



SPR Quarterly Progress Report
April 1, 2009 through June 30, 2009

Date October 1, 2009

TO: Technical Advisory Committee Members:

Miguel Estrada, ODOT
Michele Eraut, FHWA
William Fletcher, ODOT, Research Proposer
Charlotte Kucera, ODOT
Devin Simmons, NMFS

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1. Project

Copper Toxicity and ESA Listed Salmon
SPR # 663

2. Key Dates

Start Date for ODOT: September 10, 2007
Completion Date for ODOT: October 31, 2009

3. Principal Investigator

Jeffrey A. Nason
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Friend of the Committee

William VanPeeters, FHWA

4. Progress

- Much of July-September was quite dry. We deployed the sampler at the Corvallis site twice over the last quarter. We had a malfunction of the sampler during the first storm event and only captured a couple of discrete samples toward the end of the storm. More recently, we deployed the sampler again and had very good success characterizing the entire storm. 20 discrete samples were collected, including a first flush sample.

- We spent much of the last three months working out the remaining issues with the analytical method for characterizing copper speciation. It now appears that we have resolved the vast majority of the problems we had been encountering. Through the addition of a background electrolyte (NaCl) and relying on ICP-OES measurements of total copper, we have begun to get reasonable and repeatable data with respect to copper speciation in fresh water (Willamette River) and in several stormwater samples. We have analyzed a handful of the backlog stormwater samples and appear to be getting reasonable results.
- We have continued to make progress on the analysis of general stormwater quality data and writing of the final report. The introduction, background (literature review) and methods sections are essentially complete as well as the section describing trends in the general stormwater quality as a function of roadway and storm characteristics.
- We spent a reasonable amount of time investigating alternative methods for quantifying copper speciation (ion selective electrode and anodic stripping voltammetry). While these efforts did inform our refinement of the adsorptive cathodic stripping technique, neither method was suitable for our purposes without putting a substantial additional amount of time into them. At present, we are keeping these options on the back burner in case we need to pursue them further. At this point, the CLE-ACSV method seems to be working and we will continue to rely primarily in it.

5. **Problems**

- We had a problem with the automated sampler during one deployment, but we seem to have the issue fixed.
- We did continue to struggle some with the copper speciation analytical method and spent a reasonable amount of time investigating alternative methods, but seem to have most of those issues resolved

6. **Work Planned for Next Quarter**

- Work in the next quarter will focus on analyzing the backlog of frozen stormwater samples for copper speciation. We have approximately 30 samples to process.
- Upon analysis of the stormwater samples for copper speciation, the results will be analyzed and summarized in the final report. A results and discussion section in the final report will be dedicated to the speciation results.
- We aim to parallel the experimental analysis with a mathematical modeling effort to see if we can draw any conclusions between our analytical results and the predictions of chemical equilibrium software.
- Due to the workload involved with sample analysis and writing, we have made the decision to not collect any more stormwater samples from the Corvallis site. If we complete all of the existing analysis and have some time, we will consider collecting additional samples.

7. **Finances**

SPR Project Summary

VENDOR	FY'08	FY'09	FY'10	FY11	TOTALS
ORIGINAL BUDGET	\$ 120,000	\$ 240,000	\$ 28,000		\$ 388,000
REVISED BUDGET	\$ 89,592	\$ 182,138	\$ 116,474		\$ 388,204
EXPENDITURES - VENDOR	\$ 89,592	\$ 182,138	\$ -	\$ -	\$ 271,730
BALANCE	\$ -	\$ -	\$ 116,474	\$ -	\$ 116,474

ODOT	FY'08	FY'09	FY'10	FY11	TOTALS
ORIGINAL BUDGET	\$ 4,000	\$ 5,000	\$ 3,000		\$ 12,000
REVISED BUDGET	\$ 5,044	\$ 3,068	\$ 3,000		\$ 11,112
EXPENDITURES - ODOT	\$ 5,044	\$ 3,067	\$ 1,378	\$ -	\$ 9,489
BALANCE	\$ -	\$ 1	\$ 1,622	\$ -	\$ 1,623

PROJECT	FY'08	FY'09	FY'10	FY11	TOTALS
ORIGINAL BUDGET	\$ 124,000	\$ 245,000	\$ 31,000	\$ -	\$ 400,000
REVISED BUDGET	\$ 94,636	\$ 185,206	\$ 119,474	\$ -	\$ 399,316
EXPENDITURES - PROJECT	\$ 94,636	\$ 185,205	\$ 1,378		\$ 281,219
BALANCE	\$ -	\$ 1	\$ 118,096	\$ -	\$ 118,097