FISH GROUP

This handout should help you plan your research project with Inland Seas

Tip: Look at the results from previous years to help you plan your study. Can you build on what has already been done?

1. **What is your research question? What are you trying to find out?**

2. **Outline your experiment design here:**

Treatments / Contents of each minnow trap	**Number of traps per treatment**
1.	
2.	
3.	
4.	
5.	

3. **Share anything else you were thinking about when designing the study, or any questions you have**.

PLANKTON GROUP

This handout should help you plan your research project with Inland Seas

Tip: Look at the results from previous years to help you plan your study. Can you build on what has already been done?

1. **What is your research question? What are you trying to find out? You might have several questions, or just one.**

1. **Outline your study design here:**

Note: There are more blanks here than you need; it is not necessary to fill in every line, or to have information for the plankton net *and* for the plankton traps. Just use the spaces you need.

		Which samples can be compared to this one?
Range of depths with the plankton NET (feet) *ex: 0-20 ft, 0-80 ft*	1.	
	2.	
	3.	
	4.	
Depths with the plankton TRAP (feet) *ex: 20 ft, 80 ft*	1.	
	2.	
	3.	
	4.	

2. **Share anything else you were thinking about when designing the study, or any questions you have.**

BENTHOS GROUP

This handout should help you plan your research project with Inland Seas
Tip: Look at the results from previous years to help you plan your study. Can you build on what has already been done?

2. **What is your research question? What are you trying to find out? You might have several questions, or just one.**

3. **Outline your study design here:**

Depth to be sampled (feet)	Number of samples at this depth

What will you do with the sediment once it is on board?

Is your group interested in sorting sediment by particle size? Yes / No / I don't know

Is your group interested in getting a sediment core of the Bay? Yes / No / I don't know

*If your answer is Yes to either of these, contact the office at least **5 days before your trip** so we can have the equipment on board.*

4. **Share anything else you were thinking about when designing the study, or any questions you have.**

WATER QUALITY GROUP

This handout should help you plan your research project with Inland Seas
Tip: Look at the results from previous years to help you plan your study. Can you build on what has already been done?

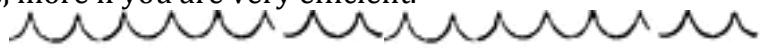
1. **What is your research question? What are you trying to find out?**

2. Outline your study design here:

The depth of the Bay where we collect samples will be between 60 and 90 feet. The sonde will measure to about 40 feet and can read Dissolved Oxygen (DO) and temperature.

→ Mark the depths where you want to take measurements with the **sonde** and what you will measure (Temp, and/or DO) at each depth. To take measurements deeper than 40 feet, you will use the Van Dorn bottle to collect water samples.

→ Mark the depths where you want to take samples with the **Van Dorn** and what you will measure at each depth: Temp, pH and/or DO. There will be time to take about 3 VanDorn samples, more if you are very efficient.



Surface = 0 feet

10 feet

20 feet

30 feet

Sonde limit = 40 feet

50 feet

Bottom = 60 feet

or *70 feet*

or *80 feet*

or *90 feet*

3. Share anything else you were thinking about when designing the study, or any questions you have.

MICROPLASTICS GROUP
This handout should help you be prepared for your research project with Inland Seas

1. **At Inland Seas we are trying to answer two questions about microplastics. What are they?**

2. **Read up on microplastics in the Great Lakes.** See the back of this page for article suggestions. All can be found free online.

3. **Make a hypothesis:** When do you think microplastics would be more abundant – spring, summer, fall or winter? Why? (If you think season does not matter, explain why)

4. Microplastics concentrations in the Great Lakes are reported as particles per kilometer squared. **What information do you need in order to calculate the number of plastics particles per kilometer squared? Try to write a formula** that will allow you to calculate this for the sample you collect when you are on the ship.

Suggested articles on microplastics:

This is the first scientific paper published on this topic:
Microplastic pollution in the surface waters of the Laurentian Great Lakes.
Marcus A, Eriksen, Sheri B. Mason, et. al.
Marine Pollution Bulletin, Volume 77, Issues 1–2, December 2013, 15 Pages 177–182
Notes: The first author, Markus Eriksen works for the 5 Gyres Institute, which studies microplastic in the oceans. Look into the work at 5 Gyres. Marcus built the trawl we will use on the ship. Sheri Mason is the researcher in New York who is guiding our research at Inland Seas.

Two or three important points or questions/thoughts after reading the article:

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-
-

This one shows how fish can be affected by microplastics. First, a news article:
Fish eat plastic like teens eat fast food, researchers say. Matt McGrath. BBC News. June 2, 2016. Accessed January 30, 2017. http://www.bbc.com/news/science-environment-36435288
Then, the scientific paper that the news article is based on:
Environmentally relevant concentrations of microplastic particles influence larval fish ecology Oona M. Lönnstedt and Peter Eklöv
Science 352 (6290), June 2, 2016, 1213-1216.

Two or three important points or questions/thoughts after reading the article:

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A nice overview of plastics, what we know and what we have to learn:
Plastic debris in the Laurentian Great Lakes: A review
Alexander G.J. Driedger, Hans H. Dürr, Kristen Mitchell, and Philippe Van Cappellen
Journal of Great Lakes Research, Volume 41, Issue 1, March 2015, Pages 9–19

Two or three important points or questions/thoughts after reading the article:

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