

Roundabout Expedition Leg 10
09-NOV-88 YOKOSUKA, JAPAN
12-DEC-88 MAJURO, MARSHALL ISLANDS

KGWU CK 110 152001Z Nov 88 Weekly Scientific Report - Since leaving Yokosuka on Nov 9, we have made detailed Seabeam surveys of "Seiko," "Winterer," and "Charlie Johnson" guyots and have crossed Tekuyodaini and "Stout" guyots. Surveys reveal multiple levels of cretaceous rudist reefs on each guyot. Related to relative changes of sea life. Reef types include fringing, barrier and atoll. Dredged basalt from "Winterer" and huge hauls of rudist limestone from "Charlie Johnson." Completed seismic, gravity, and magnetic survey along anomaly M-18. Including box surveys in two potential ODP drill sites. Expected magnetic intensity pattern complicated by uncrusted small sea mounts. All hands busy and happy after first two days of rough seas. (Winterer)

KGWU Thomas Washington CK145 212205Z November '88 Report for week of November 13-20
Made Seabeam seismic reflection, magnetic, and gravity surveys of "Charlie Johnson", "Stout", "Thomas Washington", "Isakov", and "Marakov" guyots plus an unnamed large elongate guyot at 27 deg 18 min north, 151 deg 50 min east. The long guyot is on crust about 160 MY old. Each surveyed guyot encircled by a fringing or barrier reef backed by steep slopes that lead up to a higher central limestone plateau. On the long guyot, many large and small depressions, some nearly 200 meters deep, punctuate the plateau, suggesting karstic sinkholes created by fresh water dissolution during a period of emergence of the plateau above sea level. Good basement reflections indicate minimum of 500 meters of limestone capping the long guyot. Dredges yield fossiliferous shallow water cretaceous limestone from the guyot caps and basalt from the flanks. Jerry Winterer

KGWU Thomas Washington 272000Z November '88
The week was spent surveying and dredging in the "Wake" group of seamounts between Marcuc and Wake Islands. Our seismic reflection, Seabeam, and dredge data reinforce hypothesis that these are mainly late cretaceous seamounts about 95 million years old, and suggest that they were never covered with shallow-water limestone reefs. Instead, they were formed as volcanic islands and were eroded to sea level over a period of a few million years as they subsided to sink permanently beneath the waves. Our magnetic surveys on members of this group should fix the paleolatitude of their formation. The implications for mid-cretaceous Pacific Plate Kinetics are far reaching. We discovered on older, early cretaceous (pre-anomaly M-O, or Pre-118 MY) reef-bearing guyot nestled within the wake group, but submerged several hundred meters deeper than a nearby younger neighbor and tilted by the flexuring of the lithosphere associated with the emplacement of the younger volcano. We are ready to head east into the Mid-Pacific Mountains. Jerry Winterer

KGWU Thomas Washington 032115Z December '88
Report for week ending 4 December 1988

Made Seabeam, seismic, gravity, and magnetic surveys of 5 guyots in western part of mid-pacific mountains, and recovered dredges from four of these. Dredges include datable shallow water early cretaceous fossils, comprising caprinid rudists, nerinid gastropods, and hermatypic corals, plus relatively unaltered volcanic rocks suitable for radiometric dating. Shipboard thin sections show original matrix in some limestone samples contains well-preserved coccoliths. Large guyot close to DSDP site 463 may have as much as 800 meters platform limestone. Deep close depressions on several guyots suggest karstic sinkholes. On many guyots, former sea level marked by outermost perimeter reef and slope break is warped surface with as much as 120m relief. All hands kept in good spirits by sunny weather and excellent meals. Jerry Winterer

N1 KGWU CK154 110100Z December '88 Weekly Report for Week Ending December 11

For most of the past week, we explored Allison Guyot, which is shaped like the big dipper, with a summit area within the perimeter reef of about 1300 sq km. The reef, now at a depth of about 1750m, encloses a lagoon filled with about 600m of lower cretaceous sediments. One 15-km stretch of reef wall collapsed and the full sequence of lagoonal sediments crops out, enabling us to obtain a dredge sample from low in the sequence of fossiliferous sediments. In addition to this and a dredge from the top of the limestone sequence, we have dredges from the volcanic cones that poke through the sediment cover along the dipper handle. All in all an exhilarating finale to a superb cruise. We salute Captain Tom Desjardins and all the officers and crew who performed with their customary professionalism and cooperative spirit. Jerry Winterer