

## SECTION 1. PROJECT ADMINISTRATIVE INFORMATION

### CDI Science Support Category to which the proposal is responding:

CDI SSF Category 1: Management, Policy, and Standards (SSF1)

**Project title:** Exchange Standard for Project Data Collection Event Metadata

**Name of lead USGS cost center requesting funding:** USGS Northwest Region

**Name of USGS principal investigator, mailing address, telephone, fax, and email**

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### Short description

Development of a data exchange standard for site-level data collection event (DCE) metadata associated with research, monitoring, and evaluation (RM&E) efforts to support better integration of information across time, space, and programs. We raise the value of the data by increasing its use through easier access.

## SECTION 2. PROJECT SUMMARY

In support of improved data management and in an effort to collect and publish timely, accurate, and relevant scientific data that properly inform key management questions, we propose development of a data exchange standard for site-level data collection event (DCE) metadata associated with research, monitoring, and evaluation (RM&E) efforts. A site is the spatial location where one or more measurements are taken and metrics derived. A more generic term for this is “spatial unit”. Furthermore, by establishing a national standard for this metadata in an online exchange, the data will become more valuable as funders and researchers can more easily identify where monitoring is occurring, where data are located, and what designs and methodologies were used to collect it.

Site-level DCE metadata includes the minimum information needed to render integrated maps of project locations and perform analytical queries relating to location, method, organization, and time across programs. Site-level DCE metadata can help answer the who, what, where, when, and how questions about specific projects. Over time, the expectation is that the more researchers who provide site-level DCE metadata for their RM&E data in an online exchange, the greater the access will be for everyone to a complete and up-to-date summary of the information available. This will enable managers to make better informed decisions about key management questions and to reduce redundancy or duplication when planning future efforts. We also propose to facilitate a broad review of the standard during development and after completion in order to ensure we are meeting needs of interested parties, such as the National Fish Habitat Partnership (NFHP) and Bonneville Power Administration (BPA). The intent is for this effort to be supported with cost share from BPA and in-kind support from other Pacific Northwest Aquatic Monitoring Partnership (PNAMP) partners and participants.

To the extent practical, this exchange standard will build upon some of the standards published by the OpenGIS Consortium (OGC) and ISO Technical Committee 211, specifically the use of Geography Markup Language (GML). The exchange format could ideally be specified as an “Application Schema” based on the GML Point Profile or GML Simple Features profile. Such a specification could ultimately broaden acceptance and use of this exchange format, but would take longer to implement. The outcome of this project would be a Word document with a description of the data exchange standard and an XML validating schema.

Ultimately, the intent is the online exchange of this information. When data is exchanged, the source of the data is normally the organization that implements the project and/or stores measurements and metadata related to the projects. Consumers (sinks) of this information include state or federal agencies, universities, non-profits, and the general public. We propose that exchange of site-level DCE metadata between sources and sinks occur initially through two mechanisms:

- Environmental Protection Agency (EPA) Exchange Network virtual node services
- RESTful web API (local client implementations)

Although the communications protocols and message encoding mechanisms may be different or may change over time, it is our goal that the basic information model exchanged via these two mechanisms be identical (Figure 1).

The Exchange Network (<http://www.exchangenetwork.net>) is an EPA funded standard for flowing environmental data and for supporting technology implementations that enable organizations that produce or consume environmental data to exchange information using a standard protocol. Our intent is to apply for a grant from EPA to implement web services to support virtual sharing of these data on the Exchange Network.

As important as the Exchange Network is, it does require significant IT infrastructure and skills to implement and maintain. Many organizations, especially smaller ones, lack adequate funding or skills to undertake this task and be successful. For this reason, we will also develop a secondary option more limited in potential reach, but easier and less expensive to operate. This approach will be based on a less complicated RESTful web API over HTTP as a means of exchanging site-level DCE metadata between willing participants.

Our proposed exchange will enable better integration of information from disparate efforts across time and space by providing data seekers with more than just a location. Any website with map services could use it to improve their content. We have already discussed this concept with Bonneville Power Administration, who is interested in using it to support their needs in the Columbia River Basin. Along with other PNAMP partners and NFHP information exchanges, not to mention any number of other programs across the nation, all will benefit from a formal exchange standard implemented on the EPA Exchange Network.

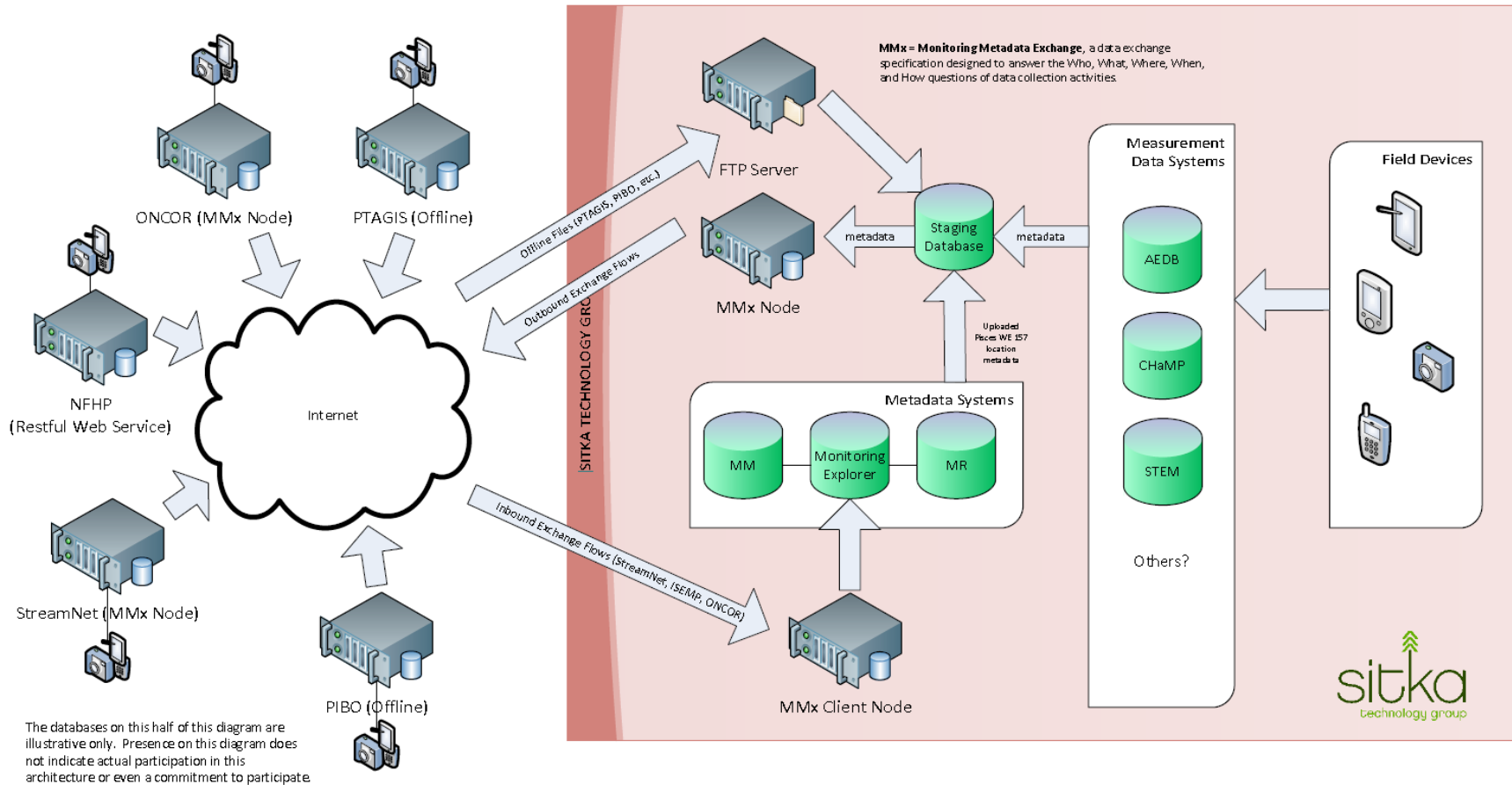


Figure 1. Conceptual data diagram for metadata exchange.

**SECTION 3. ESTIMATED BUDGET**

Budget Category	Federal Funding "Requested"	Matching Funds "Proposed"
<b>1. SALARIES (including Benefits):</b>		
Personnel Total:	\$ 16,000	\$ 12,000
Contract Personnel Total:	\$ 25,000	\$ 12,000
<b>Total Salaries:</b>	\$ 41,000	\$ 24,000
<b>2. TRAVEL EXPENSES:</b>		
Travel Total (Per Diem, Airfare, Mileage/Shuttle) x # of Trips:	\$ 0	\$ 0
Other travel expense (Registration fees):	\$ 0	\$ 0
<b>Total Travel Expenses:</b>	\$ 0	\$ 0
<b>3. OTHER DIRECT COSTS: (itemize)</b>		
Equipment (inc. software, hardware):	\$ 0	\$ 0
Publication Costs:	\$ 0	\$ 0
Office supplies, Training, Other expenses:	\$ 0	\$ 0
<b>Total Other Direct Costs:</b>	\$ 0	\$ 0
<b>Total Direct Costs:</b>	\$ 0	\$ 0
<b>Indirect Costs</b> (21.158% for reimbursable funds on federal salaries):	\$ 0	\$ 2,539
<b>GRAND TOTAL:</b>	\$ 41,000	\$ 26,539

USGS staff have checked with and received confirmation from the Contracting Officer's Representative (COR) that the contracting staff can participate in sending funds outside USGS.