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December 2, 2005

## MEMORANDUM

**TO:** Council Members

**FROM:** Peter Paquet, Council Fish & Wildlife Staff  
Stewart Toshach, NOAA Fisheries Staff

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

**ACTION:** Status Report. None Required.

### BACKGROUND:

Attached you will find two documents activities related to the Northwest Environmental Data-Network (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 for a status report on regional data management activities and to serve as the annual report for signatories to the Memorandum of Understanding that serves as the basis for this project. Staff will brief the Council on key elements of the status report (Attachment 1) and will provide a demonstration of the regional data portal for information sharing that has been developed through this project (Attachment 2).





**Northwest Environmental Data Network (NED) Executive Meeting  
December 7<sup>th</sup> 2005**

**Executive Decision Table**

**The following table summarizes the priority outcomes of the SAIC study, the May 2005 Data Workshop Meeting, the status of current efforts to address those outcomes, and needed Executive decisions to support ongoing action.**

**The first two columns (copper colored) are the Scientific Applications International Corporation (SAIC) recommendations as ranked by the NED Steering Committee. The next two columns (straw colored) represent priority recommendations from the Workshop. The next to last column (no color) shows the status of actions for each of the recommendations while the last column (green) identifies recommendations where Executive decisions are needed.**

**The NED strategy has been to work towards improving regional data management at minimal cost, by relying on coordinated activities and for the most part, in kind support. That can only go so far. Regional data management organization, planning and administration cannot succeed, or succeed very quickly without some increased support.**

**The situation requires a modest increase in resources: in particular from increases in in-kind contributions; for a Portal Administrator for the Portal; and for a cost**

## **Attachment 1**

share arrangement for the ongoing coordination costs. Increased participation is also needed.

The NED tactical approach has been to initially to work on an MOU to provide an ad-hoc mechanism for cooperative and other needed efforts. Then, to focus on standards and protocols and tools, including a portal for sharing and discovering data, and finally, to introduce Distributed Database Management System (DDBMS) tools. DDBMS systems allow an information user to make a single query that returns data from multiple data sources. The data is retained by the owner/data collector who is responsible for the data integrity but is posted to the internet for access by multiple users. DDBMS approaches will supplement existing warehouse approaches and potentially link existing warehouse data sources.

In the workshops and follow up efforts it is clear that this tactical approach is supported. The workshop provided a fine tuning of the basic approach identified by SAIC and an opportunity for many to learn about NED and other regional coordination efforts, especially the Pacific Northwest Aquatic Monitoring Partnership (PNAMP), the PNW-RGIC Pacific Northwest regional Geographic Information Council and the Northwest Habitat Institute who collaborated on the workshop.

To succeed in the short term the resource that is most needed is more in-kind support, or alternatively contract funding. Timing is important too – for example the Fish and Wildlife program is now entering into a new phase of contracting. If those contracts are be conditioned to comply with data management standards the standards first need to be completed. In the Executive decision table below the standards development tasks are the “Data Content” tasks. Increased participation, in-kind contributions or a contract budget is necessary to meet the F&W program timetable.

Other efforts, for example regional Monitoring and Evaluation efforts would also benefit from the use of more standardized approaches to data management. From the perspective of the data management community, burdened with the next- to-impossible task of integrating disparate data, Executive action to increase consistency in data reporting is welcome.

In practical terms, a commitment of at least 0.5 of an FTE over a one year period from each of the major agencies and some FTE support from all entities would go most if not all the way to developing needed regional content and other related standards/protocols. This would be an intensive but very worthwhile short term effort. The alternatives are to let this opportunity pass or provide substantial contract funding.

## Attachment 1

NORTHEAST ENVIRONMENTAL DATA NETWORK EXECUTIVE DECISION TABLE					
SAIC RECOMMENDATION	SC RANK	WORKSHOP RECOMMENDATIONS	WORKSHOP RANK	CURRENT STATUS OF TASK	NEEDED EXECUTIVE ACTION
<b>GOVERNANCE</b>					
Establish a high-level agreement (MOU or stronger document) endorsing a regional data network and pledging signatory support.	I			A high level MOU is complete and has been signed by some entities. Outreach to other participants is ongoing. There is consistent support in principle. In practice some agencies are dealing with internal data issues and are not ready or willing to contribute to a regional network. A common refrain is "what's in it for them"	Decision needed about whether to move further ahead on projects without participation from some entities.
		Convene principals of major resource databases to formalize consensus supporting the value of data network (expand NED signatories)	Short term Priority	Some database entities are supportive while others are more circumspect and may see NED as a competing data management system rather than a needed regional network system.	See above
		Identify essential additional partners and champions to support participation	Short Term Priority	This task is ongoing, see above.	See above
Formalize an accountable regional data network administrative framework.	I			An administrative framework for an accountable regional network has been developed for Executive consideration. The ISRP and SAIC pointed to the need for more formal arrangements – an entity that is "responsible" for regional data management	A decision is needed on proceeding with a more formal administrative model.
Identify a regional data network Coordinator and Project Manager.	I			The data coordinator role is in place. NED projects are currently being managed through in-kind contributions and the coordinator	More in-kind support is needed to complete needed tasks – see details below.
Write a long-term regional information system development plan.	III			NED is currently dealing with shorter-term start-up issues.	No action is needed on a long-term plan until a decision is made on adequacy of participation (above)

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Develop a process for evaluating proposed project relevance to data management goals as part of the grant and contract process.	III			As a starting point proposed projects could be assessed based on whether or not they are consistent with regional data network needs: Is metadata FGDC compliant, will data be posted to portal/s, is spatial and temporal data consistent?	Executives need to decide whether to apply data management performance criteria to funded projects
Develop a strong operations and maintenance plan.	III			This task is important, however, until the network is up and running there is no need for O&M	No action needed at this time
		Conduct annual executive-level review for regional data sharing signatories	Long term Priority	An annual executive meeting is desirable –with the idea that it be used to overview progress and develop consensus on the needed action.	This meeting meets the workshop need.
		Present regional workshop findings to regional executives	Short Term Priority	Self explanatory	This meeting meets the workshop need

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OUTREACH					
Expand outreach efforts to seek buy-in from other key decision-makers and stakeholders in the region. 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	Develop relationships with various data exchange groups	Short term priority	There has been considerable outreach to key groups who are regional stakeholders in data management. Most groups have committed in principle. Some are yet to sign the MOU or contribute substantially to the effort.	Executive decision on whether to invest further time in outreach or switch priorities towards developing products.
Develop communication and coordination hub of regional data network.	I	Establish information portal that links existing resources (with Columbia Basin as focal point)	Short term priority	NED is establishing a pilot portal that will have this capability	See below in "Data Technical Architecture"

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DATA CONTENT					
Research and post inventory(ies) of existing standards and protocols in the region.	II	Maintain and update regional data exchange and sharing protocols in a regional data dictionary accessible via the www.  Focus on establishing minimum data exchange and sharing protocols for future data collection and management efforts	Short term Priority	NED efforts have identified and promoted the need for a regional data dictionary. Since then the BRec has been working to develop a pilot data dictionary. Once complete, an evaluation of the utility of the dictionary is needed. If a decision is made to deploy, a deployment and operational plan would also be needed.	An Executive decision is needed on whether to help to evaluate and deploy a common regional data dictionary.
Develop and post regional data network standards for reporting geographic data: locations and projections	II			NED has prepared draft guidance for spatial and temporal reporting.	When standards are final, regional Executives need to review them and support usage.
Incorporate regional data network requirements into future grants and contracts.	II			As a practical starting point, require entities and agencies to consistently: complete metadata, post data to portal sites and describe data quality, all as a condition of work performance.e	Executive action is needed to require the use of standards within their agencies.
Develop and post Regional Quality Assurance and Quality Control procedures and protocols.	II			QA/QC needs to be first developed for data collection. This involves intervention in existing programs, a territorial issue for the data collection community. In kind or consultant effort is needed to establish best management practices with user communities.	Executive support is needed to find in kind contributions or contract dollars to support this effort.
Complete the preliminary inventory of information resources in the region.	II			The NED SC considers that static inventories have limited value. An alternative is to post data to the web e.g. through a portal. In this way the Portal would be dynamically updated.	Executive support is needed to fund a Portal Administrator for the portal site. See below.
Develop and post a regional data network manual that documents everything needed to become a regional data network participant.	II			At best the manual would constitute a regional data sharing agreement, setting out agreements, understandings and best practices for regional data sharing.	In-kind support is needed for this effort



## Attachment 1

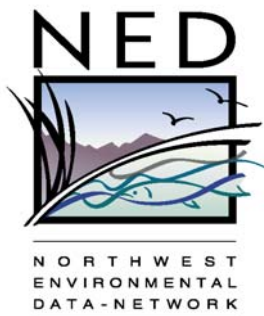
FINANCE AND BUSINESS CASE					
Develop the regional data network as a base-funding category, not to be recompleted for on an annual basis.	I			Coordination funding is currently supported by BPA and NOAAF. A more equitable arrangement is needed to include additional partners.	Executives need to decide whether their agencies are able to contribute funding to the existing NED coordination effort.
Develop a long-term resource plan (staff and dollars) for the regional data network.	III			Focused short term funding is currently the most important. Many tasks are time critical in the sense that delays in introducing standards makes the task ever more difficult.	No action needed at this point
		Explore other network options to leverage (e.g., Exchange Network)	Short term Priority	A funding request can be made to the EPA Exchange Network, however it requires a state sponsor and states and tribes often have their own requests. Requires support from grant writing professional.	In 2006, continued support of Grant writing assistance is needed from the Council. We also need a state sponsor.
		Leverage grant opportunities and partnerships	Short term Priority	Requires support from grant writing professional.	In 2006, continued support of Grant writing assistance is needed from the Council.
		Organize executive funding symposium	Short term Priority	A pre-requisite of this task is to develop a funding package and a long term data network plan. We will start long term planning in 2006.	No Executive action needed at this point
		Identify current lines of authority and/or obligations – use business case to encourage participation	Short term Priority	This is a time intensive task. While most data management efforts do not develop substantive business cases, developing a business case for regional data sharing is considered worthwhile	Additional In-kind support is needed to research the lines of authority and business case

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DATA TECHNICAL ARCHITECTURE					
Develop regional data network monitoring protocols and data standards addressing data collection, storage and analysis.	II			NED is adopting open standards from the International Standards Organization consistent with the National Spatial Data Infrastructure and with FGDC compliant metadata.	Executives are asked to endorse this approach
Develop and implement region-specific metadata tools.	II			While the NED Portal design is designed to be FGDC metadata compliant it may also be necessary to develop some metadata short-forms that would relieve the burden of metadata reporting.	No action needed at this time
Develop regional data network technical assistance.	II			This activity could help to support the portal – some entities will need assistance using the Portal even when guidance is fully developed.	Portal administrator can develop guidance and provide some assistance. No additional action needed at this time.
Establish guidelines for becoming a regional data network node.	III			A node implies participation in a Distributed Data Base Management System (or DDBMS). Currently there is a pilot DDBMS in the region – the EPA Exchange Network. NED plans to apply for 07 Challenge Grant Funding to pilot the use of the EPA exchange network for fishery and habitat data sets -	Executive support will be needed for application to the EPA challenge Grant (approximately 750K). This may also require in-kind or cash partnership contributions from the region.
Develop a regional data network using a distributed system architecture based on an enterprise approach.	III			See comment immediately above. The hard and cost intensive work here is in developing a detailed understanding of the data that will be shared and building exchange formats to allow the exchange of data between participants and nodes.	No action needed at this time. See comment immediately above.
		Develop and publish reference architecture for the system	Short term Priority	The architecture in the EPA Data exchange model should be reviewed with a view to adoption as reference architecture. In-kind expertise is needed for this task.	No action is needed at present.
		Deploy registry/repository that conforms to OGC extensions to ebRIM and provide access via simple web portal	Short term Priority	This methodology applies to the introduction of DDBMS.	No action needed at present

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		Develop test site to show power of data linkages	Short term Priority	The DDBMS goal is to develop a test site based on the EPA exchange model.	No further action needed at present
Develop tools that will enable searching, accessing, acquiring, sharing, and contributing information resources about regional resource management efforts.	III	Select small number of representative datasets and WMS services and register them in the catalog	Short term Priority	NED, with support from the BPA is developing a pilot portal to meets these needs. The Portal needs to be completed and guidance prepared. A portal content manager is needed to provide a necessary check on data compliance prior to publication	Executive action is needed to support populating the portal. This could involve requiring the registration of data work products with the Portal. A Portal Administrator is a critical resource to meet this need. Current funding is likely to be sufficient to support a Portal Administrator through FFY 2006.
<b>LEGEND</b>					
Rankings of NED Steering Committee					
Priority in White Papers					
Executive decision or support needed					



# Northwest Environmental Data-Network Portal Development

Executive Meeting for Northwest Environmental  
Data Network (NED)

December 7th 2005

Northwest Power and Conservation Council

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## Background

- There is agreement that we all need a better way to find and use fish, wildlife, and water data. The NED Pilot Portal meets regional data discovery and sharing needs identified by Scientific Applications International Corporation (SAIC) in their Regional data needs assessment. The software chosen for the Portal meets all of SAIC's recommended specifications. The Portal supports and leverages other national, regional, state, and local efforts, including the Federal Geographic Data Committee (FGDC), Geospatial One-Stop (GOS), National Spatial Data Infrastructure (NSDI), E-Government initiatives, and state Portal development. The NED Portal integrates existing resources from a wide array of entities, compiling lots of disparate data in one place. Just as there is a hierarchy of data (from national, to regional, to state-level), there are partnership arrangements that must be developed to ensure that the Portals work together. Regional support for developing improved data sharing and discovery tools was verified at the NED Workshop in May.

## What the Portal is and what it can do [<http://nppc.bpa.gov/Portal>]

- Discover distributed data (i.e., from different web sites) by doing searches based on geographic boundaries, key words, or pick a known location from a standard list. The key words search in the metadata records.
- Share data (tabular or spatial) by posting its metadata to the Internet in industry standard format.
- Look at the data, in spatial (or map) form.
- Overlay different data sets in map form.
- Print, save and recover, or email a copy of data or a map you create.
- Discover tabular data.
- Download tabular data for local use.
- Indexes and organizes tabular data, spatial data, and other electronic products such as publications.

## Features of the NED Portal

- Cost effectiveness. Builds upon and ties together comparable national and state-level efforts.
- Compliant with National and International standards, including the National NSDI and FGDC.
- Based on off-the-shelf technology. In this case ESRI's Portal Tool Kit which is also running the nation's Portal at: <http://www.geodata.gov/>.
- Focused on data needed for Pacific Northwest natural resource policy, planning, and management.
- One place to go to find all of the data you are looking for.

## What it will take for the Portal to Succeed

- Completion of the NED Portal pilot deployment and operational transition.
- Development of Operational and Business rules.
- Identifying a Portal Administrator. The Administrator will make sure that the Portal continues to run and that data posted to the system complies with agreed standards for metadata and has certified data quality.
- Posting of data. Agencies and entities completing work must post their data to the Internet so that the Portal can find it. Use of a web map service (or other industry standard web accessible services) will enable the interactive overlay of these layers. Fortunately this is easy to do and guidance is currently being developed.

- Participants must also post their metadata. Metadata is the library catalog card that the queries are based on. Regionally specific FGDC compliant metadata standards can be developed if needed. The Portal can also be set to automatically harvest metadata from specific entities.
- Agencies or entities that cannot post data may need help posting (and/or hosting) their metadata and/or actual data sets.

## What it is likely to cost to populate and maintain the Portal

- Infrastructure and staff. A Portal Administrator is needed in a full time capacity. Over time and depending on the use of the system more resource data subject-specific content managers (data stewards) could be needed.
- Fiscal Year 2006 budget needs are covered under the GIS for Subbasin Plans project (\$200,000). Out year budget proposed to be included in new BPA/Council Regional Data Management Planning and Coordination item consistent with Independent Scientific Review Panel guidance to make scientifically credible data available for fish and wildlife planning and management activities.

## Policy Commitment

- The system will only work if the metadata are posted to the Portal, the raw data are available on the Internet, and the quality of the data is assured by the data providers. The final test for success will be with users. If they can easily find the data they want and trust the data, they will use the Portal. Therefore, data quality and credibility are the keys. Regional Executives will need to support the common use of basic standards and protocols for data quality and metadata. These requirements can be attached to contract work and internal work of multiple agencies throughout the region.

## Conclusion

- The Portal is a technology evolution, not a revolution. It can make regional data sets (regarding fish, wildlife and water) discoverable and available in their native formats once their metadata is posted. The Portal will allow anyone to discover and use the data that are available to help solve natural resource problems. There is an opportunity to tap into national assistance at Geospatial One-Stop to further develop both the technology and people partnerships that will be necessary for NED to succeed. The Portal encourages an adaptive management approach to regional information system development as we work together to enhance our existing knowledge and tools in support of the NED project's goals. We ask for your suggestions, enthusiasm, and support.

Tom Pansky, Energy Resource Specialist, Bonneville Power Administration  
NED Technology for Data Discovery and Sharing Work Group