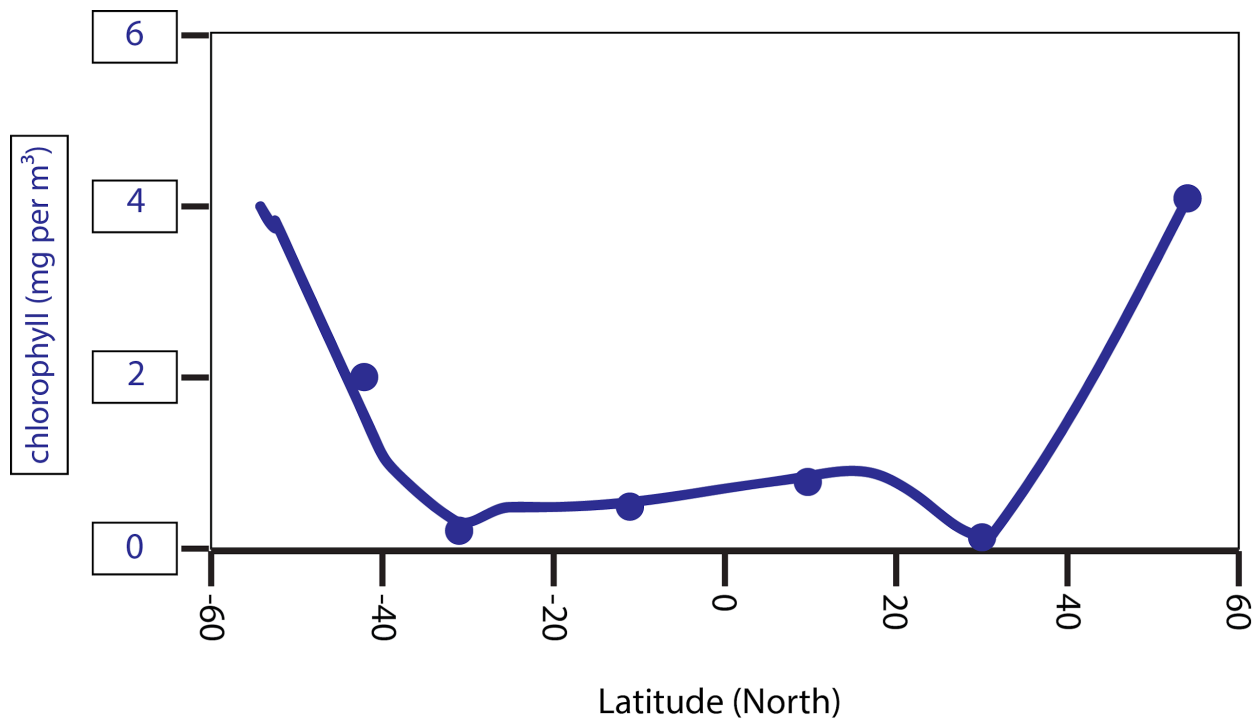


Lesson 4_Dataset 1_Microbial Oceanography: Chlorophyll concentration_Teacher Key

You have satellite data from NASA's Ocean Color Web for the Atlantic Ocean during the AMT cruise (September - October 2003) (See p.2). The satellite data are averaged from daily measurements across the entire month of September 2003.

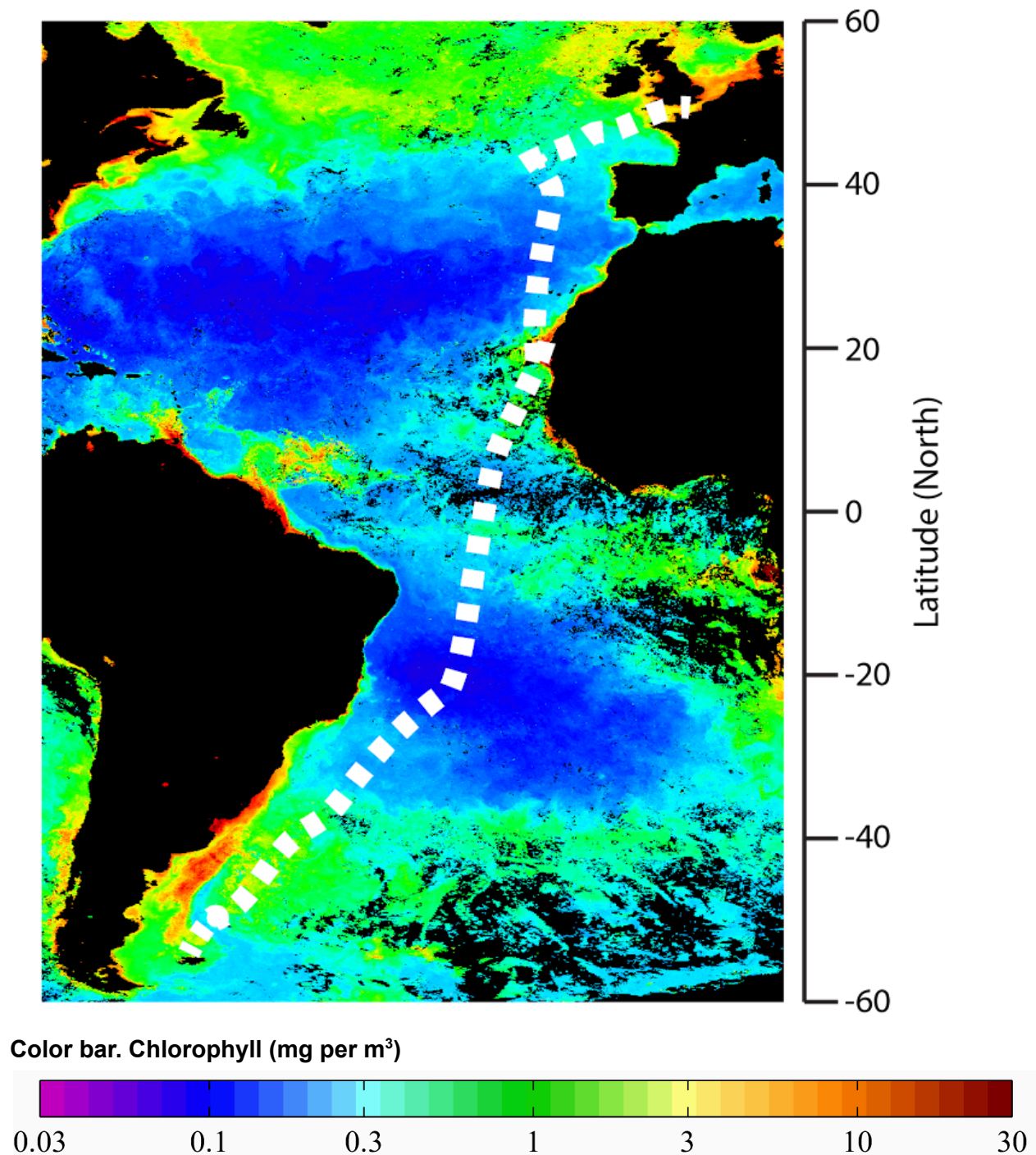
Instructions: Use the satellite image provided to graph the chlorophyll concentration along the transect. An empty table is provided to help you pick data points along the transect. Plot latitude vs. chlorophyll for 6 or more points to show how chlorophyll concentration changed over the transect. Enter values and labels for y-axis in empty boxes.

Station #	Latitude	Chlorophyll (mg per m ³)
1	45	4
2	30	0.2
3	10	0.5
4	-10	0.3
5	-30	0.2
6	-40	2



Lesson 4_Dataset 1_Microbial Oceanography: Chlorophyll concentration_Teacher Key

Satellite data on chlorophyll concentration. Dashed white line shows the AMT cruise track. Colors represent concentration of chlorophyll measured. Black represents areas with no data (land or clouds).



Lesson 4_Dataset 1_Microbial Oceanography: Chlorophyll concentration_Teacher Key

Discussion Questions (short answer)

1. How does chlorophyll concentration change along the transect?
 - Chlorophyll increases near N and S pole
 - Is lowest in the middle of the ocean
 - Except for near equator, where chlorophyll increases a little bit
2. What does the chlorophyll data tell you about the abundance of phytoplankton across the transect?
 - Students should remember that phytoplankton have chlorophyll, so that chlorophyll concentrations could indicate concentration of phytoplankton.
 - Note that this is an area of ongoing research. Phytoplankton “photoacclimate” like plants, so when they are exposed to a lot of light, they would make less chlorophyll.
 - Students may question the relevance of chlorophyll to phytoplankton abundance, which is a great discussion...and one of the disadvantages of using chlorophyll data to estimate phytoplankton biomass (abundance).
3. What information about phytoplankton is not captured by the chlorophyll data?
 - Chlorophyll doesn’t capture the abundance of different types of phytoplankton.
 - Size of phytoplankton
 - If they are acclimated to high or low light, because that would affect their concentration of chlorophyll
4. How does the satellite chlorophyll data compare to the Darwin Model?
 - Darwin model doesn’t tell you about phytoplankton abundance, so students may find a little disconnect here.
 - One similarity is that there are spatial differences in patterns of chlorophyll and phytoplankton which are similar between the two models (for example at the Gulf Stream, you can see the influence of ocean currents in these two data sets)