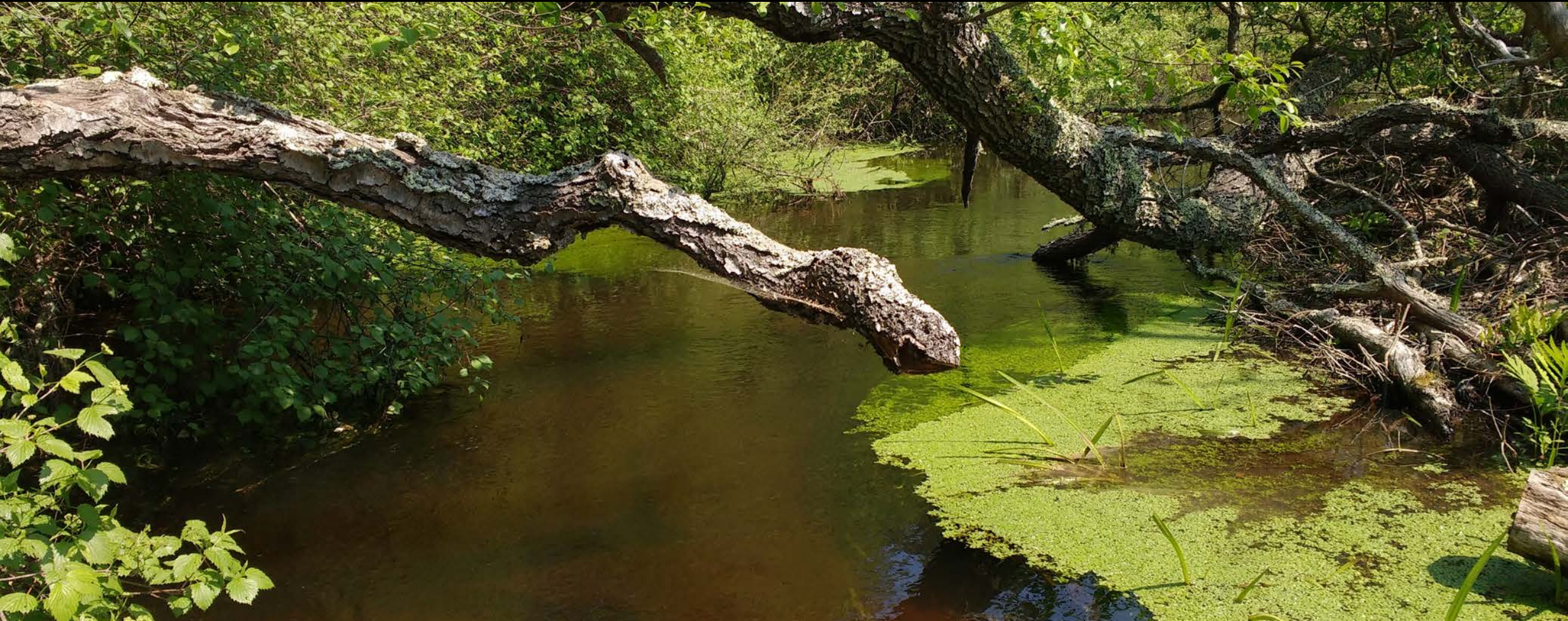


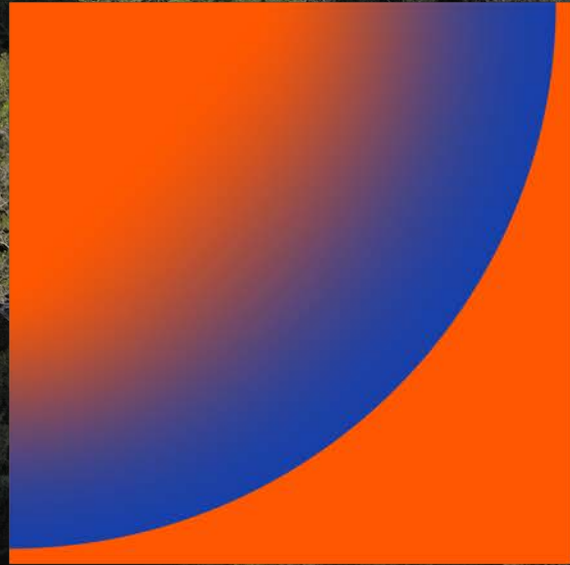
The Underappreciated Rivers Of Cape Cod



Max Holmes
Woodwell Climate Research Center

Confession...

- How and why I started paying attention
- What we're learning
- What we will learn
- A bit about a new project



**Woodwell
Climate
Research
Center**

Survey Question

Earth's most important data set?

Carbon dioxide concentration at Mauna Loa Observatory

CO₂ Concentration (ppm)

Full Record ending April 13, 2020

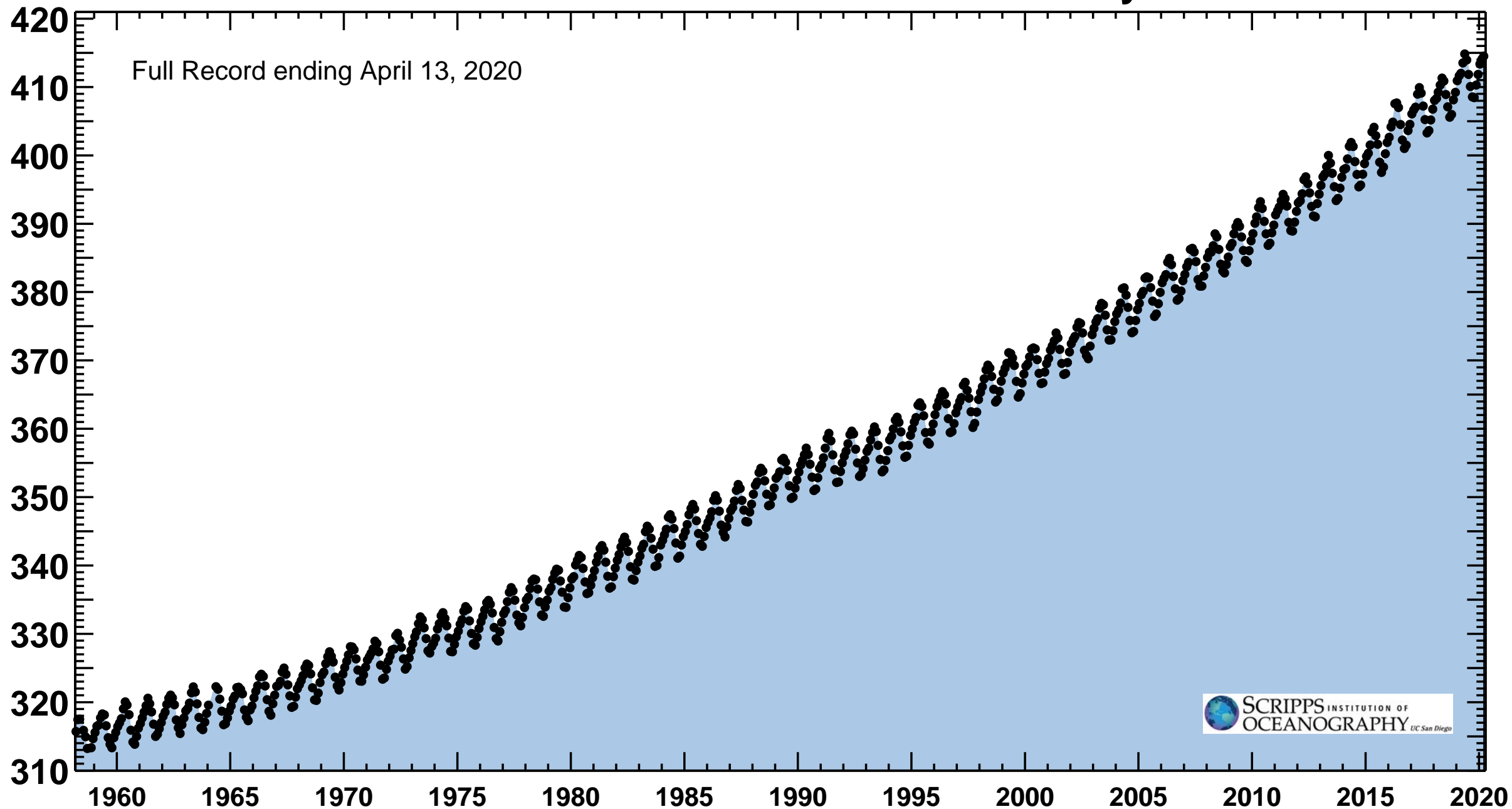






Photo by Chris Linder





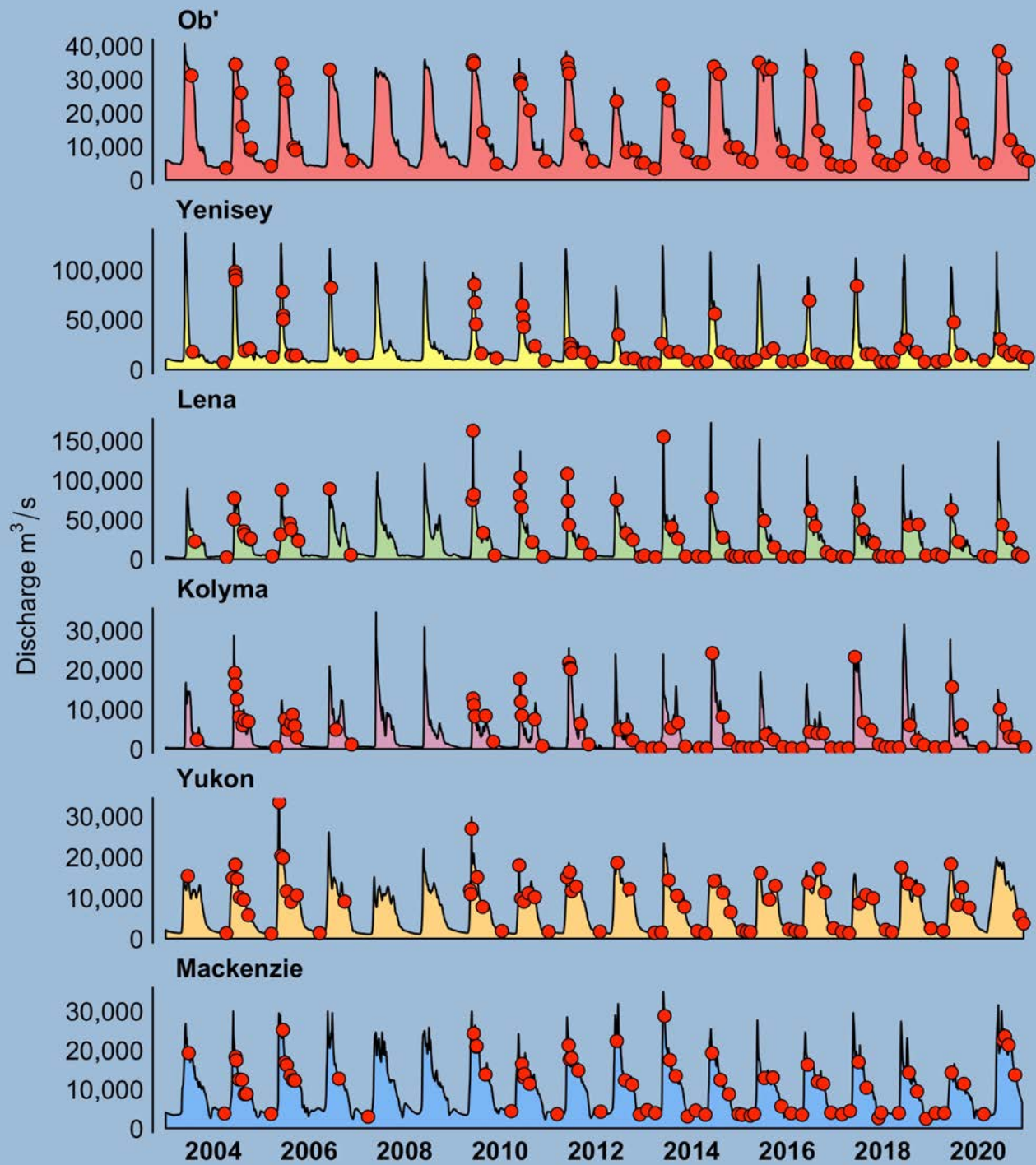
CO2 Status/Results

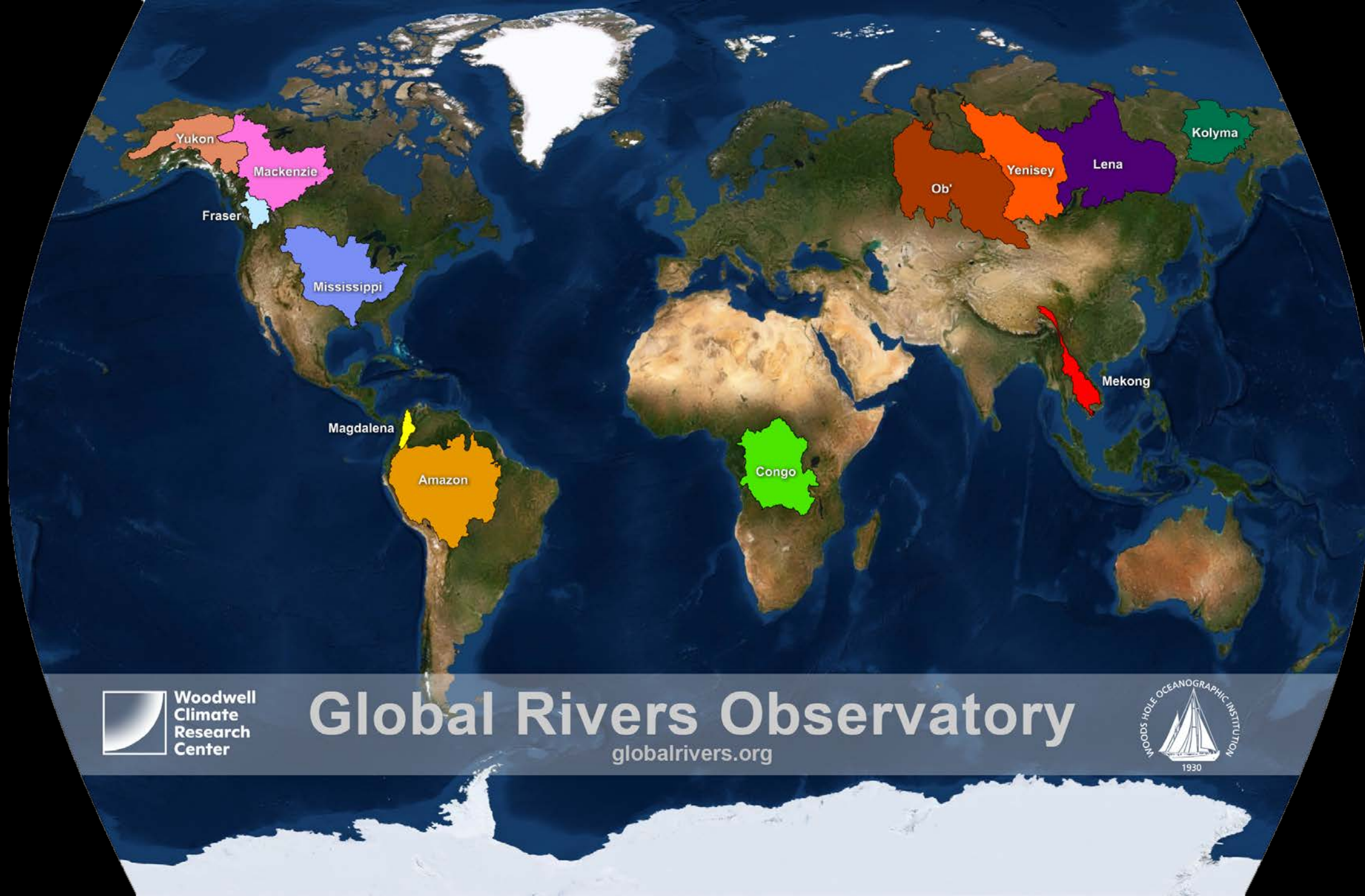
Status	Results	Mixing Ratios	Daily Stats	Sy
Date	Hour	M.R.	Std. Dev.	
31 Mar 2011	02:00	392.65	...	
31 Mar 2011	01:00	393.19	...	
31 Mar 2011	00:00	393.14	...	
30 Mar 2011	23:00	393.29	...	
30 Mar 2011	22:00	393.60	...	
30 Mar 2011	21:00	393.70	...	
30 Mar 2011	20:00	393.52	...	
30 Mar 2011	19:00	393.55	...	
30 Mar 2011	18:00	393.52	...	



ArcticGRE

ARCTIC GREAT RIVERS OBSERVATORY





Woodwell
Climate
Research
Center

Global Rivers Observatory

globalrivers.org



Cape Rivers?









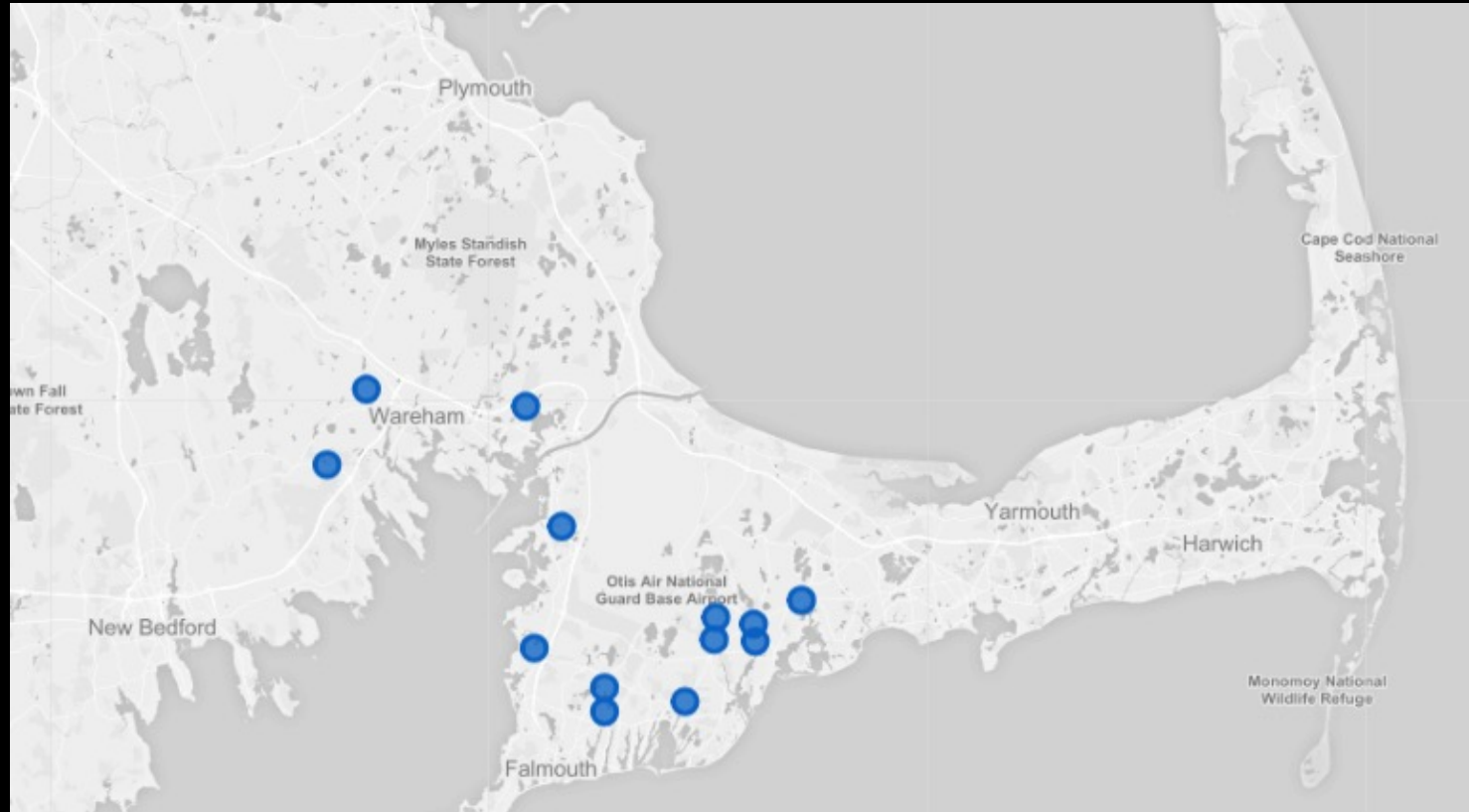






Cape Cod Rivers

OBSERVATORY



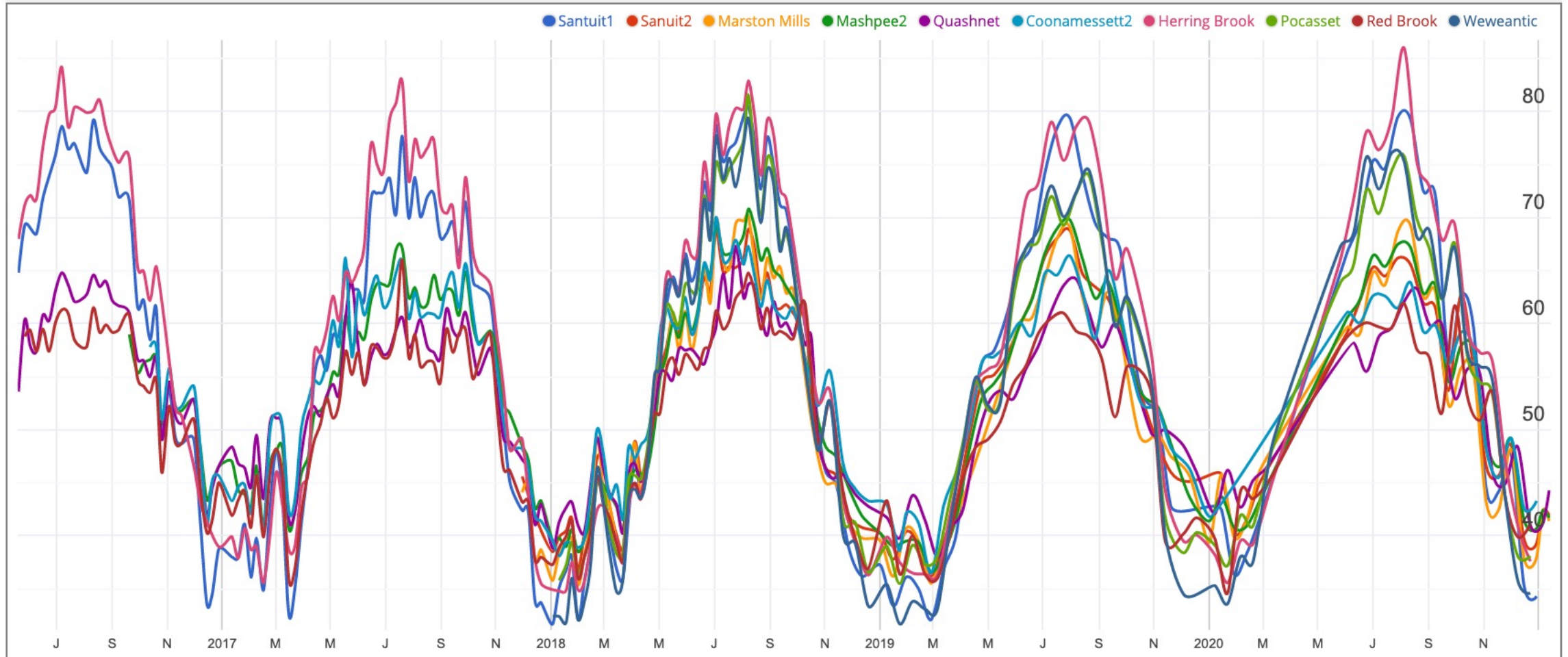
www.caperivers.org



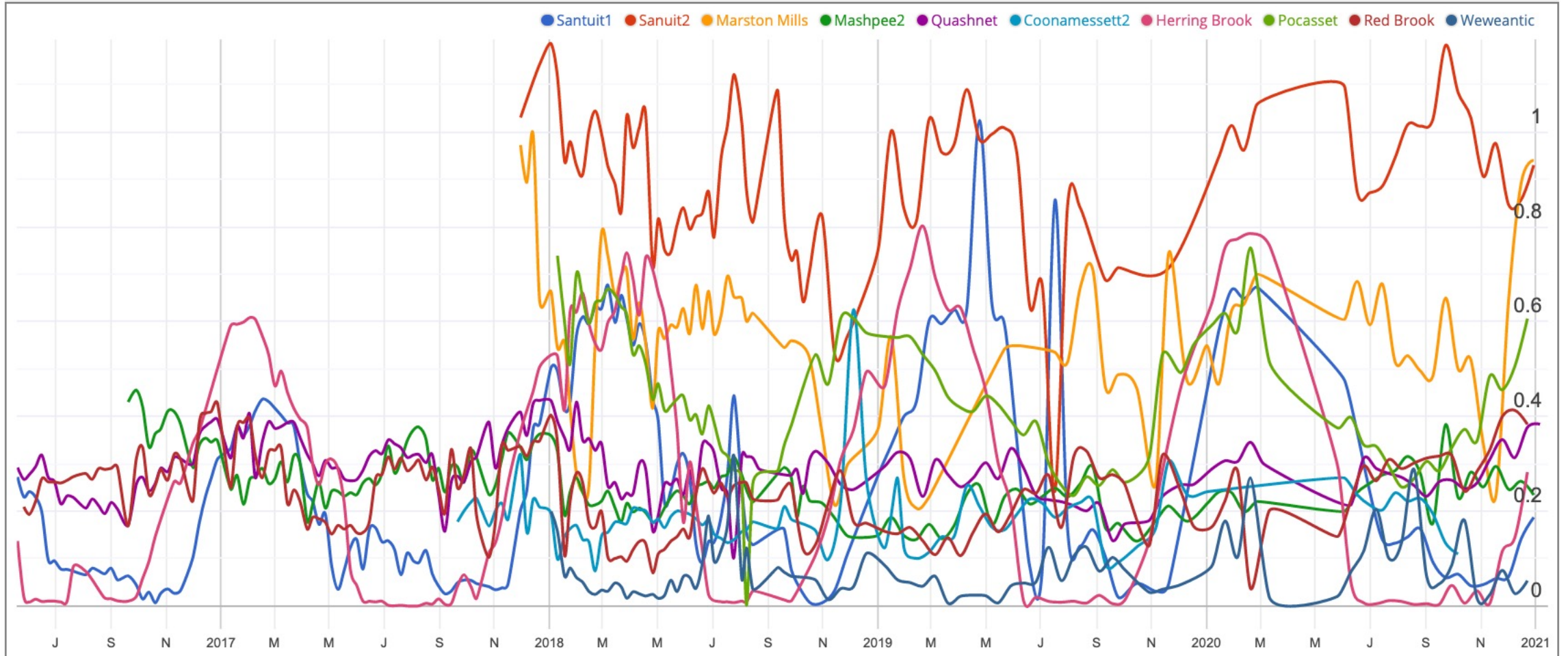
Last edit was seconds ago

 f_X

Water Temperature (°F)



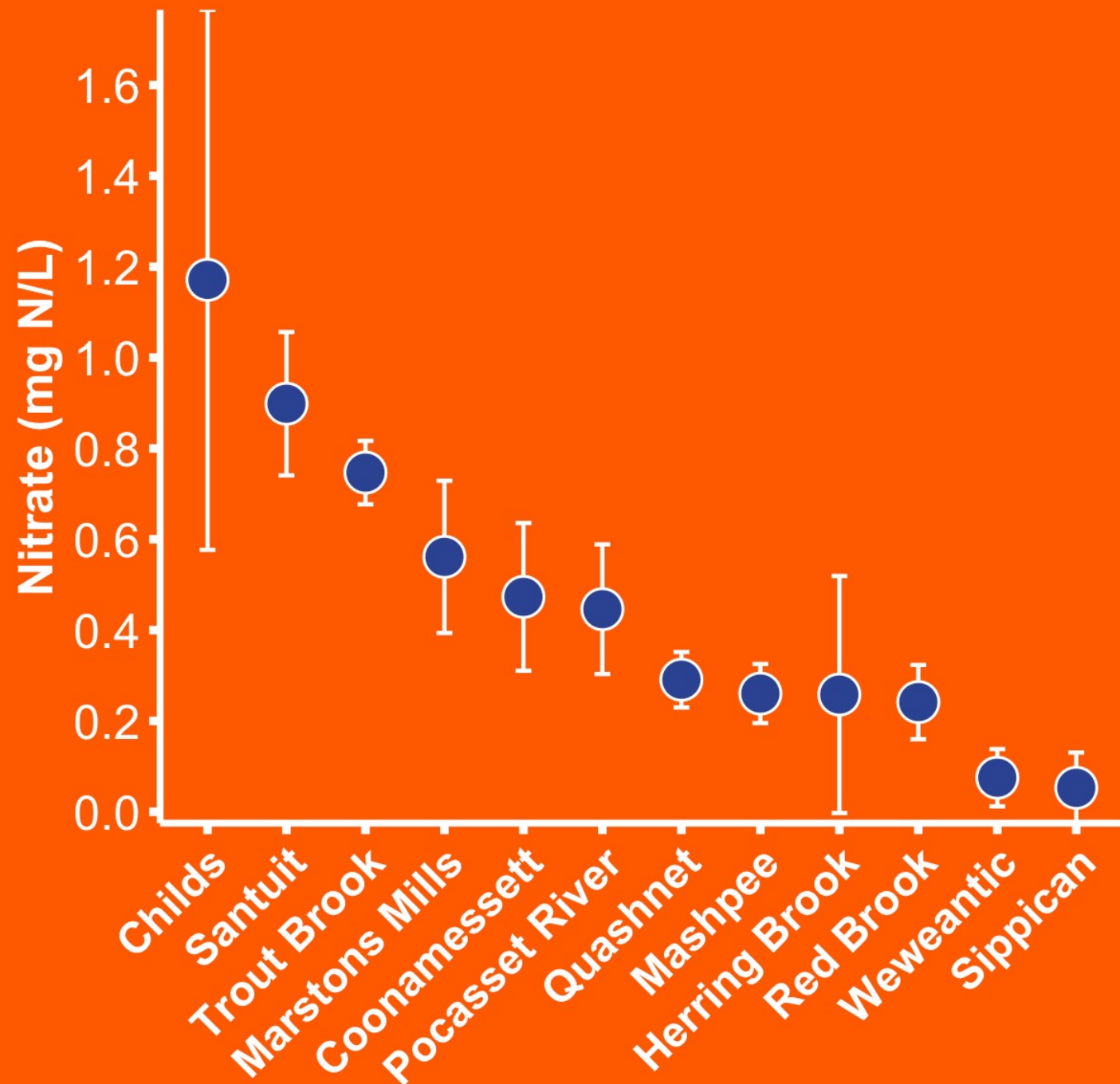
Nitrate (mg N/L)



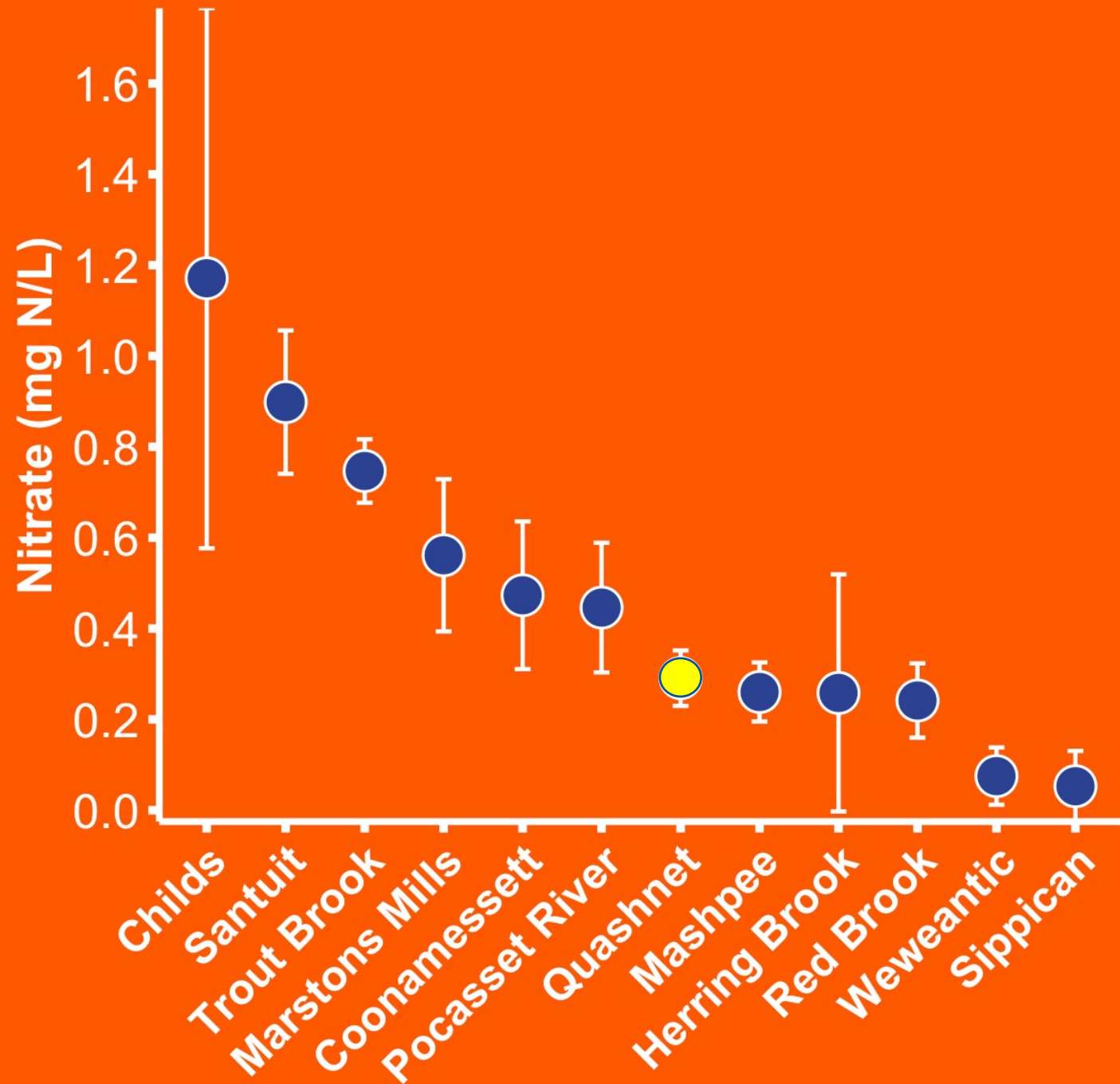
Average Nitrate Concentration

Over recent years, nitrogen inputs from rivers to estuaries on Cape Cod have:

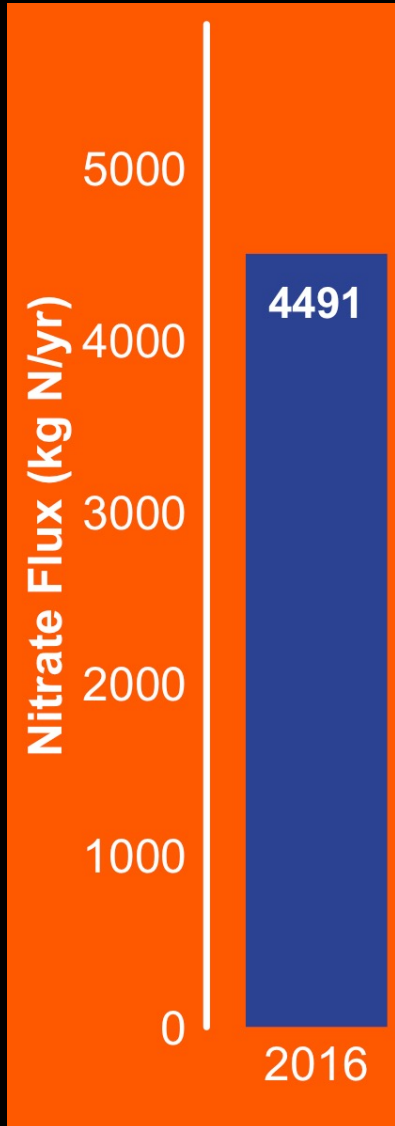
- A. Increased
- B. Decreased
- C. Stayed about the same
- D. I don't know
- E. Nobody knows



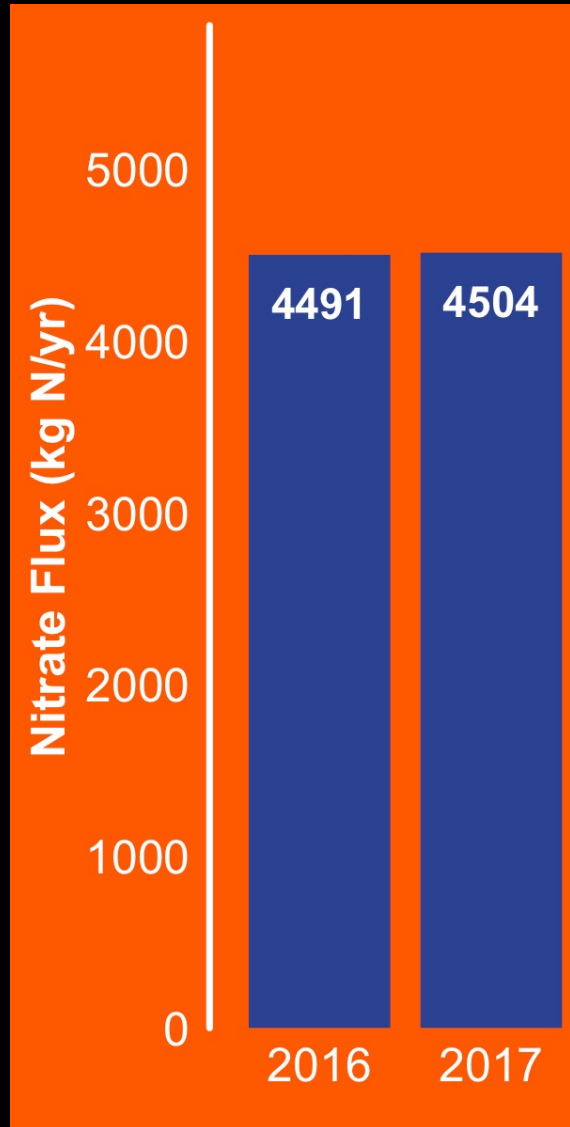
Quashnet



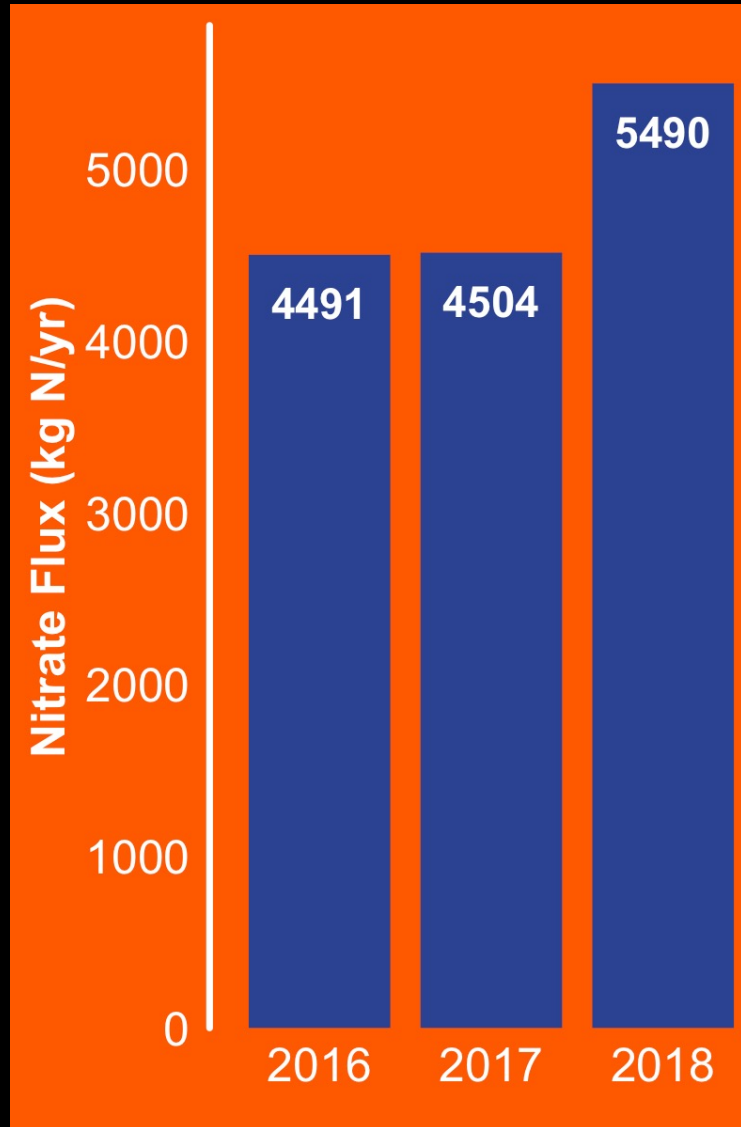
Annual Nitrate Flux



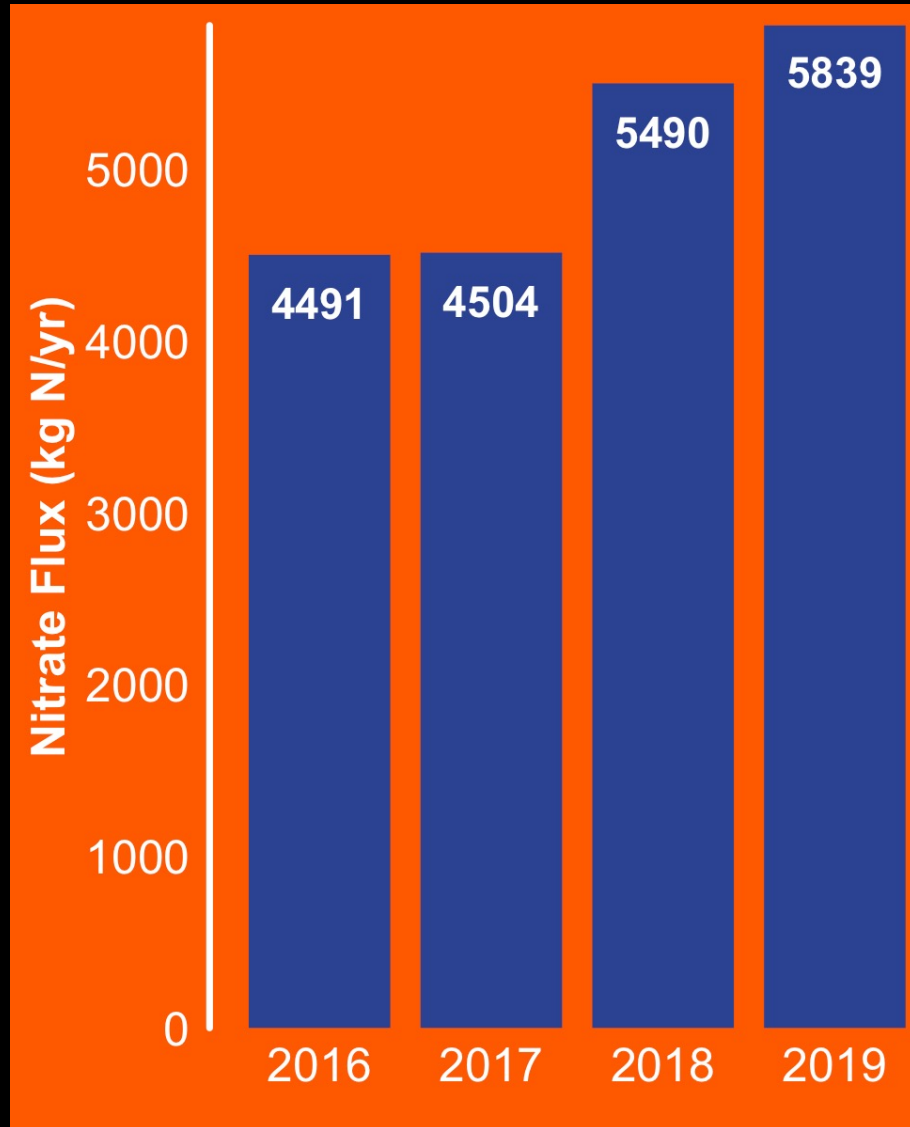
Annual Nitrate Flux



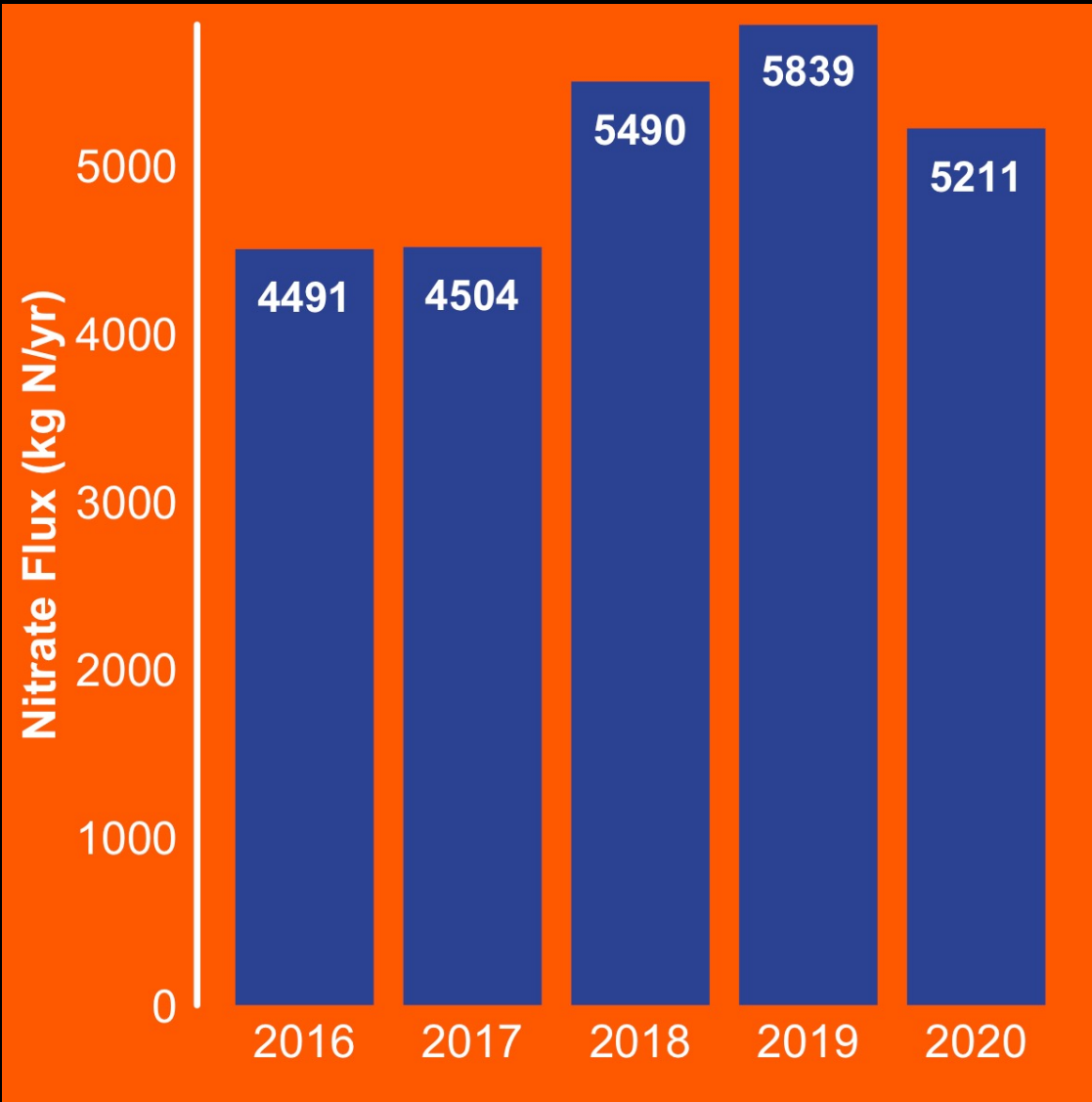
Annual Nitrate Flux



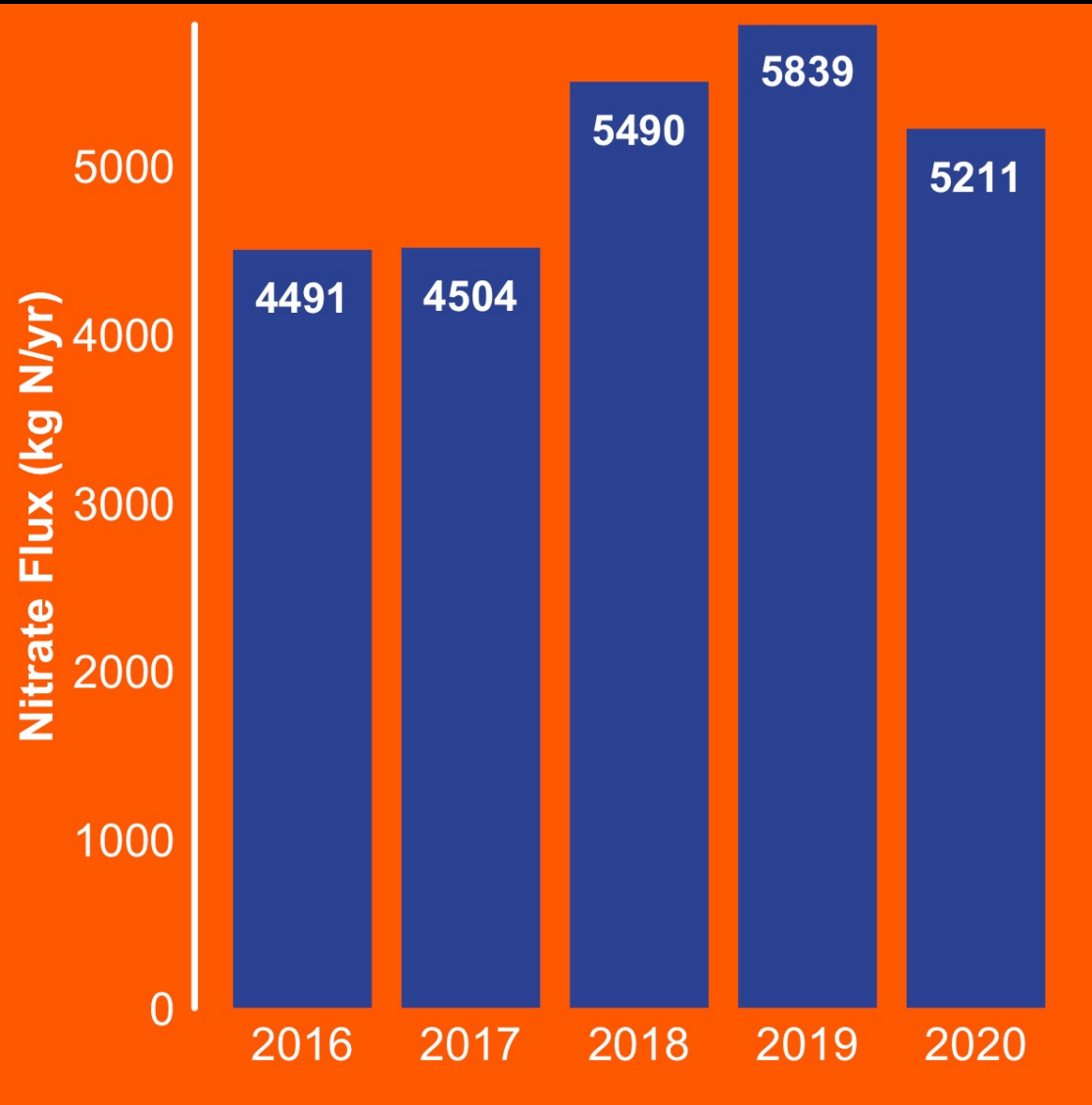
Annual Nitrate Flux



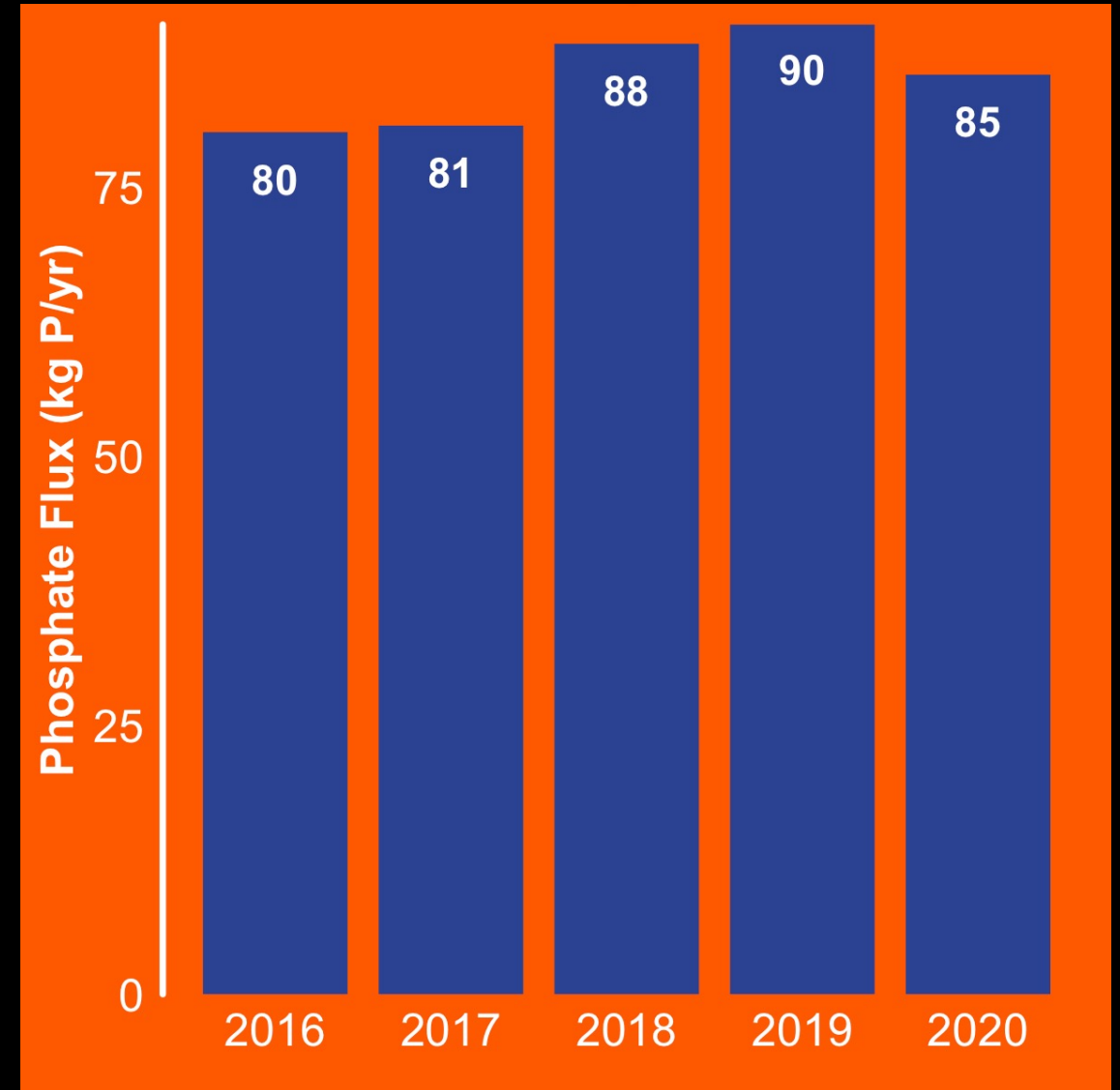
Annual Nitrate Flux



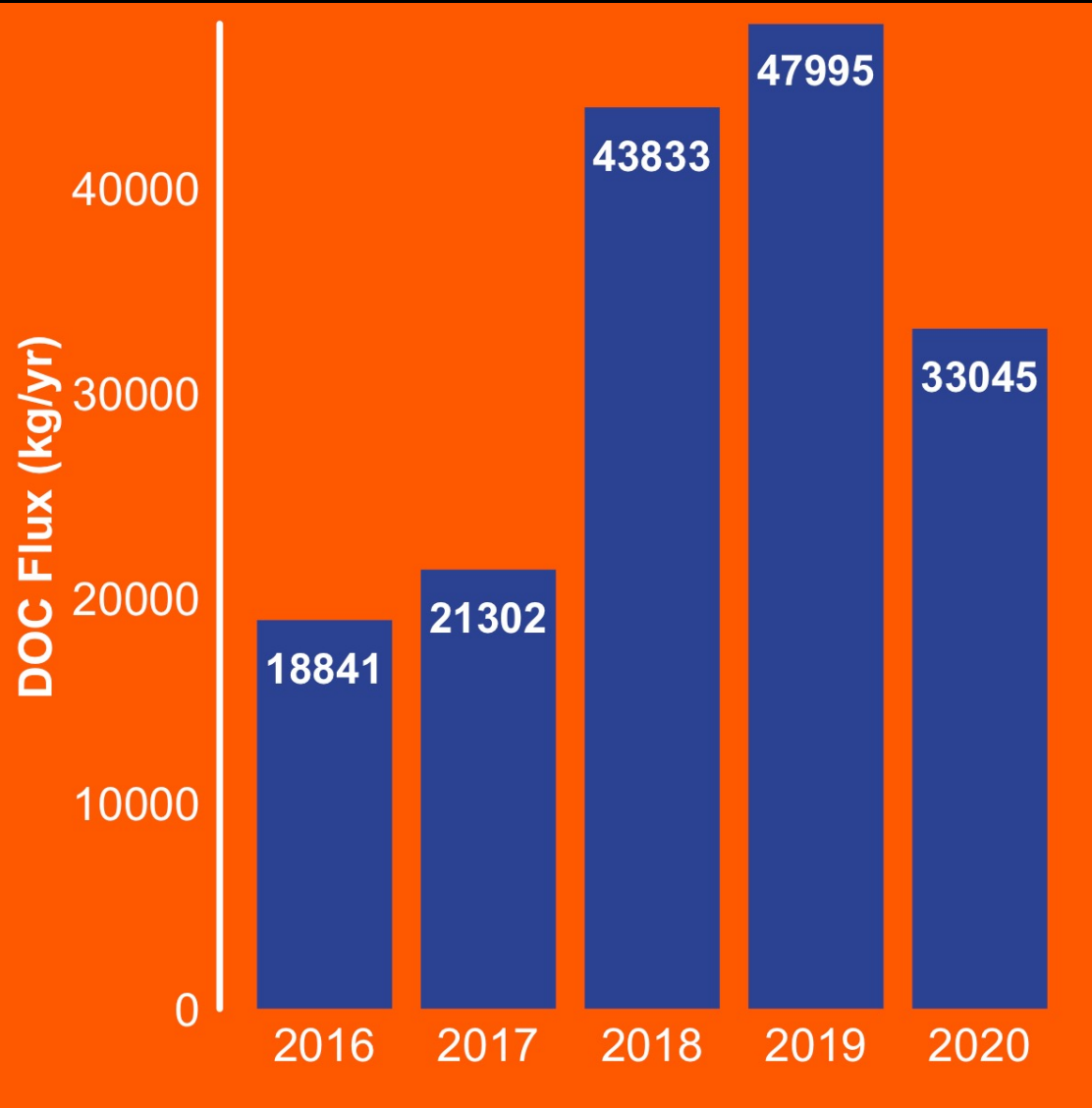
Annual Nitrate Flux



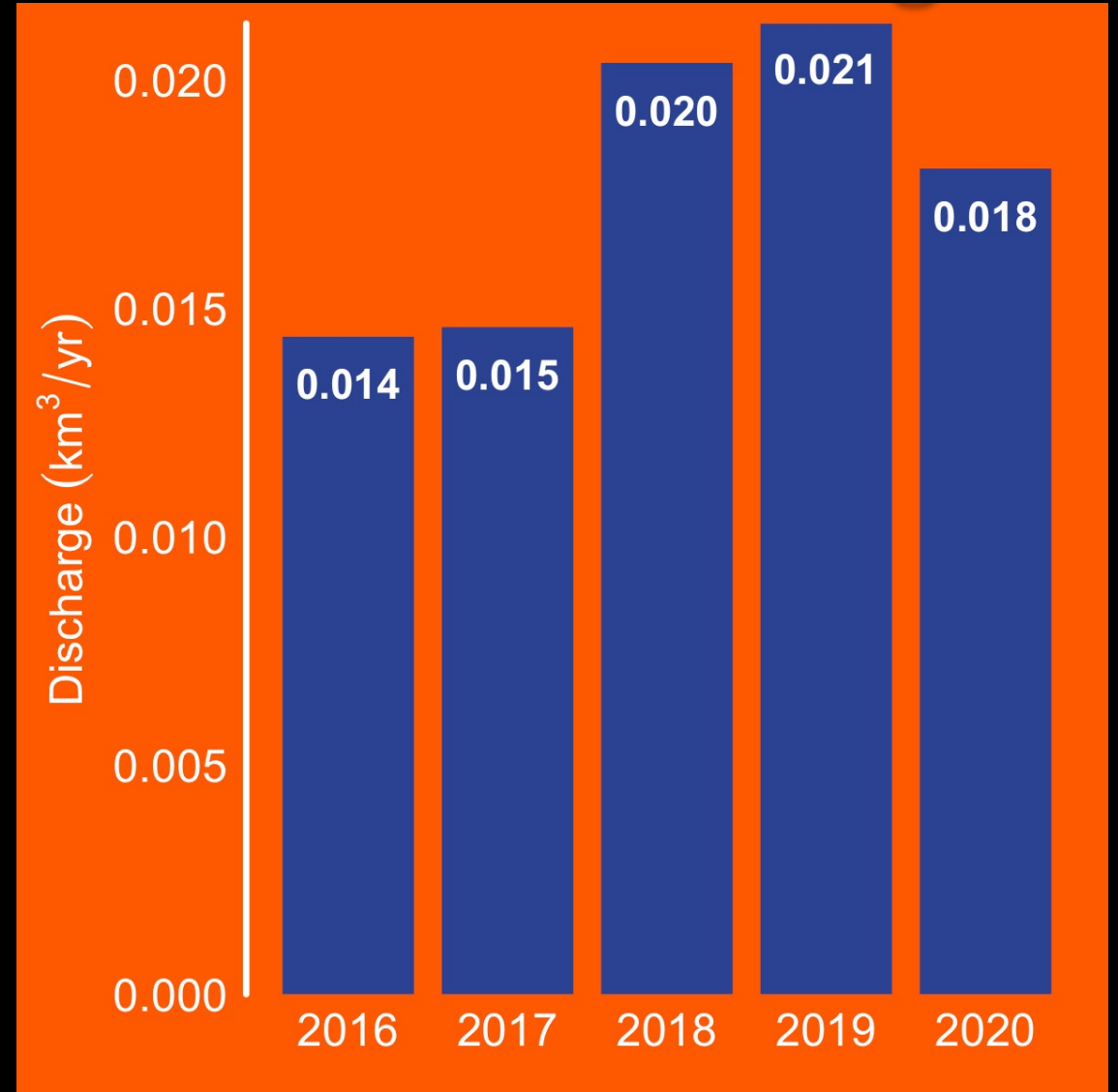
Annual Phosphate Flux



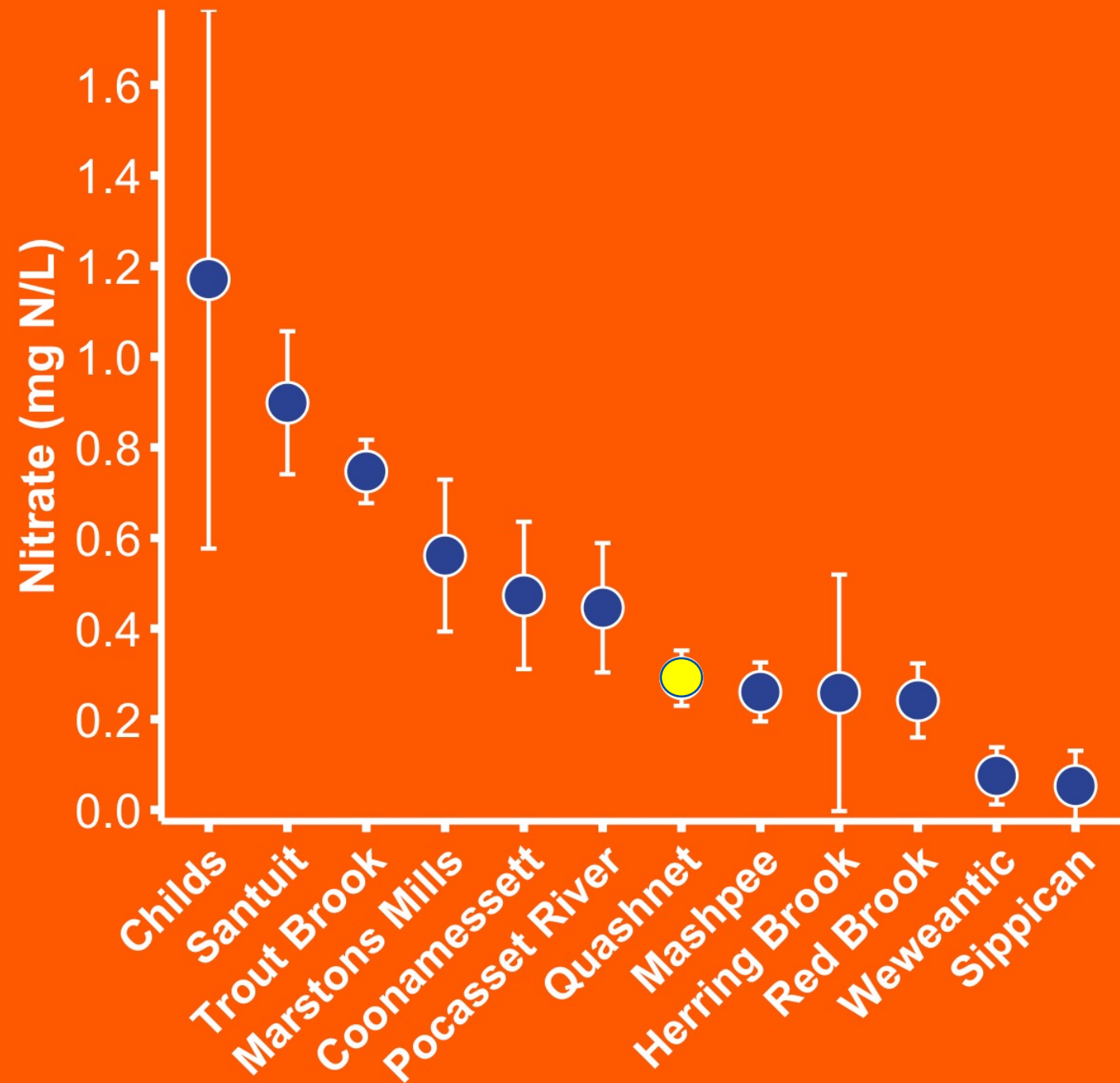
Annual DOC Flux



Annual Discharge



What about the
other rivers?



Discharge Measurements Coming For:

Santuit – USGS

Marstons Mills – USGS

Childs – Woodwell/USGS

Mashpee – Woodwell/USGS

Annual Report

Thanks and Acknowledgments...

Rob and Kate Stenson

USGS

Woodwell's Fund for Climate Solutions

Alison Leschen and Scott Lindell

Several others

Falmouth Rod and Gun Club

Mass Fish and Wildlife

WBNERR





 **MOUNTAINFILM**

NEW SHEPHERD

HOOK

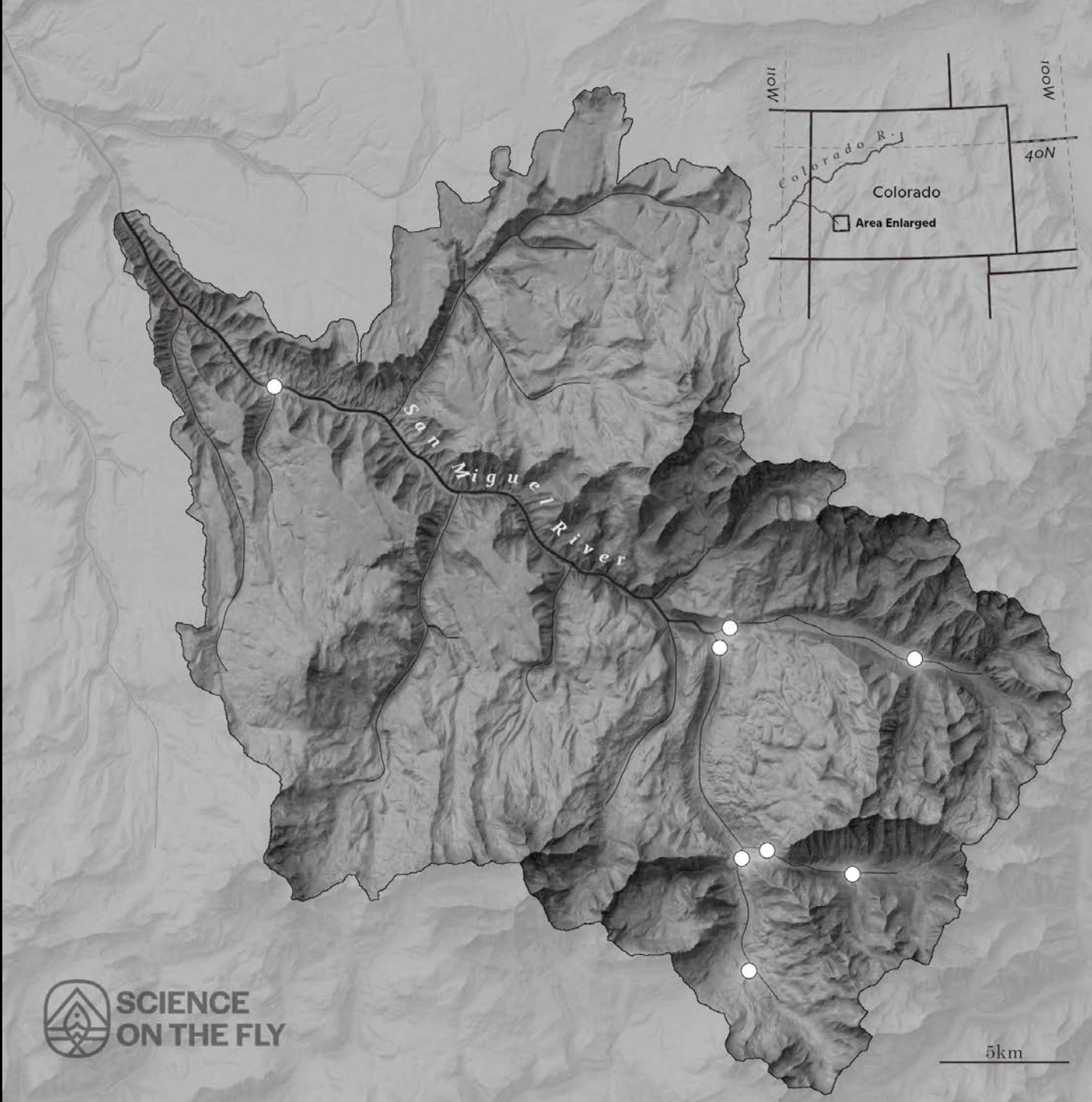
WARNING
DO NOT
PARK
IN THIS
ZONE



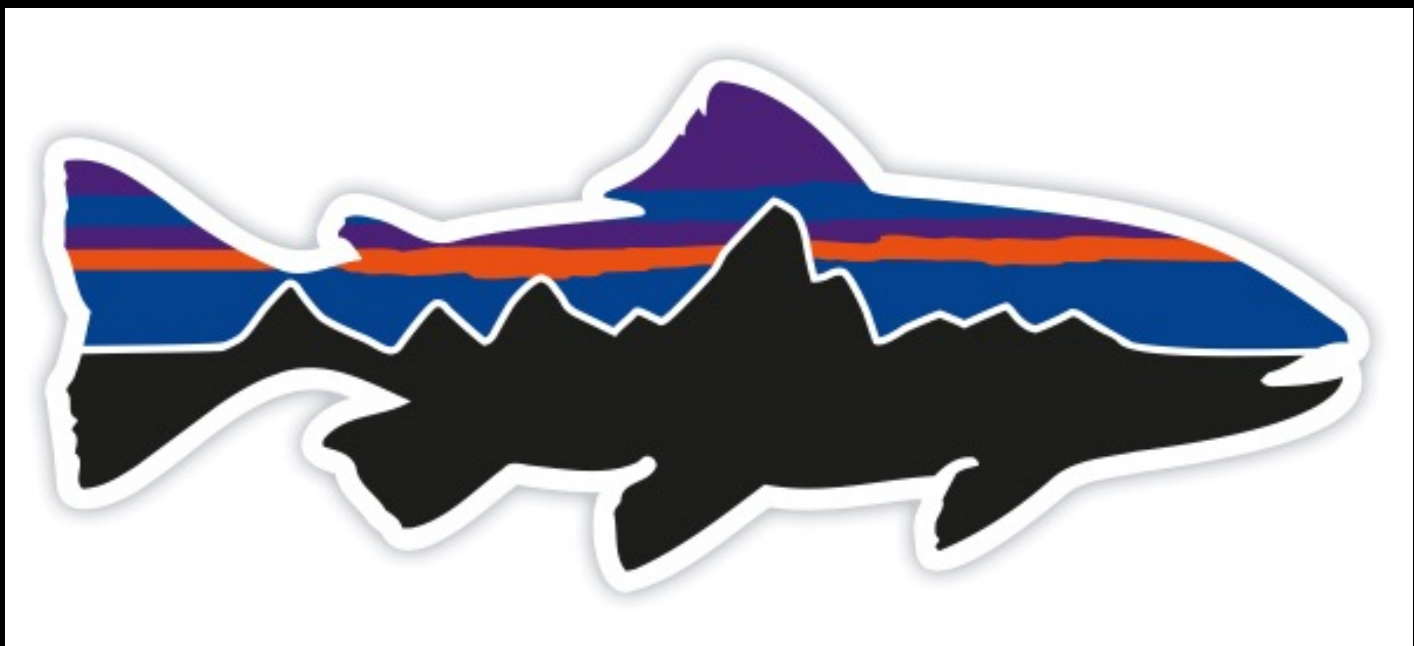
Snowmobile
Tours

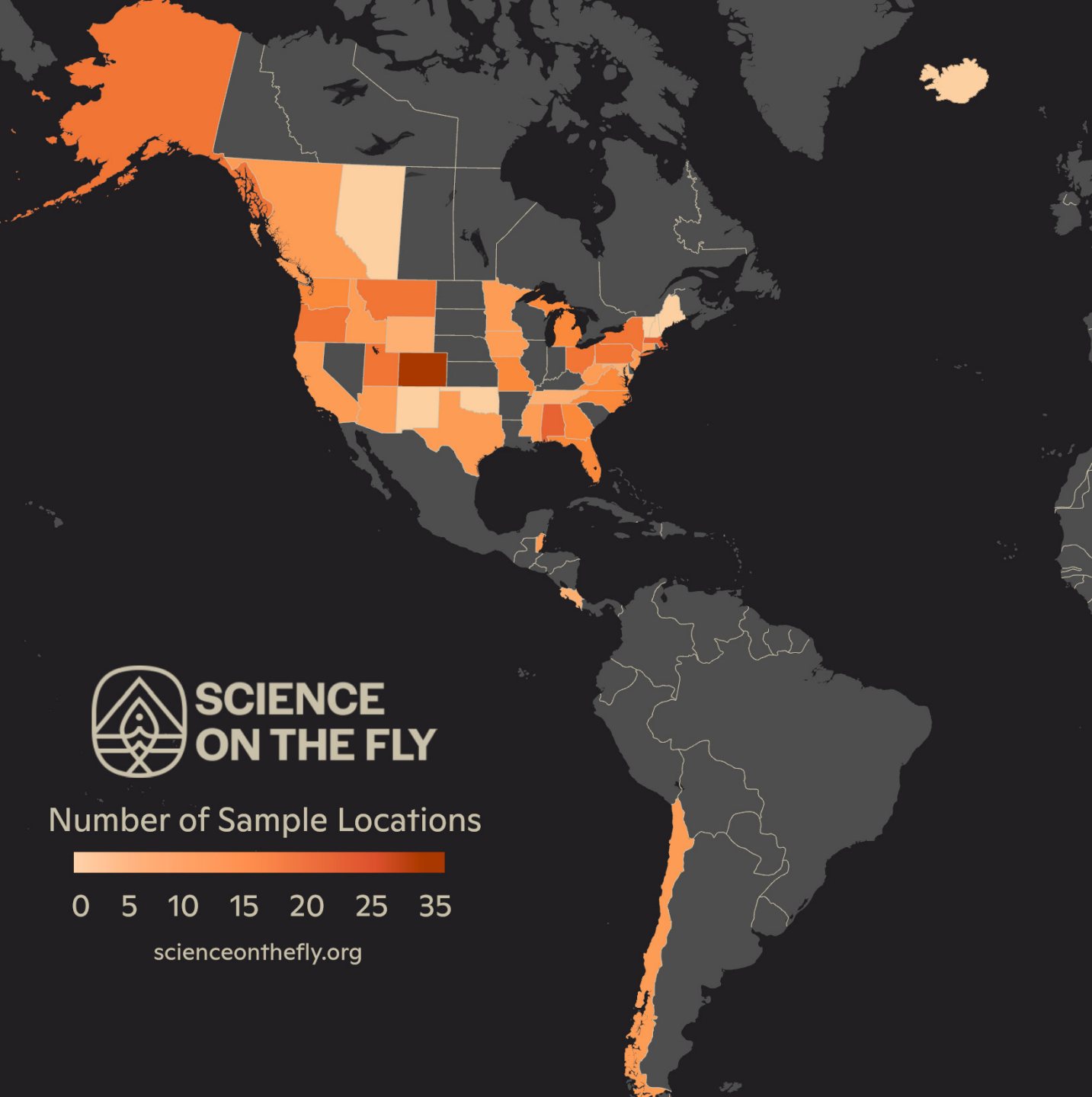






SCIENCE
ON THE FLY





**SCIENCE
ON THE FLY**

Number of Sample Locations



0 5 10 15 20 25 35

scienceonthefly.org



scienceonthefly.org

Every river tells a story.

