



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# Kamilaroi (Indigenous) Knowledge and Methodologies to Inform Water management

**Associate Professor Bradley J. Moggridge**

University of Canberra, Australia

Centre for Applied Water Science

[@bradmoggo](#)

02/02/2023

**Yaama, I Acknowledge I am on Ngunnawal Country**

**I am Kamilaroi**





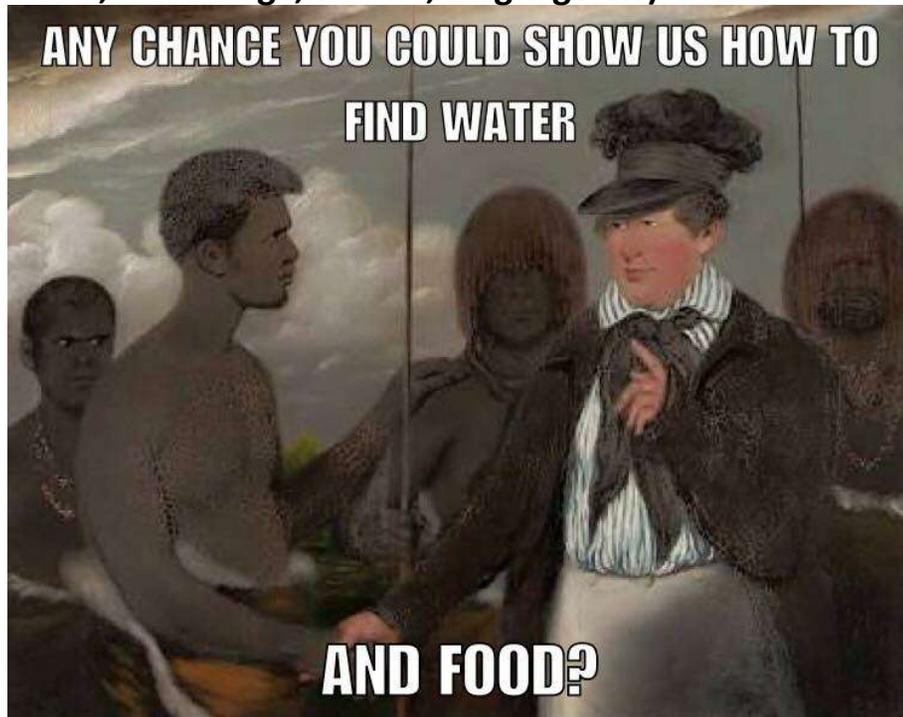
UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# Meme time

Facebook MEME, Day 1 in the Colony (and your land, knowledge, culture, language etc)



Cartoon  
Today in the Colony





UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# Culture

- **Culture for me is:**
  - Who I am and **my mob**
  - **Respect**
  - **Always learning** culture – Traditional Knowledge
  - **Language**
  - **Family** or Kin (Uncle, Brother, Aunty, Sister)
  - **Connection to Country**
  - My cultural **water (gali) place** and My **cultural Species**



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

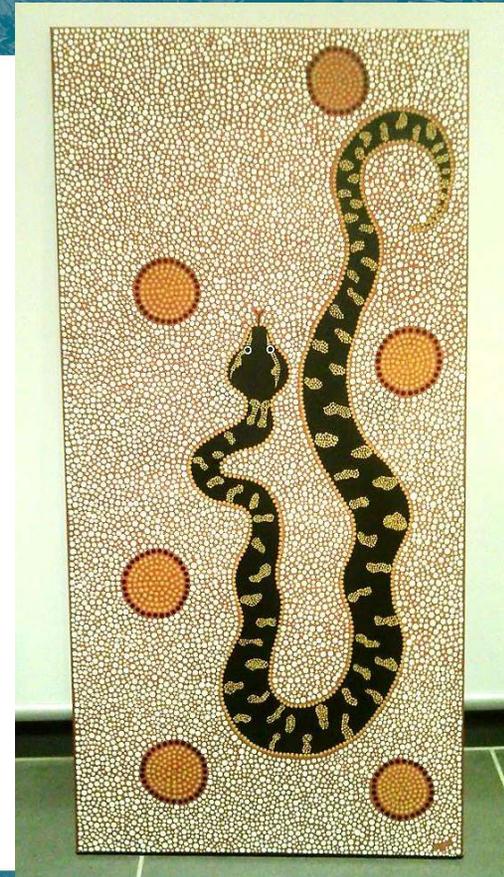
# Sharing Knowledge and Connecting



**Water is protected by Lore,** its in the songs, dances, Dreaming stories and art

Think of **Traditional Water Knowledge:**

- How the old people knew water
- Tell our stories our way about water
- Find and re-find water in a dry landscape
- Value and protect that water
- Culturally validate the knowledge



# Water Dependant Cultural Keystone Species



**Maliyan (Wedge Tailed Eagle)**  
***Aquila audax***



**Burrunga (Brolga)**  
***Grus rubicundus***



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# Methodology Setting

- **Storytelling** is central to Indigenous epistemologies – Sci.Comm
- **Stories go in circles**, not a straight line hence - **Yarning Circles, Corroboree's** and concentric **designs in art**.
- However, our **storytelling has been perceived** as:
  - Myth and Legend, Tall Tales, Folklore, Fables etc etc....
  - Moves traditional scientific knowledge from science to fiction
- **Culture of science does not acknowledge the 1000's of generations** of observation/science as evidence



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# My Methodology

- **Shift the research paradigm away from Kamilaroi peoples being the researched to becoming the researcher**
- **My knowledge (still learning) is about how I relate with people and country**
- **This differs to western thinking – gained and owned**
- **Fill the void in water management with Kamilaroi Science**
- **By Kamilaroi, With Kamilaroi, For Kamilaroi**

Recent article - Moggridge, B.J., Thompson, R.M. & Radoll, P. 2022. **Indigenous research methodologies in water management: learning from Australia and New Zealand for application on Kamilaroi country.** *Wetlands Ecology Management* (Special Issue). <https://doi.org/10.1007/s11273-022-09866-4>



# My Cultural Water Places

**Boobera Lagoon 2006**

**Gwydir Wetland  
(Gingham) 2018**





UNIVERSITY OF  
CANBERRA



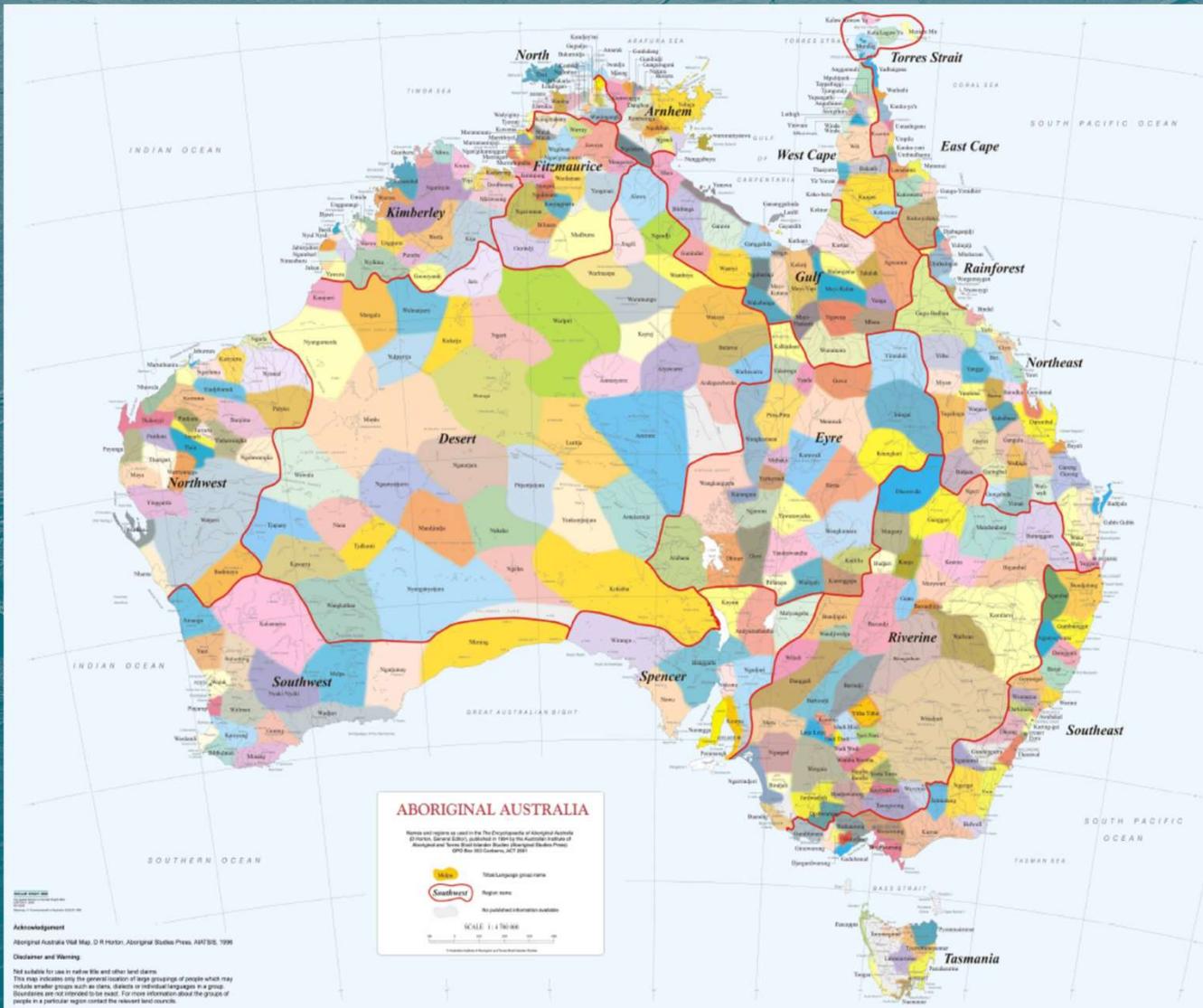
INSTITUTE FOR  
APPLIED ECOLOGY

# My Methodology

**Can this Methodology fit into the  
world of water science?**

# Diversity

**We are not all the same, every mob is different. That Difference is: Language, Lore, Landscapes, Cultural Practice, Capacity, Status and Governance.**





# First Scientists and Traditional Knowledge

- **Traditional Knowledge of water is not myth and legend, folklore, fable or mumbo jumbo**
- **Traditional Knowledge is an ongoing understanding and thousands of years of observations of the driest inhabited continent on earth**



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# Indigenous Knowledge and Science

- **Indigenous Traditional Knowledge** and **Traditional Science** is **old business** for us but new for western science
- The **methods and knowledges** are acquired (over thousands of generations) and somewhat different, but is there overlap?
- Acceptance and **cultural validation is hard to come by**, the culture of science may need to evolve
- **Lets collaborate and celebrate** and move beyond the Myth and Legend of Indigenous Knowledge and validate it through the Academy's.



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# Sea Level Rise

## **Nunn and Reid (2016)**

Stories from **21 Australian locations**, tell of a time when the former coastline of mainland **Australia was inundated by rising sea level**

Validating the stories to **7,250–13,070 years bp**

The authors add that longer-term cultural memories may be encouraged by:

- (a) **cultural isolation,**
- (b) **terrain with obvious physical reference points,**
- (c) **an environment whose harshness advantages people(s) with a good memory for what is where.**



# Volcanic Knowledge

## Cohen et al (2017)

The team, from the Scottish Universities Environmental Research Centre (SUERC) paper in Quaternary Geochronology

The researchers used a technique known as **argon-argon geochronology** putting the **Kinrara** volcanic activity age at **7000bp +/-2000years**.

The team then connected it with a 1970's story from **Gugu Badhun people** speaking of dust in the air and earth on fire = **230 generations** of oral traditions and observation



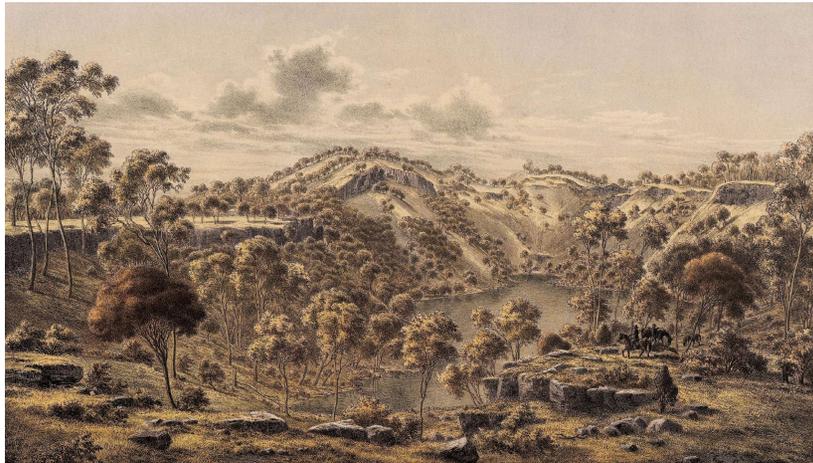
UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# Volcanic Knowledge

**Is an Aboriginal tale of an ancient volcano the oldest story ever told?  
Eruption 37,000 years ago may have sparked a legend about four  
giants**



<https://www.science.org/content/article/aboriginal-tale-ancient-volcano-oldest-story-ever-told>



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# Astronomy



Most recognisable story – **The emu in the sky** (photo from ANU) Dhinawan in the dark matter of the Milky Way

The sky is a copy of what's on earth, i.e.  
**Milky Way is a big River**

**Moon halos and No. of stars within = rain in No. of days**

**Meteors** can mean many things some e.g. someone has passed or the eyes of the rainbow serpent or eyes of creators



UNIVERSITY OF  
CANBERRA



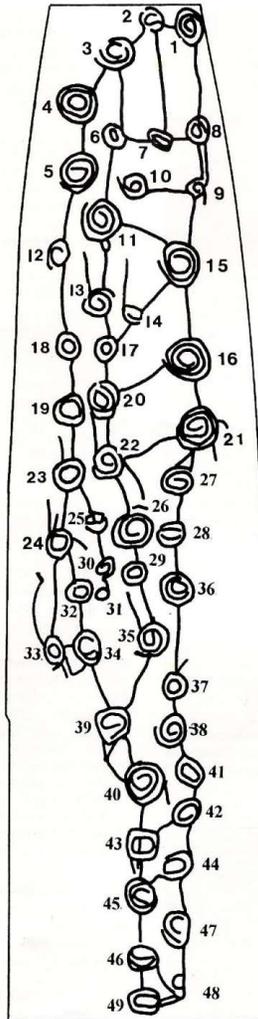
INSTITUTE FOR  
APPLIED ECOLOGY

# Significant Papers

- Hamacher and Norris 2016** Australian Aboriginal Geomythology: Eyewitness Accounts of Cosmic Impacts? *Archaeoastronomy – The Journal of Astronomy in Culture*
- Cohen et al 2017** *Holocene-Neogene volcanism in north-eastern Australia: Chronology and eruption history*, Quaternary Geochronology Volume 39, April 2017, Pages 79–91
- Nunn P.D. and N.J Reid 2016** *Aboriginal Memories of Inundation of the Australian Coast Dating from More than 7000 Years Ago*. [Australian Geographer](#) Vol. 47, Iss. 1, 2016

# Knowing Groundwater

1. Labbi-labbi
3. Liuwiringa
5. Maiyada-maiyada
7. Kirindji
9. Markodarindja
11. Wirrkaldjarra
13. Luwano
15. Tjul'tjun'waridji
17. Tildi
19. Kuna
21. Yinindi
23. Tanda
25. Palta
27. Binbiyan
29. Yirabanda
31. Yappadarra
33. Yuldumallo
35. Mukubanda
37. Karuwildji
39. Kiribarro
41. Wangadjarro
43. Tjimarri
45. Wirrarigulong
47. Miltji-miltji
49. Lola



5.0 cm

2. Tananga
4. Kunnamannera
6. Wirra-wirra
8. Kanandibaroo
10. Kampanbarro
12. Pinna
14. Kira
16. Dandju
18. Wakilbi
20. Pintinba
22. Yalbirrimanno
24. Kurandal
26. Kura
28. Tjipallalla
30. Dangalli
32. Timbabiddi
34. Kunagarri
36. Mari-mari
38. Wallabarrarba
40. Yanna
42. Wornba
44. Kunananno
46. Danneriyono
48. Papulba

**A highly conventionalised map of the Western Australian water resources of the Bindibu [=Pintupi], as carved into the back of a spear-thrower.**

Source: Redrawn from a photograph. Thomson (1962) in Bayly (1999) page 19 in Moggridge (2005).



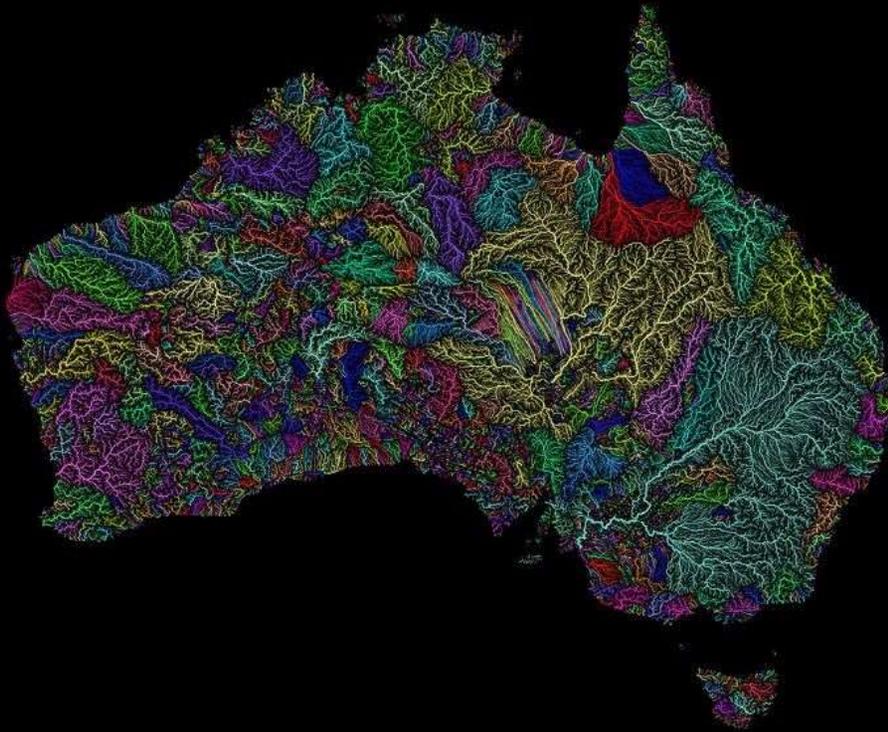
UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# Time to Celebrate

Robert Szucs/Grasshopper Geography



© ROBERT SZUCS/GRASSHOPPER GEOGRAPHY

**Something to  
consider: We  
have always been  
here but,  
why does  
Australia not  
celebrate our  
Water  
Knowledge?**



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# Let's Advance Australia's Water Share

**Water and First Peoples are connected, but where is our right to water?**

**What does history tell me?**

- Our Land and Water was **given away**
- Our rivers were **modified, over-extracted and polluted**
- Our people were **not counted as Humans until 1960's**
- When we became human there was **no land or water left**
- So if we want water - **we have to buy it from the Market**



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# Indigenous Engagement and Water Planning

## Hope or Hopeless?

- National Voice to Parliament (pending referendum)
- States have committed to a path to Treaty
- Northern Territory – Strategic Aboriginal Reserves
- Fed\$40Million for water entitlements (\$0 spent since Nov2018)
- National [Cultural Flows](#) Research Program
- No restorative Justice by regulators as a result of water theft
- Rights of Nature (Rivers)



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# The Rights of Rivers

## **2017 saw changes in this space:**

- **Aotearoa - Whanganui River**
- **India - Ganga and Yamuna Rivers**
- **Columbia - Rio Attrato**
- **Australia - Birrarung (Yarra River) Protection Act**

**Further in Western Australia the Martuwarra Council was created to protect a living being**



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# The Rights of Rivers

**Giving a voice to rivers, does this mean we humans abdicate our responsibilities to protect them?**

**This is more than a water holder providing *eWater***

**Australia has a history of not protecting the voices**



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# Refresher on our water voice?

Australia is still the **driest inhabited continent** on earth and yet one of the **oldest surviving cultures**, has no water voice

## Our voice is absent, due to:

- Being impacted by **decisions that exclude us** (No Treaty)
- Being an **after thought or out of scope** (beyond the Welcome)
- Hearing of **what we don't have** (review after review)
- Non-Aboriginal voices **telling our stories** (no disrespect) (#fishkills)

Wait there's more, N.S.P



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# Where is our water voice?

## Our voice is absent, continued:

- Always Lacking **Free, Prior Informed Consent** or any **Vito**
- **We always walk in 2 (or more) worlds** and sometimes not fitting
- **Decolonise water law – Indigenising Water**
- Always **up the black** of reports, policy, plans, legislation
- No **National Indigenous Water Advisory** mechanism
- No **National Water Strategy** or **Centre of Excellence**
- **Government** always cycles deleting our programs



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# The Rights of Rivers

## **Aotearoa - Whanganui River –**

*Ko au te Awa, ko te Awa ko au: I am the River, the River is Me*

The *Te Awa Tupua Act* provides, all rights as a person

## **Australia - The Birrarung, *the river of mist and shadows***

Under the Act the river is a living entity.

The Act does not provide independent legal status but provides a Birrarung Council to advise on behalf the River



UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# The Rights of Rivers

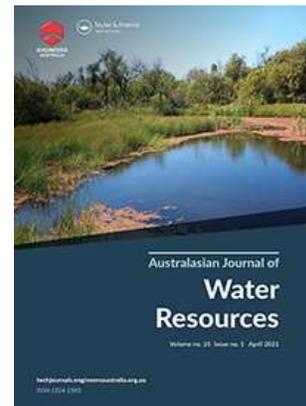
## Can Rivers Protect Themselves?



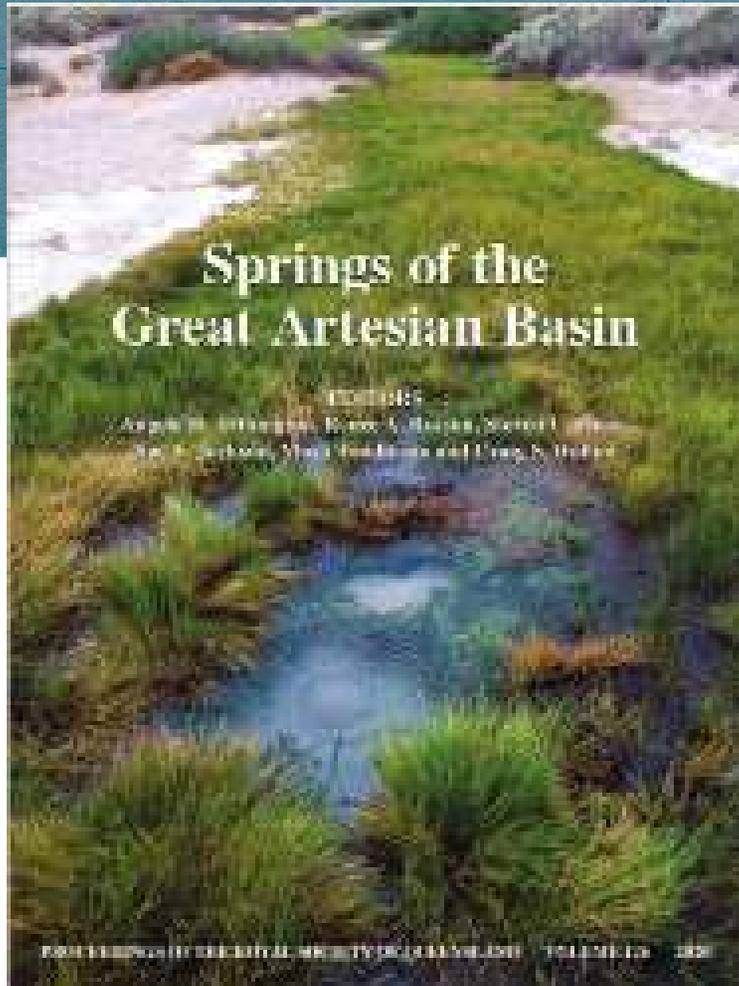
# Indigenous Led Water Science

Co-edited 2 Special Issues and published papers both linking to Indigenous Values and Water Management:

- ***Australasian Journal of Environmental Management 2019:***  
**[Vol 26 Issue 3](#)**
  - Indigenous co-led and authors (Aust and NZ)
  - Abstract written in Nyikina Language
- ***Australasian Journal of Water Resources 2021:*** **[Vol 25 Issue 1:](#)**
  - GN Alexander Medal Winning paper (Moggridge and Thompson); and
  - River as the 1<sup>st</sup> Author (Martuwarra RiverOfLife)



# Resources



Moggridge, B. J. 2020 Aboriginal People and Groundwater. *Proceedings of The Royal Society of Queensland Vol. 126, pgs 11-27 GAB Springs Special Edition*

<http://www.royalsocietyqld.org/2020-springs-special-issue-vol-126/>

Never give up on that paper, this was published 15 years after writing.



# Water Quality Resources

## ■ 2018 ANZ Water Quality Guidelines:

### Cultural and Spiritual Values Guidelines

<http://www.waterquality.gov.au/anz-guidelines/guideline-values/derive/cultural-values>

### Indigenous Principles for Water Quality

<http://www.waterquality.gov.au/anz-guidelines/guideline-values/derive/cultural-values/principles>



### Cultural and spiritual values

Water resources have important cultural and spiritual values, particularly for indigenous peoples of Australia and New Zealand.

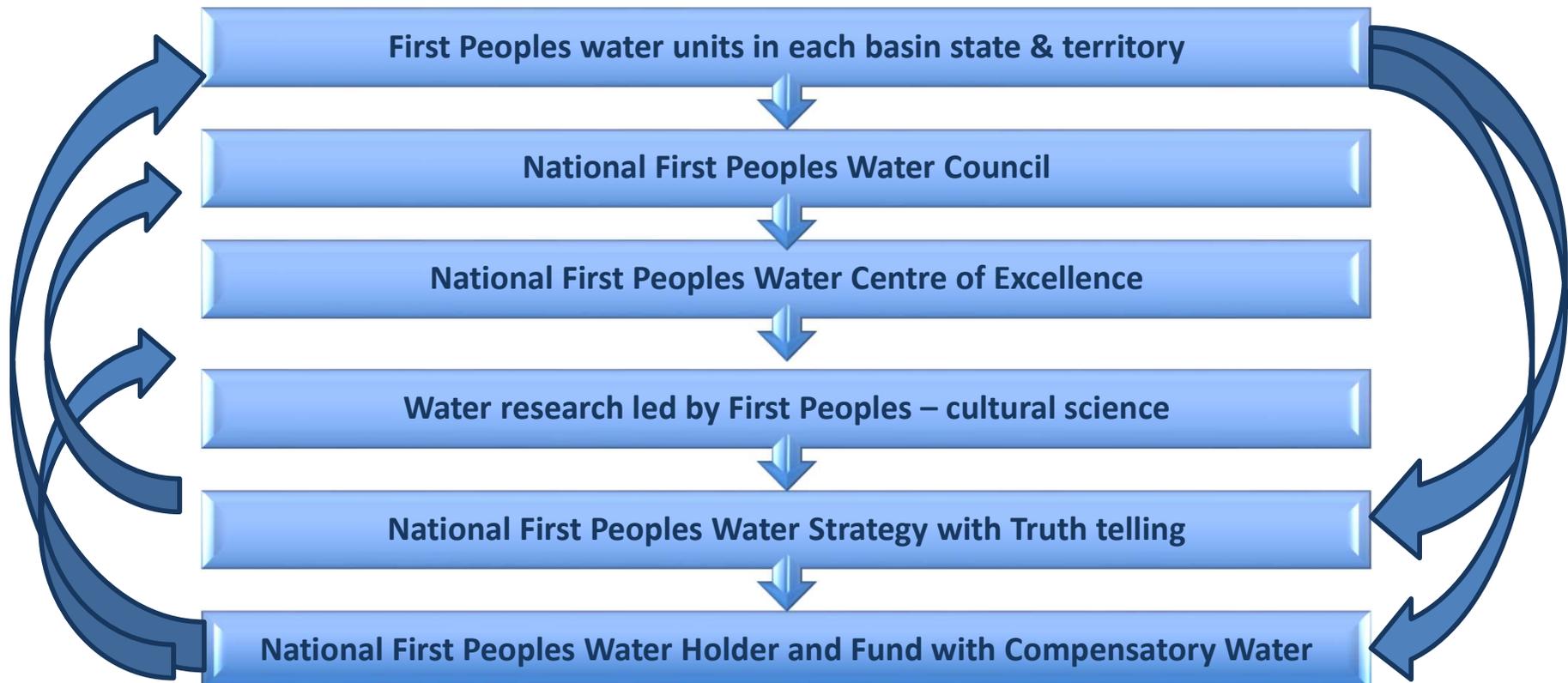


### Indigenous principles for water quality

Adapted from text written by Brad Moggridge, Kamilaroi Nation, North-West NSW, Australia; and Roku Mihinui, Te Arawa Iwi, Rotorua, Aotearoa (New Zealand)



# The Future of Aboriginal Water - in Diagram





UNIVERSITY OF  
CANBERRA



INSTITUTE FOR  
APPLIED ECOLOGY

# Yanaay (I'm going now)

**Ass/Prof Bradley J. Moggridge**

**[Bradley.Moggridge@canberra.edu.au](mailto:Bradley.Moggridge@canberra.edu.au)**

**University of Canberra**

**Centre for Applied Water Science**

