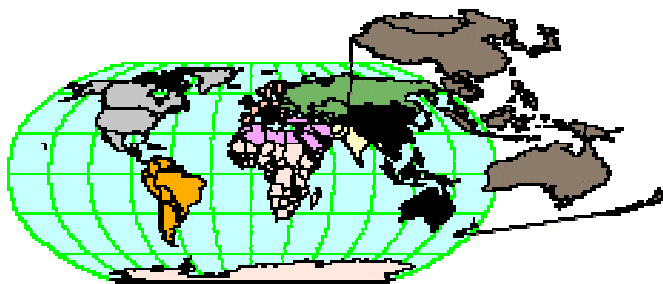


U.S. Department of the Interior
U.S. Geological Survey

MAPS SHOWING GEOLOGY, OIL AND GAS FIELDS, AND GEOLOGIC PROVINCES OF THE ASIA PACIFIC REGION

Compiled by Douglas W. Steinshouer¹, Jin Qiang², Peter J. McCabe³, and Robert T. Ryder⁴



Open- File Report 97-470F

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature. Any use of trade names is for descriptive purposes only, and does not imply endorsement by the U.S. government.

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PREFACE

This is one of a series of products resulting from the World Energy Project of the U.S. Geological Survey. Inquiries about this CD-ROM or the Project's effort in the Asia Pacific Region should be addressed to:

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The authors of the CD were responsible for the following aspects of producing the maps:

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Designation of geologic provinces: Peter McCabe, Robert Ryder and Jin Qiang

GIS input and manipulation: Douglas Steinshouer and Jin Qiang

Layout design: Jin Qiang

CD-ROM implementation and design: Douglas Steinshouer

Metadata: Douglas Steinshouer

Coordination: Peter McCabe

U.S. Geological Survey Open-File Report 97-470F

MAPS SHOWING GEOLOGY, OIL AND GAS FIELDS, AND GEOLOGIC PROVINCES OF THE ASIA PACIFIC REGION

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Maps Showing Geology, Oil and Gas Fields, and Geologic Provinces of the
Asia Pacific Region

Plate 1: The Far East

Plate 2: Southeast Asia

Plate 3: Australia and New Zealand

INTRODUCTION

This digitally compiled maps include geology, geologic provinces, and oil and gas fields of the Asia Pacific Region. The map is part of a worldwide series of maps on CD-ROM released by the U.S. Geological Survey's World Energy Project. The goal of the project is to assess the undiscovered, technically recoverable oil and gas resources of the world and report these results by the year 2000. For data management purposes, the world was divided into eight energy regions corresponding approximately to the economic regions of the world as defined by the U.S. Department of State. The Asia Pacific Region (Region 3) includes Australia, Brunei, Cambodia, The People's Republic of China, Fiji, Indonesia, Japan, North and South Korea, Laos, Malaysia, Mongolia, New Caledonia, New Zealand, Papua New Guinea, Philippines, Thailand, Vanuatu, and Vietnam.

Each region is divided into geologic provinces. Each province has a set of geologic characteristics that distinguish it from surrounding provinces. These characteristics may include the predominant lithologies, the age of the strata, and the structural style. Some provinces include multiple genetically-related basins. Geologic province boundaries are delineated using data from a number of geologic maps and other tectonic and geographic data (see References). Offshore province boundaries are defined by the 2000 meter bathymetric contour. Each province is assigned a unique number. Those provinces that lie entirely within the Asia Pacific Region begin with the number 3. Those provinces that lie partly within another region may start with a 1, for the Former Soviet Union (Persits and others 1998) or an 8, for South Asia (Wandrey and Law, 1998).

The location of oil and gas fields centerpoints are plotted based on the locations in the Petroconsultants International Data Corp. (1996) database with permission. Selected provinces are currently being investigated, by petroleum system analysis, and assessments are being made of the undiscovered oil and gas resource potential of these provinces. Klett and others (1997) discuss the worldwide geologic provinces and their relative ranking in terms of total known petroleum volume.

For specific details of the data sources and map compilation see PROCESSING STEPS or the metadata files on this CD-ROM. Some stratigraphic units are combined to simplify the map and to ensure consistency across the region. Sedimentary and metamorphic rocks are shown by age and are not differentiated.

This map is compiled using ESRI (Environmental Systems Research Institute Inc.) ARC/INFO software. Political boundaries and cartographic representations on this map are taken, with permission from ESRI's ArcWorld 1:3m digital coverages: they have no political significance and are displayed as general reference only. Portions of this database covering the coastline and country boundaries contain intellectual property of ESRI (©1992 and 1996, Environmental Systems Research Institute Inc. All rights reserved.)

DATA PROCESSING STEPS

The maps on this CD were digitally compiled and abstracted from the following maps:

Geological Map of South and East Asia, Third Edition, 1990
A. Ghose, D. Chatterjee, and J. Banerjee,
UNESCO, Commission for Geological Map of the World,
Subcommission for South and East Asia
Scale 1:5,000,000

Geological Map of the World: Australia and Oceania, Sheets 6,7,11, and 12, 1965
Bureau of Mineral Resources (now Australian Geological Survey Organisation)
Scale 1:5,000,000

Geological Map of the World: Australia and Oceania, Sheets 2, 3, and 8, 1967
Bureau of Mineral Resources (now Australian Geological Survey Organisation)
Scale 1:5,000,000

Geological Map of the World: Australia and Oceania, Sheets 9 and 13, 1971
New Zealand Geological Survey
(Institute of Geological and Nuclear Sciences, Limited)
Scale 1:5,000,000

The following process steps were taken:

1. Gray-scale scanned images of the source maps were registered and rectified in Arc/Info. In the case of the UNESCO maps, they were registered to a composite of Arcworld country boundaries (shorelines) and Arcworld water bodies projected to a Lambert projection with standard parallels of 40 and 10 degrees North, and a central meridian of 70 degrees East, with an average root mean square error of 600 meters. In the case of the Australia and New Zealand maps they were registered to a grid of latitude and longitude lines generated as an arc coverage in Arc/Info and projected to the appropriate Lambert parameters for each map sheet, with an average root mean square error of 350 meters..

3. Geologic contacts were then digitized on screen in Arcedit using the scanned gray-scale images as a backdrop. Labels were applied and attributed as the linework was digitized using special AML menus and scripts. In the case of Australia and New Zealand, the coverage being digitized was re-projected to match the projection of each source map sheet. The original geologic attribution was generalized using rselect and calculate functions in Arcedit.

4. Because of contradictions in compilation, the digitized coverages were then transformed with a series of piece wise "rubber sheet" adjustments. The composite Arcworld coverage was used for transformation because it is derived from a readily obtainable standard compiled on a worldwide basis.

5. The coverages comprising the three plates of this Open-File Report were projected to optimal Lambert projections for these particular geographic regions.

6. The map sheets were produced in Arcplot using AML scripts. The geologic legend was generated as a separate graphic file in Arcplot. The Adobe Portable Document Format was created with postscript files generated in Arcplot.

PRIMARY REFERENCES

Bureau of Mineral Resources, 1965, Geological Map of the World: Australia and Oceania, Sheets 6, 7, 11, and 12;
scale 1:5,000,000,
14 sheets
(Australian Geological Survey Organisation)

Bureau of Mineral Resources, 1967, Geological Map of the World: Australia and Oceania, Sheets 2, 3, and 8
scale 1:5,000,000,
14 sheets
(Australian Geological Survey Organisation)

Ghose, A., Chatterjee, D., and Banerjee, J. , 1990, Geological Map of South and East Asia, Third Edition: UNESCO, Commission for Geological Map of the World, Subcommission for South and East Asia;
scale 1:5,000,000,
6 sheets.

Klett T.R., Ahlbrandt, T.S., Schmoker, J.W., and Dolton, G.L., 1997, Ranking of the World's oil and gas provinces by known petroleum volumes: U.S. Geological Survey Open File Report 97-463, CD-ROM.

New Zealand Geological Survey, 1971, Geological Map of the World: Australia and Oceania, Sheets 9 and 13;
Scale 1:5,000,000
(Institute of Geological and Nuclear Sciences, Limited; <http://www.gns.cri.nz>)

Palfreyman, W.D., 1984, Guide to the geology of Australia: Bureau of Mineral Resources Bulletin 181, 111p.

Petroconsultants International Data Corp., 1996, Petroleum exploration and production database.
(Database available from Petroconsultants International Data Corp.,
P.O. Box 740619, Houston, Texas 77274-0619).

Environmental Systems Research Institute, Inc., 1992, Arcworld Digital Map of the World;
1:3,000,000

**Provinces assigned to the Asia Pacific Region
sorted by province code**

- [3001](#) [Bau Waters Basin](#)
- [3002](#) [Bellona Plateau](#)
- [3003](#) [Bligh Water Basin](#)
- [3004](#) [Shorland Basin](#)
- [3005](#) [Solomon Islands](#)
- [3006](#) [Fiji Ridge](#)
- [3007](#) [Great South Basin](#)
- [3008](#) [Hikurani Trough](#)
- [3010](#) [Kermadec Ridge](#)
- [3011](#) [Lord Howe Rise](#)
- [3012](#) [Loyalty Island Ridge](#)
- [3013](#) [Melanesia Border Plateau](#)
- [3014](#) [East Ontong Java Rise](#)
- [3015](#) [Indispensable Reef](#)
- [3016](#) [Russell Basin](#)
- [3017](#) [Mellish Reef](#)
- [3018](#) [New Caledonia](#)
- [3019](#) [New Hebrides Arc](#)
- [3020](#) [New Zealand East Coast Basin](#)
- [3021](#) [New Zealand Orogenic Belt](#)
- [3022](#) [Norfolk Island Ridge](#)
- [3023](#) [Northland Basin](#)
- [3024](#) [Samoa Basin](#)
- [3025](#) [Solander-Waiiau Basin](#)
- [3026](#) [Three Kings Rise](#)
- [3027](#) [Tonga Ridge](#)
- [3028](#) [Vanikoro Basin](#)
- [3029](#) [Waikato Basin](#)
- [3030](#) [Wanganui Basin](#)
- [3031](#) [Taranaki Basin](#)
- [3101](#) [Alashan Yinshan Fold Belt](#)
- [3102](#) [Altunshan Fold Belt](#)
- [3103](#) [Beibuwan Basin](#)
- [3105](#) [Bogdashan Fold Belt](#)
- [3106](#) [Bose Basin](#)
- [3107](#) [Chuxiong Basin](#)
- [3108](#) [Cuoqing Lunpola Basin](#)

3109 East China Sea Basin
3110 Erlian Basin
3112 Jianghan Basin
3113 Jiangnan South Jiangsu Fold Belt
3114 Jiuquan Minle Wuwei Basin
3115 Junggar Basin
3116 Karamay Thrust Belt
3117 Kumukulig Basin
3118 Kunlunshan Fold Belt
3119 Lanping Simao Basin
3120 Leidong Basin
3121 Lhasa Basin
3122 Lhasa Terrane
3124 Luxi Jiaoliao Uplift
3125 Nanpanjiang Depression
3126 Nanyang Basin
3127 Bohaiwan Basin
3128 Ordos Basin
3130 Pearl River Mouth Basin
3131 Qaidam Basin
3132 Qiangtang Tanggula Basin
3133 Qiangtang Terrane
3134 Qilianshan Fold Belt
3135 Qinling Dabieshan Fold Belt
3136 Qiongdongnan Basin
3137 Qabdu Basin
3138 Ushumun Basin
3139 Sanshui Basin
3140 Shanxi Plateau
3141 Shiwan Dashan Basin
3142 Sichuan Basin
3143 Songpan Ganzi Fold Belt
3144 Songliao Basin
3146 South China Fold Belt
3147 Subei Yellow Sea Basin
3148 Sulongshan Fold Belt
3149 Taihangshan Yanshan Fold Belt
3150 Taikang Hefei Basin
3151 Taiwan Thrust and Fold Belt
3152 Taiwan Melange Belt

3153 Taixinan Basin
3154 Tarim Basin
3156 Turpan Basin
3157 Xichang Yunnan Fold Belt
3158 Xisha Trough
3159 Yinggehai Basin
3160 Yinshan Da and Xiao Hingganling Uplift
3161 Yunnan Guizhou Hubei Fold Belt
3162 Zhangguangcailing Uplift
3164 Mohe Basin
3165 Heilongjiang Basin
3166 Erlian Uplift
3167 South China Ocean Basin
3168 Longmenshan Dabashan Fold Belt
3169 Yitong Graben
3180 Bijianan Basin
3181 South China Continental Shelf Slope
3202 Mongol-Okhotsk Folded Region
3203 Choybalsan Basin
3204 Gobi Basin
3205 Nyalga Basin
3207 Temtsag Hailar Basin
3208 Great Lake Basin
3209 Great Lake Uplift
3210 Ulan Bator Basin
3301 Akita Basin
3302 Honshu Ridge
3303 Ishikari Hidaka Basin
3304 Japan Volcanic Arc/Accreted Terrane
3305 Joban Basin
3306 Kanto Basin
3307 Miyazaki Basin
3308 Niigata Basin
3309 Okinawa Trough
3310 Ryukyu Volcanic Arc
3311 Sagara Basin
3312 Sea Of Japan Backarc Basin
3313 Sinzi Uplift
3314 Tokachi Basin
3315 Tottori Basin

3316 Tsushima Basin
3401 Gensan Basin
3402 Gyeongsang Basin
3403 Huksan Platform
3404 Korea Bay Basin
3405 Korean Craton
3406 Korean Continental Shelf
3501 Central Vietnam Basin
3502 Khorat Platform
3503 Mekong/Cuulong/Vung Tau Basin
3504 Panjang/Cardomomes Basin
3505 Saigon Basin
3506 South China Sea Platform
3507 Thai Basin
3508 Thailand Mesozoic Basin Belt
3509 Tonle Sap-Phnom Penh Basin
3510 Truong Son Fold Belt
3520 Tagaung Myitkyina Fold Belt
3601 Bicol Shelf Basin
3602 Cagayan Basin
3603 Cotabato Basin
3605 Palawan Shelf
3606 Pamusian Tarakan Basin
3607 Philippine Accretionary Prism
3608 Philippine Magmatic Arc
3609 Reed Bank Basin
3610 Sulu Arch
3611 Sulu Sea Basin
3612 Visayan
3701 Baram Delta/Brunei-Sabah Basin
3702 Greater Sarawak Basin
3703 Malay Basin
3704 Malay Peninsula
3705 Rajang-Crocker Accretionary Prism
3801 Arafura Basin-Irian Jaya
3802 Bali Basin
3803 Banda Arc
3804 Barito Basin
3805 Bintuni/Sulawati Province
3806 Bone Basin

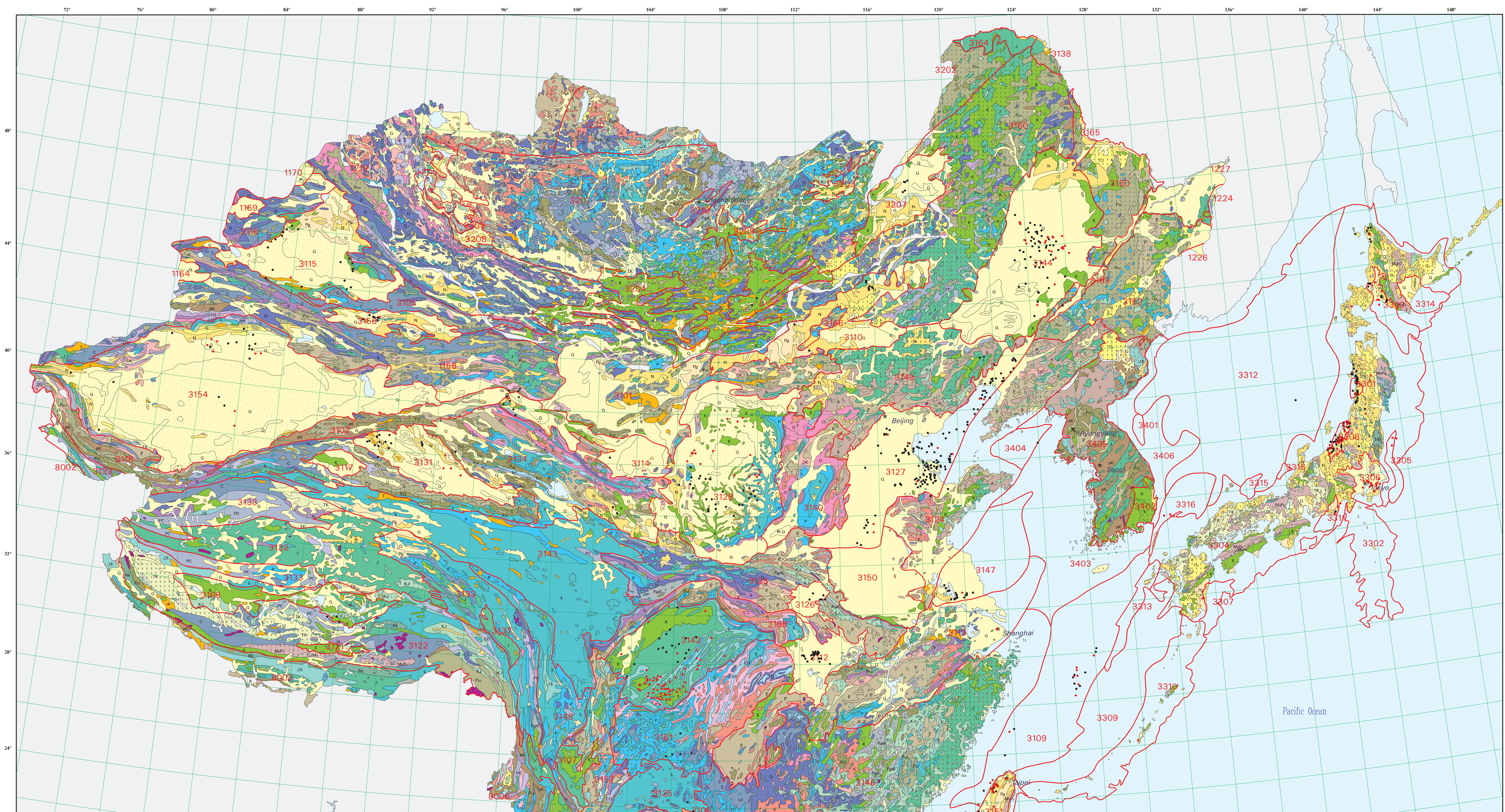
3807 Celebes Sea
3808 Central Sumatra Basin
3809 East Java Basin
3810 East Natuna Basin
3811 Flores Basin
3812 Gorontalo Basin
3813 Halmahera Basin
3814 Halmahera Platform
3815 Java/Banda Sea
3816 Ketuneau/Sintang Terrane
3817 Kutei Basin
3818 Melawi Basin
3819 Meratus High
3820 Merauke Platform
3821 North Banda Basin
3822 North Sumatra Basin
3823 Northern Irian Jaya Waropen Basin
3824 Northwest Java Basin
3825 Penyu/West Natuna Basin
3826 South Banda Basin
3827 South Makassar Basin
3828 South Sumatra Basin
3829 Sulawesi Accretionary Prism
3830 Sulawesi Magmatic Arc
3831 Sumatra/Java Accretionary Prism
3832 Sumatra/Java Fore-Arc Basins
3833 Sumatra/Java Magmatic Arc
3834 Sumba Province
3835 Sunda Platform
3836 Weber Basin
3837 Zambalez/Central Luzon Basin
3901 Adelaide and Kanmantoo Fold Belts
3902 Albany-Fraser Province
3903 Amadeus Basin
3904 Arunta Block
3905 Australian Arafura Basin
3906 Bangemall and Nabberu Basins
3907 Bass Basin
3908 Bassian Rise
3909 Birrindudu Basin and Tanami Block

3910 Bonaparte Gulf Basin
3911 Bowen Basin
3912 Bremer Basin
3913 Browse Basin
3914 Canning Basin
3915 Capricorn Basin
3916 Carnarvon Basin
3917 Carpentaria Basin
3918 Challenger Plateau
3919 Clarence-Moreton Basin
3920 Coen-Yambo Block
3921 Daly River Basin
3922 Darling Basin
3923 Drummond Fold Belt and Anakie High
3924 Eromanga Basin
3925 Eucla Basin
3926 Galilee Basin
3927 Gascoyne Block
3928 Gawler Block
3929 Georgina Basin
3930 Gippsland Basin
3931 Great Australian Bight Basin
3932 Halifax Basin
3933 Halls Creek Province
3934 Hodgkinson/Lachlan Fold Belt
3935 Kimberley Basin
3936 Lacklan Fold Belt
3937 Laura Basin
3938 Malakula/Aoba/Banks Basin
3939 Marion Terrain
3940 Maryborough Basin
3941 Money Shoal Basin
3942 Mt. Isa Block
3943 Murray Basin
3944 Musgrave Block
3945 McArthur Basin
3946 New England Fold Belt
3947 Ngalia Basin
3948 Northwest Shelf
3949 Officer Basin

3950 Otway Basin
3951 Paterson Province
3952 Perth Basin
3953 Pilbara Block
3954 Pine Creek Geosyncline
3955 Queensland Plateau
3956 Rocky Cape Block/Dundas Trough
3957 Stuart Shelf
3958 Surat Basin
3959 Sydney Basin
3960 Tasmania Basin
3961 Tennant Creek Block
3962 Victoria River Basin
3963 Wiso Basin
3964 Cape Vogel Basin
3966 New Guinea Foreland Basin-Fold Belt
3967 New Guinea Mobile Belt
3968 New Ireland Basin
3969 Papuan Basin-Shelf Platform
3970 Sepik-Ramu Basin
3971 South Bismarck Volcanic Arc
3972 Chatham Rise
3973 Fiji Islands
3974 Yilgarn Block

Provinces assigned to other regions sorted by province code

1158 Tian Shan Foldbelt
1164 East Ili Basin
1169 Alakol Basin
1170 Zaysan Basin
1219 Altay-Sayan Folded Region
1224 Sikhote-Alin Folded Region
1226 Khanka Basin
1227 Middle Amur Basin
1230 Baikal-Patom Folded Region
8002 Himalayan
8006 Tenasserim-Shan



EXPLANATION

Age of rock units			
Q Quaternary	U Undivided Tertiary	C Cenozoic	C.M. Cenozoic/Mesozoic
N Neogene	Tk Tertiary/Cretaceous	M Mesozoic	M.P. Mesozoic/Paleozoic
Pt Paleogene	KJ Cretaceous/Jurassic	P Paleozoic	P.P. Paleozoic/Precambrian
K Cretaceous	Jt Jurassic/Triassic		
J Jurassic	Tp Triassic/Permian		
T Triassic	PC Permian/Carboniferous		
P Permian	CD Carboniferous/Devonian		
C Carboniferous	DS Devonian/Silurian		
D Devonian	SO Silurian/Ordovician		
S Silurian	OK Ordovician/Cambrian		
O Ordovician			
C Cambrian			
P Proterozoic			
A Archean			

Specified rock type (Colored by respective age)

□ Eolian deposits	■ Undetermined age
□ Volcanic rocks	□ Surface water
□ Intrusive rocks	□ Geology not shown
□ Ophiolites and ultrabasic rocks	

Other units

— Geologic provinces boundary
— Province code as red numeral
● Oil field centerpoint
● Gas field centerpoint
★ Selected city

ABOUT THIS MAP

This digitally compiled map is part of a worldwide series of maps on CD-ROM released by the U.S. Geological Survey's World Energy Project. The goal of the project is to assess the undiscovered, technically recoverable oil and gas resources of the world. For data management purposes, the world was divided into eight energy regions based on political boundaries and corresponding approximately to the economic regions of the world as defined by the U.S. Department of State. This map covers the northern portion of the Asia Pacific Region (Region 3) and includes the People's Republic of China, Japan, North and South Korea and Mongolia, and parts of Cambodia, Laos, Thailand and Vietnam. Two additional maps of the Asia Pacific Region cover Southeast Asia (Plate 2) and Australia and New Zealand (Plate 3) both to the south.

The region is divided into geologic provinces. Each province has a set of geologic characteristics that distinguish it from surrounding provinces. These characteristics may include the predominant lithologies, the age of the strata, and the structural style. Some provinces include multiple genetically-related basins. Klett and others (1997) list all

by the 2000 meter bathymetric contour. Each province is assigned a unique number. Because geological trends are independent of political boundaries, some provinces overlap two regions and two or more countries. Those provinces that lie entirely within the Asia Pacific Region begin with the number 3. Those provinces that lie partly within another region may start with a 1, for the Former Soviet Union, or an 8 for South Asia. For the sake of clarity province names are not included on this plate.

Details of the data sources and map compilation are given in the metadata file on CD-ROM and at the lower left of this map. The geologic outcrops on this map are based primarily on the Geologic Map of South and East Asia by Ghose and others (1990), used with permission. Some stratigraphic units are combined to simplify the map and to ensure consistency across the region. All rocks are colored by age. Sedimentary and metamorphic rocks are not differentiated, whereas igneous rocks and their types are indicated by patterns superimposed on the appropriate age color. The centerpoint locations of oil and gas fields are plotted based on the locations in the Petroconsultants database (1996) and are used with permission.

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Projection: Lambert Conformal Conical with Two Standard Parallels at 40 degrees North and 10 degrees South Latitude
Central Meridian: 110 degrees East Longitude

REFERENCES

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- Klett, T.J., Ahlbrandt, T.S., Schmoker, J.W. and Dolton, G.L., 1997. Ranking of the World's Oil and Gas Provinces by Known Petroleum Volumes, U.S. Geological Survey Open File Report 97-463, Denver, CO, one CD-ROM.

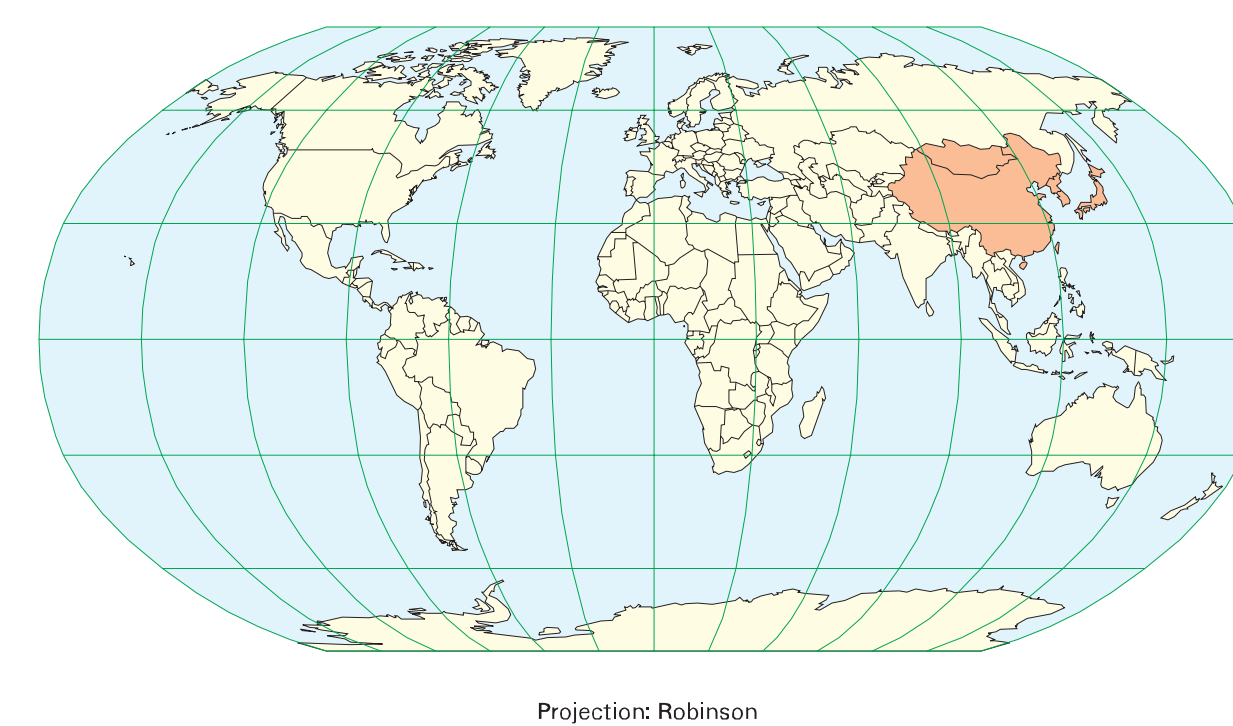
MAPS SHOWING GEOLOGY, OIL AND GAS FIELDS, AND GEOLOGIC PROVINCES OF THE ASIA PACIFIC REGION

Plate 1: The Far East

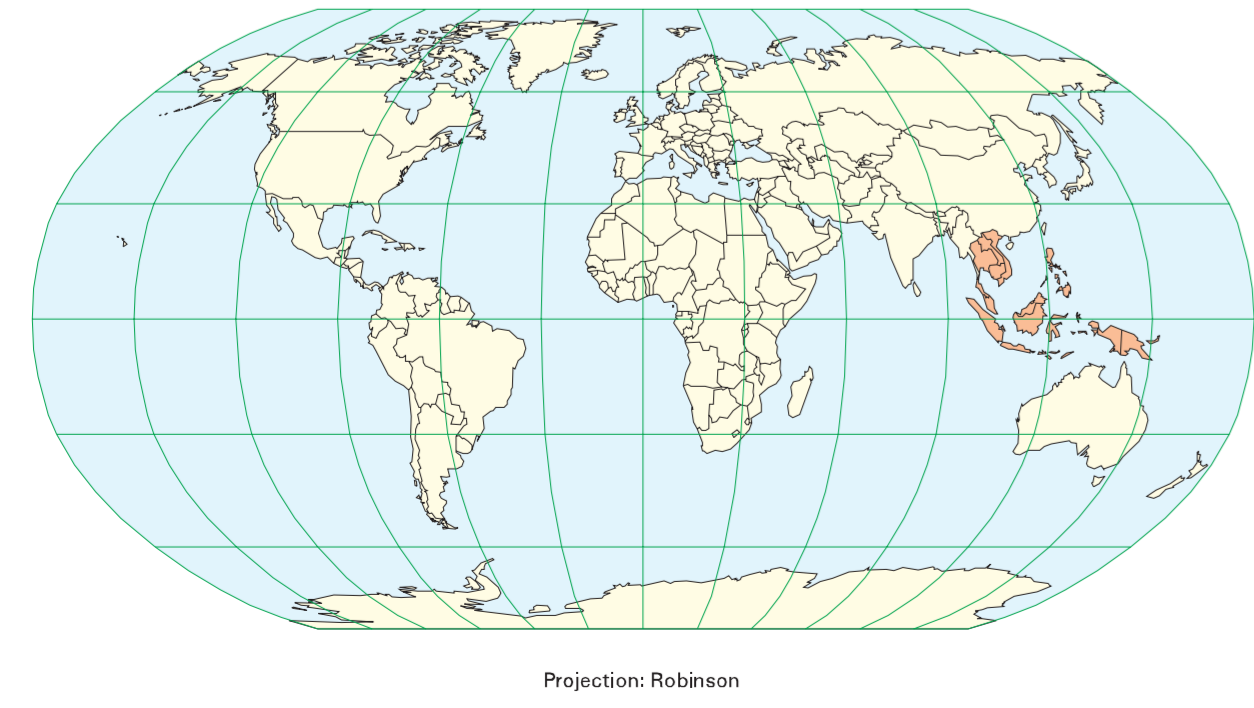
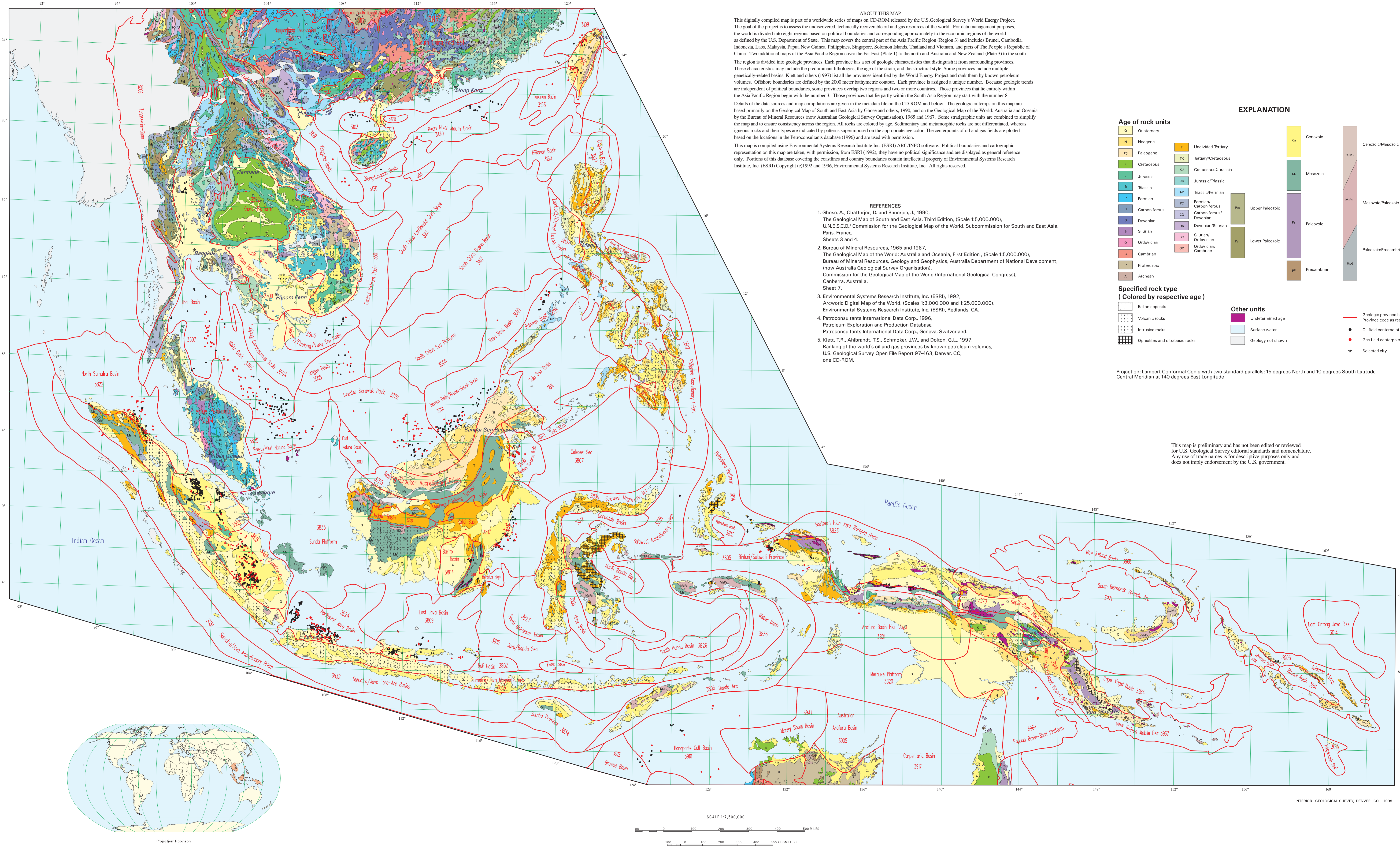
Compiled By

Douglas W. Steinshouer, Jin Qiang, Peter J. McCabe and Robert T. Ryder

1999



Projection: Robinson



ABOUT THIS MAP

This digitally compiled map is part of a worldwide series of maps on CD-ROM released by the U.S. Geological Survey's World Energy Project. The goal of the project is to assess the undiscovered, technically recoverable oil and gas resources of the world. For data management purposes, the world is divided into eight regions based on political boundaries and corresponding approximately to the economic regions of the world as defined by the U.S. Department of State. This map covers the central part of the Asia Pacific Region (Region 3) and includes Brunei, Cambodia, Indonesia, Laos, Malaysia, Papua New Guinea, Philippines, Singapore, Solomon Islands, Thailand and Vietnam, and parts of The People's Republic of China. Two additional maps of the Asia Pacific Region cover the Far East (Plate 1) to the north and Australia and New Zealand (Plate 3) to the south. The region is divided into geologic provinces. Each province has a set of geologic characteristics that distinguish it from surrounding provinces. These characteristics may include the predominant lithologies, the age of the strata, and the structural style. Some provinces include multiple geologically-related basins. Klett and others (1997) list all the provinces identified by the World Energy Project and rank them by known petroleum volumes. Offshore boundaries are defined by the 2000 meter bathymetric contour. Each province is assigned a unique number. Because geologic trends are independent of political boundaries, some provinces overlap two regions and two or more countries. Those provinces that lie entirely within the Asia Pacific Region begin with the number 3. Those provinces that lie partly within the South Asia Region may start with the number 8. Details of the data sources and map compilations are given in the metadata file on the CD-ROM and below. The geologic outcrops on this map are based primarily on the Geological Map of South and East Asia by Ghose and others, 1990, and on the Geological Map of the World: Australia and Oceania by the Bureau of Mineral Resources (now Australian Geological Survey Organisation), 1965 and 1967. Some stratigraphic units are combined to simplify the map and to ensure consistency across the region. All rocks are colored by age. Sedimentary and metamorphic rocks are not differentiated, whereas igneous rocks and their types are indicated by patterns superimposed on the appropriate age color. The centerpoints of oil and gas fields are plotted based on the locations in the Petroconsultants database (1996) and are used with permission.

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- REFERENCES**
- Ghose, A., Chatterjee, D. and Banerjee, J., 1990. The Geological Map of South and East Asia, Third Edition, (Scale 1:5,000,000). U.N.E.S.C.O., Commission for the Geological Map of the World, Subcommittee for South and East Asia, Paris, France, Sheets 3 and 4.
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 - Environmental Systems Research Institute, Inc. (ESRI), 1992. Arcworld Digital Map of the World, (Scales 1:3,000,000 and 1:25,000,000). Environmental Systems Research Institute, Inc. (ESRI), Redlands, CA.
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 - Klett, T.R., Ahlbrandt, T.S., Schmoker, J.W., and Dolton, G.L., 1997. Ranking of the world's oil and gas provinces by known petroleum volumes, U.S. Geological Survey Open File Report 97-463, Denver, CO, one CD-ROM.

EXPLANATION

Age of rock units					
Q	Quaternary	T	Undivided Tertiary	C	Cenozoic
N	Neogene	TK	Tertiary/Cretaceous	C.M.	Cenozoic/Mesozoic
Pg	Paleogene	KJ	Cretaceous/Jurassic	M	Mesozoic
C	Cretaceous	JR	Jurassic/Triassic	M.P.	Mesozoic/Paleozoic
J	Jurassic	TP	Triassic/Permian	Pz	Paleozoic
T	Triassic	PC	Permian/Carboniferous	P.L.	Lower Paleozoic
P	Permian	CD	Carboniferous/Devonian	P.P.C.	Paleozoic/Precambrian
C.	Carboniferous	DB	Devonian/Silurian		
D	Devonian	SO	Silurian/Ordovician		
S	Silurian	OC	Ordovician/Cambrian		
O	Ordovician				
C.	Cambrian				
P.	Proterozoic				
A	Archean				

Specified rock type (Colored by respective age)

(Stippled pattern)	Eolian deposits	(Purple)	Undetermined age
(Dotted pattern)	Volcanic rocks	(Blue)	Surface water
(Cross-hatched pattern)	Intrusive rocks	(Grey)	Geology not shown
(Grid pattern)	Ophiolites and ultrabasic rocks		

Other units

(Red line)	Geologic province boundary	(Black dot)	Oil field centerpoint
(Red line with number)	Province code as red numeral	(Red star)	Gas field centerpoint
		(Star)	Selected city

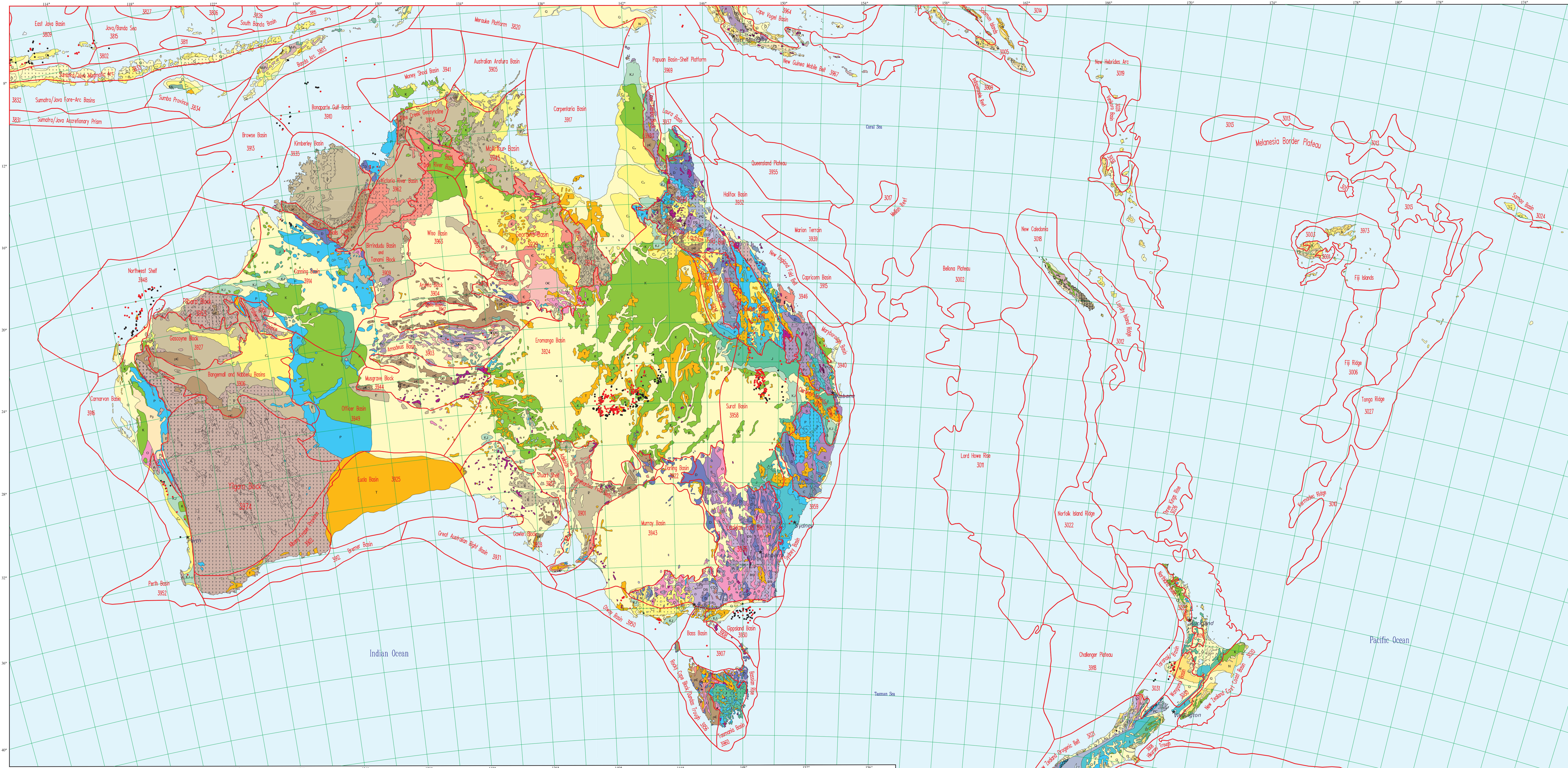
Projection: Lambert Conformal Conic with two standard parallels: 15 degrees North and 10 degrees South Latitude
Central Meridian at 140 degrees East Longitude

This map is preliminary and has not been edited or reviewed for U.S. Geological Survey editorial standards and nomenclature. Any use of trade names is for descriptive purposes only and does not imply endorsement by the U.S. government.

MAPS SHOWING GEOLOGY, OIL AND GAS FIELDS AND GEOLOGIC PROVINCES OF THE ASIA PACIFIC REGION

Plate 2: Southeast Asia

Compiled By
Douglas W. Steinshouer, Jin Qiang, Peter J. McCabe and Robert T. Ryder
1999



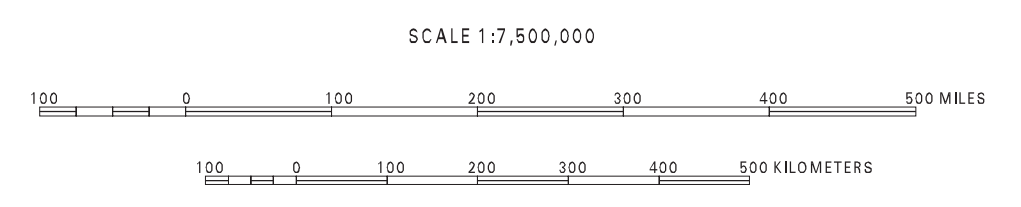
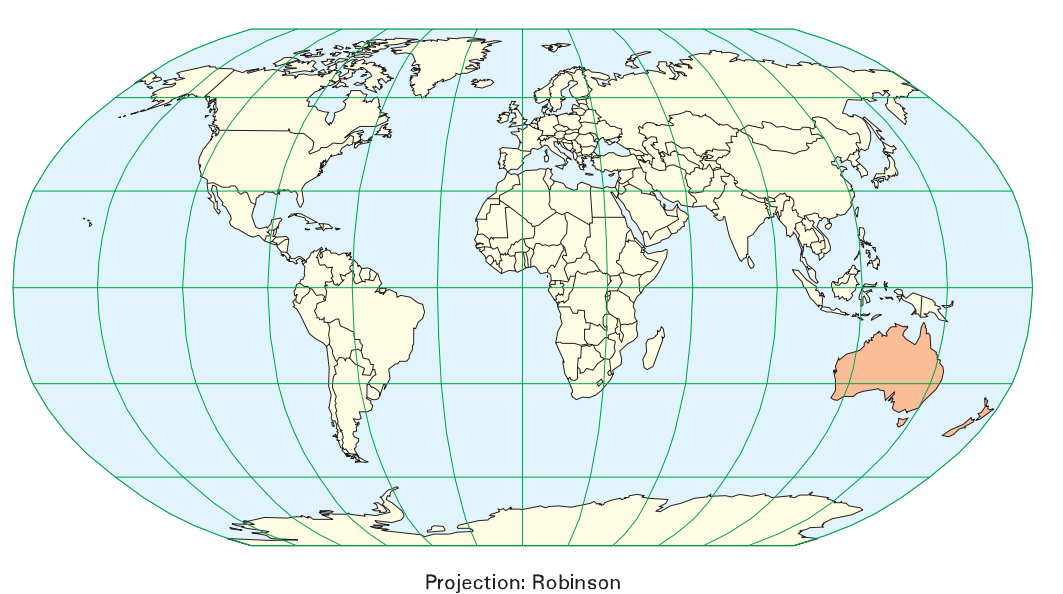
EXPLANATION

Age of rock units	Undivided Tertiary	Cenozoic
Q Quaternary	T Undivided Tertiary	Ca Cenozoic/Mesozoic
N Neogene	Tk Tertiary/Cretaceous	M Mesozoic
P Paleogene	KJ Cretaceous/Jurassic	MP Mesozoic/Paleozoic
C Cretaceous	JJ Jurassic/Jurassic	P Paleozoic
J Jurassic	JP Jurassic/Permian	PP Paleozoic/Precambrian
T Triassic	TP Triassic/Permian	
P Permian	PC Permian/Carboniferous	
C Carboniferous	CD Carboniferous/Devonian	
D Devonian	DS Devonian/Silurian	
S Silurian	SO Silurian/Ordovician	
O Ordovician	OC Ordovician/Cambrian	
C Cambrian	OCm Cambrian	
P Proterozoic		
A Archaean		

Specified rock type (Colored by respective age)

Es Eolian deposits	U Undetermined age	GB Geologic province boundary
V Volcanic rocks	S Surface water	PR Province code as red numeral
I Intrusive rocks	Geology not shown	OC Oil field centerpoint
O Ophiolites and ultrabasic rocks		GC Gas field centerpoint
		M Major city

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 - Petroleum Consultants International Data Corp., 1996. Petroleum Exploration and Production Database. Petroleum Consultants International Data Corp. Geneva, Switzerland.
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ABOUT THIS MAP

This digitally compiled map is part of a worldwide series of maps on CD-ROM released by the U.S. Geological Survey's World World Energy Project. The goal of the project is to assess the undiscovered, technically recoverable oil and gas resources of the world. For data management purposes, the world is divided into eight regions based on political boundaries, and corresponding approximately to the economic regions of the world as defined by the U.S. Department of State. This map covers the southern part of the Asia Pacific Region (Region 3) and includes Australia, Fiji, New Caledonia, New Zealand, Tonga and Vanuatu. Two additional maps of the Asia Pacific Region cover the Far East (Plate 1) and Southeast Asia (Plate 2) both to the north.

The region is divided into geologic provinces. Each province has a set of geologic characteristics that distinguish it from surrounding provinces. These characteristics may include the predominant lithologies, the age of the strata and the structural style. Some provinces contain multiple geologically-related basins. Klett and others, (1997) list all the provinces identified by the World Energy Project and rank them by known petroleum volumes. Offshore province boundaries are defined by the 3000 meter contour. Each province is assigned a unique number that begins with region number (3). Details of the map sources and compilation are given in the metadata file on the CD-ROM and at the lower left of this map. The geologic outcrops on this map are based primarily on the Geological Map of the World: Australia and Oceania by the Bureau of Mineral Resources (now Australian Geological Survey Organization) (1965 and 1967) and the New Zealand Geological Survey (Institute of Geological and Nuclear Sciences Limited) (1971). Some stratigraphic units are combined to simplify the map and to ensure consistency across the region. All rocks are colored by age. Sedimentary and metamorphic rocks are not differentiated whereas igneous rocks and their types are indicated by patterns superimposed on the appropriate age color. The centerpoint locations of oil and gas fields are plotted based on the locations in the Petroleum Consultants database (1996) with their permission.

This map is compiled using Environmental Systems Research Institute, Inc. (ESRI) Arc/Info software. Political boundaries and cartographic representations on this map are taken, with permission, from ESRI (1992); they have no political significance and are displayed as a general reference only. Portions of this database covering the coastlines and country boundaries contain intellectual property of Environmental Systems Research Institute, Inc. (ESRI), Copyright (c)1992 and 1996, ESRI. All rights reserved.

Projection: Lambert Conformal Conic with Two Standard Parallels at 10 degrees South and 30 degrees South Latitude
Central Meridian: 148 degrees East Longitude

MAPS SHOWING GEOLOGY, OIL AND GAS FIELDS, AND GEOLOGIC PROVINCES OF THE ASIA PACIFIC REGION

Plate 3: Australia and New Zealand

Compiled By

Douglas W. Steinshouer, Jin Qiang, Peter J. McCabe and Robert T. Ryder

1999

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