U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
Dallas L. Peck, Director

CIRCUM-PACIFIC MAPS

This map is one in a series of maps covering the Pacific, Antarctic, and Arctic regions. The maps have been compiled as part of the Circum-Pacific Map Project, a cooperative international effort to show the relation of mineral and energy resources to such phenomena as geology, tectonics, and crustal dynamics. The project is one of the activities of the Circum-Pacific Council for Energy and Mineral Resources.

The Map Project is made up of six panels of Earth scientists from countries in the Pacific region who contribute to maps of the Northwest, Northeast, Southwest, Southeast Quadrants, the Antarctica and Arctic areas. Eight series of maps are already published or are being prepared for future publication: Geographic, Base, Plate-Tectonic, Geologic, Tectonic, Geodynamic, Mineral-Resources, and Energy-Resources.

The six overlapping maps cover the Pacific Basin at a scale of 1:10 million, and a seventh map covers the entire region at a scale of 1:17 million. All are plotted on the Lambert azimuthal equal-area projection. The index map shows the boundaries of the quadrant maps and the boundaries of the Antarctic and Arctic area maps in the Pacific Ocean.

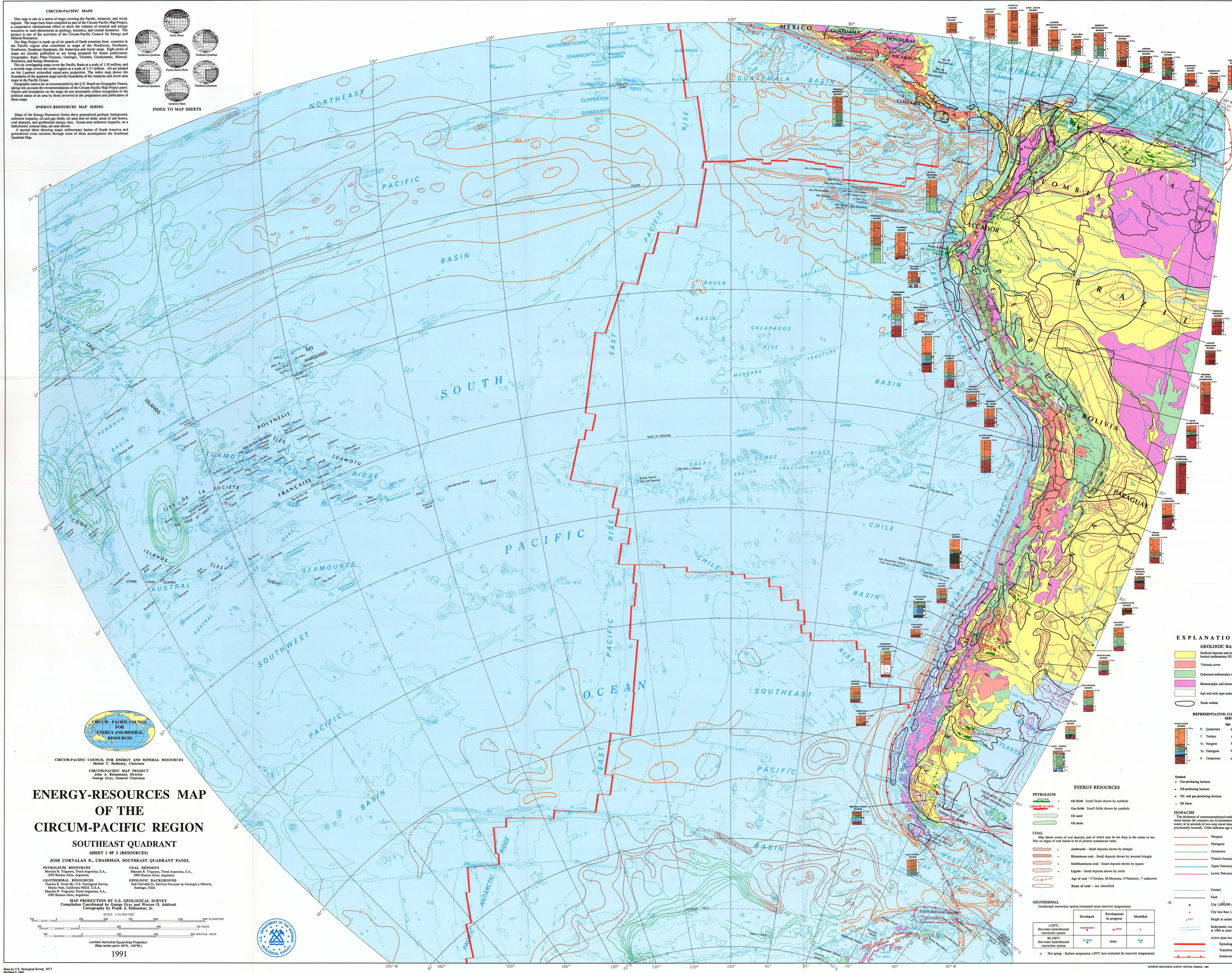
Geographic names are as recommended by the U.S. Board on Geographic Names, taking into account the recommendations of the Circum-Pacific Map Project panel. Names and boundaries on the maps do not necessarily reflect recognition of the political status of an area by those involved in the preparation and publication of these maps.

ENERGY-RESOURCES MAP SERIES

Maps of the Energy-Resources Series show generalized geologic background, sediment isopachs, oil and gas fields, oil sand and oil shale, areas of salt domes, coal deposits, and geothermal energy sites. Ocean-area sediment isopachs, on a bathymetric contour base, are also shown.

A second sheet showing major sedimentary basins of South America and generalized cross sections through most of them accompanies the Southeast Quadrant Map.

INDEX TO MAP SHEETS



CIRCUM-PACIFIC COUNCIL FOR ENERGY AND MINERAL RESOURCES
Michel T. Halbouty, Chairman

CIRCUM-PACIFIC MAP PROJECT
John A. Reinemund, Director
George Gryc, General Chairman

ENERGY-RESOURCES MAP OF THE CIRCUM-PACIFIC REGION

SOUTHEAST QUADRANT

SHEET 1 OF 2 (RESOURCES)

JOSE CORVALAN D., CHAIRMAN, SOUTHEAST QUADRANT PANEL

PETROLEUM RESOURCES
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GEOTHERMAL RESOURCES
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COAL DEPOSITS
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GEOLOGIC BACKGROUND
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MAP PRODUCTION BY U.S. GEOLOGICAL SURVEY
Compilation Coordinated by George Gryc and Warren O. Addicott
Cartography by Frank J. Sidlauskas, Jr.

SCALE 1:10 000 000

250 0 250 500 750 1000 1250 1500 KILOMETERS
250 0 250 500 750 MILES
200 0 200 400 600 NAUTICAL MILES

Lambert Azimuthal Equal-Area Projection
(Map center point: 40°S., 100°W.)

1991

Base by U.S. Geological Survey, 1977.
Modified in 1990.

SOURCES OF DATA

ENERGY RESOURCES

The principal sources of petroleum and coal data for South America were especially prepared for this map by M. R. Yrigoyen (Argentina), R. Solís Iriarte (Bolivia), E. González Pacheco (Chile), Empresa Colombiana de Petróleos (ECOPETROL) and H. Duque-Caro (Colombia), G. Rosania (Ecuador), C. del Solar, V. R. Eyzaguirre, and V. R. Sanz (Perú), and N. Pimentel de Bellizzia (Venezuela). Data for Central America are from Drummond (1986). Geothermal resource data are from Stone (1985) and Waring (1965), and updated with the assistance of individuals cited in the Explanatory Notes. A complete list of sources of data is included in the Explanatory Notes.

GEOLOGIC BACKGROUND

Land geology is simplified and generalized from Corvalán (1985). Active plate boundaries are generalized from Moore (1982), modified in 1991.

ISOPACHS

The principal sources of data for marine areas are Case and Holcombe (1980), Ludwig and others (1987), Ludwig and Houtz (1979), and Rodriquez and others (1986). Land isopachs were compiled by M. R. Yrigoyen with the assistance of individuals cited in the Energy Resources section. Other sources of data are listed in the accompanying Explanatory Notes.

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EXPLANATION

GEOLOGIC BACKGROUND

- Surficial deposits and sedimentary basins and deformed to undeformed basinal sedimentary fill
- Volcanic cover
- Deformed sedimentary and volcanic rocks
- Metamorphic and intrusive rocks of Proterozoic and Phanerzoic age
- Age and rock type unknown (Antarctica Peninsula)
- Basin outline

REPRESENTATIVE COLUMNAR SECTIONS FOR SELECTED SEDIMENTARY BASINS

HUALLAGA BASIN

Age

- Q Quaternary
- T Tertiary
- Tn Neogene
- Tp Paleogene
- K Cretaceous
- pK Pre-Cretaceous
- J Jurassic
- ₮ Triassic
- Pz Paleozoic
- p€ Precambrian

Lithologic Unit

- Sandstone
- Shale
- Conglomerate
- Chert (glacial)
- Gypsum
- Halite
- Limestone
- Metamorphic rock
- Volcanic rock
- Undifferentiated igneous rock
- Ultramafic rock

Symbol

- ☼ Gas-producing horizon
- • Oil-producing horizon
- ✱ Oil- and gas-producing horizon
- ∘ Oil show

ENERGY RESOURCES

PETROLEUM

- OFICINA — Oil fields Small fields shown by symbols
- LOMA DE LA LATA — Gas fields Small fields shown by symbols
- Oil sand
- Oil shale

COAL

Map shows extent of coal deposits, part of which may be too deep in the center or too thin on edges of coal basins to be of present commercial value.

- Anthracite - Small deposits shown by triangle
- Bituminous coal - Small deposits shown by inverted triangle
- Subbituminous coal - Small deposits shown by square
- Lignite - Small deposits shown by circle
- T–M–P–? Age of coal - T-Tertiary, M-Mesozoic, P-Paleozoic, ?-unknown
- Rank of coal – not identified

GEOTHERMAL

Geothermal convection system (estimated mean reservoir temperature)

	Developed	Development in progress	Identified
>150°C Hot-water hydrothermal convection system	MOMOTOMBO	ZUNIL	
90-150°C Hot-water hydrothermal convection system	EL TATIO	none	RUIZ

∘ Hot spring - Surface temperature >50°C (not evaluated for reservoir temperature)

ISOPACHS

The thickness of unmetamorphosed sedimentary strata is indicated by isopachs. On land and in near-shore basins the contours are in kilometers; in oceanic areas thicknesses are shown in tenths of a kilometer, or in seconds of two-way travel time (contour interval 0.1, 0.5, and 1.0 seconds, dashed where approximately located). Color indicates age of oldest sediment overlying basement, black where unknown.

- Neogene
- Paleogene
- Cretaceous
- Triassic-Jurassic
- Upper Paleozoic
- Lower Paleozoic

SYMBOLS

- Contact
- Fault
- City 1,000,000 or more people
- City less than 1,000,000 people
- ×5897 Height in meters
- Bathymetric contours - Depth of water in meters shown by 200 m contour and at 1000 m intervals from 1000 m depth. Intermediate contours dashed.
- Active plate boundaries
  - Spreading ridge
  - Transform fault
  - Subduction zone. Barbs on upper plate

INTERIOR–GEOLOGICAL SURVEY, RESTON, VIRGINIA–1991

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