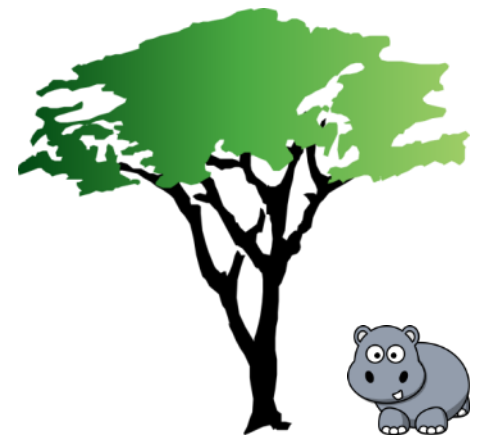


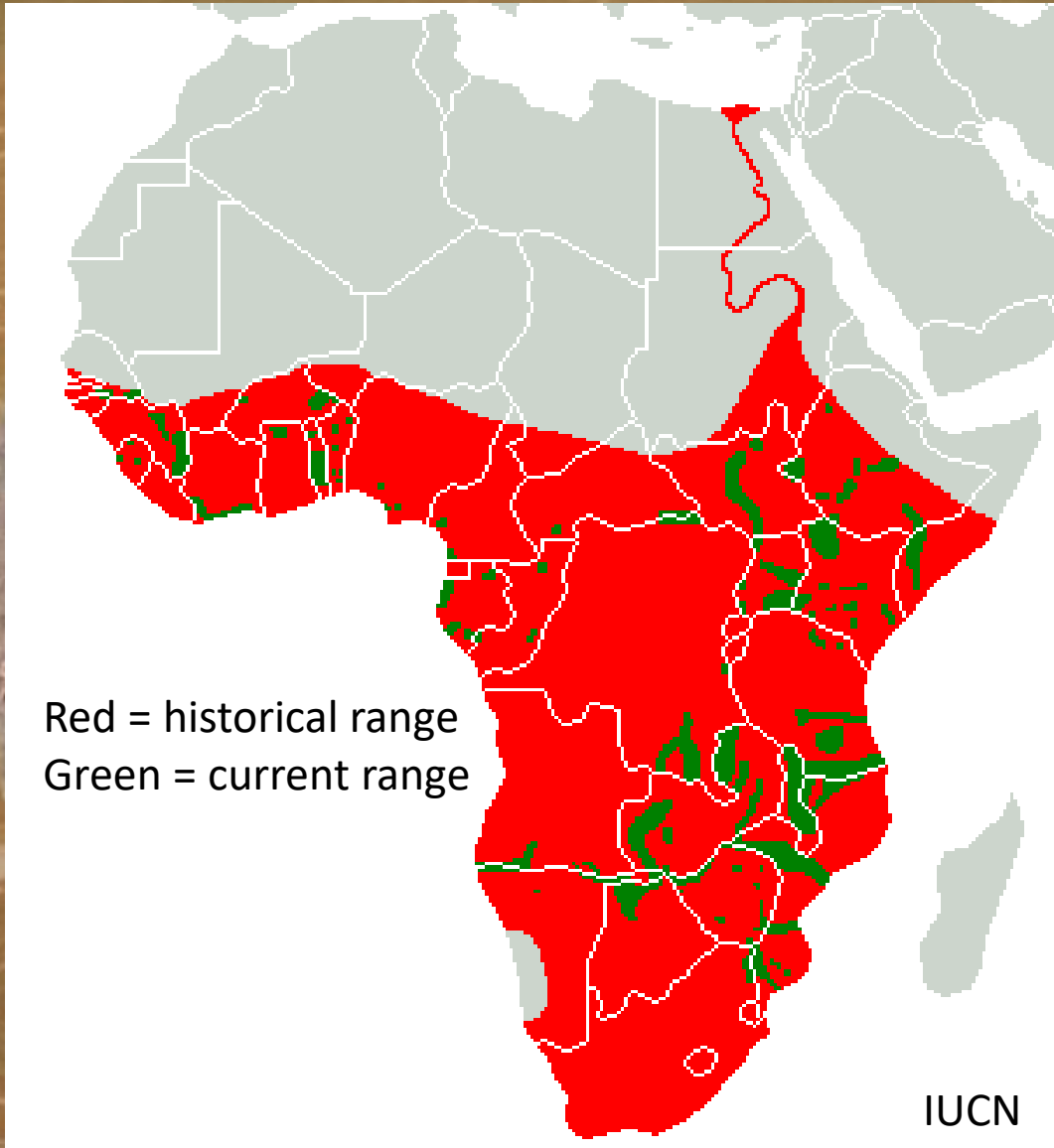
# Hippos are uniquely tied to their environment and one another through their gut microbiome

*Christopher Dutton*

*Postdoctoral Associate*

*University of Florida, Biology & Anthropology*













30S

Bushnell

2013-12-02 00:25:48

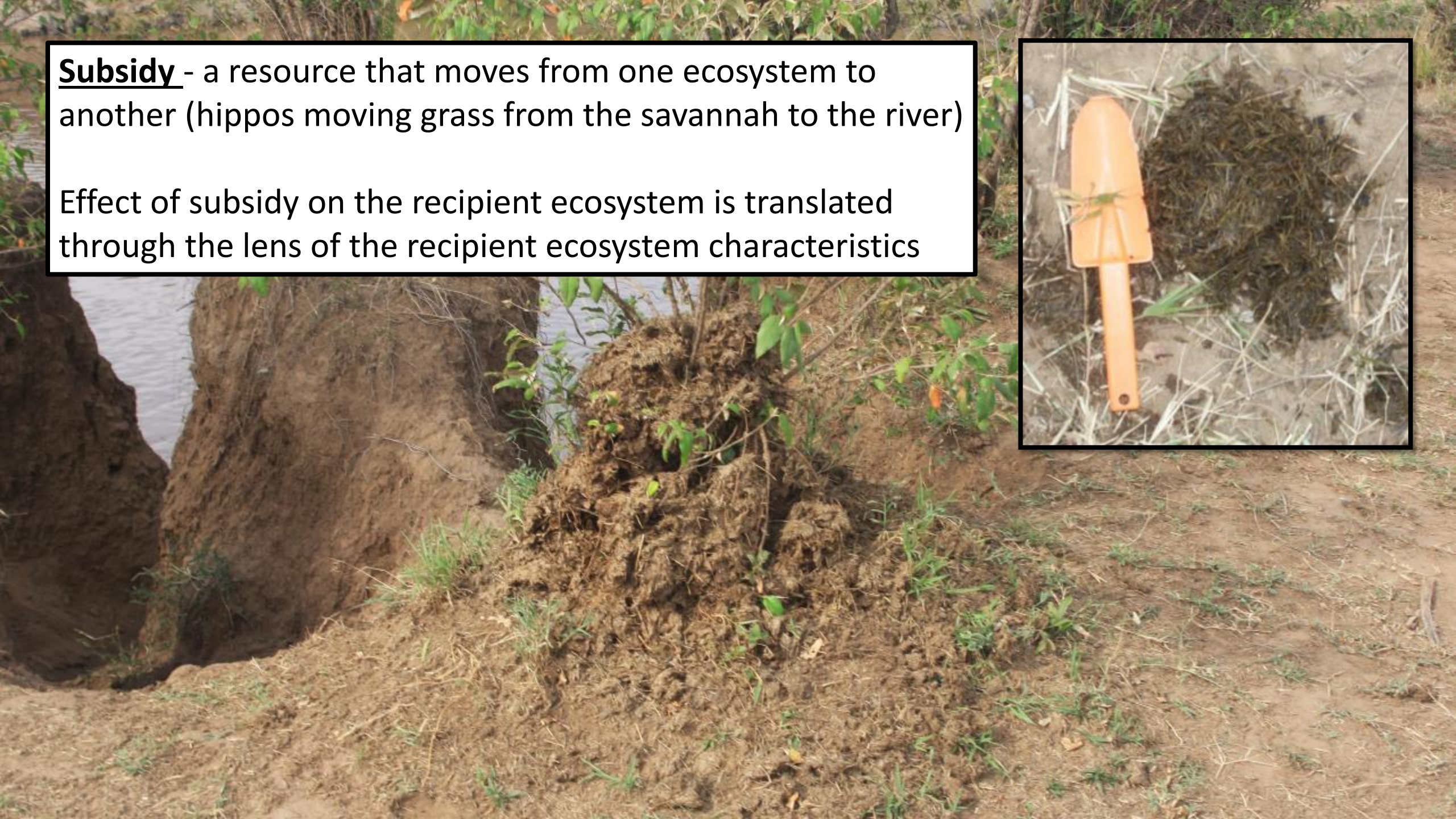
30S

Bushnell

2012-10-04 20:03:11

**Subsidy** - a resource that moves from one ecosystem to another (hippos moving grass from the savannah to the river)

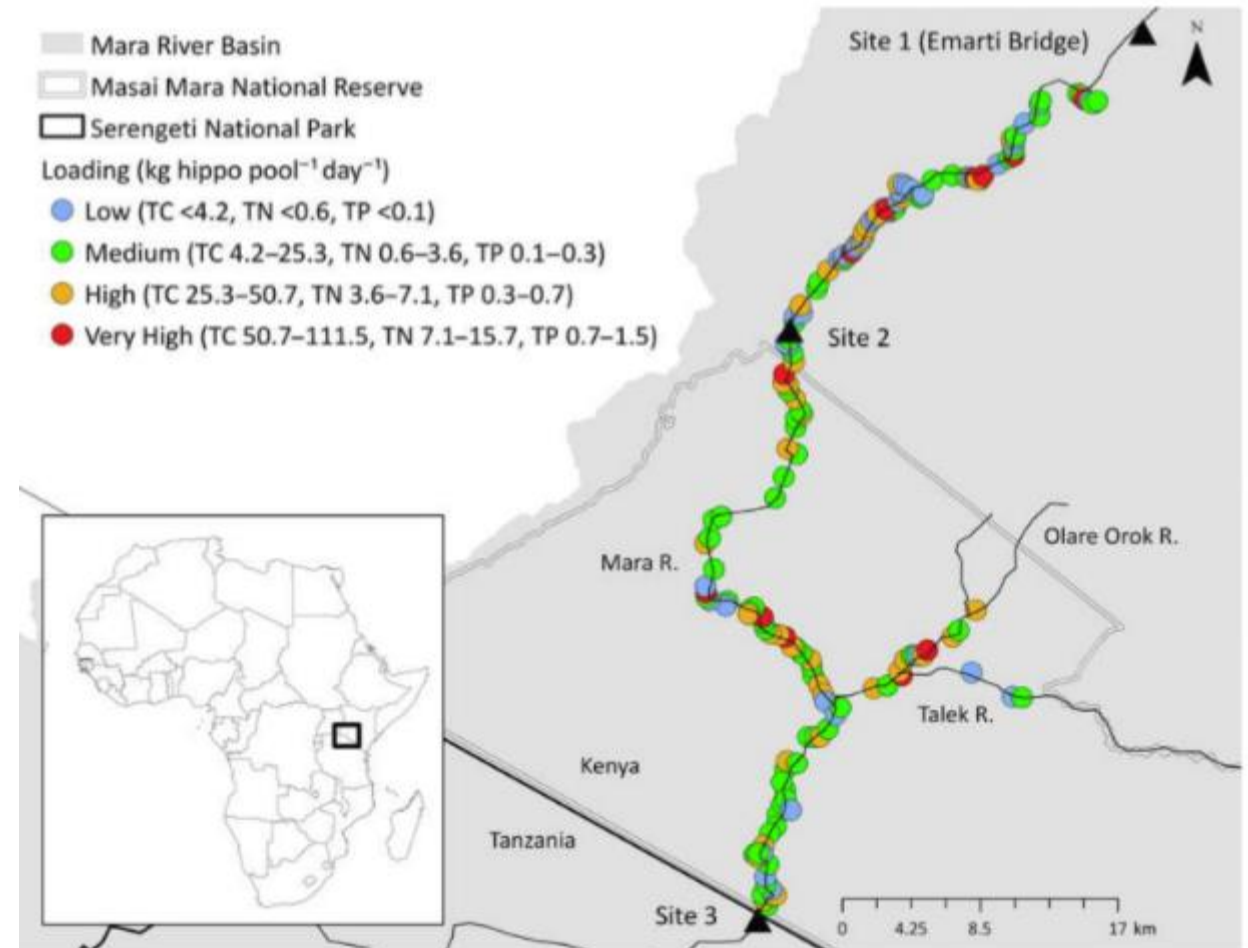
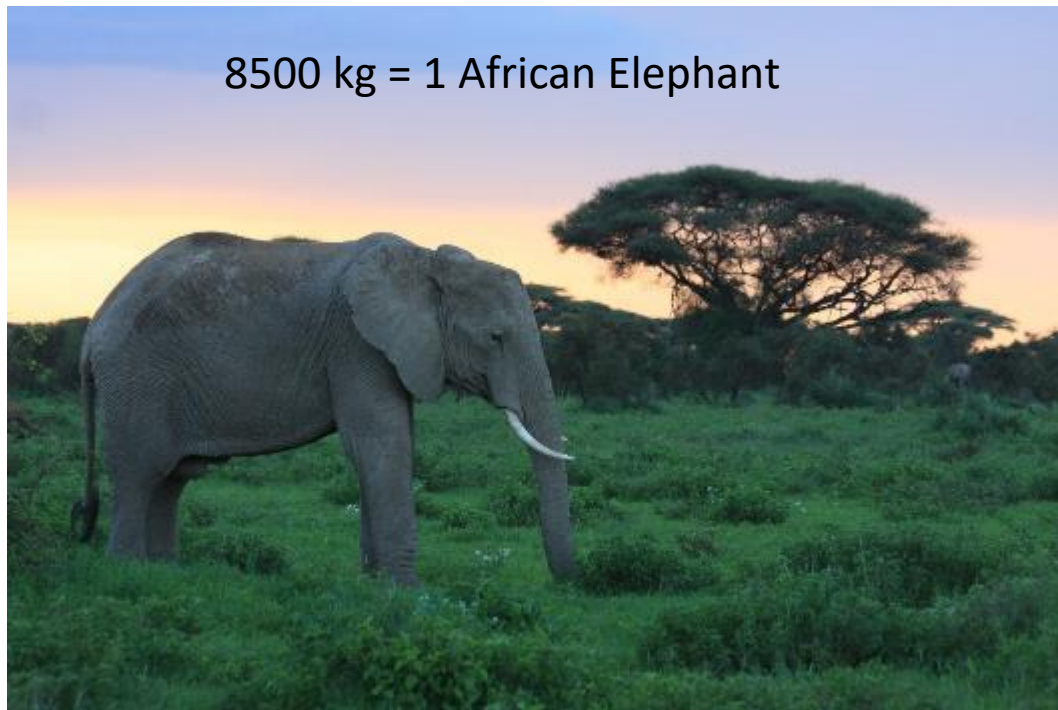
Effect of subsidy on the recipient ecosystem is translated through the lens of the recipient ecosystem characteristics





# The hippopotamus conveyor belt: vectors of carbon and nutrients from terrestrial grasslands to aquatic systems in sub-Saharan Africa

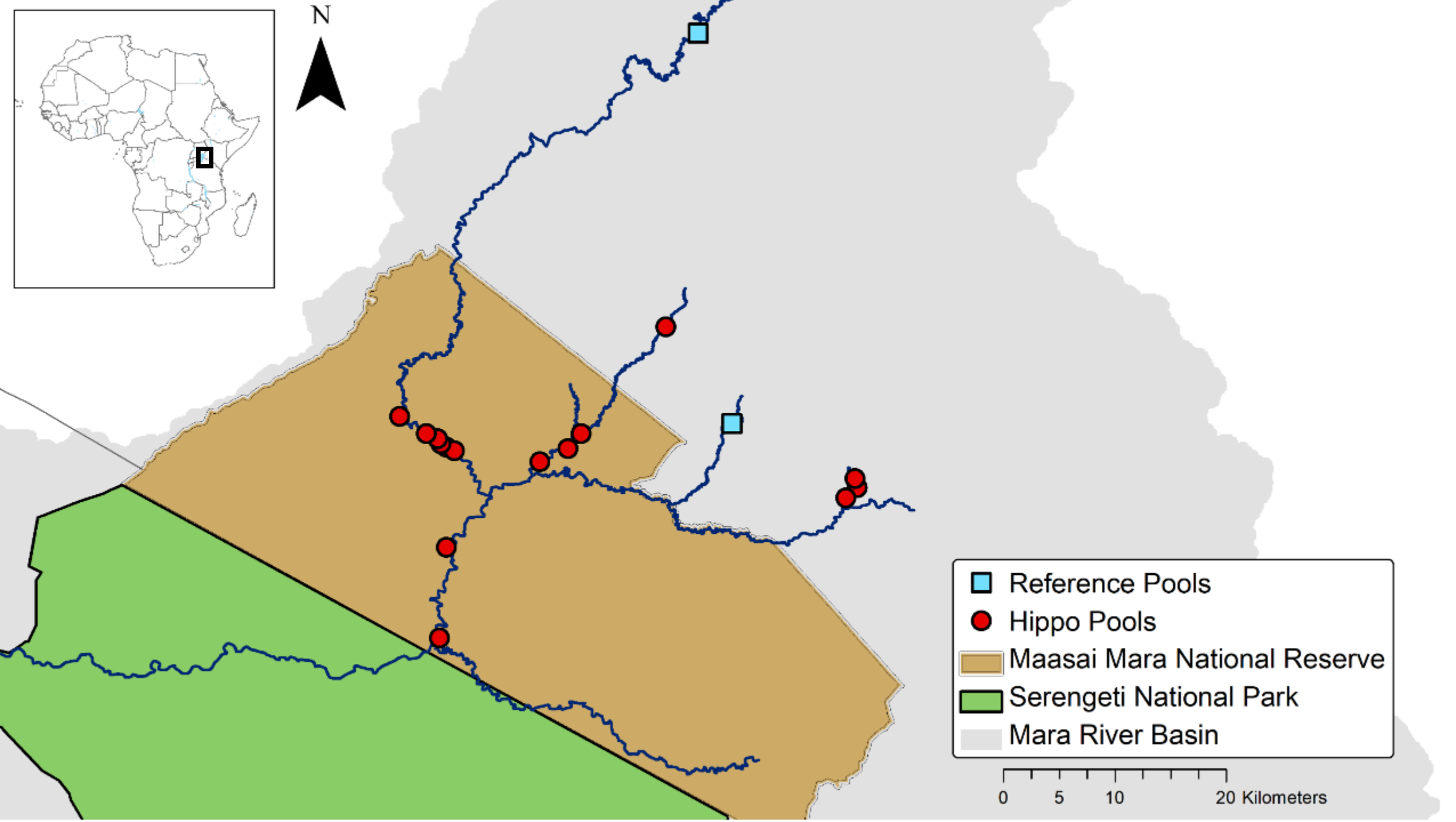
Amanda L Subalusky, Christopher L Dutton, Emma J Rosi, David M Post

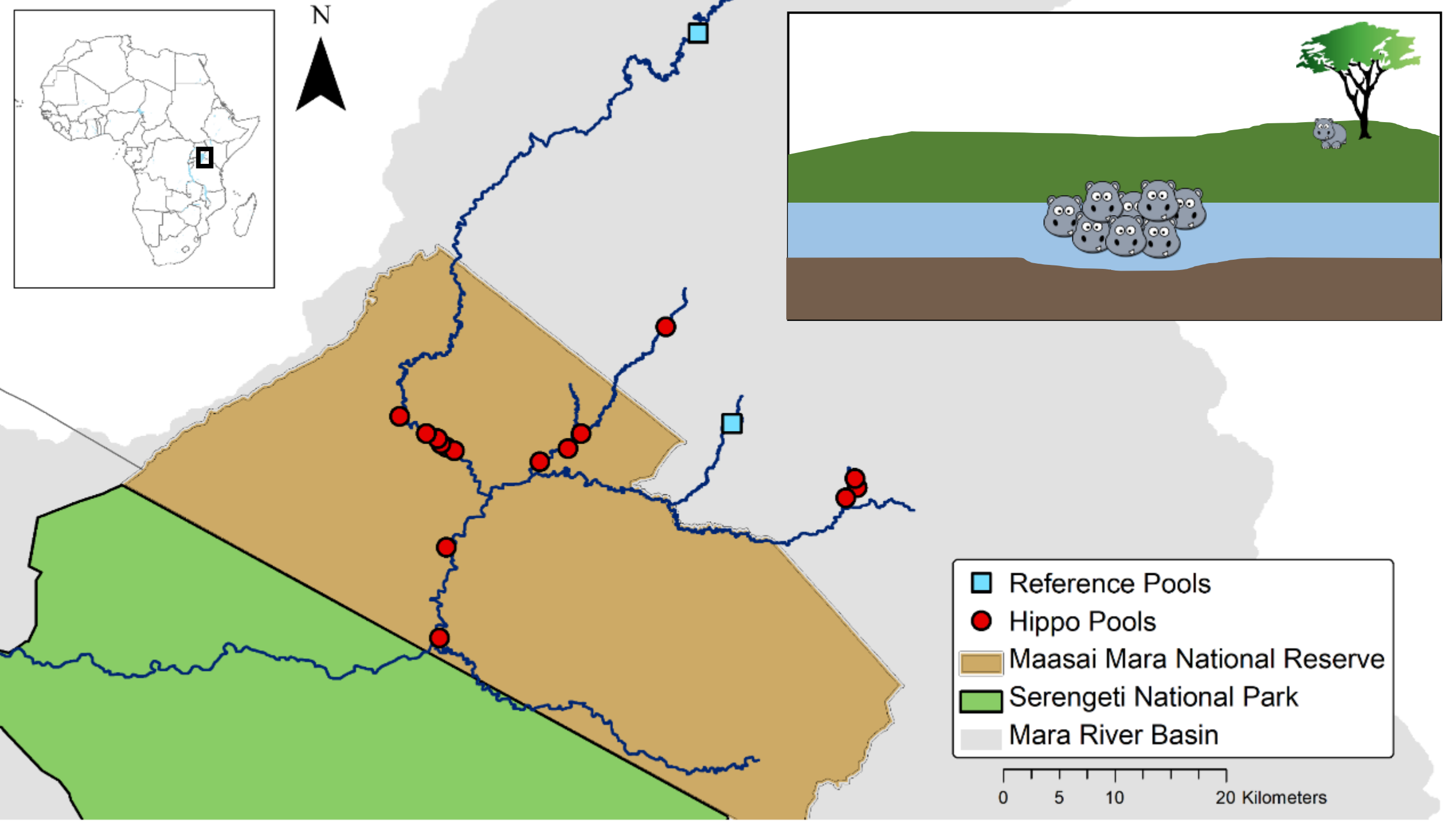


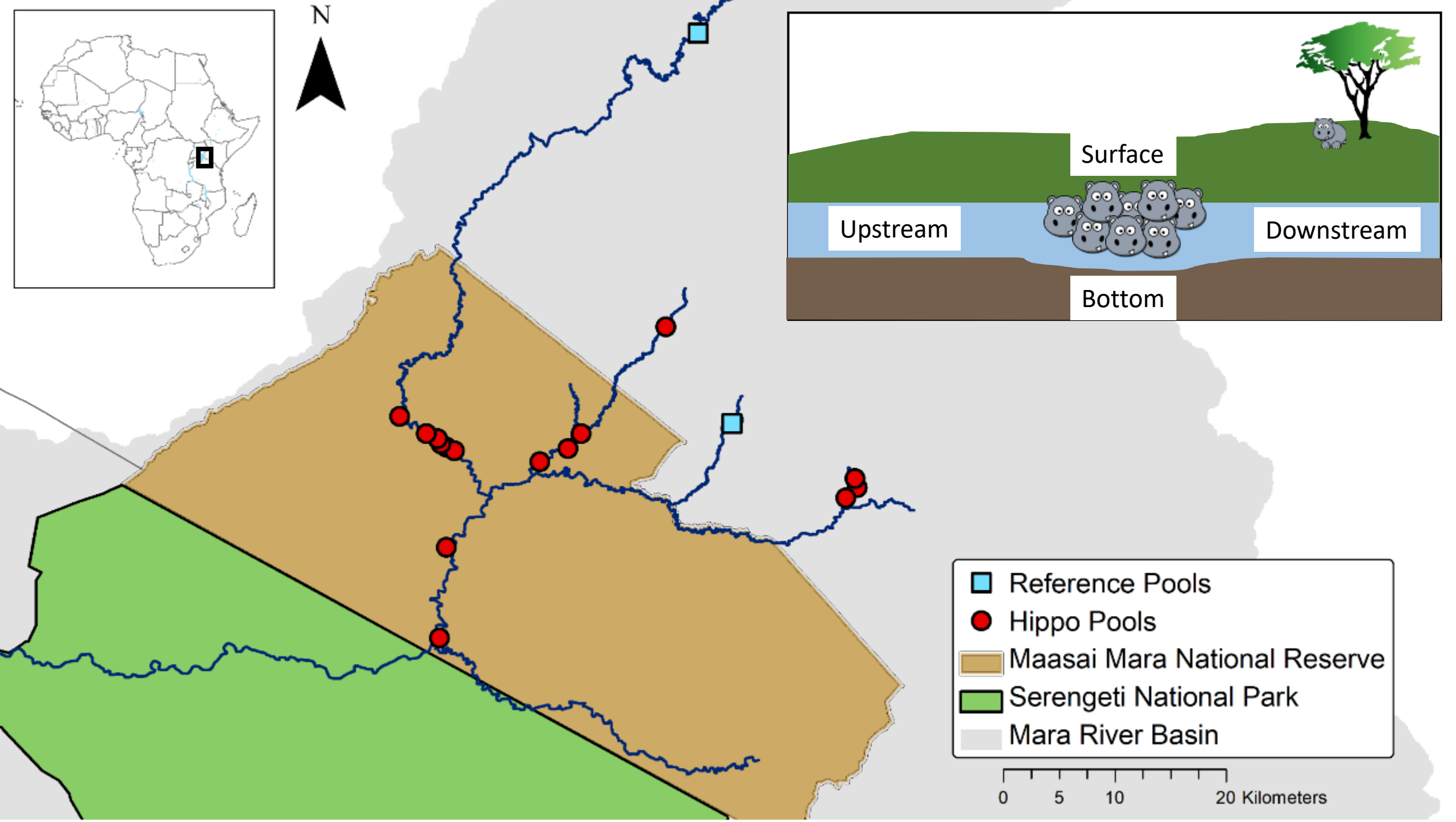


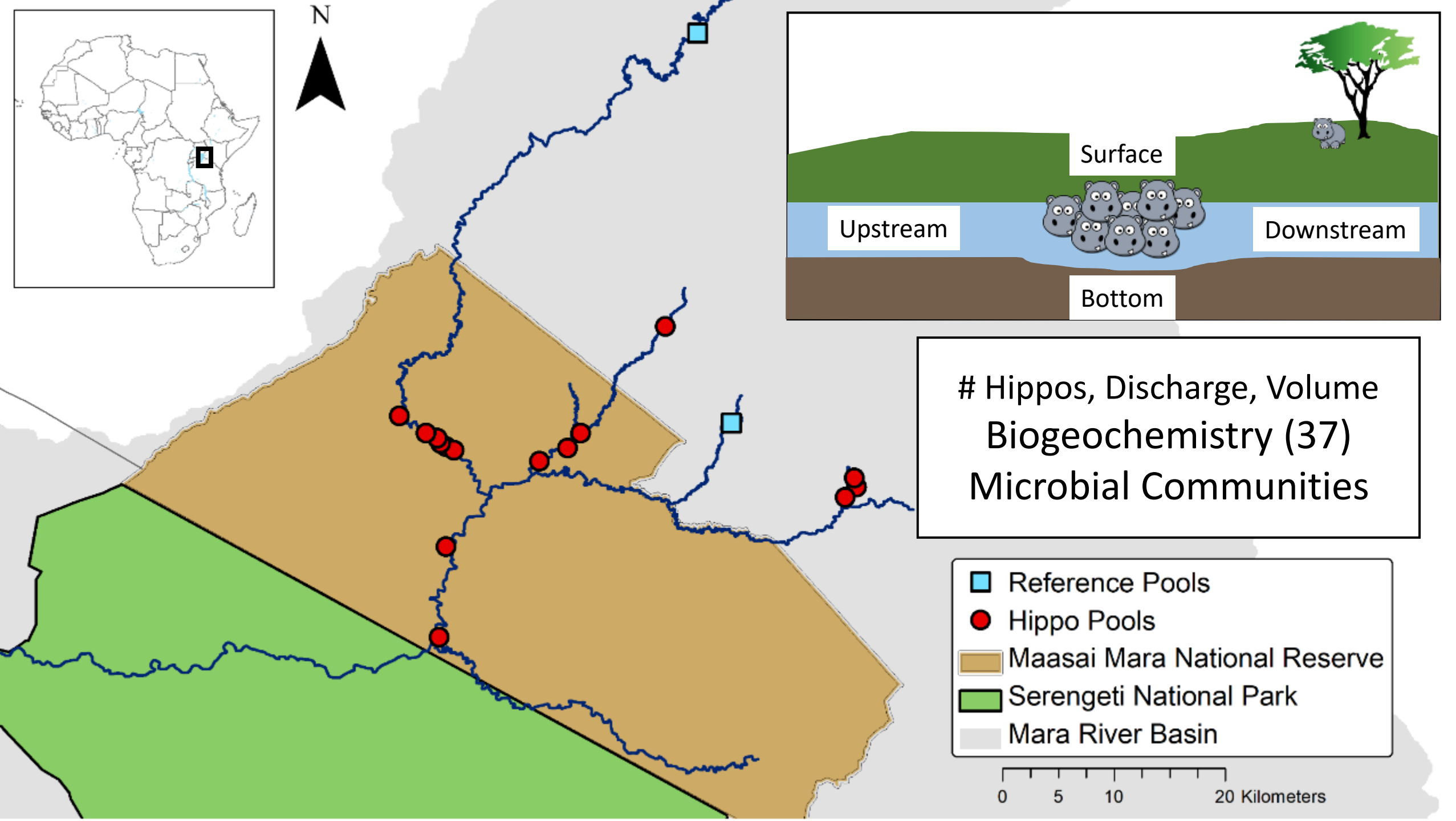
**How do hippo inputs (feces) interact with environmental context to shape pool functioning?**



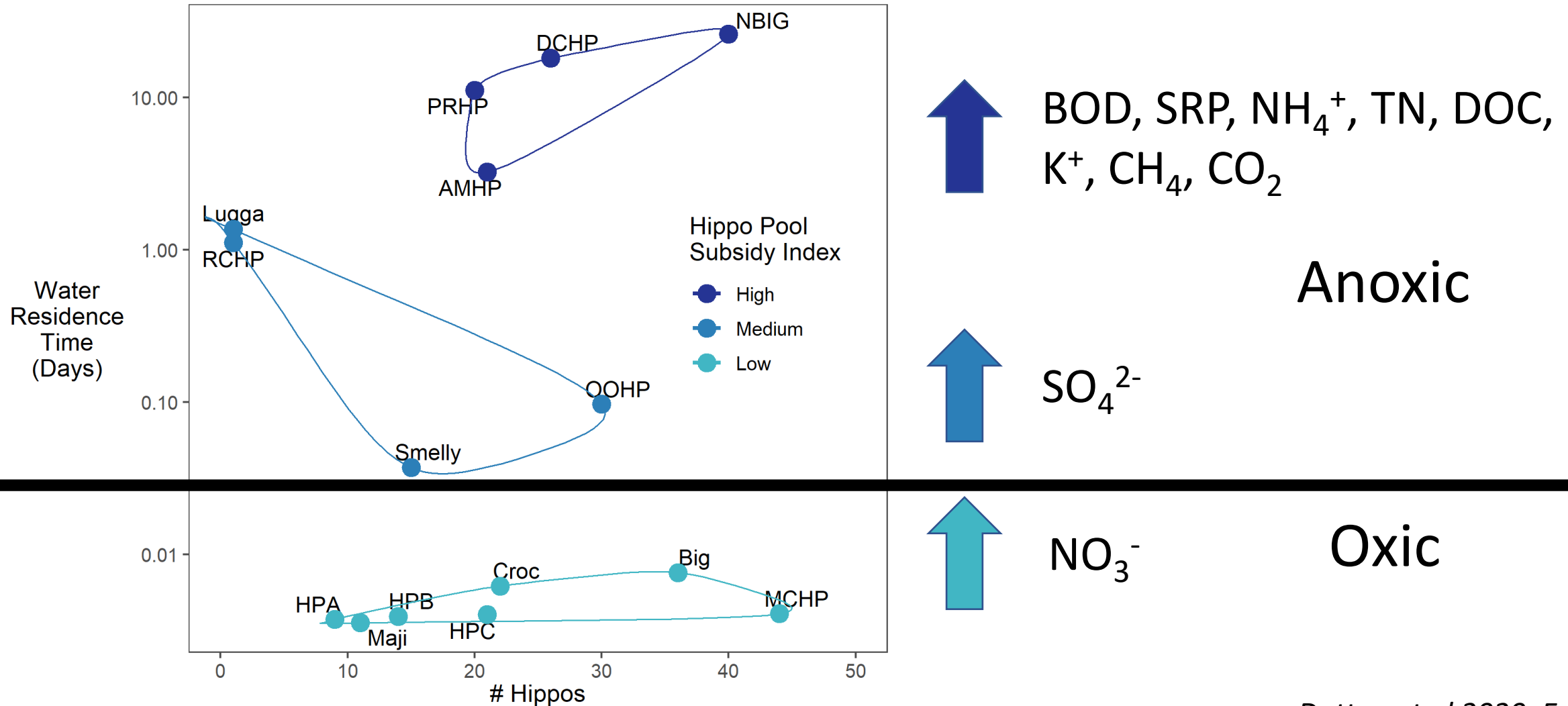






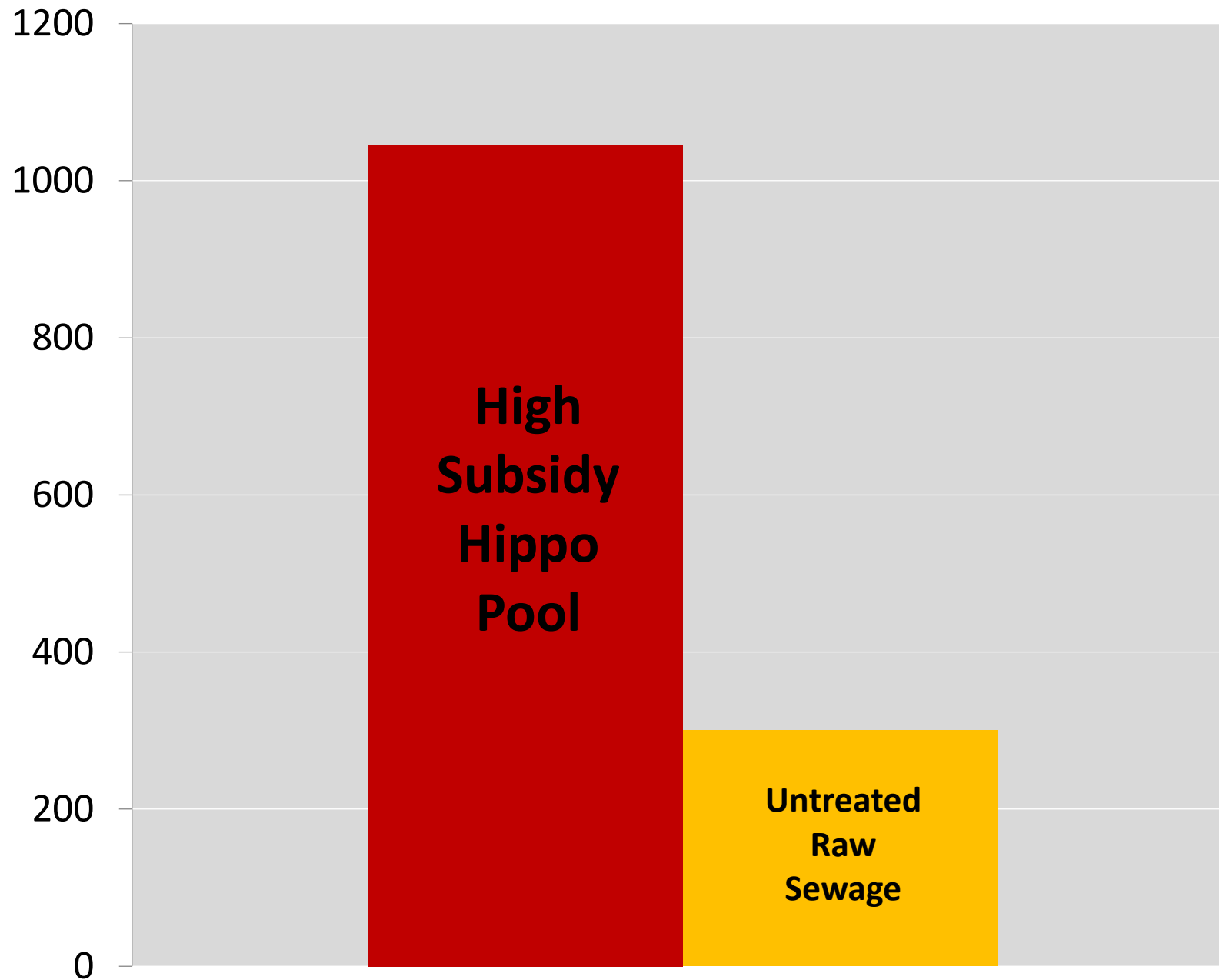


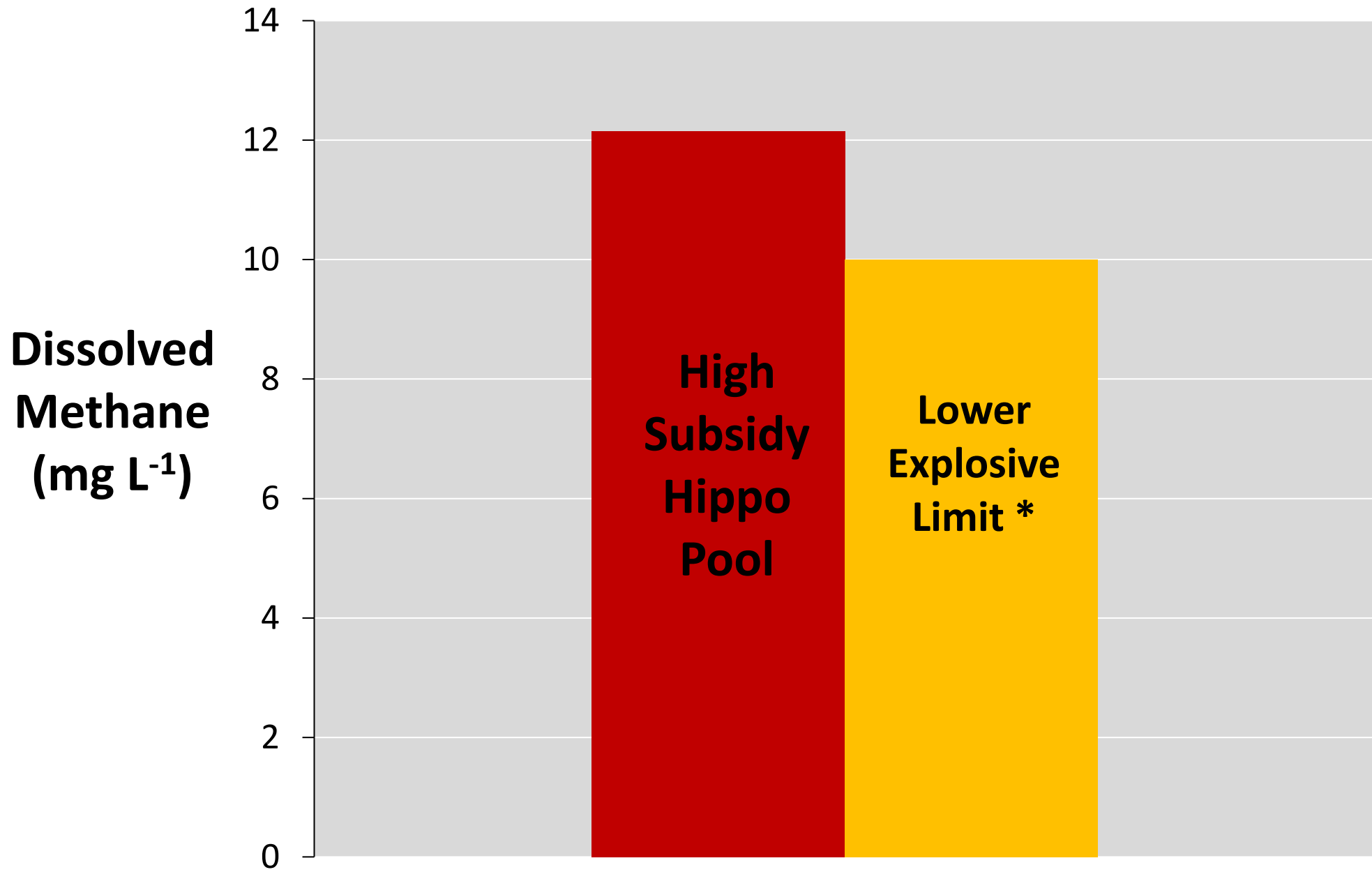
# Water Residence Time is the key determinant of how a hippo pool functions





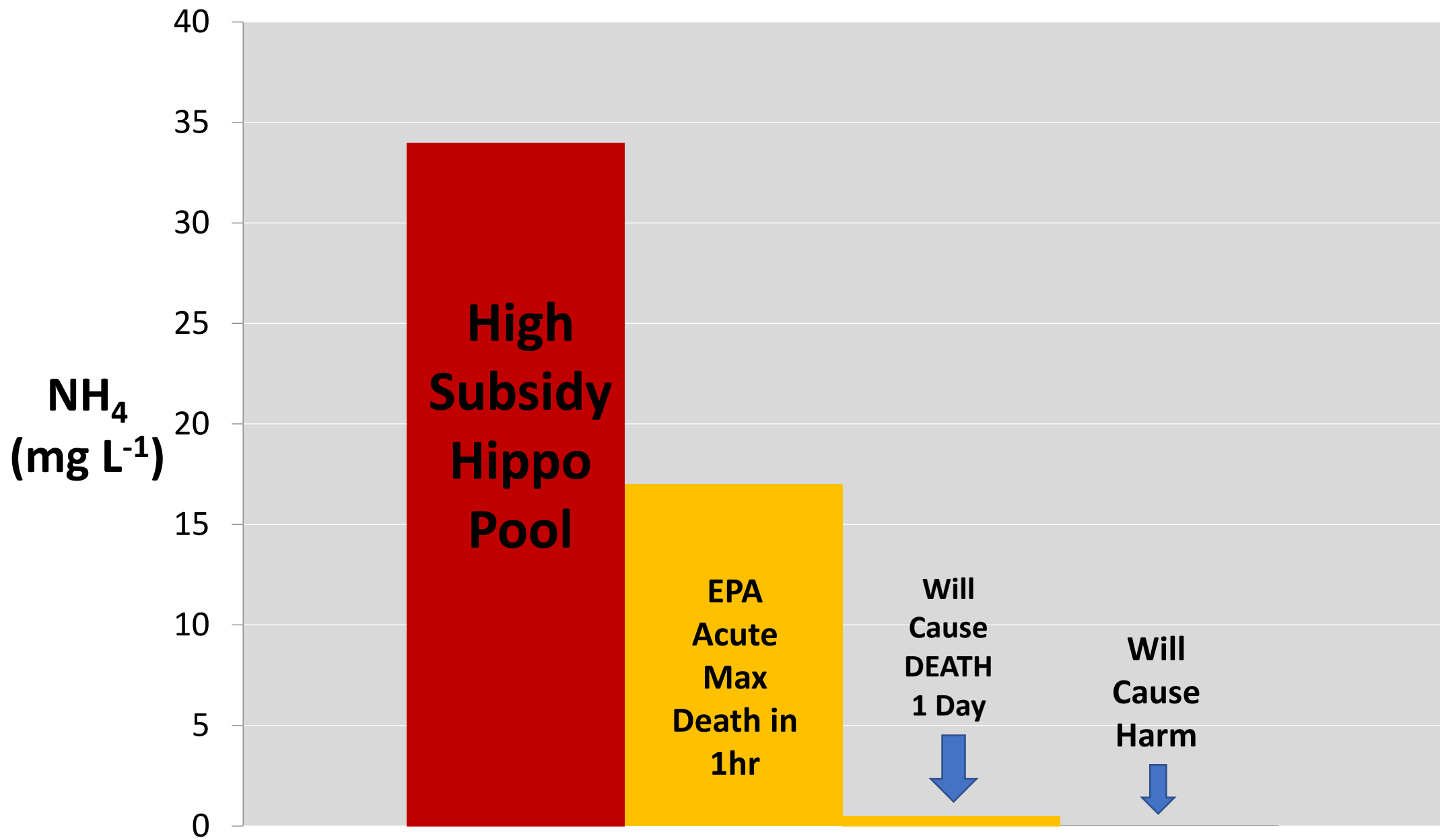
**Biochemical  
Oxygen  
Demand  
(mg L<sup>-1</sup>)**

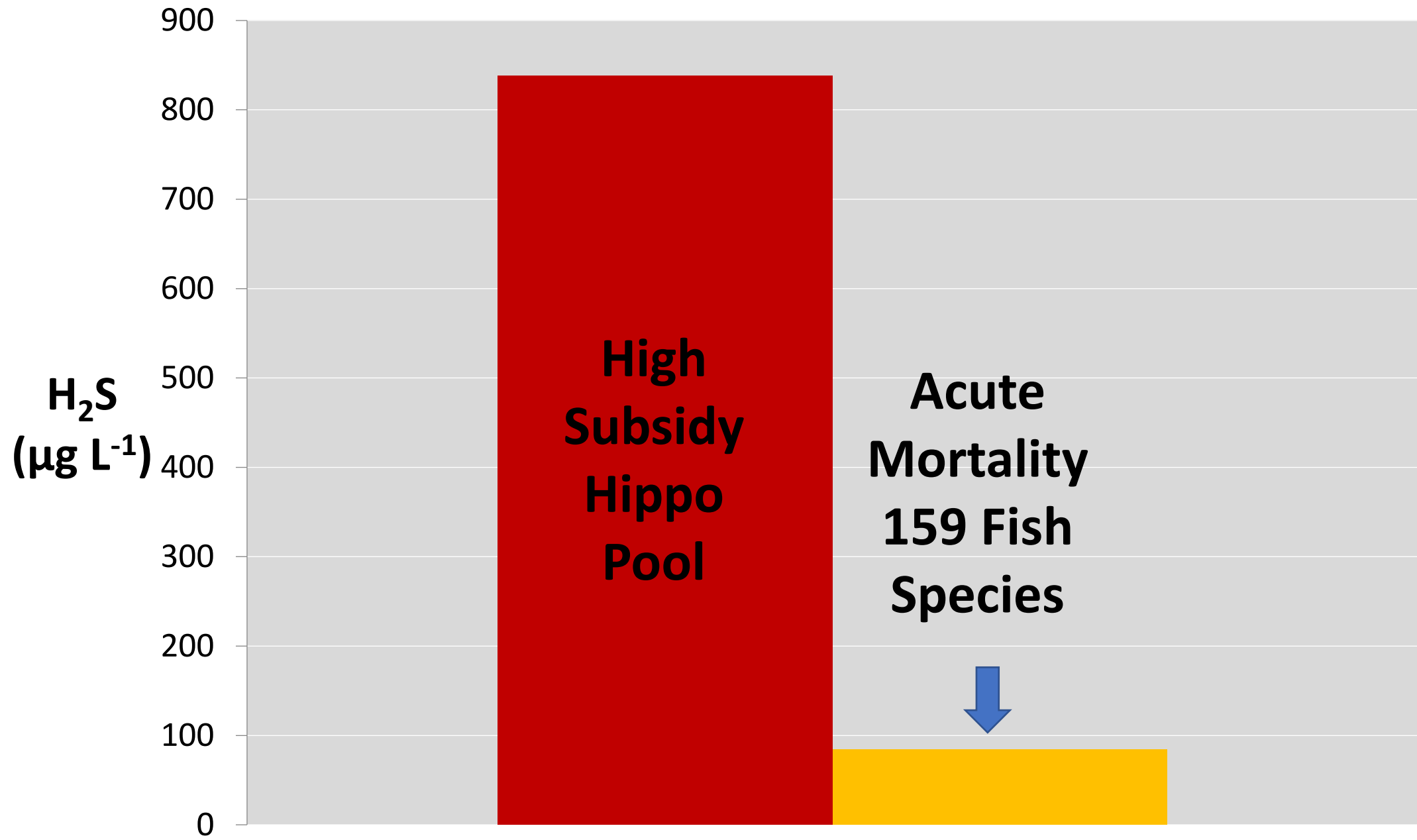




*\* Eltschlager and others, 2001*







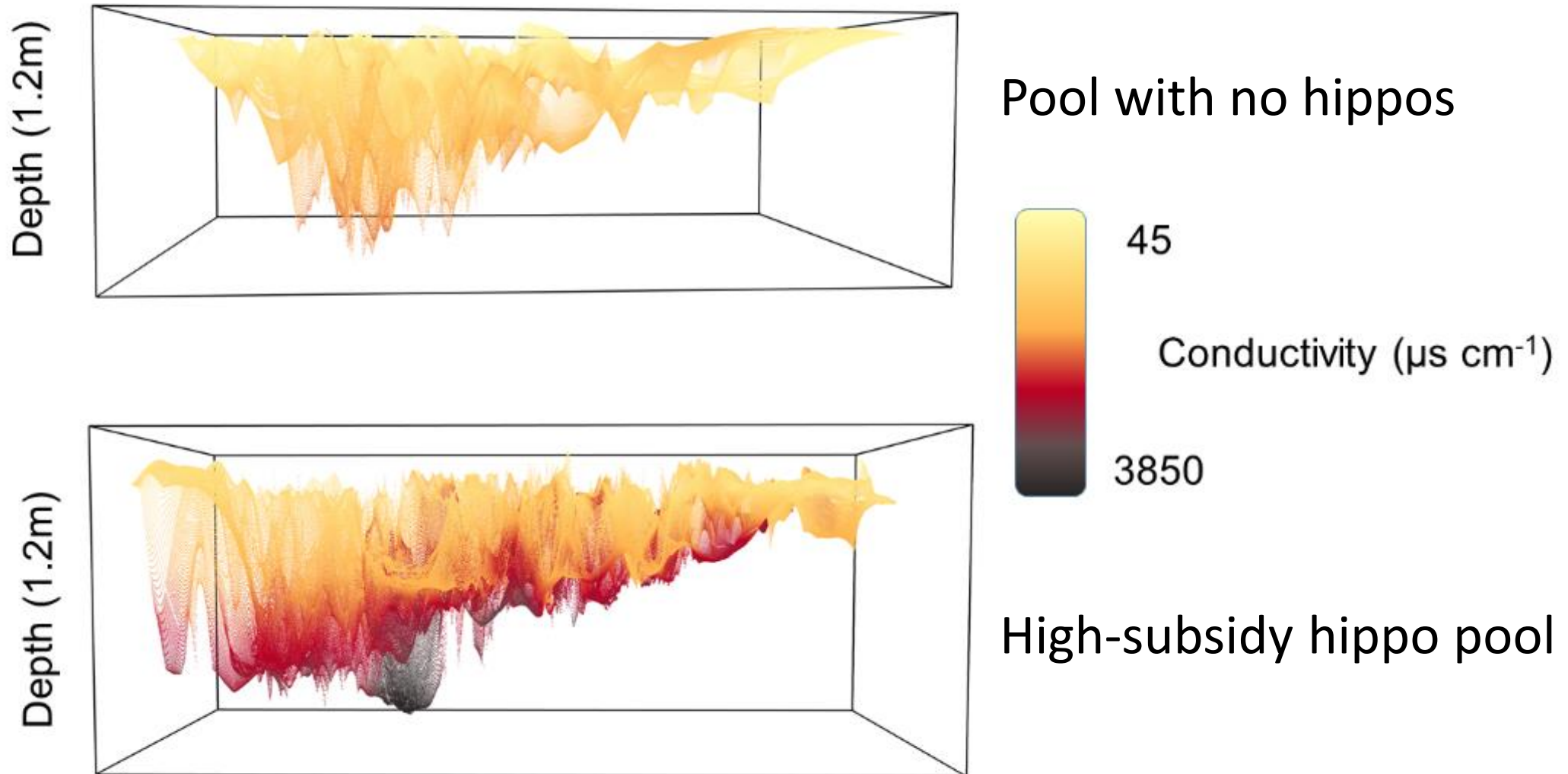




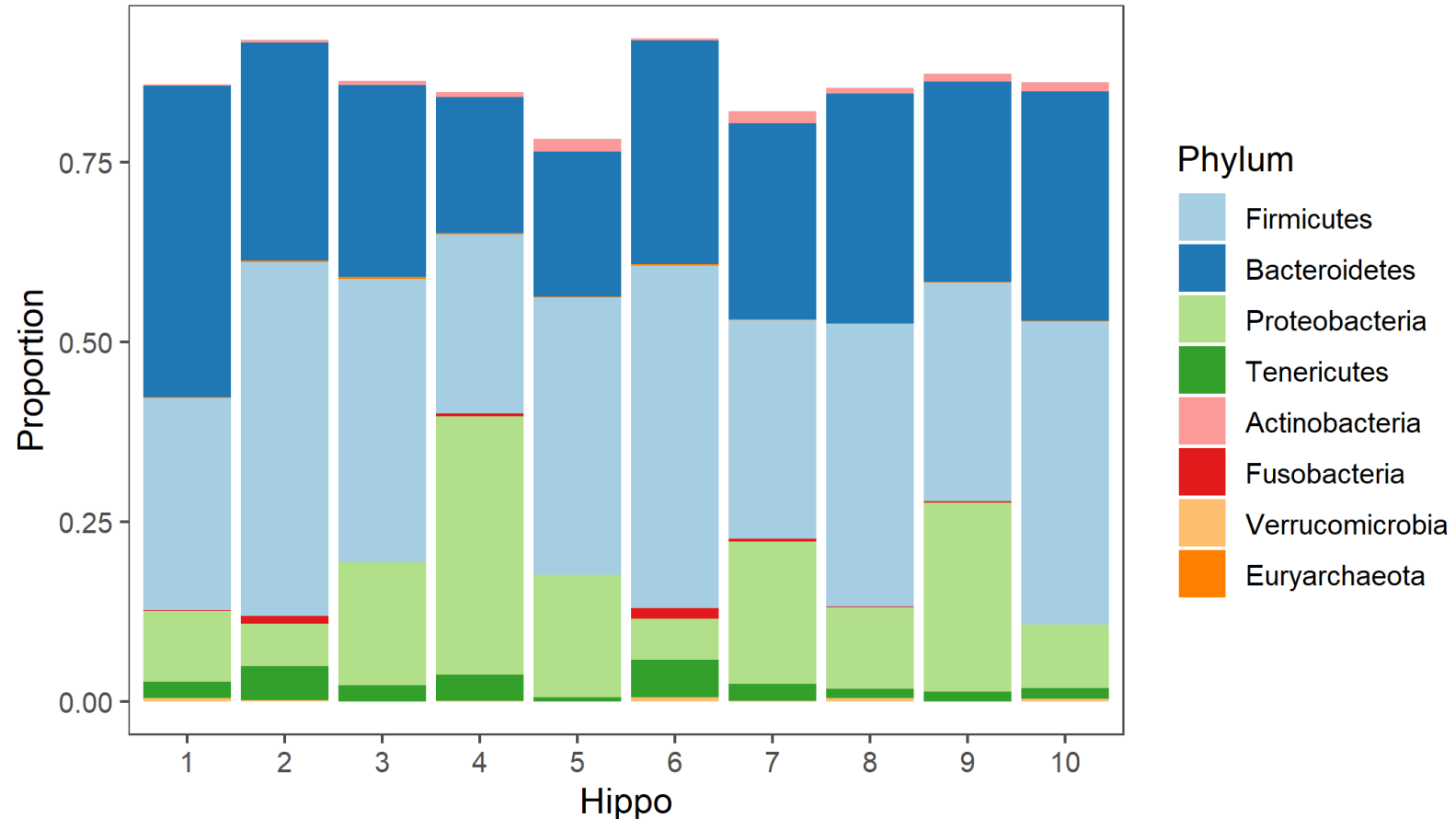




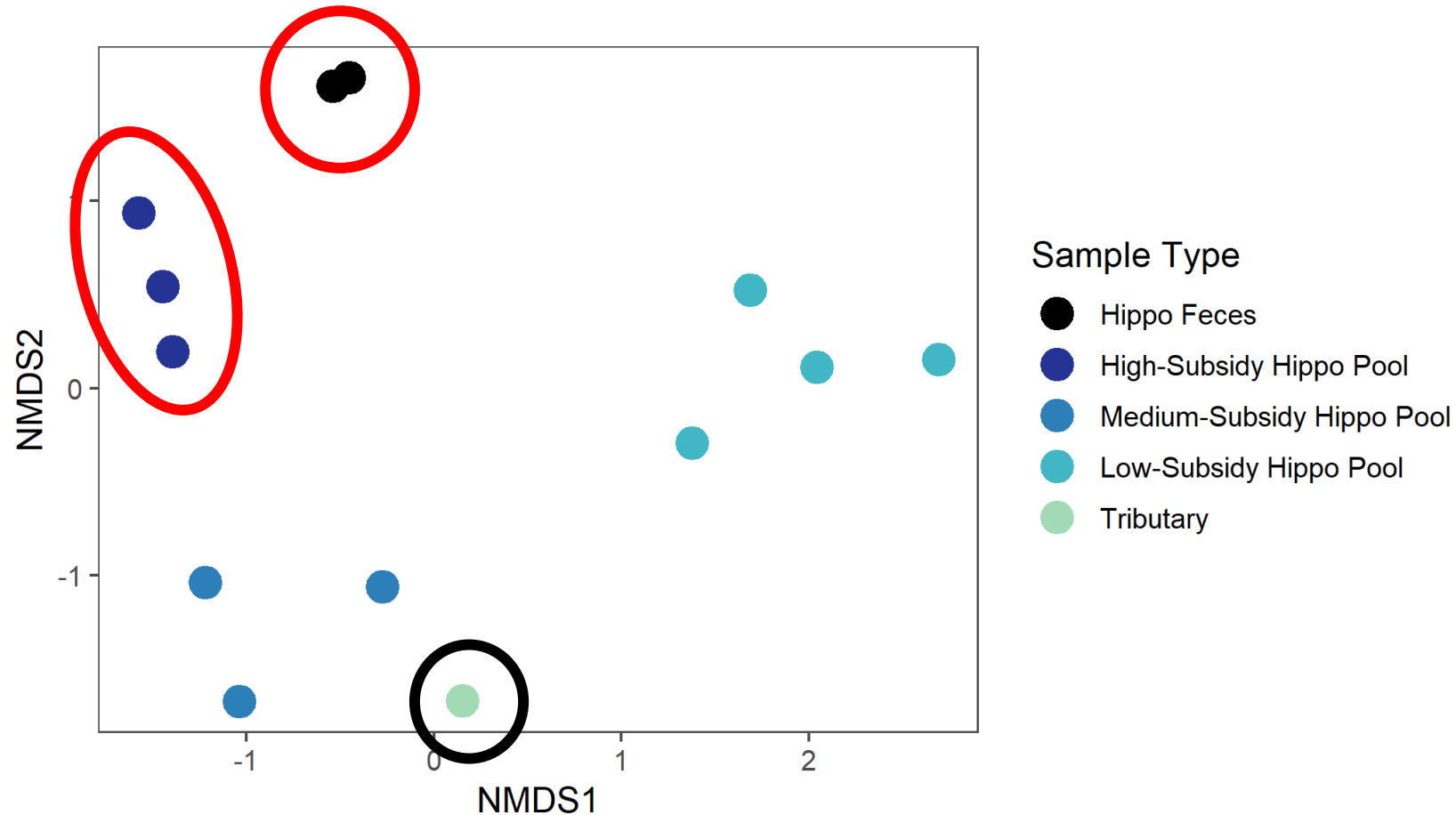
# Hippo pools are vertically stratified



# Hippo gut microbiome relatively similar among hippos

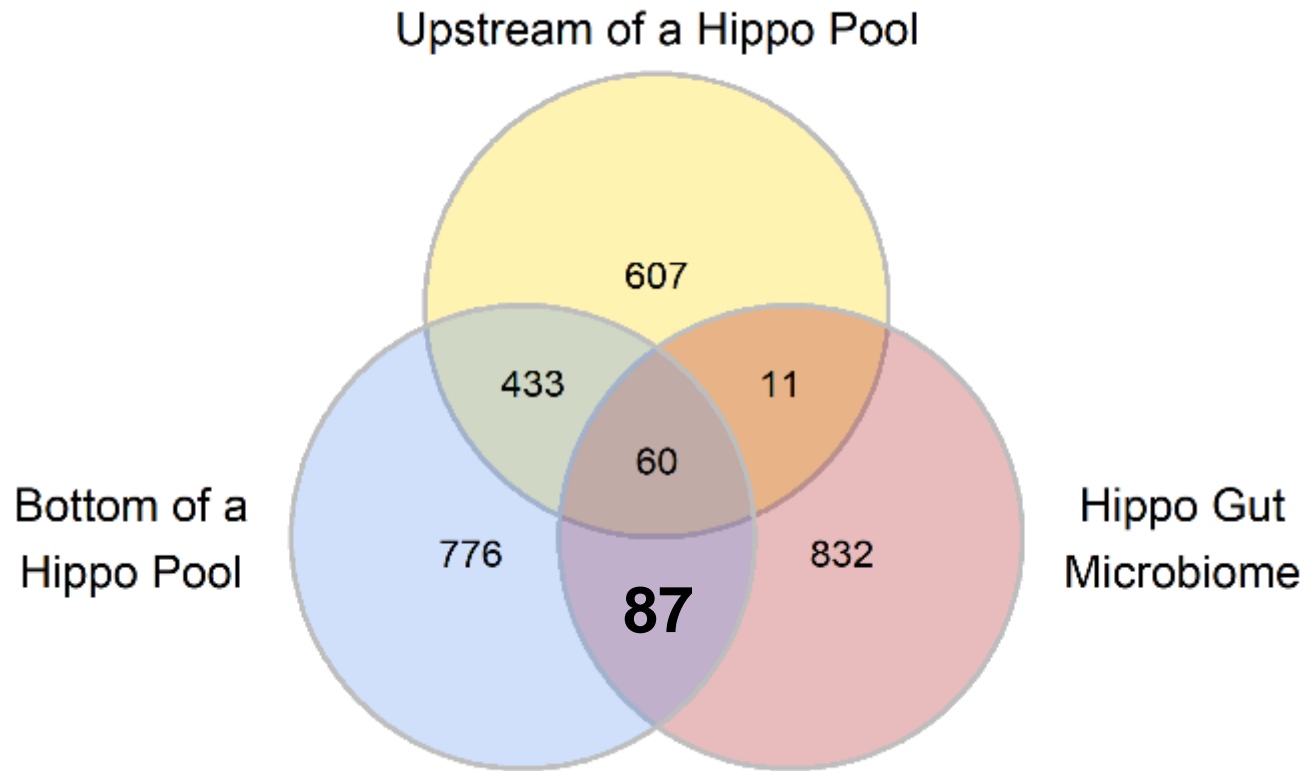


# High-subsidy hippo pool microbiomes are more similar to hippo gut microbiomes than other environmental microbiomes

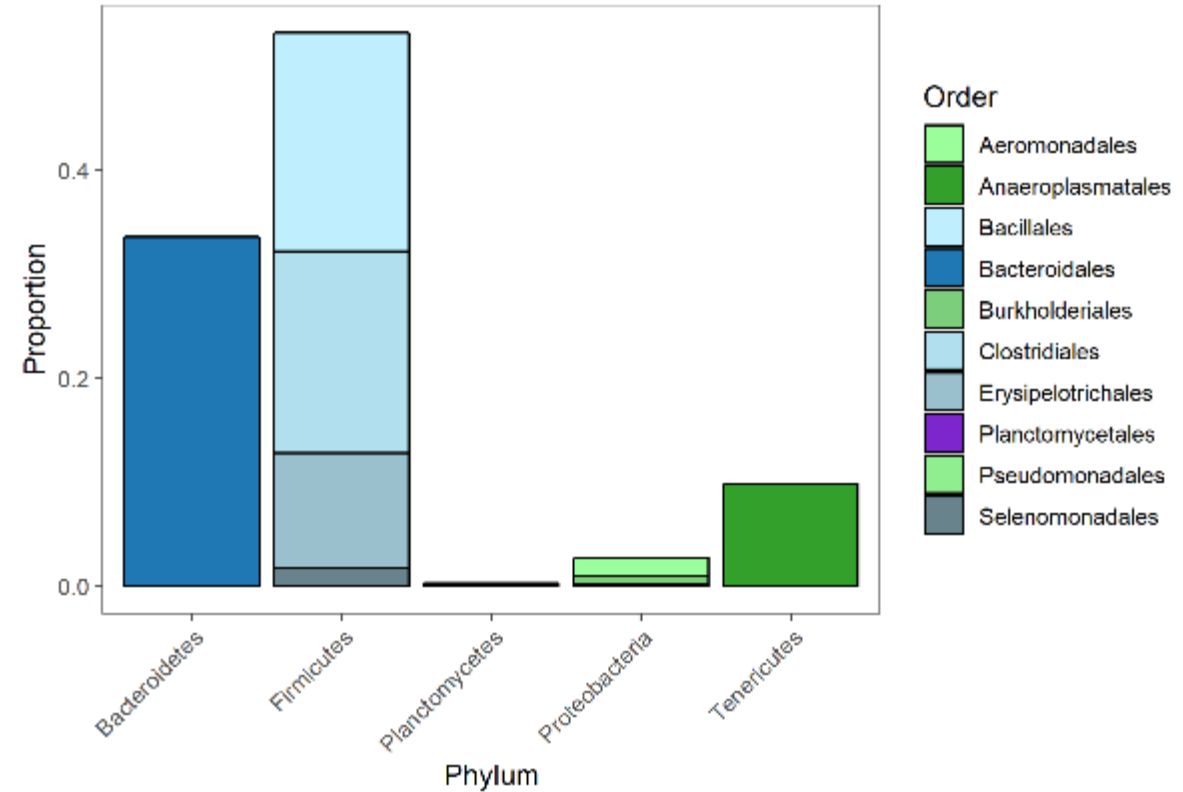


# 87 taxa are shared between the bottom of a hippo pool and the hippo gut microbiome that are not found elsewhere

A



B Proportions of 87 Shared Taxa; Hippo Gut & Bottom of Pool



# Which microbe from the hippo gut is responsible for which environmental cycle in the river?

*Metagenomics + metatranscriptomics + metabolomics + biogeochemistry*





# The hippo gut microbiome alters how the river functions

Yale University

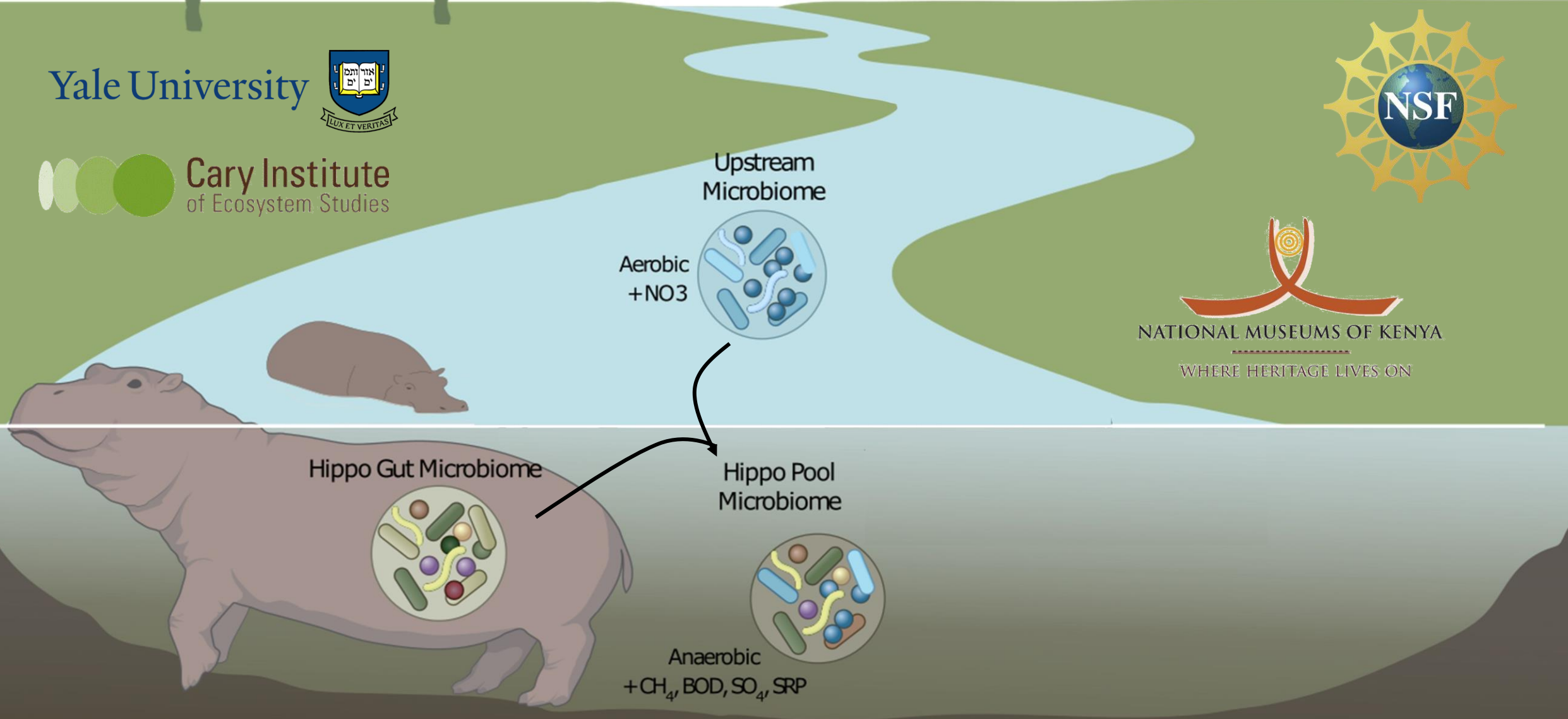


Cary Institute  
of Ecosystem Studies



NATIONAL MUSEUMS OF KENYA

WHERE HERITAGE LIVES ON



Upstream  
Microbiome

Aerobic  
+NO<sub>3</sub>

Hippo Pool  
Microbiome

Anaerobic  
+CH<sub>4</sub>, BOD, SO<sub>4</sub>, SRP

Hippo Gut Microbiome

## Upcoming Research!

- Do hippos in the same pool share a communal gut microbiome?

Christopher Dutton  
duttonc@ufl.edu

- Hippos defecate in the same water they drink and live in with other hippos.
- Is there a physiological advantage to hippos sharing a communal gut microbiome?

Please reach out if you're willing to participate in this study. Will be working with wild and captive populations of hippos.

