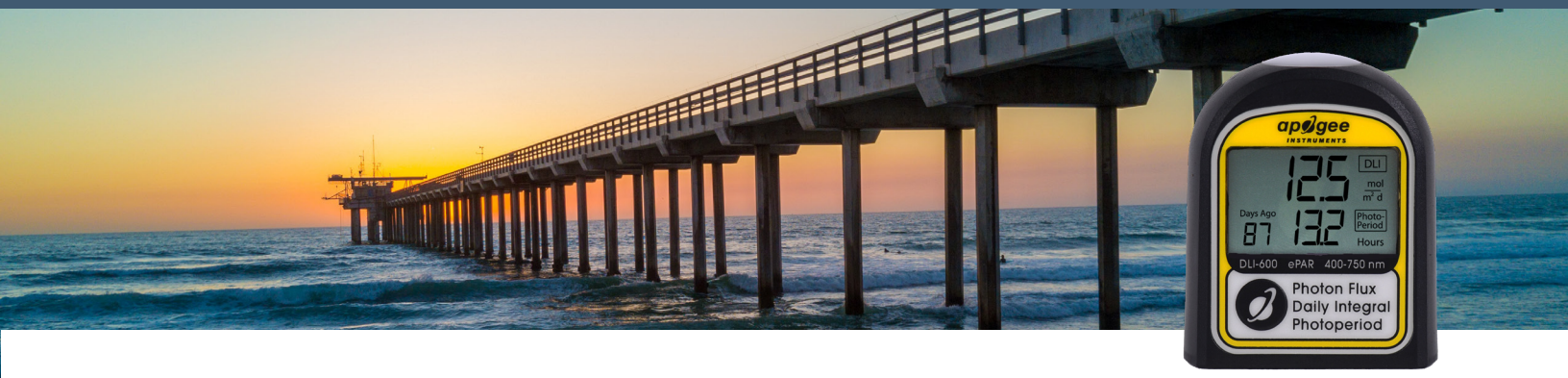
Incubation Environment that Mimics Coastal Microbiomes

Daily Light Integral Meter



Introduction:

Based on location, time, and season, coastal environments can vary widely. These environmental fluctuations affect the microbial communities in coastal waters, from things like temperature, photosynthetically active radiation (PAR), diversity, and nutrient availability. Based on the difficulty of running experiments on location in coastal areas, this research team theorizes that a combined laboratory and field model would be most effective for studying microbiomes.

Set Up:

The team created a model using a standard water bath shaker modified with programmable electronic lights and temperature cycles to mimic a natural coastal environment. The water bath allowed for quicker changes in thermal temperature.

To test how this build compares to real-environment conditions, the team ran a two-day experiment comparing changes to coastal microbiomes at the Ellen Browning Scripps Memorial Pier in La Jolla, California, versus incubation in their model mimicking live conditions at Scripps Pier in real time.

The researchers used an Apogee DLI-600 daily light integral meter to measure the 24-hour programed light cycle in the model. This meter tracked the PAR light levels and daily light integral the microbes received in the experiment.

Results:

After comparing the microbe profiles in nature and in their experiment, the researchers saw that there was significant overlap ($p > 0.2$) between the two at each time point. This indicates that their water bath build was successful and could help other studies being performed in coastal microbial ecology research. In future experiments, the team wants to better match the spectrum of natural sunlight with their adjustable lights.

Conclusion:

The researchers' build is open access to anyone who wants more information and is an affordable way to modify common laboratory equipment to research microbes in a controlled environment.

Application Summary

Summary:

Using an Apogee DLI-600 meter, researchers developed an incubation water bath to accurately monitor coastal microbiome profiles in a laboratory environment.

Apogee Sensor Used:

DLI-600 daily light integral meter

Authors:

- Brad T. Hunter
- Jaeden D. Flury
- Sebastian S. Cocioba
- Matthew L. Cope-Arguello
- Jared M. Helms
- Kevin H. Garcia
- Gerardo Dominguez
- Darcy AA. Taniguchi
- Elinne Becket

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