Award Abstract #0540908

MARGINS: Hydrothermal Circulation Within Subducting Ocean Crust: Implications for Subduction Zone Temperatures

NSF Org:	EAR
Initial Amendment Date:	February 16, 2006
Latest Amendment Date:	February 16, 2006
Award Number:	0540908
Award Instrument:	Standard Grant
Program Manager:	William P. Leeman EAR Division of Earth Sciences GEO Directorate for Geosciences
Start Date:	May 1, 2006
Expires:	April 30, 2008 (Estimated)
Awarded Amount to Date:	$105300
Investigator(s):	Glenn Spinelli spinelli@nmt.edu(Principal Investigator)
Sponsor:	New Mexico Institute of Mining and Technology 801 Leroy Place Socorro, NM 87801 505/835-5690
NSF Program(s):	EXP PROG TO STIM COMP RES, PETROLOGY AND GEOCHEMISTRY
Field Application(s):	0000099 Other Applications NEC
Program Reference Code(s):	OTHR,9150,0000
Program Element Code(s):	9150,1573

ABSTRACT

The goal of this study is to examine the influence of hydrothermal circulation in subducting crust on subduction zone temperatures. Knowledge of subduction zone temperatures is important for understanding processes controlling the updip and downdip limits of seismicity, characterizing subduction zone fluid flow systems, and understanding the fate of

subducted material. Hydrothermal cooling of ocean crust prior to subduction has been documented and can have profound effects on subduction zone temperatures. However, the role of hydrothermal circulation within subducting crust in controlling these temperatures has not been studied. The primary goal of this project is to evaluate the magnitude of these effects.. This study will consist of 1) adapting a coupled fluid and heat transport model to subduction zone problems, and 2) examining the roles of sediment distribution, convergence rate, and subduction geometry on subduction zone hydrothermal circulation. Key questions that will be addressed include 1) How far into a subduction zone can hydrothermal circulation persist? 2) What factors favor persistence versus cessation of hydrothermal circulation in subducting crust? and 3) What are the thermal consequences of this circulation? By examining hydrothermal circulation within subducting crust, this study will lead to better understanding of the controls on subduction zone temperatures. This is important for understanding hydrocarbon generation in settings like northern California, and estimating the earthquake and tsunami risk on subduction margins. Other broader impacts involve training of a Ph.D. student.

Please report errors in award information by writing to: award-abstracts-info@nsf.gov.

The National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (800) 281-8749

Last Updated:Feb 10, 2006