Chikyu Shallow Core Program (SCORE)

Proposal Cover Sheet

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Basic Information

Title:	Cycle of catastrophic caldera-forming eruption and spread-out ignimbrite at Kikai submarine caldera
Keywords: (5 or less)	Kikai caldera, flow mechanism, catastrophic caldera-forming eruption, Koya ignimbrite, volume estimation
Area:	Kikai caldera, south of Kyushu Island, Japan.

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Scientific Objectives (250 words or less)

Catastrophic caldera-forming eruption (CCFE) is rare but extremely hazardous. Understanding the volume and flow mechanism of ignimbrite, a major out-put of CCEF, is thus essential in evaluating the risk and cause of CCFE. The latest CCFE in the Japanese Archipelago occurred at 7.3 ka and formed the Kikai submarine caldera to the south of Kyushu Island. The Koya ignimbrite, the major ejecta of this CCFE, is widely distributed over the proximal/adjacent islands and the mainland of southern Kyushu. This ignimbrite has been suggested to exhibit rather low aspect ratio with thin (<2m) and wide (~100km) deposition. However, our recent on-land survey revealed that both the ignimbrite thickness and the maximum pumice size tend to decrease with increasing the distance across the sea. This may lead to a hypothesis that a significant amount of pyroclastics was lost during traveling over the sea and deposited on the sea floor. Our seismic survey further suggested a characteristic layer that is a candidate for Koya deposit is widely distributed. We also confirm that Koya ignimbrite exhibits petrological characteristics distinct from other Kikai magmatic products. Sampling and analyzing the candidate layer should thus provide the world's first precise estimation of the volume of a CCFE ignimbrite. Seismic data also suggest that the 99 mbsf drilling could penetrate a one-cycle older CCFE deposit at 95 ka, which should contribute significantly to decoding the magma discharging rate in the Kikai caldera-cycle. We here propose piston-coring at three locations around the Kikai caldera for achieving the above-mentioned scientific goals.

Proposed Sites

Site Name	Position (Lat, Lon)	Water Depth (m)	Penetration (m)	Primary or alternate
Take-shima N	30°51.2'N, 130°27.0'E	225	99	Primary
Take-shima NE	30°51.2'N, 130°32.0'E	255	99	Alternate
Kagoshima-wan	31° 08.5'N, 130°39.7'E	150	99	Alternate

[Note: Only shallow-penetration coring (about <100 m below seafloor) is available.]

Non-standard Measurements

[Note: Please describe above any non-standard measurements needed to achieve the proposed scientific objectives. Standard measurements are X-ray CT, Multi-sensor core logger, and split surface image.]

List previous drilling in area

non

List potential hazards and preferred weather window

We prefer to carry out in June or July.

Proponent List

First Name	Last Name	Affiliation	Country	Expertise
Yoshiyuki	Tatsumi	Kobe Univ.	Japan	Petrology
Nobukazu	Seama	Kobe Univ.	Japan	Geophysics
Koji	Kiyosugi	Kobe Univ.	Japan	Volcanology
Reina	Nakaoka	Kobe Univ.	Japan	Volcanology
Keiko	Suzuki	Kobe Univ.	Japan	Volcanology

[Note: For proponents who do not have J-DESC memberships, please put an asterisk (*) AFTER his/her last name.]