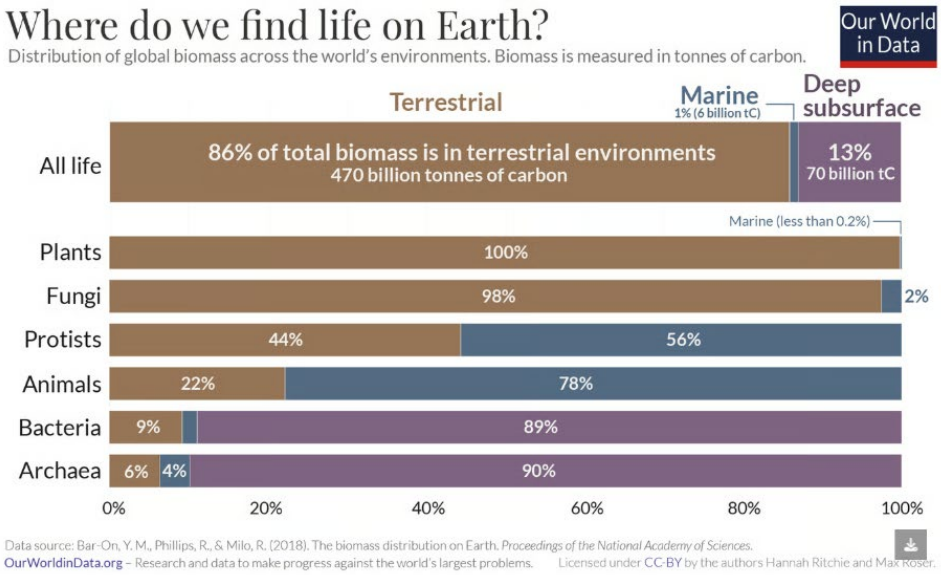
Deep Dive Reading Collective:
The Blue Machine by Helen Czerski - Chapters 4 & 5

Dates	Chapters
3/24	**Part Two: Travelling the Blue Machine** Chapter 3: Messengers Chapter 4: Passengers
4/7	Chapter 6: Voyagers **Part Three: The Blue Machine and Us** Chapter 7: Future
[Wakelet of Shared Resources]	

ICEBREAKER
Which chapter resonated more with you -- Chapter 4: Messengers or Chapter 5: Passengers? Why?

WHOLE GROUP DISCUSSION
What are your first thoughts or questions when you look at this chart?



https://ourworldindata.org/life-by-environment and https://www.pnas.org/doi/10.1073/pnas.1711842115

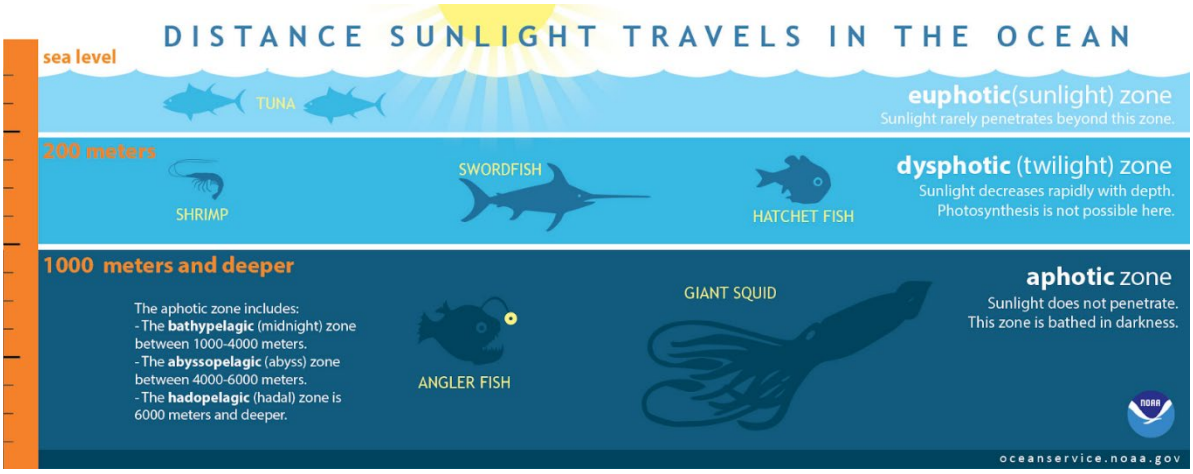
WHOLE GROUP DISCUSSION (continued)
What are some of your favorite stories from chapters 4 and 5? Which stories might resonate the most with students?

BREAKOUT GROUP DISCUSSION

#1 LIGHT

Sunlight penetrates only a fraction of the ocean in the surface layer named the euphotic zone. In the dysphotic (twilight) zone sunlight decreases rapidly with depth and in the aphotic zone there is total darkness.

- In what ways do organisms use sunlight in the euphotic zone and what effects does this have on the ocean and atmosphere?
- How do the physical properties of ocean water impact the passage of light?
- If light is one of the "messengers" in the ocean, how do life forms that live in the dark communicate?



https://oceanservice.noaa.gov/facts/light_travel.html

#2 SOUND

Sound is the other ocean messenger described by Czerski.

- Discuss how the physical properties of water, including salinity, temperature, and pressure allow water to carry sound over vast distances.
- Which is the "better" messenger? Light or sound? Or does it depend?
- How is sound being used to monitor climate change?
- How does the ocean create a "double mirror" effect with regard to sound?

#3 PASSENGERS

The messengers in the ocean are the disseminators of information, and the passengers represent the biotic and abiotic components that move through the blue machine.

- Czerski states that "the ocean's passengers are…not evenly distributed around the engine that they ride."(p275) Why is this?
- Do the passengers create inputs in the machine? Or are they simply travelers that do not impact the machine's operation?
- How does the blue machine affect the passengers? Do these effects impact ocean ecosystems?

#4 CARBON

The author gives a detailed account of the journey that a carbon molecule might travel in the ocean -- from the atmosphere to phytoplankton and beyond. During a discussion of whale poo, she states that the ocean is not a one-way pipe, but an unending cycle.

- How does her account of a carbon molecule's journey enhance or change your view of the ocean as a connected machine?
- It is well known that the ocean is a carbon sink. Does calling the ocean a carbon "sink" lead to misconceptions about the cyclical nature of ocean systems?
- After reading this section on carbon, does tackling the reality of climate change seem more pressing or more out of our grasp? Can humans continue to count on the ocean as a buffer against climate change?