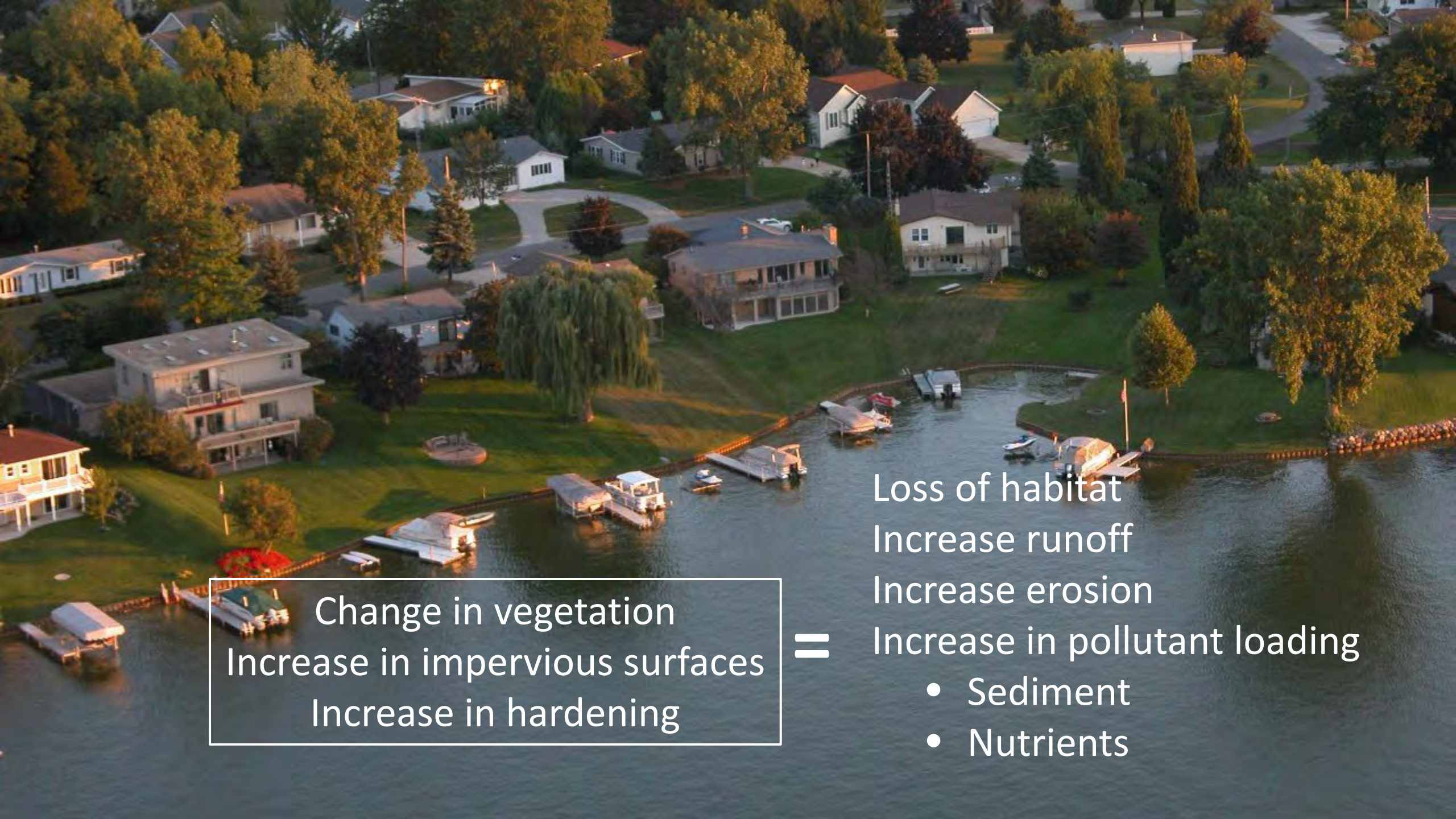




How to Tell Stories with Data

Erick Elgin
Jo Latimore



Change in vegetation
Increase in impervious surfaces
Increase in hardening

=

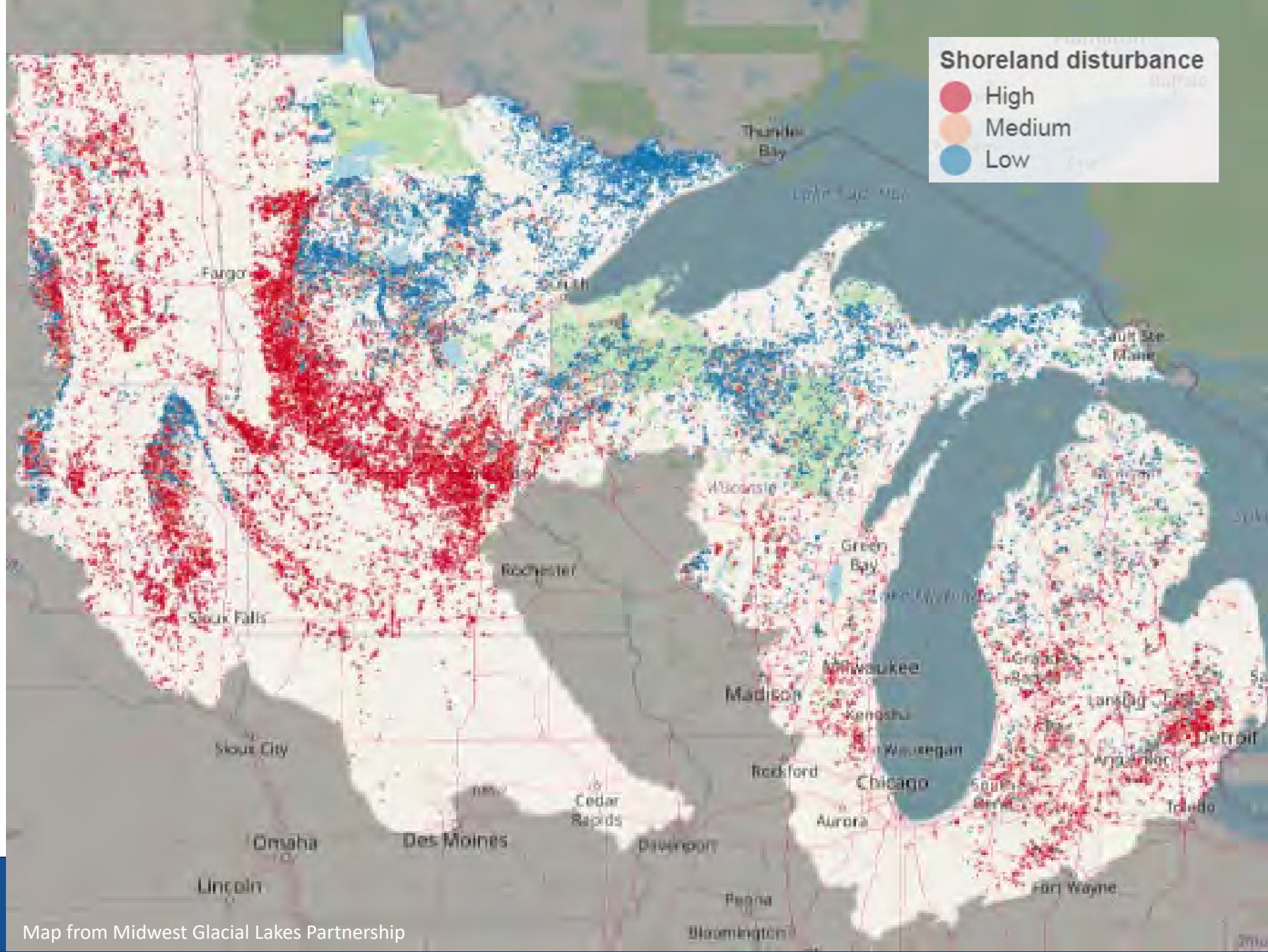
Loss of habitat
Increase runoff
Increase erosion
Increase in pollutant loading

- Sediment
- Nutrients

Loss of shoreline habitat is a regional issue

~70% of lakes in southern MI are intensely developed

- Wehrly et al. 2012



Map from Midwest Glacial Lakes Partnership



NATURAL SHORELINE (1938)

TO

DEVELOPED SHORELINE (2014)



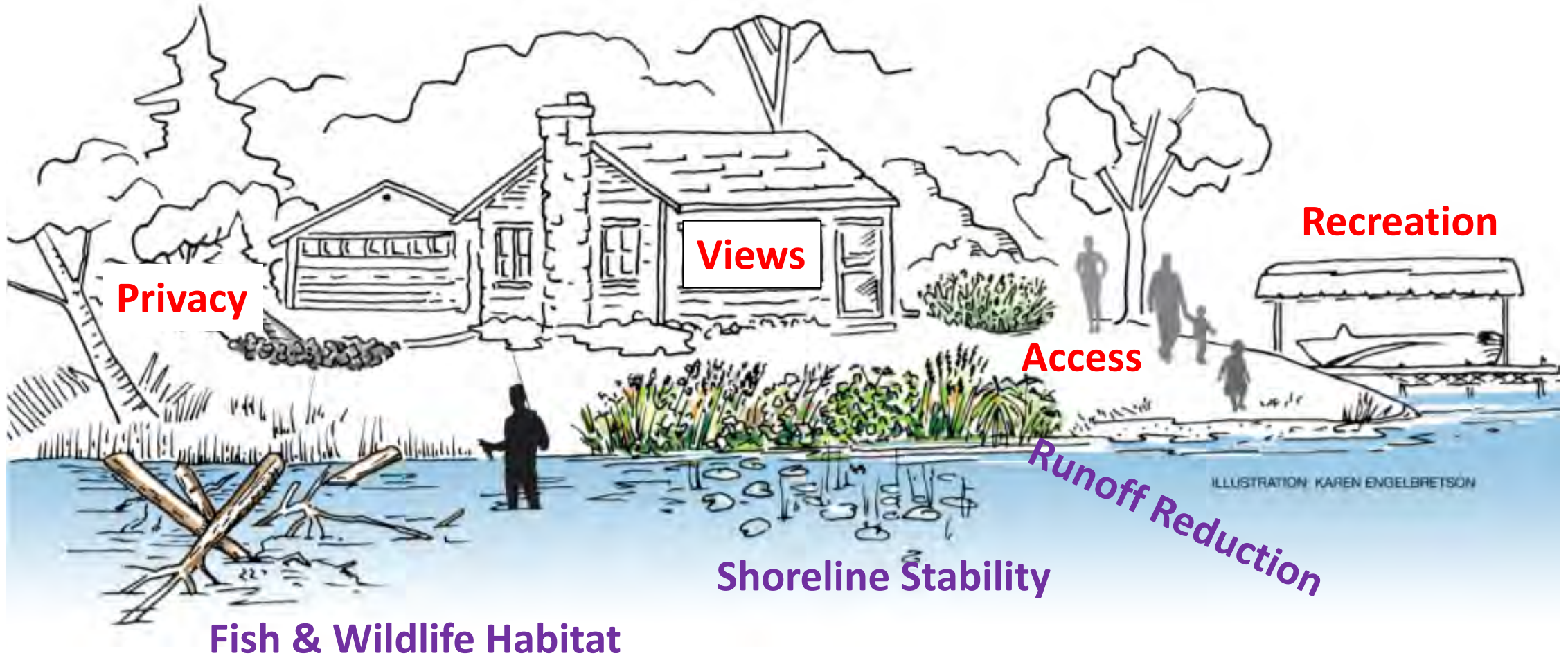
Unimpacted



Highly impacted

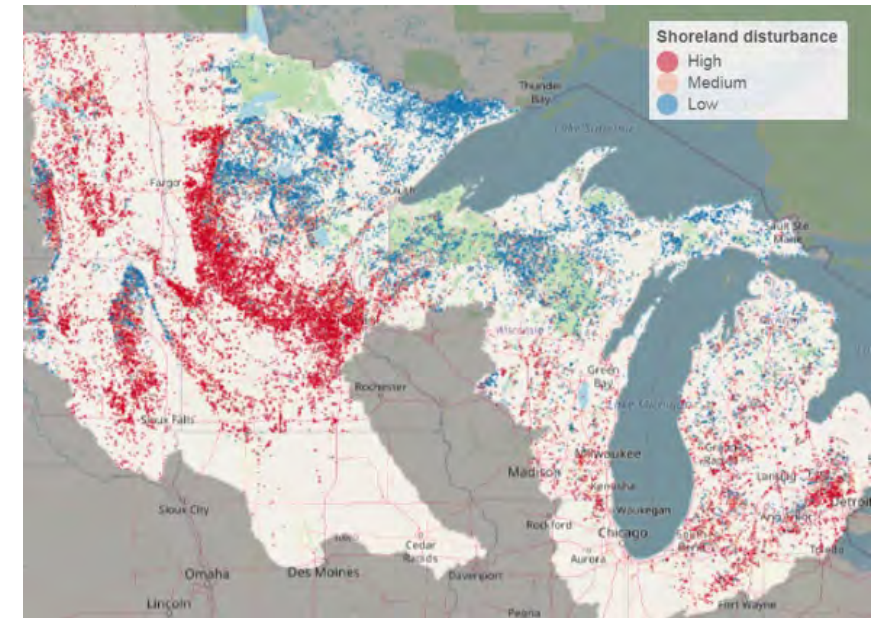


Balance our needs with the protection of the waterbody



Modified from Wisconsin Healthy Lakes

Data driven story



Goal: increase awareness and motivate change

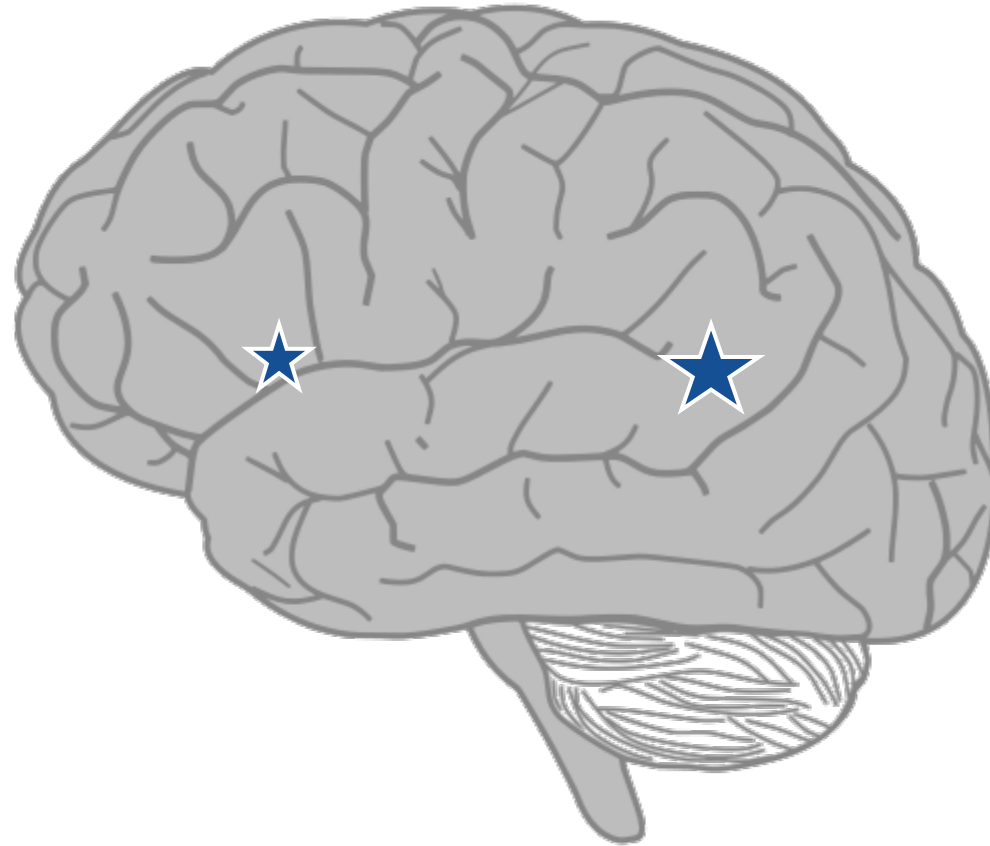
Audience: Lakefront owners

How do you want them to use the data: Want them to see the seriousness of the problem and act on their property

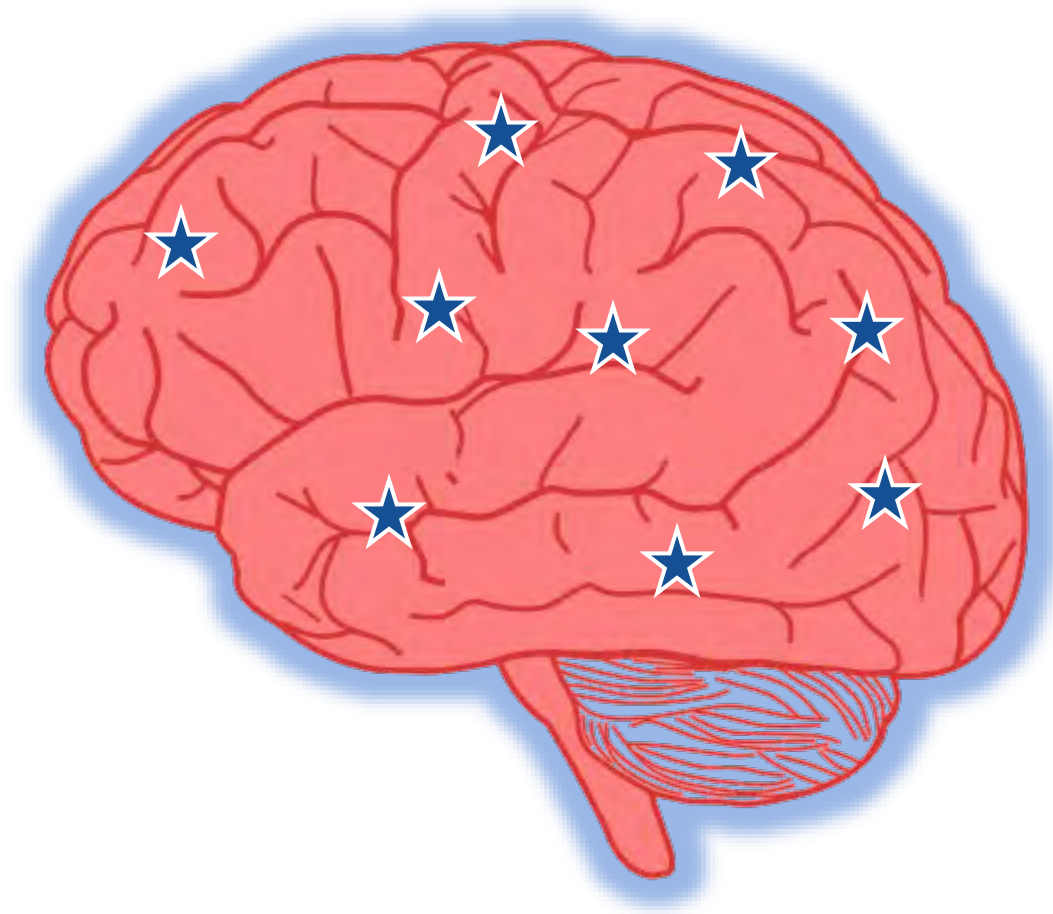


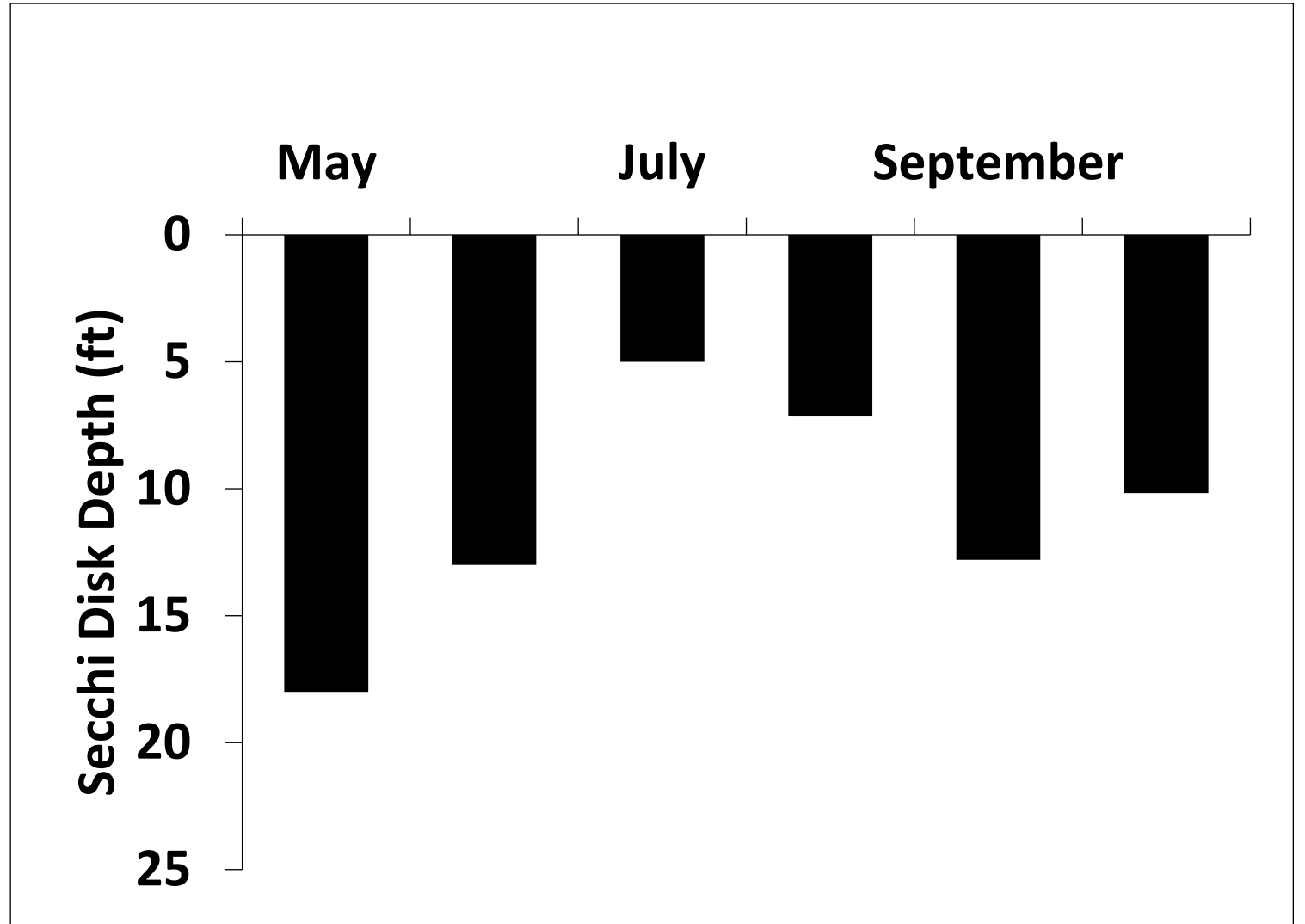
**Communication is critical to
inspiring action.**

This is your brain on bullet points



This is your brain on stories

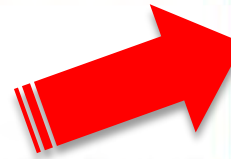






Search...

MiCorps Data Exchange Network



- Data Exchange
- Resources
- View Data
- Enter Data

The MiCorps web-based data exchange platform provides online access to volunteer monitoring data through a searchable database. Choose which water bodies you would like to search through and narrow down your search by county, hydrologic unit code (HUC) and/or water body name.

Search by Streams or Lakes

- Streams
- Lakes

Narrow Your Search

- County
- HUC
- Name
- All

Date Range

From to

Sampling Parameters

Communicating data requires more than just handing over data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Lake Name	County	Township	STORETID	Latitude	Longitude	Date Sampled	Time Sampled	Secchi Depth	Weather Conditions	Unusual Conditions	Comments	Bottom Measurement	
2	1000 Island	Gogebic	Watersmeet	270046	45.225281	-89.39917	2022-09-13	14:00:00	13	Sunny			N	
3	1000 Island	Gogebic	Watersmeet	270046	45.225281	-89.39917	2022-09-10	12:00:00	13	Cloudy			N	
4	1000 Island	Gogebic	Watersmeet	270046	45.225281	-89.39917	2022-09-01	15:00:00	14	Partly Cloudy			N	
5	1000 Isl							30:00	13	Partly Cloudy			N	
6	1000 Isl							30:00	12	Sunny			N	
7	1000 Isl							30:00	11	Partly Cloudy			N	
8	1000 Isl							00:00	11	Partly Cloudy			N	
9	1000 Isl							30:00	10	Windy			N	
10	1000 Isl							00:00	11	Cloudy			N	
11	1000 Isl							00:00	11	Cloudy			N	
12	1000 Isl							00:00	11	Windy			N	
13	1000 Isl							00:00	11	Cloudy			N	
14	1000 Isl							00:00	11	Sunny			N	
15	1000 Isl							30:00	10	Partly Cloudy			N	
16	1000 Isl							23:00	14	Partly Cloudy, Windy			N	
17	1000 Isl							58:00	12	Partly Cloudy			N	
18	1000 Isl							20:00	11	Sunny			N	
19	1000 Isl							30:00	12	Cloudy	SMOKE		N	
20	1000 Island	Gogebic	Watersmeet	270046	45.225281	-89.39917	2021-08-17	10:15:00	13	Sunny, Windy			N	
21	1000 Island	Gogebic	Watersmeet	270046	45.225281	-89.39917	2021-08-14	13:22:00	13	Sunny			N	
22	1000 Island	Gogebic	Watersmeet	270046	45.225281	-89.39917	2021-08-06	13:32:00	13	Cloudy			N	
23	1000 Island	Gogebic	Watersmeet	270046	45.225281	-89.39917	2021-07-23	13:10:00	12	Sunny, Windy	Choppy Water		N	
24	1000 Island	Gogebic	Watersmeet	270046	45.225281	-89.39917	2021-07-17	11:15:00	13	Sunny			N	
25	1000 Island	Gogebic	Watersmeet	270046	45.225281	-89.39917	2021-07-08	14:17:00	13	Cloudy			N	

The data needs:

- Context that connects to the audience's values
- To be memorable and relatable (that's why stories help)
- Help to make it understandable

What is your goal?

Who is your target audience?

How do you want them to use your data?

Best delivery method to get the desired action

Another story with data

- Goal: Recruit volunteers
- Audience: Civically active community members with little aquatic science knowledge
- Want them to use our data to: Understand that some local streams are impaired and be motivated to volunteer



Lake Dragons






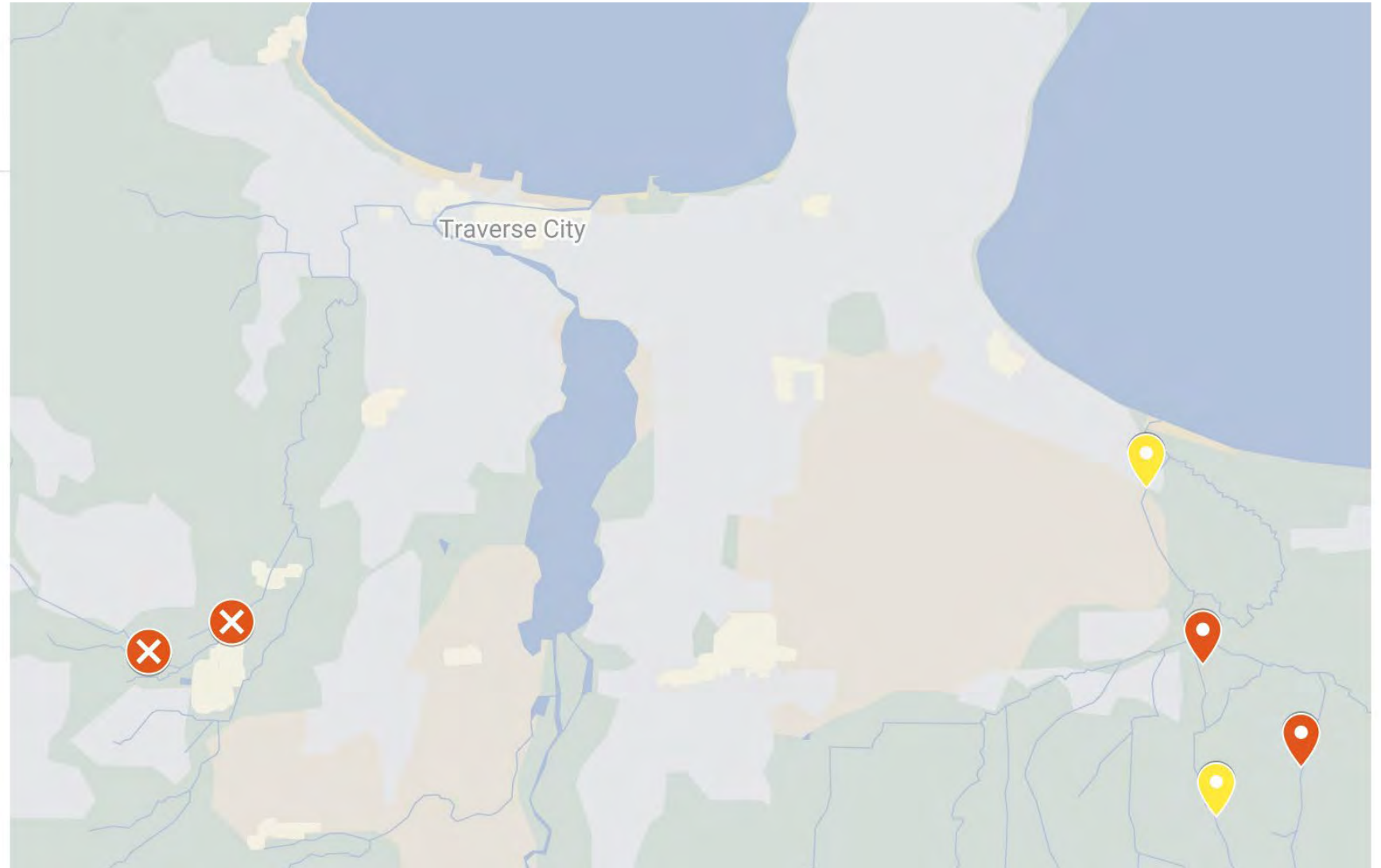






Status of our dragonflies, 2021-2022 – Grand Traverse Bay Watershed

-  present
-  disappeared
-  absent



Data Source: MiCorps Volunteer Stream Monitoring Program



Join us to
protect our
streams

Another story with data

- Goal: Recruit volunteers
- Audience: Civically active community members with little aquatic science knowledge
- Want them to use our data to: Understand that some local streams are impaired and be motivated to volunteer
- Best delivery method:
 - Provides necessary background
 - Appeals to their values
 - Incorporates a memorable story
 - Avoids unnecessary detail

What is your goal?

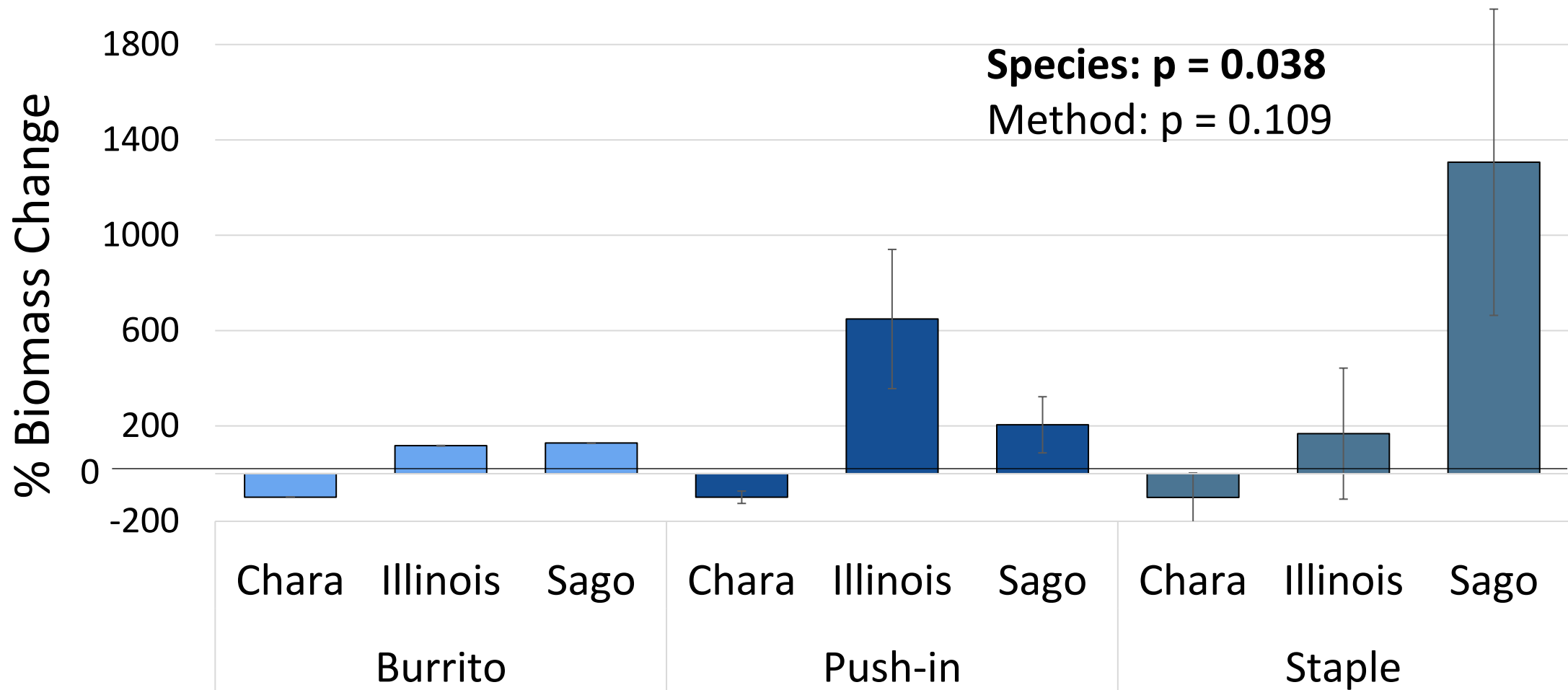


Know your Audience

- Who are they?
- What prior experience do they have?
- Why should they care?
- How can you “hook” them?
- What do they want to know?
- How much time do they have?



Results: The pondweeds increased by more than 100% for each method

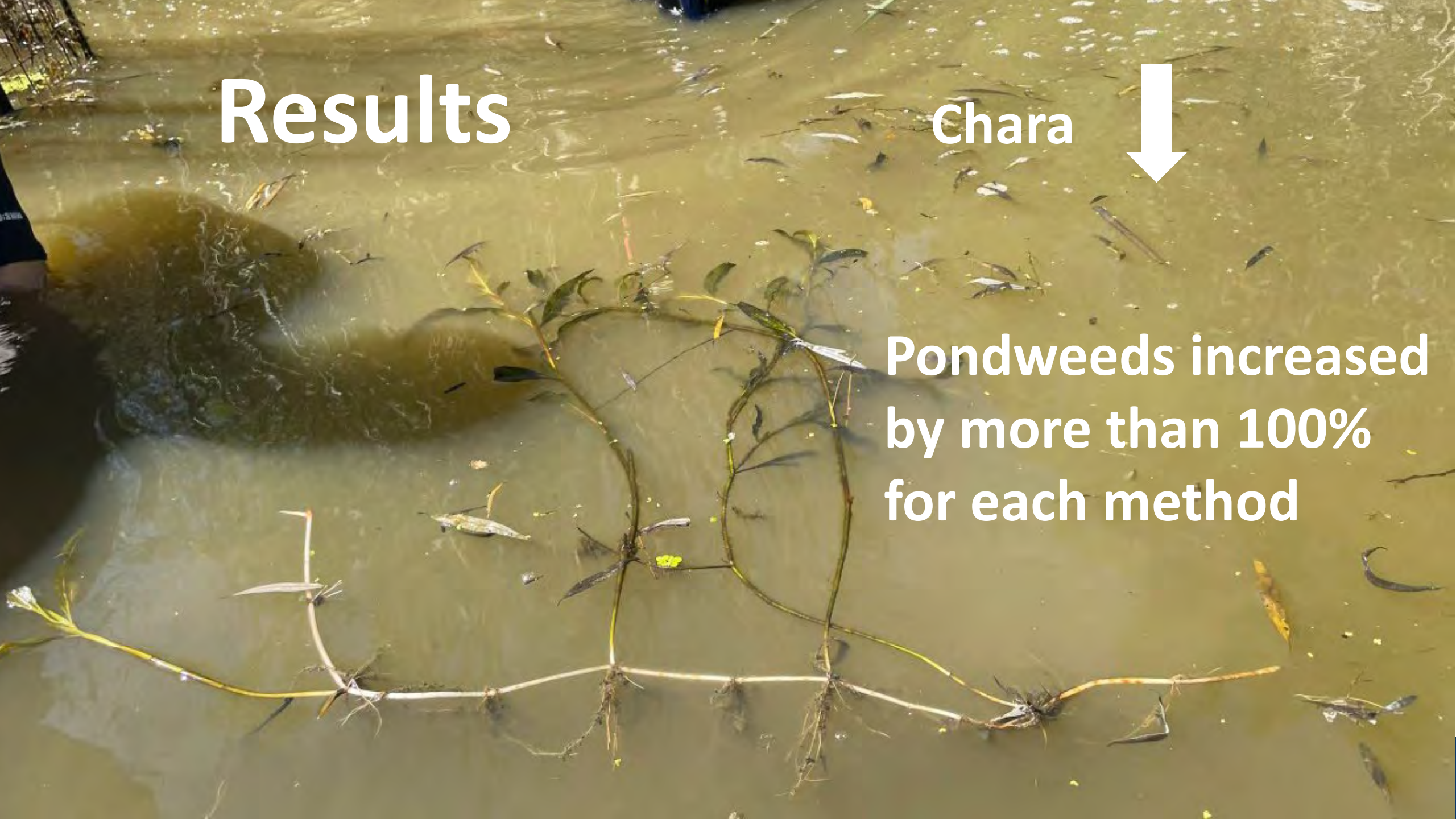


Results

Chara

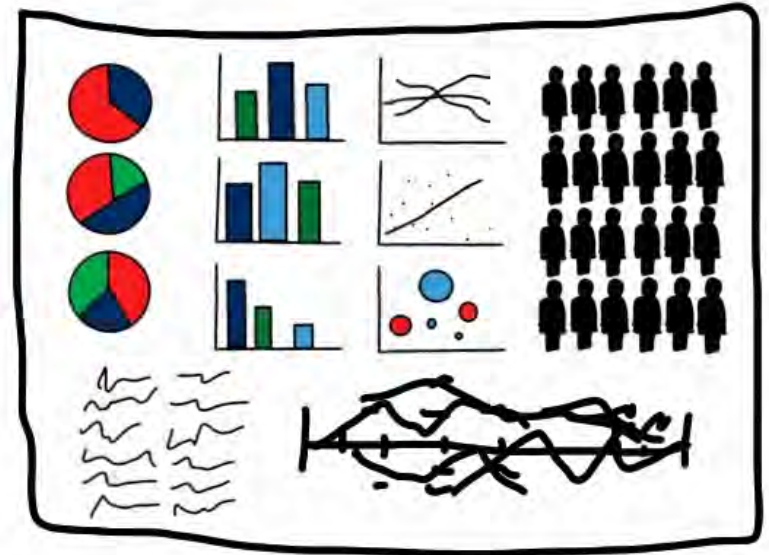


Pondweeds increased
by more than 100%
for each method



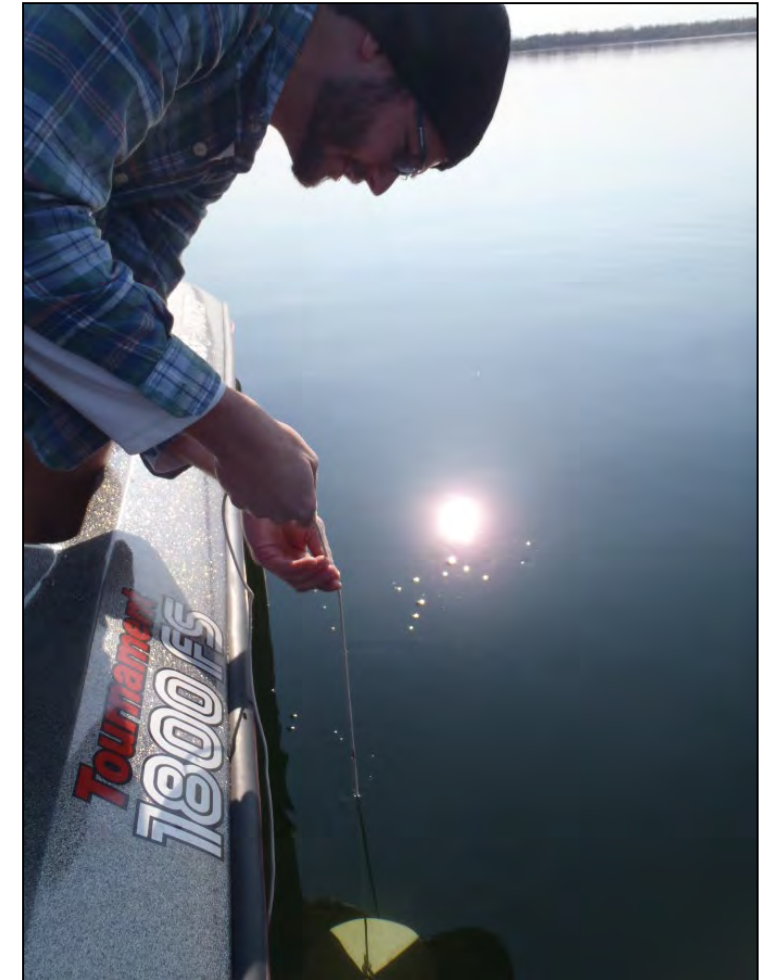
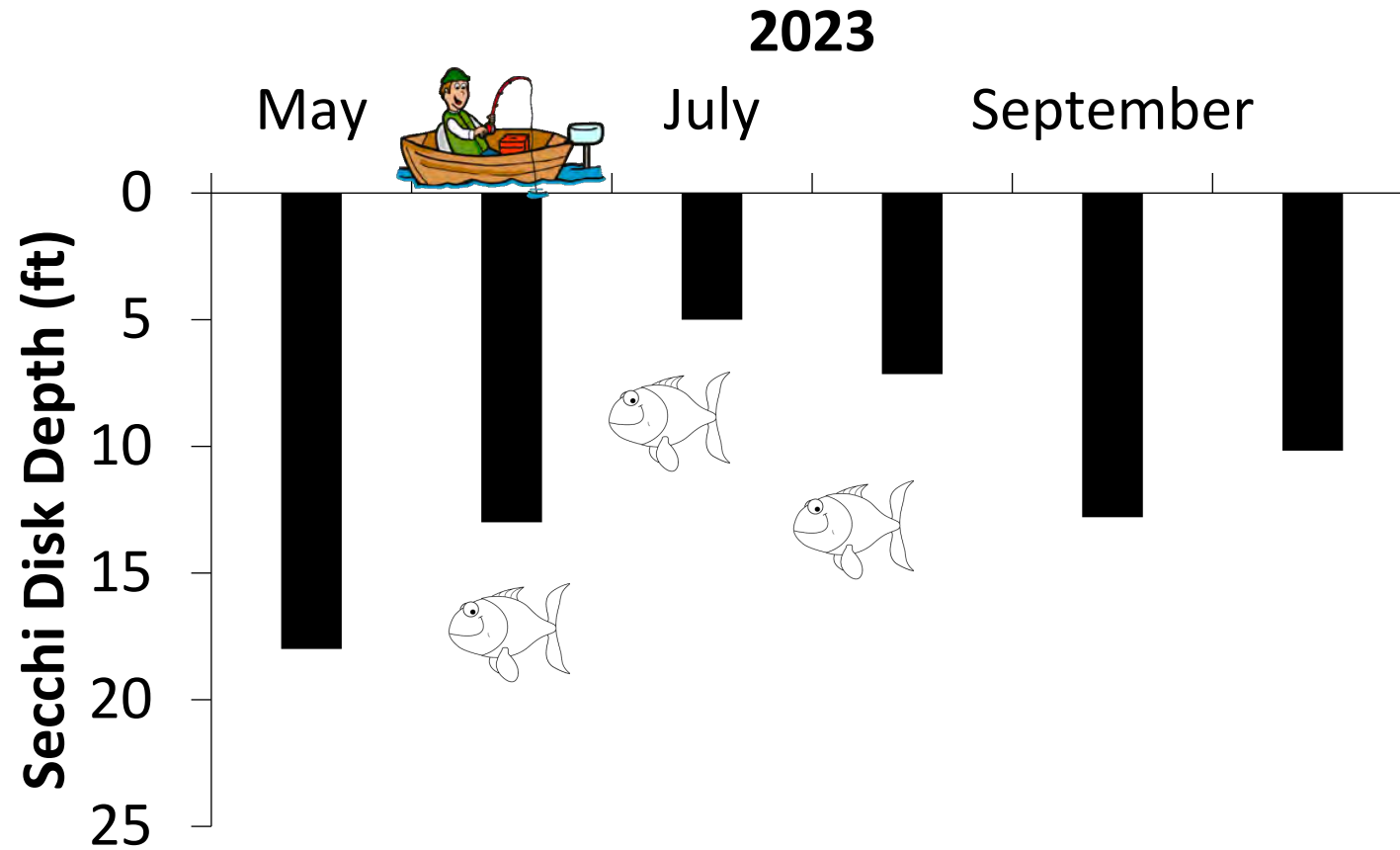
Presenting your data

Can we move on now?
We've spent 20 minutes on
this slide and I still have
15 more infographics to
cover.



freshspectrum.com

Walk through your graph and data



Slow reveal: Complex ideas or graph - Temperature and Oxygen Profiles

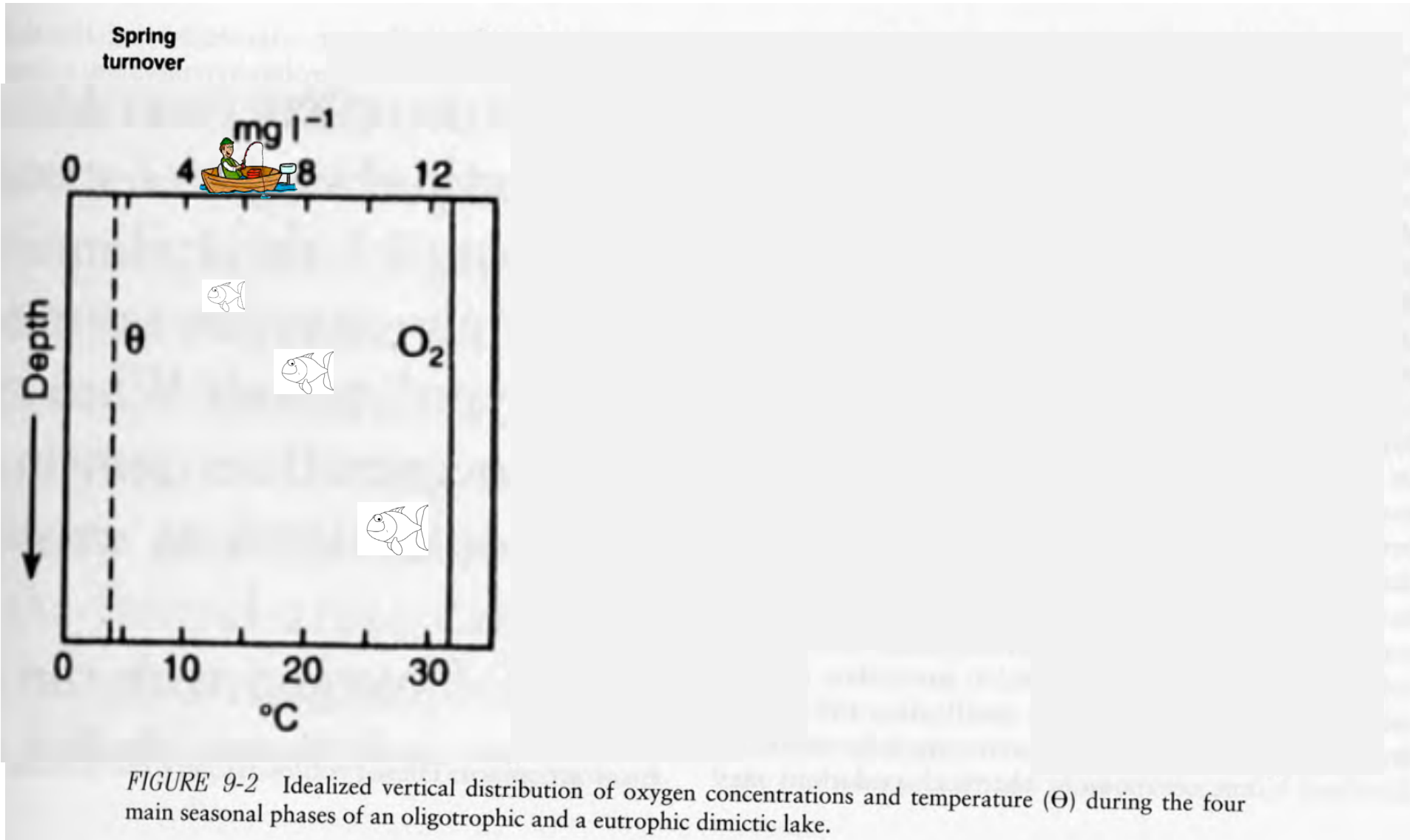
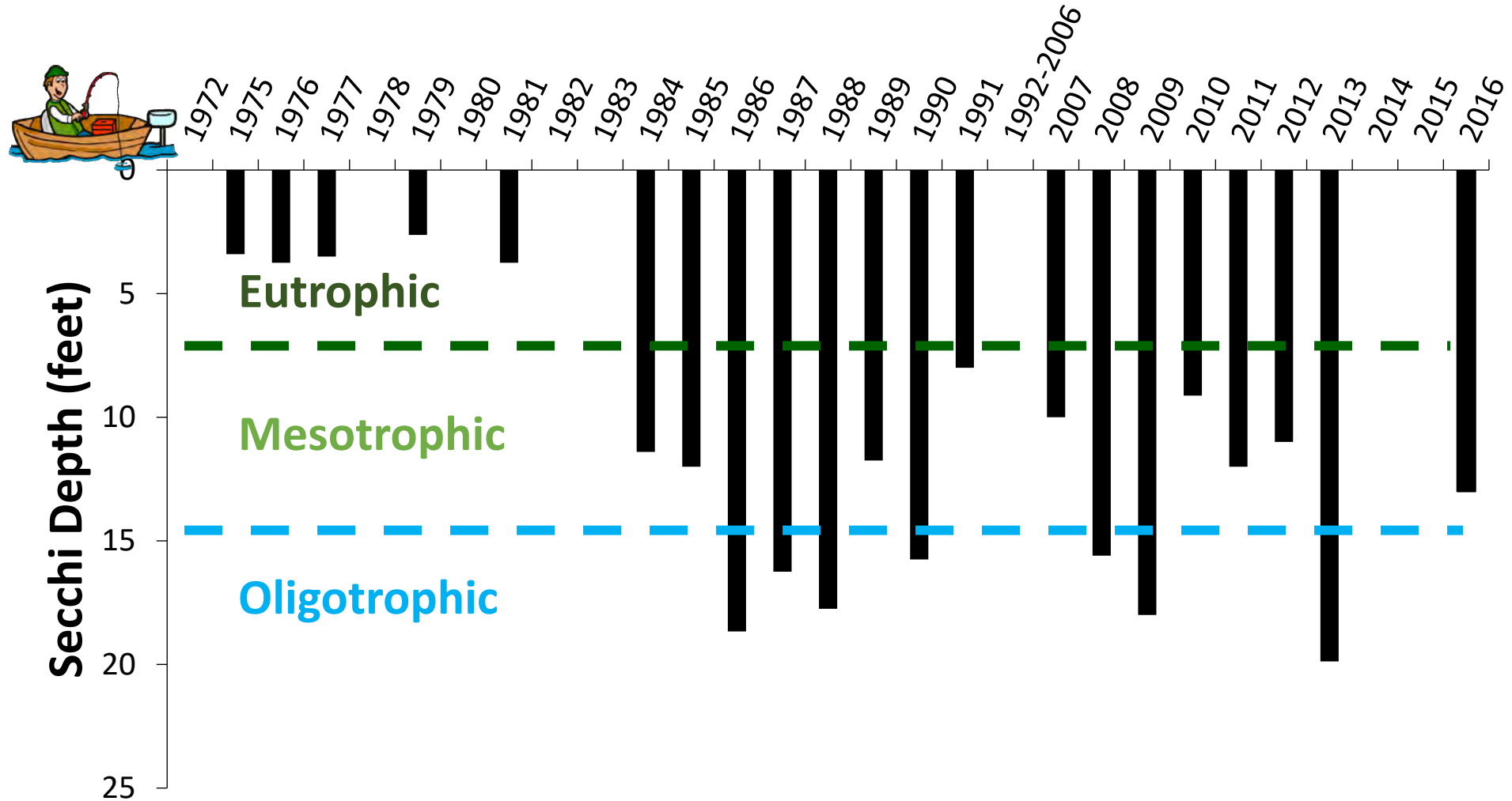


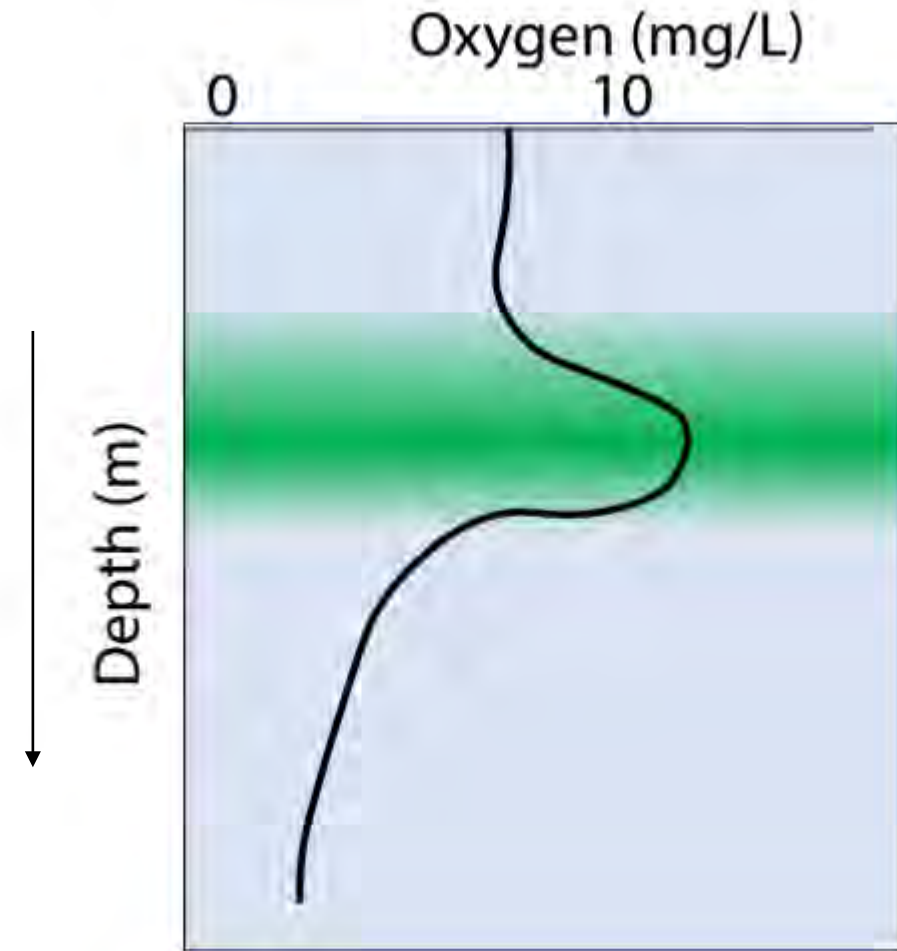
FIGURE 9-2 Idealized vertical distribution of oxygen concentrations and temperature (Θ) during the four main seasonal phases of an oligotrophic and a eutrophic dimictic lake.

Adding explanation to the data



The power of photosynthesis

Using visual cues

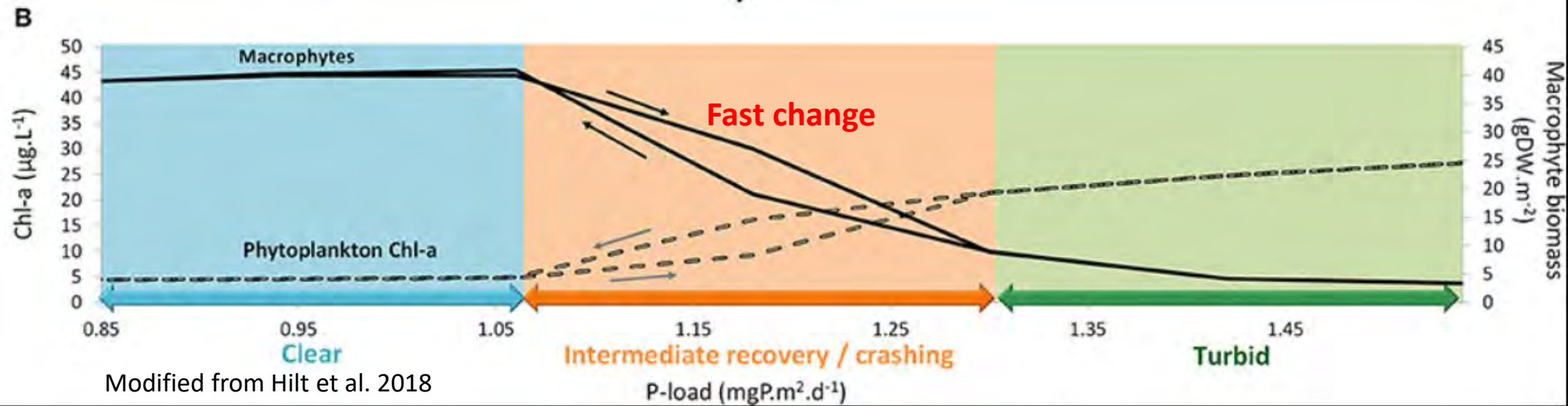
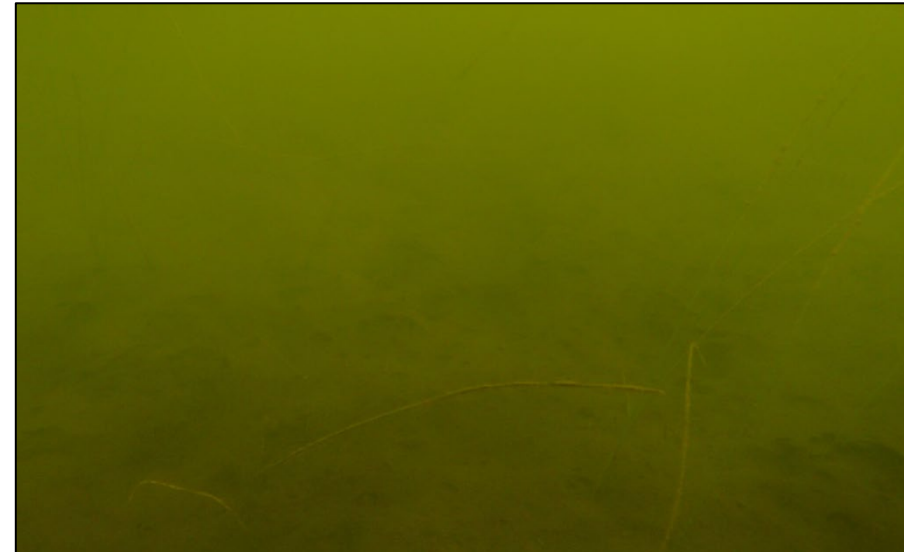


Make results real with “image assist”

Clear Water State



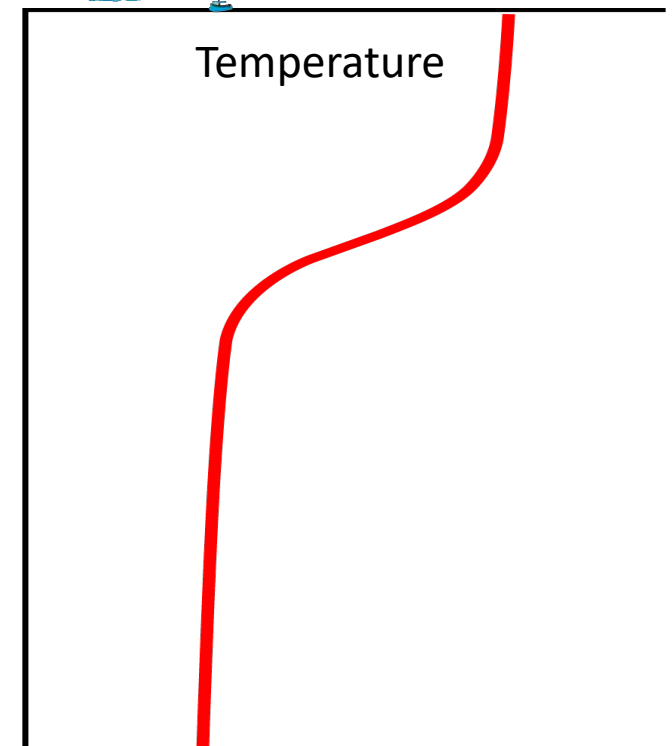
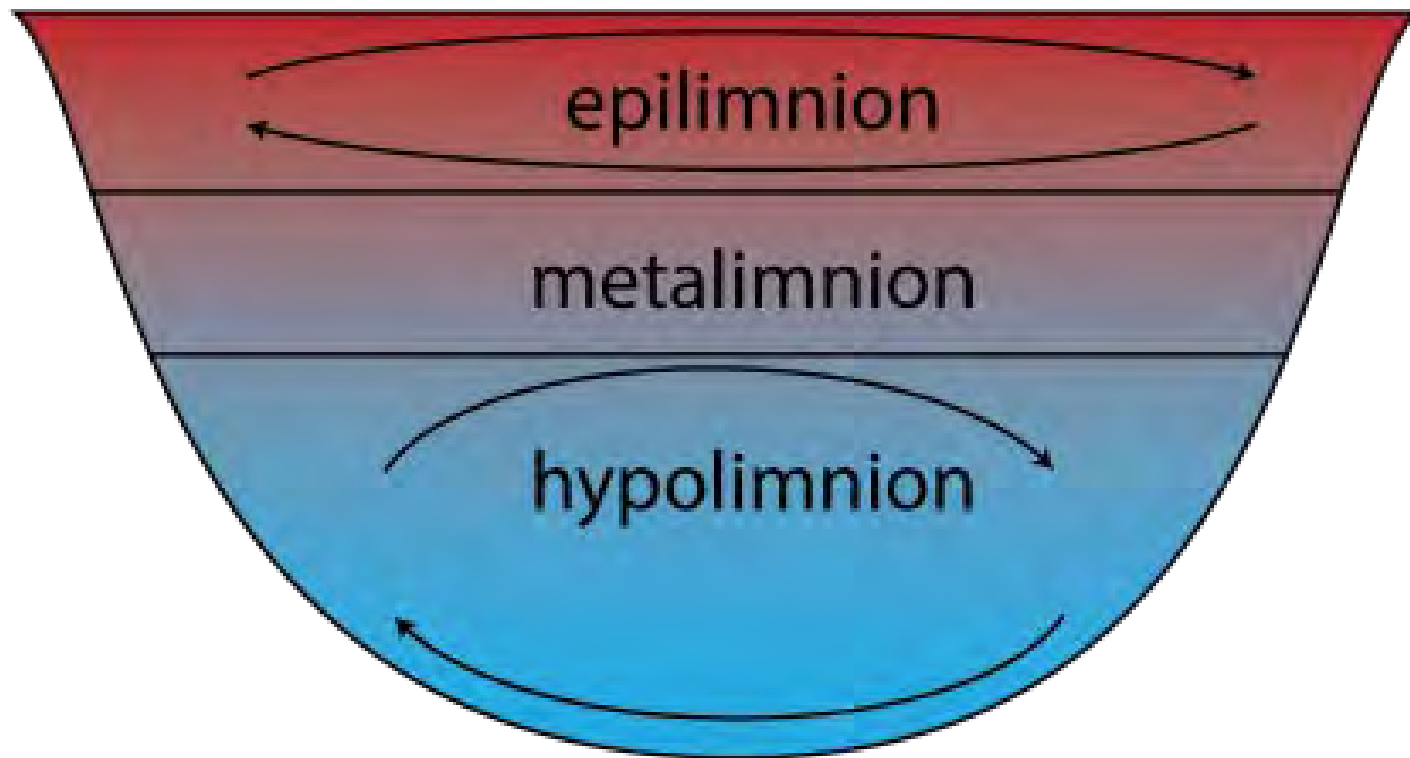
Turbid Water State



Set a scene that is relatable.
It will help folks remember.

SUMMER

Consider using diagrams as well

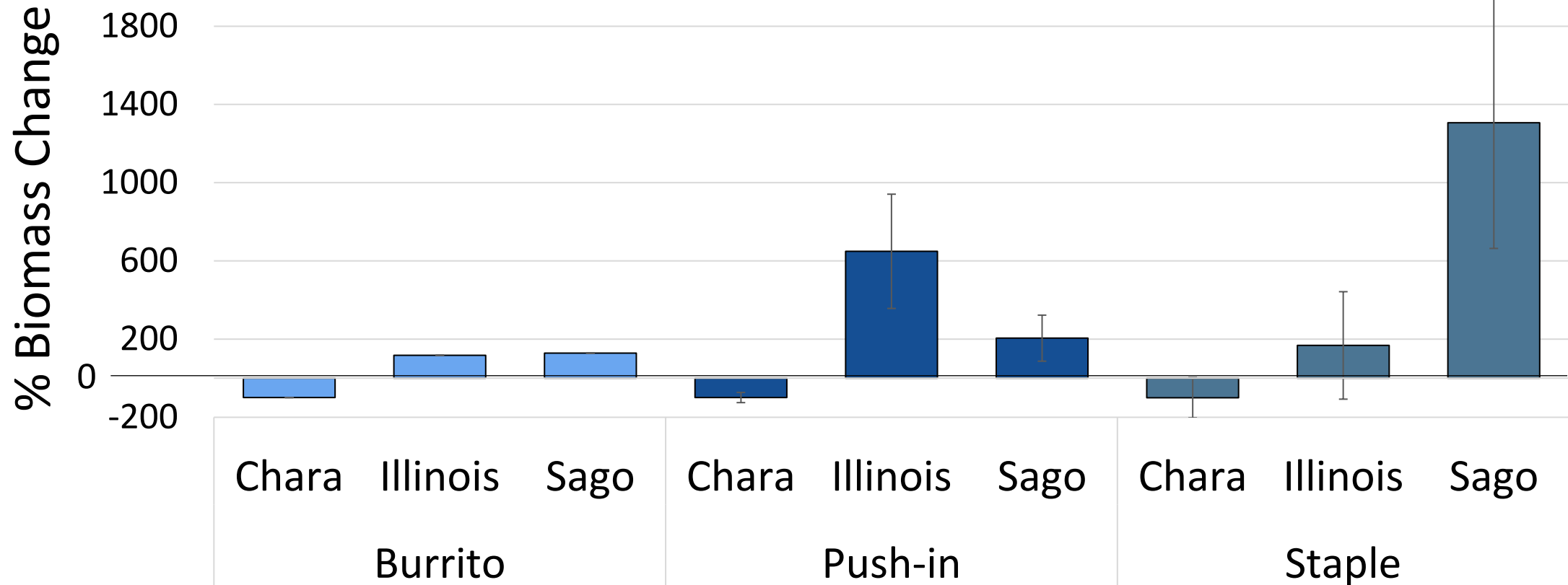


Big reveal at end or punchline first then describe?

Pondweed growth

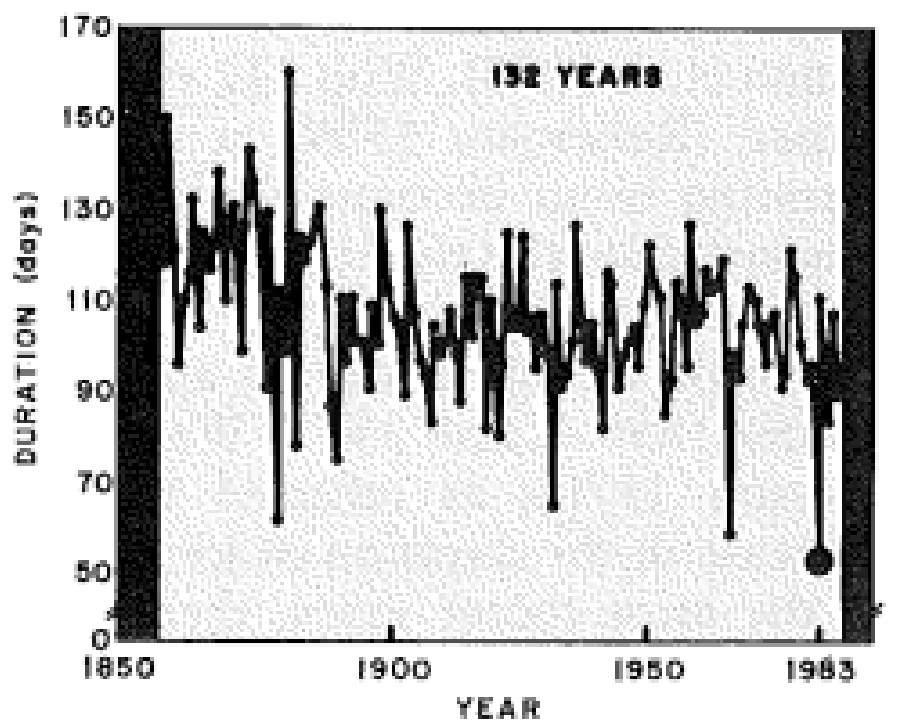
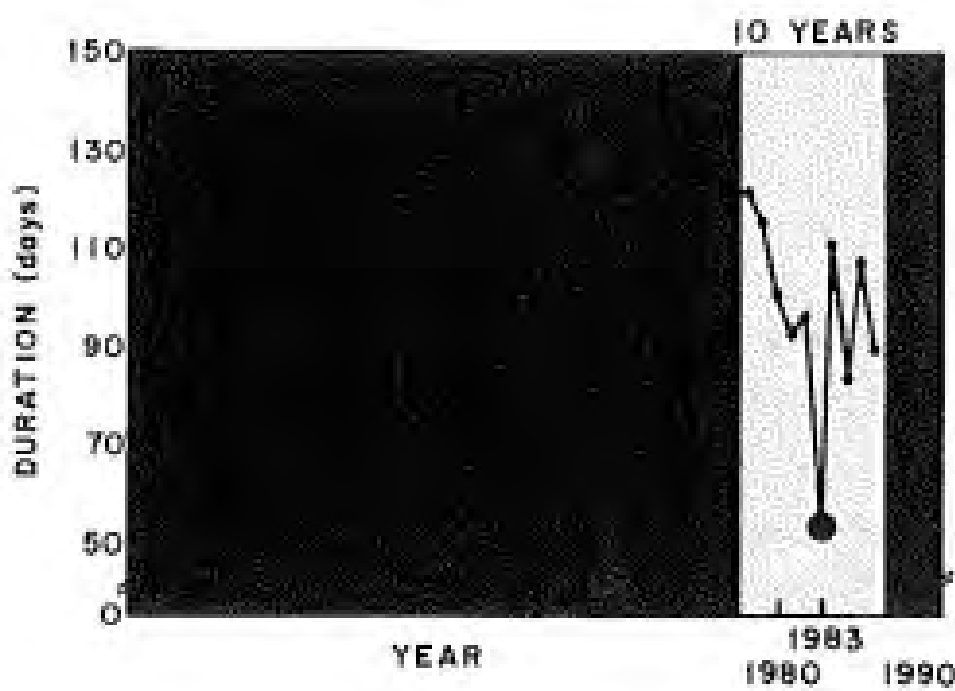
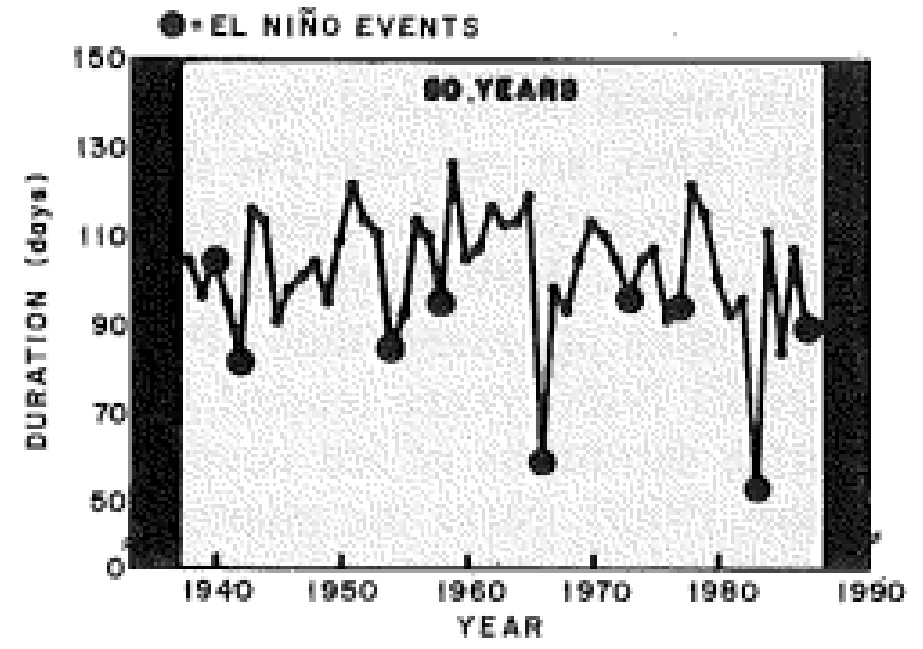
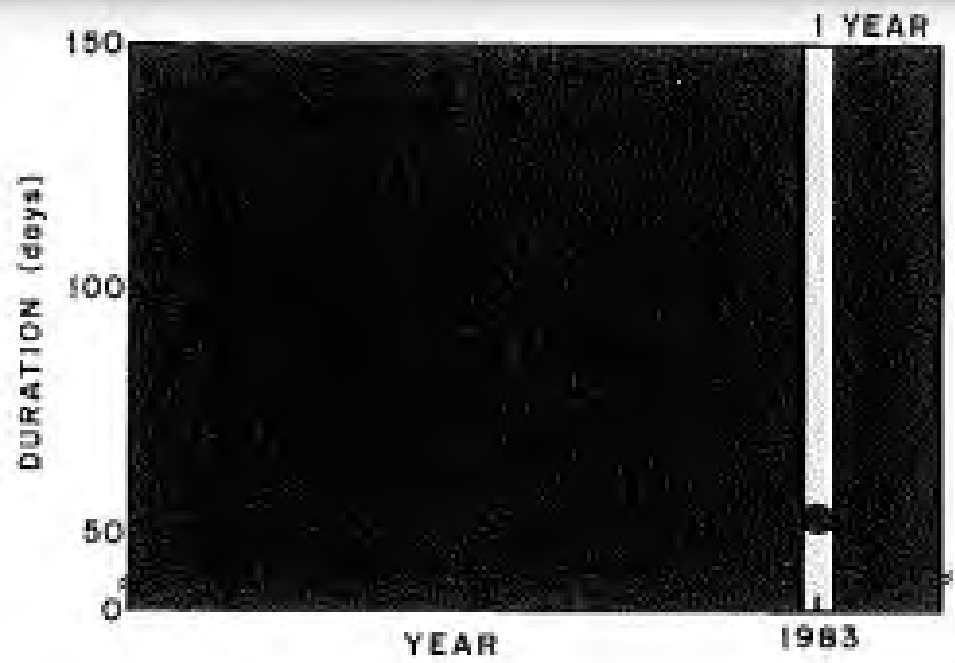
OR

Pondweed grew
by at least 100%

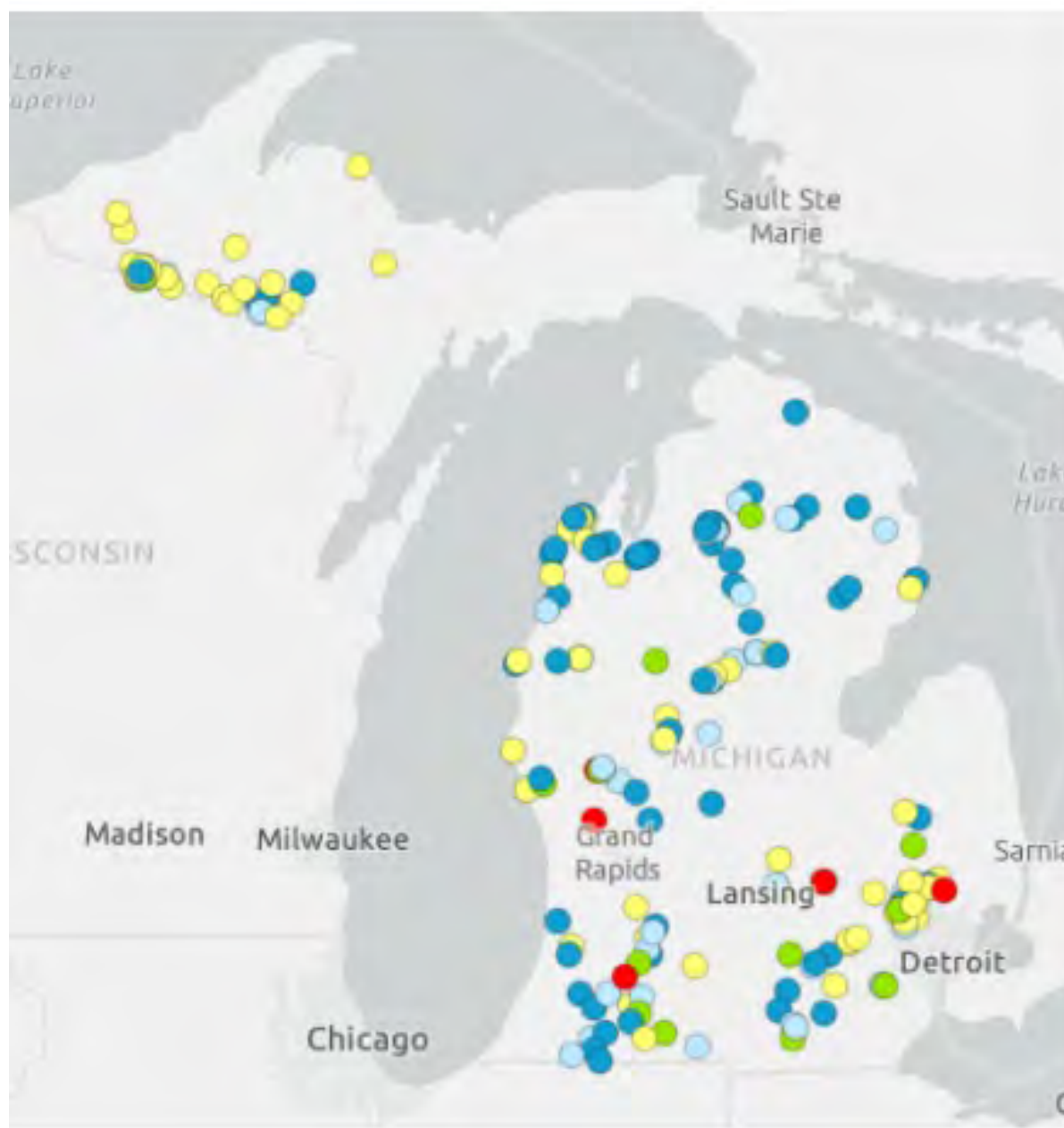


Make sure you're telling the accurate story and
not just what you want.

Don't cherry pick data



Communicating through maps!

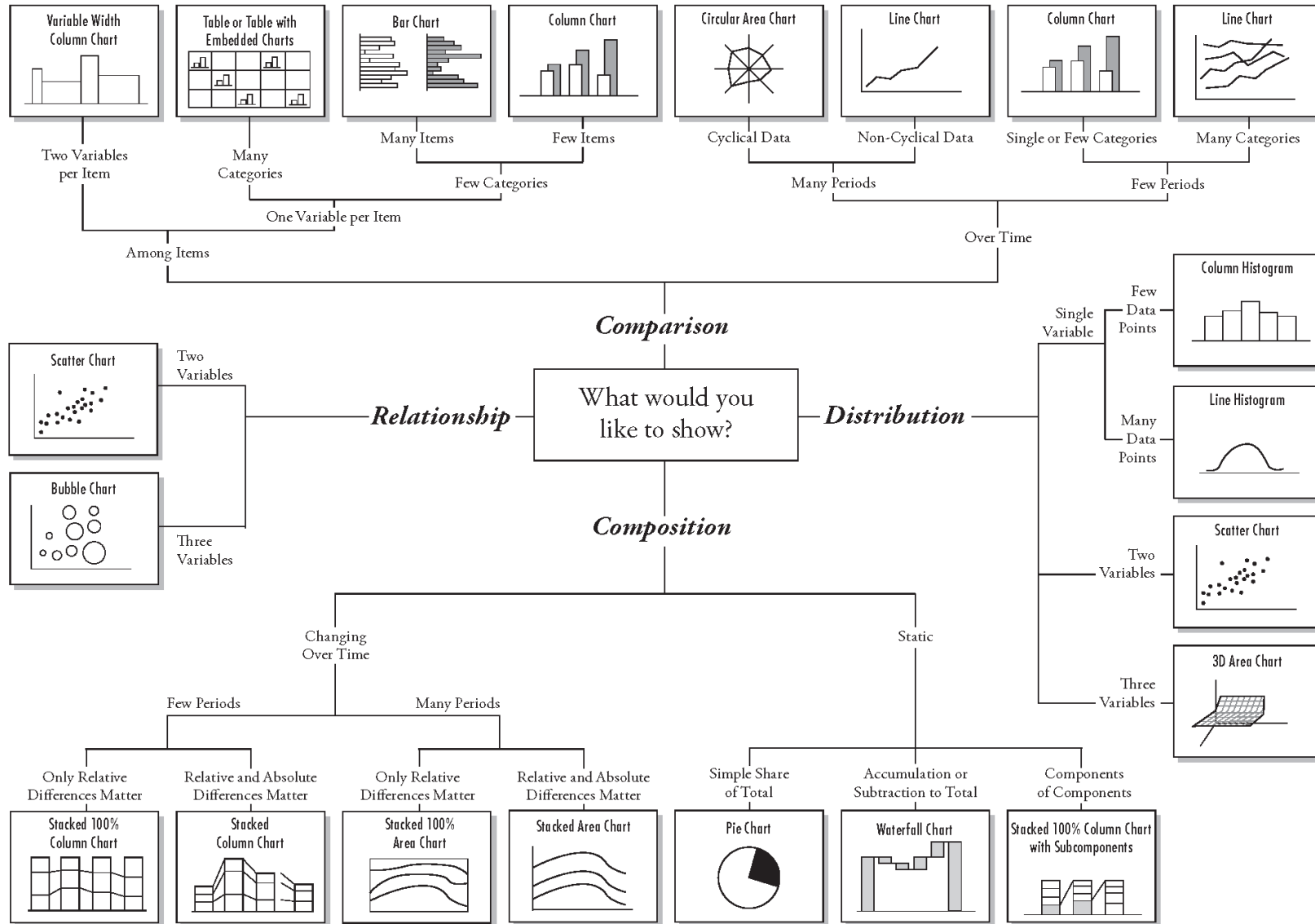


Legend

2023 Spring TP (ppb)

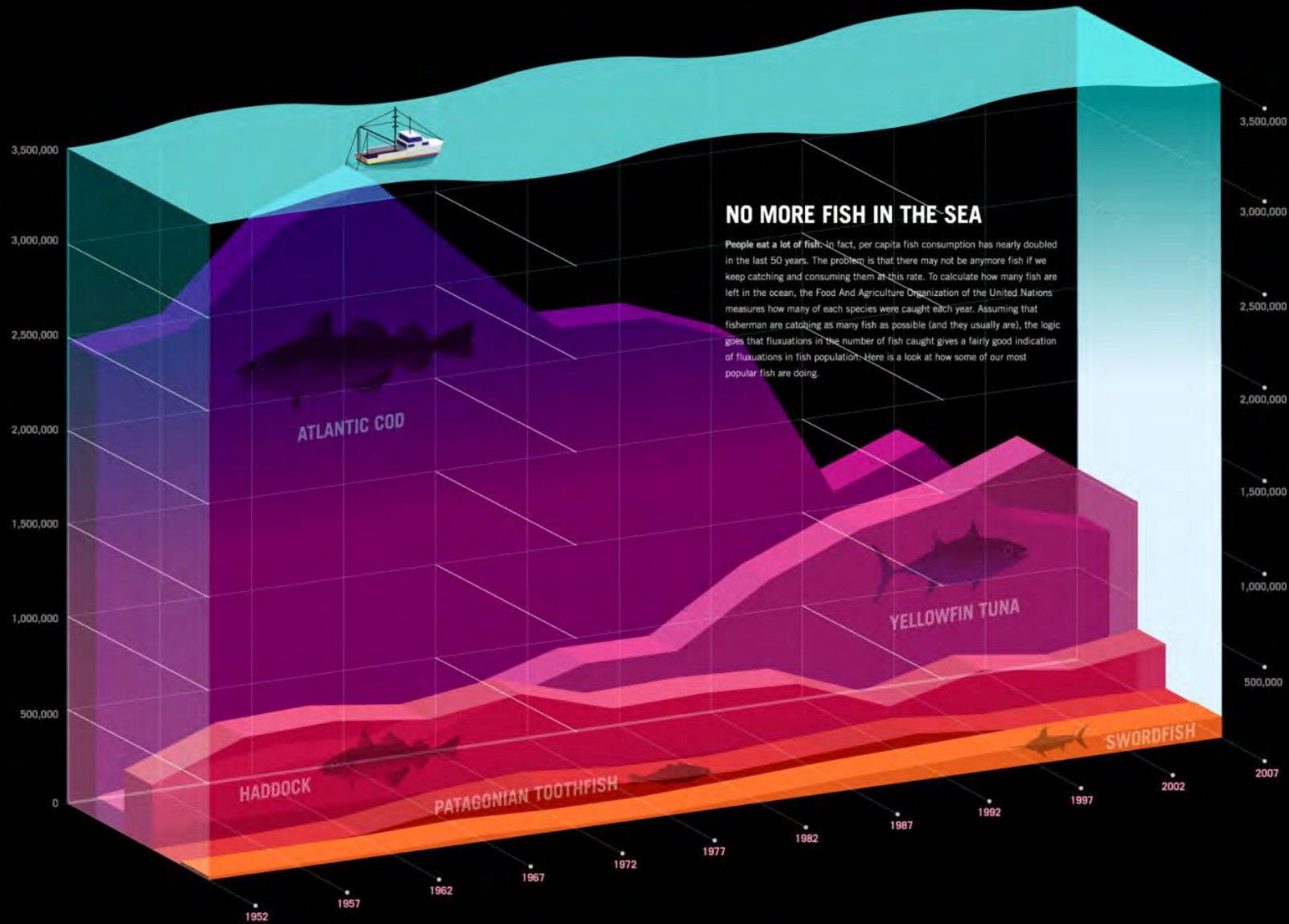
- 0-3 Non-detect
- 4-9 Oligotrophic
- 10-20 Mesotrophic
- 21-50 Eutrophic
- >50 Hypereutrophic

Chart Suggestions—A Thought-Starter





A few common data visualization mistakes

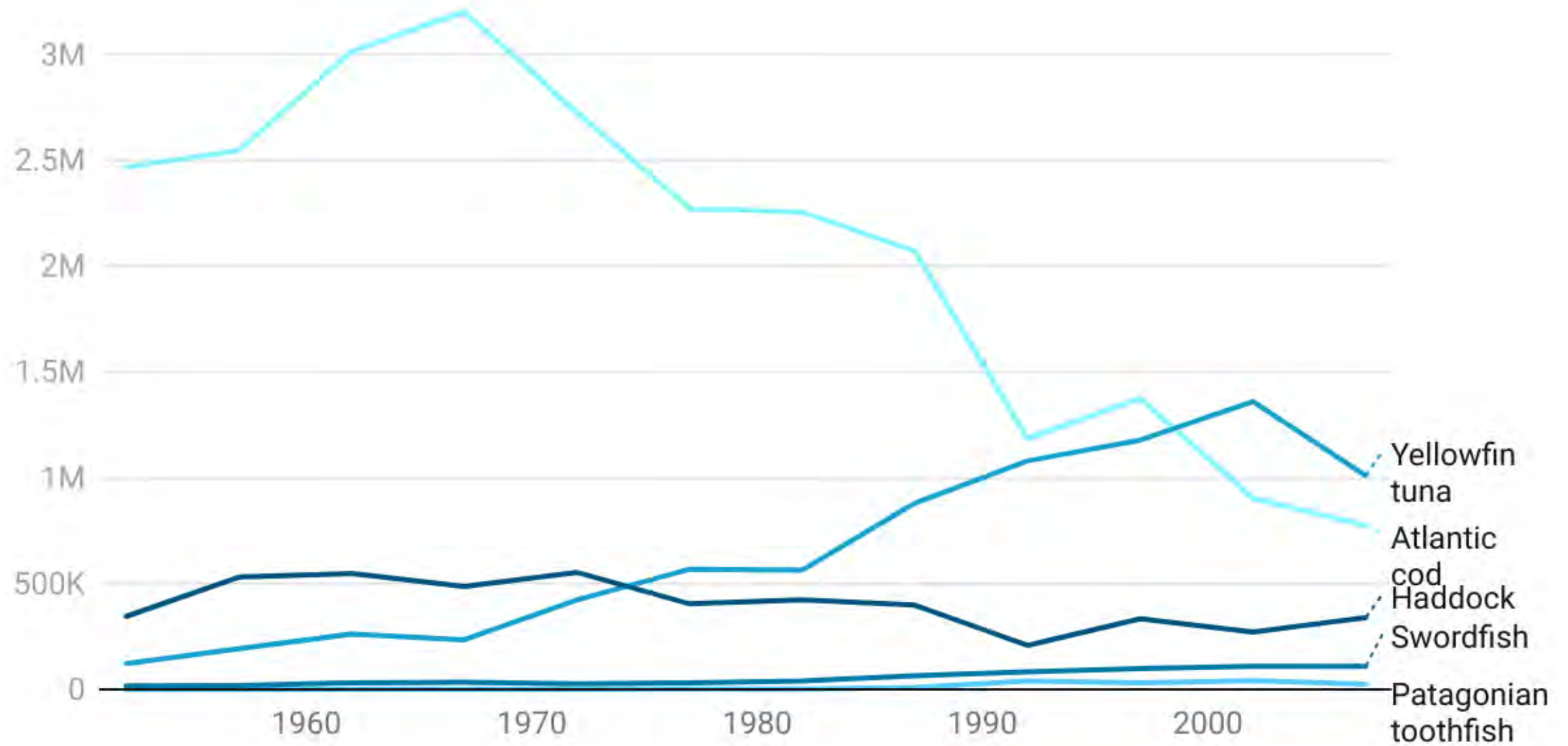


SPECIES / YEAR	1952	1957	1962	1967	1972	1977	1982	1987	1992	1997	2002	2007
ATLANTIC COD	2,467,216	2,546,954	3,013,837	3,201,009	2,727,599	2,271,320	2,254,716	2,070,596	1,185,017	1,375,079	903,211	774,188
YELLOWFIN TUNA	121,281	192,616	261,426	233,990	422,130	567,868	563,966	879,827	1,079,534	1,177,407	1,359,704	1,009,628
HADDOCK	344,795	530,888	547,494	485,670	552,866	404,303	423,103	367,894	207,815	334,105	270,299	339,230
PATAGONIAN TOOTHFISH*	0	0	0	0	0	1,178	1,153	8,641	39,836	30,175	42,076	24,726
SWORDFISH	17,561	19,138	30,889	34,419	26,569	31,280	40,322	64,949	83,037	99,212	109,707	109,271

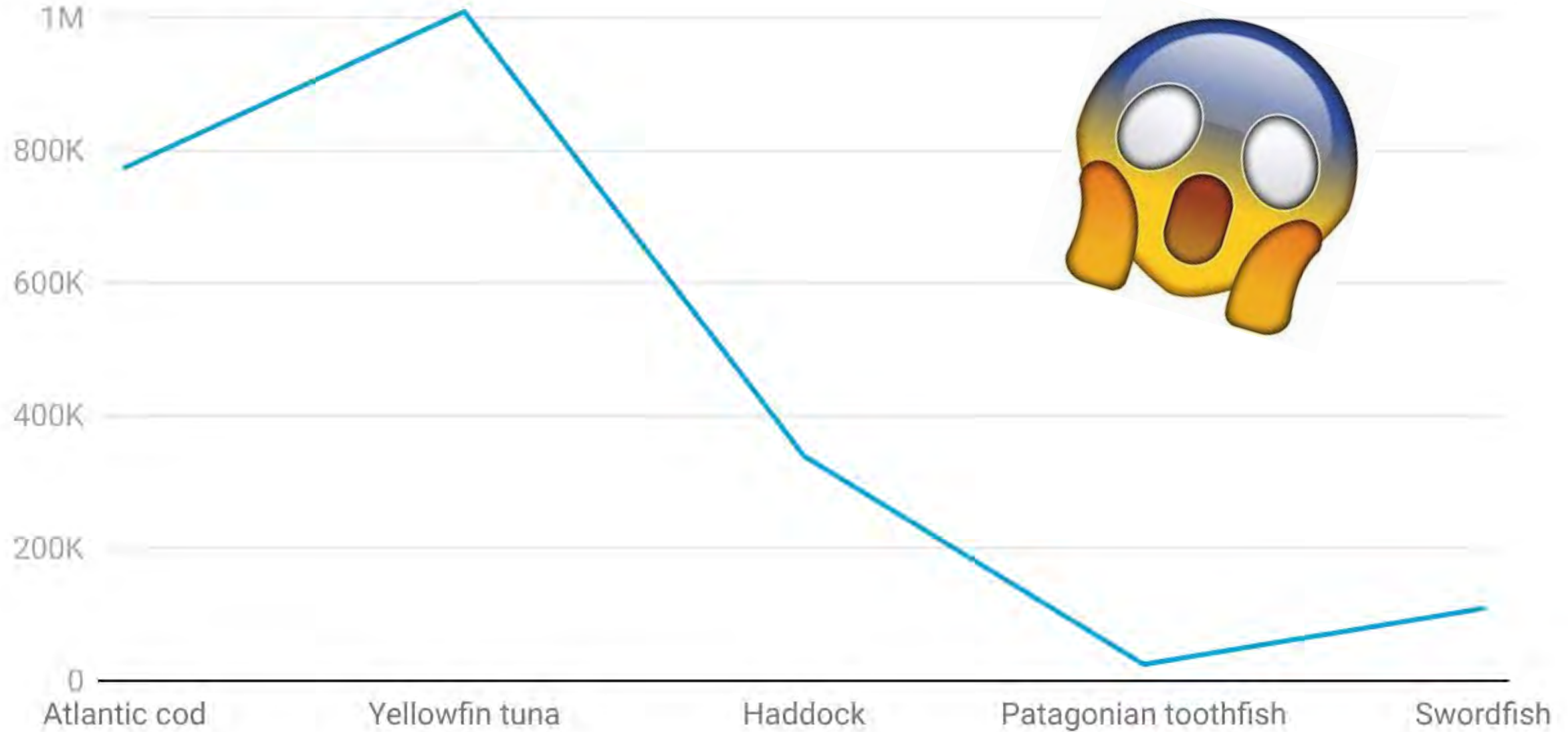
* CHILEAN SEABASS

SOURCE: The Food And Agriculture Organization of the United Nations

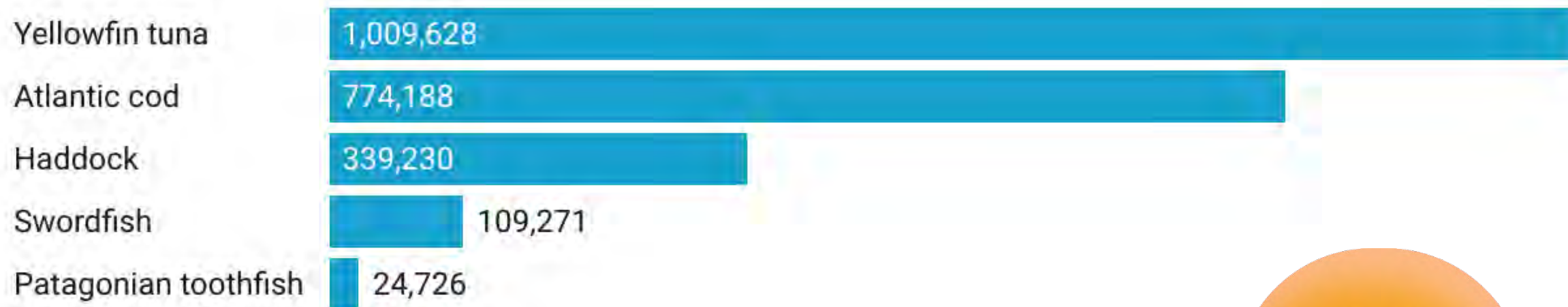
Annual Catch



2007 Annual Catch



2007 Annual Catch



Created with Datawrapper



Annual Catch

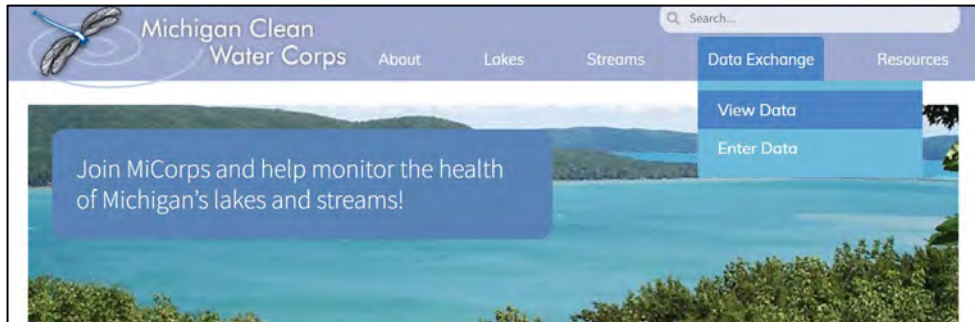
Year	Atlantic cod	Yellowfin tuna	Haddock	Patagonian toothfish	Swordfish
1952	2,467,216	121,281	344,755	0	17,561
1957	2,545,954	192,616	530,688	0	19,138
1962	3,013,837	261,426	547,494	0	30,889
1967	3,201,009	233,990	485,670	0	34,419
1972	2,727,559	422,130	552,866	0	26,569
1977	2,271,320	567,868	404,303	1,178	31,280
1982	2,254,716	563,996	423,103	1,153	40,322
1987	2,070,596	879,827	397,894	8,641	64,949
1992	1,185,017	1,079,534	207,815	39,836	83,037
1997	1,375,079	1,177,407	334,105	30,175	99,212
2002	903,211	1,359,704	270,299	42,076	109,707
2007	774,188	1,009,628	339,230	24,726	109,271

Datawrapper

- <https://www.datawrapper.de/>
- New York Times: Tracking Dangerous Heat in the U.S.
 - <https://www.nytimes.com/interactive/2022/us/heat-wave-map-tracker.html>

How to access MiCorps data

Step 1



MiCorps Data Exchange Network

The MiCorps web-based data exchange platform provides online access to volunteer monitoring data through a searchable database. Choose which water bodies you would like to search through and narrow down your search by county, hydrologic unit code (HUC) and/or water body name.

Step 2

Search by Streams or Lakes

Streams

Lakes

Narrow Your Search

County

HUC

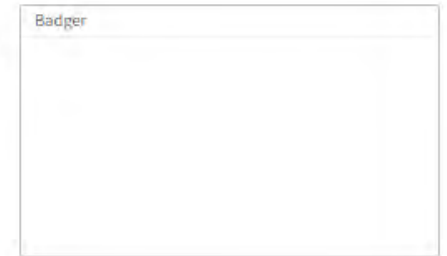
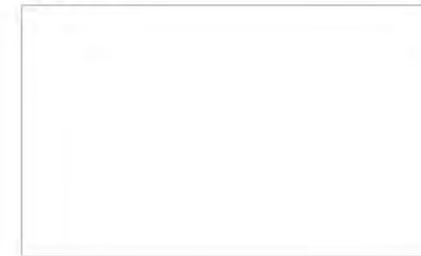
Name

All

The left column contains items you can filter your search with. Click an item on the left to move it to the right column, which contains any items you've chosen to filter with. If you change your mind, click on an item in the right column to stop filtering with it. Multiple types of filters can be selected by clicking on each button above.

Type a word into the search box to only show items that contain that word.

badger



Step 3

Date Range

From January 01 1970 to July 11 2023

Sampling Parameters

- Secchi Disk
- Phosphorus (Spring Overturm)
- Phosphorus (Late Summer)
- Chlorophyll
- Dissolved Oxygen/Temperature
- Aquatic Plants
- Exotic Plants
- Score The Shore

Data Tier

Data generated under different Quality Assurance Project Plans (QAPPs) belong to different tiers.

- Tier 1: The MiCorps QAPP
- Tier 2: Another acceptable QAPP
- Tier 3: No QAPP, but acceptable Standard Operating Procedures

View Results

Download in Excel

Raw Data

MiCorps Data Exchange Search Results [Download in Excel](#) [New Search](#)

Searched by name: Badger Page 1 of 1

From: January, 01 1970 to July, 11 2023 5, 10, 25 sites per page

Sort by: **County** • Watershed

County HUC and Watershed	Lake Name	STORETID
Alcona 4070006Thunder Bay	Badger	010122

Secchi

Date	Time	Depth	Weather	
Jan 1, 2018	04:21:00	5 ft	Sunny	View Graph
Sep 15, 2010	15:00:00	13 ft	Sunny	View Graph
Sep 1, 2010	10:45:00	12 ft	Sunny, Windy	View Graph
Aug 15, 2010	10:45:00	11 ft	Cloudy, Windy	View Graph
Aug 4, 2010	09:00:00	12 ft	Sunny	View Graph

Step 4

How to access individual lake reports

micorps.net/lake-monitoring/individual-lake-reports/

Michigan Clean Water Corps

About Lakes Streams Data Exchange Resources

Search...

Individual Lake Reports

Please click on the County Name to view reports listed by "Lake Name, Site ID (through 2014) may be available by contacting Paul Steen.

- > Alcona County
- > Alger County
- > Allegan County
- > Alpena County
- > Antrim County

Inside this section:

- Become a Volunteer
- CLMP Documents
- Lake Training

Featured content

- Lake Data Reports
- Individual Lake Reports

MiCorps.net -> CLMP documents -> scroll down to: **CLMP Graphing Tool**

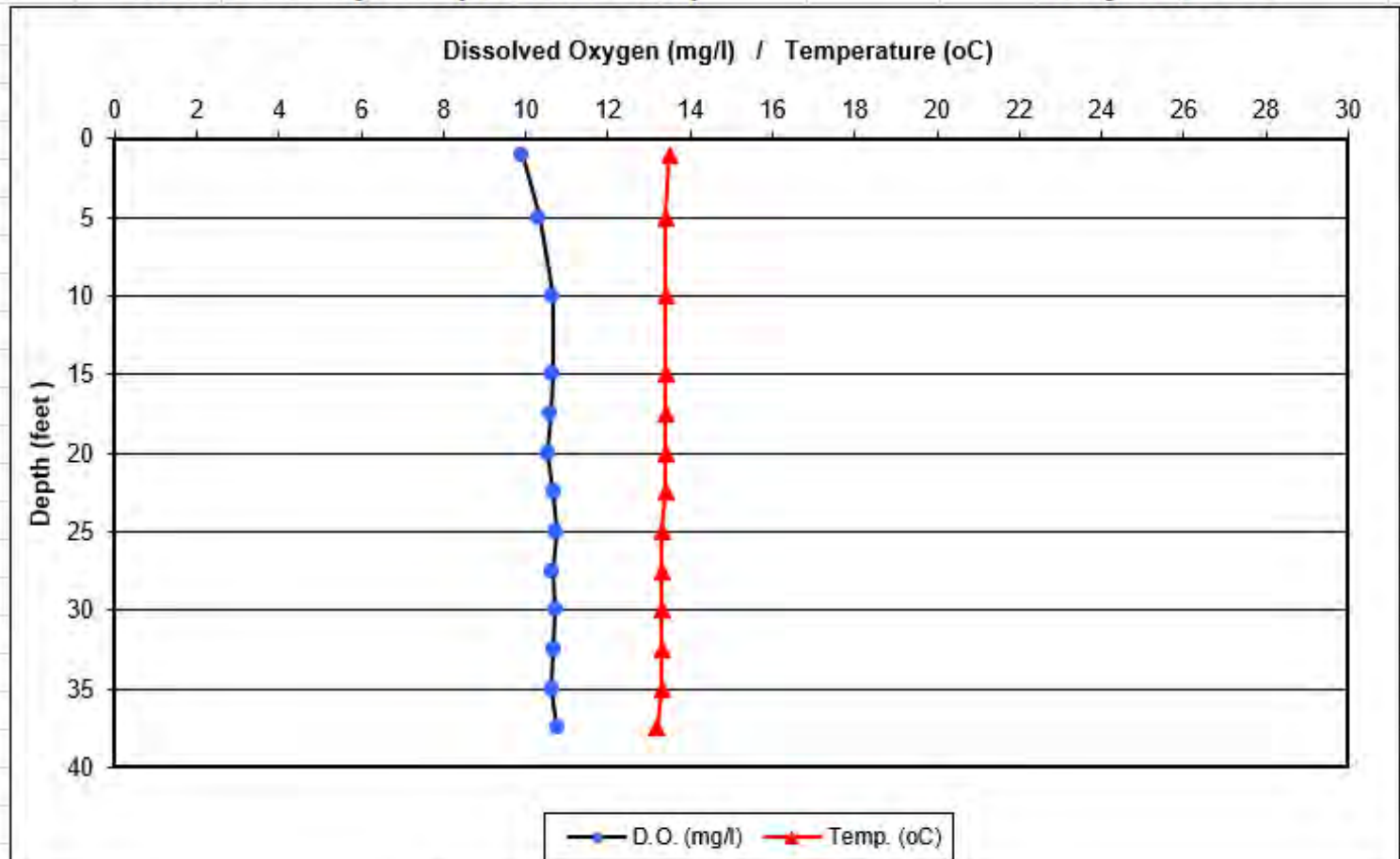
Time: Dead Spider
County: Nowhere
Date: May 15, 2010
Time: 12:30

Dissolved Oxygen and Temperature Profile

Lake: Dead Spider (Nowhere Co.)

May 15, 2010

Depth (ft.)	Temp. (°C)	D.O. (mg/l)
1	13.5	9.91
5	13.4	10.32
10	13.4	10.64
15	13.4	10.66
17.5	13.4	10.6
20	13.4	10.53
22.5	13.4	10.67
25	13.3	10.75
27.5	13.3	10.66
30	13.3	10.71
32.5	13.3	10.67
35	13.3	10.62
37.5	13.2	10.77



A storytelling approach to sharing your data will help you...



Questions?

CLMP Contacts

Erick Elgin – elgineri@msu.edu

Jo Latimore - latimor1@msu.edu

Jean Roth - jean.roth@mymlsa.org

Tamara Lipsey - lipseyt@michigan.gov

Not sure who to ask?

MiCorps@msu.edu

