



The landscape holds answers to more questions than we have yet learned to ask

Apologies: Nancy Wynne Newhall

Perspectives of an environmental scientist

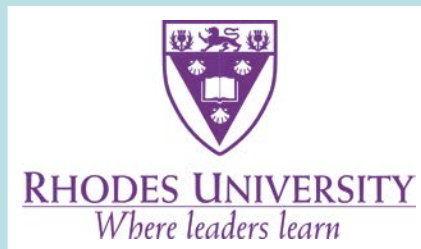
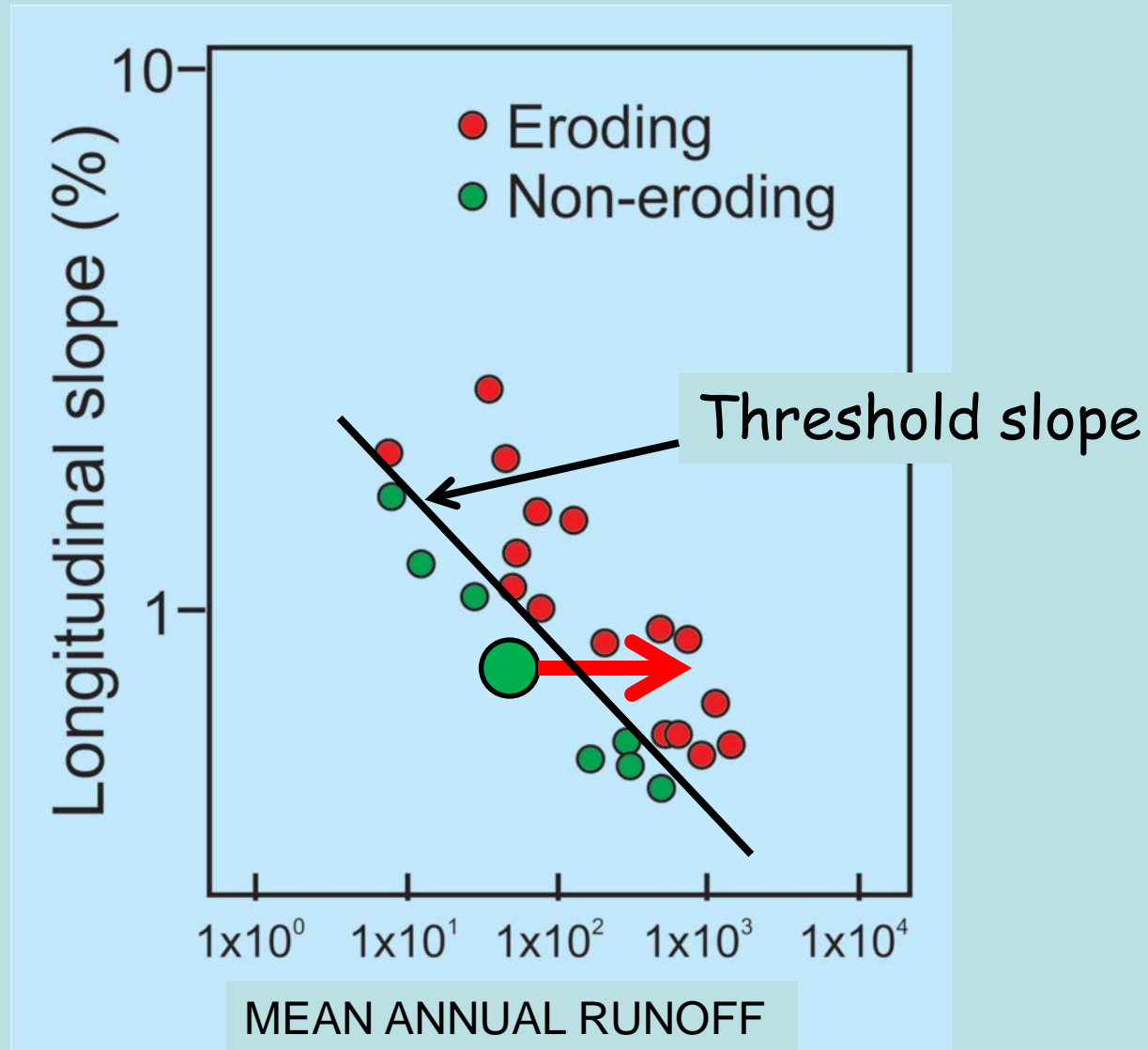




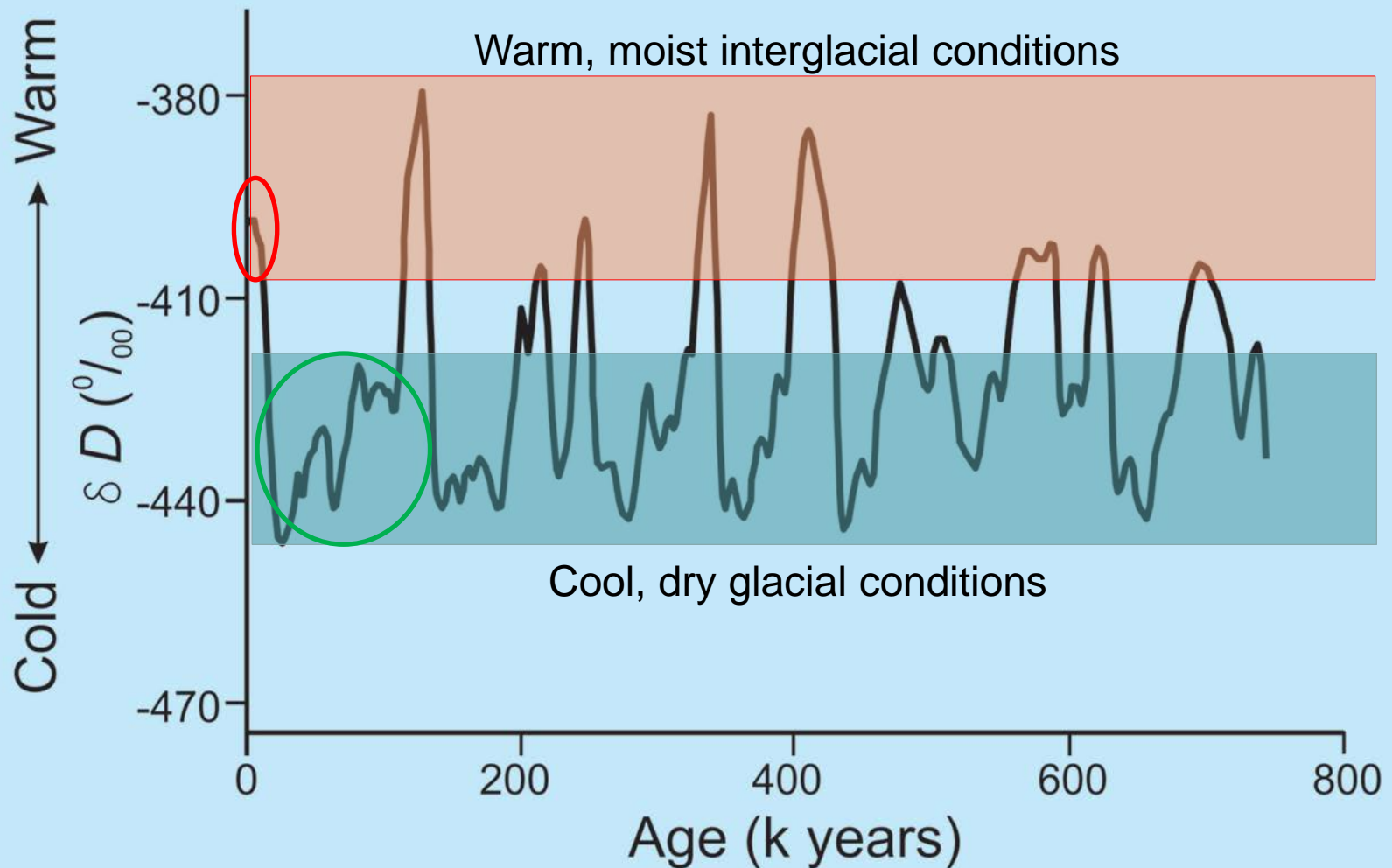


Photo: Stephen Penney
Grocott's Mail

Why do wetlands erode? Thresholds



Wetlands and climate variability

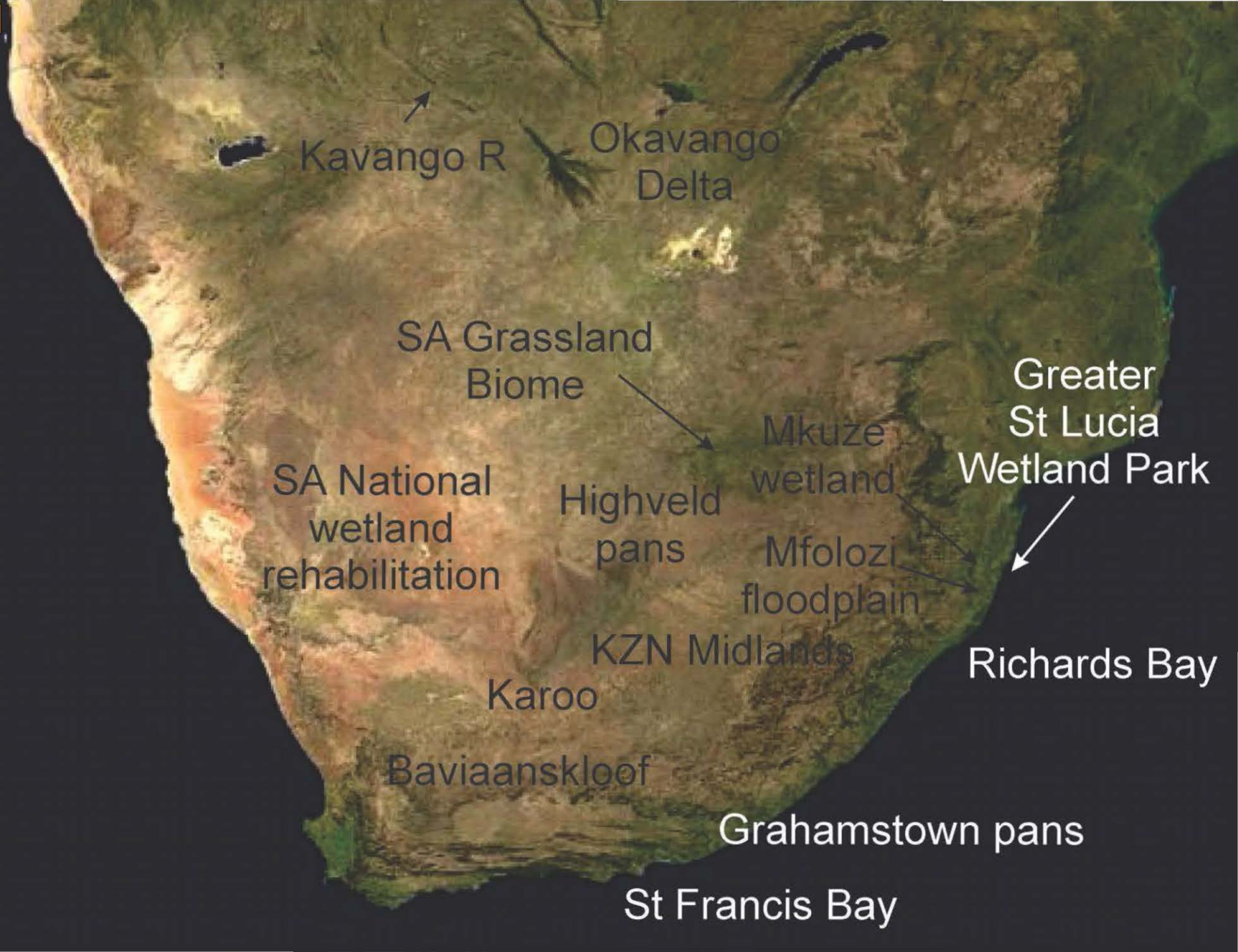




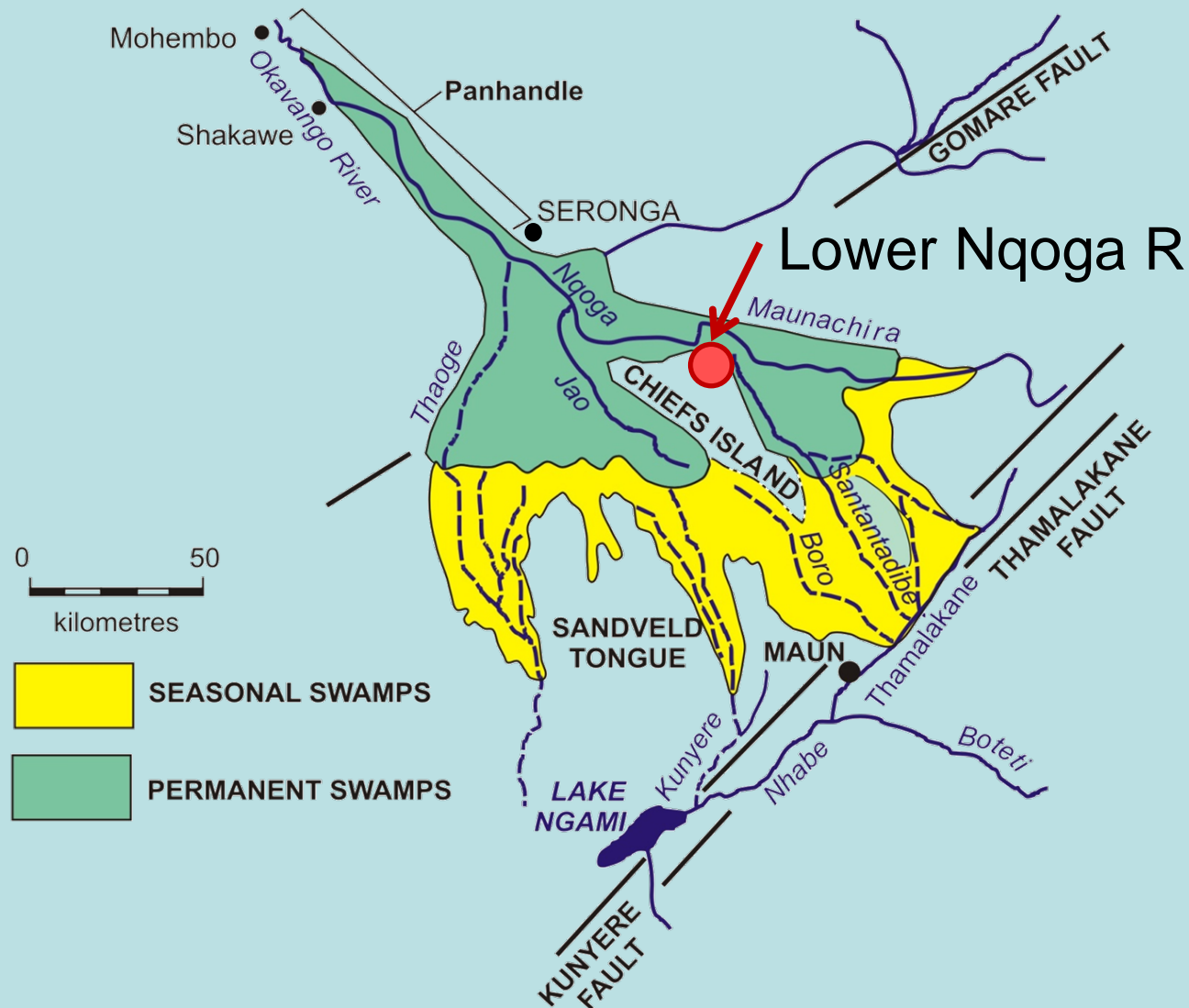
What excites me about my work?

- Understanding underlying causes
- Being creative:
 - Asking good questions
 - Seeing detail but not getting lost in it
 - Finding simple and elegant answers
 - Integrating observations across scales
 - Applying knowledge to solve problems
- Sharing ideas and knowledge with others





What causes radical changes in flow?





Abandoned Lower Nqoga R



Present state



Modern analogue



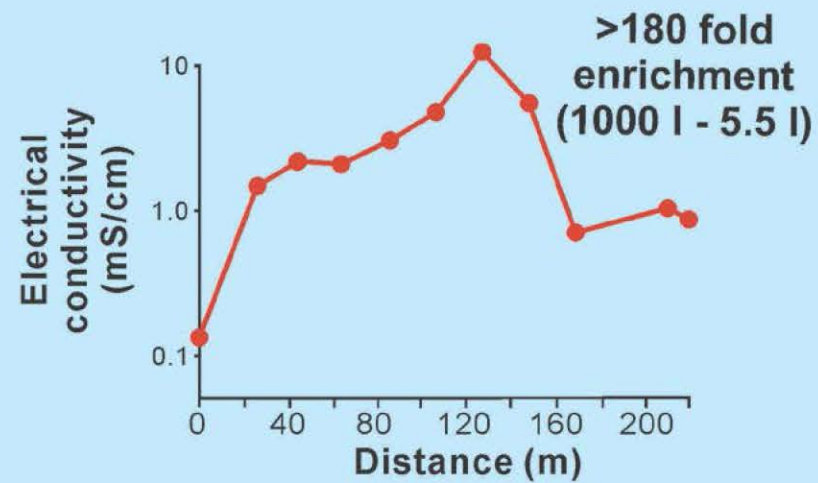
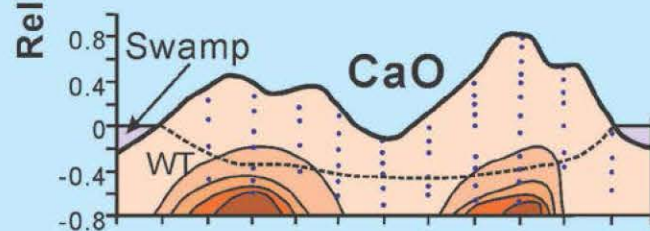
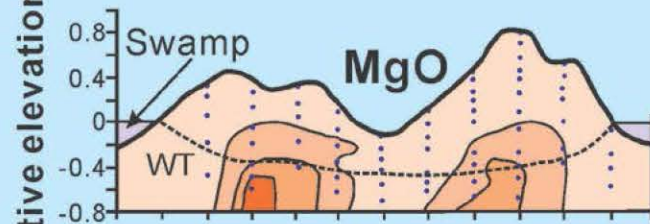
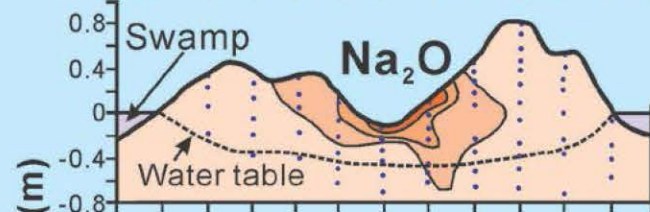
Why is the Okavango not saline?

Freshwater
Okavango

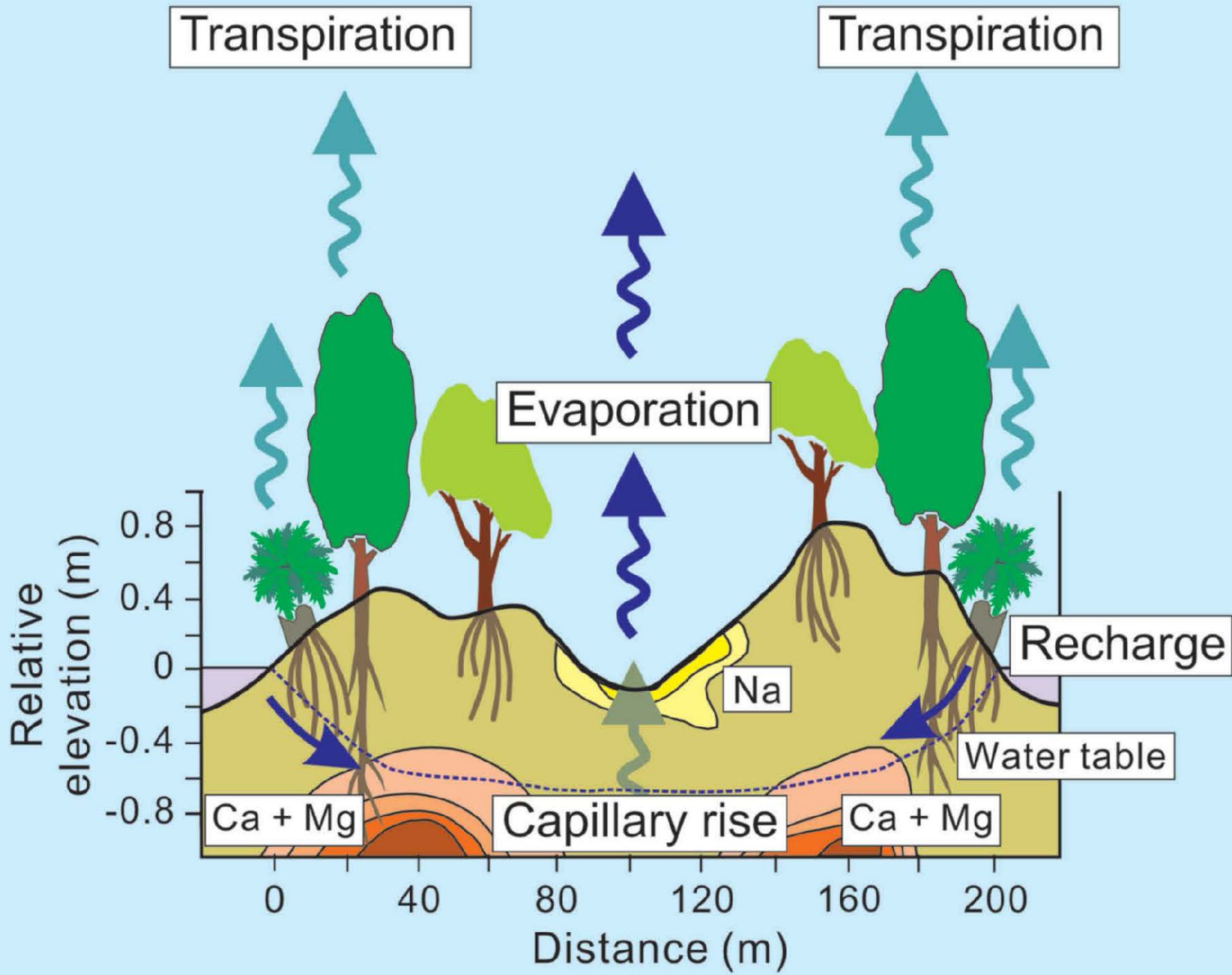
Hypersaline
Makgadikgadi

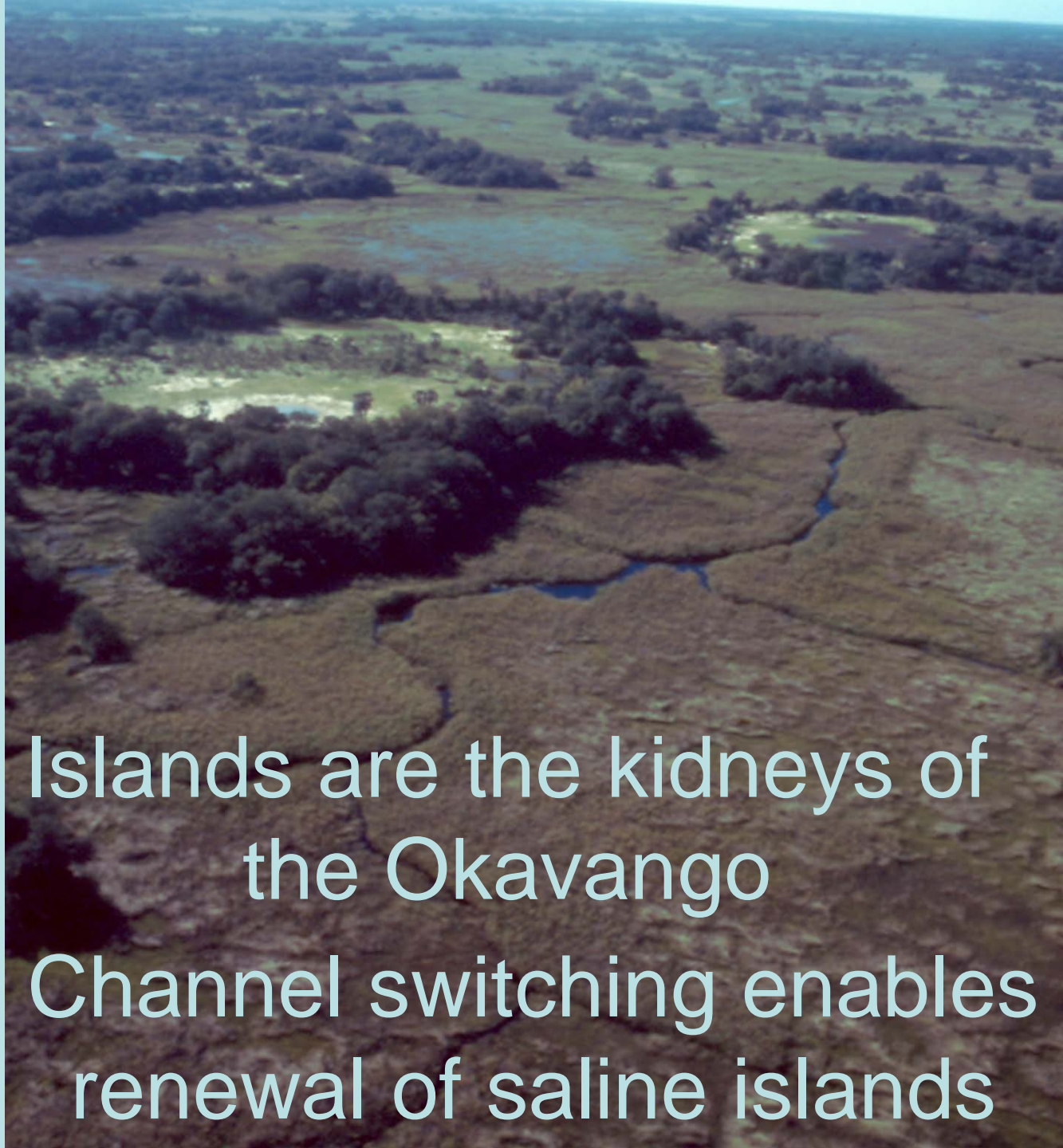








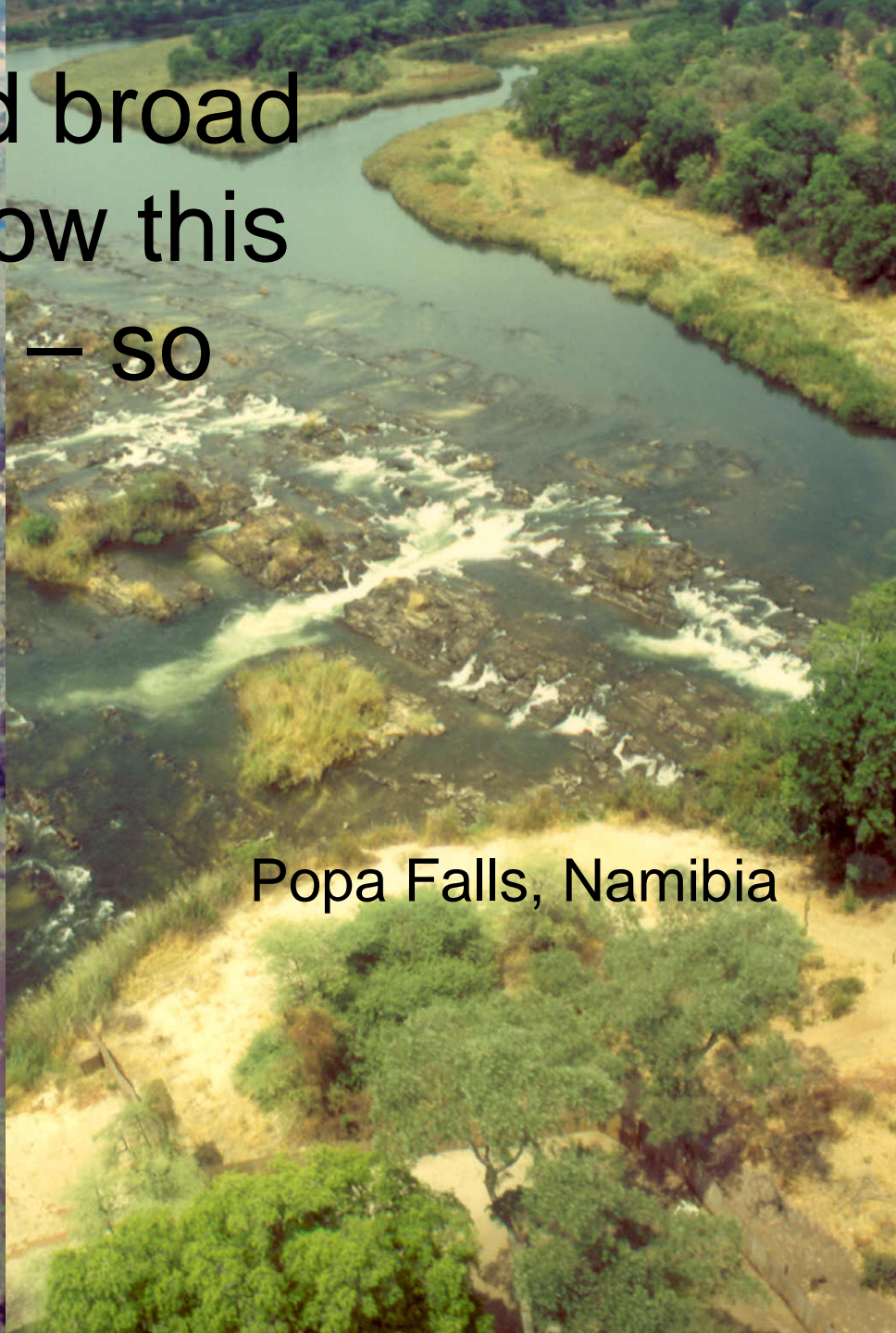
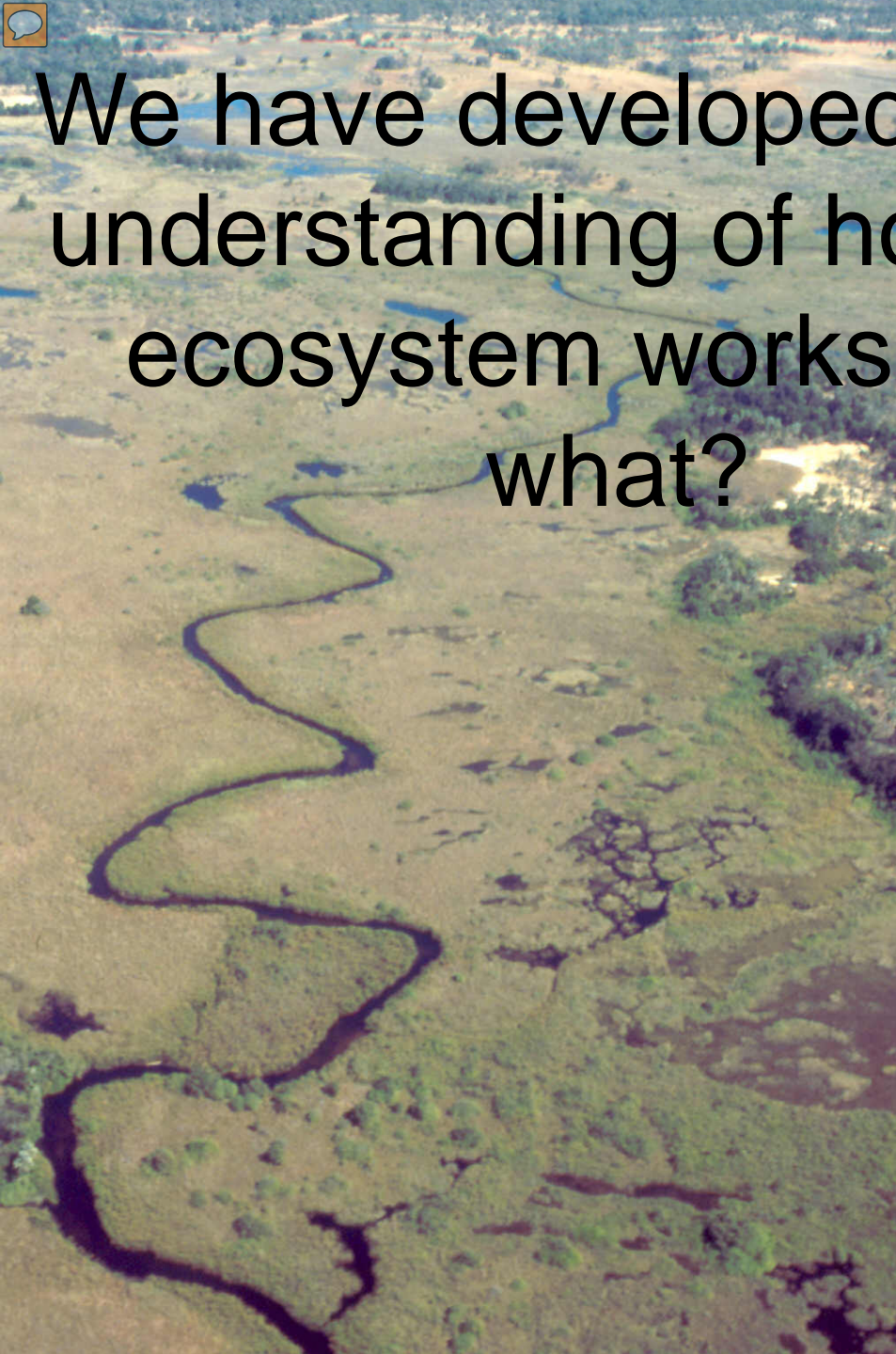




Islands are the kidneys of
the Okavango
Channel switching enables
renewal of saline islands



We have developed broad understanding of how this ecosystem works – so what?



Popa Falls, Namibia

Why do destructive floods and debris flows occur in Cape St Francis?



R330

Kromme R

Sand R

July 2011

St Francis Bay

Nov 2007

R330

Oyster Bay

Thyspunt

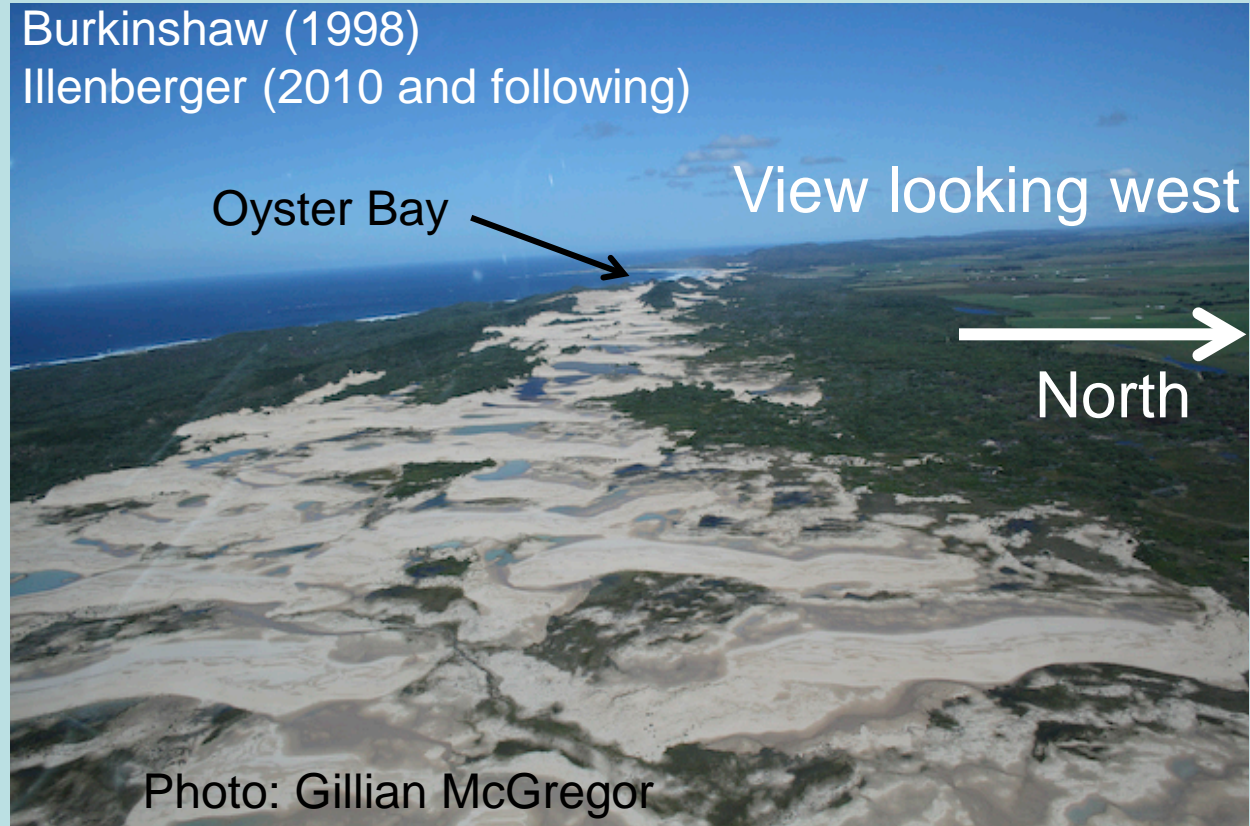
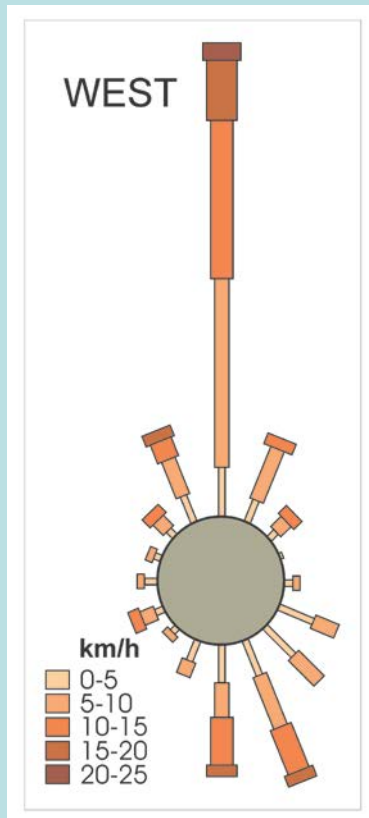
Cape St Francis

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2010 Cnes/Spot Image
Image © 2010 DigitalGlobe

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The Oyster Bay Headland Bypass Dunefield (OBHBD)

Existing knowledge suggests that the system is structured by wind and is therefore predictable



Occasionally the giant awakens... water is also a key factor!

November 2007



R330

Sediment flux in
the Oyster Bay
HBD is just
about wind and
sand??

The work of water is clear



Is this due to human impacts?



The Sand River is a small river

- 11th of April 2012
- 17th of May 2012



Occasionally the Sand River awakens (7 July 2011)



Is this due to human impacts?



Sand River



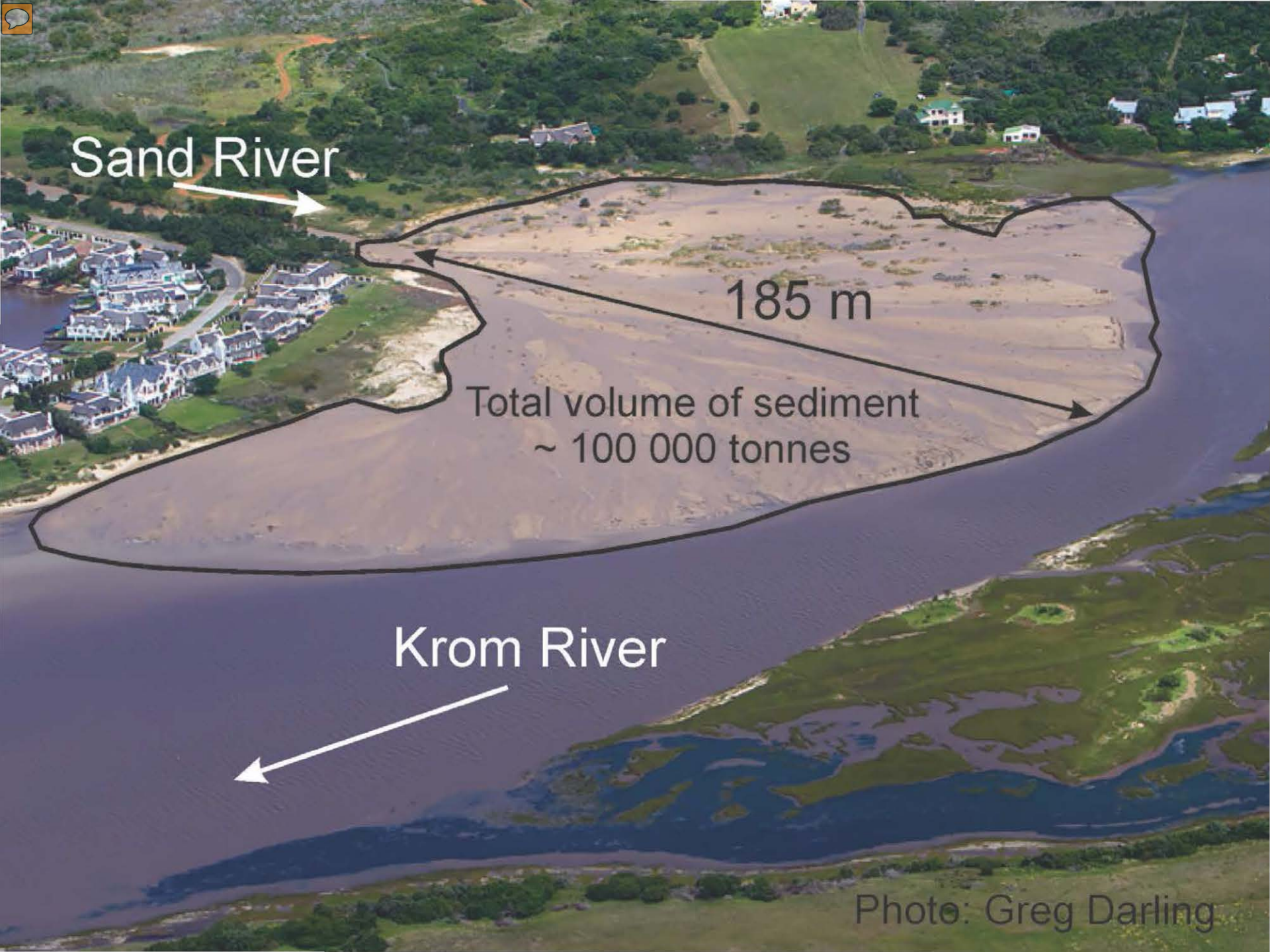
185 m

Total volume of sediment
~ 100 000 tonnes

Krom River



Photo: Greg Darling

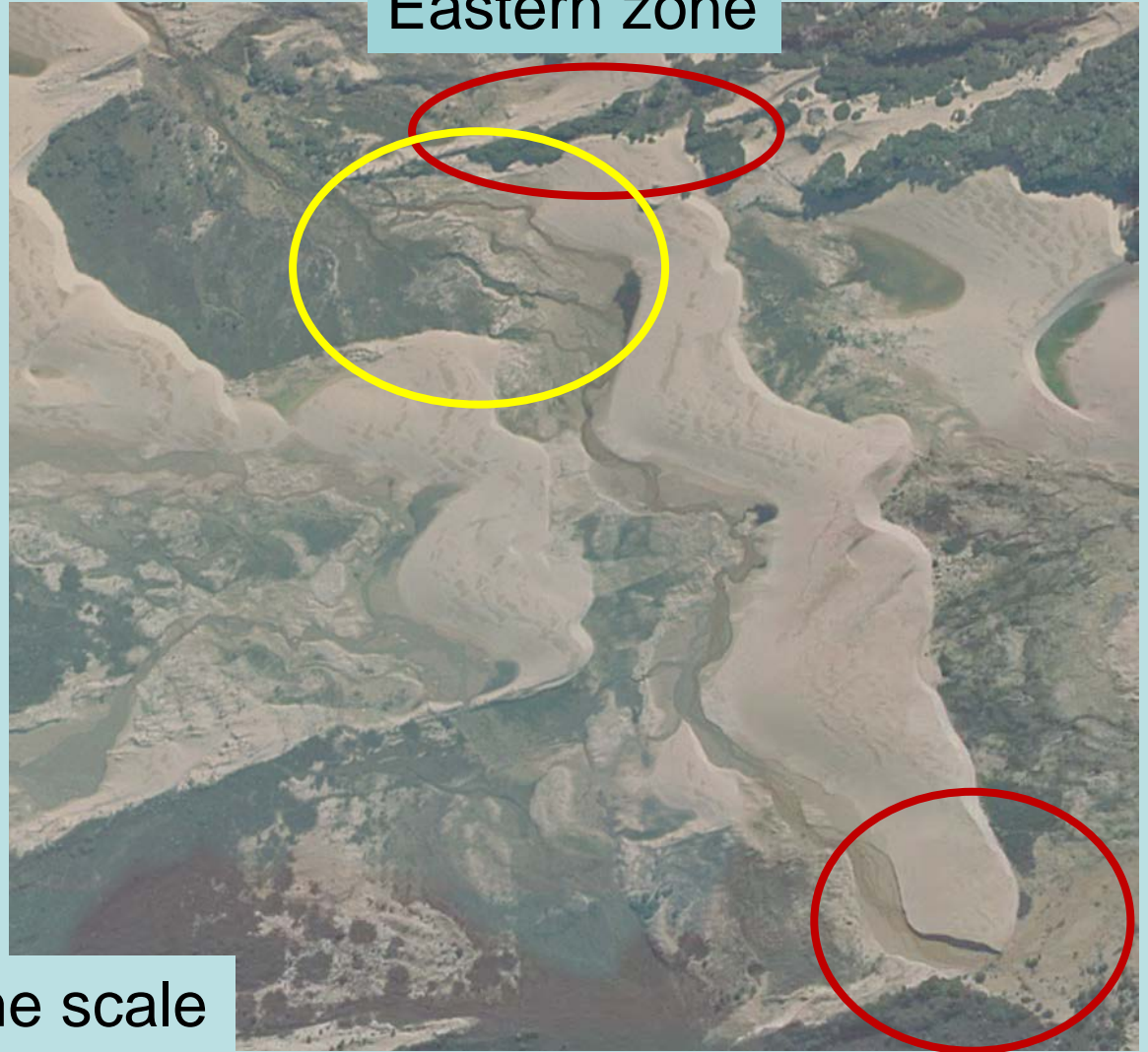


Dunefield structure

Western zone

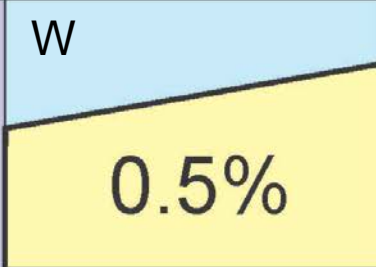
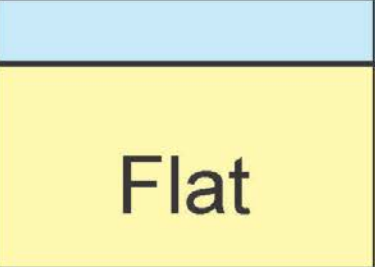

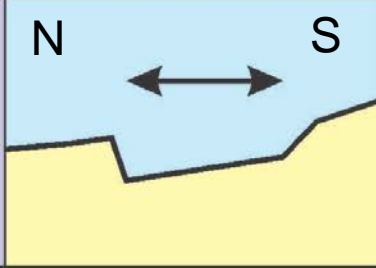
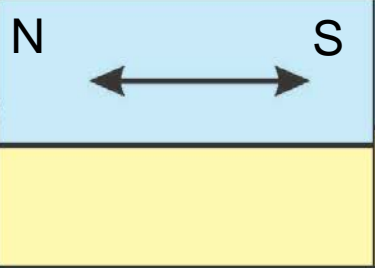
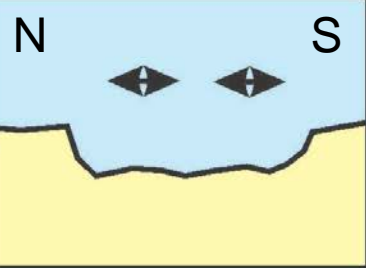


Eastern zone



Images are at the same scale

Data sets HBD structure, function

	Western zone	Central zone	Eastern zone
Longitudinal slope	 <p>W 0.5% E</p>	 <p>Flat</p>	 <p>1.1%</p>
Cross-section	 <p>N S</p>	 <p>N S</p>	 <p>N S</p>
Aeolian flux (tonnes pa)	11 150	7 140	5 670



debris flow

Clear Creek County,
Colorado

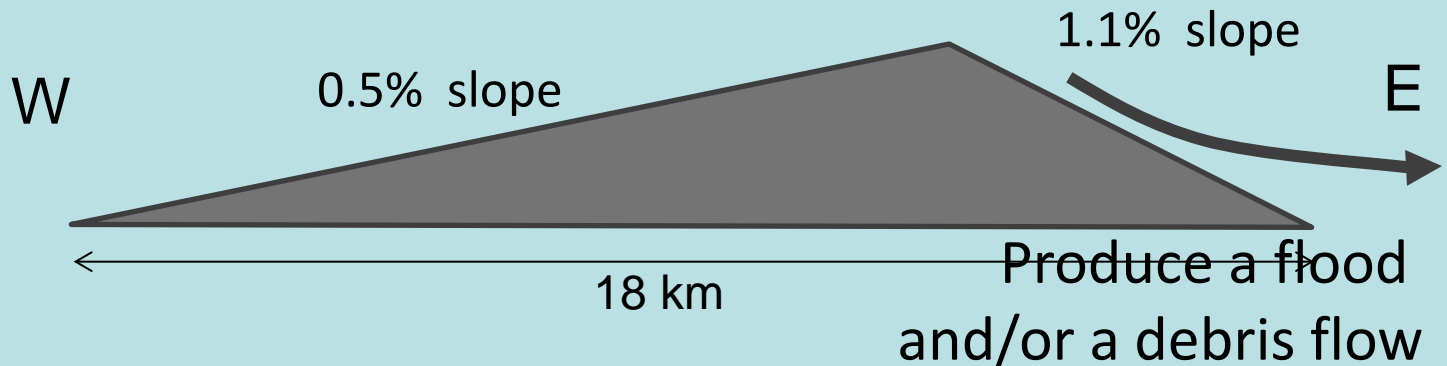


Debris flows in the sedimentary record



OBHBD conceptual model

Gently add water



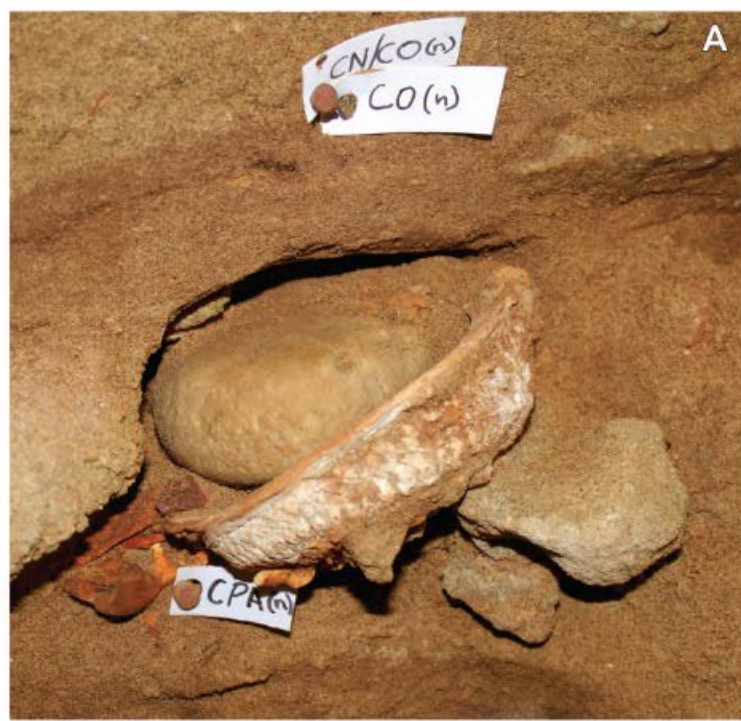
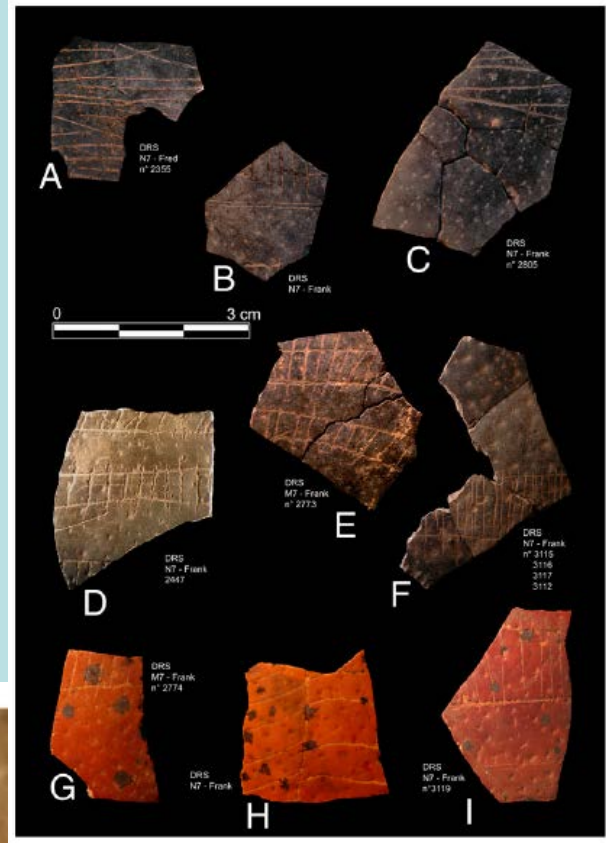


A 100,000-Year-Old Ochre-Processing Workshop at Blombos Cave, South Africa

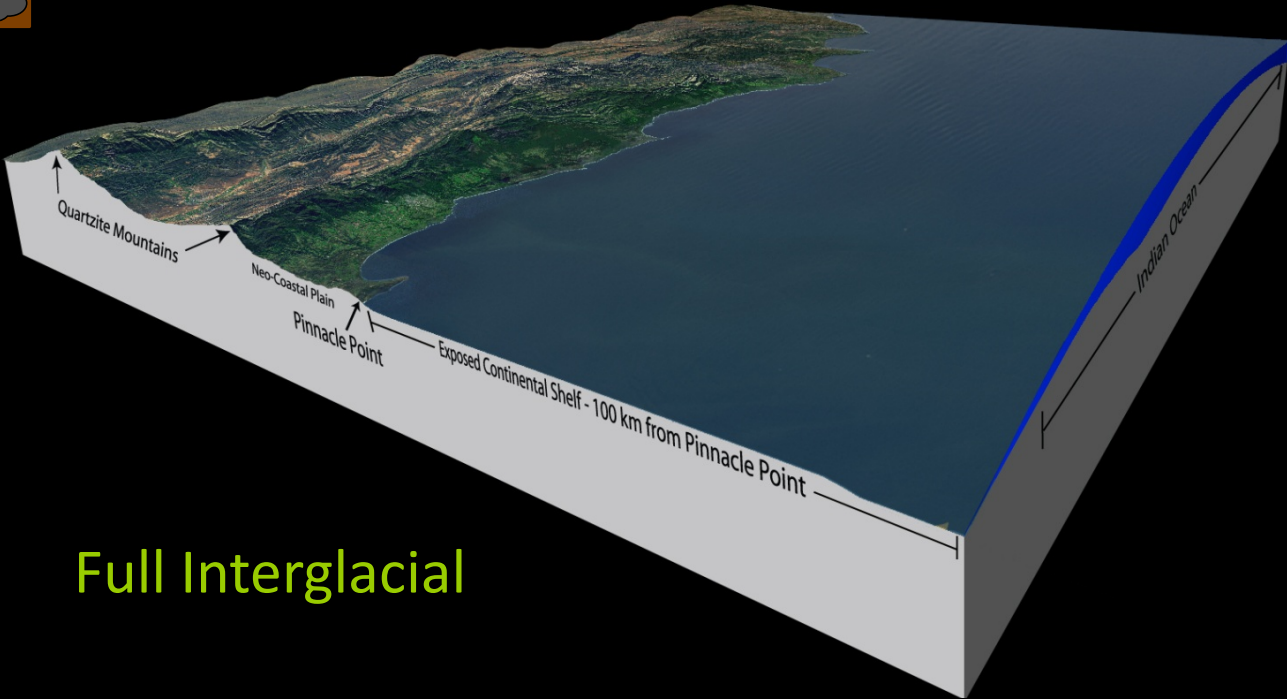
Christopher S. Henshilwood,^{1,2*} Francesco d'Errico,^{3,1} Karen L. van Niekerk,¹ Yvan Coquinot,⁴ Zenobia Jacobs,⁵ Stein-Erik Lauritzen,⁶ Michel Menu,⁴ Renata García-Moreno³

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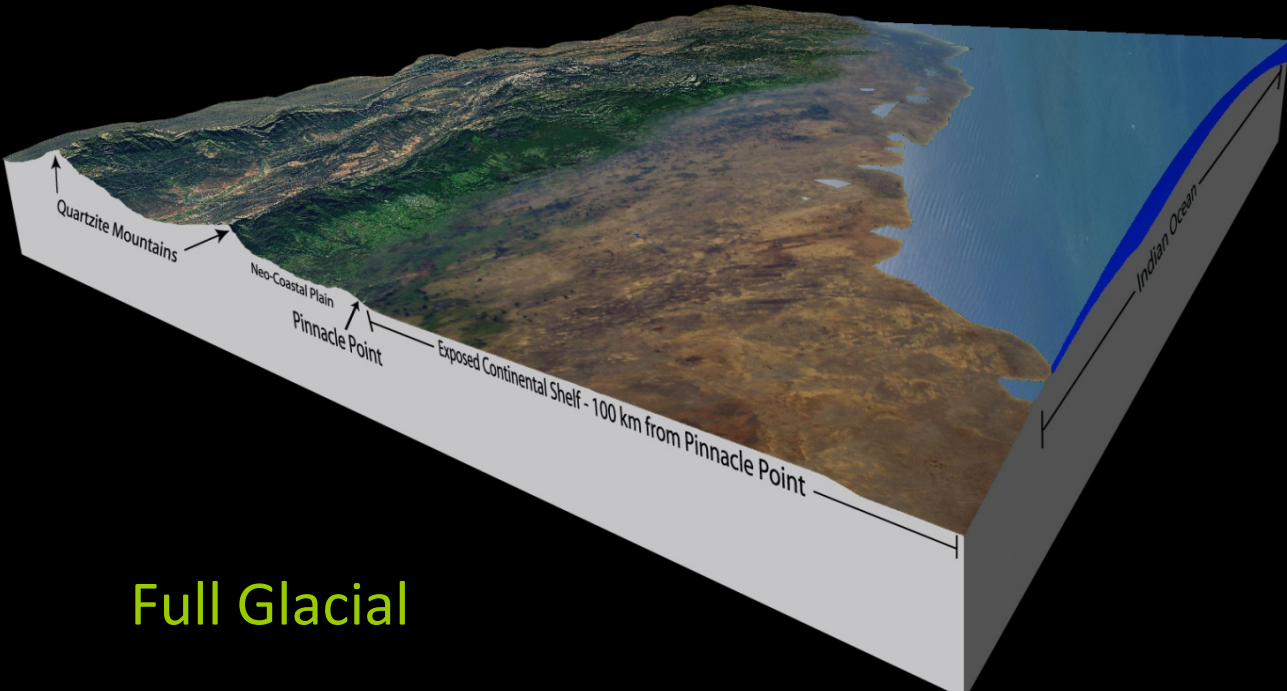
100 ka ochre processing toolkit in situ



65 ka ochre decorated ostrich eggshell containers



Full Interglacial



Full Glacial



