

Oil & Natural Gas Technology

DOE Award No.: DE-NT0005666

Quarterly Progress Report

January 1, 2009- March 31, 2009

Characterization of Methane Degradation and Methane-Degrading Microbes in Alaska Coastal Water

Submitted by:
College of Marine and Earth Studies
University of Delaware
Lewes, Delaware 19958

Principal Investigator: David L. Kirchman

Prepared for:
United States Department of Energy
National Energy Technology Laboratory

April 24, 2009



Office of Fossil Energy

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EXECUTIVE SUMMARY

This National Energy Technology Laboratory (NETL) project, “Characterization of Methane Degradation and Methane-Degrading Microbes in Alaska Coastal Water”, began on October 1, 2008. The second quarter was mostly dedicated to planning for the upcoming expedition in September 2009 to sample Alaska coastal waters. We have been working with expedition leaders (mostly Dr. Rick Coffin) and close colleagues, including Dr. Leila J. Hamdan (Naval Research Lab) and Dr. Tina Treude, at the Leibniz Institute of Marine Sciences, Germany. The planning has consisted of refining research objectives, outlining responsibilities to minimize overlap and maximize synergy, and starting to work on experimental procedures. We also have been working with the US Coast Guard, directly or indirectly, on details about facilities on the USCG Polar Sea for the expedition.

The second quarter of this project was also used for another activity that eventually will help support the NETL-supported work. We submitted a proposal to the Community Sequencing Program of the Department of Energy, requesting metagenomic sequencing of four samples to be collected by this NETL project. The sequence data would provide different insights into methane degradation and related processes in the Arctic.

Progress Report

Task 1: Project Management Plan

This task is completed.

Task 2: Cruise Logistics and Planning

Discussions are still on-going about the upcoming expedition to sample Alaska coastal waters. The time frame of the expedition is now set for September 11-23, 2009, with some possibility that a few more days will be added if more ship funding is secured. We have been working with expedition leaders (mostly Dr. Rick Coffin) and close colleagues, most Dr. Leila J. Hamdan (Naval Research Lab) and Dr. Tina Treude (Leibniz Institute of Marine Sciences, Germany). The planning has consisted of refining research objectives, outlining responsibilities to minimize overlap and maximize synergy, and starting to work on gathering supplies and equipment.

It will soon be possible to prepare the Data Collection/Sampling and Analysis Plan document now that the expedition time has been set and that expedition plans have been discussed with other expedition participants. The precise location of the samples and analyses will undoubtedly change due to logistical constraints (e.g. ice may prevent some stations and locations from being sampled), but the general plan is now known.

Technology Transfer (Task 7) and Other Tasks

Tasks 3-6 are scheduled to be completed during upcoming budget periods. Completion of these tasks will depend on the expedition to Alaska coastal waters in September 2009.

Some progress was made on Task 7, "Technology Transfer". During the first budget period, a web site was written to summarize the PI's (Kirchman) research activities in the Arctic, including this NETL project (<http://www.ocean.udel.edu/cms/dkirchman/Arctic/>). This web site has been updated and revised. The web site dedicated to the NETL project will be built soon as the project proceeds and specific findings can be added. The web site will target colleagues in the field, but it will have information for the interested outsider.

This budget period was also used to prepare a proposal to DOE's community sequencing program (<http://www.jgi.doe.gov/CSP/>) to obtain metagenomic sequence data from samples collected as part of the NETL-supported work. After receiving a positive response from DOE about a preproposal submitted on January 26, 2009, the full proposal was submitted on March 20, 2009, with the expectation that we should receive word about it by June 2009. The community sequencing program would provide direct sequence data about microbes in Alaska samples with varying methane concentrations. Although not essential for this NETL project, it would potentially give many new insights into methane degradation at no additional cost to this project.

Delays and other problems

There have been no major delays or problems.

Conclusions

The second quarter of this project was devoted to planning for the fall expedition, to outreach and to the project-related CSP proposal. The project is proceeding on schedule and has not encountered any significant problems. The next few months will see a start in purchasing needed expendable supplies and permanent equipment in anticipation of the field work in the late summer/early fall of 2009.

Cost Status

The table below gives the project expenses for the second quarter as originally budgeted ("Original") and actual expenditures ("Actual"), as of April 7, 2009.

Second Quarter Budget

	<u>Original</u>	<u>Actual</u>
Personnel	\$ 12,256	\$ 5,877
Benefits	2,192	1,998
Permanent Equipment	10,800	-
Expendable Supplies	3,000	-
Travel	-	-
Subtotal	\$ 28,248	\$ 7,875
Indirect costs (53%)	14,972	4,503
Total	\$ 43,220	\$ 20,875

There are two large differences between the Original and Actual budgets. One is in personnel costs, specifically how the time of the PI (Kirchman) was charged to the grant. The time requested of DOE was two months for the entire first year of the project. This time was originally thought to be in the two quarters of the project, reflecting Kirchman's role in completing project-related work. However, following their standard practice with extramural support, the College business office spread out those two months of salary and benefits over the entire first year of the project. The other large difference is that we did not purchase the permanent piece of equipment as originally planned. There was no need to do so during this quarter as it will not be needed until the summer, closer to the expedition in September. Similarly, although we anticipated some incidental expenses, no funds in the Expendable Supplies category were in fact used in this quarter.

Products

- Revised Web site

A Web site was set up outlining work in the Arctic by Kirchman lab, including the NETL project (<http://www.ocean.udel.edu/cms/dkirchman/Arctic/>).

- Contacts and lectures with the general public

Kirchman's seminars on climate change in polar environments are available on his Arctic web site.

National Energy Technology Laboratory

626 Cochrans Mill Road
P.O. Box 10940
Pittsburgh, PA 15236-0940

3610 Collins Ferry Road
P.O. Box 880
Morgantown, WV 26507-0880

One West Third Street, Suite 1400
Tulsa, OK 74103-3519

1450 Queen Avenue SW
Albany, OR 97321-2198

2175 University Ave. South
Suite 201
Fairbanks, AK 99709

Visit the NETL website at:
www.netl.doe.gov

Customer Service:
1-800-553-7681

