Bonneville Power Administration
Fish and Wildlife Program FY99 Proposal

Section 1. General administrative information

Feasibility Study For A State-Wide Water Quality Data Sharing Mechanism In Oregon

Bonneville project number, if an ongoing project 9049

Business name of agency, institution or organization requesting funding
Rachel Stein, MS , hydrologist

Business acronym (if appropriate)

Proposal contact person or principal investigator:

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Subcontractors.

Organization	Mailing Address	City, ST Zip	Contact Name

NPPC Program Measure Number(s) which this project addresses.
3.3., 3.2, 4.2

NMFS Biological Opinion Number(s) which this project addresses.

Other planning document references.
Oregon Coastal Salmon Restoration Initiative

Subbasin.

Short description.
Evaluate water quality data sources within the State of Oregon. Compile a data base of this information. Use information to recommend an efficient data sharing mechanism that would provide user-friendly, real-time access to state-wide water quality data

Section 2. Key words

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish		Construction	X	Watershed
+	Resident fish		O & M		Biodiversity/genetics
+	Wildlife		Production	+	Population dynamics
+	Oceans/estuaries	X	Research	+	Ecosystems
	Climate	+	Monitoring/eval.	+	Flow/survival
	Other	+	Resource mgmt		Fish disease
		+	Planning/admin.		Supplementation
		+	Enforcement	+	Wildlife habitat en-
		+	Acquisitions		hancement/restoration

Other keywords.
water quality, data coordination, administrative support, baseline data

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship
8810804	Streamnet	supplementary data

Section 4. Objectives, tasks and schedules

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Identify biological, chemical, and physical water quality data being collected within the state of Oregon	a	contact federal, state, local agencies, organizations, watershed councils, tribes
		b	create data base for information
		c	transfer data into useable form

2	Recommend an efficient data-sharing mechanism	a	analyze information about data collection
		b	write report
		c	assess possibilities of integration into Streamnet, using Internet and GIS

Objective schedules and costs

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	10/1998	10/1999	85.00%
2	10/1999	4/2000	15.00%
			TOTAL 100%

Schedule constraints.
Constraints- possible difficulty in contacting parties
Milestones- (1)- finish data collection, (2)- write report of results

Completion date.
2000

Section 5. Budget

FY99 budget by line item

Item	Note	FY99
Personnel	professional time	42,700
Fringe benefits	health insurance, car insurance	2,040
Supplies, materials, non-expendable property	office supplies, copying, faxing, printing	1,190
Operations & maintenance	computer lease, printer and fax lease, fax line, telephone line, internet service, office rent, telephone calls	12,845
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	software **NOTE:** If a computer, printer and fax were purchased instead of leased, costs could be lowered	1,700
PIT tags	# of tags:	
Travel	to agencies, organizations	5700
Indirect costs		
Subcontracts		

Other	order library materials	200
TOTAL		$66,375

Outyear costs

Outyear costs	**FY2000**	**FY01**	**FY02**	**FY03**
Total budget	37,843			
O&M as % of total	17 %			

Section 6. Abstract

As the concern for salmon recovery in the Northwest increases, the State of Oregon has been forced to evaluate the effects of land use management upon its fish and wildlife habitat. It has become evident that the need for a quick solution to the declining salmon populations is crucial.

The sharing of natural resource data and coordination of information is a major element sought after by salmon-related plans such as the Columbia Basin Fish and Wildlife Plan and the Oregon Coastal Salmon Restoration Initiative. This ensures that management decisions are based on a comprehensive view of the problem, rather than focusing on small parts.

Currently, water quality data is being collected state-wide by a variety of agencies and organizations. This data is gathered at different times, in different places and at different frequencies. Often, this data may consist of overlapping information or contain gaps, unbeknownst to either party. Because of this lack of coordination, a great amount of money and resources are being wasted. Watershed councils are having difficulties obtaining the information they need to make efficient planning decisions. Without a baseline and real-time data, agencies are losing precious time in fish and wildlife recovery efforts.

Up to the present, there have been only a few efforts to bring natural resource data together. The Streamnet system provided by the Columbia Fish and Wildlife Plan is an example of such an effort, yet it does not include an inventory of water quality information. The goal of the grant proposal is to assess the feasibility of a state-wide water quality data-sharing mechanism for Oregon. Such a system would establish a baseline of information, improve access to real-time water quality data, assist in coordination efforts between agencies, and provide knowledge as to where data is being duplicated and where information is lacking. It would serve as a management tool for salmon recovery efforts throughout the state of Oregon, as well as providing a precedent for other states in their restoration efforts. An integrated data-sharing mechanism would ensure cost-effectiveness for all parties conducting research.

The study would involve contacting agencies, organizations, watershed councils and other

groups within the state and compiling a data base on their data-collection practices. This would last for 1 1/2 years, after which there would be a report outlining results. A recommendation for the actual mechanism will be made.

Section 7. Project description

a. Technical and/or scientific background.

Salmon recovery efforts have been declared by Governor Kitzhaber to be a priority for natural resource planning in the State of Oregon. The Northwest Power Act emphasizes the fact that anadromous fish "...are of particular significance to the social and economic well-being of the Pacific Northwest and the Nation (Columbia River Basin Fish and Wildlife Program, 1994)". It has been made clear that a coordination of efforts is crucial to ensure anadromous fish survival. Information related to salmon must be comprehensive and usable by managers and planners everywhere. An integrated data system would ensure that real-time data was used to support the decision-making process.

Several mechanisms are in place where data-sharing has been successful. The Pacific State Fisheries Commission, under BPA funding, has established a data-base that is accessible on the world wide web and profiles fish distribution, fish abundance indices and fish habitat data. This information is available to any interested party, and is comprehensive for the states of OR, WA, MT, and ID. The data has been fused with GIS, and converted into a user-friendly format for natural resource management. Yet, this data base does not contain any water quality information. Water quality data plays a crucial role for examining salmonids and other species as well. It provides insight into habitat conditions and how they are being altered. If water quality data were incorporated into this data base, it would allow for a more comprehensive picture to watershed health. These efforts would also set a precedent for states nation-wide by demonstrating how maximum data-sharing efficiency and coordination can be achieved.

A water quality data-sharing mechanism can play an important role in helping a number of federal, state and local agencies, watershed councils, tribes and organizations serve their part in salmon restoration and protection. Up to this point, it has been difficult for all of these entities to reconcile their information. Political and communication boundaries impede the coordination process. But salmon habitat is subject to the rules of nature, and cannot be restricted to human boundaries that have been erected. This emphasizes the current need for coordination and data sharing among different parties in the State of Oregon. Historically, everyone was assigned to a piece, but now we must collaborate and examine natural resource problems in terms of the whole.

b. Proposal objectives.

The following are objectives and outcomes of the study:

1-Identify chemical, biological and physical water quality data being collected within the

State of Oregon
2-Outline, using spatial analysis, areas of overlapping data as well as areas in need of information
3-Provide recommendations and methods for an efficient data sharing mechanism
4-Write a report, detailing the above information, that can be used as a supplementary management tool for salmon recovery efforts
5-Set the stage for creation of a new system of data integration within the State of Oregon to be used for all future natural resource planning

c. Rationale and significance to Regional Programs.

The Columbia Basin Fish and Wildlife Program outlines the need for a data synthesis mechanism; "Existing information from fish and wildlife program projects, other regional research efforts, and related national and international anadromous fish research should be compiled and made available to users in the form of a computerized bibliographic data base and a systematic, readily accessible, document retrieval system. Research data bases..should be cataloged in a summary data base..." (1994). These efforts have been led by Streamnet for fish habitat, population and passage data. Water quality data would supplement this existing data base. "(The Coordinated Information System) is essential to the efficient collection and dissemination of information produced as a result of this program. The system also serves to increase the cost-effectiveness of research, monitoring and evaluation by ensuring that information produced by these programs is readily available to the region" The proposed study would support the efforts of various agencies to establish a more comprehensive picture of natural resource issues.

Data sharing and integration is a priority goal of the Oregon Coastal Salmon Restoration Initiative, a part of the Governor's Oregon Plan; "The capacity to process and assimilate the input from all the existing and proposed monitoring activities that will be conducted at the stream reach and site level is a fundamental goal of the overall monitoring strategy" (OCSRI, 1997). This plan addresses data sharing as a way to "reduce costs, increase benefits, and eliminate duplicative activities". It stresses the need for support and coordination to provide equal access to information. A state-wide data sharing mechanism provides a link to a specific need for baseline data. "An integrated system is needed to create a comprehensive record of projects on state, federal and private lands, develop a consistent monitoring protocol, avoid multiple requests for information, and to provide centralized access to information" (OCSRI, 1997).

According to the NMFS Biological Opinion, water quality is one the essential factors to salmon survival. Water quality has been modified through gas supersaturation, timber harvest (silt saturation), and paper and pulp mills (chemical degradation). It is essential that data concerning these water quality indicators be readily available for decision-making and management purposes.

A state-wide data sharing mechanism has been almost impossible due to political constraints. The significance of implementing such a mechanism is great. Often,

researchers are only examining a small part of the picture, while ultimately there is a great correlation between numerous types of data. If all of this data were synthesized, the goal of achieving a holistic approach to fish and wildlife issues would be greatly advanced.

This project would serve as a precedent for states nation-wide by demonstrating the effectiveness of an integrated data base for natural resource management. Information would be available in 'real-time', and would move between agencies quickly and efficiently. This would enhance the decision-making process by expediting the exchange of natural resource data.

d. Project history

e. Methods.

This feasibility study would entail compiling a detailed inventory of water quality data that is being gathered state-wide.

This study seeks to identify and outline the following:

Objective 1- Identify all physical, chemical and biological water quality data (surface water and groundwater) being collected within the State of Oregon.
Tasks:
Identify, using (telephone or computer communications and meetings) :
1-name of agency, watershed council, organization, volunteer group, student group, etc.
2-location of data collected (stream, river, watershed, political boundaries)
3-which type of stream classification system is used
4-type of data collected (chemical, physical, biological); specify different types
5-how often is data collected (weekly, daily, monthly, annually, etc.)
6-method used to collect data
7-where data is stored (type of computer, program, physical file)
8-what type of analysis is performed on data, what is it used for
9-what types of data sharing are already in place (who can access data & how is it transferred)
10-who inputs into data base, how often

Objective 2-Recommend an efficient data sharing mechanism
Tasks:
1-Use computer software (Excel, Grapher, SAS) to analyze information about data collection obtained through study
2-compose a report of findings in hard copy and digital copy
A recommendation will be made as to how a data-sharing mechanism may be put into place. To be discussed:
a-existing data (location, type, amount, etc.)

b-overlapping data
c-areas lacking data
d-data-sharing mechanisms already in place
e-options for data-base sharing; compatibility, capabilites of computer systems
f-assessment of sources available but not being used
g-outline impediments to state-wide data sharing

3-evaluate possibilities of merging with Streamnet (ie. making data available on Internet) and using GIS for data interpretation

Agencies, watershed councils, and organizations will be contacted via telephone. When necessary, the researcher will travel on-site to conduct an assessment of data gathering techniques. The manager of each division will be asked to provide this information.

Results expected are the following:
1-Establish guidelines for a successful integration of state-wide water quality data into a user-friendly computer network
2-Initiate the process to create a prototype for a completely new storage and retrieval system for natural resource data within the State of Oregon.

f. Facilities and equipment.

A computer terminal will be set up in my office to input data. A telephone and fax line will also be installed to facilitate communication with agencies. This equipment will be leased, unless an agreement can be made with BPA to purchase equipment.

People will be contacted during working hours 8am-5pm, Monday through Friday. An initial inventory of state, federal and local agencies, organizations, and watershed councils will be conducted. Key persons will then be contacted and the purpose of the study and their role will be explained. A telephone conference or a site visit will then be set up to discuss data information detailed in Section e above. My car will be used for travel, with mileage paid for by the grant.

The information collected will be compiled into a data-base. Various software will be used to sort and evaluate data and compose reports of findings . The suitability of mapping this information into GIS will be examined, although the actual task is anticipated to be outside the scope of this project.

The anticipated duration of this study is 1 1/2 years. This includes time to contact all state agencies, compile the information, evaluate and analyze the information, and provide a summary of findings and recommendations.

Should more funding be secured at the end of this term, the researcher would like to attempt to create, implement and oversee the new state-wide data sharing mechanism.

The success of the project will be determined through several mechanisms:
1-feedback from involved parties
2-A cost/benefit analysis of management time saved in instituting a state-wide data sharing mechanism
3-response from the public

g. References.

Oregon Coastal Salmon Restoration Initiative Conservation Plan, March 1997, The Governor's Office, Salem

Biological Opinion, National Marine Fisheries Service, Northwest Region, Endangered Species Act-Section 7 Consultation, March 1995.

Columbia River Basin Fish and Wildlife Program, Northwest Power Planning Council, December 1994.

Stein, Rachel. "Guidelines for an Integrated Approach to Water Quality Monitoring", Masters Thesis, 1996. Colorado State University

Section 8. Relationships to other projects

Collaborative efforts with other agencies and organizations for this study include: EPA (Seattle, Portland), DEQ (Portland), USFS (Siuslaw NF), Streamnet (BPA). This study involves contact with all agencies, organizations or groups in Oregon that are collecting water quality data.

Section 9. Key personnel

Rachel Stein
Hydrologist

Education

BS, International Environmental Studies
Rutgers University, 1994

MS, Hydrology/Watershed Science
Colorado State University, 1996

Expertise

Watershed Assessment
Water Quality Monitoring and Analysis

Non-point Source Pollution Studies
Natural Resource Data Management
Environmental Assessments for Water Resource Issues
Stream and River Restoration

Professional Affiliations

Society of Women Engineers
Women on Water
Oregon Association of Environmental Professionals

Ms. Stein has acquired an extensive knowledge of watershed-related issues in Oregon. She has experience with watershed health assessment and design of monitoring networks. Rachel has been involved with a broad range of environmental projects, including hazardous waste investigations, non-point source pollution studies, laboratory and field collection and analysis, geotechnical investigations and ecosystem management. Experience with software includes ArcInfo, AutoCad, Microsoft Excel, Idrisi, and Quattro Pro. Her research addresses water quality data integration and management. Work experience for public agencies, institutions and private consulting has given her an extensive knowledge of natural resource management and implementation issues.

Recent Projects

-**Ocklawaha River Dam Removal and Channel Rehabilitation**
channel morphology analysis, flow management, aerial photo interpretation

-**Oregon Garden**
hydrologic evaluations and water quality analysis, prepared wetlands flow management plan, natural resource data coordination

-**Hazardous Waste Legislative Investigation-Superfund Site**
researched adequacy of mitigation measures, technical support for law personnel

-**Environmental Site Assessments in Estonia, Russia**
data coordination and analysis, translation assistance, waste characterization

-**John Day River Water Quality Monitoring**
implemented water quality monitoring system for various sub-basins, field sample collection and laboratory analysis

Section 10. Information/technology transfer

Information will be distributed in hard copies and in digital form. Copies will be available on the Internet. An article will be written and submitted for publication. The information will be used to incorporate into a new standard for state-wide data collectors.