

Mars-Oz at Arkaroola: A Prime Australian Site for Mars Analogue Field Research

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Mars Society Australia has selected the Arkaroola region in South Australia as its prime area for Mars analogue research. The region is accessible by road and air from Adelaide, the capital of South Australia. Much of the central part of the region is held under private leasehold as a wilderness sanctuary. The lessees are highly supportive of scientific and technological research. The region and its hinterland have a diversity of geological and astrobiological features of interest for Mars research and Mars exploration.

These include:

GEOLOGY

- Modern and ancient (Neoproterozoic, Carboniferous) hydrothermal systems;
- Gravel outwash plains of the present desert environment;
- Late Proterozoic Wooltana Basalt with localised quartz-haematite breccia veins;
- Neoproterozoic evaporitic non-clastic and minor carbonate sediments Of the Callanna and Burra Groups;
- Pre-Cretaceous weathering surfaces;
- Cretaceous marine shoreline deposits;
- Playa lakes
- Artesian springs;
- Dune fields;
- Iron, silica, carbonate and sulphate duricrusts;
- Pleistocene high level gravels of fans and pediments, and
- Holocene creek gravels.

BIOLOGY AND PALAEOONTOLOGY

- Modern extremophile populations in uranium and sulphide mineralisation;
- Extremophiles associated with radioactive hydrothermal springs;
- Playa lake microbial communities;
- Microbiotic soil crusts;
- Cryptoendoliths;
- Desert varnish;
- Neoproterozoic stromatolites;
- Possible fossil “deep hot biosphere” bacteria in Neoproterozoic vein systems, and
- Possible microfossils in Carboniferous hydrothermal sinters.

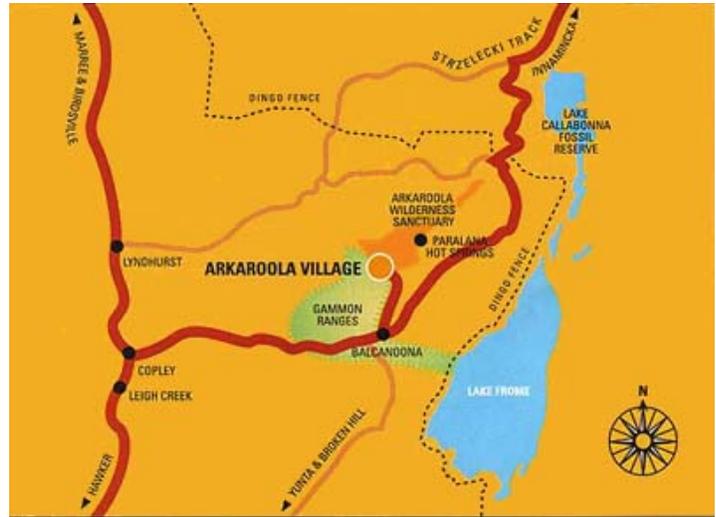
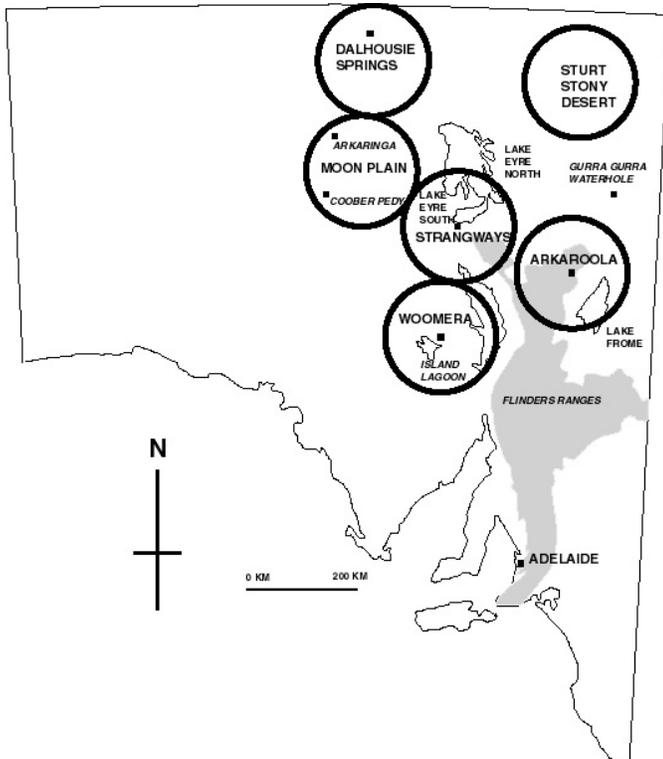
The diversity of rock types and regolith materials provides an ideal test bed for remote sensing systems and ground instruments. The range of terrain provide excellent opportunities for testing Mars related exploration systems in particular the proposed Australian simulated Mars base - Mars-Oz.

The Arkaroola Region

Arkaroola is located in the northern Flinders Ranges in South Australia.

It is 8 hours drive from Adelaide in South Australia.

MSA selected the Arkaroola region over five other areas in central Australia as its prime region for Mars analogue research on the basis of its scientific interest, accessibility, and suitability for a range of engineering and social psychological field research.



Map of the Arkaroola region showing the village, wilderness sanctuary Parralama hot springs and lake Frome

Five other areas in central Australia assessed by MSA as possible Mars analogue research sites and Arkaroola.



Aerial view of the eastern margins of the Flinders Ranges and the adjacent Lake Frome Plain.



• Eastern margins of the Flinders Ranges showing dissect alluvial fan surface

Some features of Arkaroola



- The Lake Frome playa system with artesian springs and the Strzelecki Desert behind.



- A 650 million year old stromatolite. Will we find them on Mars?



- Ripple-cross laminated sandstone, similar to samples found at Meridiani Planum



- Paralana radioactive hot (80°C) artesian spring supporting specialised microbiology



- Sief dunes of Sturts Stony Desert



- The prime Mars-Oz site, looking north west. In the foreground are Neoproterozoic basalts (Woolana volcanics), while the hills in the distance are Sturtian tillites.

