

Various Ways of Knowing

What are some of the ways that a person can learn and then know things about how our world works?

Hemispheric black carbon increase after the 13th-century Māori arrival in New Zealand

[Joseph R. McConnell](#) , [Nathan J. Chellman](#), [Robert Mulvaney](#), [Sabine Eckhardt](#), [Andreas Stohl](#), [Gill Plunkett](#), [Sepp Kipfstuhl](#), [Johannes Freitag](#), [Elisabeth Isaksson](#), [Kelly E. Gleason](#), [Sandra O. Brugger](#), [David B. McWethy](#), [Nerilie J. Abram](#), [Pengfei Liu](#) & [Alberto J. Aristarain](#)

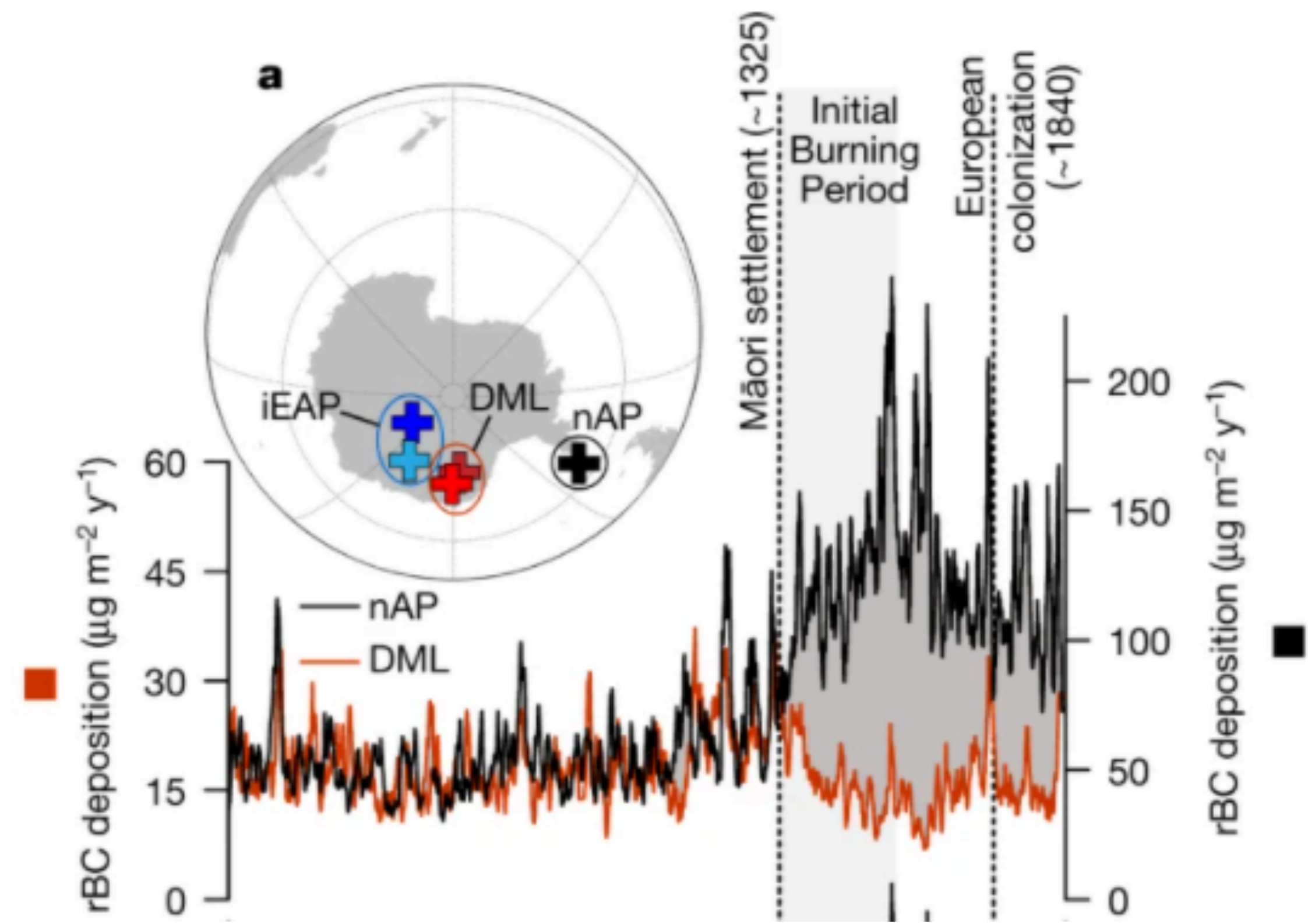
[Nature](#) **598**, 82–85 (2021) | [Cite this article](#)

2526 Accesses | 443 Altmetric | [Metrics](#)

“Deposition in Antarctica shows that black carbon emissions from burning in New Zealand dwarfed other preindustrial emissions in these regions during the past 2,000 years, providing clear evidence of large-scale environmental effects associated with early human activities across the remote Southern Hemisphere.”

Example: Indigenous Knowledge was not Included

Fig. 1: Proxy records of Southern Hemisphere biomass burning fallout during the past two millennia.



How Maori Arrival in New Zealand Was Frozen in Antarctic Ice

Ice cores drilled from the southern continent preserved a signal of the peopling of islands thousands of miles away.



“The idea that humans at this time in history caused such a significant change in atmospheric black carbon through their land clearing activities is quite surprising”, says McConnell.

“We used to think that if you went back a few hundred years you’d be looking at a pristine, pre-industrial world, but it’s clear from this study that humans have been impacting the environment over the southern Ocean and Antarctic Peninsula for at least the last 700 years”.

Implication: humans began carbon emissions/environmental impact earlier than previously thought.

How Maori Arrival in New Zealand Was Frozen in Antarctic Ice

Ice cores drilled from the southern continent preserved a signal of the peopling of islands thousands of miles away.



- Why is this an example of why including indigenous knowledge in our scientific studies is important?
- What are some ways that this study might have been improved by including Māori knowledge?
- What is your interpretation of the takeaway message of this paper? What picture does it paint of Māori/early human interaction with the environment?

Implication: humans began carbon emissions/environmental impact earlier than previously thought.

Māori voices are needed to understand Antarctic ice core

A study in *Nature* has declared that Māori people have burned
enshot
...ts in New Zealand to clear land for 700 years. One problem:
they didn't engage Māori scientists for their explanation.

“The principle of kaitiakitanga, or guardianship, is a mantle of responsibility for us and one we willingly share to improve the wellbeing of our oceans and planet. Please do not distort your scientific evidence to position Māori as the problem... The association of Māori with fire is longstanding”

