Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

SCG65-11 会場:201B 時間:5 月 20 日 13:45-14:15

地球の熱史と海洋の進化
Thermal history of Earth and the evolution of oceans

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Our understanding of the thermal budget of Earth and its long-term evolution has been considerably improved in the last several years, owing to an unusual confluence of new theoretical developments and multi-disciplinary observations. In this contribution, I will present the latest summary on the thermal history of Earth during the last 4 billion years and discuss how it may be exploited to better understand the global water cycle and the evolution of oceans. To be consistent with the thermal evolution of Earth, the Archean oceans may have been twice as voluminous as the present-day oceans, and Earth's mantle is suggested to have been gradually hydrated by subduction. Net water exchange between the surface reservoir and the deep interior is likely to be essential for the stable operation of plate tectonics over Earth's history.