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**DEPARTMENT OF
NATIONAL RESOURCES**



**BUREAU OF MINERAL RESOURCES,
GEOLOGY AND GEOPHYSICS**

Record 1978/78



AUSTRALIAN ACTIVITIES IN THE FIELD OF STRATIGRAPHIC CORRELATION
1975-1978

by

Bureau of Mineral Resources, Geology and Geophysics, Canberra

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Research relating to stratigraphic correlation has been continued by State Geological Surveys, the (Federal) Bureau of Mineral Resources Geology & Geophysics, universities, and mining and petroleum exploration companies. Primary reconnaissance geological mapping at 1:250 000 scale is now virtually complete for all sedimentary basin areas, as is gravity coverage at the same scale. The interpretation of offshore areas of the Australian continent is well advanced, and papers have been published on almost all areas with known petroleum potential.

In 1976 the Australian Institute of Mining and Metallurgy published a volume on petroleum, containing reviews of Australia's prospective sedimentary basins, in its 'Economic Geology of Australia and Papua New Guinea' monograph series.

A detailed review of the stratigraphy of the State of Victoria is included in a monograph on the geology of Victoria published in 1976 by the Geological Society of Australia.

ACTIVITIES BY BUREAU OF MINERAL RESOURCES

Contributions to the stratigraphic atlas

The preparation of well correlation charts for the ESCAP stratigraphic atlas is continuing, and the project has been extended to include the preparation of explanatory notes to accompany the charts for each sedimentary basin. Charts and notes have been prepared for the Carnarvon, Laura, Sydney, Carpentaria, Karumba, and Bonaparte Gulf Basins; those for the Carnarvon and Laura Basins are in press. Work on charts and notes for the Money Shoals and Arafura Basins is under way.

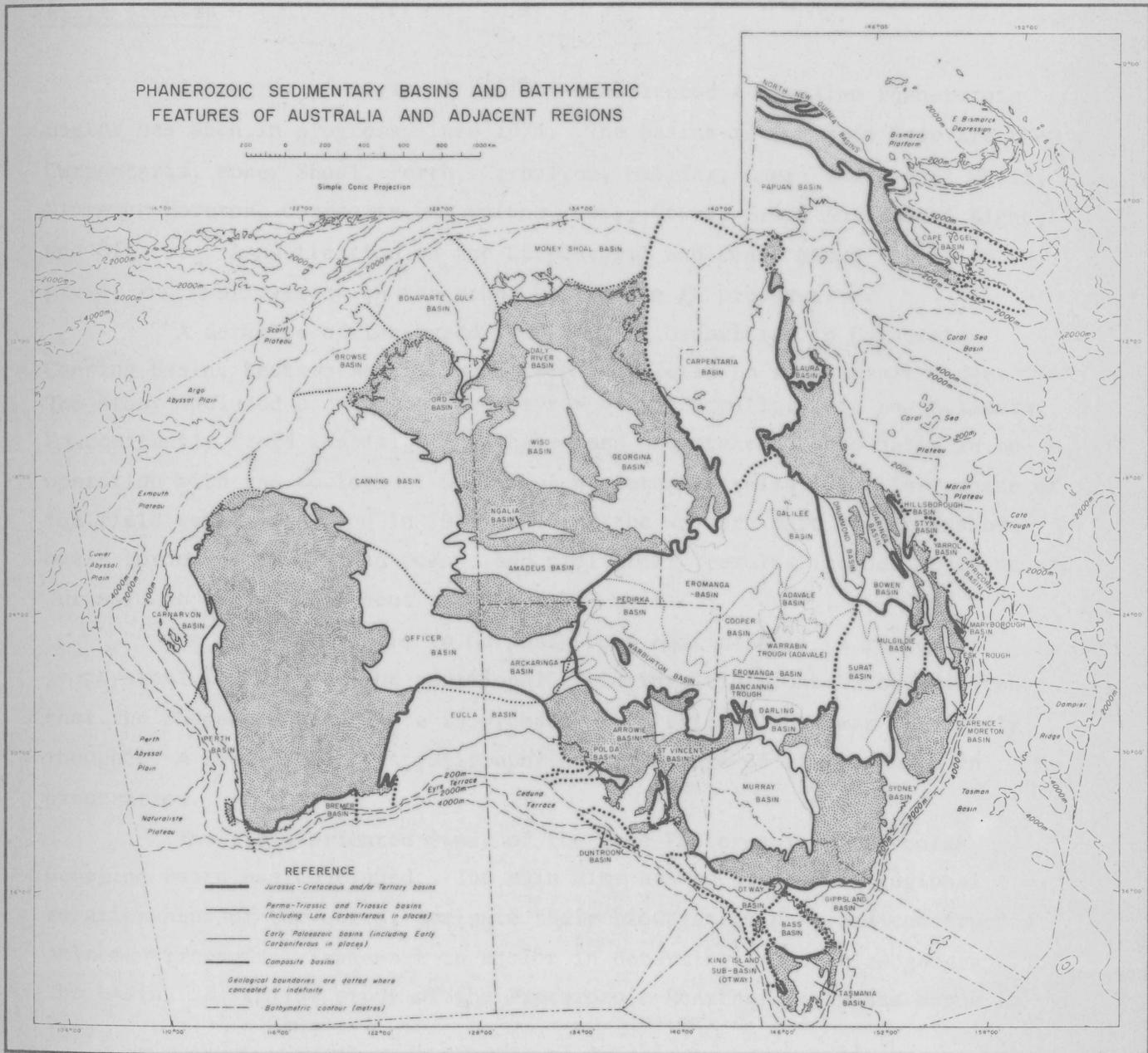
Stratigraphic correlation charts

A series of Australian Platform Cover correlation charts with an accompanying text was published in 1976. The charts summarise the stratigraphy of the major Australian basins that contain late Proterozoic to Holocene rocks. The lithology, maximum thickness, and environment of deposition

PHANEROZOIC SEDIMENTARY BASINS AND BATHYMETRIC FEATURES OF AUSTRALIA AND ADJACENT REGIONS

0 200 400 600 800 1000m

Simple Conic Projection



of each rock unit are shown. Brief notes are given on the major time-rock groupings, together with selected bibliographies. A correlation chart for the Permian System was published in 1976; one for the Triassic System is in press.

Basin studies

A program of regional reviews of selected Australian Phanerozoic basins has been in progress since 1974. The basins reviewed to date are the Carpentaria, Money Shoal, Perth, Carnarvon, Halifax, Laura and Torres Shelf, Clarence-Moreton, Capricorn, Gippsland, Bass, Otway, Great Australian Bight, and Officer. A publication on the Carpentaria and Money Shoal Basins is in press, and publications on the other basins are in preparation.

A detailed office-based study of the Ordovician to Cainozoic Canning Basin, Western Australia has been completed to first draft stage. The study included a comprehensive review of the stratigraphic nomenclature. Concomitantly field investigations have been undertaken in the basin in co-operation with the Geological Survey of Western Australia. The last phase of the field work, completed in 1977, covered the western part of the onshore basin bordering the Indian Ocean, and preliminary results include revision of Jurassic to Early Cretaceous stratigraphic units.

In the Proterozoic to Carboniferous Ngalia Basin, a review of geophysical information and additional field investigations have indicated that the Phanerozoic sequence is probably much thicker than was previously thought. A review of the stratigraphy and structure of the basin is in preparation.

The field-oriented study of the Late Proterozoic to Devonian Georgina Basin has continued. The main aims are to assess the regional relationships of the units, evaluate their biostratigraphy, and construct a palaeoenvironmental framework to assist in determining the palaeogeography of the basin. A similar study of the Proterozoic McArthur Basin was begun in 1977.

Magnetostratigraphic methods are being increasingly used to correlate poorly fossiliferous Late Proterozoic units between the southern Georgina, Amadeus, and Ngalia Basins.

ACTIVITIES OF STATE GEOLOGICAL SURVEYS

The Geological Survey of Western Australia published a Memoir on the geology of Western Australia in 1975. A Bulletin on the geology of the Perth Basin was published in 1976, and one on the Officer Basin, written in co-operation with the Bureau of Mineral Resources, is in preparation.

A surface and subsurface study of the Carnarvon Basin is in progress, and the Survey has been involved in a joint field-orientated project in the Canning Basin with the Bureau of Mineral Resources.

The results of work on the stratigraphy of the Proterozoic rocks in the eastern Bangemall Basin were published in 1976.

Recent publications of stratigraphic significance by the South Australian Geological Survey include: an investigation of the biostratigraphic significance of Proterozoic stromatolites from the Nabberu and Officer Basins, Western Australia; new and revised stratigraphic nomenclature for the Willunga Embayment of the St Vincent Basin, South Australia, and the first discovery of fossiliferous material in early Palaeozoic rocks of the eastern Officer Basin.

A 1:1 million geological map of South Australia is in preparation.

The Geological Survey of New South Wales is engaged in a study of the Silurian System in New South Wales, a study of the coal resources and stratigraphy of the Sydney Basin, and an assessment of the geology of the Mesozoic Eromanga and Surat Basins in New South Wales. Explanatory Notes for the 1:1 million scale Tectonic Map of New South Wales (1974) were published in 1976.

The Geological Survey of Tasmania published a 1:500 000 scale geological map of Tasmania in 1976.

The Geological Survey of Queensland has carried out a stratigraphic and facies investigation as part of a review of the hydrocarbon prospects of the Carboniferous to Triassic Galilee Basin, and has started a study of the Bowen Basin. The Survey published a 1:2.5 million scale geological map of the state in 1976.

COMPANY ACTIVITIES

Company activities related to petroleum exploration continue to make an important contribution to Australian stratigraphy, particularly in the sedimentary basins which lie off the northwest coast of Australia. Recent papers published by Woodside Petroleum Development Pty Ltd include stratigraphic information from the Browse, offshore Canning, and northern offshore Carnarvon Basins.

In the field of biostratigraphy, Esso Australia Ltd, in 1976, published correlations of foraminiferal, dinoflagellate, and spore-pollen assemblage zones of the offshore Gippsland Basin, off the southern Australian coast, with the Geological Time Scale. Changes from previous correlations included that of the position of the Cretaceous/Tertiary boundary.

In the onshore area, company geologists (Mines Administration Pty Ltd) are reviewing the Adavale Basin in Queensland. An interim report includes changes in stratigraphic interpretation.

MAPS OF SEDIMENTARY BASINS

The 1:2.5 million Geological Map of Australia published in 1976 shows basement contour information for offshore sedimentary basins, and typical well sections. A map at 1:10 million scale showing sedimentary basins is being prepared by the Bureau of Mineral Resources, Canberra. It will show basins by age of inception, their thickness, and regional tectonic features.

FOSSIL REPOSITORY

The repository of topotype material of regionally important index fossils, established at the Bureau of Mineral Resources, Canberra, was expanded during the period; lists of material in the collection have been circulated to countries in the ESCAP region.

PALAEONTOLOGICAL STUDIES

Biostratigraphical studies of many fossil groups by personnel from government organisations, universities, and companies have continued. Systematic studies have been made on virtually all fossil groups; many of the studies concern biostratigraphical correlation, particularly application of the Europe systems and stage boundaries in Australia. Although studies have ranged throughout the geological time scale, particular advances have been made in studies of late Mesozoic and Cainozoic fossils of the coastal and offshore areas, and in Precambrian palaeontology.