

# Developing the Oregon Explorer™ -- a Natural Resources Digital Library

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## Abstract

The Oregon Explorer™ ([www.oregonexplorer.info](http://www.oregonexplorer.info)) strives to support informed decisions and actions by people concerned with Oregon's natural resources and environment. The Oregon Explorer's multi-media environment integrates archived digital documents, mapping and decision support tools, and finding aids for specific natural resource issues and topics. This paper presents the chronology of this purposeful and place-based natural resources digital library and the process which has evolved for new portal development within its framework.

## Introduction

The Institute for Natural Resources and the Oregon State University Libraries launched the Oregon Explorer in June 2007. Currently, the Oregon Explorer natural resources digital library consists of a statewide site ([www.oregonexplorer.info](http://www.oregonexplorer.info)) which provides the overarching framework for associated basin, topic, and data portals developed during the previous five years.

Oregon Explorer helps users to find, retrieve, integrate and synthesize information related to natural resource issues. Oregon Explorer portals provide access to Geographic Information System (GIS), visualization and reporting tools, as well as archived geo-referenced materials in interactive formats. Natural resource issues of greatest concern to Oregon's citizens are addressed by basins and by topics. Maps, stories, reports and data help users to better understand the impacts of change. This includes changes resulting from proposed land use measures,

increasing wildfire risk, habitat concerns for listed and recovering species, and changing community demographics throughout Oregon, especially for resource-dependent rural communities.

Oregon State University (OSU) has an international reputation as a premier research institution in the areas of forestry, fisheries, wildlife, oceanography, and climate change. Sustainable Earth Ecosystems is one of three signature areas of distinction in the OSU Strategic Plan (Oregon State University, 2009). The Corvallis campus of OSU is also the home for researchers employed by the U.S. Forest Service, the U. S. Geological Survey, U. S. Environmental Protection Agency, and the State of Oregon's Department of Fish and Wildlife. As a land grant institution, Oregon State University is looked to as a credible source of data and synthesized information related to our state's economic and environmental health.

OSU is also the home of the Institute for Natural Resources (INR) which was authorized in 2001 by the Oregon Legislature to recognize the importance of natural resources research, policy and information sharing within the state. The Institute's charge includes making natural resource research findings more readily available to policy makers and the general public. Wanting to promote Oregon State University Libraries (OSUL) as a leader in digital initiatives, the University Librarian advocated for it to take a lead role in the information sharing function of the Institute via what would become the Oregon Explorer™.

## **Development Chronology of the Oregon Explorer™**

### **Purpose and Vision**

The *Oregon State of the Environment Report 2000* concluded that Oregon's existing environmental data collection and management system must be improved to effectively measure ecological conditions, trends, or risks (Oregon Progress Board, 2000). Citizens, businesses, agencies, and scholars spend countless hours trying to find the information they need for decision making and research. Data gathering may be duplicated simply because past studies and data cannot be found. Too often the maps and data systems of one agency cannot be integrated with those of other agencies.

The development of OSUL's natural resources digital library emerged from a needs assessment (Salwasser and Murray-Rust, 2002) and the opportunity to collaborate with the INR. The vision shared between OSUL and INR is to provide a single access point on the web to Oregon natural resources information useful in supporting informed decision-making. Primary audiences are citizens and decision makers actively involved in, and affected by, natural resource use, policy, and planning. The Oregon Explorer should empower community members to actively engage in creating and sharing the knowledge needed to solve current and future resource management problems by providing them with access to decision support tools and relevant content.

The needs assessment identified specific content and technology parameters that were important to users, as well as potential partners for digital library development. Users wanted a digital library that was both purposeful and place-based. Each of the users expressed a need to access information that would help them address natural resource issues at a variety of scales, be that their local community, watershed, county, ecoregion or statewide.

## In-house Development Decision

The needs assessment provided an important vote of confidence for further development but begged the question of how to define this digital library.

*“A managed environment of multimedia materials in digital form, designed for the benefit of its user population, structured to facilitate access to its contents, and equipped with aids to navigate the global network...”*

*“An electronic library in which the users and the holdings are totally distributed, yet still managed as a coherent whole” (Collier, 1997)*

These evolving definitions of “digital library” presented by Mel Collier more than a decade ago provided the forward looking, multifaceted framework needed. We looked to other digital libraries and information systems that offered the features that our users wanted such as these place-based examples:

- The Alexandria Digital Library (<http://alexandria.sdc.ucsb.edu/>),
- The California Rivers Assessment ([www.ice.ucdavis.newcara](http://www.ice.ucdavis.newcara)), and
- The Chesapeake Bay Information Management System (<http://archive.chesapeakebay.net/cims/index.htm>).

Regionally, we found impressive efforts from government document librarians such as Inside Idaho (<http://insideidaho.org/default.htm>), Montana’s Natural Resource Information System (<http://nris.mt.gov/>), and the Southern Oregon Digital Archives (<http://soda.sou.edu/index.html>).

But in 2002, these systems did not offer the full suite of digital library services that our users needed. We therefore set out to build a system that enabled access to archived geo-referenced materials, GIS data and mapping tools, decision-support tools, and user-submitted content that provides a context for learning about natural resources issues for specific places and topics.

An initial decision was made to develop the natural resources digital library using a combination of custom programming and off-the-shelf software. For example, the GIS applications were built using Environmental Systems Research Institute, Inc. (ESRI) software because of the availability of a free site-license on the OSU campus and the predominant use of ESRI software and products by state agencies in Oregon. Custom programming was utilized to develop a content management system that enabled remote users to add content to a particular portal. The system architecture has evolved from PHP: Hypertext Preprocessor, to a Microsoft .NET infrastructure, and most recently to one that takes full advantage of new open-source solutions.

## Basin Portal Prototype

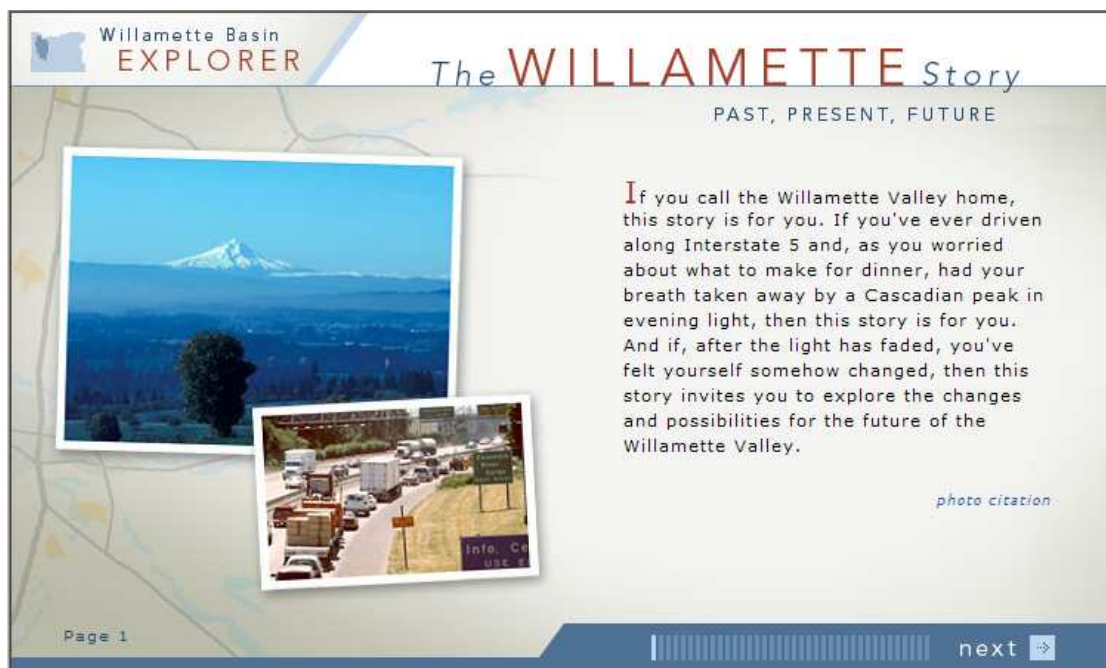
Development of a digital library prototype at the basin scale was a recommended first step suggested in the needs assessment workshop with users. A partnership formed with

representation from OSU, INR, University of Oregon and Defenders of Wildlife, to write a proposal to fund the prototype. The Willamette Basin was selected because of a \$10 million dollar USEPA investment resulting in the development of the *Willamette River Basin Planning Atlas* (The Pacific Northwest Ecosystem Research Consortium, 2002). Though useful and thought-provoking, this publication had a limited print run and was described by users as difficult to interpret at local scales.

The data and content associated with this atlas became the content focus for the proposed Willamette Basin Explorer (natural resources digital library prototype). The project was initially funded by a philanthropic organization (Meyer Memorial Trust) and developed in collaboration with the partnership that had formed to secure that funding. Supplemental funds were provided by the Oregon Watershed Enhancement Board. Two years later, the Willamette Basin Explorer ([www.willametteexplorer.info](http://www.willametteexplorer.info)) was launched for public use. The purpose of the site is to provide information that helps both policymakers and local citizens make better decisions about land and water use in the Willamette River Basin.

The Willamette Basin Explorer portal project brought to the OSU Libraries specialized expertise to develop the site and associated decision-support tools. Specifically, a project manager, programmer, and a GIS specialist were hired. Consulting services were also brought in to design the portal and to write additional content.

OSUL users made it clear that they wanted more than just search results, documents, or data from a digital library. They wanted to know why someone should care about an issue first. The concept of “feature stories” and “context” for the site emerged from ideas expressed by our project partners. The “learn about” sections within the portal navigation area provide this context, and the home page generally features a multi-media story (see Figure 1) that helps users to understand a particular natural resources issue, topic, or place.



**Figure 1. Example of multi-media story featured on the home page of the Willamette Basin Explorer ([www.willametteexplorer.info](http://www.willametteexplorer.info))**

The Willamette Basin Explorer features interpretative information, several multimedia stories, free GIS mapping tools, conservation reporting tools, and online maps. Access to the ScholarsArchive@OSU, our dSpace-based institutional repository, and the OSU Archives' digital photo collections in CONTENTdm enables users to access pertinent reports and scholarly materials for the Willamette Basin. Geo-reference indexing was later added to both our instance of dSpace and CONTENTdm to facilitate access to materials for particular geographies.

The success of the Willamette Basin Explorer led to the development of basin portals for Oregon's North Coast ([www.northcoastexplorer.info](http://www.northcoastexplorer.info)) and Umpqua Basin ([www.umpquaexplorer.info](http://www.umpquaexplorer.info)). An Oregon Explorer business plan was developed ([Oregon State University Libraries and Institute for Natural Resources], 2007) after these basin portals were underway. It set out to create basin portals for the 15 designated basins in Oregon. We have since realized that portal development should be based on user demand. Where there is demand, a good case can be made that the site will be used (and maintained) and a stronger case for funding portal development can be made.

In the case of the Umpqua Basin Explorer, the Partnership for the Umpqua Rivers (PUR) approached OSU Libraries with funding to develop a site encompassing their local watersheds and supporting watershed restoration decision-making. With PUR, we have completed three development phases of this basin portal. Currently basin portals for the Deschutes Basin and the Lakes Basin are under development with the support and input of the locals in each of these areas.

## **Topic Portals and Tool Development**

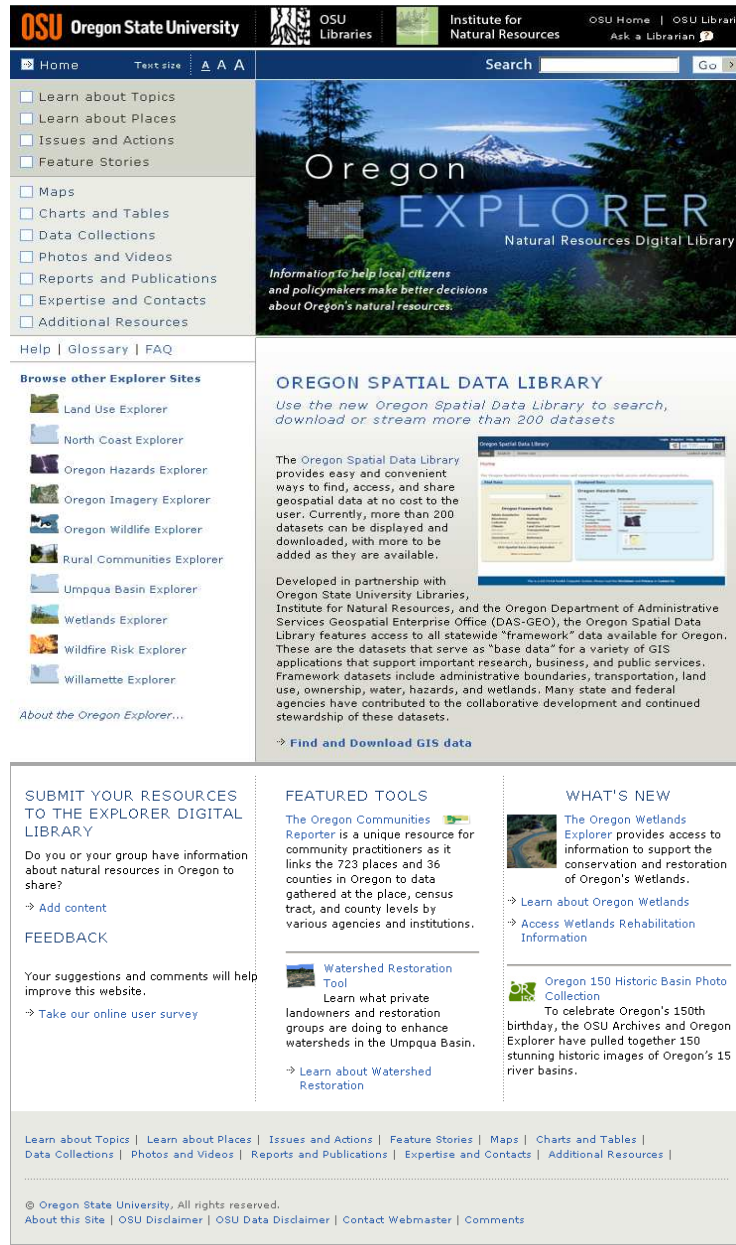
After three basin portals had been launched, OSUL and INR were approached by State agencies interested in providing access to their data and information. This information was often statewide, but narrowly focused on particular natural resource issues and topics. The first public agency to approach us was the Oregon Department of Forestry after they had completed a statewide wildfire risk assessment with public involvement. The concept of digital library "topic portals" complemented our growing collection of "basin portals". In partnership with the Oregon Department of Forestry, we developed the Wildfire Risk Explorer ([www.oregonexplorer.info/wildfire](http://www.oregonexplorer.info/wildfire))--the first statewide topic portal in our evolving natural resources digital library--the Oregon Explorer.

Like our basin portals, the topic portals provide access to stories, expertise, mapping tools, reporting tools, and the documents in the ScholarsArchive. Development of each new Oregon Explorer portal has involved the creation of at least one new decision support tool and the addition of new GIS data layers to the Oregon Explorer advanced mapping tool. The Wildfire Risk Mapping tool featured on the Wildfire Risk Explorer was developed to support community wildfire protection planning throughout the State. Users can create online maps of wildfire risk in an area based on different search criteria. One of our most popular Oregon Explorer topic

portal tools is the Oregon Communities Reporter featured on the Rural Communities Explorer ([www.oregonexplorer.info/rural](http://www.oregonexplorer.info/rural)). With this tool, users can report on up-to-date social, demographic, economic, and environmental information for communities throughout Oregon (Etuk and Bridges, 2009).

## **Oregon Explorer--Phase 1**

With the launch of the first statewide topic portal, we were well positioned to develop the full natural resources digital library we envisioned for Oregon. A successful grant application to the Oregon Watershed Enhancement Board enabled us to develop and launch the Oregon Explorer site (phase 1) within a one-year timeframe. The Oregon Explorer site provides the framework for all current and future geographic and topic portals. An important need was for a user to search across all the sites, experience a consistent “look and feel,” and access a growing collection of multi-media stories, decision support tools, and geo-referenced materials.

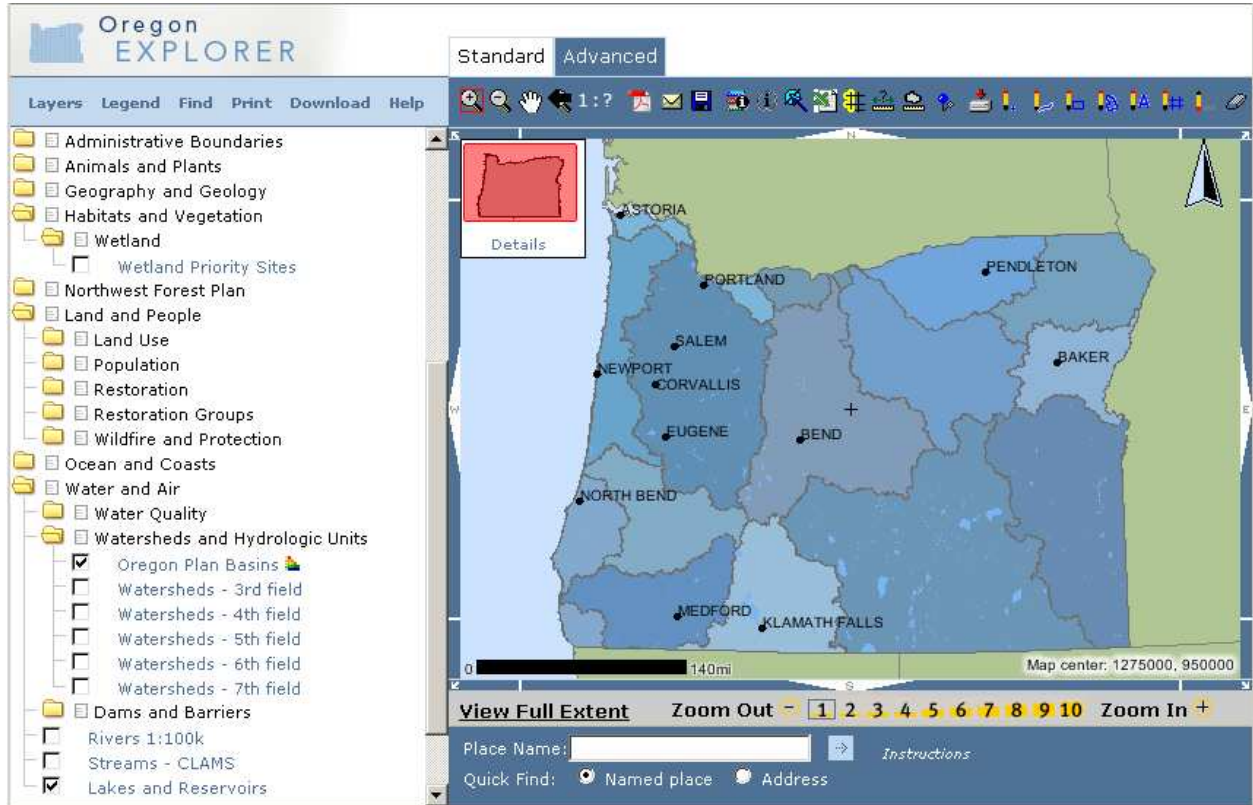


**Figure 2. Oregon Explorer home page ([www.oregonexplorer.info](http://www.oregonexplorer.info)) as of 11-18-09**

From the Oregon Explorer home page (see Figure 2), users can now search all of the Oregon Explorer portals, access a multi-media feature story or high profile decision support tool, browse by places (water basins, counties, or ecoregions) or topics (e.g., soils, fish, forests, invasive species, fire, endangered species, or water quality). The search feature currently relies on LibraryFind™ (<http://libraryfind.org/>), a tool developed at OSUL which harvests a wide variety of materials from Open Archives Initiative (OAI)-compliant sources including university libraries and federal, state, and local agency sites.

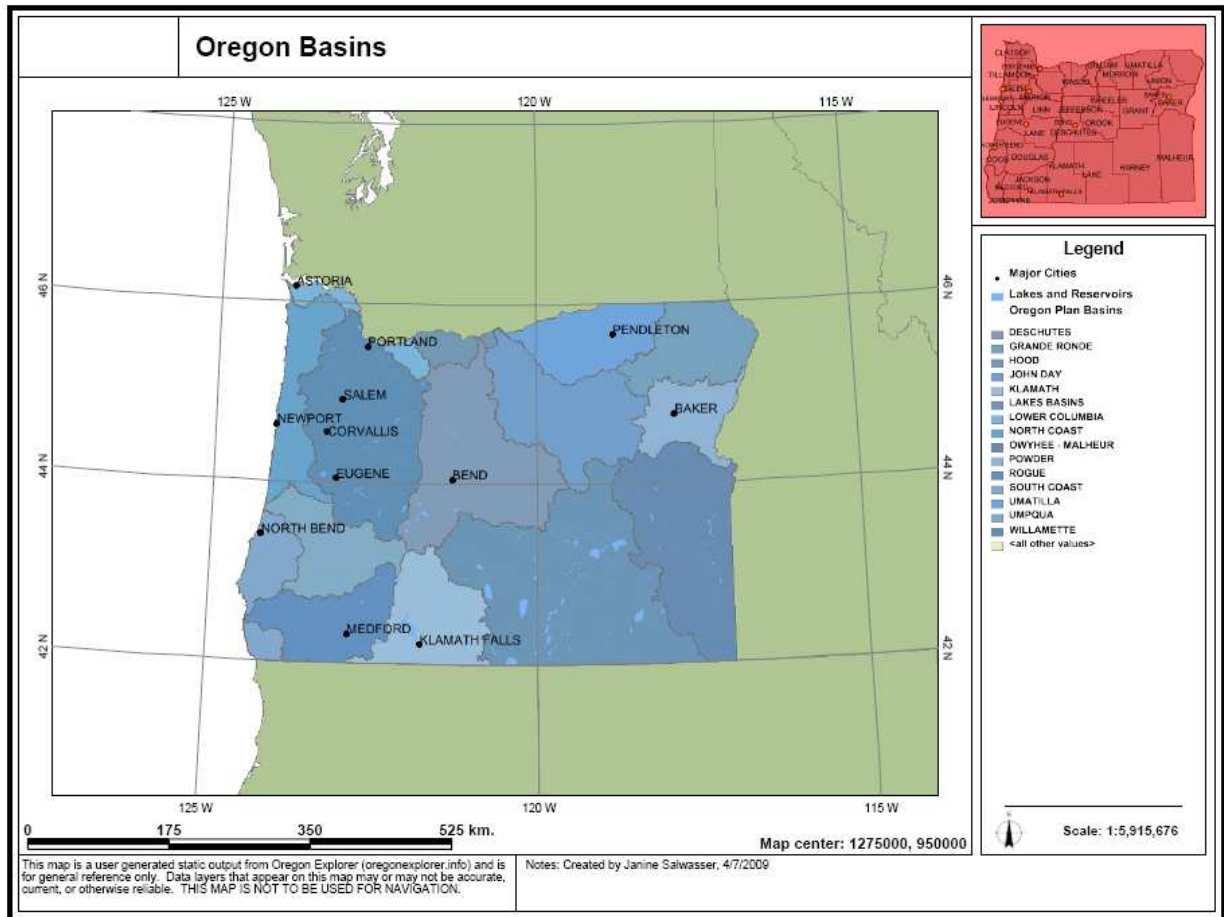
County pages were developed to integrate the various tools and content developed in each of the Oregon Explorer portals. Static “basin pages” were created (primarily as placeholders) for those

basins that do not have a corresponding basin portal. The free GIS mapping tools (see Figures 3 and 4) and multi-media stories continue to be the most highly accessed digital library features. In the GIS mapping tools, layers are turned on and off by checking the boxes listed to the left of the layer names within open folders. Maps can be annotated and analyzed within the tool.



**Figure 3. Example of the Oregon Explorer advanced mapping tool**





**Figure 4. Output map created using the Oregon Explorer advanced mapping tool**

Our usability tests have shown that users appreciate and value the Oregon Explorer’s free access to GIS software, data, and metadata. Access to a high speed internet connection and a computer is all that is needed. The advanced mapping tool also enables the user to download GIS data, as well as print or email a map he or she has created.

With the launch of the Oregon Explorer, the demand for topic portals increased, and we began to develop them at a more rapid pace and at a significantly lower cost per portal. The first portal (Willamette Basin Explorer) was developed with a \$500,000 grant and the topic portals have averaged \$50,000 to 75,000 per portal to develop. The cost reductions are largely due to early investments in system architecture and tool construction (e.g., GIS mapping tools and visualization tools) that can be re-purposed and enhanced for new applications with significantly less programming time.

## Data Portals

The Oregon Imagery Explorer was the first data portal to be created for the Oregon Explorer. The Oregon Department of Administrative Services (DAS) had acquired .5 meter color

photography (vintage 2005) for the entire state and was supportive of the Oregon Explorer mission and services. DAS is the state entity that coordinates all data standards and GIS data development in the state. A partnership with DAS was formed to develop the Oregon Imagery Explorer (<http://www.oregonexplorer.info/imagery>). With this data portal, the imagery is stored at the State Data Center behind firewalls, and a third party contractor was hired to create the interface to access imagery (see Figure 5). This has been a very successful portal, and new statewide imagery will be uploaded as it is collected. A second Oregon Explorer data portal, the Oregon Spatial Data Library (<http://spatialdata.oregonexplorer.info>) developed in partnership with DAS provides access to all the spatial data including “framework” data for the State of Oregon. Framework datasets serve as “base data” for a variety of GIS applications that support important research, business, and public services. Administrative boundaries, transportation, land use, ownership, water, hazards, and wetlands are examples of framework data.

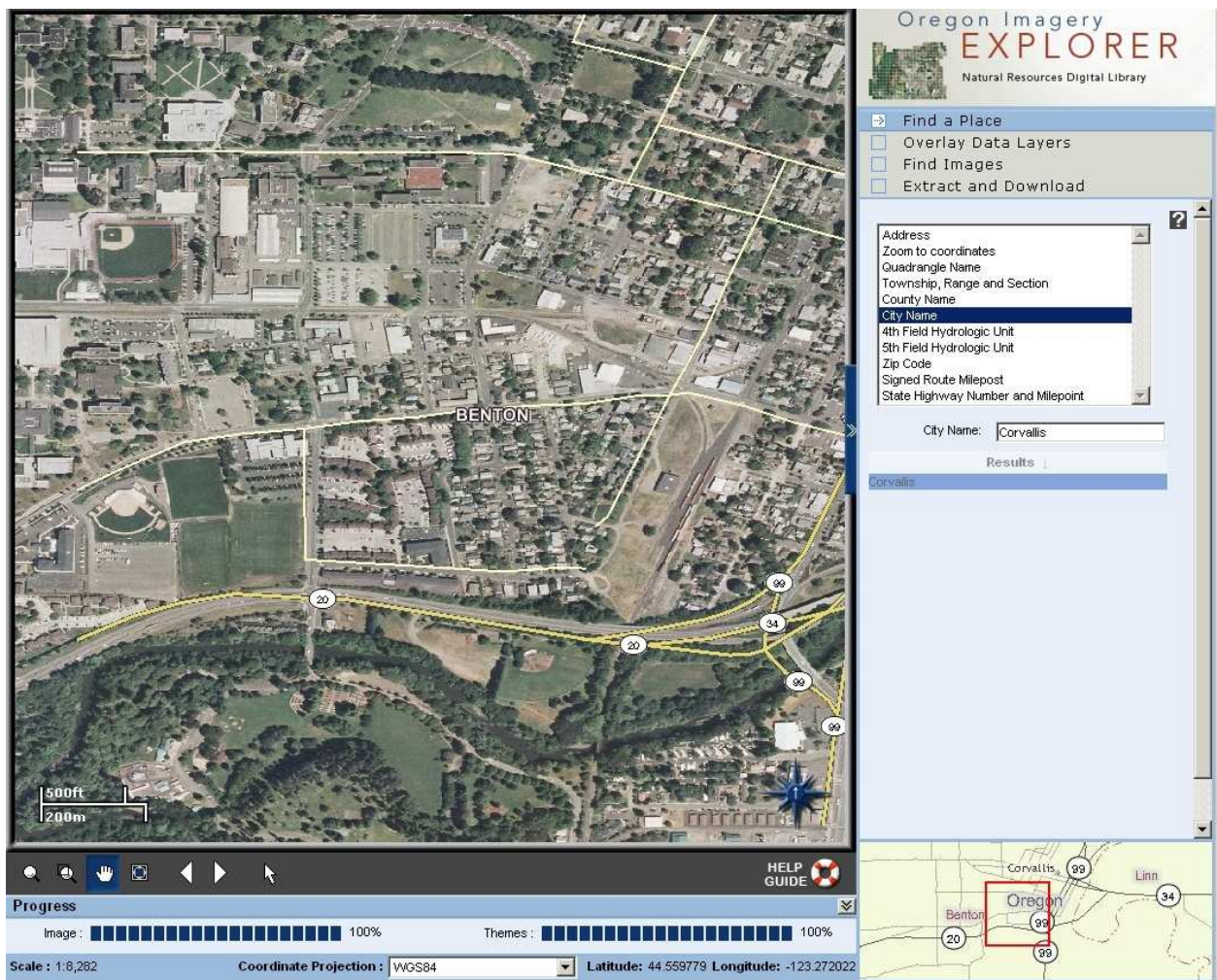


Figure 5. Example of Oregon Imagery Explorer image viewing and extraction tool ([www.oregonexplorer.info/imagery](http://www.oregonexplorer.info/imagery))

## Current State

As of November 2009, the Oregon Explorer provides users with access to three basin portals, six topic portals, and two data portals. A complete chronology of Oregon Explorer portal development is presented in Table 1.

Portal	Public Launch	Portal Type	Partners	Decision-support tools developed
Willamette Basin Explorer	June 2004	Basin	OSUL, INR, University of Oregon, Defenders of Wildlife, Oregon Watershed Enhancement Board	GIS mapping, conservation reporting tool, access to atlas content and research materials
North Coast Explorer	February 2005	Basin	OSUL, INR, University of Oregon, Oregon Dept. of Fish & Wildlife, Oregon Dept. of Administrative Services, Oregon Dept. of Environmental Quality	Visualization tools for salmon habitat restoration, access to watershed assessments
Umpqua Basin Explorer	March 2006	Basin	OSUL, INR, Partnership for the Umpqua Rivers, Oregon Watershed Enhancement Board	Visualization tools for watershed restoration, water quality, fish passage, access to bibliography
Wildfire Risk Explorer	October 2006	Topic	OSUL, INR, Oregon Dept. of Forestry	Visualization tools for wildfire risk mapping
Oregon Explorer	June 2007	ALL	OSUL, INR, Oregon Watershed Enhancement Board	Federated searching, watershed mapping and reporting tools
Oregon Imagery Explorer	October 2007	Data	OSUL, INR, Oregon Dept. of Administrative Services	Image viewing and extract tool, image streaming
Land Use Explorer	November 2007	Topic	OSUL, INR, Portland State University, Oregon Community Foundation	Visualization tools for land use decision-making
Oregon Wildlife Explorer	January 2008	Topic	OSUL, INR, Oregon Dept. of Fish & Wildlife	Wildlife reporting tool

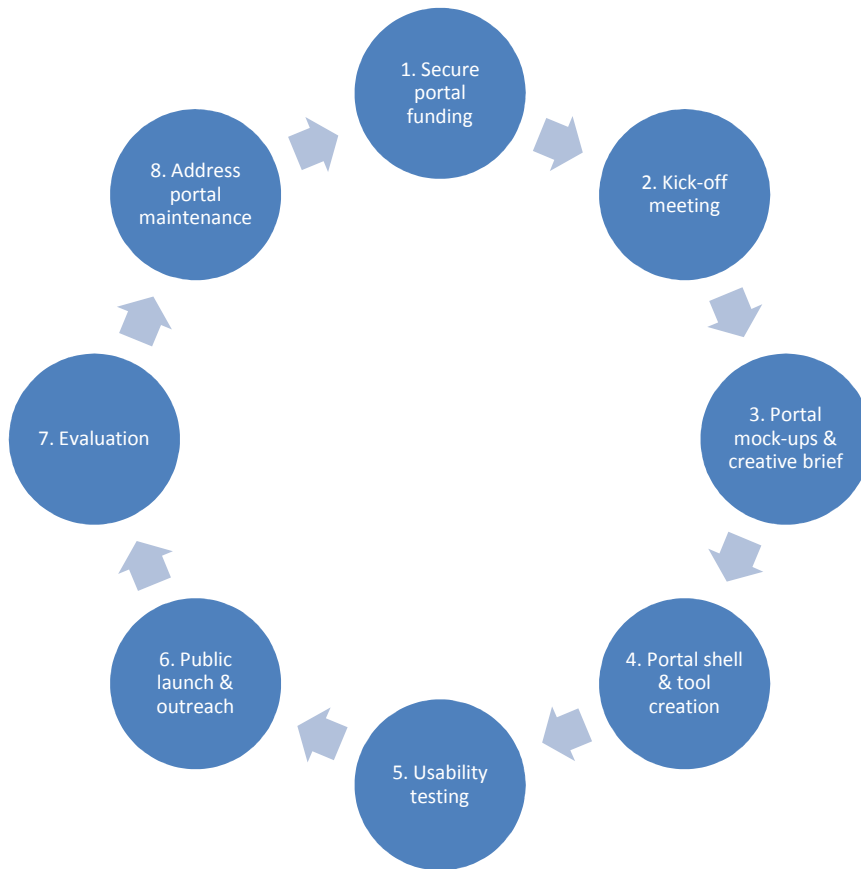
Rural Communities Explorer	October 2008	Topic	OSUL, INR, OSU Rural Studies Program, OSU Extension	Oregon communities reporting tool
Oregon Hazards Explorer	June 2009	Topic	OSUL, INR, Oregon Dept. of Administrative Services, Oregon Dept. of Land Conservation & Development	Hazards reporting tool
Oregon Wetlands Explorer	November 2009	Topic	OSUL, INR, The Wetlands Conservancy, Oregon Dept. of State Lands	Oregon rapid wetland assessment protocol tool
Oregon Spatial Data Library	November 2009	Data	OSUL, INR, Oregon Dept. of Administrative Services	GIS data viewing and extract tool, data streaming

**Table 1. Chronology of Oregon Explorer portals, partners, and decision-support tools**

Development of the Oregon Explorer and the associated basin, topic, and data portals has helped us towards our goal of developing a comprehensive natural resources digital library. Different partnerships have formed for the different places and topics which we believe will help to sustain the Oregon Explorer over the long-term.

## Digital Library and Portal Development Process

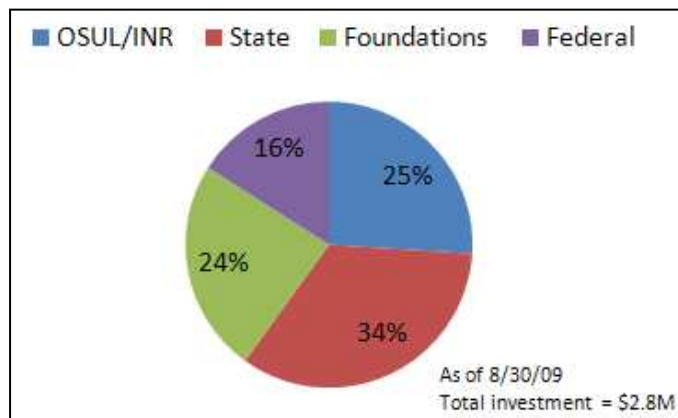
When we developed the first digital library prototype, the Willamette Basin Explorer, we utilized a process that engaged users (who often were our project partners) at the onset. The portal development team included librarians, researchers, conservationists, natural resource specialists, programmers, graphic designers, and science writers. All team members also lived within the Willamette Basin. For each subsequent portal developed, we continue to bring in a diversity of talents and skills to serve on portal project development teams. For our basin portals, it is especially important to have local representation from that basin on the project team. The process used to develop portals for the Oregon Explorer is graphically presented in Figure 6.



**Figure 6. Schematic of digital library/portal development process**

### 1. Secure portal funding

The first step of any portal development project is to secure new funds. The Oregon Explorer has been developed and funded incrementally over the past seven years. To date, more than \$2.8 million has been invested in the development and maintenance of the site as a whole (see Figure 7).



**Figure 7. Oregon Explorer investments by funding category**

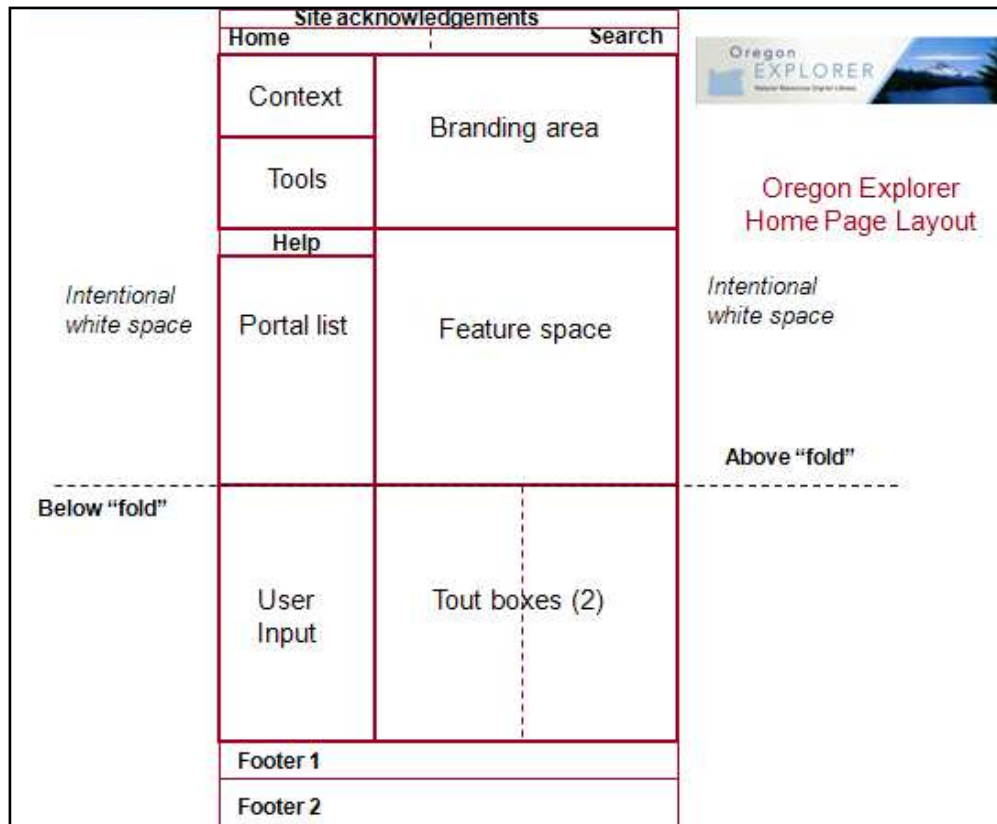
Each portal has been developed with a different combination of public and private funds. Our portal partners often help us to identify and secure appropriate funding sources. For new (“phase 1”) portals, it can take from 6 to 18 months to secure funding, whereas for enhancements to an existing portal (“phase 2” etc.), the funding can often be secured in half that time.

## **2. Kick-off meeting**

The purpose of a “kick-off” meeting is to formally begin a portal development project with our partners and reach agreement on the specific scope of a site, especially for a phase 1 product. At this meeting, we review the “Oregon Explorer” framework and discuss portal expectations (site purpose, targeted users, priority issues, content focus, decision support tool needs, etc.). The “kick-off” meeting is also the venue for discussing specific development issues such as roles and responsibilities, timelines, milestones, and contacts. Subsequent meetings with the project team discuss portal content and tool development progress.

## **3. Portal mock-ups and creative briefs**

Two key documents are developed from the kick-off meetings: a creative brief and a hard copy portal mock-up(s). The creative brief specifies portal objectives, target audience, key messages, navigation fields, and content for the site. A creative brief example is provided in Attachment 1. The mock-up is a hard copy design of what the portal could look like. Sometimes it is helpful to create several mock-ups for partners to review. The finalized creative brief and mock-up are used by the project technical team (web designers, programmers, and content providers) to build a beta version of the site. Creation of the mock-up begins with a standard Oregon Explorer template (see Figure 8). Slight variations to the template are allowed to accommodate the varying needs of users in different places (basins) or for different topics (natural resource issues). For example, the “feature space” might showcase a multi-media story, decision-support tool, or dataset depending upon what is considered to be the most popular feature by our partners.



**Figure 8. Oregon Explorer template for portal home page layouts**

#### **4. Portal shell and tool development**

The portal mock-up and creative brief guide the development of a preliminary portal shell and associated decision-support tool(s). Creation of the portal shell is often an early milestone in a portal development project. Once project partners are able to access the shell remotely, it becomes much easier to track the progress of a portal development project. It also enables the remote uploading of content by our portal partners and subcontractors (e.g., the science writer). Much of the Oregon Explorer is built around “stories” or descriptive text that helps to provide a context for a place or natural resource issue.

In addition to the portal shell development, we concurrently develop the decision-support tool(s) that will help inform natural resource decision-making for specific places and/or topics. Beta versions of the tools are created mid-way through a portal project and presented to the portal partners. Refinements are made to the tools based on the input from the project partners and other potential users. The Oregon Explorer tools on all portals include a growing collection of free mapping, reporting, and visualization tools that help to make our natural resources digital library purposeful.

#### **5. Usability testing**

Prior to the completion of a portal and decision-support tool, usability testing is carried out to see if the portal and tool are resulting in a successful user experience. The usability testing is performed in both one-on-one and group (or “open house”) venues with representatives from the targeted user groups. Results from usability testing are shared with the project’s technical team

to address needed refinements prior to a public launch of the portal. It is preferable to complete usability testing 4 to 6 weeks prior to a scheduled launch date.

In our creative briefs, we often identify both a soft launch and a public launch date for a particular portal. The soft launch often occurs before a specific usability test. The idea of a “soft” launch is to let a broader group of users know about the site so that they can test the site’s performance prior to a full-scale public launch.

## **6. Public launch and outreach**

The public launch of a portal is a great time for celebration. Dates are chosen that coincide with a relevant public event. Press releases, bookmarks, flyers, and email announcements are utilized. Often portal partners are better equipped to handle the outreach of a portal, especially at the local level. For example, our partnership with OSU Extension Service, whose mission is to provide community outreach and engagement, has been instrumental in getting more people aware of and using the Rural Communities Explorer portal and the Oregon Communities Reporter tool.

Through one of our grants, a public relations firm was hired to develop an Oregon Explorer outreach strategy. The strategy includes tasks such as contacting public relations officers for all relevant state and local agencies and journalists who cover natural resource issues so that they are informed about the Oregon Explorer and can be targeted in future portal launch activities. The inclusion of a part-time outreach coordinator was another recommendation. Future grant proposals will likely include a budget to cover this important function.

## **7. Evaluation**

Once a portal has been publicly launched, the use of the site is evaluated through several means. Tracking the usage of an Explorer site is done using Urchin v.5 software. With this software, the number of sessions per day for the Oregon Explorer site can be tracked as a whole and the associated basin portals. For example, the Oregon Explorer usage statistics tell us that the site has increased from an average of 250 plus user sessions/day in 2007 (when it was launched) to an average of 640 plus user sessions/day in 2009. Summary reports can be generated for specified time periods identifying the most popular Oregon Explorer services and content accessed and downloaded, as well as the pathways users took to enter, navigate, or exit a site.

User feedback is solicited on the home page of each Oregon Explorer portal. In collaboration with the OSU College of Business, an online survey form is utilized that compiles user responses to a set of questions that can be easily modified as new portals are developed. This tool immediately informs us when a specific user is satisfied or dissatisfied with a particular portal. With this tool, specific recommendations are received on how to improve the usefulness of an Explorer portal. These recommendations are captured and often incorporated in future development phase proposals.

Focus group sessions are also used to evaluate a site and/or identify a focus for future portal development phases. Focus groups can be used to collectively identify issues and concerns associated with a particular portal and/or tool. The advantage of using focus groups is that the sharing of ideas in a group setting often results in spontaneous ideas that would not have emerged otherwise. Focus groups are more costly to conduct, and they are typically done when the prospects for funding a subsequent portal development phase are high. The needs expressed by users in a focus group session can then go directly into a proposal.



## **8. Address portal maintenance**

Long-term maintenance of a basin, topic and/or data portal is always an important issue needing to be addressed, especially after a public launch. A commitment has been in place between INR and OSUL since the beginning to maintain the overarching Oregon Explorer site.

When we began developing portals, portal sponsorship was not a consideration, as is the case now. Each of the Explorer portals (i.e., Oregon Explorer, Oregon Wildlife Explorer, Oregon Wildfire Risk Explorer, Oregon Imagery Explorer, Rural Communities Explorer, and Umpqua Basin Explorer) that prominently display a partner's logo indicates a shared commitment to maintain the site over time.

Our first attempt to formalize specific roles and responsibilities and address long-term portal maintenance issues was with the creation of a Governance Document with the Partnership for the Umpqua Rivers for the Umpqua Basin Explorer. The Governance Document identifies key issues and proposals to address them, such as who contributes content, who vets content, roles and responsibilities for site maintenance, and guiding principles for adding new content and tools. This document (which is revisited annually) is serving us well, and it is now being used as a requirement for all future portal development projects. We are considering the use of Memorandum of Understandings or Agreements as an alternative approach for the future since they are more commonly recognized, especially by public agencies. Those portals without sponsorship (i.e., Willamette Basin Explorer, North Coast Explorer, and Land Use Explorer) do not get updated as frequently, and any new development phases are less likely to be funded.

## **Looking Back and to the Future**

For the librarians involved, the Oregon Explorer has provided an opportunity to work on an interdisciplinary team. Were we to begin again with the benefit of hindsight we would no doubt agree that clarification of roles is important at the onset and benefits from periodic review. . Internal communications and coordination are as critical as external communications and coordination with portal partners. Librarians play an important role in the development of bibliographies for each portal, an activity which in turn serves to focus digitization and cataloging efforts. There is also a commonly articulated sense outside the library that all librarians are skilled in organizing large amounts of information. This is not an expertise that subject librarians automatically identify with as strength, and that provides a good reason to include staff from other library units in the initial stages of each portal project.

Among other lessons learned to date is the importance of documentation and planning for the staff time to address needed system changes and maintenance. Establishing a common institutional memory is not a simple matter when staff, priorities, and technologies change. In the last year, much attention has been given to documenting the initial user-level and system architecture and the needed system restructuring that will enable the Oregon Explorer to be efficiently maintained and enhanced in the future. The Oregon Explorer is currently moving towards an open-source system to improve navigation within and between portals; to enable a site that is easier to add to and to maintain; and to better enable the sharing of the Oregon Explorer technology at regional and national levels.

The process that we have employed to develop the Oregon Explorer collection of basin, topic, and data portals is one that relies on the involvement of users and long-term partnerships. There is a need to keep the existing basin, topic, and data portals of the Oregon Explorer fresh, useful and relevant to the users. As new natural resource issues emerge and become important to the people living, working, and visiting Oregon, the demand for new Oregon Explorer portals is anticipated. Climate change, renewable energy, and invasive species are a few of these important issues in need of a portal to integrate content and decision-support tools. Users have expressed a desire for more information about Oregon's special places, such as Crater Lake. Opportunities also exist to help teachers educate our future decision-makers--our youth--to understand and learn about Oregon's natural resources so they, too, can be informed and active in their local communities. Ultimately, it will be issues of available funding, high priority needs of targeted users, and long-term partnership commitments that determine how the Oregon Explorer continues to evolve over time.

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# Attachments

## Attachment 1. Example of Creative Brief for Digital Library Portal Development

### **Project title: Deschutes Basin Explorer Phase 1 Portal**

#### **Background/overview**

The Deschutes Basin Explorer (phase 1) will be the first of two eastside basin portals for the Oregon Explorer. Funding is provided by the Oregon Watershed Enhancement Board.

#### **Project partners**

1. Crooked River Watershed Council
2. Upper Deschutes Watershed Council
3. Deschutes River Conservancy
4. Deschutes Land Trust
5. Trust for Public Land
6. Oregon Watershed Enhancement Board
7. OSU Extension
8. OSU Cascade campus (local point of contact)

*Note: at the kick-off meeting it was decided that we would try to be as inclusive as possible in adding new partners who are supportive of the focus and scope of this project.*

#### **Project objectives**

1. Create a useful basin portal.
2. Allow users to quickly and easily determine conservation and restoration opportunities in the basin and associated counties.
3. Expand and make accessible a comprehensive bibliography on salmon restoration in the basin.
4. Digitally archive key basin documents, data, photos, and videos.
5. Highlight the Deschutes Special Investment Partnership (SIP) funded projects.
6. Update Oregon Explorer county pages with Deschutes Basin Explorer tools and content.
7. Promote K-12 educational opportunities and learning locations in the basin.
8. Explore ability to announce current events in the basin.
9. Create a governance document to address long-term roles and responsibilities of portal partners.

#### **Target audience**

- Conservation groups: watershed councils, soil & water conservation districts, land trusts and conservancies
- Interested citizens and landowners
- Agency staff
- Teachers, educators and students

**Tagline:**

Information to help local citizens and policymakers make better decisions about natural resources, including watersheds and fish populations, in Oregon's Deschutes Basin.

**Key messages: *With the Deschutes Basin Explorer...***

- You can access and use basin-level conservation and restoration data to identify restoration and conservation opportunities.
- You can learn about anadromous fish reintroductions and water flow restoration in the basin.
- You can access K-12 natural resource educational materials and information about specific learning locations.

**Key topics**

- Ecosystem Diversity
- Watershed Restoration
- Recreation
- Native American Tribes
- Fire and Fire Risk

**Key places**

- Deschutes Basin
- Watershed Councils
- Counties
  - Crook County
  - Deschutes County
  - Hood River County
  - Grant County
  - Harney County
  - Klamath County
  - Lake County
  - Jefferson County
  - Sherman County
  - Wasco County
  - Wheeler County
- Ecoregions (Level IV)

**Key data (spatial)**

- Ownership data (taxlot, public lands, etc.)
- Fish data (distributions, barriers, etc.)
- Habitat data (wetlands, riparian, habitat priorities, etc.)
- Water quality data (flow, 303d listing, etc.)
- Conservation opportunity data (Oregon Conservation Strategy, local strategies, etc.)

**Key documents**

Generate a bibliography with a prioritized list of materials to be compiled and digitally archived.

**Key photos (historical)**

- OSU Archives
- Prineville Bowman Museum
- Deschutes Historic Society
- Central Oregon Community College's Central Oregon Photograph File

**Tone and perception**

- Address the target informatively and neutrally (without bias)
- Support informed decision-making

**Additional information**

- Link to work on Lakes Basin Explorer phase 1
- Link to work on Wetlands Explorer
- Link to work on Oregon Spatial Data Library
- Links to possible work on Deschutes County Page and GreenPrint project

**Creative and technical requirements**

- Consistency with "Oregon Explorer" design and functionality
- Incorporate recommended Oregon Explorer system architecture and mapping tool changes

**Deliverables and Milestones**

- Kick-Off meeting – November 11, 2007
- Deschutes Basin Explorer portal shell and preliminary content – February 12, 2008
- Deschutes Basin Explorer portal public launch – to be determined
- Project and contract end date – April 30, 2010
- Final report due date – May 30, 2010