Northwest
Power and
Conservation
Council

October 4, 2004

MEMORANDUM

TO: Council Members

FROM: Peter Paquet, Council Staff
            Stewart Toshach, NOAA Fisheries Staff

SUBJECT: Data Management – Northwest Environmental Data-Network (NED)

Proposed Action: Approve the attached scope of work (Appendix 1) for implementation of the
Northwest Environmental Data-Network project. This action will allow Bonneville to negotiate
the necessary contracts for project implementation. The costs of these activities should not
exceed $170,000 and would be charged against the $490,000 data management placeholder in
the FY05 budget.

Background: Attached you will find the scope of work (Attachment 1) for activities related to
the NED project that focuses on development and implementation of a regional data
management network for fish, wildlife and water data. This product was produced in response to
the Council's request to review proposed data management projects associated with the data
management placeholder in the FY 05 budget. This scope of work is intended to assist in
carrying out the activitities described in the Memorandum of Understanding (MOU) on data
management between NOAA Fisheries and the Council. Additionally, we have included a
document describing the activities of NED to date (Appendix 2).

Budget: We estimate that the cost to implement this scope of work will not exceed $175,000.
Approximately $113,000 will go towards salary and travel costs for the project coordinator, Mr.
Stewart Toshach of NOAA Fisheries. Contracting for assistance in the development of a pilot
metadata server should not exceed $25,000. The remainder of the budget ($26,000) will be used
for the development of specific work group products described in the scope of work using a
combination of workshops and meetings.

APPENDIX 1

NORTHWEST ENVIRONMENTAL DATA-NETWORK
FFY 05 SCOPE OF WORK

Purpose and Rationale

The purpose of this outline is to describe NED work tasks for the first year (FFY05) of Phase II effort to develop the NED.

The outline identifies tasks that could be completed by work groups within NED, depending on the interests and time availability of members, and tasks that need to be completed by the NED Project Team as a whole. The outline is consistent with the steps outlined by SAIC in their recommendations – with a particular focus on supporting identified groups which have contemporary data network and management issues, and with a strong emphasis on protocols and standards and working with existing regional data entities.

1.0 FACILITATE AND PROMOTE COMMON APPROACHES TO THE DEVELOPMENT AND USE OF CONSISTENT DATA MANAGEMENT PROTOCOLS FOR AND ACROSS VARIOUS CLIENT GROUPS IN THE REGION, FOR EXAMPLE:

1.1. Salmonid Monitoring and Research (work group)

- PNAMP/EMPG - Effectiveness Monitoring. Provide part time support to PNAMP as PNAMP Data Management Coordinator.

- Subbasin Pilots – Track Status and Trend Monitoring pilot data management efforts. Continue to facilitate the use of consistent approaches to data management in these and subsequent pilots.

- Phase II of PSCRF Project Monitoring. Help to coordinate and facilitate the adoption of standard regional protocols for project reporting and metrics.

- Potential Trans Boundary Pilot Project. Develop funding request to research, compare and facilitate cross boundary protocols and standards for consistent reporting of cross-boundary project, habitat, and effectiveness monitoring efforts.

1.2 SubBasin Planning (work group):

- Facilitate an action plan for compiling current subbasin planning information for areas other than Oregon to ensure that it is archived & accessible.

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- Facilitate the development of draft standards and protocols for ongoing reporting of Sub-Basin planning for projects, status and trends and effectiveness monitoring.

1.3 Water Quality (work group)

- Facilitate and promote the adoption of the PNWWQDE formats and protocols and technologies within the region.

1.4 Regional Upland/Riparian Habitat data (work group)

- Facilitate the compilation of consistent data definitions for riparian and upland species.

2. ESTABLISH CROSS-CONTENT TECHNICAL WORK GROUPS

2.1 Regional Spatial Definitions (work group

- Create a work group to develop geographic methodology for reporting project or site location. Create minimum standards and common language. Explore model language (e.g. EPA E-Map) that we can use as a starting point.

2.2 Regional Project Management Data Management (work group)

- Host a work group to support the ongoing development and use of consistent data protocols for reporting of project level data across all groups.

2.3 Regional Data Networking (work group)

- Develop protocols and rules for sharing data using open standards protocols such as "web mapping services" Since the standard (WMS) is already in place, how about just doing it? Replace above sentence with something like:

- Identify existing sites and link using ISO Web Map Service standard or other agreed on standards.

- Evaluate the adaptation of the PNWWQDE model for sharing data sets (other than water quality.

- Explore options for creating regional metadata server, including SAIC proposal and the bullets above.

NED Contract task:

Develop document and provide a detailed design, a work plan, and specifications (including a detailed description of any skills and costs) necessary for the development, testing and

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deployment of a regional pilot level metadata server. The scope and scale and needs of the pilot metadata server will be defined in advance by the Regional Networking Group within NED.

The contractor will specify and document:
1) A design: including an architecture, specifications of needed software and hardware and network capacity and descriptions of skills and experience staffing
2) A detailed work plan defining all needed inputs and steps with estimates of the time and cost needed to complete the pilot level effort and operate it for one year after deployment.
To the maximum extent possible the design would be based on off-the-shelf technology. The starting point for this effort by the Regional Networking Group within NED is the SAIC proposal for a regional metadata server.

2.4 Regional data QA/QC (Quality Assurance and Quality Control) (work group)

- Develop a consistent regional terminology and model methodology for QA/QC.

- Identify legal, scientific or other rules or guidance that are already a part of completing data QA/QC.

3) MAINTAIN A PILOT NED WEB SITE

- Provide consistent and updated information about regional data networking, QA/QC or other data mgt protocols for habitat, water quality and fish via the web in the form of a regional data dictionary and provide public access to NED reports:

  - project reporting
  - salmon status and trend
  - effectiveness monitoring
  - non-andromous species
  - upland species
  - related info (e.g., power planning)
  - other research

4) IDENTIFY REGIONAL REQUIREMENTS FOR SPATIAL AND METADATA FRAMEWORK COMPLIANCE (WORK GROUP)

- Work with Federal, State and other entities (especially IRICC which is proposing to further develop this role) with responsibility for defining and developing spatial framework layers and metadata requirements.

- Document the obligations to meet spatial and metadata requirements and to make these requirements available to data collectors and users.

- Identify, maintain and support framework elements for data collection and management protocols that are consistent with State, National and other protocols.

- Work with group in section 2.3 above to ensure consistency and compatibility.

5) WRITE A REGIONAL DATA NETWORK PLAN (NED PROJECT TEAM)

- Develop a plan to identify and stage the steps necessary to achieve improvements in regional data quality, quantity and access.

- Identify options, tasks and likely costs of completing the plan.

- Use the CBCIS/NED Project Team December 2003 Report and CBCIS report to the NPCC as a reference point.

6) DEVELOP ORGANIZATIONAL AND ADMINISTRATIVE ARRANGEMENTS FOR REGIONAL DATA MANAGEMENT. (NED PROJECT TEAM)

- Identify and facilitate development and adoption of organizational and administrative arrangements for regional data sharing and networking. (This was the #1 issue from the NED /CBCIS report and from other reports on regional (and national) information management.
- Identify and commit staff resources.

7) IDENTIFY SOURCES AND A MECHANISM FOR REGIONAL DATA NETWORK FUNDING. (NED PROJECT TEAM)

- Identify an equitable method and a process for funding regional network projects.

8) PROMOTE AND EDUCATE ON THE USE OF CONSISTENT REGIONAL DATA MANAGEMENT PROTOCOLS BY AGENCIES AND ENTITIES. (NED PROJECT TEAM)

- Encourage the use of NED-developed or adopted data mgt/networking protocols in agencies internal and external business practices – such as contracting.
- Develop/identify training & educational programs

9) Period of Work

It is expected that while completion of all these tasks will require an 18 to 24 month period, significant progress can be made over one year.

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Appendix 2

REPORT ON PHASE I

At the Council's December 2003 meeting the Council, with NOAAF support, agreed to the following specific tasks. The tasks are reported below in italics together with a statement of progress made on each task.

1 Draft Memorandum of Agreement.

TASK: It is recommended that staff distribute and discuss the draft MOA with regional stakeholders to gather input with a goal of creating agreement on a common regional MOA.

The draft MOA was distributed and comments were sought. Consensus was reached that an MOU (rather than an MOA) that clearly set out the goals of the Data Network effort would be a significant step forward.

A revised MOU (copy attached as ATTACHMENT 1) was developed, presented to the Council at the September meeting in Seattle and approved for Council signature.

It provides for participants to work collaboratively on a wide range of potential issues relating to improved regional data networking. This arrangement provides the opportunity for entities and agencies to develop work groups to develop solutions for improving regional data management without requiring and up front agreement by all parties on a 'perfect' solution.

We have a reasonable expectation that the BPA, the EPA and the BC Ministry for Sustainable Resource Management will join with NOAAF and the NPCC in signing the MOU. Consultations with the States, Tribes and other entities are ongoing and to date we have no indication that other key entities will not participate.

2 Draft administrative framework.

TASK: It is recommended that staff distribute the administrative framework functional outline and discuss it with regional stakeholders with a goal of reaching agreement on an accountable administrative mechanism for a regional data network.

Staff distributed the draft administrative framework as a part of consultations with agencies and entities. Most potential participants were not ready to agree on a more permanent administrative and organizational structure (the #1 most needed task in the SAIC report). Instead they wanted to initially develop an MOU that allowed regional entities to work collaboratively on regional data network issues, and to continue to work on development of a more permanent arrangement administrative/organizational arrangement. This understanding is reflected in the both the revised MOU and Phase II work plan.

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3 Ongoing coordination with existing programs.

TASK: It is recommended that staff complete further coordination as needed with other programs serving regional information management needs with respect to the development of the proposed regional data network.

NED staff made significant contributions in leadership roles or other contributions to the following regional data coordination efforts:

- Leading an effort to develop and write a Data Management Plan for the FCRPS 2000 BiOp. The plan was jointly reviewed by the ISAB/ISRP who endorsed the recommended approach.

- Advocating for and promoting the development and use of common data definitions for the sub-basin pilot projects under the 2000 FCRPS BiOp. We provided technical support to the Bureau of Reclamation as it developed a statement of work for the John Day data dictionary and have participated in follow up meetings for the John Day and the Upper Columbia pilot projects.

- Leading the Data Management Work Group within PNAMP to develop a Data Management Plan for PNAMP and participated in the PNAMP Steering Committee. Hosted meetings for the PNAMP data management group within NED.

- Provided technical input and final checking and validation of the data definitions and data management business rules developed for the Pacific Coast Salmon Recovery Fund.

- Participated in and made significant contributions to the drafting of a Fish Data Collection protocol document at the Welches Oregon 3-day workshop.

- Worked and consulted with many groups such as IRICC, the USGS, state GIS and standards efforts and PNAMP to understand different roles and avoid duplication of work.

4 Work plan development and detailed costs.

TASK: It is recommended that staff proceed to develop, with some support from consultants, a detailed work plan and costs for Phase II.

The Phase II work plan is attached to this report. Minimal use of consultants is required at this stage.

5 Public outreach.

It is recommended that staff make information about the proposal for a regional data network publicly available and continue to solicit public input.

The SAIC report was made public via the NOAAF and the NPCC web sites with an invitation to provide input. All public input was favorable and was considered as a part of the ongoing effort. Plans are in place to develop a web-site for the NED project. The NWFSC of NOAAF has agreed to host a publicly accessible web-site location for the NED project as a part of the Phase II effort.

November 2004 Report to NPCC. North-West Environmental Data Network Report on Phase I and the Phase II Work plan.

6 Project Team.

It is recommended that staff arrange for the existing SAIC Project Team and Coordinating

Committee arrangements be consolidated into one Project Team.

The Project Team and the Coordinating Committee have been consolidated into one work group called the Project Team. Staff have convened monthly meetings of the Project Team and plan to continue with this arrangement.

7 Timing. Parts 4.1 through 4.6 should be completed within 9 months.

The Council approved action on the tasks (1-7) above in December of 2003. While significant progress has been made on all tasks within this time not all tasks are fully completed. In particular it is necessary to continue outreach and education to additional MOU partners and the public, to further develop regional funding arrangements and to reach agreement on a longer-term administrative/organizational arrangement.

Most regional entities indicated that while they are strongly supportive of the need for improved regional data management they need more time and more consideration of the way in which the region will pay for this and the administrative arrangements that would need to be made. We have included ongoing effort on the uncompleted tasks in the Phase II work plan.

While the tasks above are considered critical to long-term success we have made more progress than expected on immediate regional data networking needs through our participation in existing regional efforts.

November 2004 Report to NPCC. North-West Environmental Data Network Report on Phase I and the Phase II Work plan.

On a positive note, we have a reasonable expectation, over the next few months, that the BPA, the EPA and the BCMSRM will join with NOAAF and the NPCC in signing the MOU and a further expectation that other entities will join the MOU once the organizations above have committed.   The MOU has been designed specifically to allow others to join the effort at a later time.

C. PROPOSED PHASE II NED WORK PLAN

Memorandum of Understanding: Northwest Environmental Data-Network (NED)

_____

This Memorandum of Understanding is entered into this the _____ day of _____, ____ between the:

NED Co chairs:

The Northwest Regional Office of NOAA Fisheries (NOAAF-NWRO), as represented by the Regional Administrator NOAAF-NWRO, Mr. D. Robert Lohn

The Northwest Fisheries Science Centre of NOAA Fisheries (NWFSC-NOAAF) as represented by the Science Director, Dr. Usha Varanasi

and,

The Northwest Power Planning and Conservation Council (NPCC) as represented by the

Chairman, Judi Danielson

Add any other NED Co chairs here:

And any other NED Participants here:

(Hereinafter together referred to as the "Parties").

WHEREAS the NPCC has an overall planning responsibility for power and conservation issues arising from the development of the Federal Columbia River Power System (FCRPS) within the Columbia Basin.

WHEREAS NOAAF has a lead responsibility for anadromous fish conservation and management.

Add brief description of responsibility of other co chairs or participants here:

(Hereinafter together referred to as the "Parties").

The Parties have agreed to undertake collaborative activities as detailed below:

I. PURPOSE

This Memorandum of Understanding (the "MOU") between the parties is intended to acknowledge and encourage discussion that may lead to further collaborative action and joint activities in areas of mutual interest with respect to improving the collection, management and sharing of environmental data and information.

It is understood that where our legal responsibilities require decision making based on good science and in many other areas our work depends on environmental data that is verifiable, of highly defined, high quality, accessible via internet technologies and is based on consistent or comparable methodologies and standards.

The MOU will serve as a basis for the development of mutually beneficial activities based on principles of cooperation, communication, trust, commitment and shared risk and benefit. It is a voluntary arrangement between the Parties and seeks to define the parameters of the relationship. It is understood by the Parties that subsidiary annexes, addenda or agreements will be required for all joint projects that may result from this MOU so as to ensure that the usual commercial concerns are duly resolved to the satisfaction of the Parties including but not limited to those involving financial and other commitments, as well as those involving intellectual property, copyright ownership and licensing of any existing or newly developed products.

For greater clarity, this MOU is not intended to, nor shall it, result in or create any binding legal obligations on the part of any Party and shall have no effect upon the governance or management of any Party.

It is essential that provinces, states, tribes, other federal agencies, local governments, citizens, and all interested parties have an opportunity to participate in the development of these information resources.

Under this MOU, the Parties seek to explore areas of mutual interest which may include:

- Identification of consistent data management standards and use of information technology tools to provide for an improved and more consistent data-network and exchange, including portals for public access.

November 2004 Report to NPCC. North-West Environmental Data Network Report on Phase I and the Phase II Work plan.

- Capacity building, knowledge sharing and establishment of communities of practice in the areas of information technology and information management

- Coordination with existing data management entities and initiatives, for example with the Inter-Organizational Resource Information Coordinating Council (IRICC)

  - Timely sharing of information system planning and plans for potential legislation

- Pursuing the use of consistent and common data collection and monitoring procedures, metadata standards, data dictionaries, data quality assurance and control, data cataloguing, and document management and promoting the support and implementation of the agreed upon standards

  - Pursuing joint projects and co-funding opportunities with a focus to non-commercial, public uses

  - Fostering common approach and communications for sharing data and information with other local, state, provincial, national, and international initiatives, especially through the use of open source applications and technologies

- Establishing linkages to science and technical information collections supporting sustainable resource management

- Any other areas or activities of mutual interest that may be deemed appropriate by the Parties including the development of similar MOUs to include other jurisdictions

II. ROLES AND RESPONSIBILITIES OF THE PARTIES

A. This MOU will be implemented by a Steering Committee to be established at the time of execution. An appointed designee from each signatory will serve as the lead representative for that Party on the Steering Committee. Parties signing as Co-chairs will lead the Steering Committee. Each signatory must appoint a designee within 30 days of signing the MOU.

B. The Steering Committee will be guided by this MOU and by corresponding Work Plans to be agreed on upon by the Steering Committee members.

C. Consistent with the enabling nature of this MOU the Parties will act to:

- Assemble working groups and other meetings as required
- Consider, and if needed, complete staff exchanges and joint training
- Exchange annual plans or master project lists
- Undertake collaborative projects and joint co-funding opportunities as appropriate, and
- Cooperate to make funding requests to further the purpose of this MOU

D. For specific projects undertaken related to this MOU, the Parties will commit key staff to work with one another on assigned projects as may be mutually agreed to in subsequent applicable memoranda of understanding or in addenda to this MOU.

III. PROCEDURES

A. At a minimum bi-annual meetings will be completed by the NED Steering Committee to review and assess progress with the MOU and measured benefits will be reported to the signatories of this MOU. All decisions will be made by consensus.

B. The Steering Committee, will as needed develop a proposed budget, required staffing level, and cost-sharing proposal for implementing this plan. The plan, budget and cost sharing arrangement shall be presented to each signatory for executive approval.

IV. ADDITION OF OTHER PARTIES

Upon agreement of the Steering Committee, other parties may formally participate in the MOU by signing ATTACHMENT A: <u>Form for Adding Additional Participants to the Northwest Environmental Data-Network</u>. All organizations involved in gathering and managing environmental data are encouraged to participate in the purpose and commitments described in this MOU.

V. TERM

The term of this MOU will be for 36 months effective September __, 2004 and ending September __, 2007 unless terminated sooner as per the conditions of this MOU. Furthermore, with the concurrence of The Parties, this MOU is renewable for subsequent terms. Prior to extension, a report shall be prepared by the steering committee describing the extent to which the activities performed under this MOA have accomplished their objectives.

VI. FINANCIAL COMMITMENTS

Signing of this MOU by the Parties does not, and shall not be deemed to impose on any Party any financial commitment to the other. Any financial commitment intended to bind any Party will first be approved by the Steering Committee, then reduced to writing and presented to the administrations of the Parties for their respective approval and subsequent mutual agreement.

VII. TERMINATION

Any Party may terminate its participation in this MOU at any time by giving the other Party(s) 60 days written notice to this effect.

SIGNED CO CHAIRS:

_____   _____

Mr. D. Robert Lohn   Date

November 2004 Report to NPCC. North-West Environmental Data Network Report on Phase I and the Phase II Work plan.

Regional Director
NOAAF NWRO

_____   _____
Dr Usha Varanasi   Date
Director
North West Fisheries Science Center

_____   _____
Judi Danielson   Date
Chair NPCC

ADD ANY OTHER COCHAIRS HERE:

_____   _____
                                        Date

ADD ANY OTHER PARTICIPANTS HERE:

_____   _____
Signer Name & Organization)   Date

November 2004 Report to NPCC. North-West Environmental Data Network Report on Phase
I and the Phase II Work plan.

ATTACHMENT A: FORM for ADDING ADDITIONAL PARTICIPANTS to the Northwest Environmental Data Network (NED)

The undersigned agree to participate in the Northwest Environmental Data-Network.

Signer (Name and Organization)   Date signed

ATTACHMENT 2: Workplan Tasks From the SAIC Report (together with Project Team Priorities and Comments)

TASKS from SAIC Recommendations	PROJECT PHASE	PROJECT TEAM TASK Priority	Project Team Comment
Establish a high-level agreement (MOU or stronger document) endorsing a regional data network and pledging signatory support.	I	1.1	NOAA Fisheries and the NWPCC have signed a cooperative agreement. The project team is recommending that the MOA be expanded through direct consultation to extend the cooperative effort and to add other organizations when and if they are willing to participate. See draft MOU.
Develop the regional data network as a base-funding category, not to be recompeted for on an annual basis.	I	1.2	See funding. Consultation is needed to develop further understanding on the willingness and ways that stakeholders are willing to contribute to a regional system.
Expand outreach efforts to seek buy-in from other key decision-makers and stakeholders in the regi0n. Develop targeted outreach and education materials for key regional data network participants and supporters that clearly outline the need for a regional data network and describe the benefits and costs for such an endeavor. Ensure this outreach approach addresses the need for long-term support for a regional data network to succeed.	I	1.3	The first emphasis here is on executive level consultation with stakeholders on plans, obligations and expectations. At the same time, further public outreach is essential to raise awareness.
Formalize an accountable regional data network administrative framework.	I	1.4	Currently this element does not exist at a regional level. The project team is proposing an approach that recognizes the critical importance of data networking and management while building on current institutional arrangements and decision-making, processes.
Identify a regional data	I	2	In progress: Program

network Coordinator and Project Manager.			Coordinator. Technical Project planner/manager should be involved when needed. To date the NMFS and the NWPPC have provided support for coordination functions under the existing MOA. A ½ time FTE is planned, but not yet funded for FY 2004. Some consultant support is also needed.
Develop communication and coordination hub of regional data network.	I	3	Web site
Research and post inventory(ies) of existing standards and protocols in the region.	II	4.1	
Develop and post regional data network standards for reporting geographic data: locations and projections	II	4.2	
Incorporate regional data network requirements into future grants and contracts.	II	4.3	Yes. As soon as they become available, across participating funding agencies
Develop regional data network monitoring protocols and data standards addressing data collection, storage and analysis.	II	4.4	Monitoring protocols is mostly being done by other groups, however regional coordination is still necessary.
Develop and post regional Quality Assurance and Quality Control procedures and protocols.	II	4.5	Detailed Quality Assurance and Quality Control procedures can be jointly developed by data staff and data collection entities. QA/QC is missing in many of the existing programs.
Develop and implement region-specific metadata tools.	II	4.6	This is potential demonstration.
Complete the preliminary inventory of information resources in the region.	II	4.7	
Develop and post a regional data network guidance manual that documents everything needed to become a regional data network participant.	II	5	
Develop regional data network technical assistance.	II	6	This is important as a part of all projects. While technical capability is not uniformly spread across the region, the regional system is as weak as the weakest link.

Write a long-term regional information system development plan.	III	7	A long-term plan is needed to guide investment and staffing decisions. Organizational investments in IT will return more in a more certain and planned environment. The plan however, needs to deal with issues that support the development in the region, of a distributed database management system. It is critical to understand that regardless of individual agency efforts, improvements to the overall network require base level efforts on protocols and standards – all the elements in 1-6 above.
Develop a process for evaluating proposed project relevance to goals as part of the grant and contract process.	III	8	Longer term
Develop a long-term resource plan (staff and dollars) for the regional data network.	III	9	Meet critical short-term objectives first.
Develop a strong operations and maintenance plan.	III	10	
Develop a regional data network using a distributed system architecture based on an enterprise approach.	III	11	Regardless of whether the region relies on more of a distributed system architecture or repositories (and the region is currently using both), regional efficiencies and data quality will be improved with the adoption of regional standards and protocols.
Develop tools that will enable searching, accessing, acquiring, sharing, and contributing information resources about the regional resource management efforts.	III	11.1	Possibly as a demonstration.
Establish guidelines for becoming a regional data network node.	III	12	
Redirect resources to support development of regional data network nodes at originating data sources.		Review need & rank	
Develop a funding and resource support workgroup.		Review need & rank	
Develop regional data network		Review need	

November 2004 Report to NPCC. North-West Environmental Data Network Report on Phase I and the Phase II Work plan.

conceptual design and demonstration package (interactive presentation).		& rank	
Develop a regional data network working prototype. (metadata server)		Review need & rank	A regional metadata server is one needed part a regional information system. It could first be developed as a prototype.
Develop regional goals, objectives and measures (e.g., performance measures, indicators) that cut across and integrate individual agency missions and mandates.		Review need & rank	Subbasin Planning/other planning entities have this role
Develop an overall regional management strategy.		Review need & rank	Not a data network responsibility
Further evaluate regional information needs against available information resources to develop acquisition strategy.		Review need & rank	
Establish a regional research and monitoring strategy.		Review need & rank	This is an important goal, but it is a goal that scientific staff in RM&E groups should lead
Develop an online, interactive research and monitoring inventory.		Review need & rank	
Develop documentation standards for data processing and analysis.		Review need & rank	
Develop system security protocols.		Review need & rank	
Develop and post common database designs for similar information types.		Review need & rank	
Develop management and public information/communications work groups as part of the regional administrative structure.		Review need & rank	
Expand regional outreach and investigation to other segments of the regional community not included in the original requirements analysis.		Review need & rank	
Conduct regionwide public workshops to advertise and seek feedback on recommendations.		Review need & rank	
Develop a regional public data outreach strategy.		Review need & rank	

November 2004 Report to NPCC. North-West Environmental Data Network Report on Phase I and the Phase II Work plan.

Support regional data network using financial arrangements and participation incentives.		Review need & rank	
Conduct an annual regional data network workshop.		Review need & rank	
Develop regional data network data repositories.		Review need & rank	It is not clear that this is needed other than for specific mandates. The challenges (political and financial) are substantial. If many of the preceding recommendations are satisfied the need for data repositories will be reduced.
Develop a means to compile historic metadata.		Review need & rank	
The regional data network should provide access to modeling information and basic analytical tools to perform user-defined queries, simple statistics, and trend analyses against databases.		Review need & rank	Long term if at all. Needed tools should be clearly defined before action is taken.
Develop WWW-enabled interactive mapping tool.		Review need & rank	Other entities have this capability. The region should define what information should be conveyed by an interactive mapping tool.
Conduct periodic evaluations of regional data network implementation.		Review need & rank	
Conduct periodic evaluation of the relationship between goals and information management		Review need & rank	