

Introduction

- Dissolved oxygen (O_2) in Wequetequock Cove is depleted to near zero in summer mornings.
- At nighttime, animals, algae, aquatic plants and plankton all consume oxygen.
- We investigated the extent to which components of the Wequetequock ecosystem contribute to oxygen depletion.

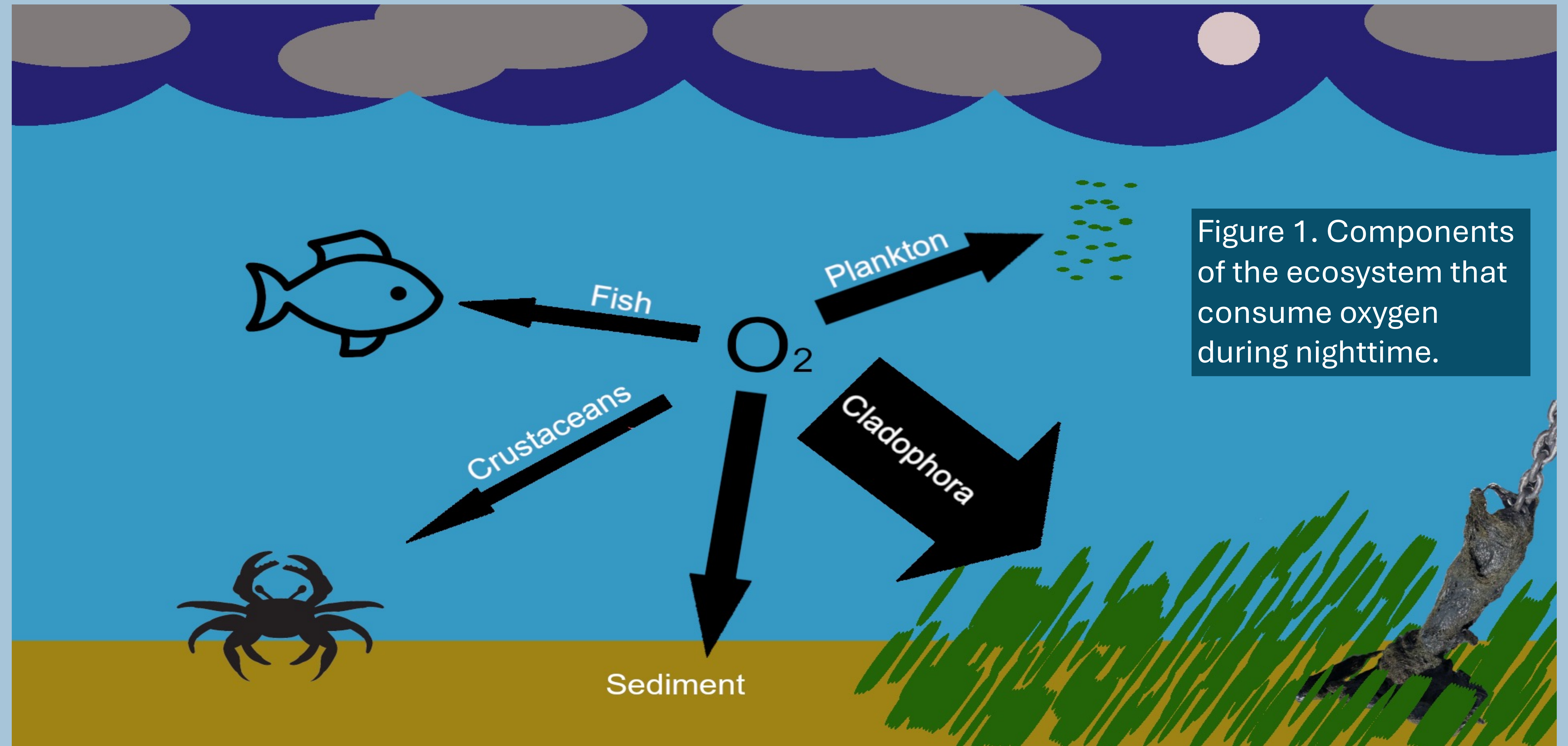
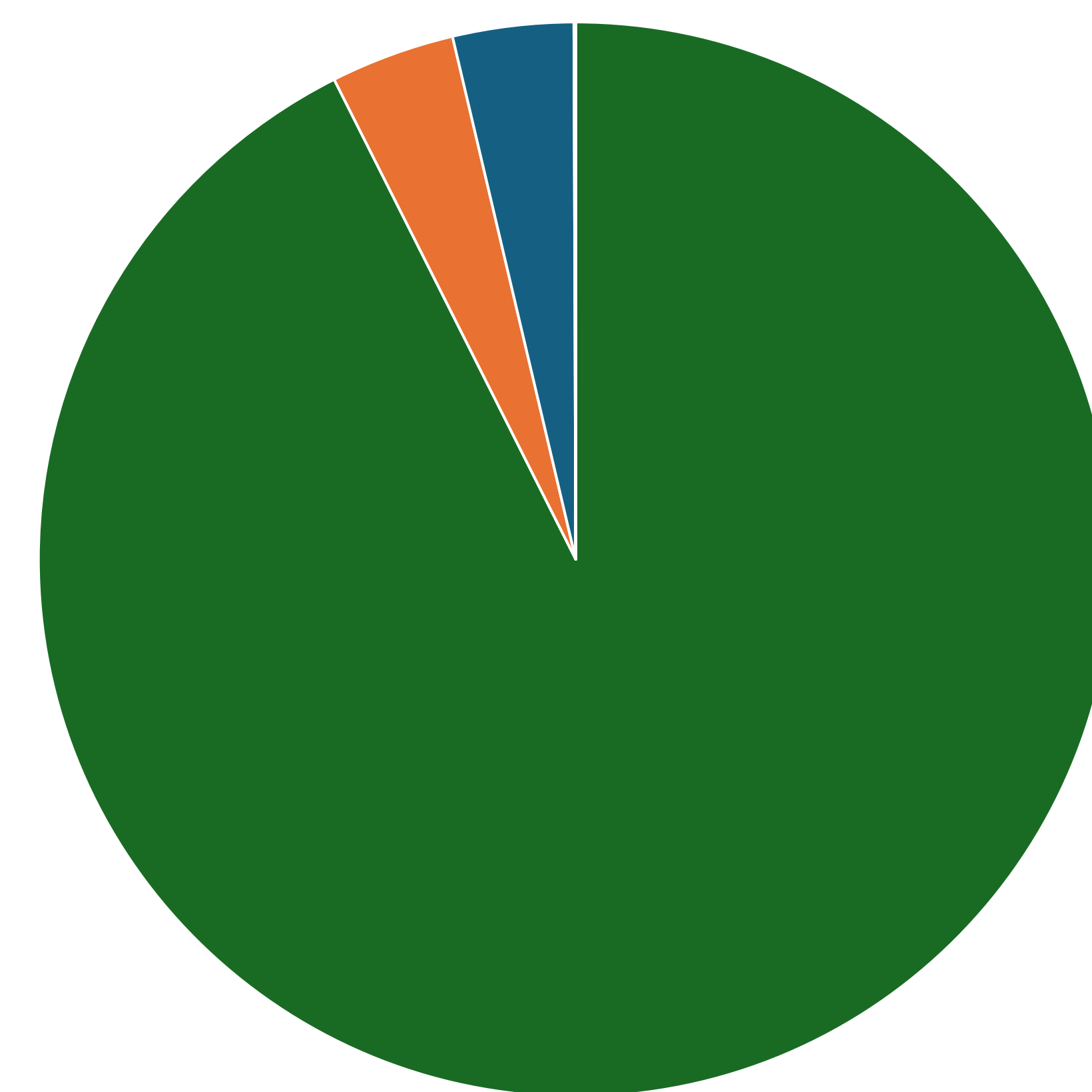


Figure 1. Components of the ecosystem that consume oxygen during nighttime.

Methods

- **O_2 consumption by plankton** was estimated from dark incubations of water collected in the cove.
- **O_2 consumption in sediments** was estimated from sediment incubations.
- **O_2 consumption by macroalgae** was estimated from incubations of Cladophora clumps.
- **O_2 consumption by fish and invertebrates** was estimated based on published measurements of organismal respiration rates (Peck, 2003, Newell, 1972) and inferred abundances of organisms in the cove.



■ Cladophora (92.57%)	■ Sediment (3.74%)
■ Plankton (3.63%)	■ Fish (0.03%)
■ Crustaceans (0.03%)	

Figure 2. Pie chart of nighttime O_2 demand of ecosystem components in Wequetequock Cove.

Findings

- **O_2 consumption** in Wequetequock Cove is dominated by **Cladophora**.
- O_2 consumption by plankton and in sediment was a smaller contribution.
- O_2 consumption by animals was trivial.

Sources

Peck, M. A., Katersky, R. S., Menard, L. M., & Bengtson, D. A. (2003). The effect of body size on food consumption, absorption efficiency, respiration, and ammonia excretion by the inland silverside, *Menidia beryllina* (Cope) (Osteichthyes: Atherinidae). *Zeitschrift Für Angewandte Ichthyology*, 19(4), 195–201.

Newell, R., Ahsanullah, M., & Pye, V. (1972). Aerial and aquatic respiration in the shore crab *Carcinus maenas* (L.). *Comparative Biochemistry and Physiology*, 43(2), 239–252.