OREGON DEPARTMENT OF TRANSPORTATION

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SPR Quarterly Progress Report
October 1, 2016 through December 31, 2016

Date January 17, 2017

TO: Technical Advisory Committee Members:
William Fletcher (ODOT), *Project Champion*
Alvin Shoblom (ODOT)
Jeff Moore (ODOT)
Tom Loynes (ODOT)
Susan Jones (FHWA)
Kira Glover-Cutter (ODOT), *Chair*

1. Project

Analysis of Highway System Impacts on TMDL Watersheds Using the FHWA Stochastic Loading and Dilution Model
SPR # 798

2. Project Investigator

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3. Project Coordinator

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4. Key Dates

Project start date: July 14, 2016
Project completion date: July 31, 2017

First Fiscal Year: 2017
Final Fiscal Year: 2018
[List revised completion dates and corresponding amendment numbers]

5. Project Status (Completed by project investigator)

Task 1: ***Geographic analysis of State roadways and upstream land uses/land covers.***
The USGS will use GIS techniques and the batch-processing capabilities in Streamstats to do geographic analyses to examine the potential effects of State roadways on receiving water quality. Two types of analyses will be done on selected basins in Oregon.

Task 1 Deliverable: GIS analysis [November 2016]
Percent completed reported in last quarterly report: 100%

Task 2: ***Select example subbasins for stormwater analyses.***
In this task the USGS will work closely with ODOT in selecting watersheds within Oregon (fig. 1) that are suitable for study objectives.

Task 2 Deliverable: Watersheds selected [October 2016]
Percent completed reported in last quarterly report: 5%
Percent completed after this quarter: 100%

Key Progress-To-Date
- Evaluated basin attributes with ODOT colleagues to select two representative watersheds.

Specific Progress This Quarter
- Same as Key Progress-To-Date

Problems
- None

Work Planned for Next Quarter
- None

Task 3: ***Compute or compile storm precipitation and hydrologic statistics.***
Pre-storm streamflow, storm-event precipitation, runoff coefficients, and storm-event hydrograph statistics, which are used as input to SELDM, will be compiled for two study watersheds.

Task 3 Deliverable: Precipitation and Hydrologic Statistics [November 2016]
Percent completed reported in last quarterly report: 0%
Percent completed after this quarter: 50%

Key Progress-To-Date
- Evaluated precipitation statistics to derive relationships based on watershed characteristics.
- Evaluated hydrograph statistics for region surrounding one of two watersheds.
- Began evaluating pre-storm streamflow

Specific Progress This Quarter
- Same as Key Progress-To-Date

Problems
- none

Work Planned for Next Quarter
- Complete Task 3 (Finish hydrograph statistics and evaluate runoff coefficients)

Task 4: ***Compile runoff-quantity data and statistics for simulating highway-runoff discharges.***
In this task, the USGS will compile runoff-quality data and statistics for selected highway-runoff constituents based on the availability and quality of such data.

Task 4 Deliverable: Highway-runoff discharge data and statistics [November 2016]
Percent completed reported in last quarterly report: 25%
Percent completed after this quarter: 75%

Key Progress-To-Date
- Obtained initial data from ODOT in October
- Obtained other runoff-quality data in November
- Formatted site information, precipitation and flow data, and water-quality data for analysis.

Specific Progress This Quarter
- Same as Key Progress-To-Date

Problems
- None

Work Planned for Next Quarter
- Calculate EMC statistics for Oregon
- Compare Oregon highway-runoff statistics to statistics from Washington and northern California

Task 5: ***Compile runoff-quantity data and statistics for simulating highway-runoff discharges from non-highway land uses.***
In this task the USGS will compile runoff-quality data and statistics based on the availability and quality of such data.

Task 5 Deliverable: Non-highway land use highway-runoff data and statistics [November 2016]
Percent completed reported in last quarterly report: 5%

Percent completed after this quarter: 5%

Key Progress-To-Date

- Contacted International BMP database group to find out when the next version would be available in August (prior version was 2014).
- Obtained the latest version 2016-09-23
- Begin the process of identifying relevant data by constructing queries.
- Applied methods developed in cooperation with the FHWA to estimate suspended sediment and total copper for forested basins in Washington State that had available event-mean concentration data.
- Conducted training on the process for developing transport curves

Specific Progress This Quarter

- None

Problems

- None

Work Planned for Next Quarter

- Calculate water-quality statistics for developed land uses from data in the international BMP database
- Develop suspended sediment concentration and total phosphorus transport curves for minimally-developed basins in Oregon. Excluding data collected in the aftermath of the Mt. St. Helens eruption.
- Obtain location, flow and water-quality data from wastewater-treatment plants in the Mill and Bear Creek Basins in Oregon

Task 6: ***Perform preliminary watershed-scale SELDM model runs.***

Although SELDM is not a watershed model, the mass balance approach that SELDM uses can be applied to assess the effects of runoff from a site of interest and an upstream basin at any point along the stream. SELDM will be configured to do a series of preliminary dilution-factor analyses to assess the contribution of the highway under different upstream scenarios.

Task 6 Deliverable: SELDM Model Run [December 2016]
Percent completed reported in last quarterly report: 0%
Percent completed after this quarter: 0%

Key Progress-To-Date

- None

Specific Progress This Quarter

- None

Problems

- None

Work Planned for Next Quarter

- Set up input values and do some trial runs.

Task 7: ***Simulate the potential effectiveness of stormwater mitigation methods for reducing the risks for water-quality exceedances.***

Simulations will be done with and without application of flow reduction, hydrograph extension, and concentration reductions by stormwater BMPs for the highway sites and aggregated upstream land-use areas. Representative statistics documented by Granato (2014) will be used to simulate the effects of several commonly used stormwater BMPs.

Task 7 Deliverable: Exceedances Simulation [March 2017]
Percent completed reported in last quarterly report: 0%
Percent completed after this quarter: 0%

Key Progress-To-Date

- Not scheduled for this quarter.

Specific Progress This Quarter

- Not scheduled for this quarter.

Problems

- None

Work Planned for Next Quarter

- Set up statistics from Granato (2014) for use in Oregon simulations.

Task 8: ***Create guidance for conducting watershed-scale SELDM applications.***

Both ODOT and the USGS will meet and assess modeling results and experiences learned in tasks 1, 2, and 7. The assessment will be used to formulate practical guidance for watershed-scale SELDM applications on watersheds with multiple highway stream crossing sites.

Task 7 Deliverable: Guidance Documentation and Demonstration [April 2017]
Percent completed reported in last quarterly report: 0%
Percent completed after this quarter: 0%

Key Progress-To-Date

- Not scheduled for this quarter.

Specific Progress This Quarter

- Not scheduled for this quarter.

Problems

- None

Work Planned for Next Quarter

- None.

Task 9: ***Write a report describing watershed-scale SELDM results and guidance.***
Data sets, model results, and guidance for SELDM analysis will be included in a USGS Scientific Investigations Report (SIR) publication to be completed at the end of the study.

Task 9 Deliverable: Final Report [July 2018]
Percent completed reported in last quarterly report: 0%
Percent completed after this quarter: 0%

Key Progress-To-Date
- Not scheduled for this quarter.

Specific Progress This Quarter
- Not scheduled for this quarter.

Problems
- None

Work Planned for Next Quarter
- None

6. Project Coordinator's Comments (Completed by ODOT)

This project continues to proceed nicely as outlined in the SOW. The last mini-TAC meeting update was useful to successfully identify representative basins for the SELDM watershed analysis. I will follow with USGS team lead to identify key needs for the next upcoming quarter. Billing is timely and efficient, which is much appreciated.

7. Finances (Completed by ODOT)

SPR Project Summary

VENDOR	FY'17	FY'16	FY'17	FY'18	TOTALS
ORIGINAL BUDGET	**$ 106,091**	$ -	$ -	$ -	$ 106,091
WORK PLAN BUDGET	**$ 106,091**	$ -	$ -		
REVISED BUDGET	**$ -**	**$ -**	**$ -**	**$ -**	$ -
EXPENDITURES - VENDOR	**$ 19,097**	$ -	$ -	$ -	$ 19,097
BALANCE	**$ 86,994**	$ -	$ -	$ -	$ 86,994
ODOT	FY'17	FY'16	FY'17	FY'18	TOTALS
ORIGINAL BUDGET	**$ 10,000**	$ 5,000	$ -	$ -	$ 15,000
REVISED BUDGET	**$ -**	$ -	$ -	$ -	$ -
EXPENDITURES - ODOT	**$ 2,649**	$ -	$ -	$ -	$ 2,649
BALANCE	**$ 7,351**	$ 5,000	$ -	$ -	$ 12,351
PROJECT	FY'17	FY'16	FY'17	FY'18	TOTALS
ORIGINAL BUDGET	**$ 116,091**	$ 5,000	$ -	$ -	$ 121,091
REVISED BUDGET	**$ -**	$ -	$ -	$ -	$ -
EXPENDITURES - PROJECT	$ 21,746	$ -	$ -	$ -	$ 21,746
BALANCE	**$ 94,345**	$ 5,000	$ -	$ -	$ 99,345