

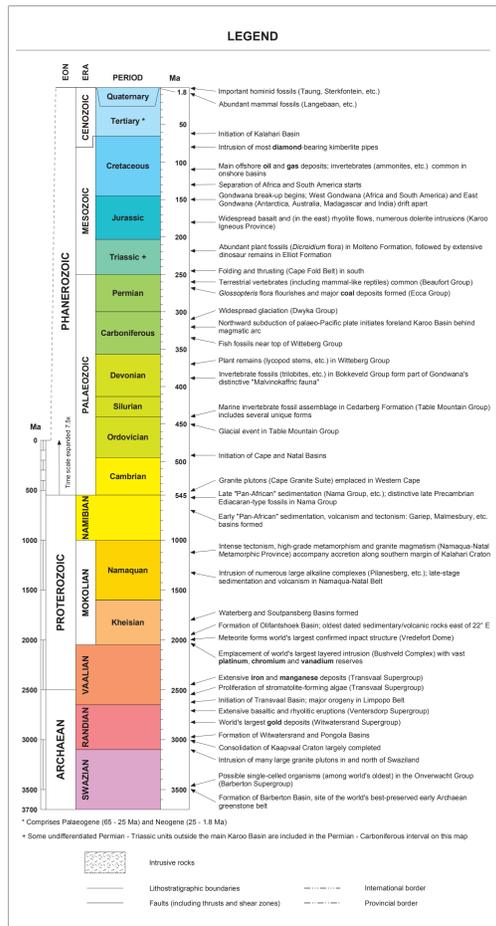
CHRONOSTRATIGRAPHIC MAP OF THE REPUBLIC OF SOUTH AFRICA AND THE KINGDOMS OF LESOTHO AND SWAZILAND

2008

1:2 000 000



Projection: Albers Equal Area
Central meridian: 24° E
Standard parallels: 20° S, 30° S



NOTES ON THE CHRONOSTRATIGRAPHIC MAP OF THE REPUBLIC OF SOUTH AFRICA AND THE KINGDOMS OF LESOTHO AND SWAZILAND

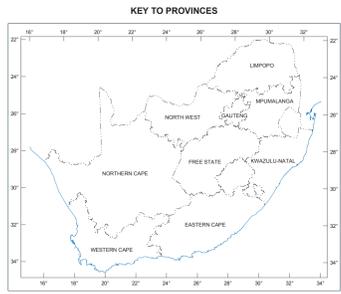
With the completely digital production of the 1:1 000 000 scale geological map, the task of compiling a chronostratigraphic map for South Africa became considerably easier than it would have been in the past. The data used in the production process were captured using a Geographical Information System (GIS) and certain full attributes relating to the stratigraphy and lithology of the various geological units on the map. The data are stored in a GIS database for use in other projects.

For this project, an important initial task was deciding on the cut-off points of the age groupings to be shown on the map. Once this had been done, the chronostratigraphic map could be created simply by assigning each of the existing lithostratigraphic units to the correct time interval. Different colours, ranging from purple/red for the oldest to blue for the youngest, were then allocated to each of the relevant time intervals. The original lithostratigraphic boundaries were retained as background lines on the chronostratigraphic map. In order to provide a quick visual impression of the extent of intrusive igneous activity within each time interval, a distinctive ornamentation has been used to highlight the intrusive rocks.

In the Archaean and Proterozoic Eons the standard local eras and periods were used as the primary time divisions, since they correlate better with the local geology than the international subdivisions. The Namaquan has, however, been combined with the Cambrian in view of the fact that a number of units have ages close to or straddling the boundary (e.g., the Cape Granite Suite). In the Phanerozoic, the Ordovician, Silurian and Devonian Periods form a convenient grouping extending from the base of the Table Mountain Group to the top of the main quartzite unit of the Witteberg Group (i.e., the Witpoort Formation). The boundary between the Carboniferous and Permian Periods falls somewhere within the Dwyka Group, making it necessary to combine them as well. The Permian-Triassic boundary conveniently coincides with the contact between the Adelaide and Tarkastad Subgroups of the Beaufort Group in the main Karoo Basin, but in the small Karoo basins to the north this boundary is unclear and the undifferentiated Permian-Triassic strata in these basins have been arbitrarily assigned to the Permian-Carboniferous interval. The base of the extensive Clarens Formation is a reasonably close approximation of the top of the Triassic. The Jurassic and Cretaceous successions are generally quite distinct except that in the Algoa Basin and its equivalents further west the Kirkwood Formation (Uitenhage Group) may straddle the boundary; all of it has here been assigned to the Cretaceous Period.

A list of the main geological and palaeontological events in South Africa's geological history has been combined with the legend. The ages of these events, relative to the time scale, have been indicated, and it can be seen that there are no major gaps present, with all the eras (in the Precambrian) and periods (in the Phanerozoic) being represented. In other words, South Africa has a fairly continuous geological record covering some 3600 million years. Special emphasis has been placed on South Africa's mineral wealth, and the restricted time slots in which the country's extensive gold, iron, manganese, platinum, chromium, coal and diamond deposits formed can be clearly seen. While the terrestrial vertebrate fossils (reptiles, mammal-like reptiles and amphibians) in the Karoo Supergroup and hominid remains in cave deposits such as Sterkfontein and Swartkrans are world famous, there are many other important fossil-bearing units and the most significant of these have also been noted.

It is anticipated that this map will prove to be particularly useful to students, overseas visitors and non-geologists wanting a bird's-eye view of the distribution of rocks of different ages in South Africa without getting bogged down in the details of lithostratigraphic nomenclature. As mentioned above, the lithostratigraphic contacts as they appear on the 1:1 000 000-scale geological map have been retained and those wishing to know the name of a specific unit within a certain age band can obtain this information by referring to the geological map.



Compiled by: M.R. Johnson and L.G. Wolmarans
 Cartographically prepared by: C. Thomas
 Copies of the Map (also in digital format) are obtainable from the Council for Geoscience, Private Bag X112, Pretoria, 0001. <http://www.geoscience.org.za>
 COPYRIGHT: COUNCIL FOR GEOSCIENCE 2008



Council for Geoscience