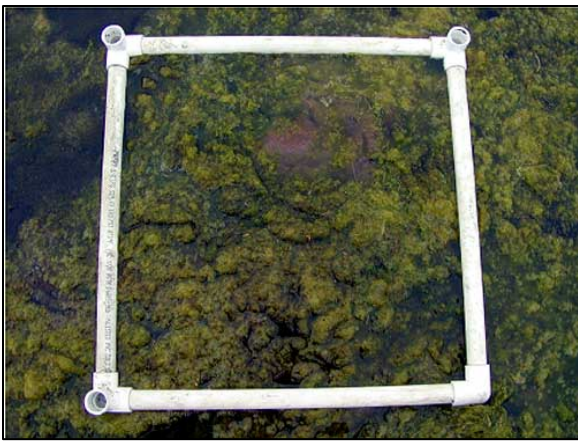


Can algae be used to create clean energy?

Clean and renewable energy sources are becoming more mainstream because of their environmental benefits and decreasing costs. The production of biological hydrogen through anaerobic fermentation is an appealing approach to achieving reliable clean energy. Hydrogen reduces our dependency on fossil fuels; it can be used to make fuel cells that can power everything from buildings to cars. The only byproducts of the fermentation process are water and biofertilizer, and the process itself can act as a carbon sink. Biofertilizers can replace chemical fertilizers, promote crop health and reduce nutrient runoff.



Elkhorn Slough is a seven-mile long tidal slough and estuary located just north of Moss Landing Marine Laboratories. The slough is the largest tract of tidal salt marsh in California and provides habitat for hundreds of species of plants, invertebrates, fish, migratory birds and marine mammals. The Slough is surrounded by agricultural lands that drain into the Slough. The runoff is rich in nutrients and fuels the growth of large, dense mats of the green alga *Ulva lactuca* that often

cover sensitive areas of the Slough. These mats can deplete oxygen levels in water column and cause shifts in community assemblages.

By collecting *U. lactuca* from areas of interest throughout the Slough and fermenting it with anaerobic bacteria it may be possible to reduce the effects of eutrophication within the Slough and produce clean energy at the same time. This project aims to 1) quantify how much biological hydrogen can be produced from *U. lactuca*, and 2) determine the quality of the biofertilizer produced through the fermentation process.



As an undergraduate student assistant for this project, you will get to assist with:

- Preparing for and monitoring the fermentation process
 - Collecting and preparing batches of algae for fermentation
 - Plating bacterial cultures
 - Identifying microbes

Things you will learn/be exposed to:

- Field sampling techniques and experimental design
- Basic algae identification
- Nitrogen and carbon cycles
- Laboratory procedures
- Operation of anaerobic chamber and autoclave
- Data organization

You will need to be willing and able to:

- Carry up to 50 lbs.
- Work in wet and dirty conditions
- Work with syringes
- Work independently and as a team member
- Reliably get yourself to Moss Landing Marine Laboratories

Looking for someone who is:

- Hard working
- Enthusiastic
- Attentive to detail
- Organized
- Focused