ReC23-01 – Initial Results of the first KCC-J-DESC Repository Core Re-Discovery Program (ReCoRD)

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In 2023, the ReCoRD program was initiated by a joint venture of the Kochi Core Center (KCC), Kochi University and the Japan Drilling Earth Science Consortium (J-DESC) as a new workshop type, providing access to IODP cores archived at the KCC in Kochi, Japan. The first ReCoRD workshop, ReC23-01, “Tracing Intermediate Water Current Changes and Sea Ice Expansion in the Indian Ocean”, was held between the 27th of August and the 5th of September 2023 at the KCC in Kochi. The goals of ReC23-01 were to gather new data to test the hypothesis that the expansion of sea ice around Antarctica impacted water circulation in the Indian Ocean through changes in intermediate water formation and the northward expansion of the Antarctic polar front through the Middle to Late Miocene following the Middle Miocene Climatic Transition (< 13.8 Ma).

During ReC23-01, we targeted a latitudinal transect from the high southern latitudes to the tropical Indian Ocean consisting of 1 DSDP and 2 ODP sites. DSDP Site 266 represents the high-latitude target site located just south of the present-day location of the polar front. Data gathered for Site 266 during ReC23-01 is a new tracer location for ice-rafted debris (IRD) accumulation and changes in the Southern Hemisphere frontal system for the Neogene in the Indian Ocean. ODP Site 752 on the Broken Ridge provides a unique record of mid-latitude intermediate water paths, including SAMW and AAIW originating from the high latitudes and the Tasman Leakage. ODP Site 707 represents a critical end member of the south equatorial current and related Indonesian Intermediate Waters in the tropical Indian Ocean.
The ReC23-01 workshop within the ReCoRD program allowed international research collaborators to fully benefit from the legacy of over 50 years of International Ocean Drilling Research from the Deep Sea Drilling Program (DSDP), Ocean Drilling Program (ODP), and International Ocean Discovery Program (IODP). Combining in-tandem sedimentological core descriptions with existing and new core data provides a unique opportunity to re-investigate and evaluate archived (legacy) core material. In particular, the availability of computer tomography (CT) core images provided critical information in assessing sedimentology and drilling disturbance in older DSDP and ODP core material to gather new data from over 50-year-old cores.

ReC23-01 illustrates how ReCoRD-style workshops can offer a new way to explore research questions that could not be easily addressed by single sea-going expeditions. These workshops provide additional and powerful research opportunities based on legacy core material beyond individual sample and data requests, with large-scale community benefits. For instance, ReC23-01 provided an excellent training opportunity for early career researchers in a shipboard-like setting.