

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
AMENDMENT OF JOINT FUNDING AGREEMENT
FOR
WATER RESOURCES INVESTIGATIONS

This amendment is for the agreement dated January 1, 2015

Paragraphs 2a and 2b of the agreement are hereby modified to read as follows:

- (a) \$50,000 by the party of the first part during the period
January 1, 2015 to March 31, 2018.
- (b) \$754,726 by the party of the second part during the period
January 1, 2015 to March 31, 2018.

The Joint Funding Agreement (JFA) between the USGS and the Department of Ecology for a fixed priced agreement is amended to include a series of new data analysis and report writing activities. This amendment reflects a 24-month extension of the current agreement (15WNWA30026) that expires on March 31, 2016. Additional funding from Ecology for the activities covered in this amendment is \$147,320.

A detailed description of the program is provided in the enclosed amendment. The total fixed cost of the original agreement and this amendment is \$804,726 of which Department of Ecology share is \$754,726.

All remaining terms and conditions as included in the original JFA are unchanged.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Cynthia Barton
(Signature)
Cynthia Barton, Ph.D., L.G., LHG
(Name)
Center Director
(Title)

Department of Ecology
Brandi Lubliner - Water Quality

Polly Zehm
(Signature)
POLLY ZEEM
(Name)
DEPUTY DIRECTOR
(Title)

Date 3-17-16

Date 3-21-16

Attachment B

RSMP Streams Data Analysis Scope of Work

RSMP Streams Data Analysis Tasks

The tasks listed below describe the data assessment steps to answer the priority questions for the analysis and interpretation of the RSMP small streams data. The strategy for data analysis is described in Quality Assurance Project Plan Addendum developed for the project. The technical analytical team will be made up of experts at the U.S. Geological Survey, Ecology, King County and the Puget Sound Partnership. The information below outlines the aspects of the data analysis that USGS is responsible for completing.

Task B1: RSMP Stream Data Status Assessment

Water, sediment and benthic macroinvertebrate data will be used to answer the first question on status of the streams meeting numeric freshwater and sediment Washington state criteria (WAC 173-201A; WAC 173-204-563). In addition the Water Quality Index score will be calculated, where possible. All of the data will be "rolled-up" as a categorical group for the assessment strata (within and outside UGAs). Where various designated beneficial uses have multiple water quality standards (e.g. temperature), the analysis will not be done at the reach level, but rather summarized to tell the broader story.

The analysis will investigate what natural and human activity "predictor variables" help explain the scores found at the RSMP small stream sites. Additional data will be gather and correlated to the small streams data response variables gathered (water and biological quality). Advanced statistical approaches to evaluate correlations between predictor and response variables will be employed (e.g. relative and attributable risk, or boosted regression trees) for the identified key variables. Data analysis tools will include the use of R stats, Access, Excel, or other programs to produce summary statistics, graphics (boxplots, charts), and tables.

Total funding for Task B1: \$34,240

Deliverable	Description	Relates to subtasks ¹	Cost	Deliverable Target Date
B1.1	Consult with Kathy Irvine (USGS) or delegate to review spatial weights based on initial design and site screening documentation (target sites, rejected sites)	1.1	\$3,200	June 30, 2016

B1.2	Compile site and stream network data and delineate any watersheds that are not already delineated	1.5	\$9,600	June 30, 2016
B1.3	Compile natural and human factor data for use in statistical analyses designed to answer questions 2 and 3 (e.g., digital ground model, PRISM precipitation data, C-CAP and/or NLCD land cover data, road network coverage, population, etc). "ETC" will be limited to USGS - LandSat updated in 2012.	1.9	\$12,800	June 30, 2016
B1.4	Assist team with preparation of handouts for workshop; brief report summarizing themes from comments. Co-host workshop to present results to SWG/FWG and permittees, collect comments for additional analyses.	1.19	\$640	September 30, 2016
B1.5	Present results in draft and final report and summary handouts. Include CDFs and box plots, categorical assessments in terms of % of sites in good, fair, and poor condition inside and outside UGAs, PS lowland whole. Identify variables that correlate with stream quality. Discuss results from comparisons to standards, relative risk/attribution effort, signal to noise analyses, and discern valuable parameters for the future RSMP small streams trend program. Recommendations for parameters and also frequency of the various RSMP small stream monitoring components (flow, bug, water quality, sediment quality) will be made to both the Stormwater Work Group and Freshwater Work Group.	1.20	\$8,000	December 31, 2016 for draft; March 31, 2017 for final

¹ = subtask numbering relates to the QAPP addendum spreadsheet of tasks for all team members. Only USGS lead or substantial contribution sub-tasks are outlined here.

Task B2: Comparison of probabilistic to targeted programs.

RSMP small streams sites were chosen from the Washington State Master Sample which was created using EPA's generalized random-tessellation stratified (GRTS) design. In the Pacific Northwest, there are several other stream monitoring programs that also use the same randomized study design. RSMP small streams monitoring randomized design was chosen such that results represent the entire Puget Lowlands ecoregion and the Puget Sound Salmon Recovery Region. Targeted (non-randomized) stream monitoring programs also exist in this same region, and the comparability of these programs to the RSMP is unknown. Some local jurisdictions collect extensive stream datasets, and in terms of methods and protocols may be very similar to the RSMP.

Total funding for Task B2: \$27,040

Deliverable	Description	Relates to subtasks¹	Cost	Deliverable Target Date
B2.1	Compile water, sediment, habitat, and biota data from selected USGS monitoring programs for inclusion in regional wide comparison of sampling programs.	2.1	\$6,400	June 30, 2016 for USGS data compilation
B2.2	Assist with writing or conduct a peer-review draft report sections and summary handouts.	2.6	\$6,400	June 30, 2016 for draft report section; March 31, 2017 for final
B2.3	Review the Lower Columbia Habitat Status and Trend (LCHST) project and Redmond Paired Watershed project plans for recommendations on improving the RSMP small streams status and trends project.	2.1	\$12,800	September 30, 2016 for completed review of other programs
B2.4	Participate in RSMP stream data analysis team calls or meetings to discuss results comparing probabilistic and target programs. CDFs and box plots, categorical assessments in terms of % of sites in good, fair, and poor condition inside and outside UGAs, PS lowland whole.	2.7	\$640	September 30, 2016
B2.5	Assist PSP in preparation or review of focus sheet to external audience on interpretations and implications of results.	2.8	\$800	September 30, 2016

¹ = subtask numbering relates to the QAPP addendum spreadsheet of tasks for all team members. Only USGS lead or substantial contribution sub-tasks are outlined here.

Task B3: Recommendations for future RSMP small stream monitoring

The 2015 RSMP small streams data collection effort captures a wide range of parameters. Based on the data analysis for status assessments and comparisons to other monitoring efforts, the SWG seeks feedback on what are the recommended changes to the streams monitoring effort to become more relevant, efficient and purposeful in answering stormwater management impact questions.

Total funding for Task B3: \$80,280

Deliverable	Description	Relates to subtasks ¹	Cost	Deliverable Target Date
B3.1	Assist King County as needed with estimates of variance for metrics with repeat-sample data from other programs; estimate precision, identify metrics with sufficient precision for detecting differences in stream quality (e.g., temporal variance < spatial variance)	3.1	\$6,400	June 30, 2016
B3.2	Calculate variance of monthly water quality values, evaluate seasonal patterns, estimate the increase in precision from monthly sampling	3.2	\$12,800	June 30, 2016
	Assist team with communicating results and options for RSMP coordinator and SWG	3.2.a	\$800	June 30, 2016
B3.3	Assist team to evaluate statistical power to detect trends based on estimated precision of selected metrics, determine the number of samples to detect a specified (e.g., 25%) change in stream quality	3.3	\$6,400	June 30, 2016
	Assist team with communicating results and options for RSMP coordinator and SWG.	3.3.a	\$600	June 30, 2016
B3.4 (optional)	The RSMP Coordinator will give permission to conduct this optional work. This deliverable with approval will examine spatial correlation of stream quality for nested sites, identify criteria for "spatially-independent sites"	3.4	\$12,800	September 30, 2016
B3.5 (optional)	The RSMP Coordinator will give permission to conduct this optional work. This deliverable with approval will describe based on a couple parameters (Cu, TSS, maybe another) likely sources, transport, and potential effects of stormwater management (structural/non-structural, source control, etc.); identify key gaps in understanding how stormwater management affects key parameter/pollutant	3.5	\$25,600	September 30, 2016
B3.6	Interpret results and options for answering SWG questions about WQ; meet with scientists, provide written comments to scientists	3.5.a	\$800	September 30, 2016

B3.7	Assist team with preparation of short written description of data to be collected for the next round of adaptive management.	3.6	\$12,800	September 30, 2016
B3.8	Write draft report sections related to this task. Peer-review draft report.	3.7	\$1,280	December 31, 2016 for draft; March 31, 2017 for final

¹ = subtask numbering relates to the QAPP addendum spreadsheet of tasks for all team members. Only USGS lead or substantial contribution sub-tasks are outlined here.

Task B4: Project Management and communication with Stormwater and Freshwater work groups

During the duration of the data analysis process for the RSMP small streams monitoring, USGS will provide input to representatives from Puget Sound Partnership (PSP) to take to higher level meetings within the RSMP organizational structure. These activities include participation in conference calls, in-person meetings, and participation in various 1-day workshops where interpretation of data analysis and discussion of results are presented.

Total funding for Task B4: \$5,760

Task B5: Additional data analysis and exploration to address USGS water mission area goals

Most data analysis of the RSMP data is designed to answer specific questions to inform the Stormwater Workgroup, Freshwater Work Group, and municipal storm water permits issued by Ecology. The USGS will be contributing federal matching funds in order to provide additional data analysis to address priorities of the USGS Water Mission Area that include the assessment of sources, transport and delivery of nutrients, sediment, and other contaminants in streams. The direction of this additional data analysis will be informed by the initial results provided in tasks 1-3. In addition, this funding will allow USGS to incorporate data collected by the National Water Quality Program's Pacific Northwest Stream Assessment (NAWQA-PNSQA) project that took place during the same time as the RSMP small stream status and trends work. The PNSQA project also sampled small streams in the Puget Lowlands but site selection was targeted and sampling was more intensive (weekly for 10 weeks versus monthly for one year). The funding for this task is provided by USGS and will not include any funding from Ecology.

Total funding for Task B5: \$50,000

TIMELINE

Fiscal Year	FY2016				FY2017			
	1	2	3	4	1	2	3	4
Task								
1. RSMP stream data assessment								
2. Comparison to targeted programs								
3. Recommendations for future RSMP monitoring								
4. Project Management								
5. Additional data analysis to address USGS priorities								

BUDGET SUMMARY

The total budget for completing the data analysis and reporting tasks in Attachment B is \$184,520 with \$134,520 paid for by Ecology and \$50,000 from USGS.

Details of the budget for completing work given in Attachment B:

	Task 1. RSMP stream data assessment	Task 2. Comparison to targeted programs	Task 3. Recommendations for future RSMP monitoring	Task 4. Project Management	Task 5. Additional data analysis	Agency totals
Ecology	\$34,240	\$27,040	\$80,280	\$5,760		\$147,320
USGS					\$50,000	\$50,000
Amendment total						\$197,320

Budget Detail by federal fiscal year (October 1 to September 30) for Attachment B:

	FY2016	FY2017	TOTAL
Ecology	\$92,800	\$54,520	\$147,320
USGS	\$20,000	\$30,000	\$50,000
Totals	\$112,800	\$84,520	\$197,320