China Sea spreading center. A pre-Tertiary continental basement complex is separated from the accreted oceanic crust, outcropping on southern Palawan, by the Ulugan Bay fault, which is one of several north-south-trending strike-slip fault zones recognized in the area.

A geologic section consisting, in the lower part, of limestones, volcanics and fine-grained clastics, ranging in age from pre-Tertiary to lower Oligocene, is encountered off northwest Palawan. This is unconformably overlain by the Nido Limestone and deep-marine shales of the Pagasa Formation (upper Oligocene to middle Miocene). The contact with the coarse clastic Matinloc Formation is an unconformity recognized on a regional scale and related to collision of the drifting margin with the remainder of the Philippine archipelago. The sequence is topped by the Carcar Limestone, described from many areas in the Philippines.

A total of 30 wells have been drilled so far: 12 were dry, 10 were discoveries, 7 of which have been declared commercial, and 7 were delineation wells. Occurrence of hydrocarbons had been restricted to reef-related reservoirs of the Nido Limestone, until the recent discovry of oil in sandstone reservoirs in Galoc 1 heralded a new chapter in the Philippines search for hydrocarbons.

Evaluation of the production performance from these reefs and analysis of the behavior of fractured limestones as reservoirs serves as a guide for future operations in the area. The future prospects of the northwest Palaway shelf and rise can be assessed from the current discovery success ratio in the exploration for reefs and from initial discoveries in turbidites.

SCHEIBNER, ERWIN, Dept. Mineral Resources, Australia

Tectonic Map of Circum-Pacific Southwest Quadrant—A Draft Presentation

(No abstract)

SCHOLL, D. W., U.S. Geol. Survey, Menlo Park, California, T. U MAUNG, CCOP/SOPAC, U.N. Offshore Mineral Prospecting, Suva, Fiji, T. V. VALLIER, U.S. Geol. Survey, Menlo Park, California, and Scientific Party Cruise, CCOP/SOPAC, R/V *S. P. Lee* (J. CHILDS and A. J. STEVENSON, U.S. Geol. Survey, Menlo Park, California; N. F. EXON, Bur. Mineral Resources, Canberra, A.C.T., Australia; R. H. HERZER, New Zealand Geol. Survey, Lower Hutt; M. W. SANDSTROM, Australian Natl. Univ., Canberra, A.C.T.; S. SOAKI, Ministry of Lands, Nuku'alofa, Tongatapu, Tonga)

Preliminary Results of Geophysical and Geological Studies to Assess Resource Potential and Geologic Evolution of Central Tonga Ridge and Summit Platform (21-24° Latitude)

In April 1982, the R/V *S. P. Lee*, operated by the USGS, supported geological and geophysical studies over the central area of the Tonga Ridge immediately south of Tongatapu. The cruise plan calls for the collection of approximately 1,250 mi (2,000 km) of multichannel (24) seismic reflection data and several dredge stations to sample submarine outcrops. The bulk (70%) of this work will be concentrated over the summit platform of the ridge, in water depths less than about 5,000 ft (1,500 m). One or more seismic lines will be extended eastward to and slightly seaward of the Tonga Trench, and westward of the ridge's present volcanic axis toward the Lau Basin, in order to resolve the regional rock and structural framework of the ridge. Several multichannel lines will cross the fore-arc basin that lies between the summit platform and the trench. Sonobuoy refraction and wide-angle reflection data will be gathered routinely as well as gravity and magnetic data and high-resolution subbottom seismic records (3.5 kHz and multiplate Uniboom sources). Navigation will be controlled by satellite fixes and computer-generated dead-reckoning positions, based on ship's heading and speed, and doppler-sonar inputs.

The results of the shipboard examination of dredged samples, seismic monitor records, and possibly several hundred km of brute-stacked processed multichannel records will be presented at the CPEMRC III. The implications of this sketchy and roughly assembled data base relative to the mineral and petroleum resource potential of the sedimentary sections underlying the ridge's summit platform and the adjacent fore-arc basin will be discussed. Comments on the geologic and tectonic history of the Tonga Ridge implied by the incompletely analyzed field data will be offered for discussion and consideration.

SHUPE, JOHN W., and D. RICHARD NEILL, Hawaii Natural Energy Inst., Univ. Hawaii, Honolulu, Hawaii

Wind Applications in Pacific

Hawaii shares with many other isolated areas and island communities of the Pacific a near-total dependence for energy on imported oil—a supply source which during the past decade has become increasingly expensive and less secure. Hawaii also shares with many of these areas which are deficient in conventional energy supplies, a variety of renewable energy resources which can serve as substitutes, or alternatives to seaborne petroleum. A case study showing what has been accomplished in Hawaii in moving one of these resources—wind energy—closer to commercialization is based on the limited amount of known information on the potential of wind energy in the Pacific region and studies which are underway to expand the knowledge on the extent of the wind resource throughout this region.

The Hawaii Natural Energy Institute (HNEI) and the Department of Meteorology of the University of Hawaii have developed over the past 6 years an inventory of the wind resource in Hawaii. This effort involved an extensive system of 18 long-term wind data stations located on the five major islands, supplemented by a series of mobile, short-term stations and a loan program of wind measurement devices for specific site measurements. The Hawaii Wind Data Bank provides information both to wind researchers and to those who are seeking optimum sites for installing wind energy conversion systems (WECS). HNEI also is engaged in a WECS reliability verification program and is conducting research on various wind energy applications, including storage and nitrogen generation.

SITUMORANG, B., Oil and Gas Technology Development Center-LEMIGAS, Jakarta, Indonesia

Formation, Evolution, and Hydrocarbon Prospects of Makassar Basin, Indonesia

The occurrence of hydrocarbons in back-arc basins of Indonesia has been known since the beginning of this century, but its relation to the formation and evolution of sedimentary basins is rather poorly understood. This can be resolved by explaining the origin of a basin in terms of extensional tectonics. This approach has been applied to the Makassar basin. Data provided by well records and multichannel seismic reflection profiling indicate that the observed subsidence can be explained by the thinning of continental crust by a factor of between 2 and 2.9. Stret-