

SEISMIC STRATIGRAPHIC RECORD OF WEST ANTARCTIC ICE SHEET
FLUCTUATIONS WITHIN THE EASTERN BASIN OF THE ROSS SEA, ANTARCTICA

Audrey Susan Loth

A thesis submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Masters of Science in the Department of Geological Sciences.

Chapel Hill
2009

Approved by:

Dr. Louis R. Bartek III

Dr. Donna M. Surge

Dr. Stephen R. Meyers

ABSTRACT

AUDREY LOTH: Seismic stratigraphic record of West Antarctic Ice Sheet fluctuations within the Eastern Basin of the Ross Sea, Antarctica
(Under the direction of Dr. Louis R. Bartek III)

Using geophysical data collected aboard the R/V Nathaniel B. Palmer during the austral summer of 2004 the stratigraphy of the up-dip portion of the Antarctic margin was studied. Analysis of up-dip SCS profiles illustrated an incomplete glacial record with multiple thin, polar Plio-Pleistocene sequences reflecting the presence of Northern Hemisphere ice, and fewer, thick Early Miocene sequences indicating perhaps a subpolar basal regime. Across the shelf of the Eastern Basin, the majority of the sequences terminate mid-shelf suggesting that not all ice sheet events are the same magnitude, which may be a function of climate change or autogenic ice sheet fluctuations. Through quantitative analysis the up-dip stratigraphy of the Eastern Basin was shown to be highly heterogeneous. This work has provided a more robust illustration of the complexity of glacial stratigraphy in the up-dip setting, and it is possible to see a reflection of changing climate preserved in the seismic signature of the NBP 0306 profiles.

Note: This thesis is too large to be submitted electronically. Instead, pending the approval of the Graduate School of the University of North Carolina, a DVD will be sent containing the entire document and this portion can be disregarded.