SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Structures for Space Education (2)

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CONDUCTING A MARS SIMULATION MISSION WITH STUDENTS AND PARENTS IN A SEMI-REMOTE SETTING ON EARTH: AN INTEGRATION OF SCIENTIFIC METHODOLOGIES SHARED BY THE NASA SPACEWARD BOUND PROGRAM

Abstract

Introduction: NASA has been spreading the enthusiasm of space science to schools across the United States since the 1980s, when the organization first initiated the Teacher in Space component to the astronaut corps. Today this public outreach has evolved into a variety of NASA funded education programs designed to inspire students and communities to fulfill the rising national and international career demands with respect to space science and engineering. This paper investigates the educational outreach initiatives, structure, and impact of one of NASA's newest space education programs—the NASA Spaceward Bound program. **Purpose:** Spaceward Bound is an educational program organized at NASA Ames in partnership with The Mars Society and funded by the Exploration Systems Mission Directorate (ESMD) at NASA Headquarters. The program focuses on inspiring and training the next generation of explorers through student and teacher outreach opportunities. Spaceward Bound further provides teachers the opportunity to collaborate with scientists to learn how to conduct science studies in the field, while developing innovative ways of leveraging the experiences with their students in the classroom. During Spaceward Bound teachers work in Moon and Mars analog environments, directly participating in the exploration process and learning field documentation methodologies, while focusing on four key field exploration processes: logistics and transportation; energy and life support; human factors; and extravehicular activities (EVAs). Since its inception in 2006, Spaceward Bound has both inspired and provided outreach opportunities to over 75 teachers, and has fostered international collaboration between teachers from the United States, Chile, Spain, Canada, and Australia. **Methods:** Four United States middle school students and their parents embarked on a three-day Mars Simulation field expedition in a remote area north of Stone State Park in Northwest Iowa, USA. The students participated in pre-mission training every two weeks for four months prior to the expedition. The mission was lead by a teacher who had received extensive training from several Spaceward Bound Programs. Mission objectives were

directly correlated to science field methodologies and concepts used and shared during Spaceward Bound outreach programs. **Results:** This student expedition was very successful and in the future will be offered to a larger group of students. Improvements to mission activities could include: more in-depth pre-mission training; more student-led development of GPS caching sites; student-led monitoring of camp duties/chores; graphing data collected in the field; a better integration of robotics; and longer mission duration.