



ICMGP 2024
CAPE TOWN • SOUTH AFRICA • 21 - 26 JULY

From North to South of Australia: A Comprehensive Examination of Atmospheric Mercury Deposition and their Implications for the Southeast Asia Mercury Cycle

Larissa Schneider

Simon Haberle, Michael Fletcher,
Atun Zawadzki, Zoe Thomas,
Krystyna Saunders, James Latimer



Australian
National
University



Global mercury deposition from the pre-anthropogenic period to present



3-5-fold increase for both hemispheres



A synthesis of progress and uncertainties in attributing the sources of mercury in deposition

Steve Lindberg¹, Russell Bullock, Ralf Ebinghaus, Daniel Engstrom, Xinbin Feng, William Fitzgerald, Nicola Pirrone, Eric Prestbo, Christian Seigneur, Panel on Source Attribution of Atmospheric Mercury

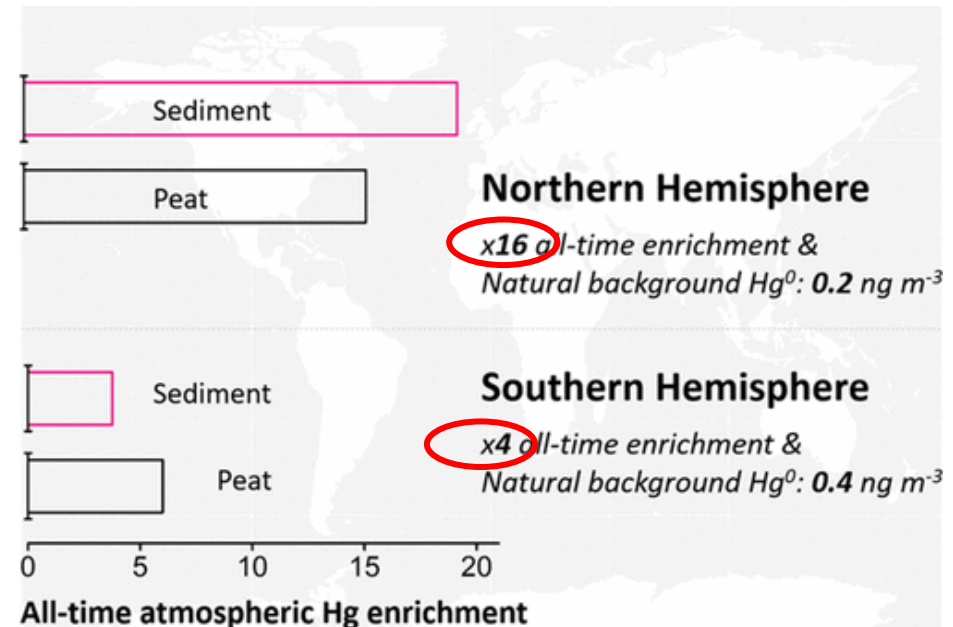
Atmospheric Hg Emissions from Preindustrial Gold and Silver Extraction in the Americas: A Reevaluation from Lake-Sediment Archives

Daniel R. Engstrom^{*†}, William F. Fitzgerald[‡], Colin A. Cooke[§], Carl H. Lamborg^{||}, Paul E. Drevnick[‡], Edward B. Swain[#], Steven J. Balogh[∇], and Prentiss H. Balcom[‡]

Global Biogeochemical Cycles*

Modern and historic atmospheric mercury fluxes in both hemispheres: Global and regional mercury cycling implications

C. H. Lamborg, W. F. Fitzgerald, A. W. H. Damman, J. M. Benoit, P. H. Balcom, D. R. Engstrom
First published: 30 November 2002 | <https://doi.org/10.1029/2001GB001847>



Unequal Anthropogenic Enrichment of Mercury in Earth's Northern and Southern Hemispheres

Chuxian Li, Jeroen E. Sonke*, Gaël Le Roux, Natalia Piotrowska, Nathalie Van der Putten, Stephen J. Roberts, Tim Daley, Emma Rice, Roland Gehrels, Maxime Enrico, Dmitri Mauquoy, Thomas P. Roland, and François De Vleeschouwer

✓ Cite this: *ACS Earth Space Chem.* 2020, 4, 11, 2073–2081

Publication Date: October 30, 2020 ∨

<https://doi.org/10.1021/acsearthspacechem.0c00220>

Copyright © 2020 American Chemical Society

[RIGHTS & PERMISSIONS](#)

Article Views

400

Altmetric

9

Citations

18

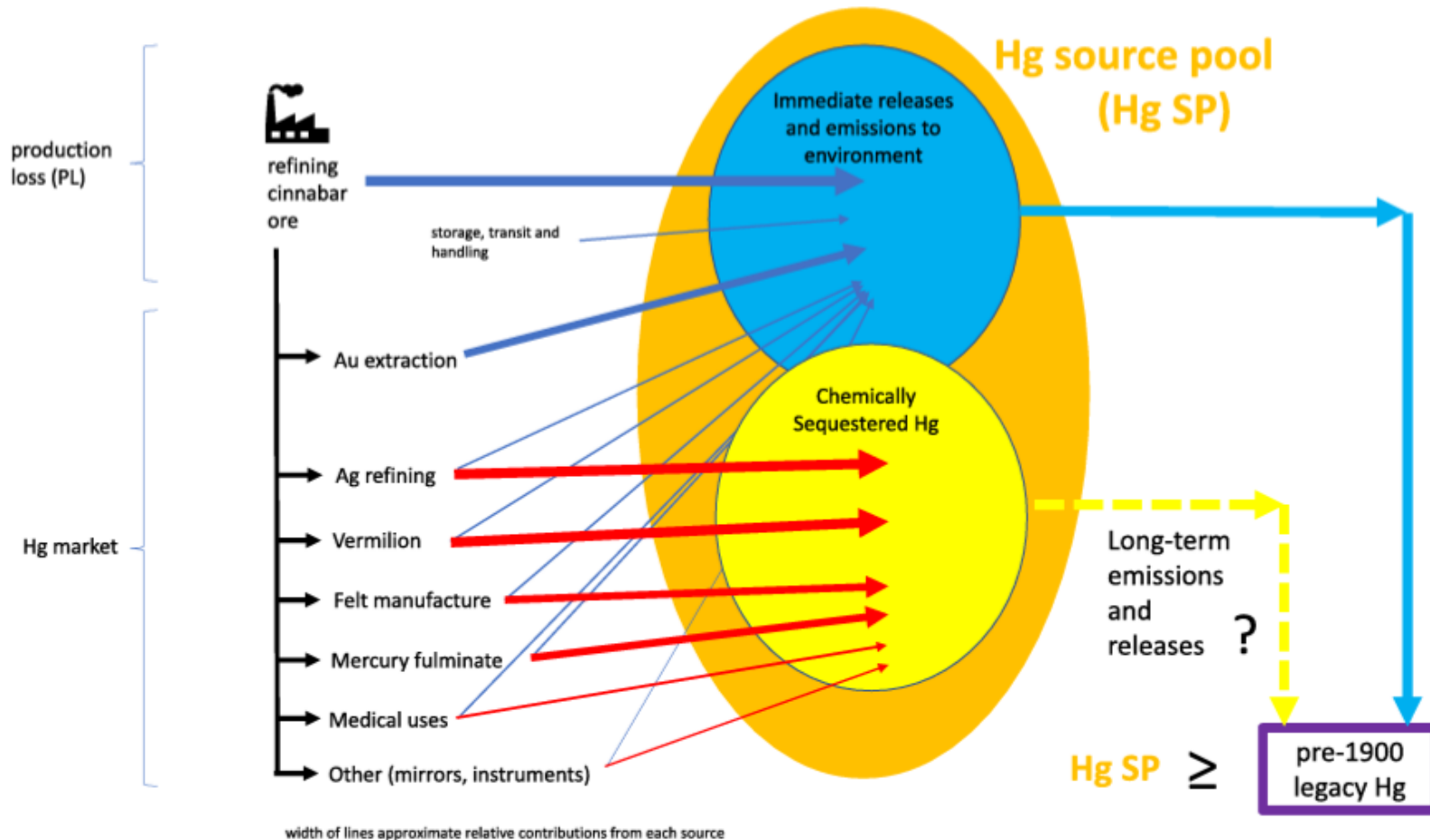
[LEARN ABOUT THESE METRICS](#)

Share Add to Export



The global roots of pre-1900 legacy mercury

Saul Guerrero^{a,1}  and Larissa Schneider^a 



Our Focus Questions for This Project



- 1) What are the unique aspects of the Hg cycle in Australasia?
- 2) Has industrialisation impacted the Hg cycle and deposition in Australia? If so, in what ways?
- 3) What new insights can Australia's unique ecosystems provide to enhance our understanding of the global Hg cycle?



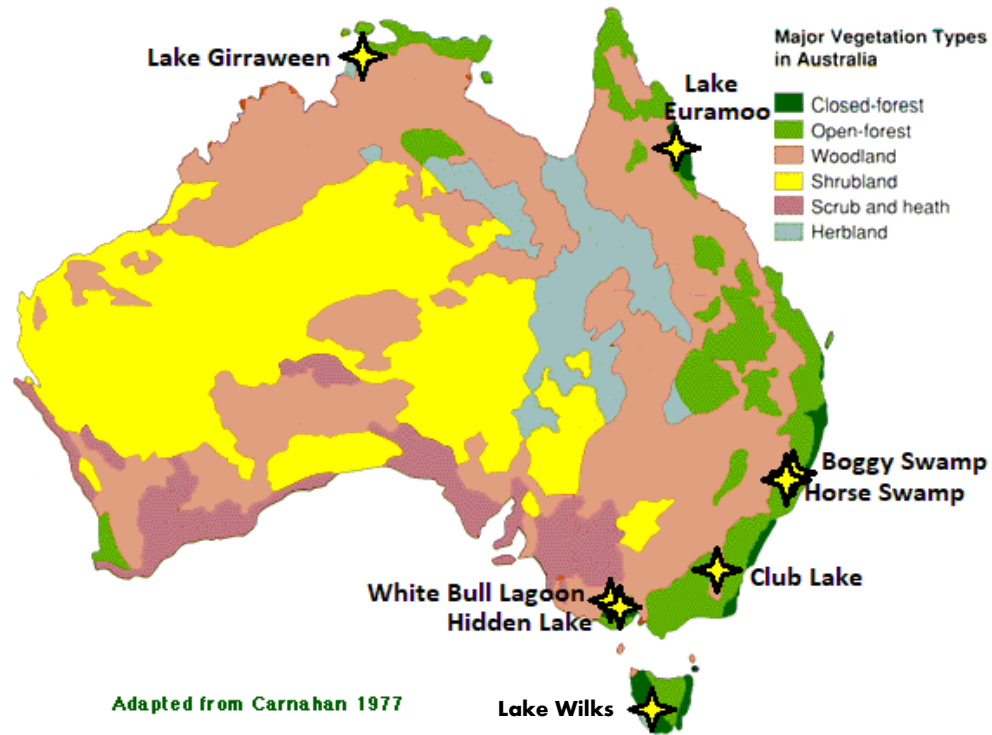


MERCURY AUSTRALIA

www.mercury-australia.com.au



- Lake Iralalaro – Timor Leste
- Lake Zelehu – Timor Leste



Lake Girraween = tropical savannah woodlands.

Lake Euramoo = rainforest

Boggy and Horse swamp = open eucalyptus forest

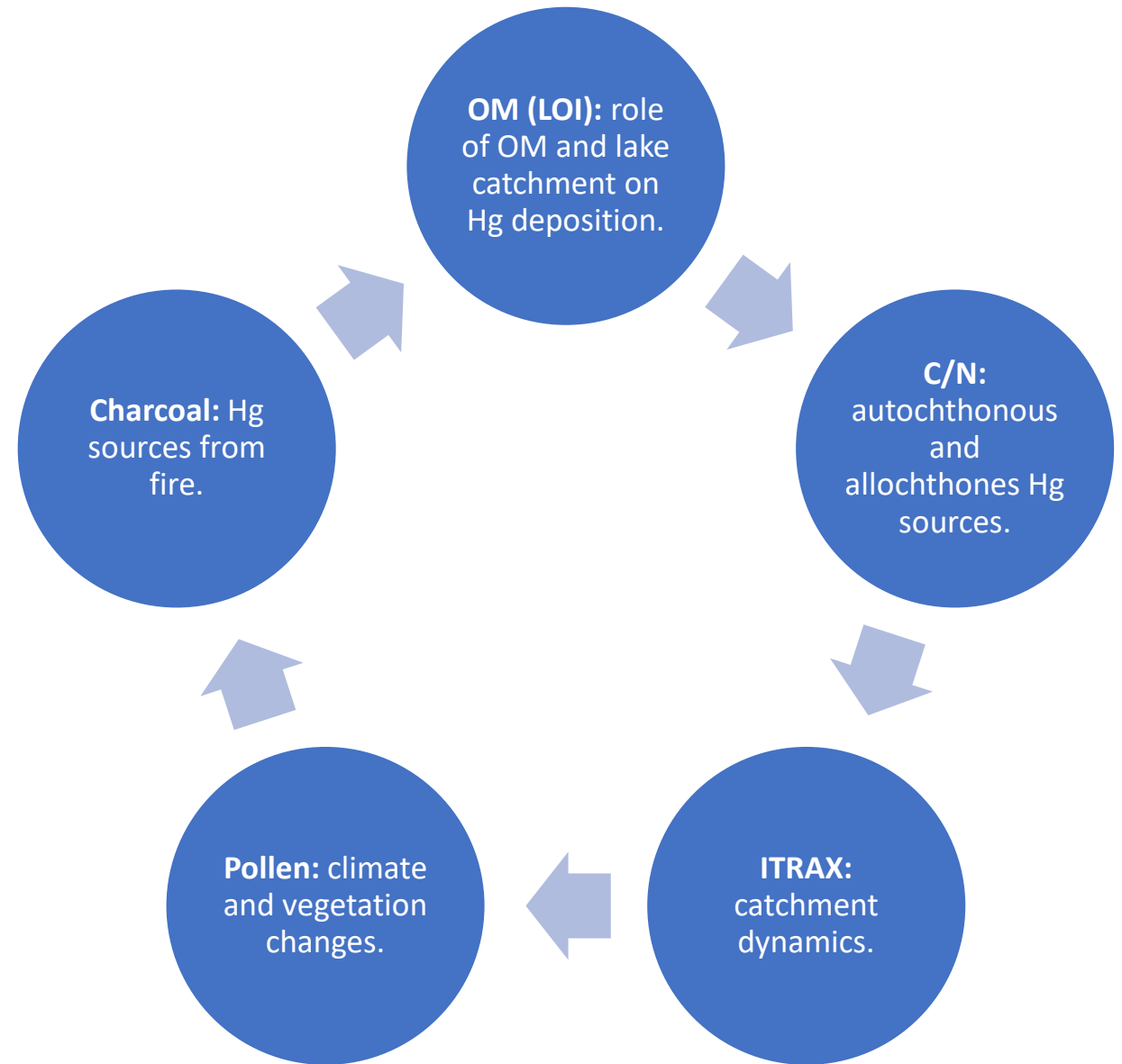
Club Lake = alpine vegetation

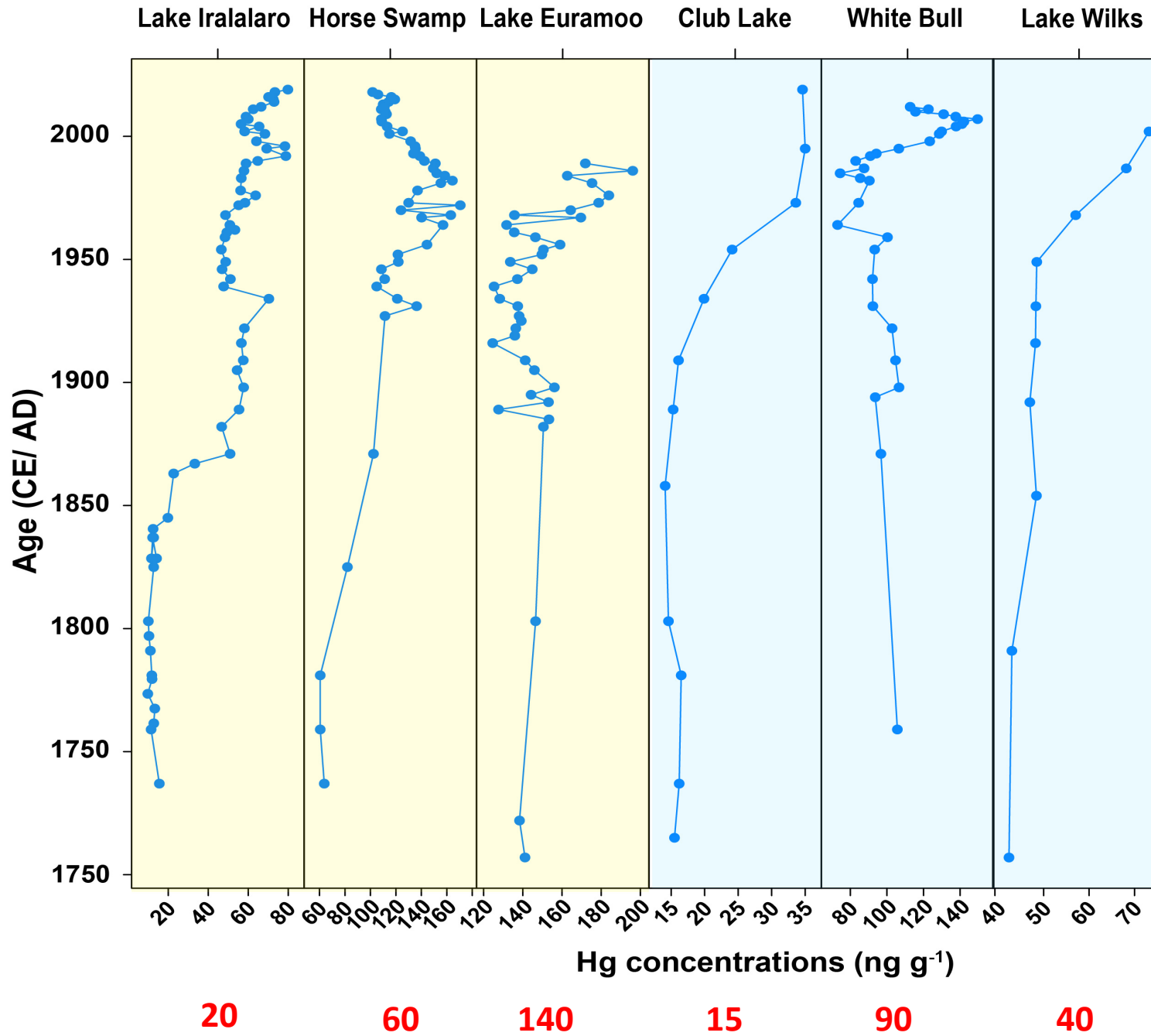
White Bull and Hidden Lake = open woodland forest

Lake Wilks = temperate rainforest

Challenging age-depth models

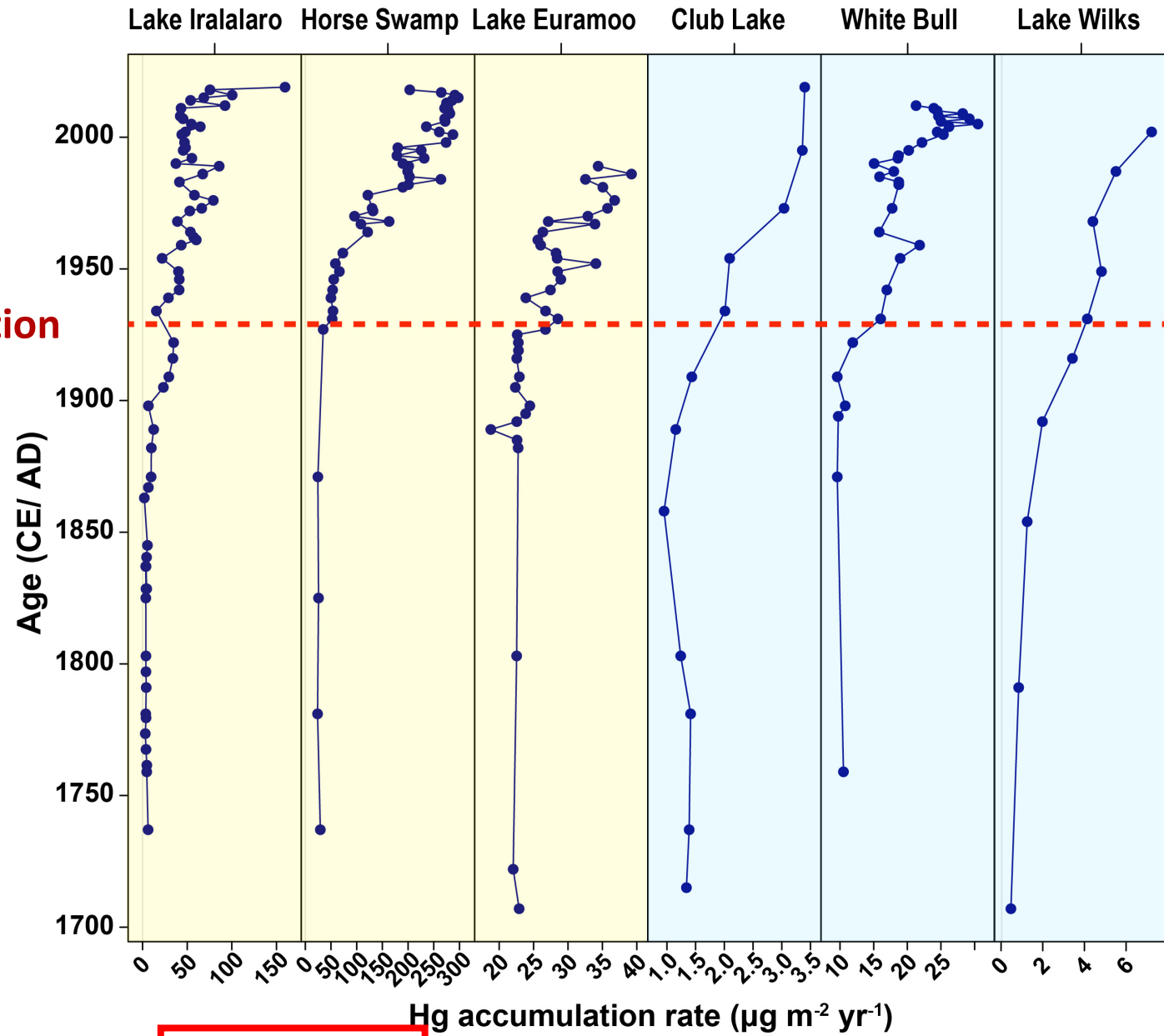
Proxies





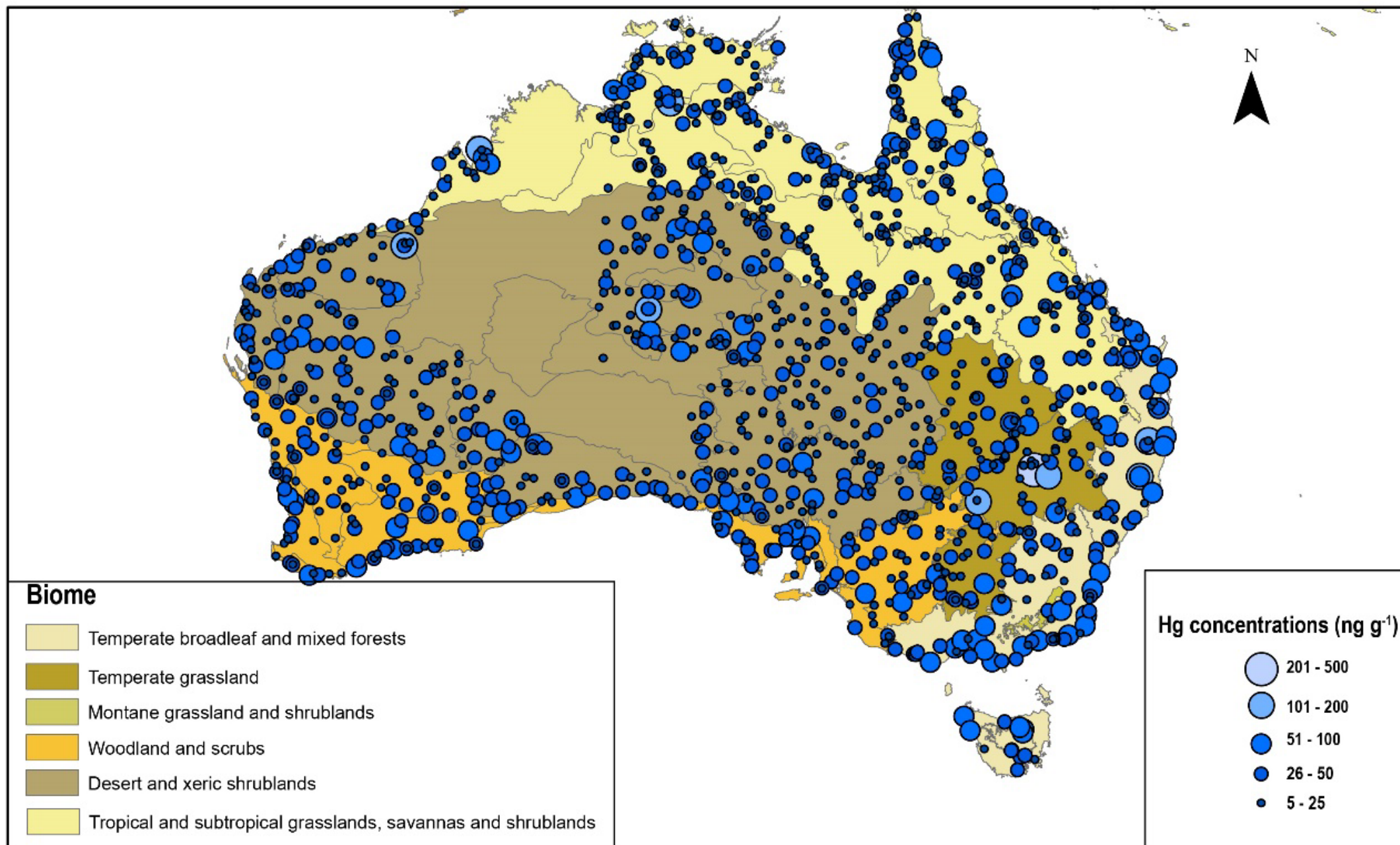
- No clear decrease in the 20th century.
- No changes in regulations. E.g. power stations
- Better modeling of the atmospheric lifetime of Hg.
- Magnitude of the interhemispheric gradient.
- Vertical exchange between the surface ocean and the permanent thermocline
- **≠ Hg deposition within SH.**

Great Acceleration



5 5

NH influence?



Thanks!

A/Prof Larissa Schneider

The Australian National University

Larissa.Schneider@anu.edu.au

