

Oil & Natural Gas Technology

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Quarterly Progress Report

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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

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National Energy Technology Laboratory

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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 first quarter was mostly dedicated to project management activities that included revising the Project Management Plan, writing the Technology Summary Assessment (with helpful input from NETL personnel) , and participating in the project kick-off meeting held at the Morgantown campus of NETL.

This period was also used to continue to plan 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, most notably 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.

The first quarter of this project was also used to start two activities that eventually will help support the NETL-supported work. A web site was written to summarize the principal investigator’s (Kirchman) research activities in the Arctic, including this NETL project. The web site dedicated to the NETL project will be built soon as the project continues. Finally, we started work on a letter of intent to DOE’s community sequencing program to obtain metagenomic sequence data from samples collected as part of the NETL-supported work.

Progress Report

Task 1: Project Management Plan

In October, the principal investigator (PI) revised and resubmitted the Project Management Plan (PMP), incorporating comments from the DOE Project Officer. This plan outlines the research to be performed during the entire three-year project. In addition, the PI wrote and submitted the Technology Status Assessment with helpful input from NETL personnel.

Task 2: Cruise Logistics and Planning

Discussions continued (e.g. at a meeting at AGU on December 17, 2008) and are still on-going about the upcoming expedition to sample Alaska coastal waters. The time frame of the expedition now seems set for September 2009, although the exact length of the cruise remains to be determined, pending ship funding. We have been working with expedition leaders (mostly Dr. Rick Coffin) and close colleagues, most notably Dr. Tina Treude, at 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". 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/>). 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.

The lead PI has been involved in various outreach efforts that take advantage of his work in the Arctic. He participated in an interview style TV show about the Arctic as part of the PBS series, Great Decisions. This was done by Foreign Policy Association on October 2, 2008 and will be aired sometime in early 2009. He also gave a seminar about global change in polar environments to the University of Delaware's Academy of Lifelong Learning in Wilmington, DE on December 8, 2008. The presentation of this seminar is available on the Arctic web site.

We also worked on a letter of intent 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. The letter was eventually submitted on January 26, 2009 with the expectation that we should receive word about submitting a full proposal by March 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

The uncertainty about the expedition's timing has caused some minor problems, but there has been and will be sufficient time to plan and prepare adequately for the field work.

Conclusions

This first quarter of this project was devoted to project management, to expedition planning, and to outreach and project-related projects. 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 as originally budgeted (“Original”) and actual expenditures (“Actual”), as of January 9, 2009.

<u>Expense Category</u>	<u>Original</u>	<u>Actual</u>
Personnel	\$11,563	\$3,525
Benefits	3,931	1,199
Permanent Equipment	0	0
Expendable Supplies	0	0
Travel*	2,000	622
Subtotal	17,494	5,346
<u>Indirect costs (53%)</u>	<u>9,272</u>	<u>2,833</u>
Total	\$26,765	\$8,179

*The kick-off meeting at Morgantown.

The largest difference between Original and Actual is in personnel costs, more 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 first quarter of the project, reflecting Kirchman’s role in completing Tasks 1, 2, and 7 and other 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.

It is anticipated that Original and Actual will converge more during the next quarter of the project.

Products

- Revised Project Management Plan
- Project 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/>).

- NETL kick-off meeting, Morgantown, WV – December 10, 2008

The PI delivered a project overview presentation at the kick-off meeting at the NETL Morgantown campus. The presentation is available on the Arctic web site.

- Contacts and lectures with the general public

Kirchman's seminar on climate change in polar environments is available on the Arctic web site.

National Energy Technology Laboratory

626 Cochran's 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

