

Probing the Tectonic Evolution of the South China Sea: International Ocean Discovery Program Expedition 349

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TEJADA, Maria luisa^{1*}; LI, Chun-feng²; LIN, Jian³; KULHANEK, Denise⁴; WILLIAMS, Trevor⁵; BAO, Rui⁶; BRIAIS, Anne⁷; CHEN, Yifeng⁸; CLIFT, Peter⁹; COLWELL, Frederick¹⁰; DADD, Kelsie¹¹; DING, Weiwei¹²; HERNANDEZ-ALMEIDA, Ivan¹³; HUANG, Xiao-long⁸; HYUN, Sangmin¹⁴; JIANG, Tao¹⁵; KOPPERS, Anthony¹⁰; LI, Qianyu²; LIU, Chuanlian²; LIU, Qingsong¹⁶; LIU, Zhifei²; NAGAI, Renata¹⁷; PELEO-ALAMPAY, Alyssa¹⁸; SU, Xin¹⁹; SUN, Zhen²⁰; TRINH, Hai son²¹; YEH, Yi-ching²²; ZHANG, Chuanlun²; ZHANG, Fan³; ZHANG, Guo-liang²³; ZHAO, Xixi²

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¹Department of Solid Earth Geochemistry, Japan Agency for Marine-Earth Science and Technology, Japan, ²State Key Laboratory of Marine Geology, Tongji University, China, ³Woods Hole Oceanographic Institution, USA, ⁴IODP, Texas A&M University, USA, ⁵Lamont-Doherty Earth Observatory of Columbia University, USA, ⁶Geologisches Institut, Swiss Federal Institute of Technology, Switzerland, ⁷Centre National de la Recherche Scientifique, University of Toulouse, France, ⁸Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, China, ⁹Department of Geology and Geophysics, Louisiana State University, USA, ¹⁰College of Earth, Ocean and Atmospheric Sciences, Oregon State University, USA, ¹¹Department of Earth and Planetary Sciences, Macquarie University, Australia, ¹²Second Institute of Oceanography, State Oceanic Administration, China, ¹³Institute of Geography/Oeschger Centre for Climate Change Research, Univ. of Bern, Switzerland, ¹⁴Korea Institute of Ocean Science and Technology, Republic of Korea, ¹⁵Faculty of Earth Resources, China University of Geosciences, China, ¹⁶State Key Laboratory of Lithospheric Evolution, Institute of Geology and Geophysics, CAS, China, ¹⁷Department of Physical, Chemical and Geological Oceanography, Universidade de Sao Paulo, Brazil, ¹⁸National Institute of Geological Sciences, Univ. of the Philippines, Philippines, ¹⁹School of Marine Geosciences, China University of Geosciences, China, ²⁰South China Sea Institute of Oceanology, Chinese Academy of Sciences, China, ²¹Department of Science and Technology, Min. of Natural Resources and Environment, Vietnam, ²²Taiwan Ocean Research Institute, Taiwan, Republic of China, ²³Key Laboratory of Marine Geology and Environment, Institute of Oceanology, CAS, China

¹Department of Solid Earth Geochemistry, Japan Agency for Marine-Earth Science and Technology, Japan, ²State Key Laboratory of Marine Geology, Tongji University, China, ³Woods Hole Oceanographic Institution, USA, ⁴IODP, Texas A&M University, USA, ⁵Lamont-Doherty Earth Observatory of Columbia University, USA, ⁶Geologisches Institut, Swiss Federal Institute of Technology, Switzerland, ⁷Centre National de la Recherche Scientifique, University of Toulouse, France, ⁸Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, China, ⁹Department of Geology and Geophysics, Louisiana State University, USA, ¹⁰College of Earth, Ocean and Atmospheric Sciences, Oregon State University, USA, ¹¹Department of Earth and Planetary Sciences, Macquarie University, Australia, ¹²Second Institute of Oceanography, State Oceanic Administration, China, ¹³Institute of Geography/Oeschger Centre for Climate Change Research, Univ. of Bern, Switzerland, ¹⁴Korea Institute of Ocean Science and Technology, Republic of Korea, ¹⁵Faculty of Earth Resources, China University of Geosciences, China, ¹⁶State Key Laboratory of Lithospheric Evolution, Institute of Geology and Geophysics, CAS, China, ¹⁷Department of Physical, Chemical and Geological Oceanography, Universidade de Sao Paulo, Brazil, ¹⁸National Institute of Geological Sciences, Univ. of the Philippines, Philippines, ¹⁹School of Marine Geosciences, China University of Geosciences, China, ²⁰South China Sea Institute of Oceanology, Chinese Academy of Sciences, China, ²¹Department of Science and Technology, Min. of Natural Resources and Environment, Vietnam, ²²Taiwan Ocean Research Institute, Taiwan, Republic of China, ²³Key Laboratory of Marine Geology and Environment, Institute of Oceanology, CAS, China

Expedition 349, South China Sea (SCS) Tectonics, was the first voyage of the *JOIDES Resolution* under the new International Ocean Discovery Program. The objectives of this expedition were to: 1) determine the timing, mechanisms, and sequence of the opening and closing of different subbasins of the SCS by coring and directly dating the oceanic crust; 2) investigate the tectonic history of the SCS by conducting biostratigraphic and magnetostratigraphic investigations on the sedimentary sequences

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to help constrain the timing and sequence of geologic events and the sedimentary responses to tectonic evolution of the basin; 3) measure the geochemical composition, magnetization, and physical properties of the oceanic crust and seamount volcanic products to understand crustal accretion and deep mantle processes associated with the tectonic development of the basin; and 4) test the different proposed driving mechanisms that led to continental breakup and seafloor spreading. To attain these objectives, we cored near the ocean-continent boundary (U1432 and U1435) inferred to be underlain by the oldest oceanic crust, and near the fossil spreading centers in the East Subbasin (U1431) and the Southwest Subbasin (U1433 and U1434) where the youngest crust formed. The main scientific outcomes of Expedition 349 include 1) in-situ SCS oceanic crust was recovered for the first time, providing critical control on the timing of termination of spreading in the SCS; 2) the cessation age of spreading in both the East and Southwest Subbasins are similar (~16 Ma), based on shipboard biostratigraphy from reddish-brown clays overlying and within the oceanic crust at Sites U1431 and U1433; and 3) determination of the nature of the structural high at Site U1435, where a sharp, possibly rift-related unconformity was recovered, providing indirect evidence for the onset of seafloor spreading at ~33 Ma. In addition, 4) the nature of post-spreading seamount volcanism will be examined from the volcanoclastic sediments recovered at Sites U1431 and U1434; and 5) the past environmental, climatic, and oceanographic conditions related to the tectonic evolution of the SCS will be gleaned from studies of the 1524 m of sedimentary deposits recovered from all sites.

キーワード: South China Sea, tectonic evolution, seafloor spreading, International Ocean Discovery Program, Expedition 349, oceanic crust drilling

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