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ANDRILL STRATIGRAPHIC DRILLING PROJECT IN SOUTHERN MCMURDO SOUND: AN OVERVIEW OF SCIENTIFIC OBJECTIVES AND UPDATE ON SITE SELECTION

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During the austral summer of 2007 the ANtarctic DRILLing Program (ANDRILL) will drill from a sea-ice platform in the McMurdo Sound region to obtain new information about the Neogene Antarctic cryosphere and evolution of Antarctic rift basins. Target strata for the Southern McMurdo Sound Project (SMS) are middle Miocene to Quaternary in age (~17 Ma to present) deposited in a subsiding half-graben on the margin of the Victoria Land Basin (VLB). The key aim of the SMS Project is to establish a robust history of Neogene Antarctic ice sheet variation and climate evolution that can be integrated into continental and global records toward a better understanding of Antarctica's role in the past, present and future global system. To achieve this aim, two drillholes (~500 m and ~700 m) will sample a sequence of strata identified on new seismic lines collected during a novel over sea-ice reflection survey completed in November 2005. The two drillholes will recover a composite thickness of >1000 m of strata that lie stratigraphically above the lower Miocene section recovered at the top of the nearby CIROS-1 drillcore, and above the 1400 m composite section recovered by the Cape Roberts Project (~34 to 17 Ma). Drilling technology will utilize a sea-riser system and continuous wire-line diamond-bit coring to ensure high-percentage core recovery. Specific scientific objectives include: (a) document the initial onset and subsequent history of sea-ice presence/absence; (b) document the evolution and demise of Neogene terrestrial vegetation; (c) test whether stable cold-polar climate conditions persisted for the last 15 m.y.; (d) construct a composite event history of glacial and interglacial events across a coastal to deep basin transect; (e) provide chronostratigraphic control for the regional seismic framework in the VLB and western Ross Sea; (f) develop a Neogene subsidence and fault history for the Victoria Land Basin; and (g) feed new paleoclimatic data into ice sheet and climate models. The background, scientific rationale and details regarding the targeted sequences for the SMS project are described in a Prospectus document available at http://andrill.org.