

Biological Weathering – Teacher Notes

Weathering is a **destructive** process



The number of people visiting Karijini National Park in the Hamersley Range has increased dramatically over the last ten years. Australian native animals are soft footed and their impact is minimal. Humans are more destructive. Not only do they dislodge rocks exposing underlying strata to weathering but their impact kills vegetation making the area more prone to erosion.

Which biological weathering agent caused the development of the path? **Humans – tourists to Karijini**

What can be done to stop this damage? **Exclude people. Move paths elsewhere. Stabilise path with concrete or wood to reduce impact.**

What will happen if this weathering is allowed to continue? **Erosion by wind and rain will expand the pathway. There are already signs asking visitors to stay on the paths. These are not always followed.**

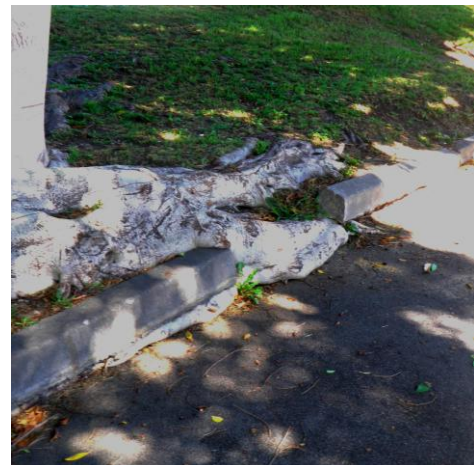
Which biological agent is causing the break-up of the path?

The invasive root of the Moreton Bay fig tree which was planted twelve years previously

What can be done to stop this damage? **Remove the tree. Redirect the pathway.**

What will happen if this weathering is allowed to continue?

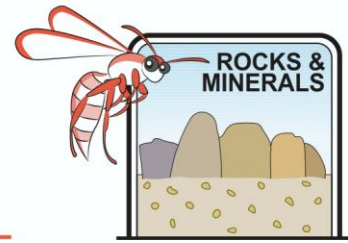
The expanding root system will further crack the concrete and tarmac exposing the underlying material to weathering by wind and water



Weathering in this cave is caused by bats.

This cave is in a breakaway east of Geraldton

How could bats cause the breakdown of rock?
Bats (Chiroptera) roost in this cave. Being living things, bats urinate and defecate. Although most of their droppings are the hard exoskeleton of their insect diet the urine and faeces combine to stain and chemically break down rock over time.



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Is biological weathering always damaging to rock? **No.**

Are there any positive results from biological weathering? **Biological weathering is an essential part of the production of soil. Soil is essential for the maintenance of life on Earth. It is the basis of the food chain on land.**

Over the 70,000 years since the end of the last Ice Age the number of humans on our planet has expanded from possibly 20,000 people to 7.089 billion in mid 2013 (US Census figure).

Describe four ways human activities can cause changes in weathering patterns.

Agriculture changing soils and hooved creatures impacting it. Salinity changes due to agriculture.

Acid rain from burning fossil fuels.

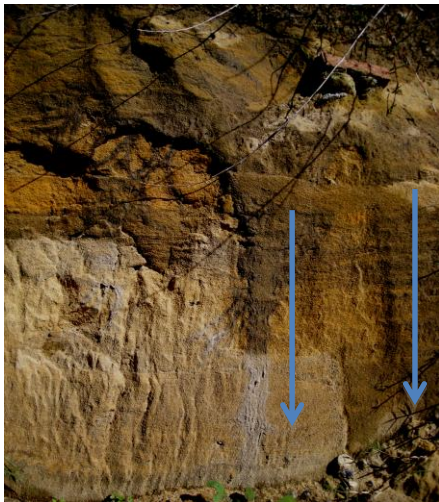
Mining breaking and moving rocks.

Runoff from roads.

Building using rocks, sand and bricks (baked clay).

Roads & railways exposing rock, moving rock and changing waterways.

Global climate change increasing rate of chemical breakdown and weather pattern change.



Biological weathering of limestone in coastal Tamala Limestone near Fremantle

This picture demonstrates how grass root systems and dead grass can break down solid limestone and turn it into soil. Humic acid is created from rotting vegetable matter. The acid reacts with the limestone.

The blue arrows lie to the right of major roots. Since living things are based on the element carbon, dead material appears darker. A lighter zone lies under the left root where humic acid has penetrated and reacted with the limestone. Once this has broken down it will be colonised by extensions of the root.