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The Marine Food Web and Global Energy Systems ←

Rocky Bulldog ←

Environmental Resilience, UNC Asheville ←

MSER 532: Energy Systems and the Environment ←

Dr. Bully Dawg ←

September 14, 2025 ←

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**Author
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The Marine Food Web and Global Energy Systems ←

When the evolutionary precursors of modern whales abandoned their terrestrial habits
for the ocean, the thermodynamic demands of water-bound life diverted their evolutionary
course. Though the closest living relatives to whales on land include large mammals like the ←

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In-Text Parenthetical Citations

hippopotamus and the elephant, the colder ocean temperature pushed whales towards an even
larger optimum size. The mammalian energy equation begins with initial metabolic energy from
feeding minus the energy cost of basic existence, or basal metabolism, and the energy lost in
heat to its environment (Gearty et al., 2018). Marine mammals with increased biomass and a ←
layer of blubber to insulate themselves against the cold were more successful, and this
adaptation continued (Dahlman & Lindsey, 2018). As whales grew in size to adapt to their colder ←
surroundings and grew into a niche in the marine food web as depositories of biomass and

3+ Authors

2 Authors

carbon and enter it into the ocean's ecosystem. Basu and Mackey estimated the oceans
sequester up to a third of carbon dioxide emissions and fix around fifty gigatons of carbon each
year (2018). The carbon cycle follows the same pathways that energy does through the food

**Narrative Citations
Introduce the
Authors in the Text**

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**List Sources Alphabetically
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