AQUACULTURE

APPLICATION GUIDE

ACCURATE AQUACULTURE MONITORING FOR ROBUST PRODUCTION | Global monitoring solutions.

From shoreside oyster farms to salmon pens in the open ocean, aquaculture has historically augmented seafood supply traditionally dominated by commerical fishing. Today, thanks to advances in technology and increased demand for sustainably-sourced seafood, aquaculture is a major source of food and income. Governments across the world have recognized the financial and environmental benefits of aquaculture, and those with access to suitable marine land are leveraging new technology to establish aquaculture facilities.

PREVENTING DISEASE.

In 2007, an outbreak of Infectious salmon anemia (ISA) stalled the rapid growth the Chilean salmon farming industry, prompting an immediate response.

In the years since the ISA outbreak, new monitoring regulations imposed by the Chilean government have improved operators' knowledge of the environment's capacity to support aquaculture. These regulations have prevented large-scale spread of disease.

However, not all locations are suitable, and choosing the wrong location can be dangerous. Integrating an artificial aquaculture plot with the natural environment can negatively impact the surrounding water and impose a risk to the farmed species. Environmental events like a harmful algal bloom can introduce toxic chemicals and clog fish gills, while ocean acidification can decimate entire generations of shellfish. In 2007, an outbreak of Infectious salmon anemia (ISA) stalled the rapid growth of the Chilean salmon farming industry, prompting an immediate response.

Fortunately, the tools traditionally used by oceanographers and environmental scientists of all disciplines are readily available. By using water quality sensors, organizations are able understand what makes an appropriate site for aquaculture, how to protect their investment, and avoid impacing the natural environment.

Sea-Bird Scientific has provided the standard in oceanographic research tools for decades. Our line of CTDs and biogeochemical sensors offer research-grade performance in a field-proven package; perfectly suited for today's science-driven aquaculture facilities.

KEY PARAMETERS FOR AQUACULTURE

Understanding how our instruments support sustainable & compliant aquaculture programs.

1 Phycoerythrin, phycocyanin & fDOM

HABs pose both a physical and chemical threat to fish and shellfish farms. Serious HABs can clog fish gills and introduce toxic chemicals into the food chain. Autonomous sensors that measure phycoerythrin, phycocyanin, chlorophyll, turbidity, nutrients, and photosyntetically active radiation (PAR) can provide data for advanced modeling and prediction of HABs.

2 Disolved oxygen (DO)

Dissolved oxygen must be within a range that supports sea life. Low or anoxic conditions resulting from upwelling or eutrophication can lead to massive mortality events. Measuring dissolved oxygen at different depths, including within sediment and just above the seafloor, is crucial for health and safety of the fish stocks. A well-designed autonomous system can use sensors that inform operators when to utilize equipment that safely oxygenates the water.

3 pH

Ocean acidification is of particular concern to shellfish aquaculture. Monitoring long-term trends of pH as well as discrete events is crucial for determining environmental health and preventing vulnerable juveniles from exposure to corrosive water.

4 Temperature & salinity

CTD data, including water temperature and salinity provide valuable baseline measurements that characterize an environment. All species thrive in an ideal range of ocean conditions. Some species thrive in warmer brackish water, while others prefer cold open-ocean pens. Measuring CTD data allows operators to select a plot within the bounds of the appropriate environmental ranges.

KEY SYSTEMS

Our best in class sytems to make your aquaculture program successful.

HYDROCAT-EP V2
MULTIPARAMETER PROBE

The HydroCAT-EP V2 is one of our sleekest multiparameter CTDs that can measure everything from conductivity, temperature, and depth, to dissolved oxygen, chlorophyll, turbidity, and pH.

	CHLOROPHYLL	CONDUCTIVITY	DISSOLVED OXYGEN	fDOM	NITRATE	PH	PHYCOERYTHRIN	PHYCOCYANIN	PRESSURE	TEMPERATURE	TURBIDITY
37-SMP-ODO CTD		±0.003 S/m	±0.1 mg/L						±0.1% of full scale range	±0.002 °C	
39PLUS Temperature and Pressure Logger		± 0.1% of full scale range								±0.002 °C	
ECO V2 Combination Optical Sensors	0–400 µg/L			0–900 ppb			0-175 ppb	0-230 ppb			0-350 NTU, 0-1000 NTU
HYDROCAT-EP V2 Multiparameter CTD	±3% signal equivalent of Uranine	± 0.0003 S/m (0.003 mS/cm)	±0.1 mg/L			± 0.1 pH			±0.1% of full scale range	± 0.002°C up to 32°C ± 0.01°C (over 32°C)	±1%
SBE 56 Miniature Temperature Logger										±0.002 °C	
SEAFET™/ SEAPHOX™ V2 ISFET pH and CTD		±0.0003 S/m	±0.1 mg/L			±0.05 pH			±0.1% of full scale range	±0.002 °C	
SUNA V2 Nitrate Sensor					0.028 mgN/L (2 µM)						