



**SPR Quarterly Progress Report**  
January 1, 2009 through March 31, 2009

Date April 1, 2009

**TO:** Technical Advisory Committee Members:

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

FROM: Matthew Mabey, Research Coordinator (ph: (503) 986-2847)

**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  
Department of Chemical, Biological and Environmental Engineering  
Oregon State University  
102 Gleeson Hall  
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**Friend of the Committee**

William VanPeeters, FHWA

**4. Progress**

- During the last quarter we collected samples from 3 storms at the continuous monitoring site in Corvallis. Discrete, flow-weighted samples were taken throughout each storm and aliquots of those samples were combined to generate a single composite sample. We have also continued to collect a first-flush sample from each storm. Water quality analyses (with the exception of the copper speciation tests) were performed on the first-flush sample, the composite sample, and selected discrete

samples. Aliquots of the samples have been frozen for future testing with the voltammetric technique.

- We also received and analyzed several samples from the sites managed by Herrera. We analyzed 3 composite samples from the Wemme site and 1 composite sample from the Bend site. Again, we have performed all water quality analyses with the exception of copper speciation via voltammetric titration. Aliquots have been frozen for future testing.
- We have made steady progress in developing the analytical method for copper speciation via voltammetric titration. As mentioned in the last report, we were investigating a revised protocol to allow the titrations to be carried out at a pH closer to the pH values we have been seeing in actual samples. We identified a new buffer and have done the requisite testing to determine that it will work. Data we have been receiving from the preliminary analyses has been very good and indicates that we are getting close to having a working procedure. We are now in what we hope will be the final phase of calibrating and verifying the method. Once we do that, we will be able to go back and analyze all the samples we have collected thus far.
- We started work on the final report. Efforts were focused on getting information from the literature review and the analytical methods into the correct format and developing an outline for the report. We are currently working on developing an appendix that will contain all of the raw storm and water quality data.
- We have started doing some preliminary equilibrium modeling based on water quality data collected during each storm. As a first pass, we are using Visual Minteq for the modeling and incorporating the models for binding by organic matter that are included in that software. We plan to compare these results with the voltammetric titrations when those are complete

## 5. **Problems**

- There were no major problems this quarter. Developing the analytical method and performing all of the required analyses necessary for the speciation measurements have continued to take longer than anticipated. Despite the lagging timeline for these measurements, we have continued to make steady progress. We are getting close to having all the parameters we need for the speciation measurements and should be able to begin analyzing the backlog of samples shortly.

## 6. **Work Planned for Next Quarter**

- Continued collection and analysis of spring storms from Corvallis and Herrera sampling sites.
- Finalization of the voltammetric titration procedure and commencement of speciation measurements on backlogged stormwater samples (frozen for preservation)
- Continued work on the modeling of copper speciation using chemical equilibrium software
- Continued data analysis and work on the final project report.

7. **Finances**

SPR Project Summary

<b>VENDOR</b>	<b>FY'08</b>	<b>FY'09</b>	<b>FY'10</b>	<b>FY11</b>	<b>TOTALS</b>
ORIGINAL BUDGET	\$ 120,000	\$ 240,000	\$ 28,000		\$ 388,000
<b>REVISED BUDGET</b>	\$ 89,592	\$ 180,846	\$ 117,766		\$ 388,204
EXPENDITURES - VENDOR	\$ 89,592	\$ 73,844	\$ -	\$ -	\$ 163,436
<b>BALANCE</b>	\$ -	\$ 107,002	\$ 117,766	\$ -	\$ 224,768

<b>ODOT</b>	<b>FY'08</b>	<b>FY'09</b>	<b>FY'10</b>	<b>FY11</b>	<b>TOTALS</b>
ORIGINAL BUDGET	\$ 4,000	\$ 5,000	\$ 3,000		\$ 12,000
<b>REVISED BUDGET</b>	\$ 5,044	\$ 3,000	\$ 3,000		\$ 11,044
EXPENDITURES - ODOT	\$ 5,044	\$ 1,285	\$ -	\$ -	\$ 6,329
<b>BALANCE</b>	\$ -	\$ 1,715	\$ 3,000	\$ -	\$ 4,715

<b>PROJECT</b>	<b>FY'08</b>	<b>FY'09</b>	<b>FY'10</b>	<b>FY11</b>	<b>TOTALS</b>
ORIGINAL BUDGET	\$ 124,000	\$ 245,000	\$ 31,000	\$ -	\$ 400,000
<b>REVISED BUDGET</b>	\$ 94,636	\$ 183,846	\$ 120,766	\$ -	\$ 399,248
EXPENDITURES - PROJECT	\$ 94,636	\$ 75,129	\$ -		\$ 169,765
<b>BALANCE</b>	\$ -	\$ 108,717	\$ 120,766	\$ -	\$ 229,483