

# **A Simple Networked Information System to Support Research, Monitoring and Evaluation Science**

## **Synchronizing Collaboration and Communication with Product Dissemination & Optimized Organization**

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### **Executive Summary**

The success of regional research, monitoring and evaluation processes, techniques and use is limited by the ability to efficiently communicate between and among the Pacific Northwest's contemporary RME groups, academia, governments and the public. Many new RME products and advances are unable to be delivered to Executives as completed products because the basic means and measures to do so are absent. Institutional attempts have proven complex, costly and unsuccessful. Thus, a simple **Networked Information System** (NIS) is needed to unify communication and systematize products, making them available in an organized, timely and cost-effective manner.

The problem will grow worse if left unresolved. The integrity and durability of RME designs are being enhanced and produced at a vigorous rate across all monitoring sectors. Regional organizations have convened the appropriate work groups and subcommittees—each possessing broad expertise and shared goals. Facilitating these experts and the development of durable products is not the problem; it is the absence of internal organization tools and a simple delivery and communications system to finalize and distribute improved decision-making information. This cannot be done at the scale and within the time frame requested without a functional and uncomplicated information support system within six-ten months.

An NIS system is different from a web page approach and/or a complicated data management system, organization or program. Rather, NIS provides an expanded and efficient communication structure and publication capacity for multi-level users. It also provides RME organizations the ability to operate effectively internally and externally—a fundamental requirement in the development and delivery process. Simply put, an NIS is necessary given the enormity of the work and the technical aspects of the subject-matter. Further, the decision and management significance represented requires supplementary capacity.

Networked Information Systems are used by nearly all academic institutions, the entire medical research community, e-publication of varying disciplines, and large work group

organizations. These systems are accepted globally by the public, private sector and for complex project and program management industries.

The scientific publication community has also developed discriminating and organized peer-review criteria and processes. In literally thousands of published reports, authors state that NIS coalitions and e-publication is the preferred approach and they provide ample and logical rationale. NIS is therefore a good fit and a necessary organizational step for PNAMP to support its continually expanding level of regional leadership and the scope of its monitoring programs.

These systems also meet, and may even possibly exceed, the original expectations of the Executive Network and the region especially for product delivery (formal publication) and coalition-forming purposes.

While this system does not directly address data management, or the issues of metadata and its multivariate complexities, for example, an NIS will provide a new framework and an extensible system for initiating progress in this area—progress that has been institutionally burdened and lacking continuity to date.

Evaluating and analyzing the applicability of actions, projects and programs will also be more easily matched and united to the fundamental and accepted management questions. This will make specific responsibilities and obligations clearer and linked to the appropriate entities. NIS is an exceptional example of a necessary investment—one that represents a *positive return-on-investment* expenditure and a tool that will catalyze the RME development and collaboration effort.

Finally, *adaptive management* is deeply-rooted and is the definitive step in all management/recovery etc. plans. Monitoring programs (i.e. RME) are how the data to *adaptively manage* is collected. It is the single process that will validate or adjust restoration, mitigation, enhancement and/or conservation actions. Without a basic support system, sound data, with an acceptable level of inferential power, reasonable confidence intervals data that transparently identifies all assumptions regarding error, bias and variance, will not be available.

A regionally deployed NIS tool deployed and managed by a PNAMP-led subcommittee has the potential to bring about favorably disproportionate progress in this regard. The resources PNAMP investigators have uncovered provide evidence that we can manage the content internally, and the system can be quickly launched within six-ten months without necessarily having to purchase hardware or software design. We will need a PNAMP partner to provide a dedicated server however.

Information supporting PNAMP's proposal that describes the basic architecture, capacity, costs and capabilities are further described in this briefing along with a draft comparative analysis citing pros and cons.

## Options, Capacity and Technical Information

A Networked Information System will:

- Provide publication and download capacity of scholarly works, methods, protocols, strategic plans, recommendations, communiqués, and importantly, peer-reviewed RME publications and products from multiple sources;
- Advance the economic advantage of networked information for the Partnership and for groups with mutual and shared goals;
- Enhance training, project and program development and implementation;
- Optimize and expand all sector forms of RME information on the Internet. Examples include population forecasting, harvest regimes, passage efficiencies, genetic stock identification, watershed condition, habitat action effectiveness technology and monitoring protocols etc;
- Provide sensible, multi-level user tools such as keyword search, public and work group space, calendaring, automated action item tracking and communication systems, and contacts for example;
- Utilize the secure and well-developed internet technology and infrastructure, and
- Provide all PNAMP meeting minutes, decisions and planning activities.

Sample and Simple/Attainable Goals:

1. Manage Networked Information Content Internally;
2. External Systems Support—no increase in IT FTE's;
3. Continue to Integrate Organizations, Professions, and Individuals;
4. Building Common Technology, Science, and Infrastructure, and
5. Continue to actively promote Cross-Program, Top-Down and Bottom-Up collaboration and communication.

These guidelines provide an environment for collaborative development of RME products, objective peer- review, publication and dissemination to thrive. Comparable, accessible and tractable data is the product. And, the singular need to improve RME accuracy and spatial coverage. NIS systems have the capability to provide the region with the most contemporary and updated methods, protocols and training sufficient to collect and manage ecosystem, ecological and population data.

Literally thousands of practitioners, researchers and managers are beginning to jointly develop shared goals in a corresponding and increasingly credible manner. The directives come from a variety of Executive sources including the U.S. Canada Treaty, (the United States State Department and the Ministry of Canada) four U.S. states' Governors, the U.S. office of General Accounting, regional interest groups, state Legislatures, professional societies, customer and constituent groups and the U.S. Congress. All of these groups and individuals share common objectives aimed at reducing independent,

isolated and/or tactical RME efforts. Another objective is to use RME to support uninterrupted implementation of sequential on-the-ground restoration actions while meeting the regional/national “accountability” bar.

PNAMP and a handful of regional groups have formed to respond in a responsible and expert manner. Their universal goal is to improve the scientific foundation, collection and use of RME. Further, this supports the need to produce comparable and accurate data for regional and/or population-based status and trend monitoring. Finally, these steps will facilitate and encourage intermittently scheduled adaptive management processes. This step is the essential information that will be analyzed to report success or failure of programs, projects and actions with known performance standards and benchmarks and hypothesis testing or experiments.



### **Tools for the Tool Box:**

Below are carefully vetted links to the means of access and literature that have been found most useful and applicable. These provide the basic and detailed information to gain an objective perspective on utility, cost and need.

These are the NIS and e-publication web links and literature the FPM TTM and TTM publication committee has found most useful and applicable for gaining perspective on utility, cost and need.

If successful, we could directly address some wasteful expenditures, institutional failures and unmet expectations.

- <http://www.cni.org/organization.html#Program>
- <http://www.ksg.harvard.edu/>
- <http://kwu.blackboard.com/webapps/portal/frameset.jsp>
- <http://www.educause.edu/>
- [http://www.codesria.org/Links/conferences/el\\_publ/anbu.pdf](http://www.codesria.org/Links/conferences/el_publ/anbu.pdf)
- <http://www.crownpeak.com/>
- <http://www.nyu.edu/its/pubs/connect/archives/96spring/gessnerejournal.html>
- <http://www.mantex.co.uk/reviews/okerson.htm>

Two tangible examples (with many embedded links) of NIS systems that serve the education field very well. The second link is a system used by the University of Oregon and many others:

1. <http://www.learningobjects.com/>
2. <http://libweb.uoregon.edu/cet/>



## PNAMP as the Stimulus and Administrative Body:

Regional partnerships make up a focused and scaled set of supporting tasks.

- 1) Expand clarity and implementation of a pilot Networked Information Sharing system using the EN and Executives Summit to urge expanded agency participation;
- 2) Build up an NIS system that will optimize PNAMP's internal communication and provide a clearinghouse for information derived from CSMEP, Federal, State and Tribal Caucus' and others' RME products. This task will act as **a critical and unmet touchstone for actively fostering and tangibly supporting region-wide RME partnerships**. PNAMP represents a good choice for this task;
- 3) Build up and test an NIS system that readily allows products to be delivered quickly and provides full access and broad dissemination. Under this model, no single group prevails in-and-of-itself, or in isolation as an RME leader, rather, the sum of RME expertise is combined and its applications are understandable, and,
- 4) Retain authorship rights and grant source acknowledgements.



## Example Pros and cons:

- **Cost:** Pro is that we have a large pool of EN agencies that can and should support this tool: Con: turf and ego can scuttle the idea
- **Technology:** Pro is that many "out of the box" systems exist. For example, the Coalition for Networked Information provides an enormous set of academic, library resources, research, training, symposia and workshops, most or all these services are free of charge. CSI would provide the baseline support and guidance for the use and integration of an NIS with a global professional society. Con is that systems can be complex if allowed to grow beyond valuable utility and if information administration becomes a large exercise.
- **Hardware/Software:** Pro is that several systems require one server as the only user purchased and maintained hardware and software. Pro is that the region would administer and control all content. The vendor provides the splash pages outlines, landing page template and the plug-ins (calendar, auto email reminders, work group space, discussion/blog forum, conferencing and 24/7 maintenance) from a list of options that we chose. Con is that will require a vendor relationship and broad consensus on tools. Pro: Unlike other systems, the relationship does not require annual fees nor is the technology provisional or proprietary in nature.



## Conclusions:

- A regional NIS system will allow RME, analysis and adaptive management to occur with commonality. This is part of PNAMP's goals and objectives as a regional entity. It is a shared objective between and among management entities and others;
- There is an expectation that PNAMP can help focus PNW regional RME organizations towards a single and straightforward goal. NIS will provide enhanced capacity in this regard, and, at multiple levels;
- PNAMP is probably the best-suited to do the NIS pilot project and the FPM is the can provide an in process demonstration product. For example, NIS is a requirement for the Tagging, Telemetry and Marking Guidelines task and is on a firm critical path leading to publication of expert and globally-developed recommendations;
- NIS's are designed to expand and upgrade PNAMP's internal and external organizational needs and streamline production and external outreach needs. It is generally agreed that the EN and other PNW entities expects and needs this functionality;
- This tool will also help all organizations meet expectations and continue to conduct their unique technological, interactions and advisory roles;
- NIS will also be a powerful tool to manage our internal tasks and support the work groups. And, importantly, this system will enhance the ability to *manage expectations*, and,
- Most RME methods, protocol, training, data management, and/or design information has become difficult to access. An NIS system will help many groups to compare and contrast methods.
- Finally, as far as PNAMP's and its partners' goals: an NIS will provide expanded potential to broadly disseminate products that encompasses multi-level input (i.e. details ranging from statistical design to field logistics) and provide them as reviewed, vetted, and in some cases, supplementary recommendations.