CDI FY17 Request for Proposals

Developing APIs to support enterprise level monitoring using existing tools

Submission Title: Developing APIs to support enterprise level monitoring using existing tools

Lead PI: Patricia Stevens

Mission Area: Ecosystems

Region: Northwest Region

Organization: Fort Collins Science Center

OrcId: NA

Phone: 9702269499

Email: rscully@usgs.gov

City: Fort Collins

State: CO

Co-PIs and Collaborators:

Type: CO-PI

Name: Rebecca Scully

Mission Area: Ecosystems

Region: Northwest Region

Organization: Pacific Northwest Aquatic Monitoring Partnership

OrcId: 0000-0003-0704-8907

Phone: 5095382920

Email: rscully@usgs.gov

City:

State:

Type: CO-PI

Name: Jake Weltzin

Mission Area: Ecosystems

Region: Headquarters

Organization: National Phenology Network

OrcId: 0000-0001-8641-6645

Phone: 5206263821

Email: jweltzin@usgs.gov

City: Tucson

State: AZ

Type: CO-PI

Name: Jennifer Bayer

Mission Area: Ecosystems

Region: Northwest Region

Organization: Pacific Northwest Aquatic Monitoring Partnership

OrcId: 0000-0001-9564-3110

Phone: 5032014179
Email: jbayer@usgs.gov
City: Cook
State: WA

Science Support Framework Element 1: Web Services

Science Support Framework Element 2: Science Data Lifecycle - Planning

Science Support Framework Element 3: Data Management

In-Kind Match: $49,675.00

List of anticipated deliverables from the project: 1-3 fully developed, published and documented API services functioning between existing web resources

Lead Cost Center: Fort Collins Science Center

Notes, Comments:

Project Description: Enhance existing web resources to support aspects of the data management process for multiple research and monitoring programs and projects that operate at local to national scales. The North American BAt Monitoring Program is in need of application programming interfaces (APIs) to leverage MonitoringResources.org's application building blocks. APIs will allow NABat developers interface with the proven programming routines found in MonitoringResources.org. Users will be provided the ability to seamlessly select Master Sample site locations through the NABat web application and upload data collected back to MonitoringResources.org without ever leaving the NABat web application. This provides users access to a unified sample design, and protocol that is implemented in each sampling process. This collection data can then be referenced in reports used by statisticians, monitoring practitioners, and resource managers to better understand sample design and site selection. The APIs, workflows and lessons learned will be documented, and shared, enhancing availability to support other local to continental scale monitoring programs such as the North American Monarch Monitoring initiative.

Total Budget: $44,100.00

SECTION 1. PROJECT SUMMARY

Project title: Developing APIs to support enterprise level monitoring using existing tools
Name of USGS principal investigator: Patricia Stevens

This project is intended to support current and proposed monitoring efforts (continental-wide to local scale) to better manage data such that it is documented, understood, accessible, and preserved. We will develop and apply technologies that support consistent data collection and management protocols and that enable best practices to describe, organize, curate, and facilitate access to scientific data. Documentation of data collection protocols, methods and designs is essential to ensuring that data are well managed and available for decision making and future science. Specifically, we have identified tasks that will support design and implementation of local, regional and national monitoring programs and improve collaboration among monitoring programs, including publication and exchange of the following: design/sample creation (GRTS algorithm, master samples); design documentation; event/site location documentation; site location visualization, methods documentation; and protocol documentation. The goals are to (1) provide best practices and improved tools to support science data management for research activities within USGS (e.g., at the project or Center level), and (2) provide capacity and leadership for information management within other DOI Bureaus (e.g., USFWS, NPS) charged with implementing regional to national-scale monitoring activities.

MonitoringResources.org, was developed by the Pacific Northwest Aquatic Monitoring Partnership (PNAMP) to provide online public structured documentation of protocols, methods and designs in a consistent format to improve data documentation, discovery and collaboration among partners in the Pacific Northwest. The tools may be accessed and used by any entity or individual seeking sustained public documentation; thus reuse of this existing tool efficiently offloads part of entities' data management needs to a public registry. This contributes to data usability with respect to data management mandates, while saving money by reusing existing tools (not new development); meeting program needs more quickly; promoting inter-program coordination (for planning and implementing); improving data discovery (to facilitate data reuse); and improving data reuse through better documentation and enhanced metadata.

In 2016, a workshop was held to discuss development and provisioning of enterprise level resources for large-scale, long-term monitoring programs. The intent is to build enterprise capacity within MonitoringResources.org that will support a diversity of national-scale monitoring programs through provision of online tools and services to support program coordination, proper documentation and implementation of monitoring design, protocols and methods, data visualization, and data discovery.

This workshop identified a number of potential use cases interested in using MonitoringResources.org to facilitate aspects (study design, protocols and methods, data visualization) of their respective monitoring program; specifically the need for Application Programming Interfaces (APIs) to facilitate data sharing and management was identified by the following:

- North American Bat Monitoring Program (NABat)
- Monarch Monitoring and the Resources that Sustain Them
- OBIS (Ocean Biological Information System)
- USGS Ecosystems/Fisheries Program eDNA pilot program
- National Phenological Network (NPN)

Using NABat's as a pilot, this proposal would support NABat's data project management and implementation needs by integrating with MonitoringResources.org spatial design and project implementation features. NABat will utilize Application Programming Interfaces (APIs) to leverage

MonitoringResources.org's application building blocks. The APIs allows NABat developers interface with the proven programming routines found in MonitoringResources.org. Users will be provided the ability to seamlessly select Master Sample site locations through the NABat web application and upload data collected back to MonitoringResources.org without ever leaving the NABat web application. This provides users access to a unified sample design, and protocol that is implemented in each sampling process. Specifically, we will develop, publish, test and apply APIs for protocol, method, design documentation, and data visualization web services between MonitoringResources.org and NABats' web resources. This allows the NABat to utilize MonitoringResources.org Sample Design and Master Sample Library features while retaining the NABat user interface. NABat will develop, publish, test and apply APIs to support sharing of the metadata associated with bat data collection events to support the tracking of (master sample) design implementation and data discovery in the existing MonitoringResources.org tools. This approach supports enterprise monitoring by creating cross-data sharing capabilities that can be reused by multiple partners within the USGS, DOI and outside agencies.

USGS staff will facilitate face to face and teleconference work sessions and contracted development work to publish and document APIs by September.

Section 2. Estimated Budget

Budget Category "Proposed"	Federal Funding "Requested"	Matching Funds
1. SALARIES (including Benefits):		
Personnel Total:	$ 8,000	$ 19,675
Contract Personnel Total:	$23,750	$ 15,000
Total Salaries:	**$31,750**	**$ 34,675**
2. TRAVEL EXPENSES:		
Travel Total (Per Diem, Airfare, Mileage/Shuttle) **x** # of Trips:		
*Travel for 2 staff from Fort Collins, CO to Portland, OR (1 trip of 4 days)		
*Travel for 2 staff Lakewood, CO for CDI meeting (1 from Fort Collins, CO; 1 from Portland, OR)		
	$ 5000	$ 0
Other travel expense (Registration fees):	$ 0	$ 0
Total Travel Expenses:	**$ 5000**	**$ 0**
3. OTHER DIRECT COSTS: (itemize)		
Equipment (inc. software, hardware):	$ 0	$ 15,000
Publication Costs:	$ 0	$ 0
Office supplies, Training, Other expenses:	$ 0	$ 0
Total Other Direct Costs:	**$ 0**	**$ 15,000**
Total Direct Costs:	**$ 36,750**	**$ 0**
Indirect Costs (21.158% for reimbursable funds on federal salaries):		
	$ 7,350	**$0**
GRAND TOTAL:	**$ 44,100**	**$ 49,675**

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