PreSens
PRECISION SENSING

Characterize Your Algae

Sensors for Photosynthesis & Respirometry Measurements

Dear Max Mustermann

Water is the basis of all life. And regardless of whether you are investigating microbial activities in limnic ecosystems, want to keep an eye on the health status of corals and algae in the ocean, or are investigating the photosynthesis and calification of crustose algae - the PreSens sensor variants open up ways of minimally invasive and non-invasive measurements of O2, pH and CO2.

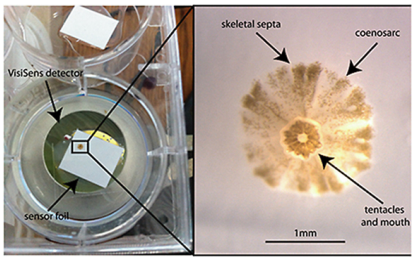
The three applications examples below give you an idea on how our sensor systems can contribute to successful research work. Any questions regarding your customized application? Then do not miss to contact our expert, Dr. Martin Gutbrod, directly!

Your PreSens Team

Application Examples

Recording Spatial Patterns of Oxygen Consumption in Individual Corals

Assessing Coral Health Under a Changing Climate with VisiSens



The calcified skeleton of corals makes it difficult to take biological measurements. The VisiSens imaging system was applied to measure oxygen consumption patterns in individual corals immediately after settlement and initiation of calcification. Furthermore, the difference in oxygen consumption between corals exposed to ambient or low pH conditions, which mimic future ocean acidification, was investigated.

After as early as two minutes of dark respiration an oxygen gradient across the cross section of the coral spat could be detected with VisiSens. Exposed to low pH, the oxygen consumption of the corals increased compared to measurements in ambient seawater. The VisiSens system provided excellent spatial resolution, and allowed oxygen mapping across all tissue compartments of the corals simultaneously.

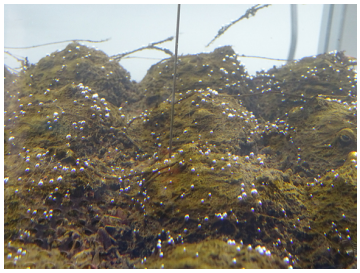
>> Read the entire application note!

Components needed for your set-up:
VisiSens A1 + Oxygen Sensor Foil + VisiSens Analytical 1 Software

High Resolution O2 Microprofiling of a Freshwater Stream Biofilm

Use of an Automated Micromanipulator System and O2 Microsensors in a Flume Experiment

The objective of this study was to determine oxygen fluxes and the spatial micro-heterogeneity of microbial respiration and photosynthesis of a stream biofilm from the Selke stream, Harz Mountains. For this purpose, we used PreSens fiber optic O2 microsensors and an Automated Micromanipulator system to record O2 micro-gradients within the biofilm and overlaying water in 100 µm resolution. The results were related to mean flow and turbulence conditions above the biofilm and showed strong variations in relation to the flow field.



>> Read the entire application note!

Components needed for your set-up:
OXY-1 ST + PM PSt7 + AM + PreSens Profiling Studio

O2, pH and CO2 Dynamics in Salt Marsh Tidal Ponds

Investigations under Different Light Regimes with Optical Profiling Microsensors and an Automated Micromanipulator

Salt marsh ponds are extreme environments characterized by high microbial activity and strong biogeochemical gradients at the sediment water interface. In this study, we investigated the O2, pH and CO2 dynamics in the top sediment layer of marsh ponds under different light regimes. Using the Automated Microprofiling System from PreSens (Automated Micromanipulator AM & Profiling Microsensors PM) profiling of O2, pH and CO2 was conducted on marsh pond sediment cores in a growth chamber under light exposure ranging from 0 to 350 photons m-2 s-1.

The oxygen penetration depth increased from 1 mm in darkness to 2 - 6 mm in light. At the sediment-water interface, photosynthetic activity by benthic microalgae and other photoautotrophs resulted in supersaturated oxygen conditions (400 - 700 µM) in light. In contrast, pH and CO2 at the sediment surface was unaffected by the varying light conditions and high photosynthetic activity suggesting a high buffering capacity of the pond water and sediment.

>> Read the entire application note!

Components needed for your set-up:
MX4 + pH-1 micro + CO2-1 ST + AM + PM-PSt 7 + PM-HP5 + NTH-CDM1 + DP-CDM1-ST

You would like to learn even more about PreSens Precision Sensing? Please visit our homepage www.presens.de and don't hesitate to contact us. Any feedback will be appreciated.

With kind regards

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Communications

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