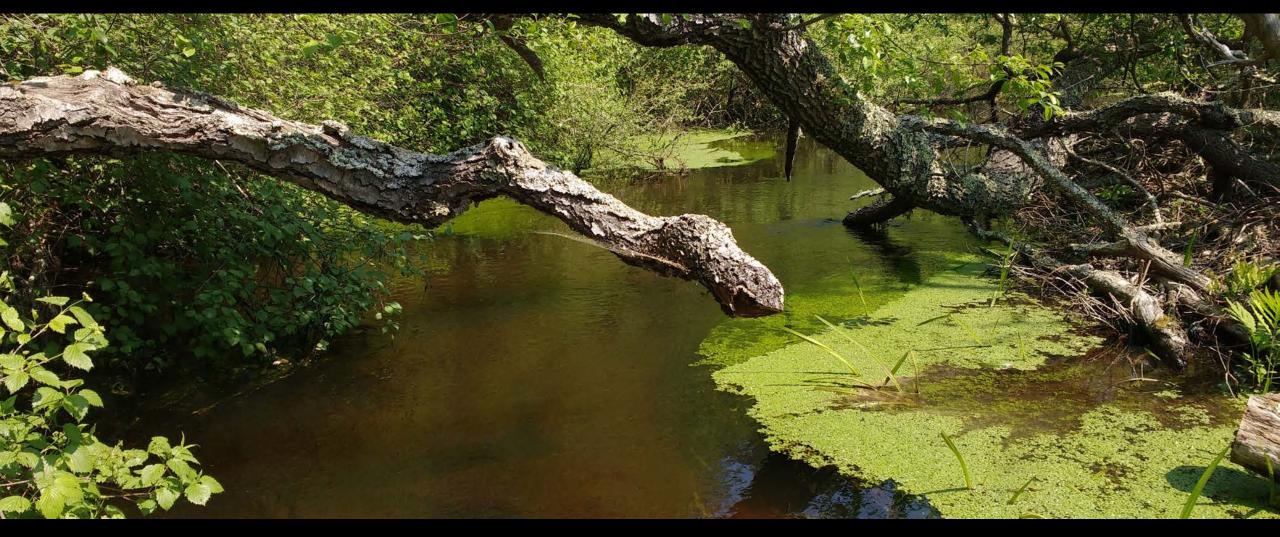
The Underappreciated Rivers Of Cape Cod



Max Holmes

Woodwell Climate Research Center

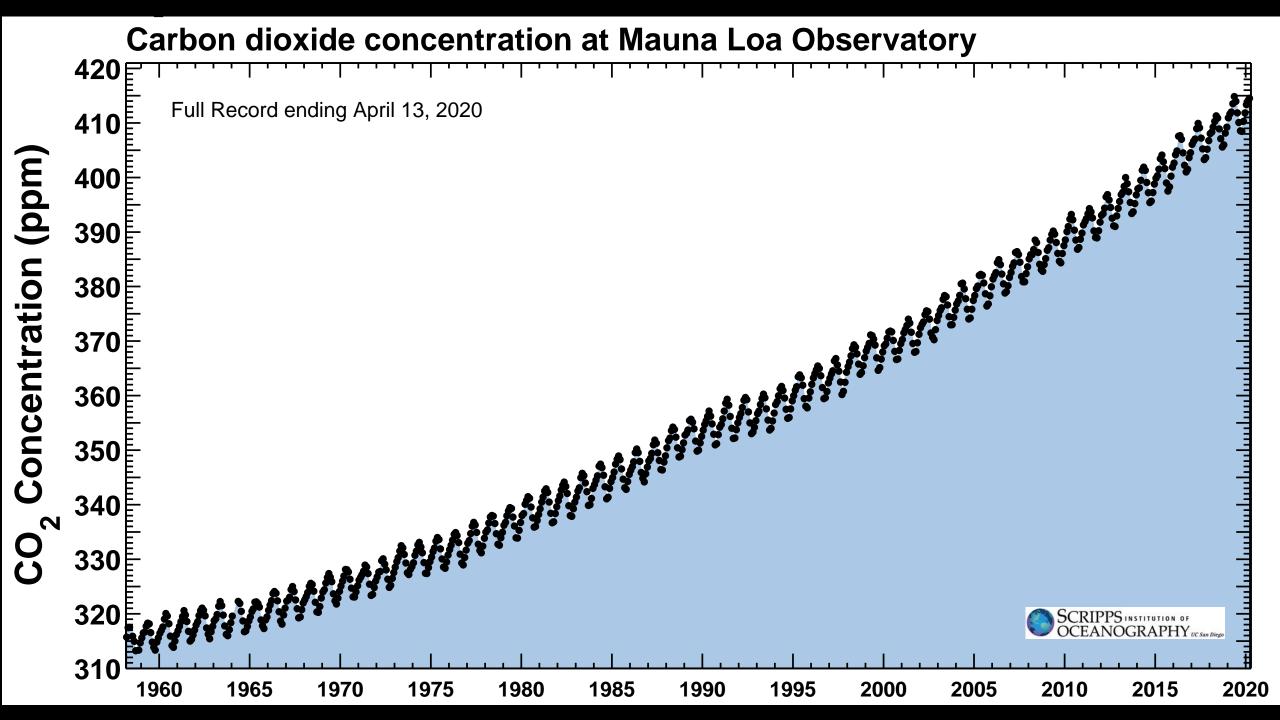
Confession...

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



Survey Question

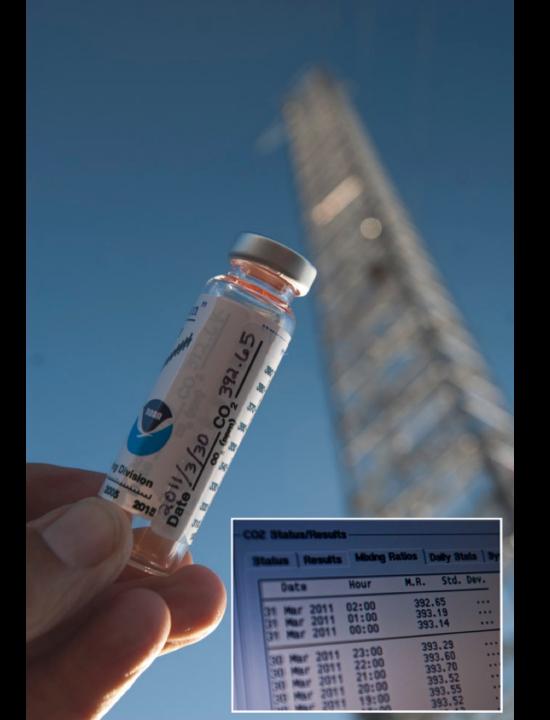
Earth's most important data set?







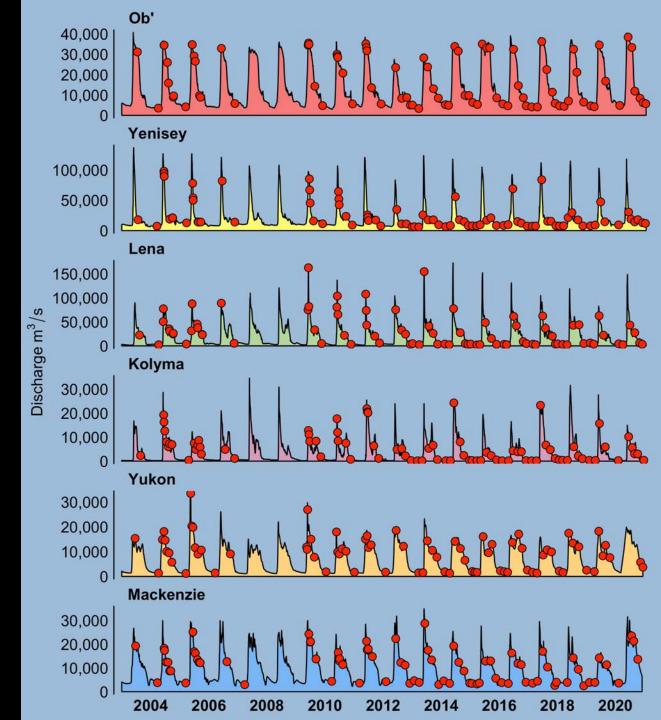


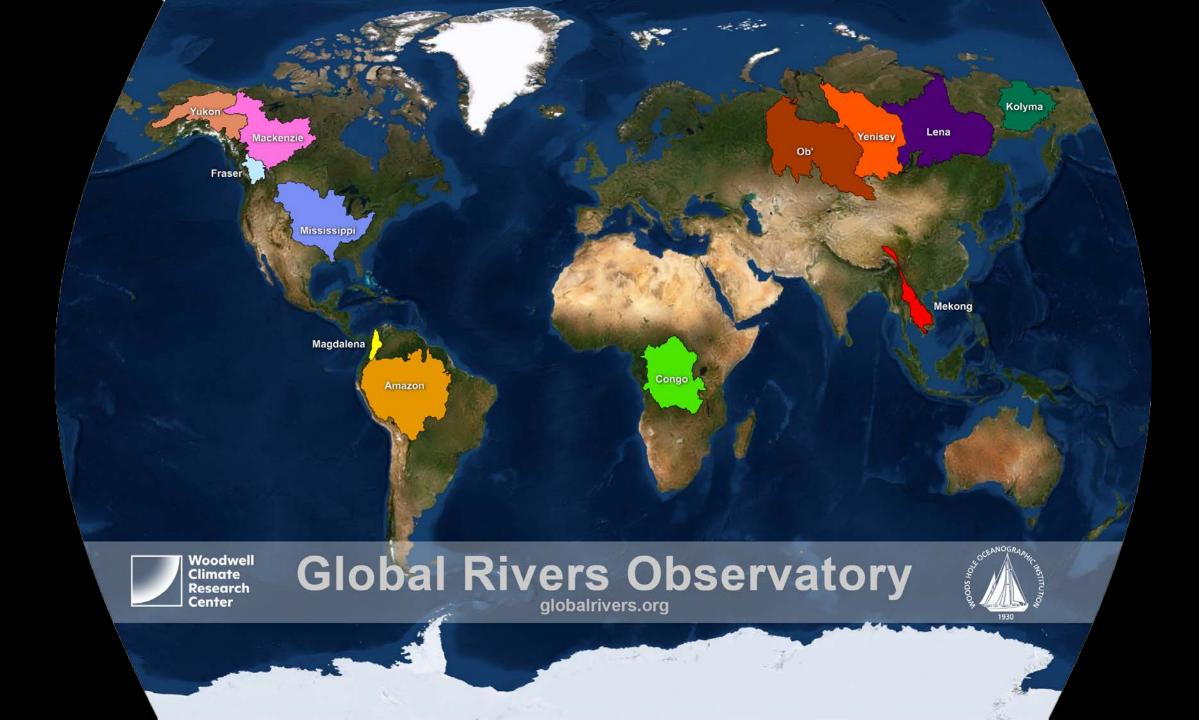












Cape Rivers?















Cape Cod Rivers OBSERVATORY



www.caperivers.org

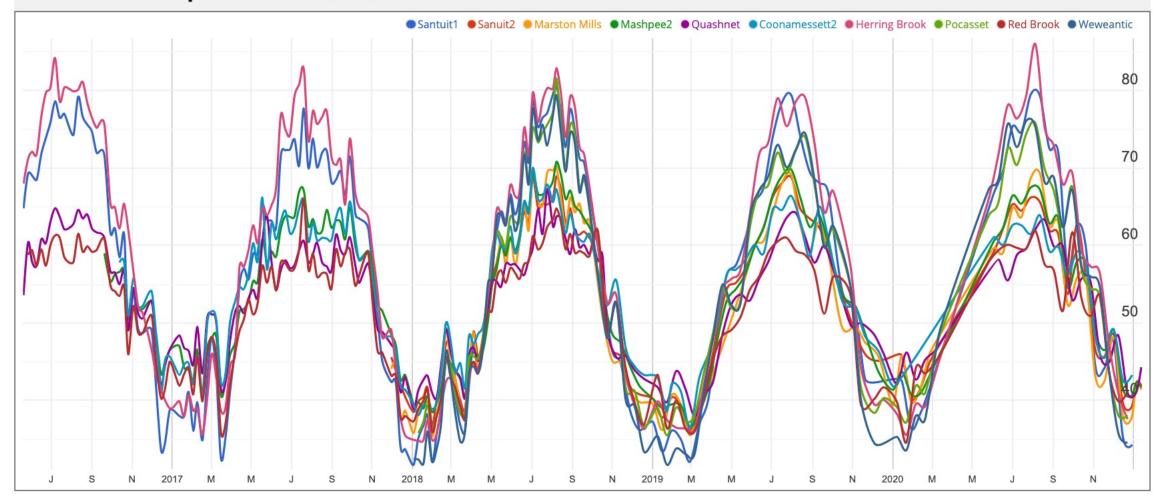


~

File Edit View Insert Format Data Tools Add-ons Help <u>Last edit was seconds ago</u>

k	~ ~ 👨	子 10	0% 🔻	\$	%	.0 _← .00 <u></u> 12:	3 ▼	Arial		▼ 1	0 •	В.	I ÷	Α	\.	B	₹ +	\equiv	→ <u>↓</u>	▼ 1 1	· P/ -	G	±	7
Y93 • <i>fX</i>																								
	A	В	С	D	Е	F	G	Н	1	J	K	L	М	N	0	Р	Q	R	S	Т	U	V	W	Х
1	Date	Herring	Temp	DO%	DO	Sp. Cond.	рΗ	DOC	TDN	NO3	NH4	PO4	Si	DON	TDP	ALK	TSS	POC	PON	A254	A375	A412	A420	A440
77	04-04-2018	Few	46.2	87	10.3	132	6.2	1.65	0.33	0.1984	0.0311	3.4	0.32	0.10			2.0			0.039	0.008	0.005	0.004	0.003
78	04-11-2018	No	45.8	90	10.7	132	6.3	1.45	0.30	0.2063	0.0500	3.3	0.45	0.05			2.4			0.032	0.007	0.004	0.004	0.003
79	04-18-2018	No	46.3	88	10.4	120	6.1	1.62	0.36	0.1967	0.0358	5.8	0.51	0.13			3.0			0.043	0.009	0.006	0.005	0.004
80	04-26-2018	No	50.3	88	9.9	127	6.1	2.49	0.32	0.1765	0.0332	5.0	0.12	0.12		7.2	3.3			0.096	0.023	0.014	0.012	0.010
81	05-02-2018	No	54.8	90	9.5	133	6.3	2.09	0.35	0.1818	0.0292	5.2	0.53	0.14		8.4	3.0			0.050	0.012	0.007	0.007	0.005
82	05-09-2018	No	57.0	89	9.2	133	6.2	2.14	0.33	0.2066	0.0318	2.8	0.80	0.09		7.9	2.3			0.053	0.012	0.007	0.007	0.005
83	05-16-2018	No	60.0	90	8.9	121	6.2	2.13	0.36	0.2288	0.0184	3.6	0.89	0.11			1.8			0.055	0.012	0.008	0.007	0.005
84	05-23-2018	No	58.7	87	8.8	135	5.9	1.99	0.37	0.2427	0.0214	3.2	0.72	0.10		8.3	1.6			0.052	0.010	0.007	0.006	0.004
85	05-30-2018	No	61.0	86	8.4	132	6.0	1.95	0.34	0.2318	0.0305	2.9	0.40	0.08		8.5	2.3			0.048	0.009	0.006	0.005	0.003
86	06-06-2018	No	59.4	85	8.5	134	6.0	1.84	0.37	0.2156	0.0642	10.0	1.75	0.09		8.3	1.8			0.055	0.011	0.007	0.006	0.005
87	06-13-2018	No	61.3	80	7.9	123	6.5	1.66	0.37	0.2501	0.0650	9.8	1.58	0.06			1.9			0.036	0.006	0.003	0.003	0.002
88	06-20-2018	No	65.5	86	8.0	127	6.6	1.65	0.36	0.2571	0.0488	14.1	2.25	0.06			2.7			0.040	0.008	0.004	0.004	0.003
89	06-27-2018	No	64.7	86	8.1	129	6.5	1.45	0.36	0.2622	0.0452	9.2	0.44	0.05			0.9			0.034	0.007	0.004	0.004	0.003
90	07-03-2018	No	69.2	84	7.5	109	6.8	2.45	0.40	0.2483	0.0481	11.1	1.44	0.11			14.9			0.047	0.011	0.007	0.006	0.005
91	07-11-2018	No	66.7	83	7.6	134	6.5	2.51	0.43	0.2726	0.0222	4.3	3.34	0.14			2.7			0.032	0.005	0.003	0.002	0.001
92	07-18-2018	No	66.6	84	7.8	130	6.3	2.29	0.39	0.2780	0.0122	3.8	3.71	0.10			3.2			0.032	0.005	0.003	0.003	0.002
93	07-25-2018	No	67.0	86	7.9	128	6.2	2.46	0.42	0.3144	0.0127	5.8	4.00	0.10			3.1			0.031	0.005	0.003	0.002	0.001

Water Temperature (°F)

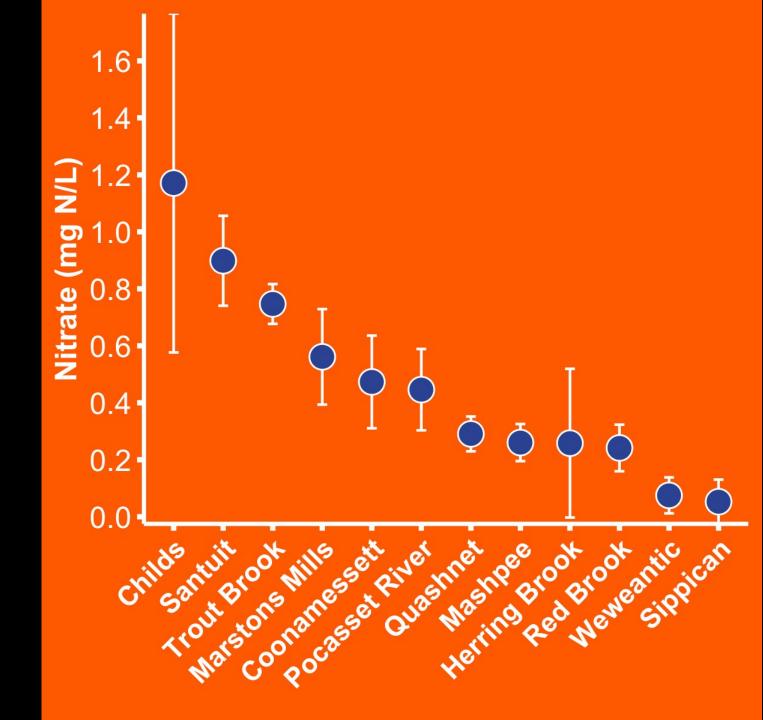


Nitrate (mg N/L) ● Santuit1 ● Sanuit2 ● Marston Mills ● Mashpee2 ● Quashnet ● Coonamessett2 ● Herring Brook ● Pocasset ● Red Brook ● Weweantic

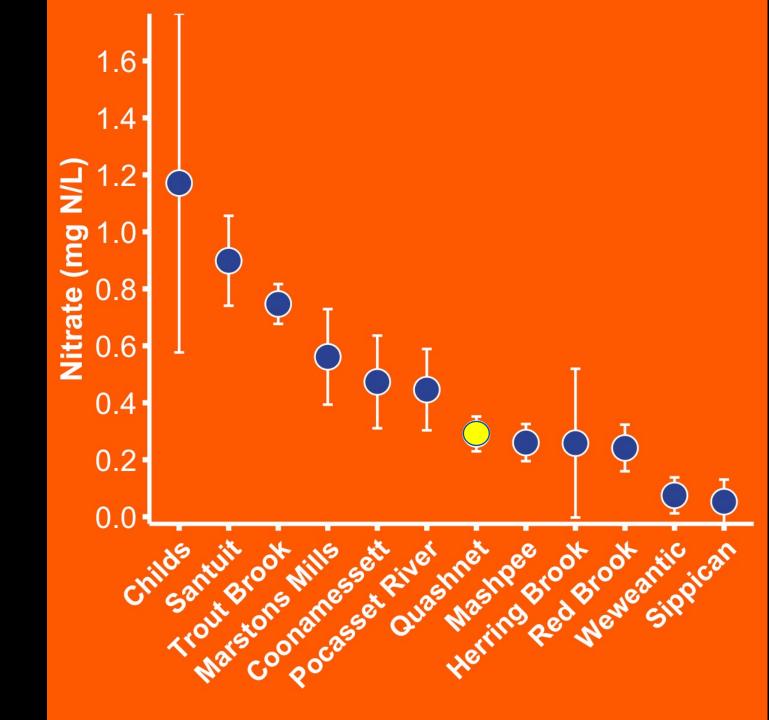
Average Nitrate Concentration

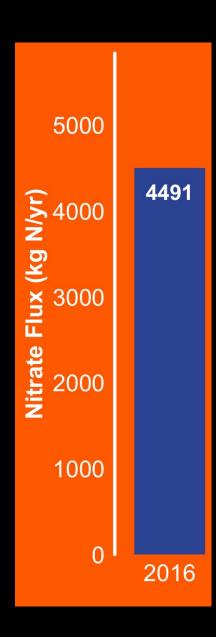
Over recent years, nitrogen inputs from rivers to estuaries on Cape Cod have:

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

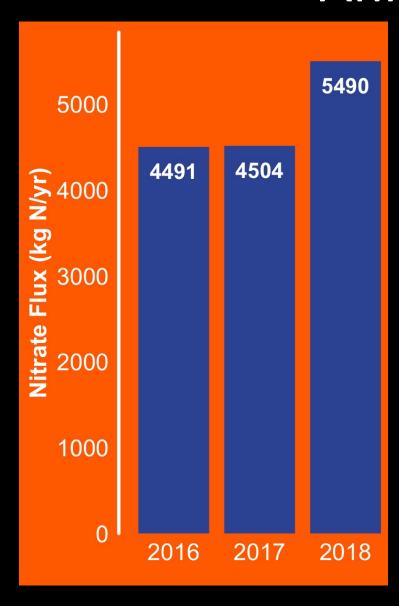


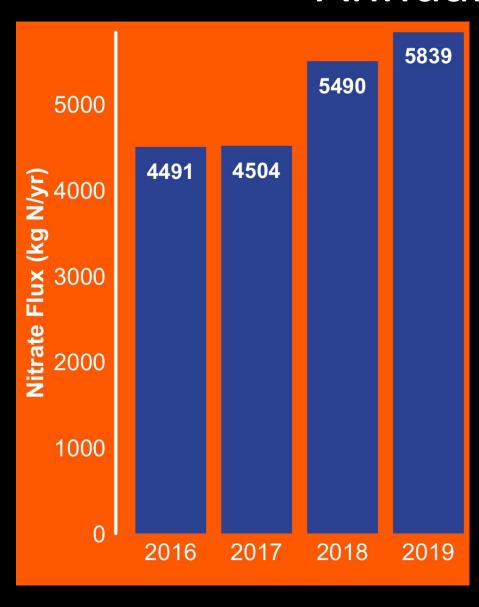
Quashnet

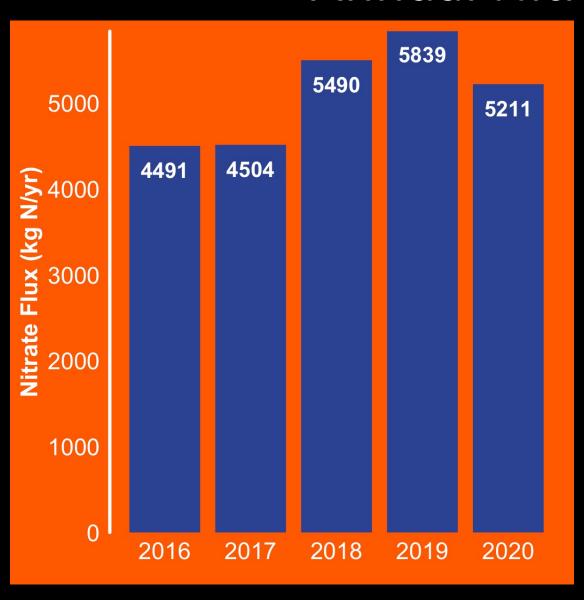






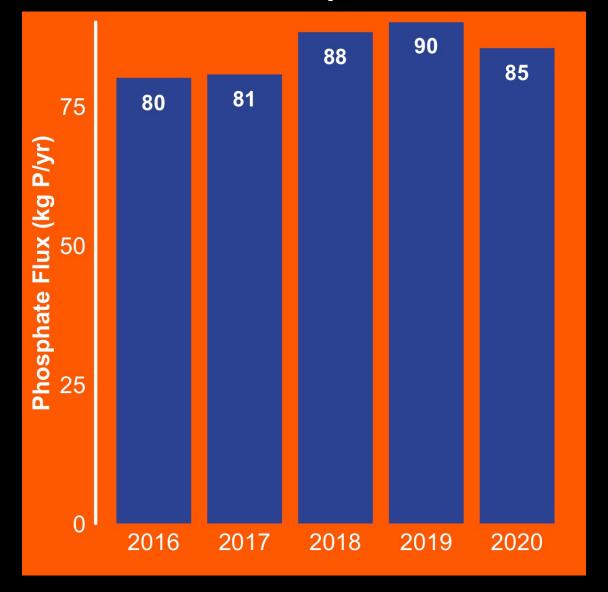






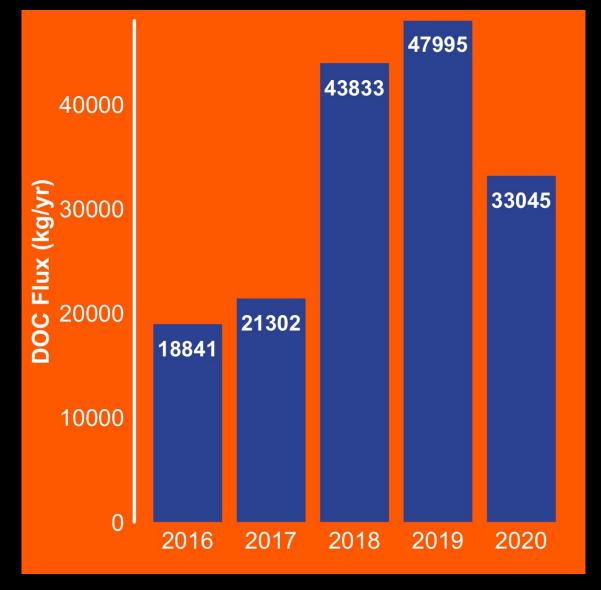
Nitrate Flux (kg N/yr) 0000 0000

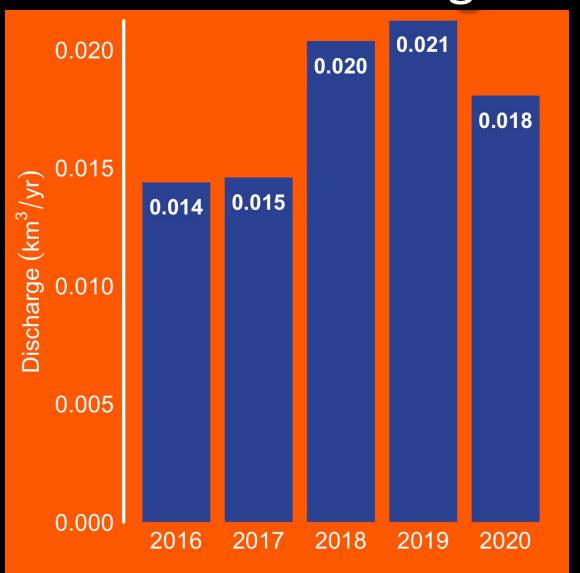
Annual Phosphate Flux



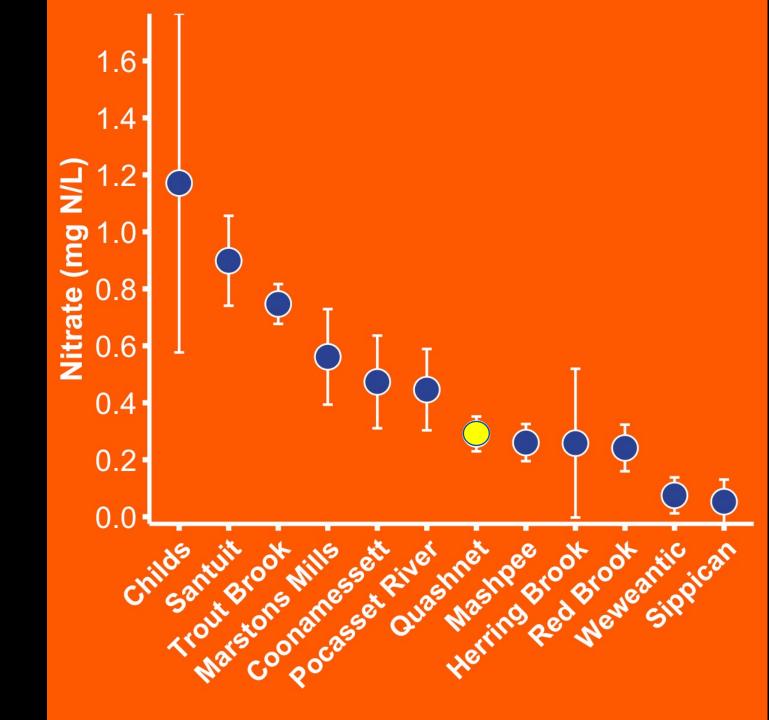
Annual DOC Flux

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

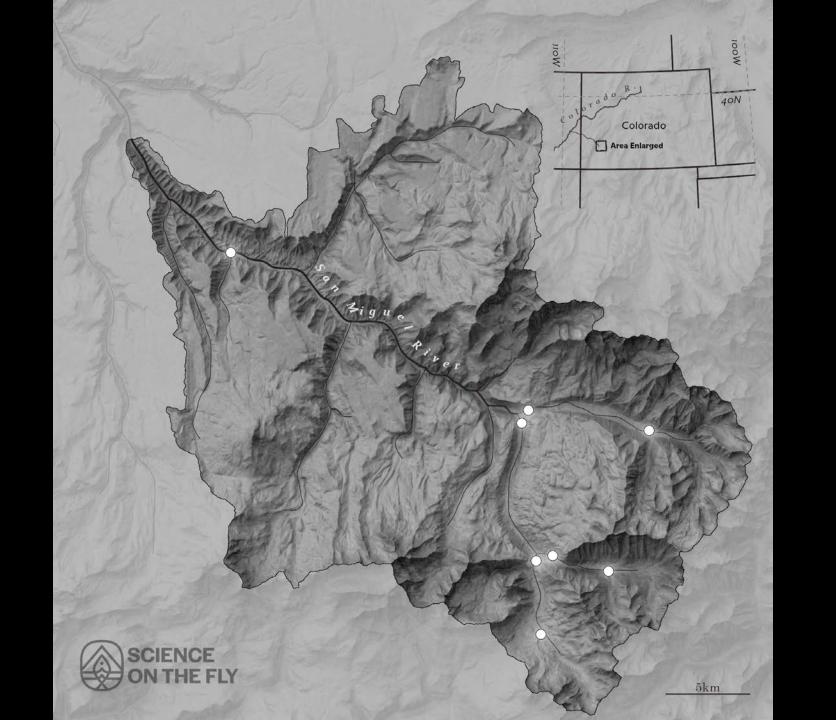


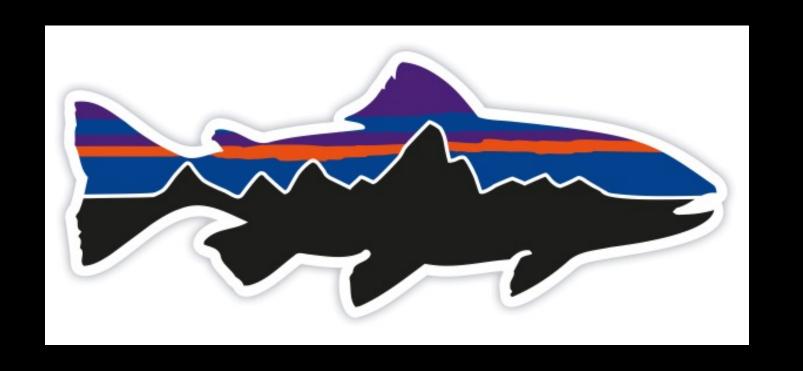


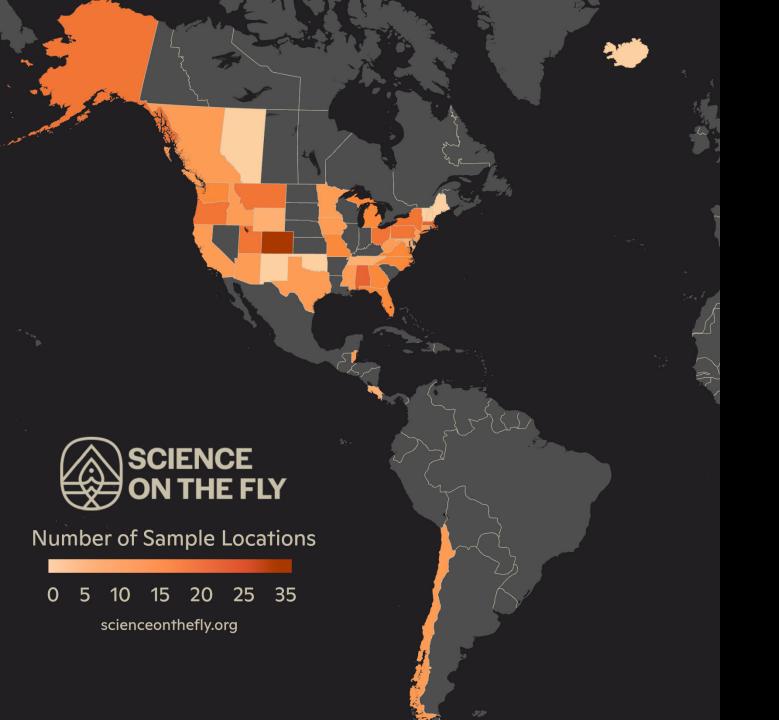














scienceonthefly.org

Every river tells a story.

