

TECHNICAL PROGRESS REPORT

Reporting Period: December 10, 2006 to March 9, 2007

EPA Agreement: EM-83329801-0 US EPA

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Project Title: Wilma H. Schiermeier Olentangy River Wetland Research Park: Teaching, research, and outreach initiative 2006

Project Objective:

This project has 3 objectives:

1. Conduct a two-year hydrologic pulsing wetland experiment related to wetland biogeochemical and water quality functions;
2. Estimate carbon sequestration of created wetlands and compare these accumulation rates with natural wetlands; and
3. Extrapolate findings at the Olentangy River hydrologic experiment on nitrogen, carbon, and other nutrients to rivers of different hydrologic pulsing and water quality in Ohio with an Ohio-wide water quality network.

SUMMARY OF ACTIVITIES:

GENERAL

QAPP was revised and submitted on January 29, 2007

PULSING STUDY

Water Quality

Weekly water samples were collected from experimental wetlands and analyzed for this quarter.

Methane

Methane was sampled from the ORW experimental wetlands and Old Woman Creek (December 2006). Gas samples have been analyzed on the gas chromatograph at the ORW.

Methane Oxidation

Worked on developing method to measure methane oxidation potential in soils. The primary task was to set up the gas chromatograph for measure methane. The student worker also learned how to microbial community profile analysis using phospholipid fingerprinting. In particular he was looking for the biomarkers for the methanotrophs or methane oxidizers.

Pathogens

Tested a general plating method to quantify *E. coli* in the water column. Learned and set up lab for using the Membrane Filtration technique to quantify fecal coliforms and *E. coli*.

Problems Encountered: The general plating method was not sensitive enough to quantify the low concentrations of coliform bacteria in the water.

CARBON SEQUESTRATION

Set up and calibration of the Germanium Detector. Detector running properly since first week of March. Soil samples from Old Woman Creek wetland started to be analyzed for Cs¹³⁷ and Pb²¹⁰ that week.

Problems Encountered: The installation of the detector took longer than expected due to some problems in the software and the calibration. It takes 24 hours to run a soil sample and, therefore, it takes 24 hours to know if any change you make in the procedure is right or wrong.

OHIO WATER QUALITY NETWORK

Began discussions with four subcontractor universities on establishing monitoring network.
Began subcontract discussions.

ANTICIPATED ACTIVITIES:

Methane: Permits must be obtained for Gahanna Woods, and then chambers will have to be installed. Gas sampling will continue seasonally at wetlands with installed chambers.

Carbon sequestration: Continue running samples from Old Woman Creek on cesium detector system.

Ohio Water Quality Network: Establish subcontracts and determine sampling locations at 4 sites in Ohio adjacent to partner institutions.