

## NSW karst environments – the treasure chests of time

### What is karst?

Karst is a distinct landform shaped largely by the dissolving action of water on carbonate rock such as limestone, dolomite and marble. This process typically occurs over thousands or millions of years, resulting in a variety of unusual surface and below ground features such as arches, gorges, sinkholes, underground streams, passageways and caves. These features interact with the surrounding environment to produce complex ecosystems containing highly specialised plants, animals and micro-organisms.

Karst landforms (or environments) may contain significant economic, scientific, educational, recreational and aesthetic values, which are highly sensitive to pollutants and human disturbance. On the surface, their thin layers of soil make them susceptible to weed infestation and erosion, while in the caves below, the myriad of solution tubes and water filled fissures can quickly spread pollution and disease.

Unfortunately, there are relatively few places in Australia, if not the world, where the opportunity to safeguard pristine karst environments remains. However, improved management practices coupled with the appropriate legislative and statutory controls, are helping to correct past problems and restore natural systems and ecology.



Glory Arch Yarrangobilly, ©Gary K.Smith

### Nature's timekeepers

The analysis of rocks, soils, bones and other materials (nature's archives) found in karst environments is commonly undertaken to establish timescales and events in the Earth's history. It also provides scientists with the opportunity to plan for future events such as the impacts of climate change or major drought. The removal or destruction of these archives may limit our capacity to understand natural processes and their role in shaping the landscape.



Megafauna skeleton, Karst and Geodiversity Unit, DECC

### A window to the past

Karst environments are nature's time capsules, capturing and preserving evidence of past events. Palaeontological discoveries in European cave systems during the eighteenth and nineteenth centuries revealed the first evidence of climate change through the study of fossils and animal remains, while ancient rock paintings depicting animals and hunting scenes have provided many clues on past ecology and civilisations. In this sense karst environments provide a window to the past and contain the following key elements:

- **Cross-sectional views of geological structures.** Used in geological and landform studies (i.e. rate of mountain building and valley incision).
- **Subterranean voids and complex surface features.** Studies of fossils found in or near these features have revealed much about the evolution of life, past environments and ecology, habitats, extinction events and major geological episodes.

Karst environments of NSW are among the oldest and most complex in the world. They are nature's time capsules, capturing and preserving evidence of past events.



# geoLOGIC

NSW karst environments –  
the treasure chests of time



Cave formation. ©S.Babka

- **Mineral deposits including calcite stalagmites and stalactites.** Used in climate studies and to establish major events such as prolonged drought and floods.
- **Human remains and other undisturbed archaeological materials.** Karst features such as caves, arches and springs have become focal points for past and present human activity and provide evidence of Aboriginal and European use.
- **Habitat for endangered plant and animal species and communities.** Karst environments provide habitats for a variety of plant and animal species that are unable to survive elsewhere. These species are often referred to as living fossils because of their unique anatomy and prehistoric origins.
- **Natural processes and systems.** Karst environments provide scientists with an insight into natural processes/systems, which are integral to ecosystem maintenance. Parameters such as air, water and temperature are easily measured in the relatively stable cave environment.

## Karst in New South Wales

There are more than 400 separate limestone deposits in New South Wales (NSW), which display some or many of the unusual features we expect to see in karst environments. Approximately 100 of these deposits are cavernous, containing caves large

enough for a person to enter. These cavernous karst environments range in size and significance from small outcrops with a few small caves and sinkholes, to karst landscapes with multiple surface features and hundreds of caves.

The karst environments of NSW are amongst the oldest and most complex in the world. Their significant age, combined with a considerable geographical and topographical spread, indicates that they have been exposed to an extensive range of natural processes. As a result, the karst environments of NSW provide numerous opportunities for researchers to study a broad spectrum of subjects in a wide variety of local settings.



Flora on karst. Karst and Geodiversity Unit. DECC

Although scattered and relatively small by world standards, the diversity and beauty of NSW karst environments attracts close to half a million visitors from around the globe every year including tourists, cave explorers and artists. They also have special meaning to Aboriginal people as sources of food and shelter and places of ceremony.

The protection and conservation of karst environments (and related features and processes) is a priority of the NSW Government. Close to half of the State's cavernous karst environments are protected in conservation reserves and national parks, with 13 of these located in world heritage listed properties. Karst conservation reserves, which recognise the unique management requirements of these environments, have also been established at Jenolan, Abercrombie, Wombeyan and Borenore caves, and together with the other reserve categories, will ensure their on-going benefit, use and appreciation by the community.



Published by: Department of Environment and Climate Change NSW  
59–61 Goulburn Street, PO Box A290, Sydney South 1232  
Phone: (02) 9995 5000 (switchboard)  
Phone: 131 555 (environment information and publications requests)  
Phone: 1300 361 967 (national parks information and publications requests)  
Fax: (02) 9995 5999 TTY: (02) 9211 4723  
Email: [info@environment.nsw.gov.au](mailto:info@environment.nsw.gov.au)  
Website: [www.environment.nsw.gov.au](http://www.environment.nsw.gov.au)

Department of Environment & Climate Change NSW

