office of Management and Budget (OMB) Circular No. A-16 Revised*, 2000.
http://www.whitehouse.gov/OMB/circulars/a016/a016.html.

*Oregon Coast Geospatial Clearinghouse (OCGC),* 2000.
http://buccaneer.geo.orst.edu/.

*Spatial Metadata Management System*, 2000.
http://www.rtseusa.com/pagetemplate/1Column.asp?pageid=263.

# Appendices

# Appendix A

A Full Metadata Record - Blank Template

## A Full Metadata Record - Blank Template:

IDENTIFICATION_INFORMATION:
DATA_QUALITY_INFORMATION:
SPATIAL_DATA_ORGANIZATION_INFORMATION:
SPATIAL_REFERENCE_INFORMATION:
ENTITY_AND_ATTRIBUTE_INFORMATION:
DISTRIBUTION_INFORMATION:
METADATA_REFERENCE_INFORMATION:

IDENTIFICATION_INFORMATION:
- Citation:
  - Citation_Information:
    - Originator:
    - Publication_Date:
    - Publication_Time:
    - Title:
    - Edition:
    - Geospatial_Data_Presentation_Form:
    - Series_Information:
      - Series_Name:
      - Issue_Identification:
    - Publication_Information:
      - Publication_Place:
      - Publisher:
    - Other_Citation_Details:
    - Online_Linkage:
    - Larger_Work_Citation:
      - Citation_Information:
- Description:
  - Abstract:
  - Purpose:
  - Supplemental_Information:
- Time_Period_of_Content:
  - Time_Period_Information:
    - Single_Data/Time:
      - Calendar_Date:
      - Time_of_Day:
    - Multiple_Dates/Times:
      - Calendar_Date:

Time_of_Day:
Range_of_Dates/Times:
Beginning_Date:
Beginning_Time:
Ending_Date:
Ending_Time:
Currentness_Reference:
Status:
Progress:
Maintenance_and_Update_Frequency:
Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate:
East_Bounding_Coordinate:
North_Bounding_Coordinate:
South_Bounding_Coordinate:
Data_Set_G-Polygon:
Data_Set_G-Polygon_Outer_G-Ring:
G-Ring_Latitude:
G-Ring_Longitude:
Data_Set_G-Polygon_Exclusion_G-Ring:
G-Ring_Latitude:
G-Ring_Longitude:
Keywords:
Theme:
Theme_Keyword_Thesaurus:
Theme_Keyword:
Place:
Place_Keyword_Thesaurus:
Place_Keyword:
Stratum:
Stratum_Keyword_Thesaurus:
Stratum_Keyword:
Temporal:
Temporal_Keyword_Thesaurus:
Temporal_Keyword:
Access_Constraints:
Use_Constraints:
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person:
Contact_Organization:

Contact_Organization_Primary:
Contact_Organization:
Contact_Person:
Contact_Position:
Contact_Address:
Address_Type:
Address:
City:
State_or_Province:
Postal_Code:
Country:
Contact_Voice_Telephone:
Contact_TDD/TTY_Telephone:
Contact_Facsimile_Telephone:
Contact_Electronic_Mail_Address:
Hours_of_Service:
Contact_Instructions:
Browse_Graphic:
Browse_Graphic_File_Name:
Browse_Graphic_File_Description:
Browse_Graphic_File_Type:
Data_Set_Credit:
Security_Information:
Security_Classification_System:
Security_Classification:
Security_Handling_Description:
Native_Data_Set_Environment:
Cross_Reference:
Citation_Information:
Originator:
Publication_Date:
Publication_Time:
Title:
Edition:
Geospatial_Data_Presentation_Form:
Series_Information:
Series_Name:
Issue_Identification:
Publication_Information:
Publication_Place:
Publisher:
Other_Citation_Details:
Online_Linkage:

```
            Larger_Work_Citation:
                Citation_Information:


DATA_QUALITY_INFORMATION:
    Attribute_Accuracy:
        Attribute_Accuracy_Report:
        Quantitative_Attribute_Accuracy_Assessment:
            Attribute_Accuracy_Value:
            Attribute_Accuracy_Explanation:
    Logical_Consistency_Report:
    Completeness_Report:
    Positional_Accuracy:
        Horizontal_Positional_Accuracy:
            Horizontal_Positional_Accuracy_Report:
            Quantitative_Horizontal_Positional_Accuracy_Assessment:
                Horizontal_Positional_Accuracy_Value:
                Horizontal_Positional_Accuracy_Explanation:
        Vertical_Positional_Accuracy:
            Vertical_Positional_Accuracy_Report:
            Quantitative_Vertical_Positional_Accuracy_Assessment:
                Vertical_Positional_Accuracy_Value:
                Vertical_Positional_Accuracy_Explanation:
    Lineage:
        Source_Information:
            Source_Citation:
                Citation_Information:
                    Originator:
                    Publication_Date:
                    Publication_Time:
                    Title:
                    Edition:
                    Geospatial_Data_Presentation_Form:
                    Series_Information:
                        Series_Name:
                        Issue_Identification:
                    Publication_Information:
                        Publication_Place:
                        Publisher:
                    Other_Citation_Details:
                    Online_Linkage:
                    Larger_Work_Citation:
                        Citation_Information:
```

Source_Scale_Denominator:
Type_of_Source_Media:
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date:
Time_of_Day:
Multiple_Dates/Times:
Calendar_Date:
Time_of_Day:
Range_of_Dates/Times:
Beginning_Date:
Beginning_Time:
Ending_Date:
Ending_Time:
Source_Currentness_Reference:
Source_Citation_Abbreviation:
Source_Contribution:
Process_Step:
Process_Description:
Source_Used_Citation_Abbreviation:
Process_Date:
Process_Time:
Source_Produced_Citation_Abbreviation:
Process_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person:
Contact_Organization:
Contact_Organization_Primary:
Contact_Organization:
Contact_Person:
Contact_Position:
Contact_Address:
Address_Type:
Address:
City:
State_or_Province:
Postal_Code:
Country:
Contact_Voice_Telephone:
Contact_TDD/TTY_Telephone:
Contact_Facsimile_Telephone:

Contact_Electronic_Mail_Address:
Hours_of_Service:
Contact_Instructions:
Cloud_Cover:

SPATIAL_DATA_ORGANIZATION_INFORMATION:
Indirect_Spatial_Reference:
Direct_Spatial_Reference_Method:
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type:
Point_and_Vector_Object_Count:
VPF_Terms_Description:
VPF_Topology_Level:
VPF_Point_and_Vector_Object_Type:
Point_and_Vector_Object_Count:
Raster_Object_Information:
Raster_Object_Type:
Row_Count:
Column_Count:
Vertical_Count:

SPATIAL_REFERENCE_INFORMATION:
Horizontal_Coordinate_System_Definition:
Geographic:
Latitude_Resolution:
Longitude_Resolution:
Geographic_Coordinate_Units:
Planar:
Map_Projection:
Map_Projection_Name:
Albers_Conical_Equal_Area:
Standard_Parallel:
Longitude_of_Central_Meridian:
Latitude_of_Projection_Origin:
False_Easting:
False_Northing:
Azimuthal_Equidistant:
Longitude_of_Central_Meridian:
Latitude_of_Projection_Origin:
False_Easting:

False_Northing:
Equidistant_Conic:
Standard_Parallel:
Longitude_of_Central_Meridian:
Latitude_of_Projection_Origin:
False_Easting:
False_Northing:
Equirectangular:
Standard_Parallel:
Longitude_of_Central_Meridian:
False_Easting:
False_Northing:
General_Vertical_Near-sided_Perspective:
Height_of_Perspective_Point_Above_Surface:
Longitude_of_Projection_Center:
Latitude_of_Projection_Center:
False_Easting:
False_Northing:
Gnomonic:
Longitude_of_Projection_Center:
Latitude_of_Projection_Center:
False_Easting:
False_Northing:
Lambert_Azimuthal_Equal_Area:
Longitude_of_Projection_Center:
Latitude_of_Projection_Center:
False_Easting:
False_Northing:
Lambert_Conformal_Conic:
Standard_Parallel:
Longitude_of_Central_Meridian:
Latitude_of_Projection_Origin:
False_Easting:
False_Northing:
Mercator:
Standard_Parallel:
Scale_Factor_at_Equator:
Longitude_of_Central_Meridian:
False_Easting:
False_Northing:
Modified_Stereographic_for_Alaska:
False_Easting:
False_Northing:

Miller_Cylindrical:
    Longitude_of_Central_Meridian:
    False_Easting:
    False_Northing:
Oblique_Mercator:
    Scale_Factor_at_Center_Line:
    Oblique_Line_Azimuth:
        Azimuthal_Angle:
        Azimuth_Measure_Point_Longitude:
    Oblique_Line_Point:
        Oblique_Line_Latitude:
        Oblique_Line_Longitude:
    Latitude_of_Projection_Origin:
    False_Easting:
    False_Northing:
Orthographic:
    Longitude_of_Projection_Center:
    Latitude_of_Projection_Center:
    False_Easting:
    False_Northing:
Polar_Stereographic:
    Straight_Vertical_Longitude_From_Pole:
    Standard_Parallel:
    Scale_Factor_at_Projection_Origin:
    False_Easting:
    False_Northing:
Polyconic:
    Longitude_of_Central_Meridian:
    Latitude_of_Projection_Origin:
    False_Easting:
    False_Northing:
Robinson:
    Longitude_of_Projection_Center:
    False_Easting:
    False_Northing:
Sinusoidal:
    Longitude_of_Central_Meridian:
    False_Easting:
    False_Northing:
Space_Oblique_Mercator_(Landsat):
    Landsat_Number:
    Path_Number:
    False_Easting:

False_Northing:
Stereographic:
Longitude_of_Projection_Center:
Latitude_of_Projection_Center:
False_Easting:
False_Northing:
Transverse_Mercator:
Scale_Factor_at_Central_Meridian:
Longitude_of_Central_Meridian:
Latitude_of_Projection_Origin:
False_Easting:
False_Northing:
van_der_Grinten:
Longitude_of_Central_Meridian:
False_Easting:
False_Northing:
Other_Projection's_Definition:
Grid_Coordinate_System:
Grid_Coordinate_System_Name:
Universal_Transverse_Mercator:
UTM_Zone_Number:
Transverse_Mercator:
Universal_Polar_Stereographic:
UPS_Zone_Identifier:
Polar_Stereographic:
State_Plane_Coordinate_System:
SPCS_Zone_Identifier:
Lambert_Conformal_Conic:
Transverse_Mercator:
Oblique_Mercator:
Polyconic:
ARC_Coordinate_System:
ARC_System_Zone_Identifier:
Equirectangular:
Azimuthal_Equidistant:
Other_Grid_System's_Definition:
Local_Planar:
Local_Planar_Description:
Local_Planar_Georeference_Information:
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method:
Coordinate_Representation:
Abscissa_Resolution:

Ordinate_Resolution:
Distance_and_Bearing_Representation:
Distance_Resolution:
Bearing_Resolution:
Bearing_Units:
Bearing_Reference_Direction:
Bearing_Reference_Meridian:
Planar_Distance_Units:
Local:
Local_Description:
Local_Georeference_Information:
Geodetic_Model:
Horizontal_Datum_Name:
Ellipsoid_Name:
Semi-major_Axis:
Denominator_of_Flattening_Ratio:
Vertical_Coordinate_System_Definition:
Altitude_System_Definition:
Altitude_Datum_Name:
Altitude_Resolution:
Altitude_Distance_Units:
Altitude_Encoding_Method:
Depth_System_Definition:
Depth_Datum_Name:
Depth_Resolution:
Depth_Distance_Units:
Depth_Encoding_Method:

ENTITY_AND_ATTRIBUTE_INFORMATION:
Detailed_Description:
Entity_Type:
Entity_Type_Label:
Entity_Type_Definition:
Entity_Type_Definition_Source:
Attribute:
Attribute_Label:
Attribute_Definition:
Attribute_Definition_Source:
Attribute_Domain_Values:
Enumerated_Domain:
Enumerated_Domain_Value:
Enumerated_Domain_Value_Definition:

Enumerated_Domain_Value_Definition_Source:
Attribute:
Attribute_Domain_Values:
Range_Domain:
Range_Domain_Minimum:
Range_Domain_Maximum:
Attribute:
Attribute_Domain_Values:
Codeset_Domain:
Codeset_Name:
Codeset_Source:
Unrepresentable_Domain:
Attribute_Units_of_Measure:
Attribute_Measurement_Resolution:
Beginning_Date_of_Attribute_Values:
Ending_Date_of_Attribute_Values:
Attribute_Value_Accuracy_Information:
Attribute_Value_Accuracy:
Attribute_Value_Accuracy_Explanation:
Attribute_Measurement_Frequency:
Overview_Description:
Entity_and_Attribute_Overview:
Entity_and_Attribute_Detail_Citation:

DISTRIBUTION_INFORMATION:
Distributor:
Contact_Information:
Contact_Person_Primary:
Contact_Person:
Contact_Organization:
Contact_Organization_Primary:
Contact_Organization:
Contact_Person:
Contact_Position:
Contact_Address:
Address_Type:
Address:
City:
State_or_Province:
Postal_Code:
Country:
Contact_Voice_Telephone:

Contact_TDD/TTY_Telephone:
Contact_Facsimile_Telephone:
Contact_Electronic_Mail_Address:
Hours_of_Service:
Contact_Instructions:
Resource_Description:
Distribution_Liability:
Standard_Order_Process:
Non-digital_Form:
Digital_Form:
Digital_Transfer_Information:
Format_Name:
Format_Version_Number:
Format_Version_Date:
Format_Specification:
Format_Information_Content:
File_Decompression_Technique:
Transfer_Size:
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name:
Dialup_Instructions:
Lowest_BPS:
Highest_BPS:
Number_DataBits:
Number_StopBits:
Parity:
Compression_Support:
Dialup_Telephone:
Dialup_File_Name:
Access_Instructions:
Online_Computer_and_Operating_System:
Offline_Option:
Offline_Media:
Recording_Capacity:
Recording Density:
Recording_Density_Units:
Recording_Format:
Compatibility_Information:
Fees:
Ordering_Instructions:

Turnaround:
Custom_Order_Process:
Technical_Prerequisites:
Available_Time_Period:
Time_Period_Information:
Single_Date/Time:
Calendar_Date:
Time_of_Day:
Multiple_Dates/Times:
Calendar_Date:
Time_of_Day:
Range_of_Dates/Times:
Beginning_Date:
Beginning_Time:
Ending_Date:
Ending_Time:

METADATA_REFERENCE_INFORMATION:
Metadata_Date:
Metadata_Review_Date:
Metadata_Future_Review_Date:
Metadata_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person:
Contact_Organization:
Contact_Organization_Primary:
Contact_Organization:
Contact_Person:
Contact_Position:
Contact_Address:
Address_Type:
Address:
City:
State_or_Province:
Postal_Code:
Country:
Contact_Voice_Telephone:
Contact_TDD/TTY_Telephone:
Contact_Facsimile_Telephone:
Contact_Electronic_Mail_Address:
Hours_of_Service:

Contact_Instructions:
Metadata_Standard_Name:
Metadata_Standard_Version:
Metadata_Time_Convention:
Metadata_Access_Constraints:
Metadata_Use_Constraints:
Metadata_Security_Information:
Metadata_Security_Classification_System:
Metadata_Security_Classification:
Metadata_Security_Handling_Description:

# Appendix B

A Short Guide To Creating, Linking, And Indexing
A Metadata Record To The OCGC

# A Short Guide To Creating, Linking, And Indexing A Metadata Record To The OCGC

1. To run the metadata parser (mp), always change file path (directory) on the terminal (host) to the file path (directory) in file manager. These paths need to match. The terminal is where to run mp and the file manager designates a folder in which to save the HTML and SGML formats created with mp.

2. To run mp and to create the HTML and SGML formats, type in the following line on the terminal (host): mp filename.txt –h filename.html –s filename.sgml

3. To copy the HTML and SGML newly created files into the directory that the Isite server reads from:
   - Get into file manager.
   - In file manager navigate to /usr/local/Isite/metadata/.
   - Create a new folder for the new organization if needed.
   - On terminal (host) navigate to the directory path to copy files FROM.
   - On terminal (host):
     - cp *.html /usr/local/Isite/metadata/NAME OF ORGANIZATION/.
     - cp *.sgml /usr/local/Isite/metadata/NAME OF ORGANIZATION/.

4. To Index the metadata files:
   - The file path /usr/local/Isite/metadata/NAME OF ORGANIZATION/ needs .html and .sgml files before running Iindex command.
   - For assistance, go to www.fgdc.gov.
     - Go to clearinghouse.
     - Go to tutorial for setting up a node.
     - Go to guided creation (Image-map).
     - Go to Index link.
   - On terminal (host) navigate to /usr/local/bin/.
   - On terminal (host) type in line from FGDC on /usr/local/bin/.

The line is: Iindex –d /usr/local/Isite/index/OCmetadata/ –t fgdc –o fieldtype=fgdc.fields /usr/local/Isite/metadata/*.sgml/

Notes for indexing:
- Isite server calls OCGC metadata.
- OCmetadata is the index name on the OCGC server that is referenced by the FGDC server.
- The "bin" file is where fgdc.fields is located on our server.

5. To set up the link to the OCGC web site: http://buccaneer.geo.orst.edu/.

Go to file manager.
Go to location to put the .html metadata files into. The path to put files
that need to be uploaded on to the OCGC web site into is:
/usr/local/http/public_server/public/metadata/http/NAME OF ORGANIZATION/.
Create a new folder for the new batch of .html files just created.
If needed create subdirectories within the new folders.
To copy the .html files:
Only the .html files are needed.
On file manager navigate to
/usr/local/Isite/metadata/NAME OF ORGANIZATION/.
Click on all of the .html files that need to be copied to the new directory.
Select "Copy To".
The destination folder is:
/usr/local/http/public_server/public/metadata/http/NAME OF ORGANIZATION/.
Edit the original HTML template to link to the metadata .html files.
See below.
To finally create the link to the OCGC:
Go to /usr/local/http/public_server/public/data/index.html.
Open this file in text editor.
Save a backup first.
Save as: /usr/local/http/public_server/public/data/index_old.html.
Scroll to "THE NAME OF ORGANIZATION".
Add </A> to the new line.
Save as: /usr/local/http/public_server/public/data/index.html.

**These steps are for editing final HTML web pages.**

1. To edit HTML templates or documents, open up the text editor. Navigate to the location of the templates. For the OCGC project the templates are in: /usr/local/Isite/metadata/ecotrust/html/.

2. To add the HTML template to the web site, save the corrected, or altered, HTML code from the text editor to a different file. From the text editor:
Save as: /usr/local/http/public_server/public/data/.
Type in "THE NAME OF ORGANIZATION_data.html".
From this file location, the HTML is automatically on the OCGC web site.

## Appendix C

Comprehensive List of Organizations Invited to be Contributors to the OCGC

# Comprehensive List of Organizations Invited to be Contributors to the OCGC

## General Contacts:

Hatfield Marine Science Center (541) 867-0100
Jim Good (541) 737-1339
good@oce.orst.edu

NOAA Main Contact:
Jessica Waddell (541) 867-0274
waddell@pmel.noaa.gov

## Federal Agencies:

COMPAS (Coastal Ocean Management, Planning and Assessment System)
Letter To: Randy Dana
800 NE Oregon St. #18
Portland, OR 97232
(503) 731-4065 ext.31
randy.dana@state.or.us

EPA, Yaquina Bay Project, Hatfield Marine Science Center
Letter To: Director: Walt Nelson
Coastal Ecology Branch/ EPA
2111 Marine Science Dr.
Newport, OR 97365
Fax: (541) 867-4049
Phone: (541) 867-5000

NOAA's ORCA (Ocean Resources Conservation and Assessment Division)
Letter To: Dan Basta
Special Projects Office
1305 East-West Hwy.
SSMC4 n/sp 9th Floor
Silver Spring, Maryland 20910
(301) 713-3000

ORCA Internet Site:
http://seaserver.nos.noaa.gov/
Director: Charles Ehler
(301) 713-2989

NOAA's PMEL (Pacific Marine Environmental Laboratory, Hatfield Marine Science Center)

Letter To: Dr. Stephen Hammond
Mark O. Hatfield Marine Science Center
2115 SE OSU Dr.
Newport, OR 97365
hammond@pmel.noaa.gov

PMEL (Based in Seattle, WA)
http://www.pmel.noaa.gov/

NOAA's Coastal Services Center

Letter To: Coastal Services Center
Attn: Anne Ball
2234 S Hobson Ave.
Charleston, SC 29405-2413
aball@csc.noaa.gov

And: Rebecca Owen (Librarian)
rowen@csc.noaa.gov

General Info:
http://www.csc.noaa.gov/
(843) 740-1200

NOAA's HAZMAT (Hazardous Materials Response and Assessment Division)

Letter To: Office of Response and Restoration
1305 East-West Hwy. Suite 10411
Silver Spring, Maryland 20910
(301) 713-2989 ext.5

And: Gerry Galt
http://response.restoration.noaa.gov/index.html
7600 Sandpoint Way NE
Seattle, WA 98115

General Info:
HAZMAT now called OR&R
Office of Response and Restoration
Based in Seattle, WA
(206) 526-6317

NOAA's National Geodetic Survey
Letter To: Curt Smith, NGS
P.O. Box 12114
Salem, OR 97309-0114
(503) 986-3543
curtsmith@earthlink.net

General Info:
http://www.ngs.noaa.gov/ADVISORS/Oregon.shtml

NOAA's National Geophysical Data Center
Contact: Mai Edwards
(301) 497-6958
NOT HELPFUL!!

General Info:
http://www.ngdc.noaa.gov/ngdc.html
Look for NOAA server for Metadata.

NOAA's National Marine Fisheries Service, Hatfield Marine Science Center
Letter To: Bruce McCain
Hatfield Marine Science Center
2030 S Marine Science Dr.
Newport, OR 97365
(541) 867-0346

NOAA's National Marine Fisheries Service, Northwest Fisheries Center, Seattle, WA
Letter To: Deputy Director: Linda Jones
2725 Montlake Blvd. E
Seattle, WA 98112

NOAA's National Ocean Service (Mapfinder Project)
Letter To: Peter L Grose
Special Projects Office, NOS
9449 SSMC4, 13th Floor
1305 East-West Hwy.

Silver Spring, Maryland 20910-3281
(301) 713-3000 ext.132
peter.grose@noaa.gov

NOAA's Office of Coast Survey
Letter To: The West Commander: James Gardner
Pacific Hydrographic Branch, Bldg.3, Room 1001
7600 Sand Point Way NE
Seattle, WA 98115
(206) 526-6835

General Info:
http://chartmaker.ncd.noaa.gov/

US Fish and Wildlife Service
Letter To: Anne Badgley (Regional Director)
US Fish and Wildlife Service
Eastside Federal Complex
911 NE 11th Ave.
Portland, OR 97232-4181
(503) 231-6121

General Info:
http://www.r1.fws.gov/ (Pacific Region)

CLAMS (US Forest Service Coastal Landscape Analysis and Modeling Study)
Letter To: Thomas A Spies
3200 SW Jefferson
Forest Sciences Laboratory
Corvallis, OR 97331
(541) 737-2244 or (541) 750-7354
spiest@fsl.orst.edu

General Info:
http://www.fsl.orst.edu/clams

US Geological Survey
Letter To: Bruce Fisher
GIS Coordinator
10615 SE Cherry Blossom Drive
Portland, OR 97216
(503) 251-3228

General Info:
http://www.usgs.gov/index.html
(888) 275-8747
Oregon District Info Specialist:
Jo Miller
(503) 251-3201

State Agencies:

Coastal Ocean Unit of the Department of Land Conservation and Development (DLCD)
Letter To: Oregon Coastal Program
Eldon Hout (Program Manager)
Portland State Office Building, Suite 1145
800 NE Oregon St. #18
Portland, OR 97232
(503) 731-4065 ext.28

Other Contact:
Don Oswalt
(503) 373-0050 ext.248

DEMIS (Dynamic Estuary Management Information System)
Letter To: Tanya Haddad at DLCD
800 NE Oregon St. #18
Portland, OR 97232
(503) 731-4065 ext.30

General Info:
http://www.lcd.state.or.us/coast/demis/core.html
On Campus Contact:
David Fuss
dfuss@oce.orst.edu (COAS)

Department of Agriculture (ODA)
Letter To: Jim Johnson
Department of Agriculture
635 Capital St. NE
Salem, OR 97301

General Info:
http://www.oda.state.or.us/
Natural Resource Division

(503) 986-4700

Department of Environmental Quality (DEQ)
Letter To: Don Yon
811 SW 6th Ave.
Portland, OR 97204
(503) 229-5076

And: Greg Pettit
DEQ Laboratory
1712 SW 11th Ave.
Portland, OR 97201

And: Rick Hafele
DEQ Laboratory
1712 SW 11th Ave.
Portland, OR 97201

General Info:
http://www.deq.state.or.us/
(800) 452-4011
Other Contact:
Andy Schidel
(503) 229-6121

Department of Fish and Wildlife (ODFW)
Letter To: Marine Resources, Newport
David Fox
2040 SE Marine Science Dr.
Newport, OR 97365
(541) 867-4741

And: GIS Coordinator
Milton Hill
2501 SW 1st Ave.
Portland, OR 97207
(503) 872-5255 ext.5583

General Info:
http://www.dfw.state.or.us/
(503) 872-5268
**Look At:**

http://www.rainbow.dfw.state.or.us/data

Department of Geology and Mineral Industries (DOGAMI)
Letter To: Lou Clark
lu.clark@state.or.us

And: DOGAMI
State Office Building, Suite 965
806 NE Oregon St. #28
Portland, OR 97232
(503) 731-4100 ext.216

Department of Forestry
Letter To: GIS Coordinator
Emmer Nile
2600 State St.
Salem, OR 97310
(503) 945-7418

General Info:
http://www.odf.state.or.us/
(503) 945-7200

State Service Center
Contact Person:
Steve Burnet
(503) 378-2166
http://www.sscgis.state.or.us/
**125 data sets on line**

Counties

Benton County—Alsea Basin
Letter To: Doug Sackinger
360 SW Avery Ave.
Corvallis, OR 97333
(541) 766-6601
douglas.a.sackinger@co.benton.or.us
General Info:
http://www.co.benton.or.us/

Clatsop County
Letter To: Doug Noltemeier

GIS Coordinator
PO Box 1070
Astoria, OR 97103
**Ask for contribution after the 1st of the year**

Coos County
Letter To: Betsy Smith
Coos County Office of the Assessor
250 N Baxter
Coquille, OR 97423

General Info:
(541) 396-3121

Curry County
Letter To: Jim Kolen
Curry County Assessor's Office
PO Box 746
Gold Beach, OR 97444

General Info:
(541) 247-7011

Douglas County
Letter To: Wendell Lewis
Douglas County Office of the Assessor
1036 SE Douglas St.
Roseburg, OR 97470
welewis@co.douglas.or.us

General Info:
(800) 224-1619 or
(541) 440-4224

Polk County (Dallas)
Letter To: Dean Anderson
polkj@teleport.com
General Info:
(503) 623-8391

Washington County
Letter To: Bob Haas

Washington County GIS Coordinator
155 N 1st Ave., MS #1
Hillsboro, OR 97124-3001
(503) 846-3550
bob_haas@co.washington.or.us

General Info:
(503) 648-8741

Yamhill County
Letter To: John Caputo
Yamhill County GIS Department
535 E 5th St.
McMinnville, OR 97128
(503) 434-7505 ext.7
caputoj@co.yamhill.or.us

Confederated Tribes

Silets Tribe
Letter To: Robert Luster
(541) 444-8287
robertl@ctsi.nsn.us

Other

Earth Designs Consultants, Inc.
Letter To: Ralph Garono
800 NW Starker, Suite 31
Corvallis, OR 97330
(541) 757-7896

COPE (Coastal Oregon Productivity Enhancement Program)
Letter To: Stephen D. Hobbs
Department of Forest Science
Richardson Hall 316
Oregon State University
Corvallis, OR 97331-5752
(541) 737-8477
hobbss@ccmail.orst.edu

General Info:
Newport ext. 7-0220

# Appendix D

HTML Code For Abstracted Metadata Web Pages

## HTML Code For Abstracted Metadata Web Pages

```
<HTML>
<HEAD>
<TITLE>SPECIFIC TITLE FOR WEB PAGE</TITLE>
<script language="JavaScript">

<!--

if (document.images) {
  image1on = new Image();
  image1on.src = "images/or_a.gif";

  image1off = new Image();
  image1off.src = "images/or_i.gif";

}

function changeImages() {
  if (document.images) {
    for (var i=0; i<changeImages.arguments.length; i+=2) {
      document[changeImages.arguments[i]].src = eval(changeImages.arguments[i+1]
+ ".src");
    }
  }
}

// -->

</script>

<link rel="stylesheet" href="../clearinghouse.css" type="text/css">
</HEAD>

<BODY bgcolor=white text=purple>
<CENTER>
<TABLE border=0 cellpadding=5 cellspacing=0>
<TR>
     <TD colspan=3 bgcolor=purple> <IMG src="../images/blank.gif" height=8
width="8">
     </TD>
</TR>
```

```
<TR>
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background="images/bground.gif"   rowspan=1> <a href="index.html"><IMG
border=0 src="images/header.gif"></a>
<P>
<A href="../myst/" class="rollwhite">Metadata Demystified</A>
<P>
<A href="../submit/" class="rollwhite">Submit Metadata Online</A>
<P>
<A href="../dsubmit/" class="rollwhite">Submit Data Online</A>
<P>
<A href="../docs/" class="rollwhite">Documents & Publications</A>
<P>
<A href="http://osu.orst.edu/class/wwwboard/coast/index.html"
class="rollwhite">Discussion Forum</A>
<P>
<A href="../people/" class="rollwhite">People</A>
<P>
<A href="../links/" class="rollwhite">Links</A>
<P>
<A href="../webmap/" class="rollwhite">OSU Online Mapping</A>
<P>

 <a href="index.html" onMouseOver="changeImages('image1', 'image1on')"
onMouseOut="changeImages('image1', 'image1off')"><img name="image1"
src="images/or_i.gif"
alt="Go Back" width=133 height=108 border=0></a> <br> <font color=white>Back
to "Data & Metadata" Home</font>
    </TD>
    <TD valign="top" width="872">
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<TD>

<P>
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                  <TD width="61%" valign="top"><b><font size=4>The Abstract below
                  is from  </font></b> <br> <a target="new" href="http://SPECIFIC
                  URL FOR THE ORGANIZATION" class="rollblue">SPECIFIC
```

```
                NAME OF ORGANIZATION</a>
                </TD>
                <TD width="39%" align="right"><img src="images/NAME OF
                IMAGE FOR INDIVIDUAL WEB PAGE.GIF" width="144"
                height="100"></TD>
              </TR>
            </TABLE>
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    </TR>
<!--The following is the information for each metadata/data file.-->
<!--It will change depending on the file you're using and it's location.-->
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    <TR>
    <TD class="white" VALIGN=top> Purpose </TD>
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<TR>
<TD class="white" VALIGN=top> North Bounding Coordinate </TD>
<TD class="white" VALIGN=top> **INFORMATION TO BE ADDED** </TD>
</TR>
<TR>
<TD class="white" VALIGN=top> South Bounding Coordinate </TD>
<TD class="white" VALIGN=top> **INFORMATION TO BE ADDED** </TD>
</TR>
<TR>
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  <TR>
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  <TR>
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  <TR>
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<TR>
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</TD>
</TR>
</TABLE>

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</BODY>
</HTML>
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