Development of the SMC Data Portal and Initial Population with Regional Monitoring Data
Proposal to the Stormwater Monitoring Coalition
March 3, 2017

Background and Objectives

Sharing and leveraging data to make regional assessments and comparisons among member agencies is the backbone of the SMC, which is why data sharing and integration is consistently ranked as one of the SMC's highest priority research projects. The SMC's first data integration and sharing project was in 2003, where standardized data transfer formats (SDTF) were created and successfully used. In addition, several member agencies currently have these requirements in their NPDES permits. Technology has changed over the last decade. Open data portals are the new standard, which evolves the SDTF approach to create simplicity and ease of use, dynamic quality assurance checkers, a map-based web query interface, and easily customizable data visualization or on-the-fly calculations. This new technology comes largely without expensive investments in software or hardware among SMC member agencies – most members can submit or access data with a standard web browser – and requires only basic training. This approach can also streamline and enhance annual reporting requirements. While it is an "open data portal" the data can be constrained to any limited number of users, from only SMC members to public-facing, and based on simple toggle switches, can be changed at any point in time.

This project proposes to update and upgrade the SMC's data sharing and integration capabilities by migrating to an open data portal. The recommended portal technology is ESRI-based, a world-wide leader in open data portals, a technology already currently being used by SCCWRP and several SMC member agencies. The migration to an open data portal will require two phases comprised of four tasks. The first phase is to develop the portal architecture. This phase can be flexible and scalable to all of the SMC data categories including discharge, IC/ID, or receiving water monitoring, and can incorporate a variety of data types such as chemistry, microbiology, toxicity, physical habitat, rainfall/flow, or biological information. The second step is implementing an initial data set – we chose the SMC's Regional Stream Monitoring program. The Regional Stream Monitoring program provides a great initiator since sampling standardization and field/lab quality assurance already ensures comparability in data generation. As the Regional Monitoring results are increasingly being used for compliance assessments and watershed planning, new data requests pour in and now comprise up to 80% of the program's Administrative costs. So, open data portal investments now, ultimately will reduce ongoing costs for regional monitoring. The tasks associated with implementing the Regional Monitoring data set includes data submittal tools, data query tools, and data visualization and reporting tools.

Task and Deliverables

The proposed project will produce the following products:

1. A data portal that provides the architecture to accommodate data from the Regional Stream Monitoring program, and a framework to incorporate data from a broad range of additional SMC projects and programs

2. Incorporation of the SMC Regional Stream Monitoring program into the data portal to test and verify the enhanced ease of data entry, automated data and quality assurance checking, and web-based data query/download and automated reporting tools
3. An SMC specific open data portal with data sharing, analysis and reporting capabilities

The following tasks will be completed to produce the above products. The first three tasks relate to developing the basic architecture of the data portal. Tasks 4, 5 and the optional Task 6 relate to incorporating SMC data into the portal:

Task 1: Develop architecture for the data portal. The goal of this task is to develop the underlying data structures for the portal, including all required business rules, data submission procedures and QA/QC checks required. A series of interviews with SMC members will be conducted in order to define the scope, content, and general functionality of the portal, including future data types and needs.

Task 2. Develop data query tools. The goal of this task is to develop spatially explicit data query tools that allow user to readily access the breadth of SMC data types through a simple, unified web interface. Data query tools will greatly accelerate data requests and will more readily allow SMC data to be combined with other data types, such as compliance monitoring, BMP, or dry/wet weather runoff data.

Task 3. Develop automated reporting and visualization tools. The goal of this task is to develop tools that output regional monitoring data into standard report formats, including computed results and comparison to specified targets or thresholds. These formats can more readily be incorporated into compliance reports, watershed plans, causal assessments, or as background information for proposed actions/projects. The specific content and format for these standard reports will be developed in cooperation with the SMC technical workgroup and executive committee, based on their priorities.

Task 4: Incorporate regional monitoring data from multiple sources into the portal. The goal of this task is to migrate the regional monitoring data systems into the new portal. This will include updating the data structures, imposing data standards, establishing a process for assigning unique site-event identifiers, creating data input templates for seamless data submittals, and development of automated data checkers to ensure the completeness and accuracy of online regional monitoring data submittals. Data structures will also be created for key calculated measurements, such as biological index scores and physical habitat metrics, so that they will be more readily available to data users. We will create the data system to ensure future compatibility and interaction with related data systems that store SMC data, such as SWAMP, CEDEN, and eCRAM. We will use web services to make the data readily discoverable and transferable to these existing data systems.

Task 5: One time upload of regional monitoring data into CEDEN. The goal of this task is to upload the appropriate data types from the current SMC regional monitoring data set to CEDEN. This would be a one-time task intended to incorporate currently available SMC data into the CEDEN. Future connection with CEDEN would occur through web-services.

Task 6. Incorporate a second data source into the portal (OPTIONAL). The goal of this task is to build capacity for the data portal to accommodate data from an additional program or source (e.g. wet weather, TMDL, BMP, vertebrate monitoring). Necessary data templates, checkers, and data structures would be developed for the additional data sources. This task could be replicated for multiple additional data sources.

Schedule and Budget

The proposed project would take two years to complete (excluding the optional Task 6). The initial data portal would be completed by the end of year 1 including loading of existing SMC regional monitoring, and simple prototype query and reporting tools. The full data submittal tool would be ready to accommodate the Fall 2017 regional monitoring submittal. Refinements to the portal and additional data loading would continue through year 2, based on interaction with member agencies. The balance of the tasks relating to enhanced data query and reporting capabilities would be complete at the end of year 2.

The proposed budget for the project is show in the table below.

Task	Year 1	Year 2	Total
1: Data portal architecture	$ 25,000	$ 10,000	$ 35,000
2: Data query tools	$ 25,000	$ 10,000	$ 35,000
3: Automated reporting and visualization	$ 10,000	$ 75,000	$ 85,000
4: Incorporate regional monitoring data	$ 65,000	$ 20,000	$ 85,000
5: One-time data upload to CEDEN	$ 15,000	$ 15,000	$ 30,000
6: Incorporate second data source (OPTIONAL)		$ 50,000	$ 50,000
Total	**$ 140,000**	**$ 180,000**	**$ 320,000**

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