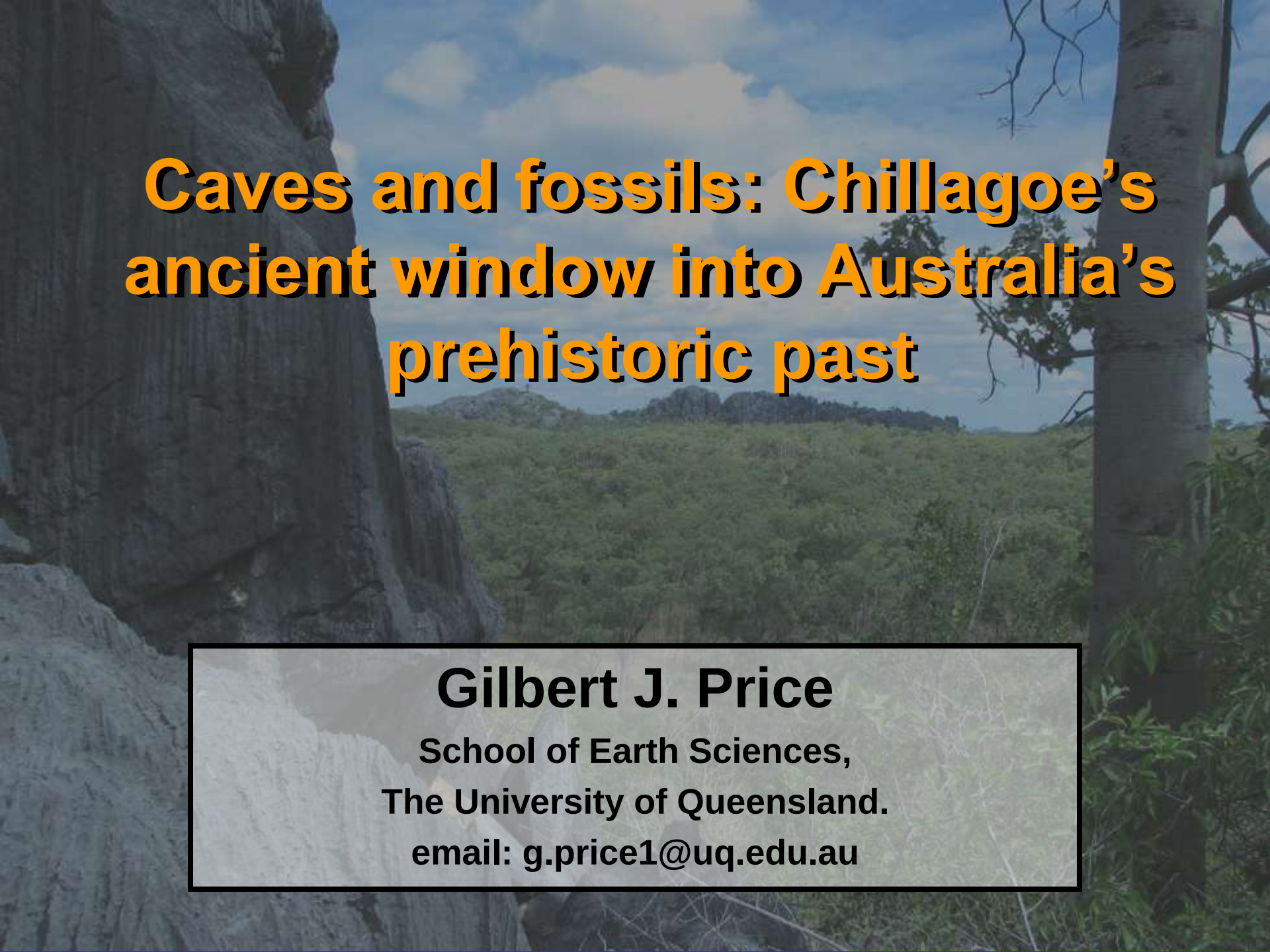




Caves and fossils: Chillagoe's ancient window into Australia's prehistoric past

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Chillagoe's fossils

Devonian limestones (ca. 400 million years)

Corals, brachiopods, bivalves

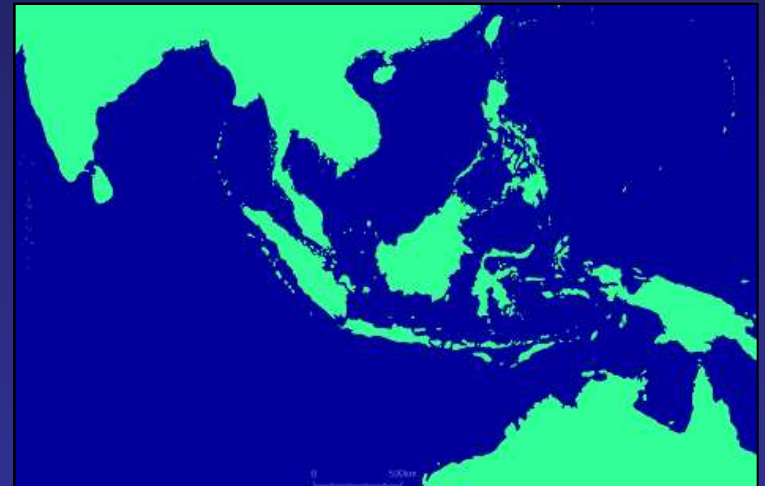
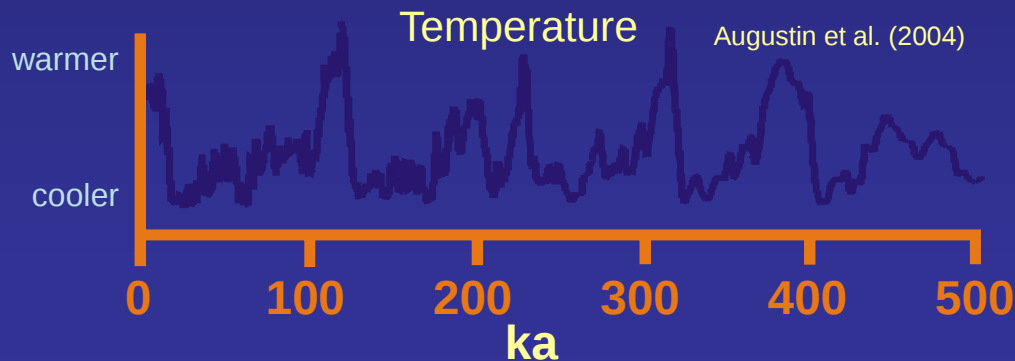
Quaternary deposits in caves
(last 2.6 million years to present)



>50 known sites in northeastern Queensland

Quaternary climate change

Divided into the: Pleistocene (2.6 million to 11 thousand years ago)
Holocene (last 11 thousand years)



Sea level fluctuations

Glacial and interglacial cycles (the 'Ice Ages')

Modern climate change



Global warming



Carbon dioxide



Water cycling



Melting glaciers
Rising sea levels



Enhanced climatic
variability



Statistics of extinction

Australian extinctions since European settlement:



Australian mammals account for ~50% of global extinctions

Biodiversity crisis? **YES**

So what are we doing about the modern biodiversity crisis?

Identifying the driving factors and risks

Development of conservation strategies

Food requirements

Home range / territory size

Predation / competition factors

Reproductive biology

Social behaviour and role in population size

Seasonal changes

Size of surviving population

Population genetics

Climate change modeling



Understanding of change from short-term records?

The ultimate goal

Predicting how things might change into the future



Modelling

GIGO Principle (Garbage In, Garbage Out)

Tells us what life **COULD** be like

Important, but only part of the basis for effective conservation

The value of the fossil record

Fossil record only empirical means of assessing long-term faunal responses to climate change

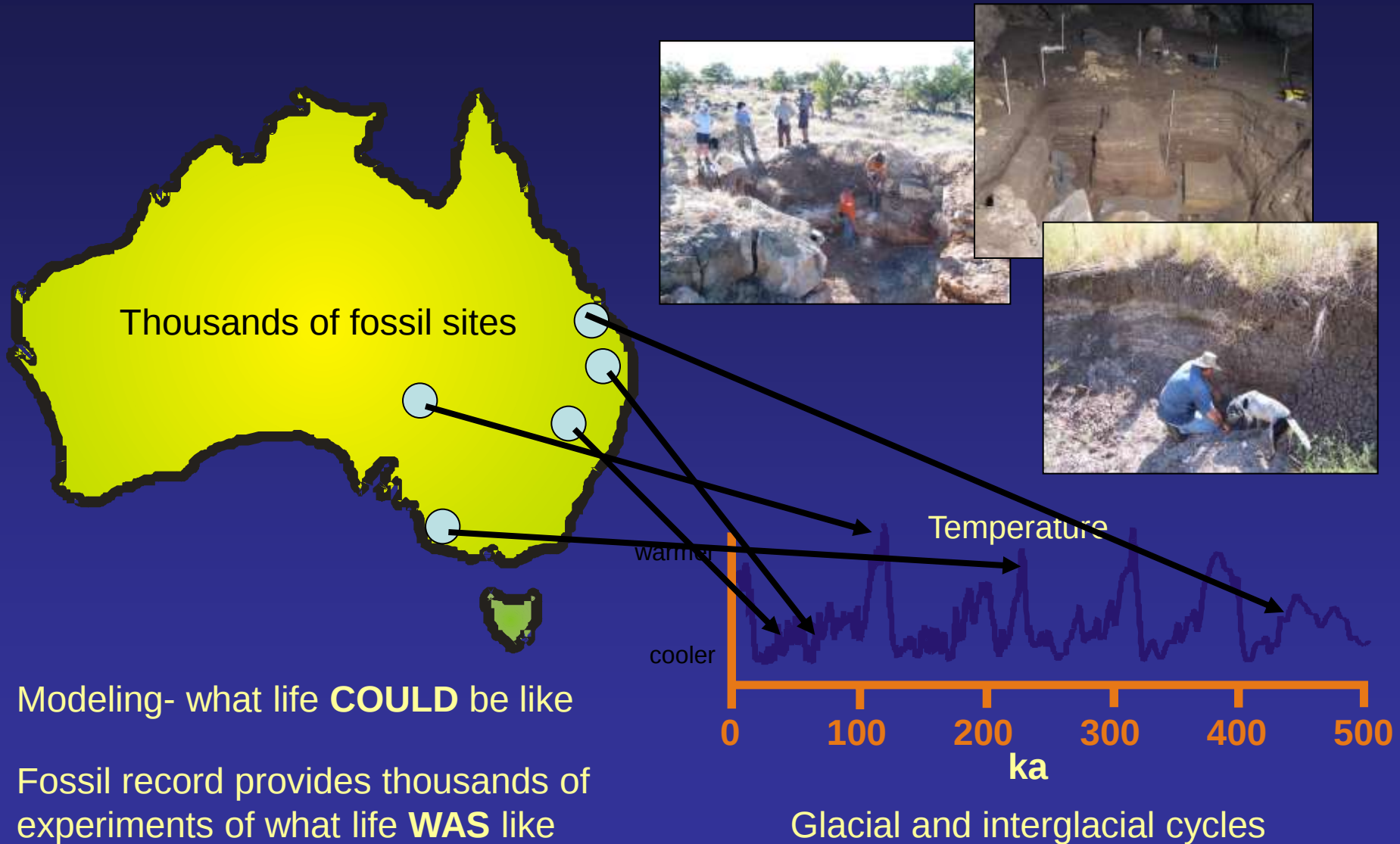


Conservation in the 4th dimension: **TIME**

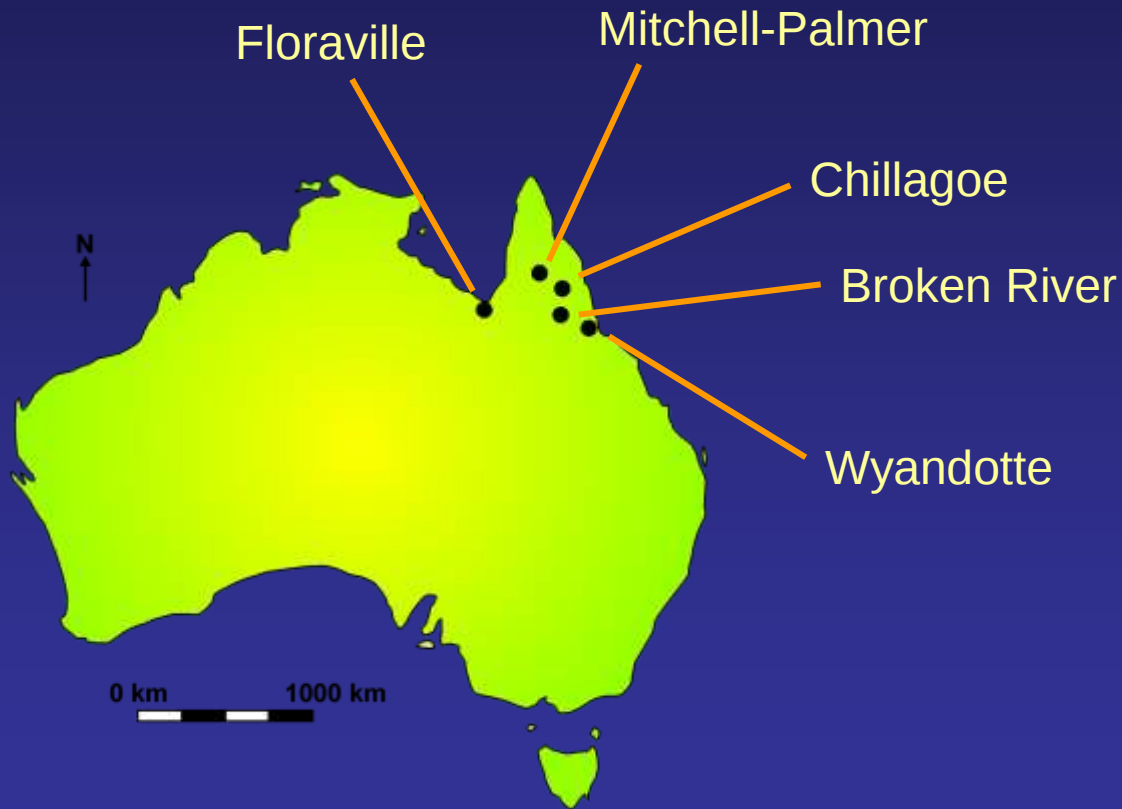
The most important tool for understanding **CHANGE**



Fossil record



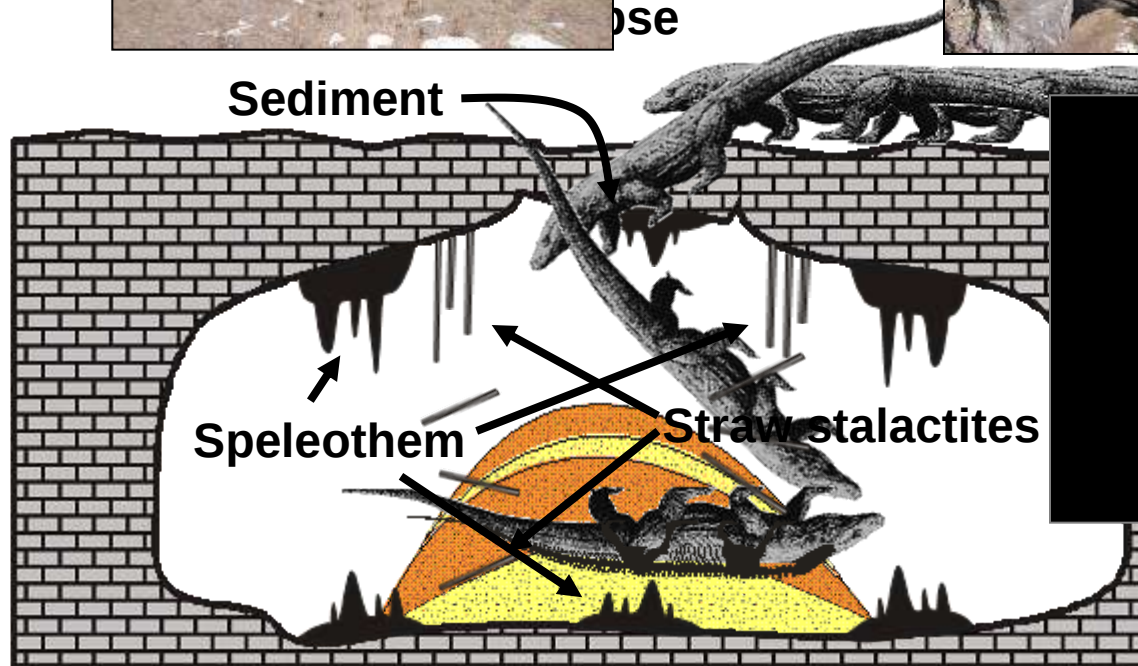
Fossil sites around Chillagoe



Every cave produces fossils!!

How to get into caves

Taphonomy

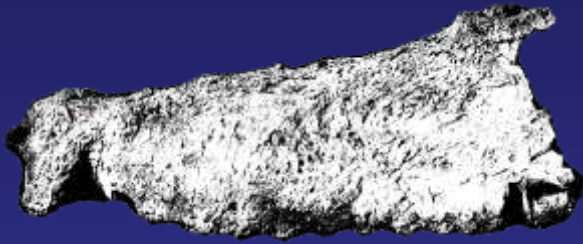


Capricorn Cave, Chillagoe



Chillagoe's unique Quaternary fauna

Quinkana fortirostrum
Land crocodile



Chillagoe's unique Quaternary fauna

Propleopus chillagoensis:
Giant carnivorous rat kangaroo



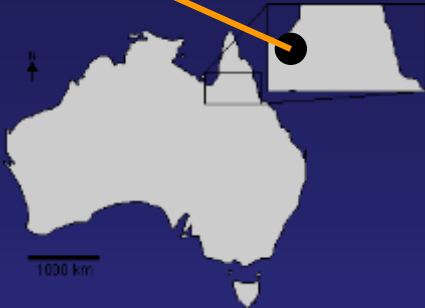
Musky rat kangaroo



We need to develop a greater understanding of Chillagoe's prehistoric faunas

Other areas in northeastern Australia

Floraville



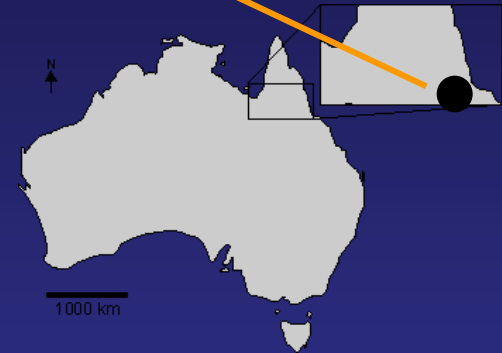
Diprotodon

Age unknown

Other areas in northeastern Australia



Wyandotte



Meiolania platyceps- Giant horned land turtle



Time of extinction???

The region is crying out for attention!

New research

The University of Queensland
Queensland University of Technology
Queensland Museum
University of New South Wales

With the assistance of the
Chillagoe Caving Club



Targeting new records and dating of deposits



Brown bandicoot
(*Isoodon obesulus*)



New research

New species

Jonathan Cramb, QUT



Leggadina



Pseudomys



New research

New records and dating

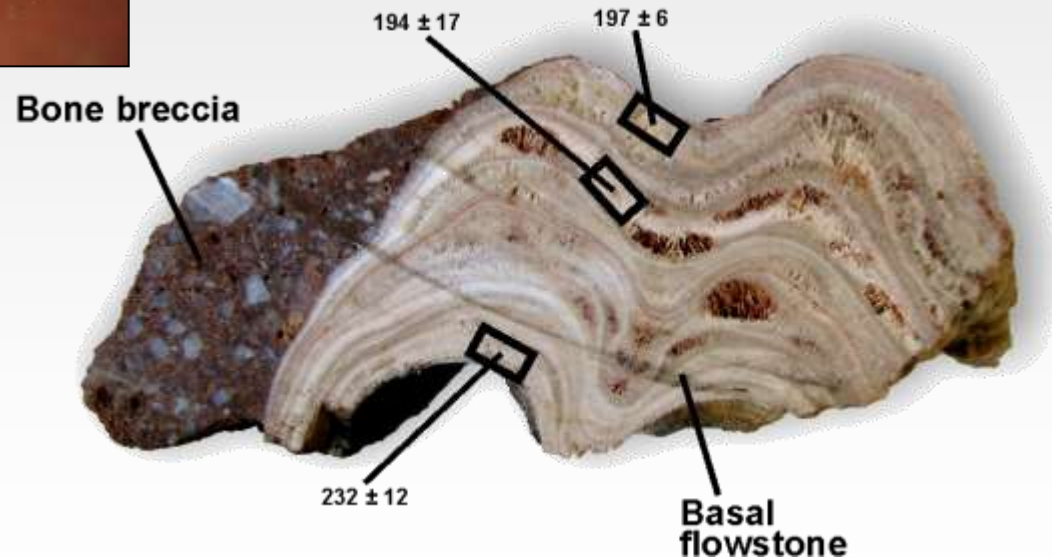
Notomys
Hopping mice



Chaeropus
Pig-footed bandicoot (now extinct)



Uranium/Thorium (U/Th) dating

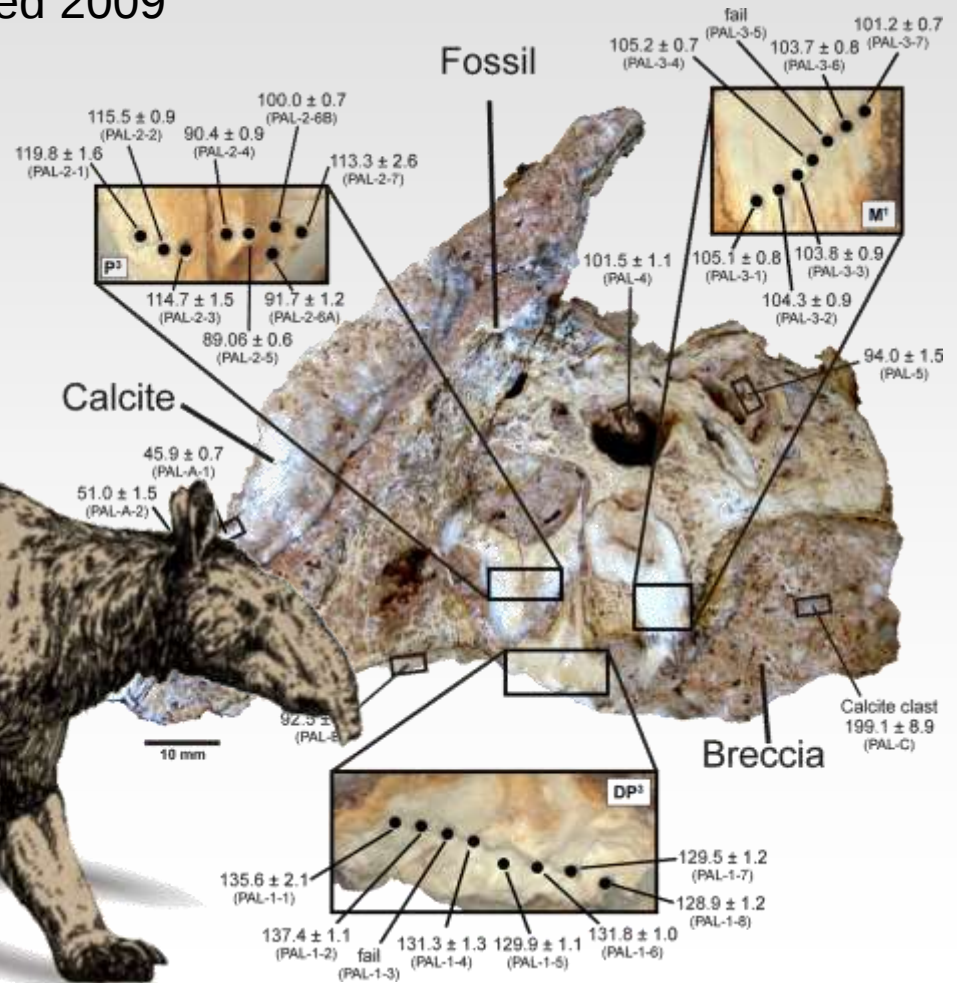


Arid environment at Chillagoe?

New research

Tea Tree Cave marsupial 'tapir'

Collected 1977, rediscovered and dated 2009



New research

New sites

Floraville



Diprotodon



Great forest wallaby
(*Protemnodon*)

Broken River (CCC)

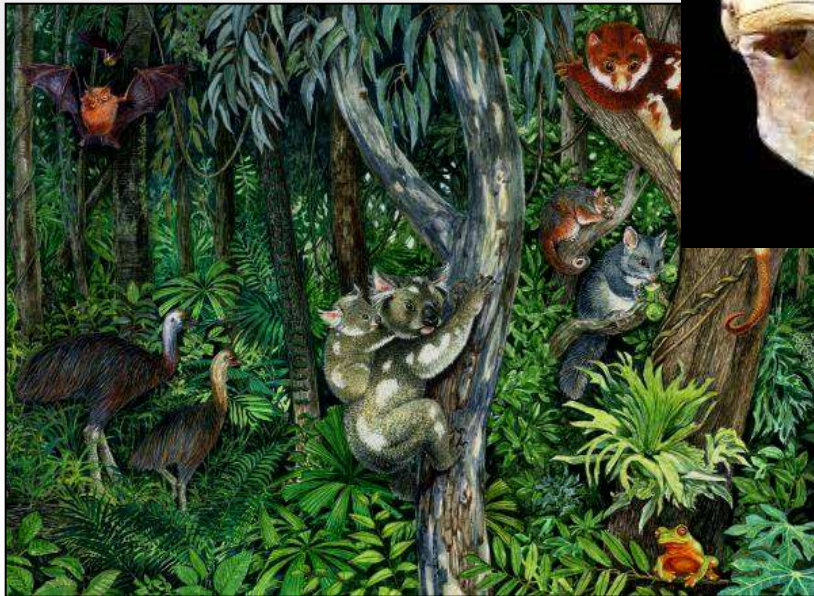


Significance

Riversleigh- north of Mt Isa

World Heritage listed fossil site

Spans 3-25 million years ago



Riversleigh cannot answer questions about Quaternary climate change and species response(s) in northeastern Australia...

But Chillagoe and its surrounds can!

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