CRUZ, J.

POSSIBILITIES FOR DEVELOPMENT OF MINERAL RESOURCES OF COLOMBIA

No abstract available.

CRUZ, L. J.

URANIUM AND ITS PROJECTION OF ELECTRICAL NUCLEAR FUTURE OF MEXICO

No abstract available.

DALE, R. H., U.S. Geol. Survey, Honolulu, Hawaii

SIMULATION MODEL OF HONOLULU BASAL AQUIFER

A mathematical model of the Honolulu aquifer that relates the historical head measurements to the rainfall and pumpage records has been formulated. This work is focused on determining the hydrodynamic relations between the freshwater and saline-water bodies to allow application of the best practices for management of the basal groundwater resource (a body of fresh water that floats on saline groundwater).

The Honolulu aquifer is composed of the basaltic lava flows that form the Koolau Range. These rocks have a value of hydraulic conductivity on the order of 10,000 ft/day (3,000 m/day). The Honolulu coastal-plain sediments conformably overlie the aquifer. The sediments have a low hydraulic conductivity, and restrict the flow of basal groundwater to the ocean. Alluvial deposits that have backfilled Pleistocene valleys cut deep into the aquifer, restrict lateral groundwater flow, and divide the Honolulu aquifer into three reservoirs.

The individual reservoirs are about 10 sq mi (26 sq km) in area. Pumping from each reservoir is restricted to one or two large pumping plants and the freshwater head has been measured by continuous recorders on a single well in each reservoir. The small size of the reservoirs, plus the limited historical data, make it convenient to use each reservoir as a computational cell of the mathematical model.

The mathematical model was derived by solving the mass-balance equation for discrete time steps for each of the reservoirs. Inflow and outflow elements considered were deep infiltration of rainfall, saltwater flow from the ocean to the underlying saltwater body, flow between the reservoirs, and pumpage. Best estimates of the aquifer parameters were obtained by processing part of the historical records using linear-programming techniques. The estimates of the aquifer parameters were used in the simulation model to compute freshwater head for the remaining part of the historical records. The fit between the historical head and the computed head is good, suggesting that the model could be used as a tool for estimating the effects of alternative management practices.

DEMANT, A., Univ. Aix-Marseille, France, C. ROBIN, Inst. de Geologia, Mexico, C. BOBIER, Centre de Recherche Geodynamique, France, and D. A. CORDOBA, Inst. de. Geologia, Mexico

MAJOR CHEMICAL CHARACTERISTICS OF TERTIARY AND QUATERNARY VOLCANISM OF BAJA CALIFORNIA—COMPARISON WITH OTHER VOLCANIC PROVINCES OF MEXICO

The volcanic series of Baja California is divided into two chemically different cycles.

A first calco-alkaline cycle is represented by deposits of highly pyroclastic andesites and dacites. This volcanism was most intense in the Miocene but started during the Oligocene. The andesitic series of Sinaloa is comparable in age to series in Baja California, but the imposing ignimbritic series of the Sierra Madre Occidental is not found at Baja California. Beginning in the Pliocene, an alkaline cycle was developed. This cycle is represented by large amounts of Hawiitan-type tuffs and is partly of Recent-Quaternary age. Some of these eruptions have occurred within historic time (Tres virgenes, close to St. Rosalia).

The chemical character of the lavas of Baja California is interpreted according to the pattern of geotectonic evolution which has been proposed for the west part of the Mexican continent, and specially in relation to the post-Pliocene opening phenomena of the Gulf of California.

A compilation of recent chemical data concerning the volcanism of Mexico was processed by computers. The program defined the petrochemical characteristics and a thesis is proposed on the petrogenetic interpretation of the three large volcanic provinces of Mexico: (1) the calco-alkaline trans-Mexican axis; (2) the calco-alkaline volcanism (alkaline at Baja California) of the Pacific Coast; and (3) the overall alkaline volcanism (with tholeiitic manifestation) of the Gulf of Mexico.

DAMIANI, O.

EVALUATION OF METALLIC AND NONMETALLIC MINERAL RESOURCES OF PERU

No abstract available.

ELY, N.

SEABED BOUNDARIES OFF COASTS OF ASIA

No abstract available.

ERICKSEN, G. E., U.S. Geol. Survey, Washington, D.C.

METALLOGENIC PROVINCES IN SOUTHEASTERN PACIFIC REGION

Mineral deposits of the southeastern Pacific region include: (1) hypogene, volcanogenic, and sedimentary deposits of the Andean region, (2) scattered copper deposits in the Antarctic Peninsula; and (3) metal-enriched sea-floor sediments and volcanic rocks. Andean metalliferous deposits are related spatially and genetically to calc-alkaline plutons and volcanic rocks emplaced during the Andean orogeny of Jurassic to Quaternary age. These deposits are components of a single metallogenic province, superimposed on two or more pre-Andean Paleozoic and Precambrian metallogenic provinces. Scattered copper deposits of the Antarctic Peninsula are similar in age and origin to deposits in the Andes and are considered to be in the Andean province. The sea-floor deposits include: (1) metal-enriched rocks and sediments that have formed at an accreting plate margin, such as the East Pacific Rise or near sea-floor volcanism; (2) sea-water precipitates; and (3) concentrations of heavy minerals in clastic sediments along the continental margin.