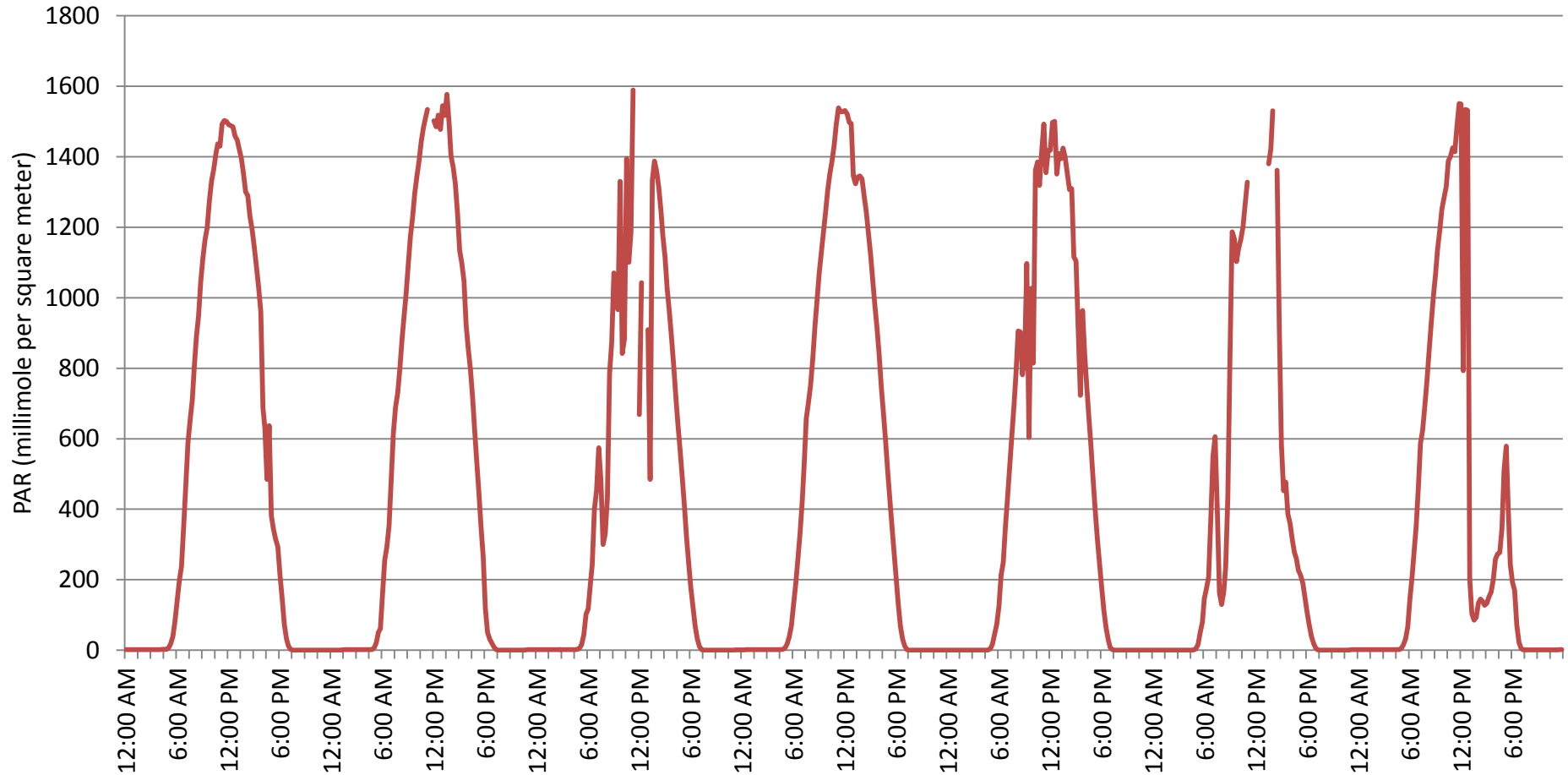




Light Energy at Weeks Bay Student Handout

Light energy recorded at Weeks Bay NERR July 4-10, 2014

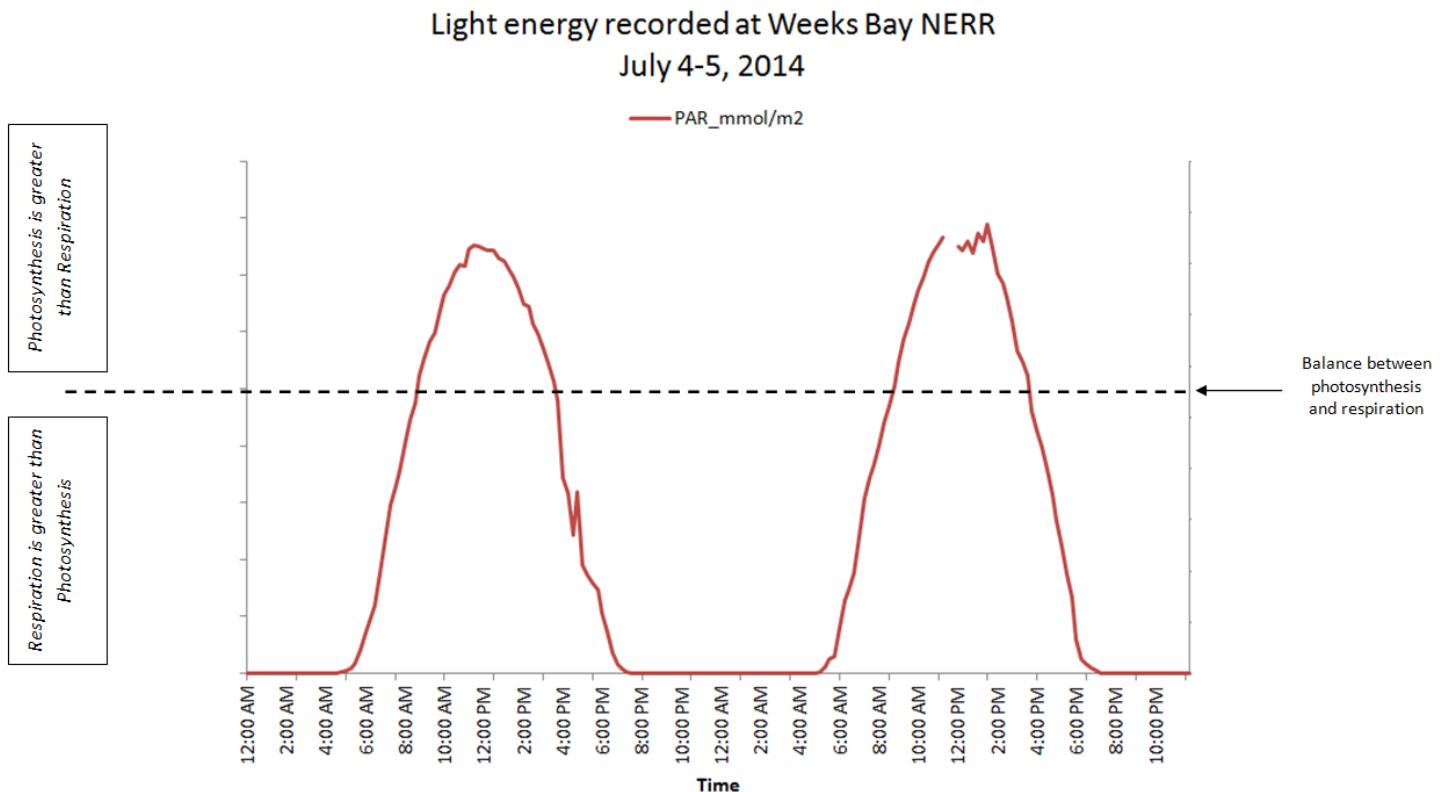


Predicting changes in O₂ and CO₂ using authentic local data

Student Handout

The figure below represents two days of light energy recorded at Weeks Bay. In this dataset, light energy is measured as photosynthetically active radiation (PAR), which is an areal measurement of amount of light available at the surface of the earth. The unit of measurement for PAR is millimoles per square meter.

- 1) Thinking about the relationship between light energy, photosynthesis and phytoplankton in the water, what do you predict would happen to dissolved oxygen concentrations as light intensity increases?
- 2) Assuming plankton respiration is relatively constant throughout at 24 hour period, what would you predict to happen to dissolved oxygen concentrations at night in the water column?
- 3) Thinking about the relationships you describe above, draw a line in the figure below representing your prediction of how dissolved oxygen concentrations would change over the two-day period as a result of photosynthesis and respiration. Conditions where respiration and photosynthesis are balanced are indicated by the hatched line.



- 4) Once you are done plotting your predictions, share with your neighbors and discuss any differences between your figures. You may also choose to check your predictions using the archived data on the NERR data portal. (Return to the homework at the end of Module 1C for instructions accessing data).
- 5) Using a different color pen or pencil, make a prediction about changes in CO₂ concentrations that you would expect over the two-day period.