



Lecture 6 – Stories and science



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Acknowledgement

Here at Curtin, we are learning on Whadjuk Noongar boodja. I would like to acknowledge the Whadjuk Noongar people, and their culture and connection to country.

I offer the class's respects to the Whadjuk Noongar Elders, past present and emerging.

! Aboriginal and Torres Strait Islander users of this material are advised there may be images, viewings, stories, photos and written materials of people which could be disturbing and/or of persons who are deceased.

Why are we here?

Revise what we've learnt so far, but taking a global perspective

Outcomes:

- Understand that there are a wide range of Indigenous cultures and knowledge systems around the world, each of which have a scientific system embedded
- Understand the importance of stories and that their existence does not conflict with science
- Intro to the next assessment

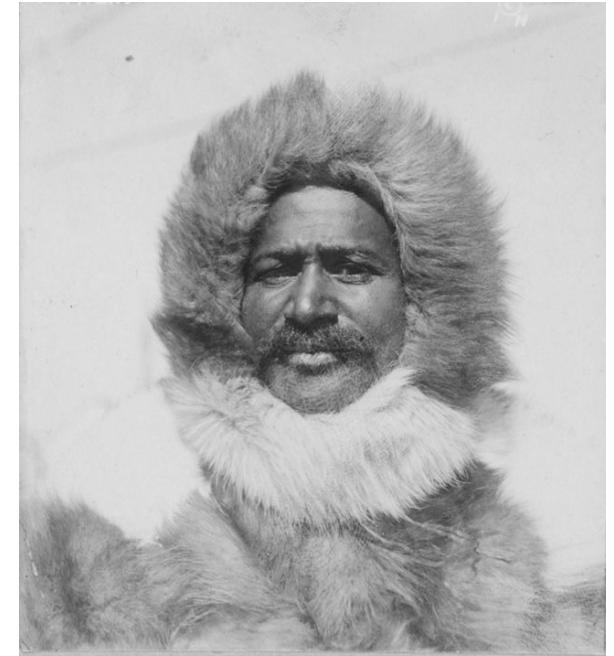
Flash back to week 2!



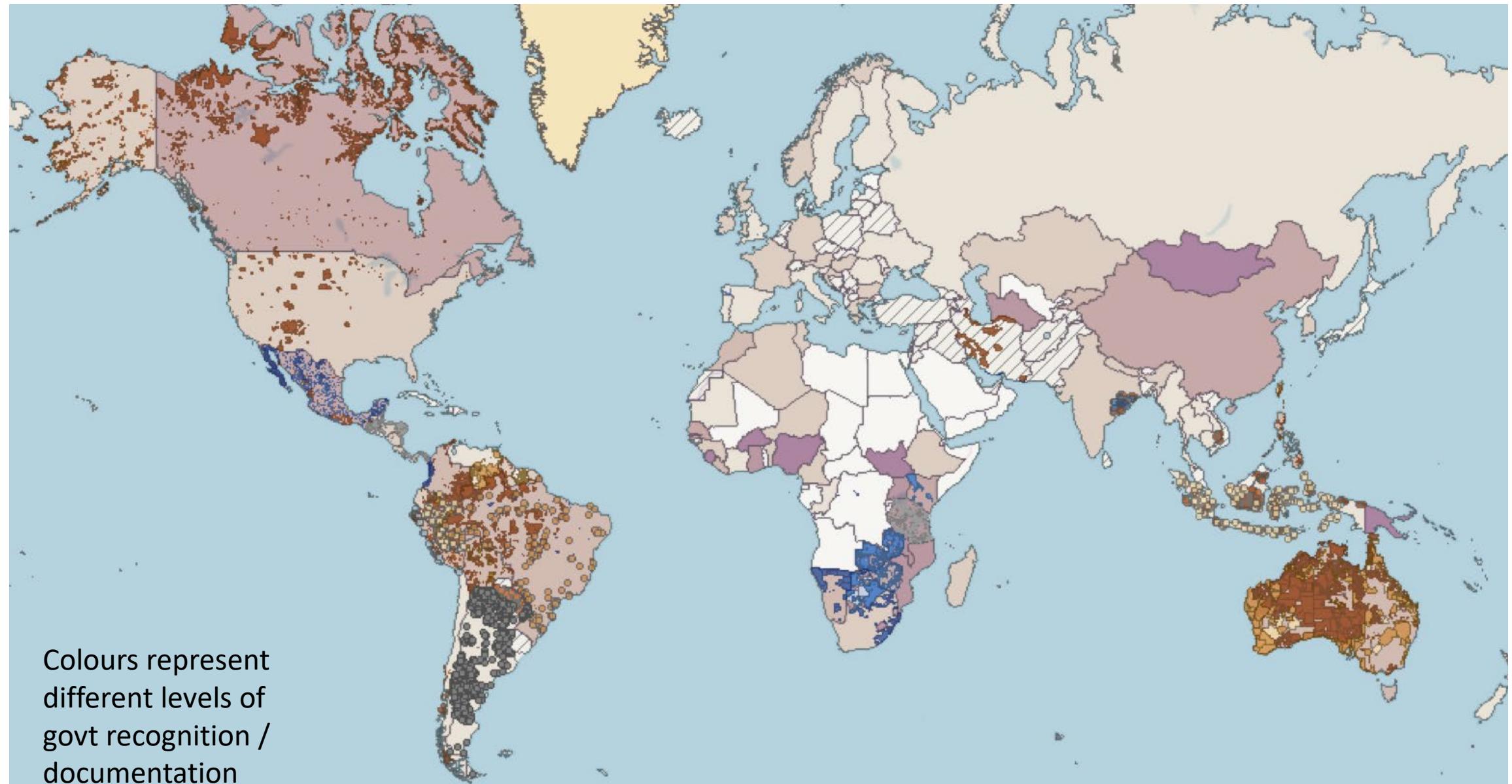
Robert Peary

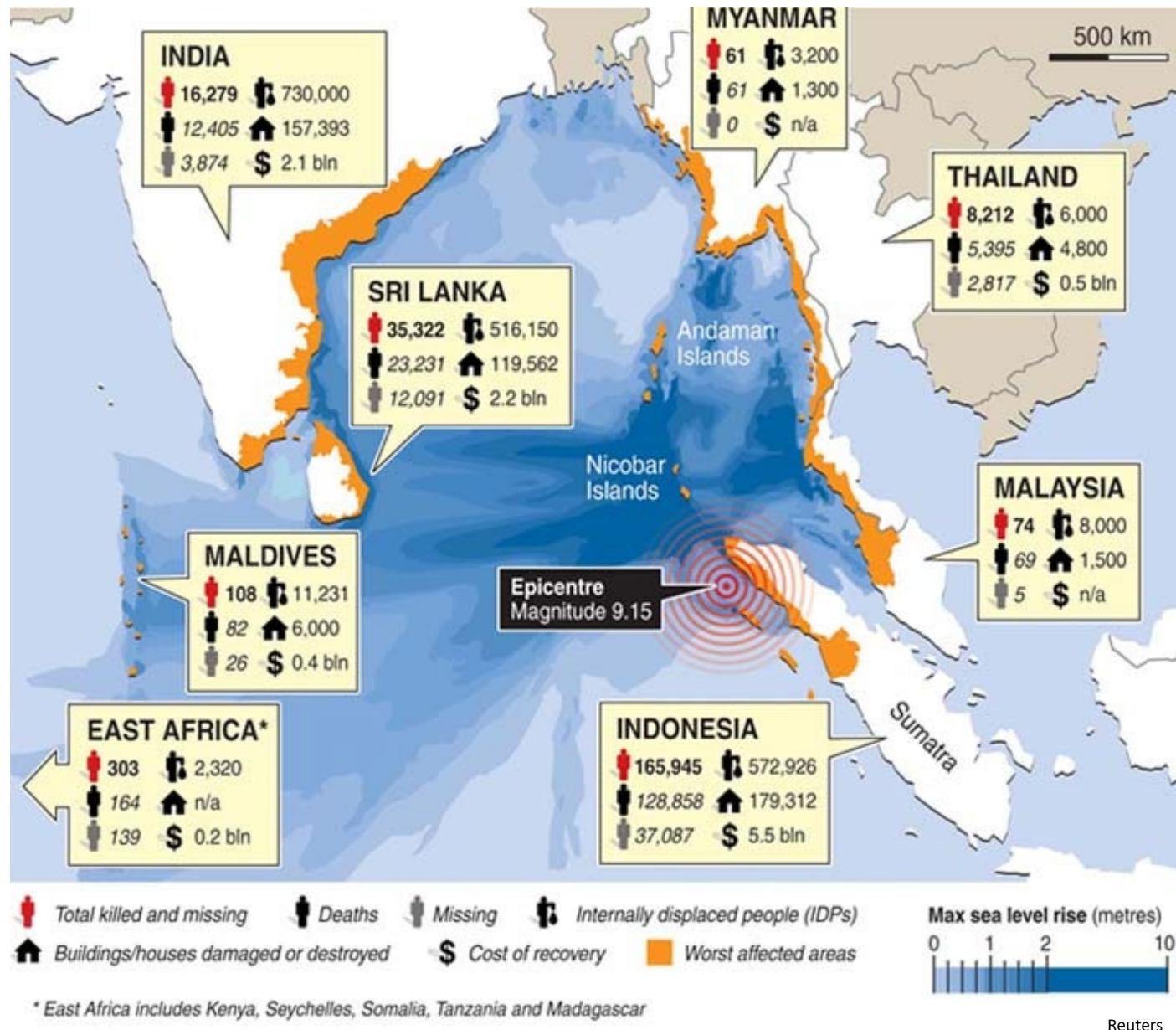
**Quick poll
(don't look up the answer!)**

What ethnicity was the first named man at the north pole?



Matthew Henson





When Smong saved thousands of lives

Boxing Day Tsunami 2004

Simeulue, an Indonesian island was one of the closest to the epicentre

But very few died.

An earthquake in 1907 had created the oral knowledge of “Smong” (tsunami in the local language).

Smong tells what to do if the earth and sea behave in certain ways

The contribution of indigenous knowledge to disaster risk reduction activities in Zimbabwe: A big call to practitioners

Ernest Dube¹ and Edson Munsaka²

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Abstract

Go to:

This article examined the contribution of indigenous knowledge to disaster risk reduction activities in Zimbabwe. The current discourse underrates the use of indigenous knowledge of communities by practitioners when dealing with disasters', as the knowledge is often viewed as outdated and primitive. This study, which was conducted in 2016, sought to examine this problem through analysing the potential contribution of indigenous knowledge as a useful disaster risk reduction intervention. Tsholotsho district in Matabeleland, North province of Zimbabwe, which frequently experiences perennial devastating floods, was used as a case study. Interviews and researcher observations were used to gather data from 40 research participants. The findings were that communities understand weather patterns and could predict imminent flooding after studying trees and clouds, and the behaviours of certain animal species. Local communities also use available local resources to put structural measures in place as part of disaster risk reduction interventions. Despite this important potential, the study found that the indigenous knowledge of disaster risk reduction of the communities is often shunned by practitioners. The practitioners claim that indigenous knowledge lacks documentation, it is not found in all generational classes, it is contextualised to particular communities and the knowledge cannot be scientifically validated. The study concluded that both local communities and disaster risk reduction practitioners can benefit from the indigenous knowledge of communities. This research has the potential to benefit communities, policymakers and disaster risk reduction practitioners.

Indigenous knowledge is local.

It is often dismissed for this reason

But a long history in one place =
knowledge of great depth.

Prejudice against Indigenous
knowledge still exists in science.

This is often based in a lack of
understanding about how
different knowledge systems work.

What is a story?

Many people confuse stories with fiction – but this is only one type

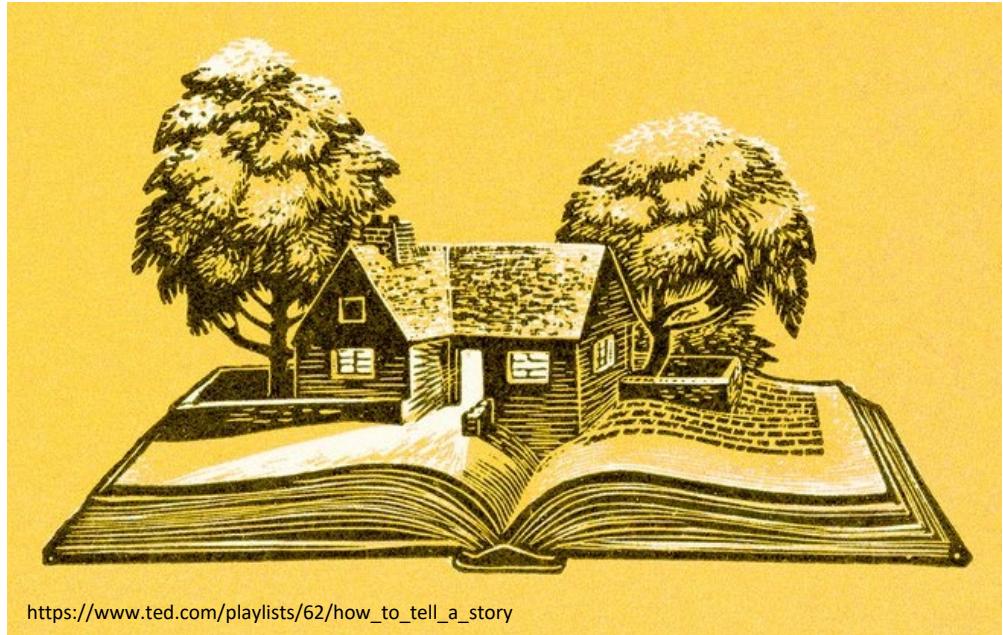
Stories can:

Relate true events entirely factually (non-fiction)

Be metaphorical (use made-up events to illustrate real ideas or facts)

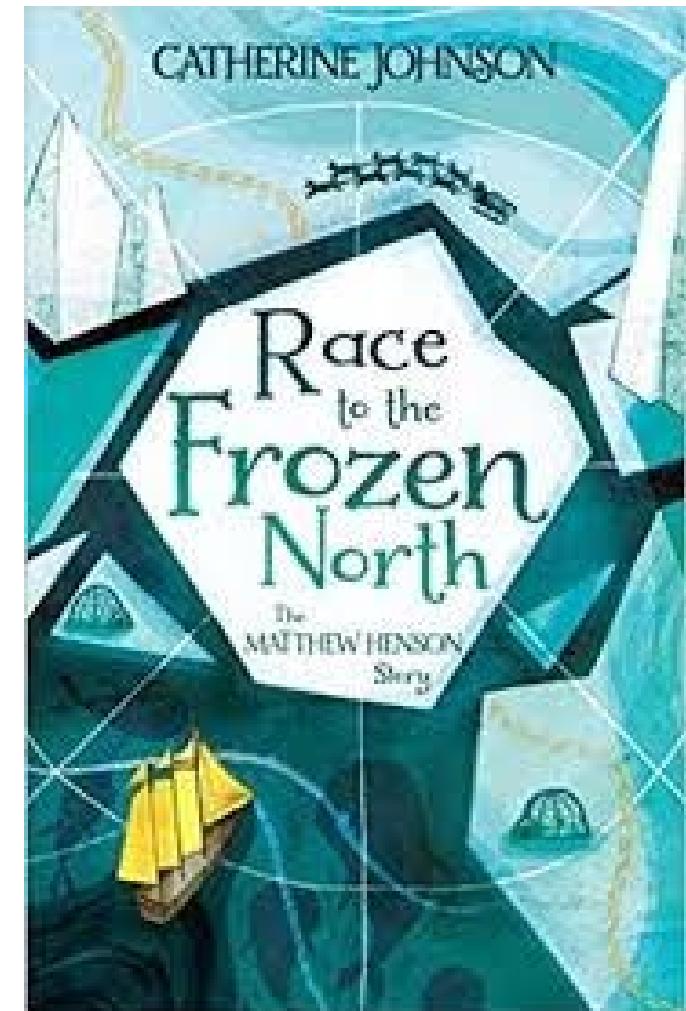
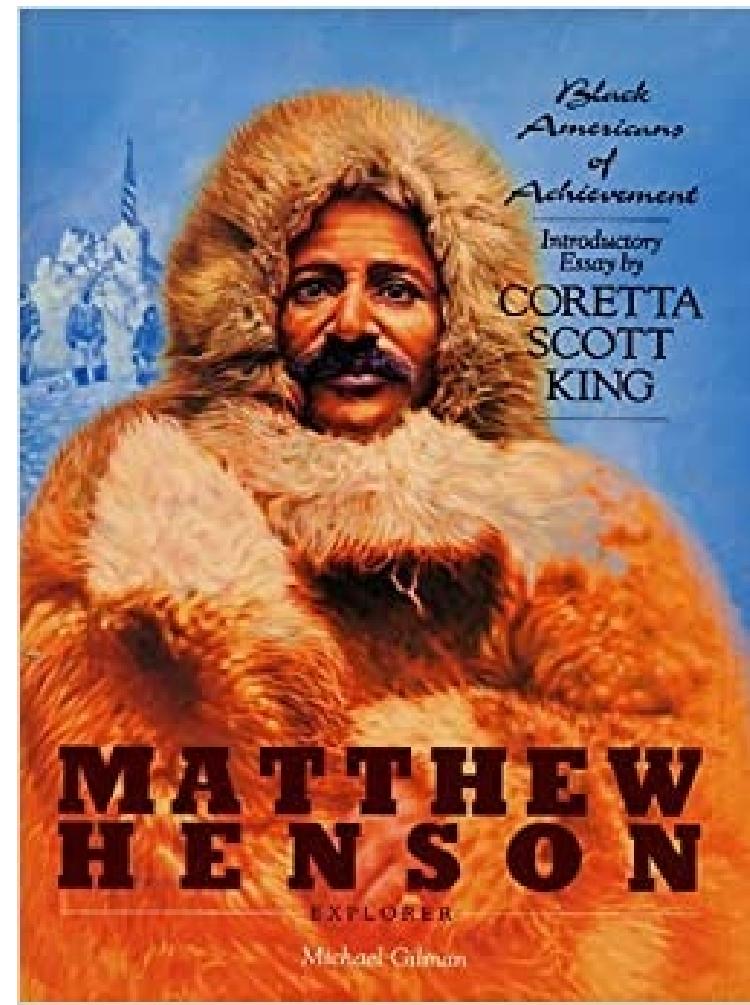
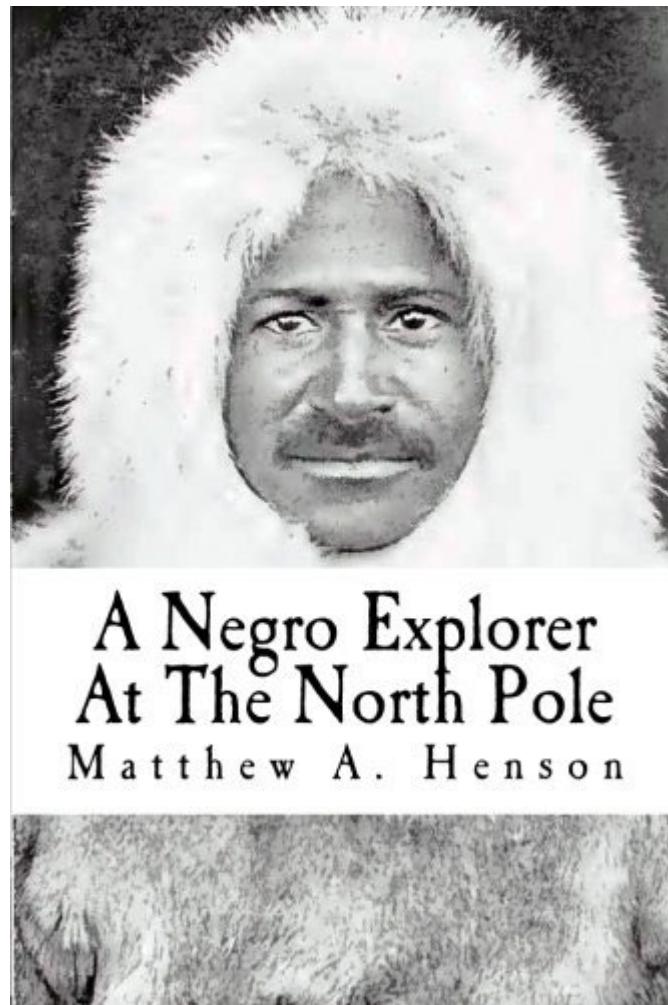
Combine a range of fact, fiction and metaphor.

Be written, oral, or visual



https://www.ted.com/playlists/62/how_to_tell_a_story

A story is a narrative that helps people engage with and remember the subject



Let me tell you a story



Tanovo was the chief of Ono Island in Fiji.

He liked to walk on the beach and watch the sunset.

Let me tell you a story

Tanovo had a rival, the chief of the volcano Nabukelevu.



Wikimedia Commons: Jaejay77, CC BY-SA

He thrust his mountain
up into the sky blocking
Tanovo's view.

Tanovo flew into a fury.

He wove baskets and
tore up the mountain.

But he was caught, and
fleeing dropped the
rocks and earth into the
sea.

Let me tell you a story

This is clearly a story about a volcanic eruption, recorded in the local oral tradition.



<https://fm96.com.fj/5-3-magnitude-earthquake-in-kadavu-poses-threat-to-nearby-villages/>

But western scientists said it was impossible for this to record a real event.

Their scientific evidence proved it.

Then they found their evidence was wrong....

Is an Aboriginal tale of an ancient volcano the oldest story ever told?

By **Colin Barras** | Feb. 11, 2020 , 5:40 PM

Long ago, four giant beings arrived in southeast Australia. Three strode out to other parts of the continent, but one crouched in place. His body transformed into a volcano called Budj Bim, and his teeth became the lava the volcano spat out.

Now, scientists say this tale—told by the Aboriginal Gunditjmara people of the area—may have some basis in fact. About 37,000 years ago, Budj Bim and another nearby volcano formed through a rapid series of eruptions, new evidence reveals, suggesting the legend may be the oldest story still being told today.

The study raises a provocative possibility, says Sean Ulm, an archaeologist at James Cook University, Cairns, who was not involved with the work. “It is an interesting proposition to think about these traditions extending for tens of thousands of years.” But he and others urge caution, as no other stories passed down orally are believed to have survived that long.

Tools were found under the volcanic deposits in the 1940s

Humans were present.

The eruption was dramatic.

Why is the idea this story relates to a real event “provocative”?

<https://www.sciencemag.org/news/2020/02/aboriginal-tale-ancient-volcano-oldest-story-ever-told>

Should science “test” Indigenous stories?

- Examination of these stories by western science, without cultural awareness, can imply that western scientific methods are the only valid approach to knowledge.

But...

- Scientific research provides new information, and can support the importance and truth of Indigenous knowledge among non-Indigenous people / authorities.

Damein Bell, CEO of the Gunditj Mirring Traditional Owners Aboriginal Corporation, says the Gunditjmara community welcomes the new study, which highlights the deep links they have with their country. “As with all First Nations around the world, our stories, heritage, identity and survival are connected to our traditional homelands and waters,” he says. Bell says the Gunditjmara already suspected their story had been kept alive by their ancestors for a very long time, but they appreciate any scientific evidence that can provide a sense of exactly how long. “We’re always amazed with ... new technologies that prove the brilliance of our ancestors.”

Consent and collaboration are crucial

Indigenous stories

Indigenous knowledge is often a holistic system, therefore the stories incorporate multiple knowledge components – scientific, moral / lore and spiritual.

Key take home points for scientists!

We need to respect the whole – the story may be sacred to its owners

The presence of spiritual or moral aspects doesn't invalidate the science present (e.g. Tanovo is a story of chiefs fighting, but it is still a record of a real event).

Western knowledge systems separate into disciplines (science, history, theology, art etc.)

Indigenous knowledge does not.

Neither is the “right” approach. They are different and complementary.

Stories in science

We use stories in science all the time.

They provide the hook to interest readers.

Planning science writing as a narrative keeps us on topic.

A good story has:

- Beginning, middle and end.
- A hook – why should the reader care?
- An arc for the “protagonist” (can be an idea not a person!).
- Something changes.

The 14 Wildest Science Stories from 2019

By Adam Mann - Live Science Contributor December 30, 2019

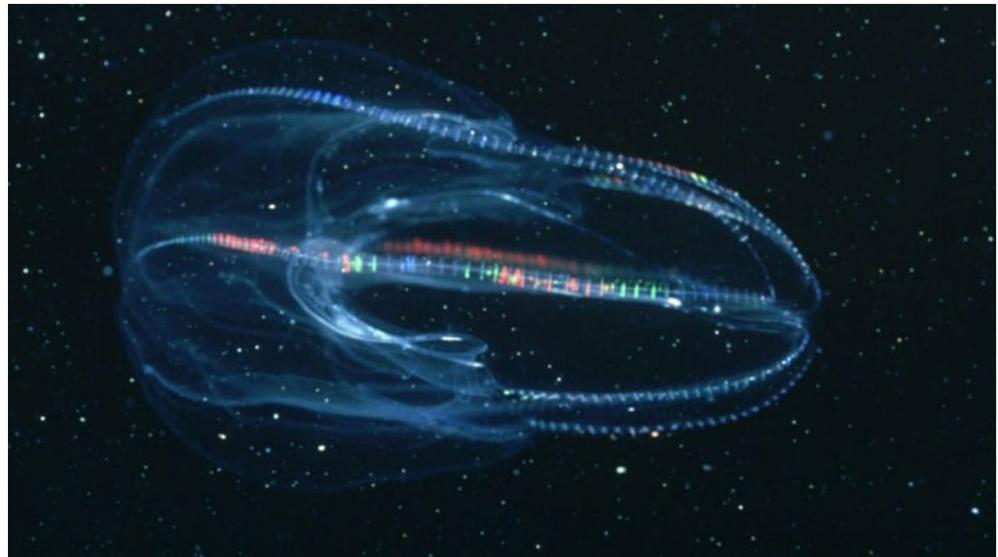
The most unusual experimental findings and strangest scientific reports from 2019



Comments (0)

Year after year, science marches on, delivering findings that fascinate, educate and awe us. And then there are those other results, the ones that make you sit up and think, "Did we really need to know that?" So, here's a tribute to the sillier side of science, with 14 of the strangest scientific stories from 2019.

Comb jelly sometimes has an anus



(Image credit: Oxford Scientific/Getty)

A scientific story from my research

The protagonist!



We know very little about how animals living in groundwater function, but we know they are important for groundwater health.



We researched how food webs change in groundwater with changes in rainfall



Animals in groundwater feed differently during different rainfall regimes

Beginning and hook

Middle – the bulk of the story

End – new knowledge

Arc



Scientific arguments as stories

Beginning and hook

Middle – the bulk of the story

End – new knowledge

**Introduction and
thesis statement**

Backing and evidence

Counter-claim and rebuttal

Conclusion

Arc



Arguments as stories

The protagonist...? Your thesis statement!

Beginning and hook

Introduction and thesis
statement

Introduce the protagonist!

Set the scene

Hook the reader



Arguments as stories

Middle – pt 1

Backing and evidence

Take the reader on a journey through the evidence,

Showing the reasoning and qualifiers

The backing / reasoning

Your thesis statement!



Arguments as stories

Middle – pt 2

Counter-claim and rebuttal

Oh no! The protagonist is challenged!

Explain the challenge.

Weigh the evidence.

Show why the thesis statement is supported



Your thesis statement!



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Arguments as stories

End – new knowledge

Conclusion

Sum up the journey

Show the reader how
their understanding has
changed



Arguments as stories

The protagonist...? Your thesis statement!

Beginning and hook

Middle – the bulk of the story

End – new knowledge

Introduction and thesis statement

Backing and evidence

Counter-claim and rebuttal

Conclusion

Introduce the protagonist!

Take the reader on a journey through the evidence, showing the reasoning and qualifiers

Oh no! The protagonist is challenged!

Sum up the journey

Set the scene

Explain the challenge.

Show the reader how their understanding has changed

Hook the reader

Weigh the evidence.

Show why the thesis statement is supported

Arc

Assessment 2 – scientific argumentation

Task Description

Research and write an argumentative essay that examines engagement between Western scientific and Indigenous knowledge systems, by demonstrating how Indigenous knowledge precedes, contributes to, collaborates with, or complements STEM (Science, Technology, Engineering or Maths) to address a Global Challenge.



Address one of the global challenges below and focus your argument on a case study from a specific geographical region.

Global Challenges :

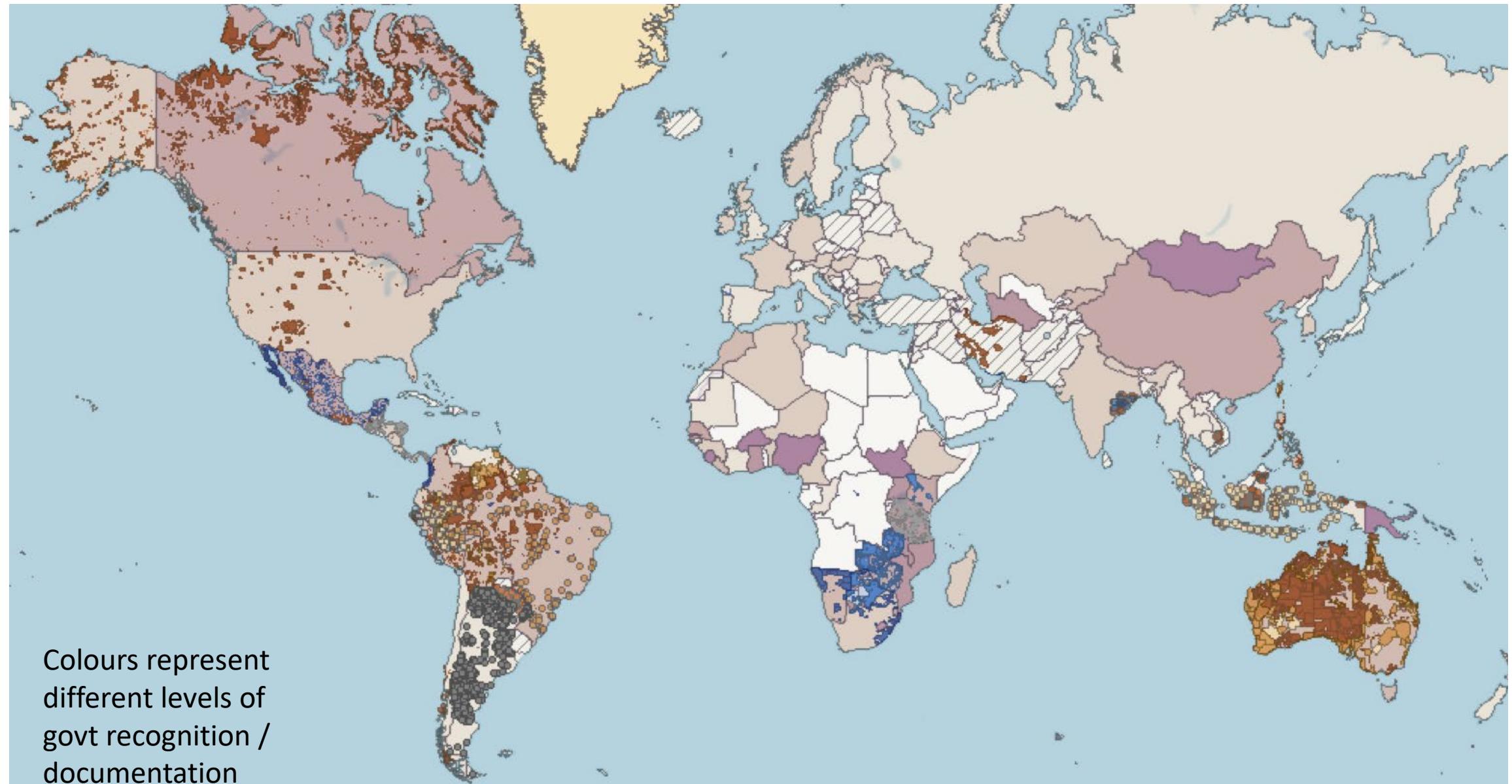
Food security; nutrition; sustainable agriculture; biodiversity; species extinction; conservation; climate impacts; water management; drought; land management, marine protection / resources; natural hazards; wildfires; new medicines; mental health; public health; sustainable development; supporting remote communities; sustainable technologies; STEM education / communication.

- a) Construct a piece of evidence-based academic writing (a scientific argument) that fully supports a thesis statement,
- b) within a word limit of 1000 - 1500 words (excluding references),
- c) using relevant evidence, with appropriate paraphrasing, to support and refute your argument,
- d) using a minimum of 10 references, that are correctly referenced (in-text and end-of-text; APA 7th).
- e) Self-evaluate your work using the marking rubric provided.

Global challenges



United Nations (2020). *Global Issues Overview*. <https://www.un.org/en/sections/issues-depth/global-issues-overview/>





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The depth of Indigenous knowledge systems provides unique insight into their countries and communities.

Western science can often add to, but not replace this knowledge

Step 1 – choose your topic

Food:

Food security;

nutrition;

sustainable agriculture;

Hazards:

natural hazards (any of them!);

wildfires;

Conservation:

biodiversity;

species extinction;

conservation;

Health:

new medicines;

mental health;

public health;

technology in health

Environment / management:

climate impacts;

water management;

drought;

land management,

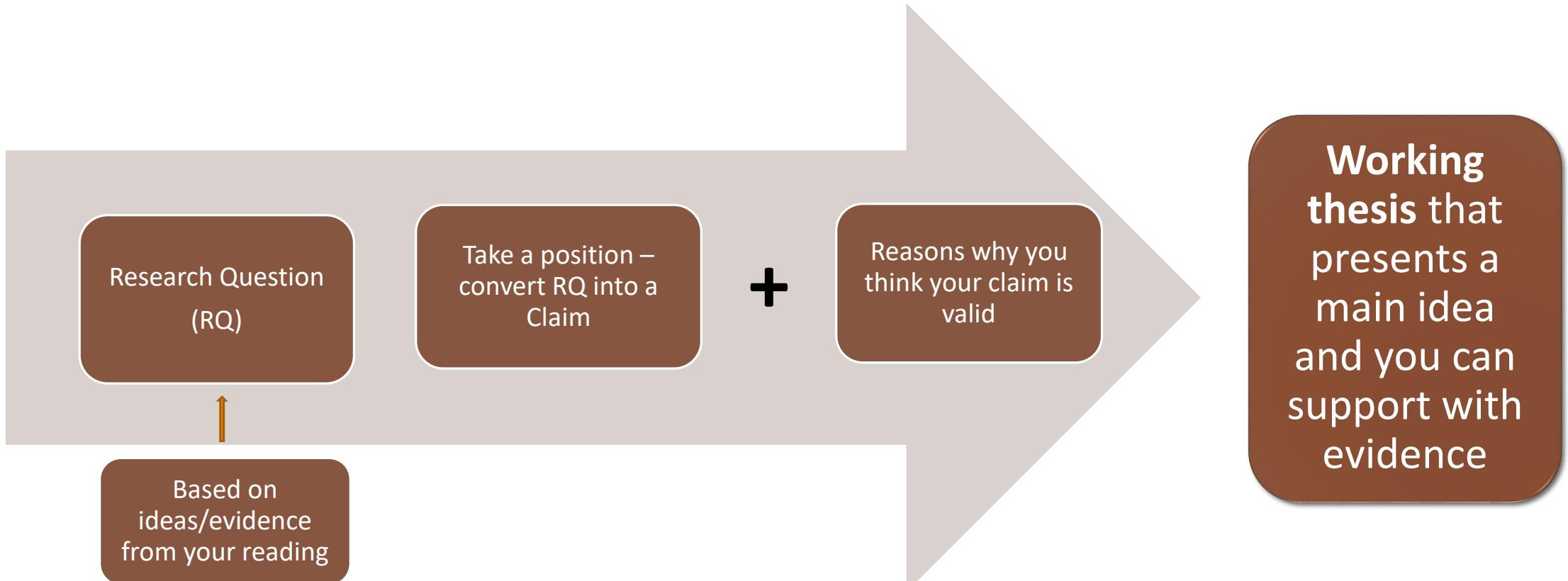
marine protection / resources;

Technology and development:

sustainable development; supporting remote communities;

sustainable technologies; STEM education / communication

Step 2 – formulate your thesis statement



Note: ‘Working thesis’ because both argument and thesis will need adjusting along the way as you write and deepen your thinking on the topic.

Adapted from: <https://writingcenter.unc.edu/tips-and-tools/thesis-statements/>



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Step 3 – choose your case study area

Step 4 – do more research! Test your claim

Step 5 – construct your argument

We'll be helping you with step 5 in the workshop after the easter teaching free period.

Take the opportunity before that to do plenty of research and get your ideas together.

Remember to submit your thesis statement to your portfolio

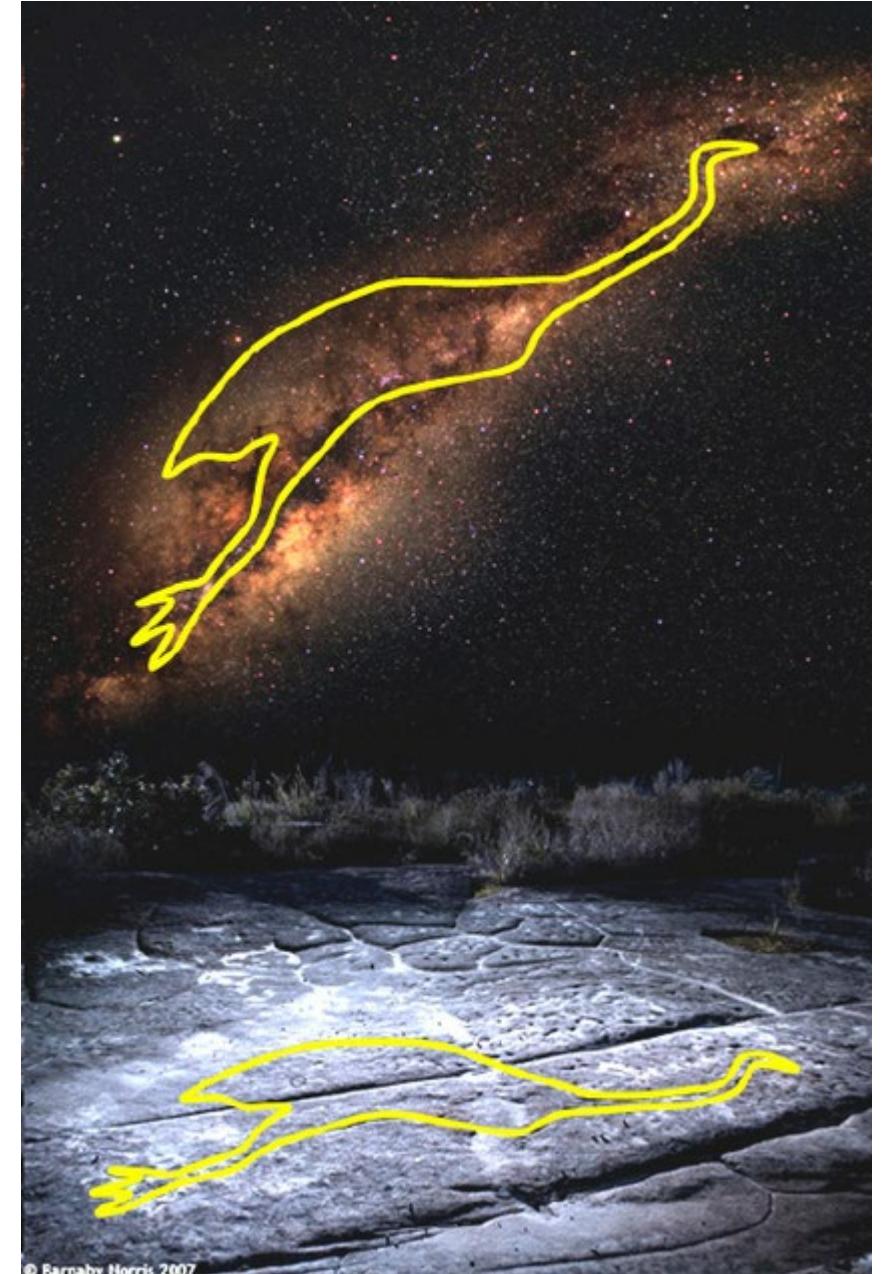


The story so far...

Indigenous knowledge systems are usually wide-reaching and holistic

We have met many Aboriginal and Noongar examples

- The importance of Dreaming and totems – spiritual and scientific knowledge as one
- Stories in the sky and how they connect to activities on the ground
- **A long history on country gives deep understanding**
 - healthy country, healthy people



© Barnaby Norris 2007

The next chapter

Indigenous knowledge has not always been valued by western science

Colonialism and the spread of western science heavily affected Indigenous peoples and cultures

We can't understand where we are today, or how to move forward without addressing this.

It's confronting. But **it's not about blame or feeling guilty.**

It's about truth and reconciliation.

If we face history together, we can move forward together