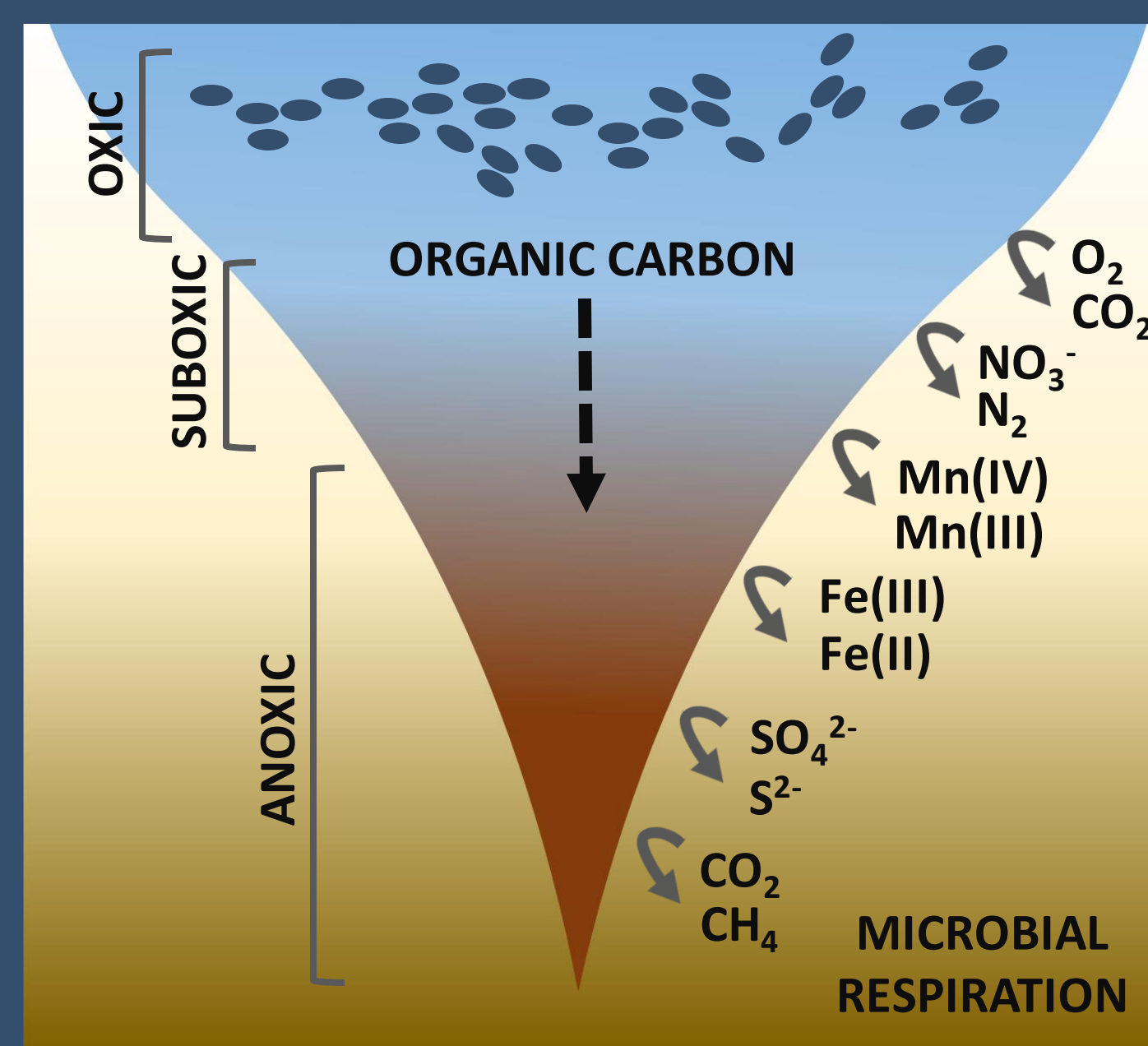


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BACKGROUND

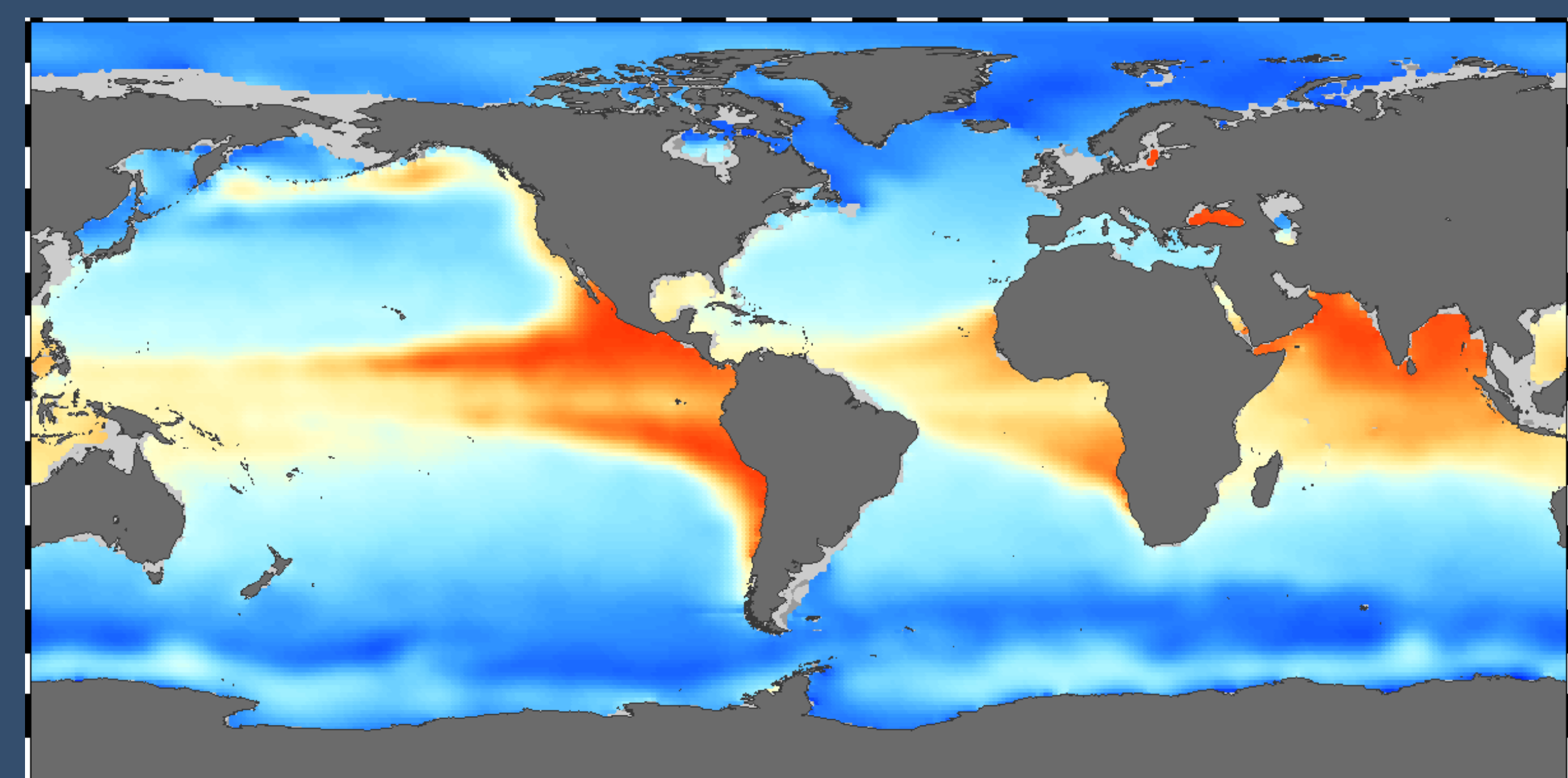
CAUSES OF ANOXIA



Water columns become anoxic when:

- Large input of nutrients causes enrichment in organic matter
- No mixing

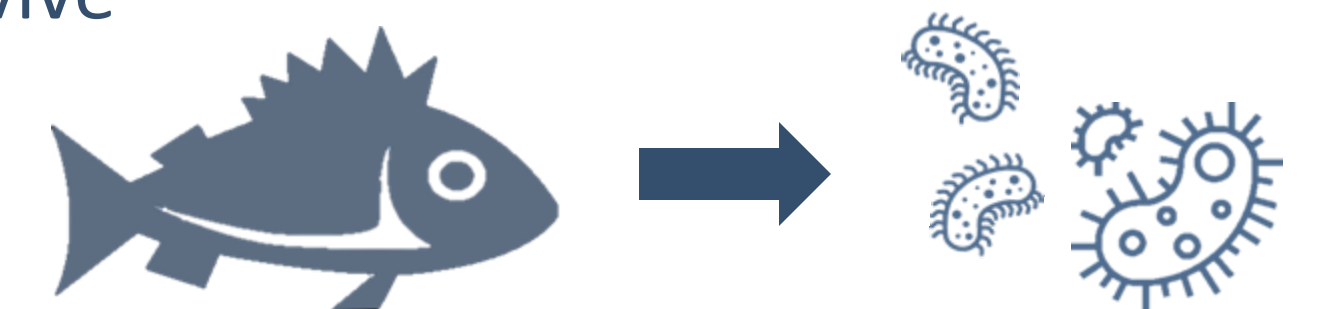
SPREAD OF ANOXIA



Though often natural, these areas are **spreading** because of human-induced warming and nutrient input into coastal areas

CONSEQUENCES

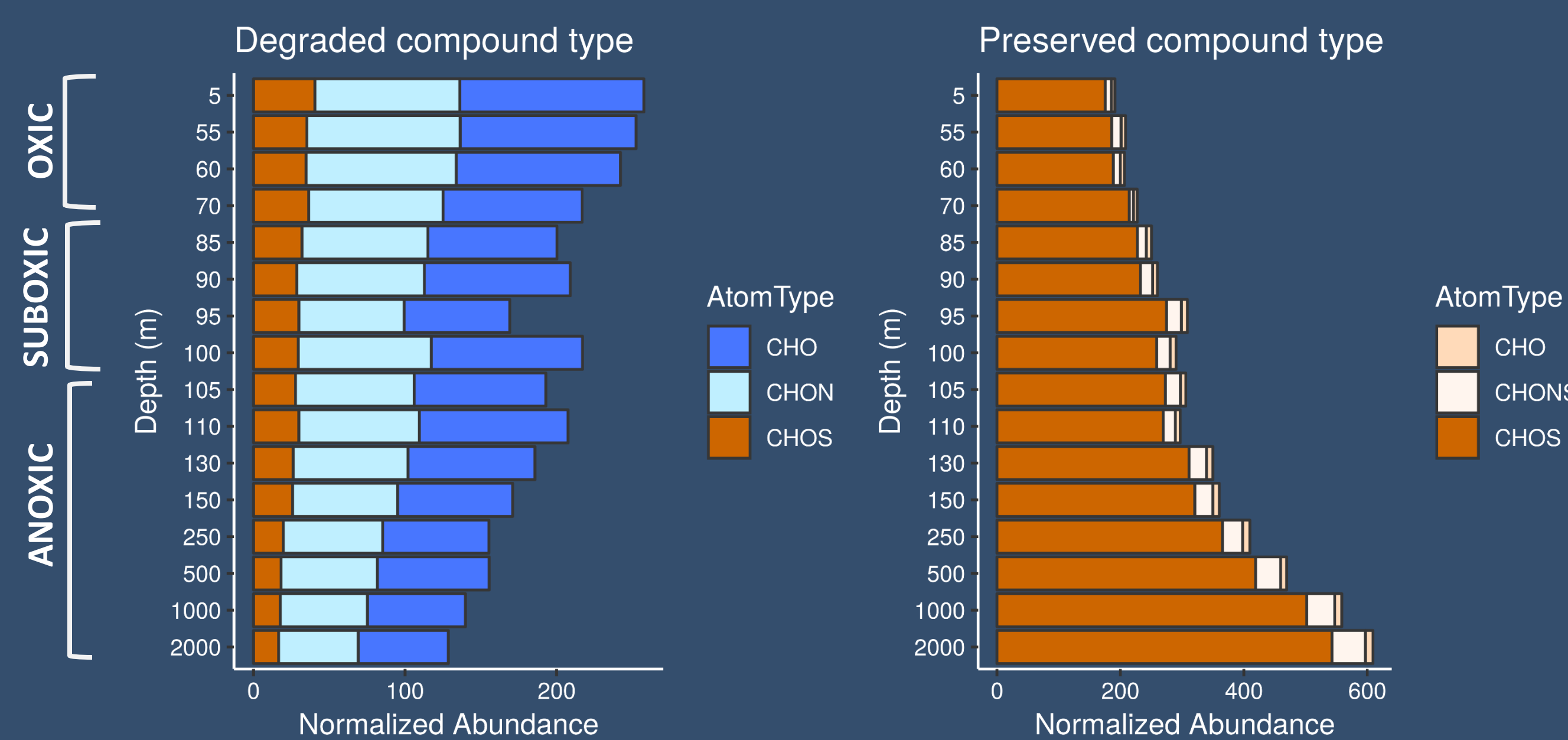
- A loss of mobile lifeforms: "dead zones"; only micro-organisms are able to survive
- This affects also major biogeochemical cycles
- The affect it will have on the carbon cycle is unknown



STUDY METHODS

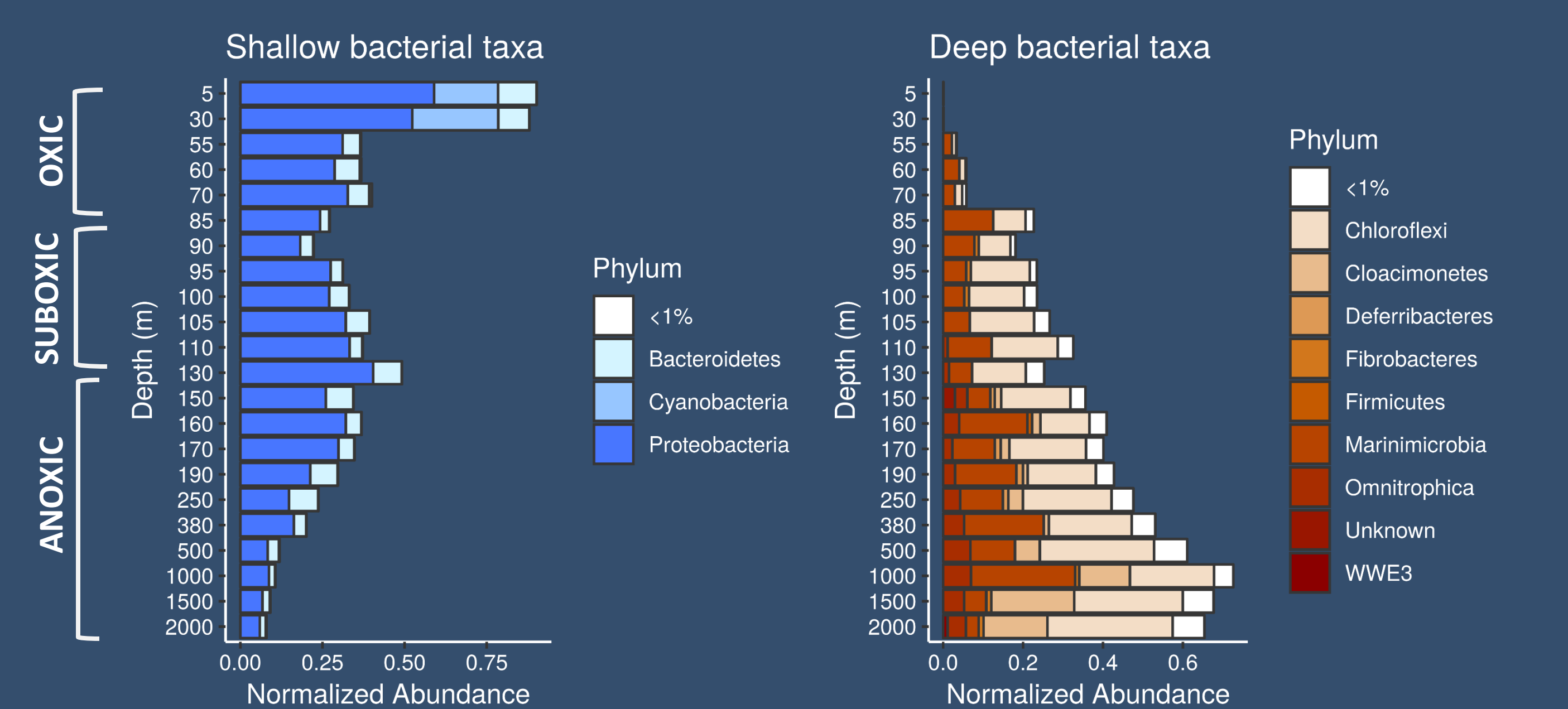
- High resolution analysis of a Black Sea water column depth profile; the molecular composition of the organic matter pool available as food for the microbes

1. DISSOLVED ORGANIC MATTER MOLECULAR COMPOSITION



- Dissolved organic carbon molecules are very diverse and dilute, making it difficult to characterize the total composition of the carbon pool

2. MICROBIAL COMMUNITY COMPOSITION

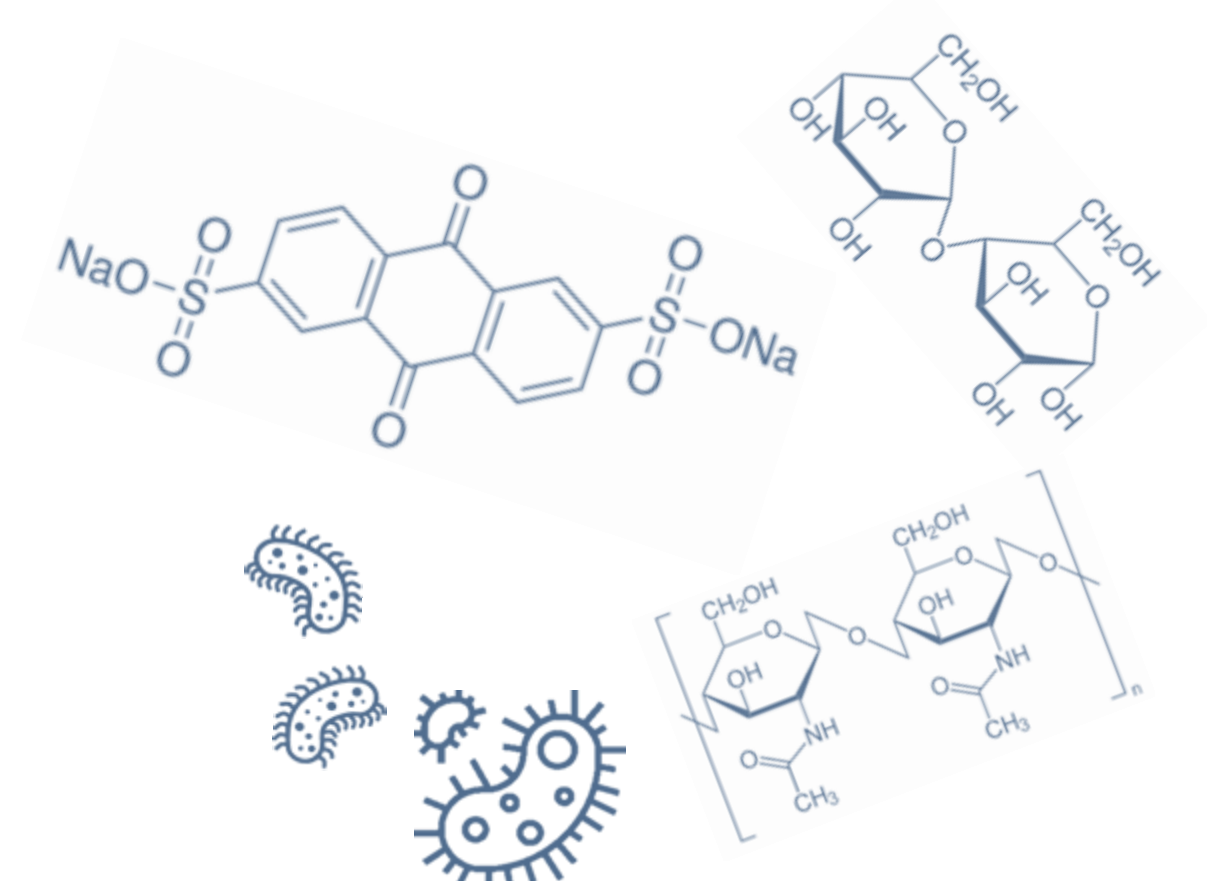


- The metabolic strategies of these microbes and how they affect carbon turnover is mostly unknown.

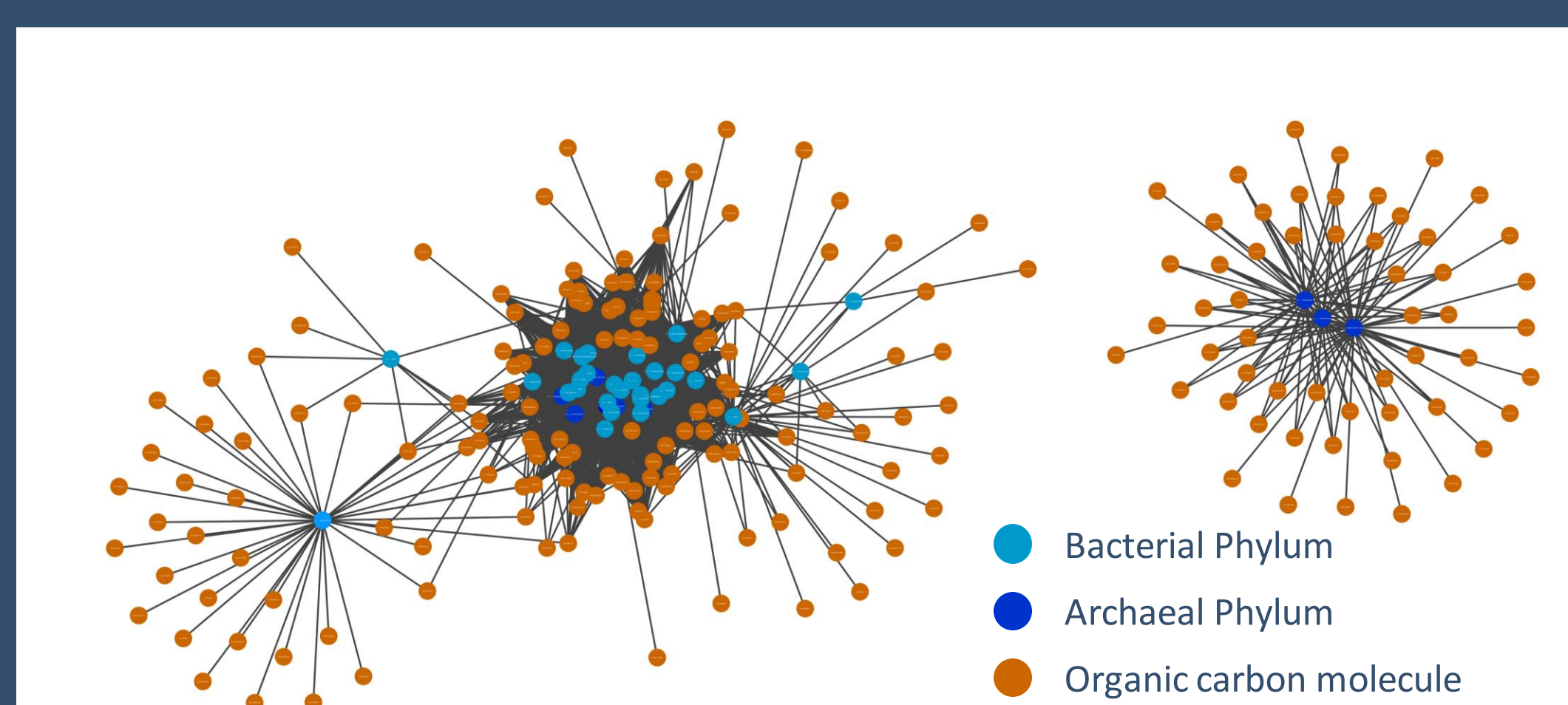
OBJECTIVES

To understand

1. Are there specialized organisms eating certain molecular groups, and how does this develop with depth and oxygen concentration
 → What are the limits of carbon processing by microbes in anoxic conditions
2. What molecular forms of carbon are preferred and what are not bioavailable in anoxia
 → How will the changing planetary conditions affect the carbon cycle



LINKING DISSOLVED ORGANIC MATTER AND MICROBIAL COMMUNITY



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FUTURE

- Multivariate statistics will be used to find the connections between dissolved organic matter (DOM) and microbial datasets
- Indications that:
 - Organisms can be specialists or generalists
 - Some archaeal groups specialized to a separate pool of organic compounds
 - Degradation of phenolic compounds increases with depth