
LIVING ON THE EDGE

Mangrove Habitats of Northern Australia



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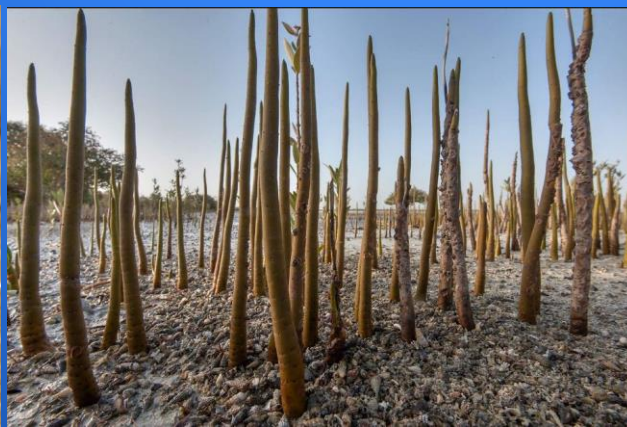
LIVING ON THE EDGE

Mangrove Habitats of Northern Australia



A Sense of Place
AGTA Conference – Mini Fieldtrip
3 October 2024

- Mangrove plants – how do they live where they do?
- The importance of mangroves
- Current threats to mangroves – global & local

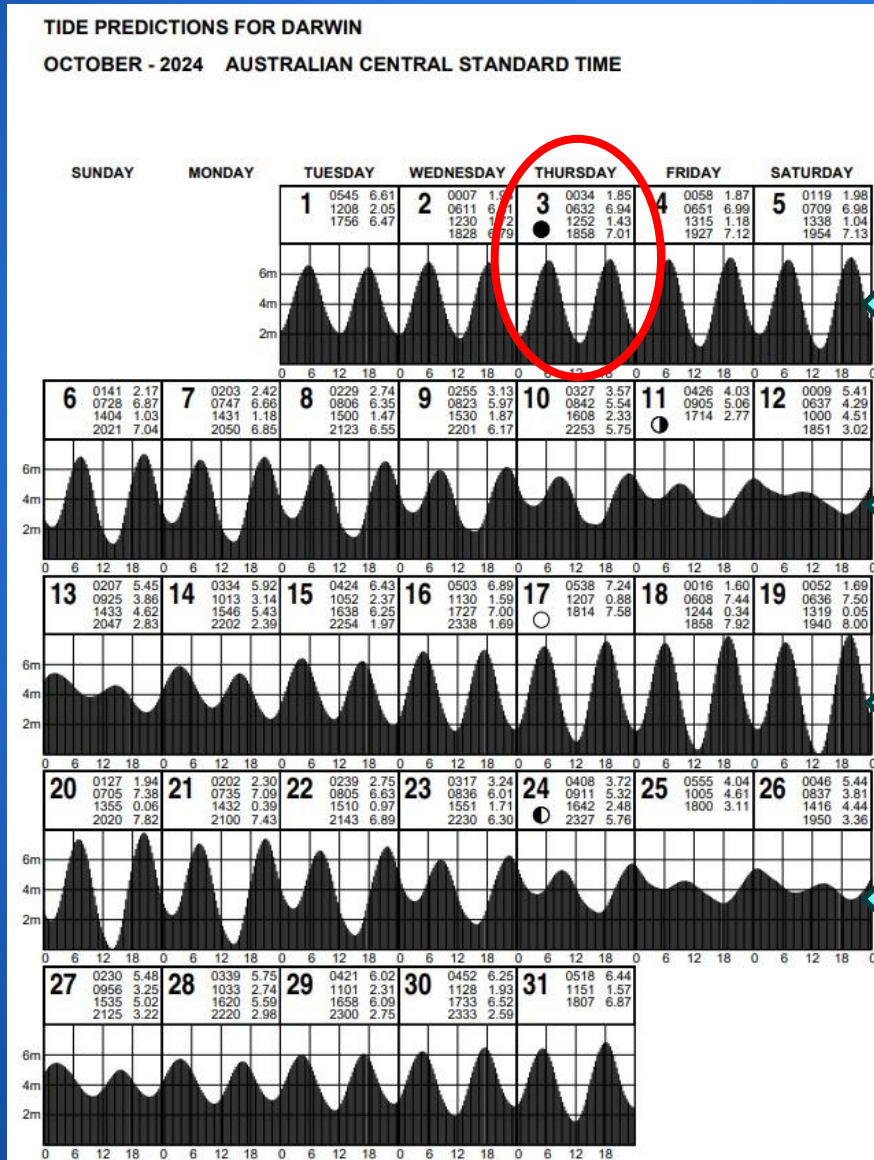


What are mangroves?

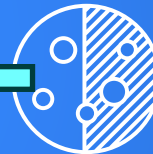
- ❖ Mangroves are a diverse collection of land plants
- ❖ Big challenges – salt, deep mud, waterlogging & daily tides
- ❖ Unique adaptations for life in a continually changing environment



Tides and the Moon ..



Spring tides – New moon



Neap tides – Half moon



Spring tides – Full moon



Neap tides – Half moon

Low tide in the Rhizophora zone



High tide in the Rhizophora zone





High tide in the seaward zone



An amazing variety of life forms



Mangrove fern



Mangrove mistletoe



Mangrove palm



Succulent



Mangrove couch grass

Mangroves have an amazing variety of flowers



Large-leaved mangrove
Bruguiera gymnorrhiza



Holly-leaf mangrove
Acanthus ebracteatus



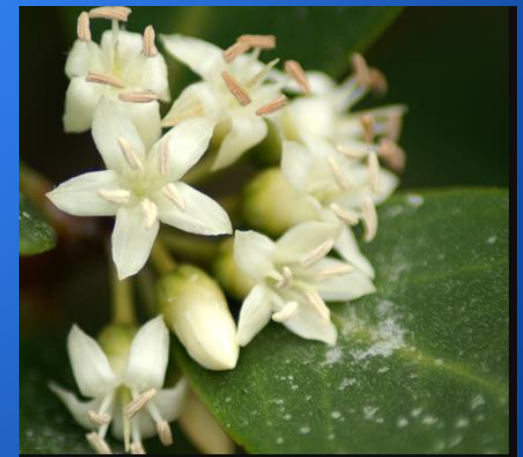
Apple mangrove
Sonneratia alba



Black mangrove
Lumnitzera racemosa



Red-flowerind black mangrove
Lumnitzera littorea



River mangrove
Aegiceras corniculatum

... and extraordinary fruits



Large-leaved mangrove
Bruguiera gymnorrhiza



Apple mangrove
Sonneratia alba



River mangrove
Aegiceras corniculatum

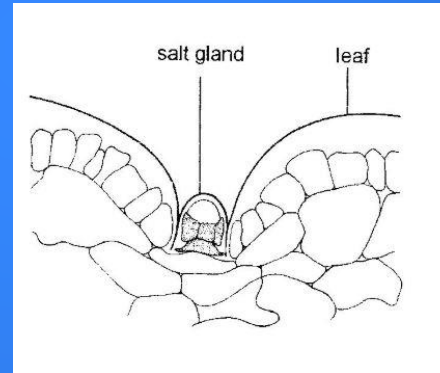


Silver-leaved mangrove
Avicennia marina



Ceriops tagal

Living in sea water is extremely challenging



Salt glands in leaves get rid of excess salt

Living in soft mud and unstable substrates is tricky



Prop roots

- support tall trees in unstable mud

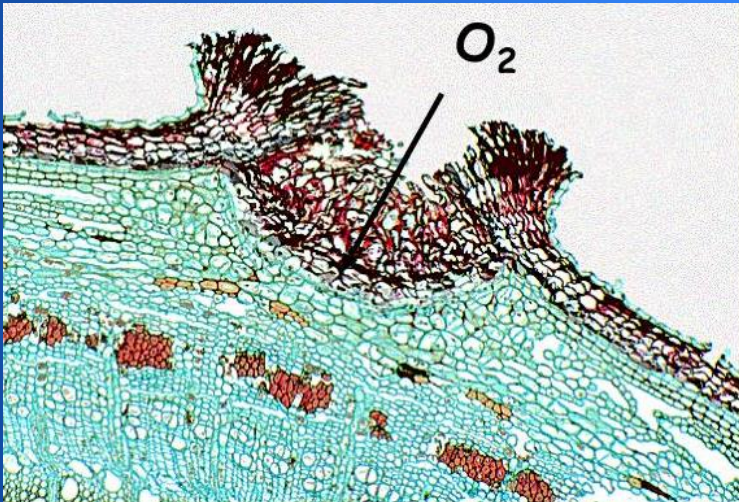


Buttress roots



Waterlogging is a big problem..

Trees and roots 'breathe' air through tiny pores or holes



A lenticel or 'breathing pore'

Lenticels



Specialised air-breathing roots...



Pneumatophores = air-breathing roots
- aerate the roots in oxygen-poor soils



- Vivipary (“live birth”) a unique strategy for reproduction



Seeds or “propagules” germinate while attached to the parent tree..
and remain attached for up to a year

- Many mangrove species have floating seeds for dispersal



- Propagules can 'self-plant' at low tide



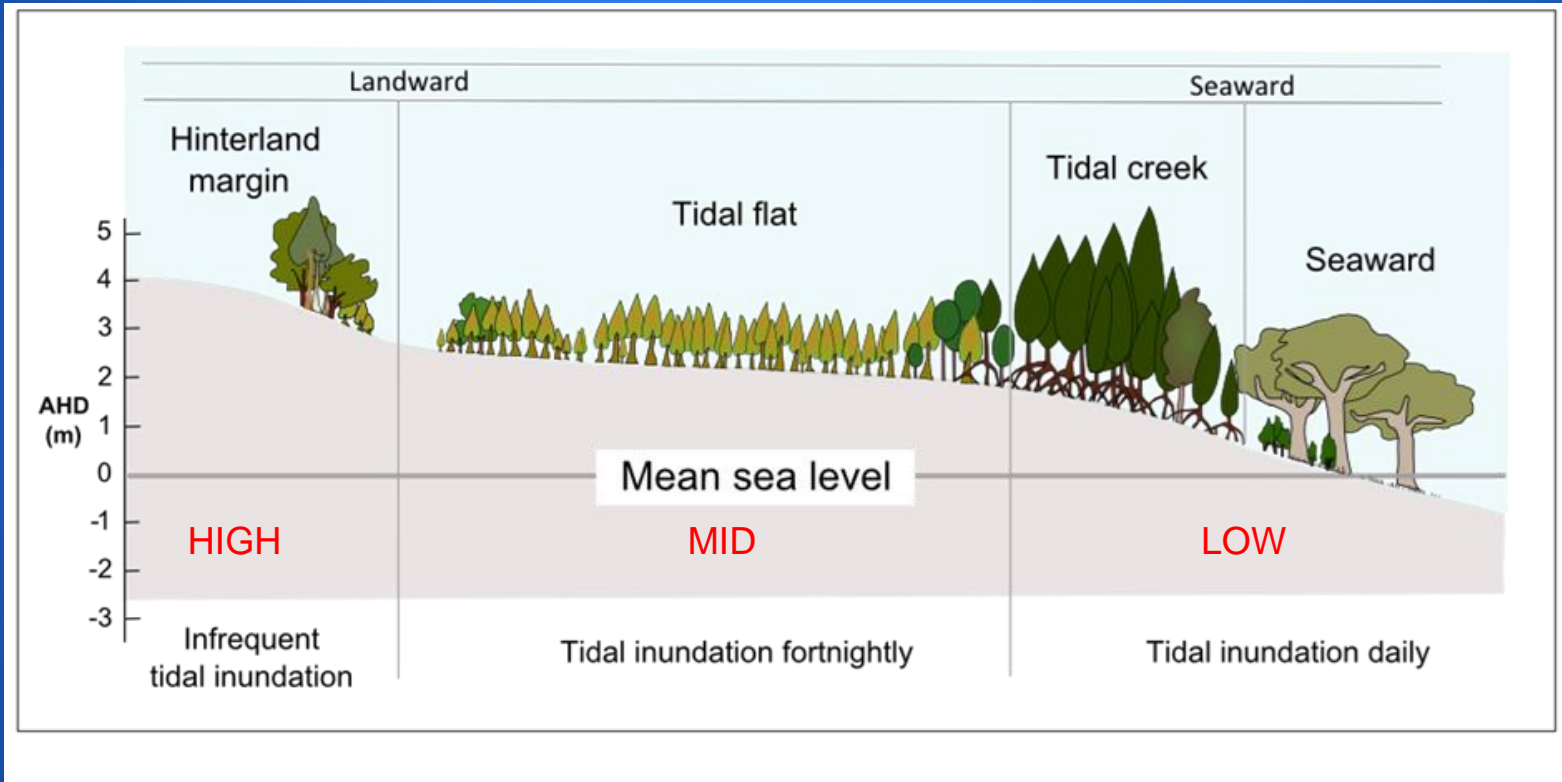
Propagule = 'ready to go' seedling

Propagules (seeds) plant themselves by spearing into the mud at low tide

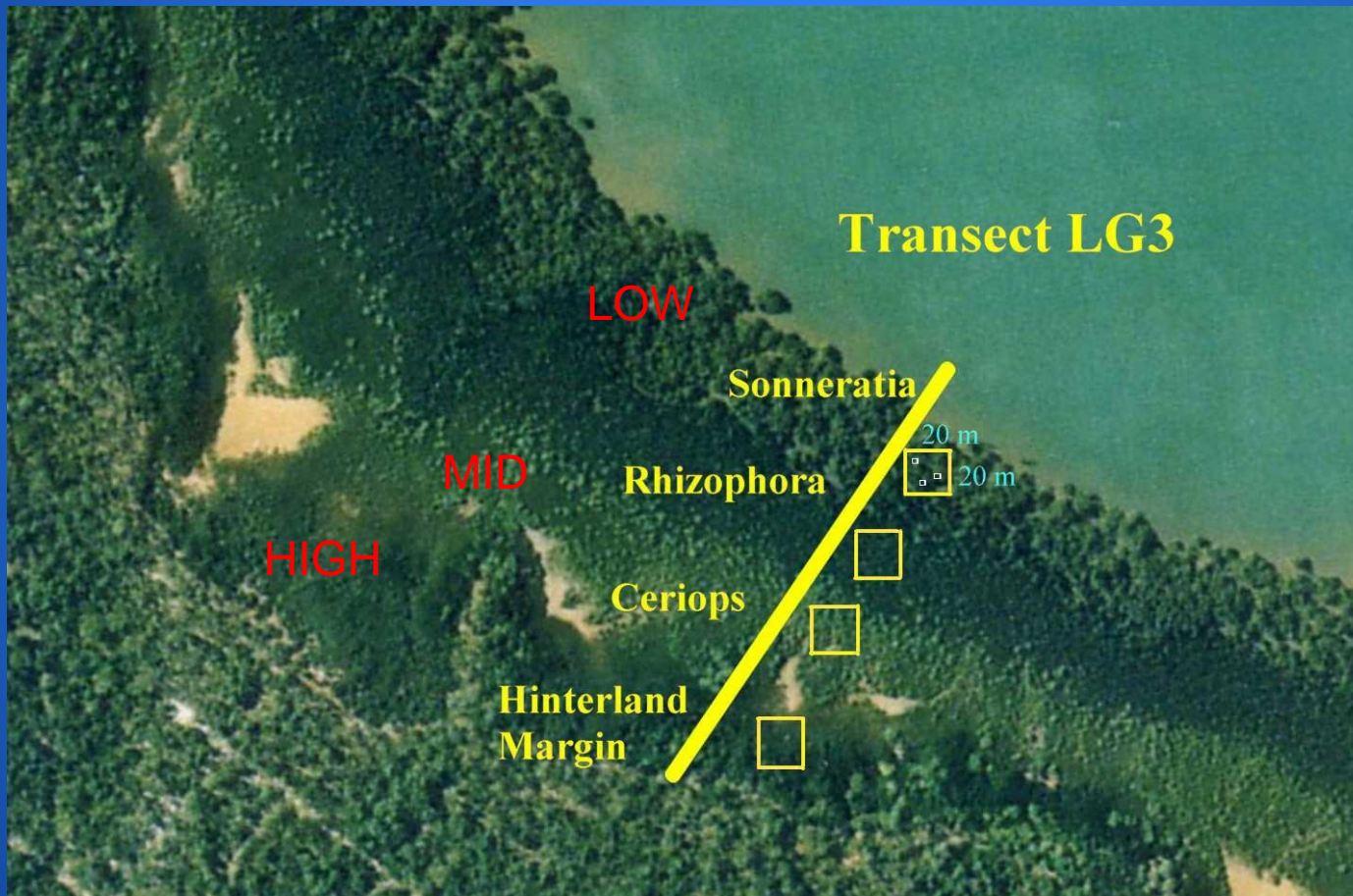
Mangroves typically grow in distinct bands or zones



Zonation of mangrove forests in Darwin Harbour

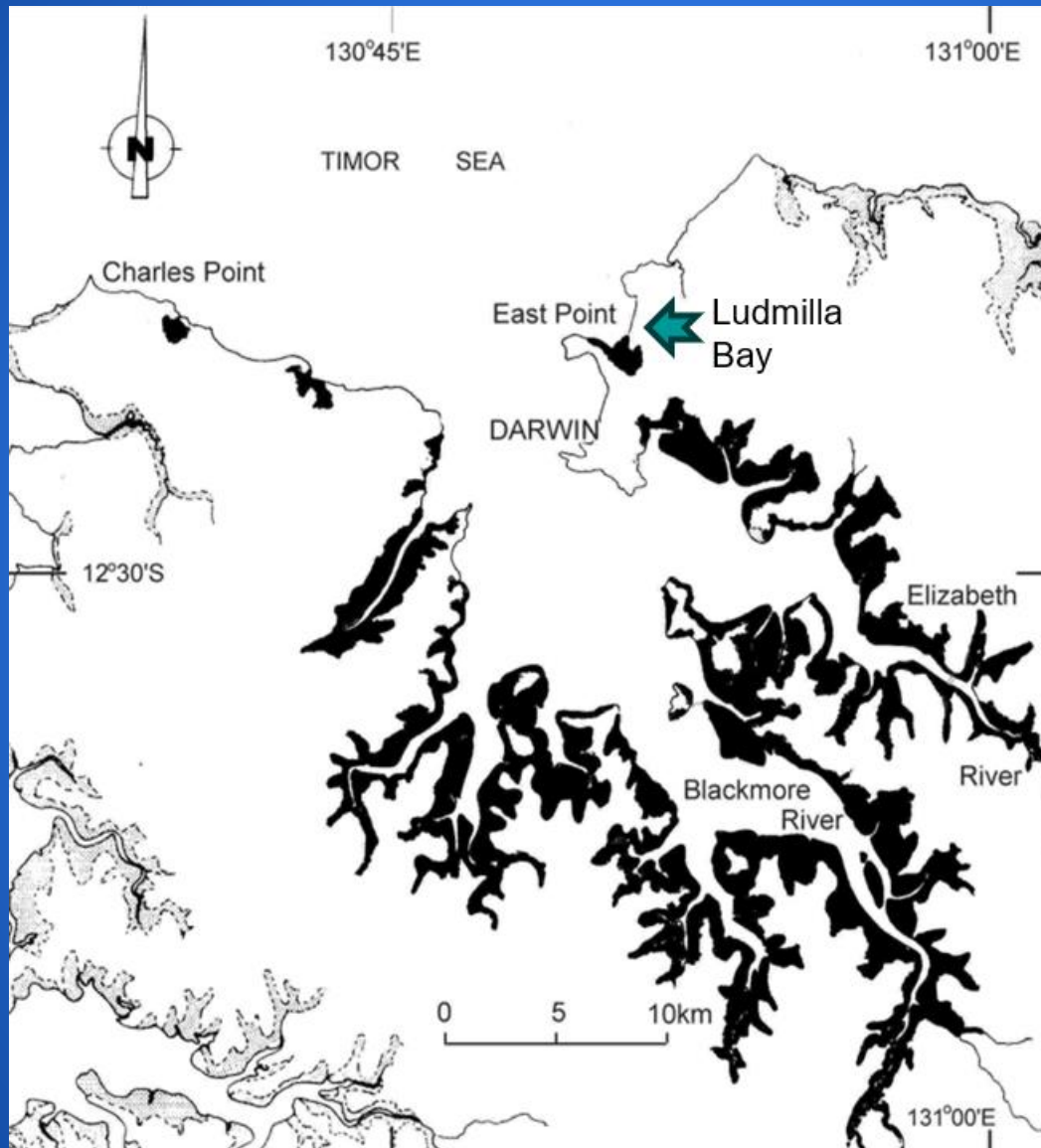


Scientific studies of fauna have shown that mangrove animals also show clear zonation





- 20,000 ha of mangrove habitat in Darwin Harbour
- 2.0% cleared since 1979 (approx 400 ha)



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Our mangrove walk today...



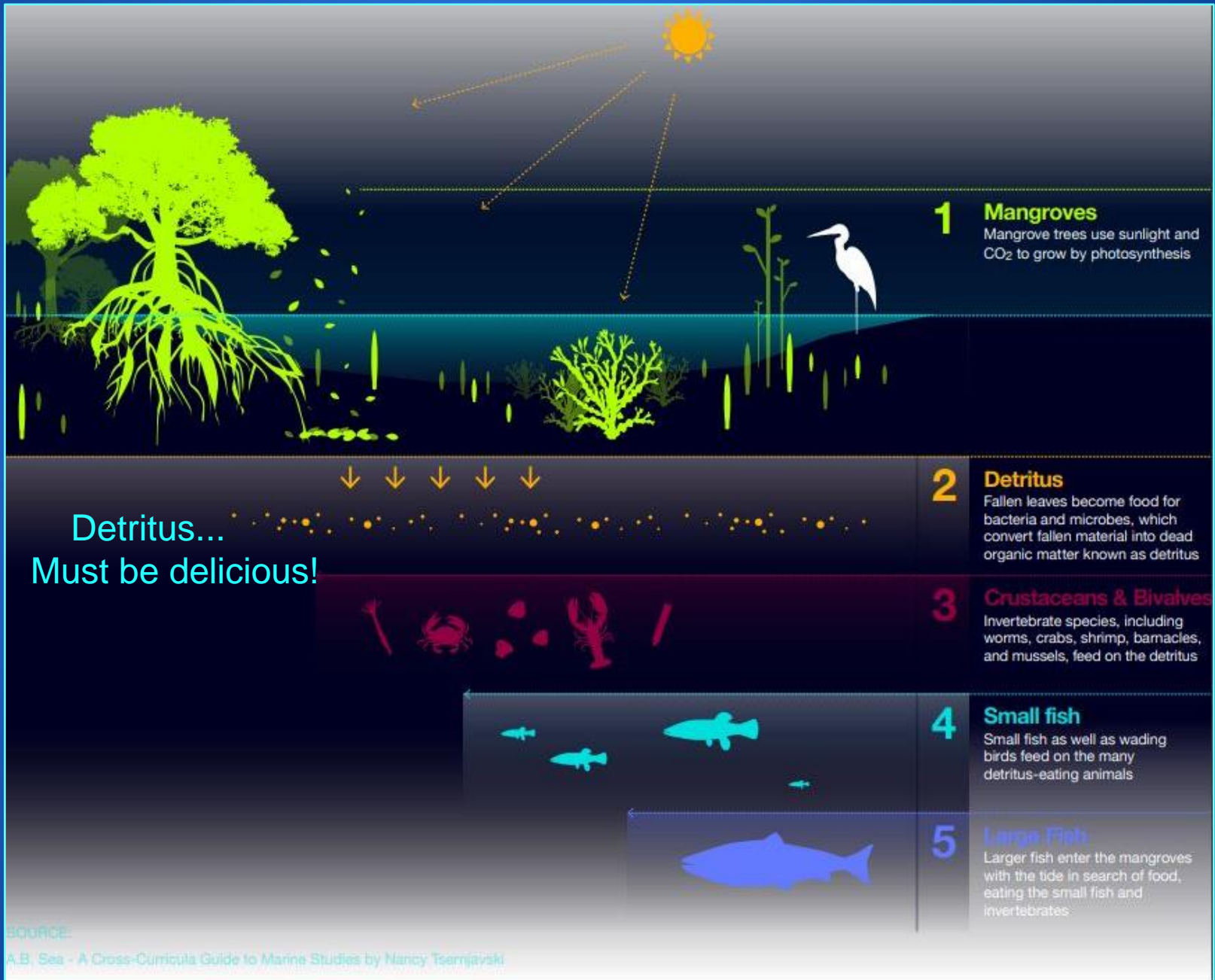
Mangroves are highly productive forests



MANGROVES SUPPORT VAST FOOD WEBS

Mangroves produce large amounts of organic material that breaks down into detritus





SOURCE:

A.B. Sea - A Cross-Curricula Guide to Marine Studies by Nancy Tsernjavski

Mangroves teem with life.. especially during high tides



when they are an important feeding ground for marine species.

When the tide recedes..



..mangroves are an important feeding ground for land animals.

Over 70 different bird species inhabit the mangroves of Darwin Harbour



Little Kingfisher



Great-billed Heron



Little Shrike-thrush



Mangrove Golden Whistler



Mangrove (Striated) Heron

Mangroves in Northern Australia have the highest number of mangrove dependent birds in the world (18 species)



Chestnut Rail

Darwin Harbour has healthy populations of 9 mangrove endemic birds

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Red-headed Honeyeater

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Black Butcher bird

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White-breasted Whistler

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Mangrove Robin

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Collared (Mangrove) Kingfisher



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Mangrove Grey Fantail

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Yellow White-eye



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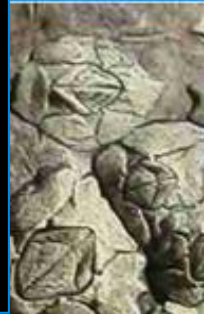
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Mangrove Gerygone

Darwin Harbour has healthy populations of 9 mangrove endemic birds

Mangroves are habitat for a great variety of invertebrates



Over 420 Invertebrates





Neosarmatium australiense



Lives in large burrows, only in the landward zone

The mud lobster –
Thalassina anomala



Watch out for this special mangrove ant...



Polyrachis sokolova - Jesus ant
...ants that walk on water



Ant Nest – *Polyrachis sokolova*



Photo: Adam J Bourke

Periwinkle – *Littoraria filosa*

- Filter stormwater

- Recycle nutrients & sediment



Mangroves help keep our oceans clean

- Sink for pollutants – especially heavy metals



Nutrients



Seagrass & corals



Sediments



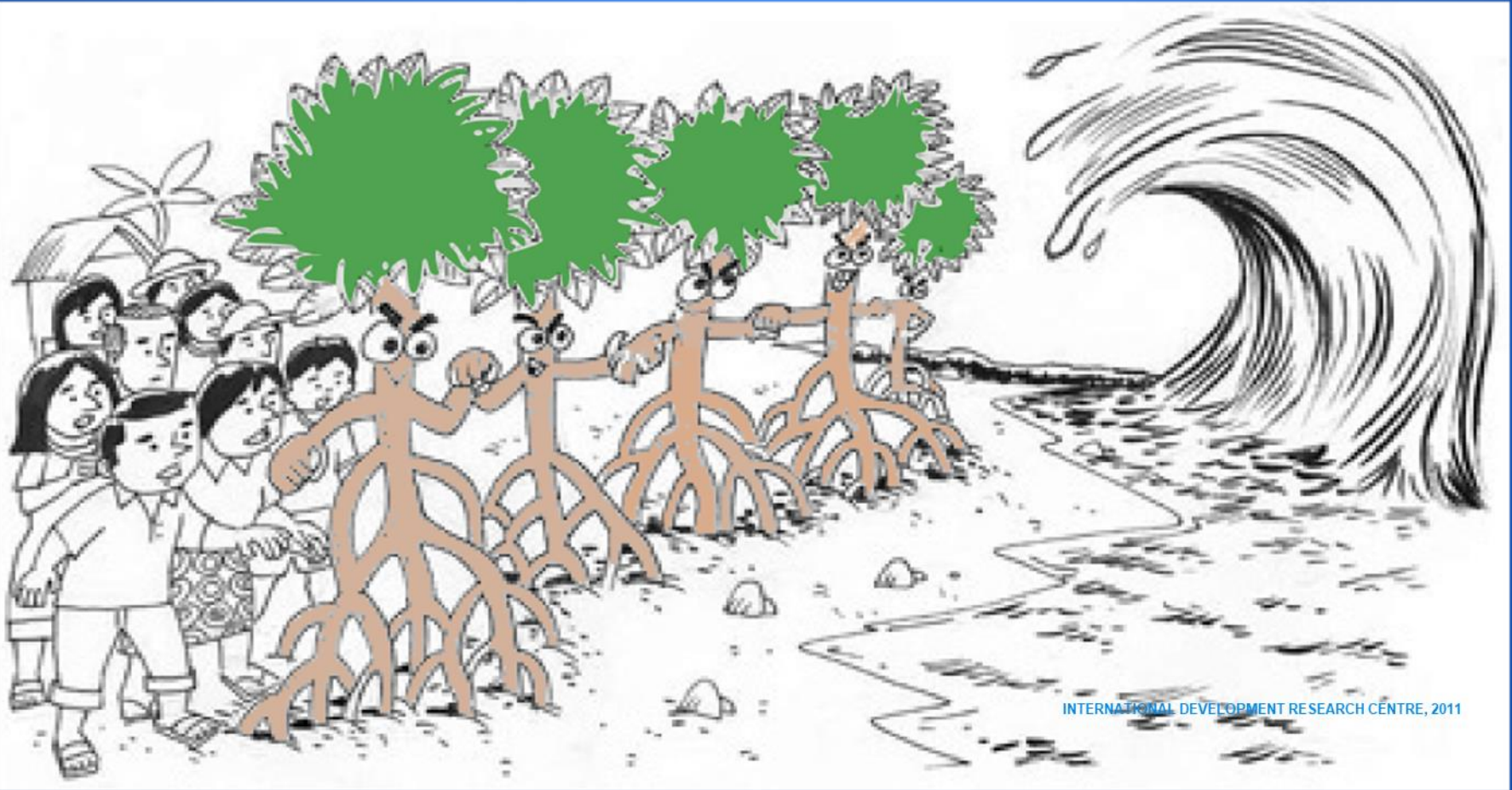
Heavy metals

- Buffer between land and sea - prevent erosion & stabilise the shore



- Protection from storms, cyclone surge & tsunamis

- Buffer between land and sea - prevent erosion & stabilise the shore



INTERNATIONAL DEVELOPMENT RESEARCH CENTRE, 2011

- Protection from storms, cyclone surge & tsunamis

BLUE CARBON

Mangrove, seagrass & saltmarsh

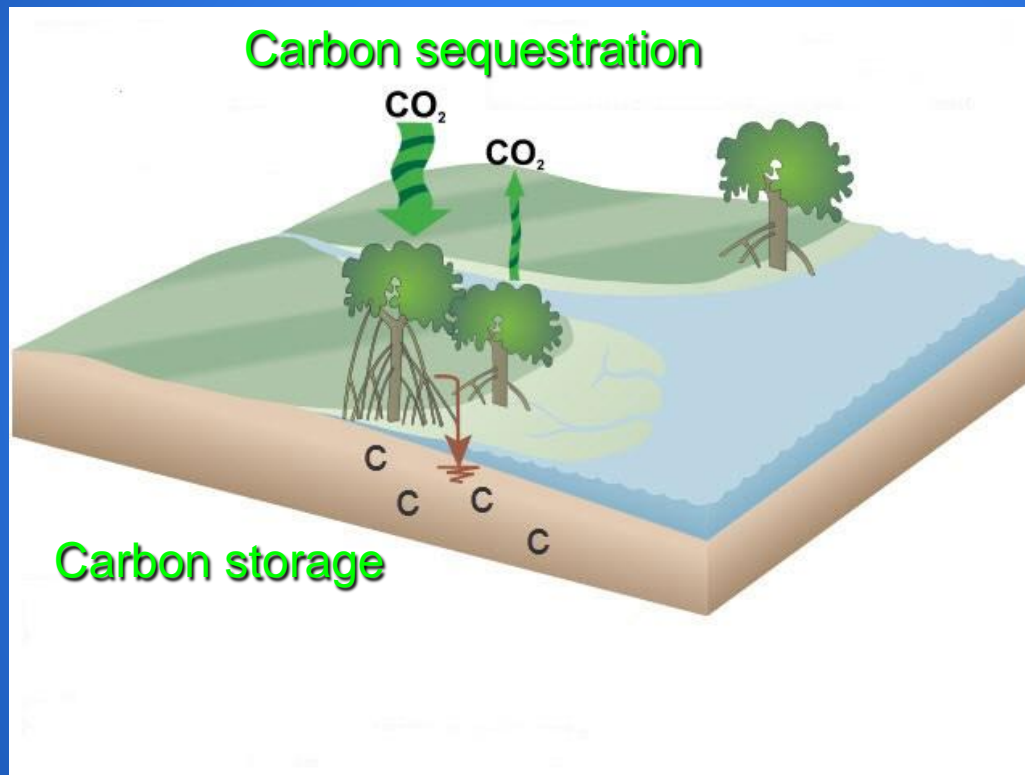


Mangroves store large quantities carbon

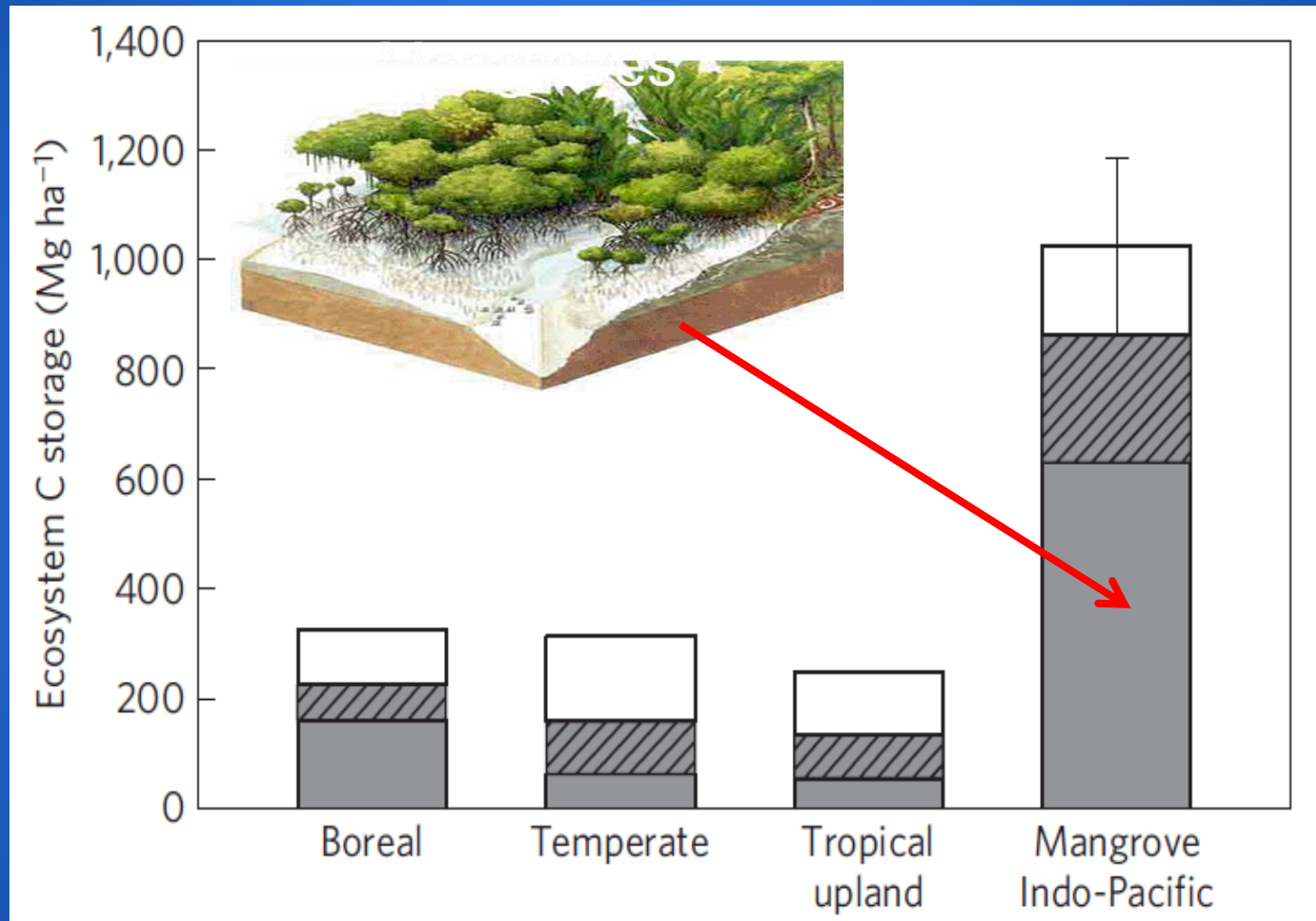
- far more effectively
- much faster
- for longer periods than other forests

Mangroves are particularly good at storing carbon because the plants:

- 1) annually **sequester** (capture) a lot of carbon and
- 2) **store** carbon for long periods of time in their soils.



= two great reasons to conserve mangrove habitats



More good news....
AUSTRALIA'S MANGROVES

Australia has very extensive areas of mangrove

The NT has nearly 11,000 km of coastline and almost half of Australia's mangrove area

Northern Australia has the most healthy, least impacted mangroves in the world

An important national and global resource



The bad news....

MANGROVES ARE THREATENED ECOSYSTEMS

- One of the world's most threatened ecosystems
- 35 – 85 % of the world's mangroves have been lost
- Clearing continues at 2% p a



Threats...

- **Aquaculture – prawn farms**




Threats...

- Agriculture – timber, charcoal, grazing, palm oil, food



Threats...

- Climate change and sea level rise



Mangrove Dieback
Gulf of Carpentaria
2015-16

Killed 7,400 ha or 6% of
mangroves from Roper
River to Karumba

Threats...

➤ Coastal development

- ports
- marinas
- residential
- industrial
- dredging
- reclamation

14% mangrove
loss in Australia
during the 1980's



Threats...

- Storms, cyclones and tsunamis



- Mangroves are fascinating, highly specialised forests
- Important habitat for fauna
- Free ecosystem services
- Carbon sequestration and storage
- Highly threatened ecosystems
- Need to manage and conserve remaining mangrove resources



Mangroves are amazing

