



Sharing Knowledge

Climate change impacts on remote  
Indigenous communities' health in northern Australia

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## Overview

## Sharing Knowledge

1. What are the impacts of climate change on health?
2. Who is vulnerable to these impacts?
3. What are their specific concerns?
4. What can be done to reduce these problems?



Aftermath of Cyclone Monica in Arnhem land

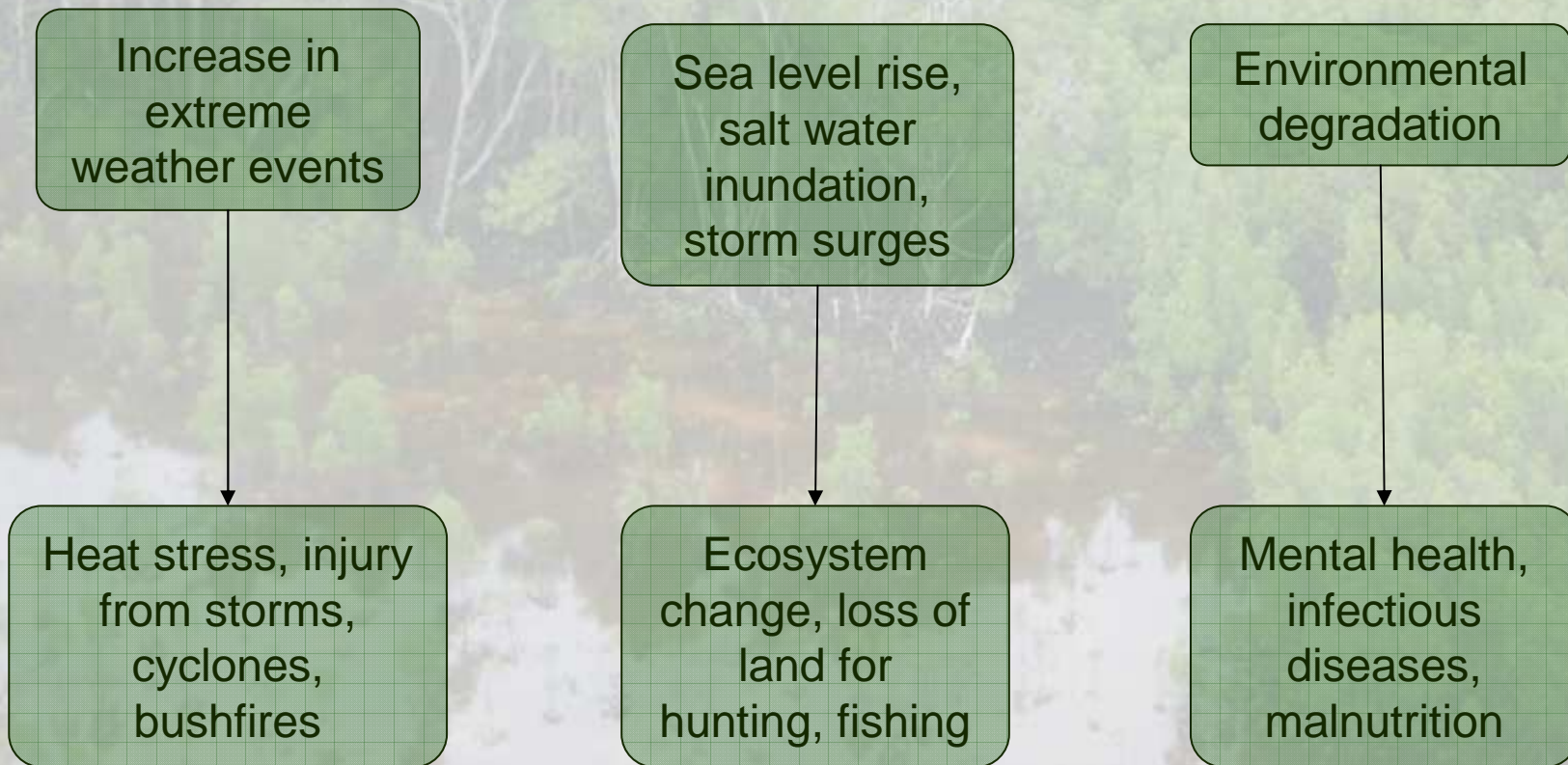
An aerial photograph of a mangrove forest. The foreground shows a body of water reflecting the sky and the surrounding greenery. The middle ground is filled with dense mangrove trees, some with prominent prop roots. The background shows more of the forest extending to the horizon.

## Overview

## Sharing Knowledge

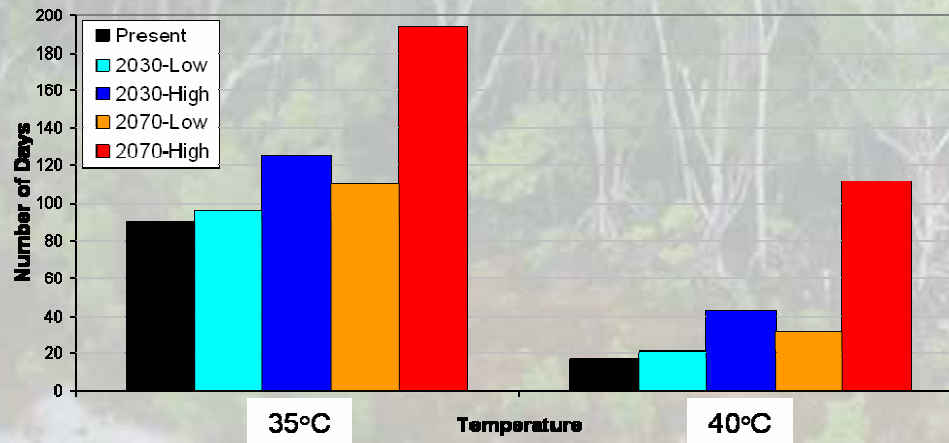
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Environmental effects..... lead to health effects



## Direct impacts:

(1) hotter days (& nights) leads to heat stress.



Estimated number of days with temperatures above 35°C and 40°C in Alice at present and in 2030 and 2070.

(2) Injury from extreme events (eg floods and storms).



**Saibai, Torres Strait from the air  
after tidal inundation**



## **Indirect impacts:**

- increase in range of vector and water borne disease
- malnutrition due to change in species composition/availability
- reduction in mental and physical well-being due to social dislocation.

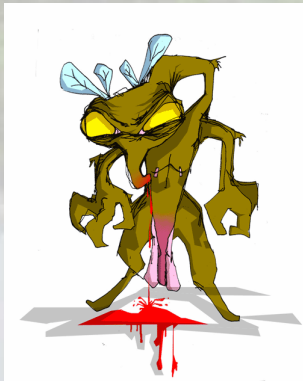
*Indirect climate impacts on health are likely to be even more significant than direct impacts.*

Most of these impacts are likely to be bad... But, there are some good ones...

Increases in night temperatures in the western desert may reduce acute lower respiratory infection (eg pneumonia) and mortality.

## Change in temperature

- change in survival of disease vector host (eg more or less mossies in different locations or at different times).



## Decrease in precipitation

- may increase number of water storage containers which may in turn increase mossie breeding sites.

## Increase in precipitation

- may reduce mossie breeding habitat by flooding out pooled water.

## Sea level rise

- change in mossie habitat.



An aerial photograph of a mangrove forest. The foreground shows a body of water reflecting the sky and the surrounding greenery. The middle ground is filled with dense mangrove trees, some with prominent prop roots. The background shows a continuation of the forest. The text 'Overview' is overlaid on the left side of the image, and 'Sharing Knowledge' is overlaid on the right side.

## Overview

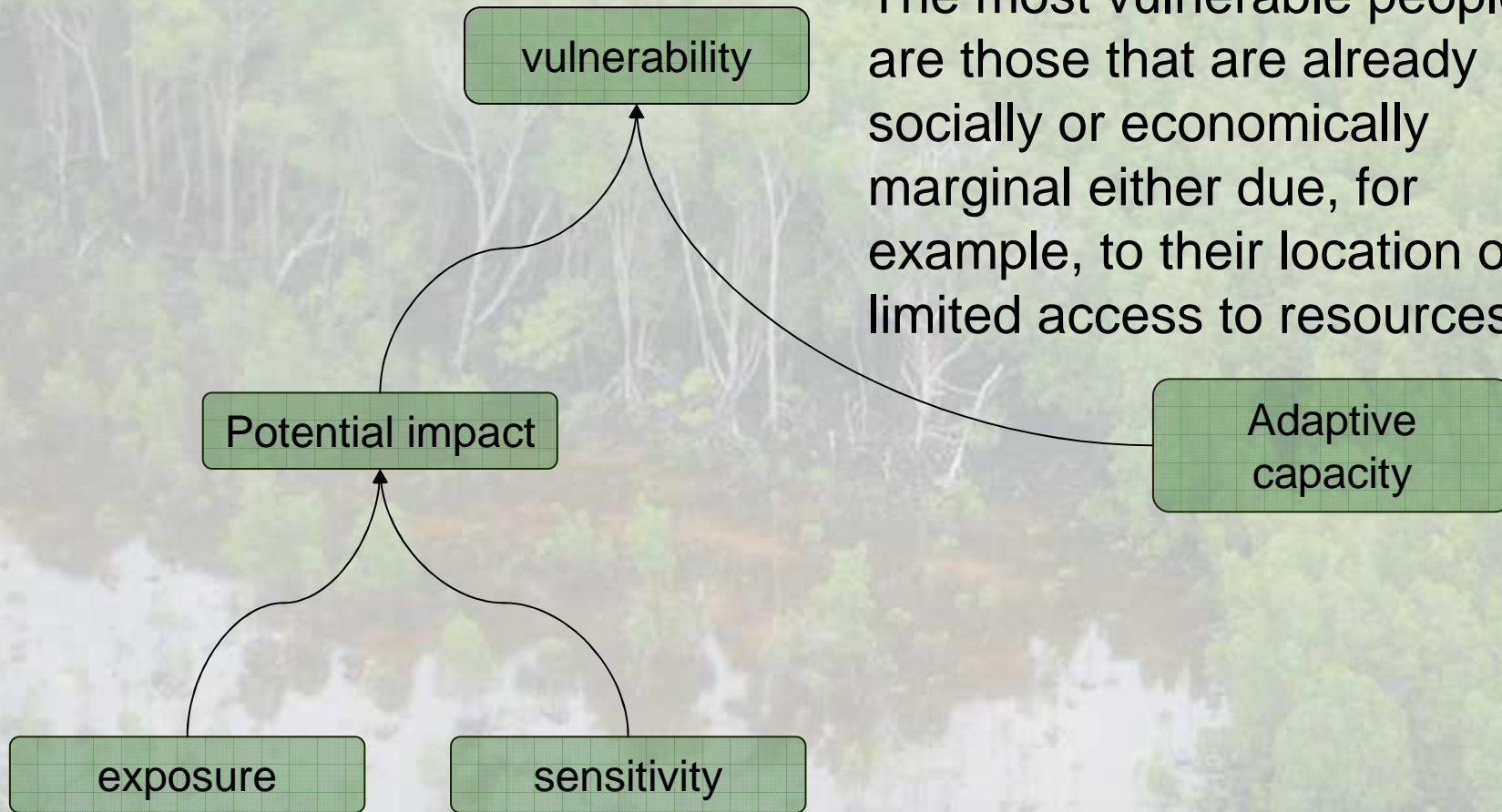
## Sharing Knowledge

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# Vulnerability

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The most vulnerable people are those that are already socially or economically marginal either due, for example, to their location or limited access to resources.



Exposure

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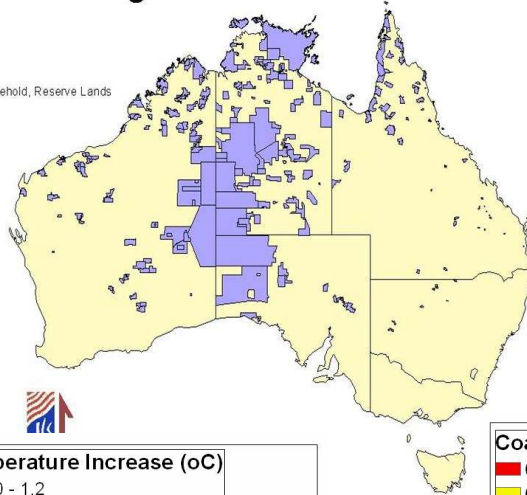


Exposure

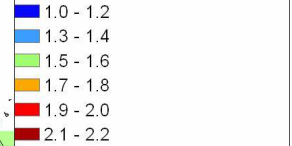
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### Indigenous Held Land\*

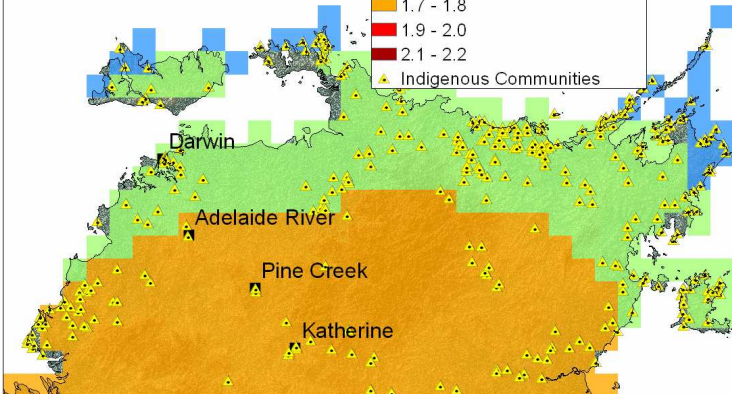
\* Freehold, Leasehold, Reserve Lands



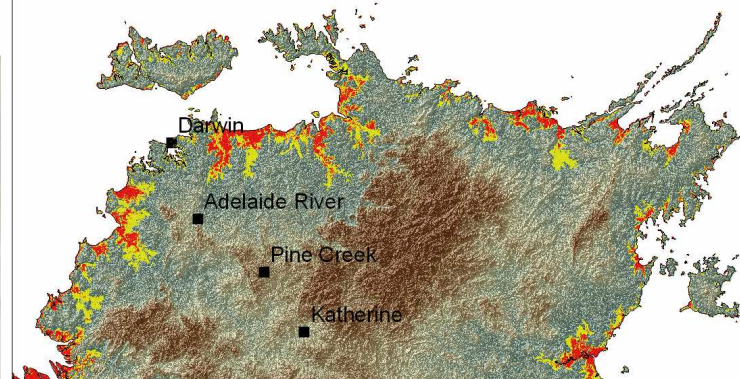
### Temperature Increase (oC)



▲ Indigenous Communities



### Coastal Elevation (m)



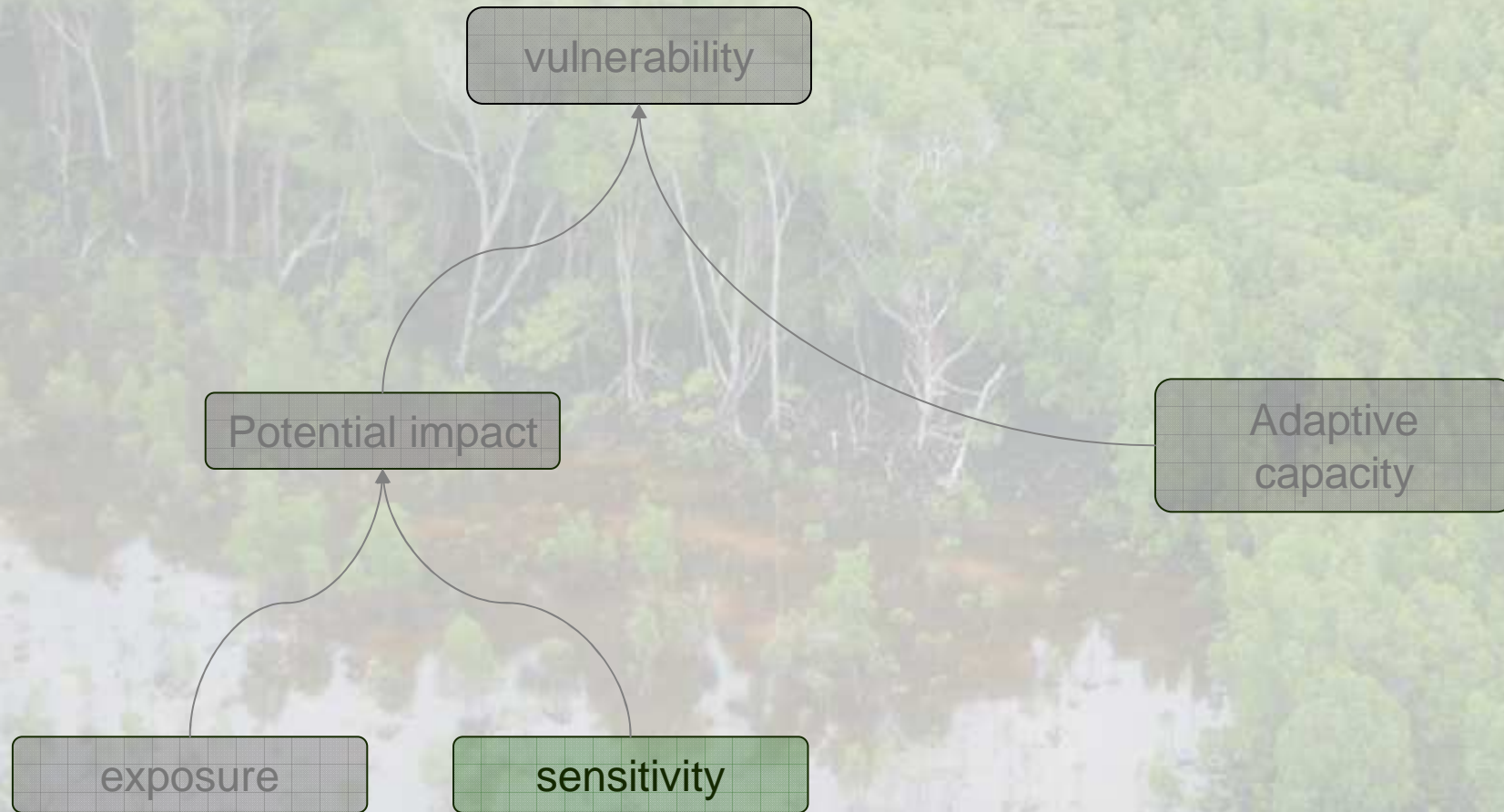
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Figure 1. Projected change in average annual temperatures in Arnhem Land in 2050.

Figure 3. Low-lying coastal areas in Arnhem Land, with areas below 5 meters in elevation in red, and between 6 and 10 meters in yellow.

Sensitivity

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An aerial photograph of a lush green forest with a river winding through it. The text 'Sensitivity' is overlaid on the left side of the image.

Sensitivity

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Climate impacts on health are likely to be compounded by existing social and economic disadvantage. For example:

1) Existing health problems

- diabetes death rates in Indigenous communities x8 non-Indigenous
- respiratory deaths, x4
- circulatory conditions, x3

2) Housing - overcrowded or inappropriate housing, lack of maintenance

3) Education - inappropriate or lack of adequate local education opportunities

4) Employment - lack of local employment opportunities

Potential impact

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Potential impact

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For many Indigenous people, the connection between the **health** of (1) 'country' (2) people and (3) culture is very important and needs to be recognised.



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As a change in one of these factors may impact the others.

Adaptive capacity

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Adaptive capacity

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Some remote Indigenous communities have lived with environmental change in Australia for over 50,000 years (*reactionary* adaptation).

But, relatively short term exposure to colonist culture (last 200 years) has created significant cultural and social problems.

Result: few resources to cope with change (low adaptive capacity for *reactionary* or *anticipatory* adaptation).



\$50,000 to raise each house

An aerial photograph of a mangrove forest. The top portion shows a dense canopy of green trees. Below this, a network of waterways winds through the forest, reflecting the sky and surrounding vegetation. The water appears calm and slightly brownish, typical of mangrove swamps. The overall scene is lush and green, with some bare tree trunks visible in the upper section.

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We can see that climate impacts that may affect health are superimposed on already stressed socio-economic systems.

Specifically these climate impacts that impact health may include:

- Heat stress (wind blown dust), injury from floods, storms and other extreme weather events
- Vector or water borne diseases:
  - reintroductions of dengue, malaria, diarrhoea, Japanese encephalitis, Murray Valley encephalitis, Ross River fever (in central Australia) - melioidosis (Top End and Central) and leptospirosis (FNQ and Top End).
- Indirect impact on species habitat can lead to reduction in protein intake, social dislocation and mental illness or grief due to inability to care for country.

An aerial photograph of a mangrove forest. The top portion shows a dense canopy of green trees, with some bare, white trunks visible. Below this, a wide, shallow waterway or canal winds through the forest, reflecting the sky and the surrounding greenery. The water appears calm and slightly murky. The overall scene is a lush, natural environment.

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An aerial photograph of a lush green forest with a river winding through it. The water is a light, milky color, and the surrounding trees are dense and vibrant green. The image is used as a background for the slide.

## Actions

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- Pre-emptive policy and planned adaptive strategies.
- Recognise that the root cause of many of the health problems need to be addressed as much as additional factors (such as climate impacts).
- Find out critical thresholds from the people affected themselves and prioritise these issues.
- Find out what adaptation strategies would be culturally acceptable.
- Community involvement in planning for change.

An aerial photograph of a mangrove forest. The top portion shows a dense canopy of green trees. Below this, a network of waterways winds through the forest, reflecting the sky and surrounding vegetation. The water appears calm and slightly brownish, typical of mangrove environments. The overall scene is lush and green, with a mix of dark and light green tones.

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*Further information on the project available at:*

**<http://www.dar.csiro.au/sharingknowledge/index.html>**

**(or www search for ‘**sharing knowledge csiro**’)**