

Oil & Natural Gas Technology

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Quarterly Research Performance Progress Report (Period ending 12/31/2012)

A new approach to understanding the occurrence and volume of natural gas hydrate in the northern Gulf of Mexico using petroleum industry well logs

10/1/2012-9/30/2015

Submitted by:



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Office of Fossil Energy

EXECUTIVE SUMMARY

The main objective of the project is to significantly increase our understanding of the occurrence, volume and fine scale distribution of natural gas hydrate in the northern Gulf of Mexico using petroleum industry and Gulf of Mexico Gas Hydrate Joint Industry Project (JIP) well logs.

For this first quarter, the initial steps were to establish an estimate for the base of gas hydrate stability zone (GHSZ) for each industry well in the Gulf of Mexico and begin ordering industry well data. For the modeling side of the project, student Brian Tost completed a formation model for JIP2 wells in Alaminos Canyon, Gulf of Mexico. Ann Cook and Barbara Anderson began constructing formation models for the sand reservoir in Green Canyon, Gulf of Mexico.

PROGRESS, RESULTS AND DISCUSSION

See Table 1 for Project Timeline on each task and subtask.

Task 1.0 – Project Management Plan

During October and November, the Cook worked with Skip Pratt to develop the PMP for the project. It was completed on November 27, 2012.

Cook participated in a project kickoff conference call with DOE on November 7, 2012.

Task 2.0: Evaluation of gas hydrate occurrence in petroleum industry well logs

Subtask 2.1: Calculate the depth of the GHSZ depth in the Gulf of Mexico using ArcGIS.

Gas hydrate stability zone models for the Gulf of Mexico were received from Matt Frye, BOEM. These models contain minimum, mean and maximum estimates as well as breakdowns from P10-P90. The Frye models were assessed and by Cook and students, and compared to a blanket GIS calculation based only on bathymetric depth. We decided Frye models were likely more accurate, and decided to use the P90 gas hydrate stability zone depth as a cutoff for the log order. Thus, wells that contains only logs depths deeper than P90 will not be ordered.

Students Tost and Ismail worked on outputting spreadsheet data from the GIS to make the industry well log orders. Some GIS issues, including missing wells, were encountered and hopefully fixed

The first well data order from BSEE was on December 7, 2012.

This task is on track to be completed by the end of Q2.

Subtask 2.2: Well log evaluation and database development.

This task is on track to begin in Q2. The database is already being built during the BSEE well data orders, where initial notes are taken on the well depth and what type of logs are available within the P90 GHSZ.

Task 3.0: Modeling of resistivity measurements from JIP Leg 2

Subtask 3.1: Develop true resistivity models for sand reservoirs for JIP Leg 2 Holes

A resistivity model that incorporates the measured resistivity and the seismic trace in for JIP2 Holes AC-21A and AC-21B has been developed by graduate student Brian Tost and Cook.

An initial model for JIP2 Hole GC-955H was completed in December 2012. Anderson and Cook are collaborating to produce more accurate models. These models are on track for completion at the end of Q4.

Subtask 3.2: Determine hydrate saturation using best-fit ANISBED models.

This task is on track to begin in Q2.

Task 4.0: Determining volume of methane in gas hydrate in the northern Gulf of Mexico

This task and associated subtasks are on track to begin in Phase II.

Task 5.0: Publication, presentation and dissemination of results.

A publication is being prepared on the resistivity anomaly in Alaminos Canyon for the *Journal of Geophysical Research* with authors Brian Tost and Ann Cook. Tost has also submitted an abstract for presentation at the Unconventional Resources Technology Conference in Denver Colorado in August 2013

	Phase 1								Phase 2			
	Year 1				Year 2				Year 3			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Task 1	[Task 1 bar]											
Task 2	[Task 2 bar]											
Subtask 2.1		●										
Subtask 2.2								●				
Task 3	[Task 3 bar]											
Subtask 3.1				●								
Subtask 3.2											●	
Task 4	[Task 4 bar]											
Subtask 4.1												●
Subtask 4.2												
Subtask 4.3												●
Task 5	[Task 5 bar]											

Table 1. Project timeline by task (tan bars) and subtask (green bars). Total project time is 2, 18 month-long phases (3 years). Milestones are indicated by a black dot.

PARTICIPANTS

Name: Ann Cook

Project Role: PI

Contribution: Managing student time, developing models for JIP wells, communicating with NETL/DOE

Person Months: .5

Name: Brian Tost

Project Role: Graduate student

Contribution: GIS management, Alaminos Canyon formation models, preparing paper for publication

Funding Support: NSF fellowship

Person Months: 1.5

Matt Frye of BSEE has also been involved with the project by supplying his GIS calculations of the gas hydrate stability zone.

COSTS

During Q1 the only charge to the project was for undergraduate hourly pay. Graduate student Tost is covered on a fellowship. This will change significantly in Q2, when graduate student Majumdar will be charged to the account, along with data orders and additional undergraduate hourly pay.

Department: 06560		The Ohio State University - Office of Sponsored Programs			Project: 60036410	
Principal Investigator: Cook, Ann Elizabeth		Project Financial Summary			Award: GRT00028365	
Sponsored Program Officer: Scribner, Joseph Scott		For the Month Ending: DEC 31, 2012			Sponsor: US Department of Energy	
Facilities & Administration Rate: 52.50 %		Project Period: 10/01/2012 to 03/31/2014			Grant/Contract: DE-FE0009949	
Project/Award Title: New approach to understanding the occurrence and volume of natural gas hydrate in the northern Gulf of Mexico using petroleum industry well logs						
Category	Budget	Sponsor			Commitments	Balance
		Expenses This Month	Expenses To Date			
Salaries and Wages	52,030.00	62.10	62.10	0.00	51,967.90	
Fringe Benefits	5,888.00	6.21	6.21	0.00	5,881.79	
GA Tuition and Fees	23,256.00	0.00	0.00	0.00	23,256.00	
Total Personnel Costs	81,174.00	68.31	68.31	0.00	81,105.69	
Domestic Travel	10,000.00	0.00	0.00	0.00	10,000.00	
Purchased Services	15,000.00	0.00	0.00	0.00	15,000.00	
Total Direct Costs	106,174.00	68.31	68.31	0.00	106,105.69	
Facilities and Administrative	43,532.00	35.87	35.87	0.00	43,496.13	
Total	149,706.00	104.18	104.18	0.00	149,601.82	

Table 2. Costs for Q1.

CONCLUSION

Currently, all project tasks are on track. The ordering is taking quite a while, but 6 months was built into the schedule to order data in case of a slow start. There are no major changes from the PMP and no impact to report this early in the project.

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