**Primary Production in the Oceans**

**Question:  What controls primary production in the temperate ocean during the summer?**

**Learning Outcomes for the activity:**

Students will be appropriately guided given their developed skills to…

* describe patterns in individual data sets
* describe comparisons between data sets
* propose a conclusion/claim about what controls primary production at the site studied
* compose an explanation using sufficient and appropriate evidence and relevant science concepts

Purpose: students will study and describe patterns in the data provided, then learn some background about relevant concepts, then will be asked to make sense of a data set about primary production for the site studied.

Students will use adjustable data visualizations to familiarize themselves with the different data sets and double y-axis scales. The study site is located at temperate latitudes along the continental margin south of the eastern tip of Long Island, NY. See the map for specific location.

Access data visualizations at: <https://datalab.marine.rutgers.edu/explorations/rider/production.htm>

**Enter your group members’ names:**

**Data description**: Look carefully at the data so you can use it to make and support your decisions. ***Focus in detail on the summer data but also compare the summer data to the entire year.***

1. Discuss in your groups what you notice about the individual data sets. See how many different observations you can make and how well you can describe them for those listening to your description. Your observations will be discussed with the entire class before moving on to Step 2.

1. For each individual data set, draft more thorough written descriptions of data patterns, using the questions below as a guide. Discuss options. Try to do this together; for example one person can take turns speaking out loud, others help refine and one person records. *Everyone in the group should contribute to the writing of these description statements...please put your initials in [ ]s at the end of each you add*.

**In your descriptions for each data set (a-d), consider at least the following:**

* + Approximate Min & Max values and range for the summer season
  + compare summer values to those of other seasons
  + Amount of change in the variable over the summer season (e.g., how much does it increase or decrease; does it fluctuate, and if so, describe how)
  + Any other patterns you notice
  + Make sure you include specific quantitative details in your patterns descriptions.
  + Also, only describe patterns...don’t explain it in this section.

1. **Chlorophyll**
2. **Temperature**
3. **Irradiance**
4. **Nitrate**
5. **Comparison.** Compare the patterns you described above considering similarities and differences in the four data sets. Here again, focus on the summer considering those data in relation to the rest of the year.
6. Given the patterns you found in the datasets (2a-e), make a claim about what controls the level of primary production at this site in the summer. ***This should be a single sentence.***
7. **Complete *individually* in Canvas Assignment**: State your claim. Then, using all relevant information from your work above, compose a scientific explanation that supports your claim. Remember, scientific explanations should tie together all relevant specific data patterns **and your understanding of relevant science concepts introduced for this topic that would explain your claim** in a logical sequence (your “reasoning”!). ***Your answer should take several well integrated sentences to complete this question.***