

# **Klamath Basin: Metadata Inventory Project**

On February 18, 2010, over 50 entities involved in the Klamath Basin, including federal and state agencies, Native American tribes, county governments, irrigators, and conservation and fishing groups signed the Klamath Basin Restoration Agreement and Klamath Hydroelectric Settlement Agreement. The Restoration Agreement "...is intended to result in effective and durable solutions which will: 1) restore and sustain natural fish production and provide for full participation in ocean and river harvest opportunities of fish species throughout the Klamath Basin; 2) establish reliable water and power supplies which sustain agricultural uses, communities, and National Wildlife Refuges; and 3) contribute to the public welfare and the sustainability of all Klamath Basin communities."<sup>1</sup>

With the signing of the KBRA, a number of actions are stipulated and need to be taken in order to help restore the ecological function and capacity of the Klamath Basin and its native fish populations. Watershed Initiatives, LLC (WI) in collaboration with Watershed Professionals Network, has created an on-line survey that provides a convenient repository for sharing data and information regarding near-term monitoring, research and restoration (MRR) activities targeted to the Basin's threatened and endangered species. This survey is secure, easy to use, and free from viruses.<sup>2</sup>

## **Background**

In 2006, Federal agencies and other interests in the Klamath Basin discussed the need for a coordinated, ecosystem-based approach that supports the recovery of a number of species including salmonids and Upper Basin suckers, as well as sustains the Basin's resources and its resource-dependent communities. NMFS-Southwest Region (SWR) approached WI to help develop a collaborative process and create database tools that identify, integrate, and prioritize near-term recovery MRR activities and programs in the Klamath Basin.

WI's charge was to: 1) create support for a more coordinated approach to MRR activities among a wide range of federal and state agencies, tribes, and stakeholders, and 2) develop tools or products that would identify additional monitoring and research needs, prioritize future restoration actions, and support new funding initiatives.

## **Klamath Meta-Data On-Line Survey and Graphic User Interface Map**

As part of this contract, WI and its technical team created an on-line survey and linked it to a graphic user interface based on a GOOGLE Earth map of the Basin. WI contacted representatives from federal agencies, tribes, applicable state agencies, academic and university extension programs, and a variety of key stakeholders to solicit their

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<sup>1</sup> <http://www.edsheets.com/Klamathdocs.html>

<sup>2</sup> WI contracted with Watershed Professionals Network to create the test survey.

participation in the survey as a way to test the efficacy of such a repository, and to determine whether this would be useful for the Basin's multiple users, researchers, and restoration interests.

The primary mechanism for the inventory of Basin MRR activities is an on-line survey at (<http://watershedexplorer.com/klamath/wiki/index.php?wiki=Index>).

WI solicited researchers and program managers to populate the online survey with information regarding what data exist in the basin, what agencies, tribes or groups have the data, what format the data are in, and how accessible the data are for others to use. The goal was to create a "test version" of a meta-data repository for the Basin in order to determine the interest and efficacy of such a tool to facilitate better coordination of MRR activities.

Survey participants are given usernames and passwords in order to gain access to the survey. Participants must have a username and password in order to enter data and information about their own MRR projects, and to review entries by other participants. Having password protection prevents viewers from removing or editing information from other sources (the only person who can change or delete information entered in the survey is the person whose contact name and password are associated with those entries). This also ensures that at this stage of development, access is limited to interested parties active in Klamath Basin MRR activities.

Users currently active in the survey represent federal and state resource agencies, tribal interests, state agencies, and local watershed groups. For those projects with links to an external web server, a user can click on the associated link and go directly to that website to review the project or report in more detail.

### **Spatial Organization**

WI had numerous discussions with agency, tribal and stakeholder representatives on ways to improve the accessibility and utility of MRR data and information for Basin users. A strong majority of respondents indicated that having the information organized at a discreet spatial scale would be valuable—preferably by USGS Hydrologic Unit Codes (HUCs). A number of researchers are working on developing spatially explicit ways to organize data and information, and WI and WPN have developed a map that shows the Basin's 5<sup>th</sup> field HUCS overlaid on a GOOGLE Earth map. Using GOOGLE Earth provides a platform for organizing and managing data with an existing graphic user interface that is less expensive and readily accessible. GOOGLE has created maps that are routinely updated with topographic features, rivers and streams, roads, highways, urban and community boundaries, and other cartographic information. These maps are public and available for use as an interface with other overlays of GIS-layers. WI has laid the Basin's 5<sup>th</sup> field HUCs on top of a GOOGLE Earth Map of the Klamath Basin and posted it at the following website: <http://watershedexplorer.com/klamath/map/>

If a user clicks on one of the HUCs, he or she will find a prompt box that lists the name of the tributary, and the USGS HUC code. Click on that link, and registered users are taken

to a dialogue box with links to a list of projects, a list of reports, or a link to data for that particular watershed (these lists only contain information that has been entered into the repository's survey by registered participants). Assuming the user has a username and password to gain access to the meta-data repository, any information that is in the database for that HUC will be viewable.

The Klamath Basin Water Quality Monitoring Coordination Group is creating a similar map of the Klamath Basin with clickable HUCs overlaid on a GOOGLE Earth map that is focused on water quality. (For more information about the KBWQMCG, go to <http://www.humboldt.edu/~kwi/?content=home>).

## **Conclusion**

The Klamath Basin Restoration Agreement provides a pathway for the Basin's constituencies, tribes, agencies and residents to begin improving the Basin's ecological function and restoring its native salmonid and sucker populations. The Klamath Basin Meta-Data survey is a prototype that allows interested parties a way to share data and information related to monitoring, research and restoration for the Basin's salmonids, suckers and habitats. WI's prototype, using GOOGLE Earth maps overlaid with specific GIS-layers, has proven to be a convenient, reliable and secure way to gather, monitor and review data on key ecological and natural resource issues in the Klamath Basin.