

TECHNICAL PROGRESS REPORT

Reporting Period: March 10, 2007 to June 9, 2007

EPA Agreement: EM-83329801-0 US EPA

Reporting Principal Investigator/ Project Director: Dr. William J. Mitsch, Olentangy River Wetland Research Park, The Ohio State University, 352 W. Dodridge Street, Columbus, OH 43202

Project Officer: Dr. Joseph P. Schubauer-Berigan, NRMRL, Cincinnati, OH 45268

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 approved.

PULSING STUDY

Water Quality

Weekly water quality samples taken and analyzed in experimental wetlands. All working well there and new technicians are great.

Denitrification

Problem encountered: Graduate student worker very slow getting started on project and had established no sampling through May 2007. She finally quits project on June 2 near the end of spring quarter.

Pathogens

Sampled using the Membrane Filtration technique. A recirculating water bath was ordered. PCR samples were analyzed.

Problems Encountered: Identified the incubators to be inadequate for proper incubation of bacteria. Determined that there is too much debris and background bacteria in the ORW water to use the Membrane Filtration method. The PCR samples had undetectable concentrations.

Methane

Methane Chambers at the ORW experimental wetland 1 were rebuilt and reinstalled after vandalism. Methane sampling was postponed until chambers were completed.

Problems Encountered: Vandals smashed several chambers at the ORW wetlands. Chambers had to be rebuilt and reinstalled.

Methane Oxidation

Tested various methane oxidation experimental methods. This included sample handling and time of incubation as well as static vs. shaking methane oxidation procedures.

CARBON SEQUESTRATION

The gamma radiation equipment is finally calibrated properly. Samples from Old Woman Creek wetland were analyzed for Cs¹³⁷ and Pb²¹⁰.

Problems Encountered: Problems in the calibration and background check affected the analysis. They were finally fixed by the beginning of May 2007 and the equipment has been working well since.

WATER QUALITY NETWORK

Group telephone meeting May 15 to organize monitoring network

Working on the subcontracts between OSU and Wright State University, Shawnee State University and Kenyon College.

Weekly water samples were collected at Olentangy River Wetland Research Park (ORW)

YSI 6000 real-time water quality with a 30-minute interval reading was taken at ORW.

Water sampling protocol for water quality network group established.

Problems Encountered: Too much time spent processing subcontracts with other universities

ANTICIPATED ACTIVITIES:

To establish the water quality network monitoring with Central State, Wright State, Shawnee State, and Kenyon College.

Continue with analysis of soil samples from wetlands at Old Woman Creek for carbon sequestration.

Replace quitting graduate student with experienced researcher to get denitrification work started quickly.