

Local weather insights for optimal marine ranch operations

A marine ranch in China improves operational resiliency with local Vaisala meteorological observations



The client:

Zhoushan Oceanthink Marine Science & Technology Co., Ltd

Vaisala provided:

Weather Transmitter WXT536

By integrating Vaisala weather measurement technology with the multi-parameter water quality instrument, overwater and underwater high-definition cameras, Oceanthink's system provides continuous marine monitoring for the long-term, continuous, in-situ and online observation of the underwater environmental elements, surface meteorological elements, and overwater and underwater video of the marine ranch. It can effectively control the ecological environment quality, regularly report marine ecological conditions, conduct timely disaster warning, improve the disaster prevention and mitigation ability, and realize visualization, detection, control and early warning of the marine ranch.

Oceanthink has built marine ranch observation stations and established a marine ranch observation network in Shandong Province, China. Through operational running and application demonstration, they have achieved remarkable results and have repeatedly sent warnings to marine ranches and related administrative departments to guide disaster prevention and mitigation, bringing significant economic and social benefits.



Marine ranching is a unique approach to sustainability in coastal environments. Popular in China, this type of aquaculture takes part in an enclosed section such as a bay where marine organisms are cultivated for food and other products. Not only do they nurture aquatic life, they are also increasingly popular

destinations for tourism and fishing. Marine ranches are subject to weather and oceanic events, and monitoring conditions is vital to their management and protection.

Zhoushan Oceanthink Marine Science & Technology Co., Ltd. (Oceanthink) specializes in providing marine environment

online observation systems. Their submarine cable online observation system is used by marine ranches for ecological environment monitoring and early warnings.

Local observations in the bay

One of Oceanthink's marine ranch observation stations is located at a marine ranch in Bohai Bay, China, which is surrounded by land on three sides. The bay is located in



parameters traceable and a protection grade of IP66, WXT536 measures the six most important weather parameters at temperatures ranging from -52° C to +60° C: air pressure, temperature, humidity, rainfall, and wind speed and direction.

The Weather Transmitter WXT536 integrates Vaisala's solid-state sensor technology which allows it to deliver weather data after just five seconds

display of the information, strengthening the real-time monitoring of the marine ranch's meteorological environment.

Through the marine ranch observation network's website and APP, operators get real-time information about the ecological environment and timely warnings which can help them minimize or avoid marine ecological emergencies such as hypoxia and algal blooms. This detailed information provides strong economic value by improving disaster prevention and mitigation ability and reducing economic losses of the ranch.

At the same time, the marine ranch observation network is of great social significance: It provides necessary ecological environment information for relevant government departments, marine ranch enterprises and farmers as well as the public, while supporting construction and basic support services for the healthy development of coastal tourism and aquaculture.



the mid-latitude monsoon region and has heavy rain seasons. Highly accurate meteorological measurements are critical for managing the marine ranch, however, existing meteorological observation stations in the sea area are limited and not close enough to the project site to provide accurate data.

The company needed to construct meteorological observation stations directly on the marine ranch site to obtain local and reliable meteorological observations. Due to the harsh environment, limited power supply, difficult and costly daily maintenance of offshore projects, the stations had to be built with strong corrosion resistance, low power consumption and high reliability.

Reliability in tough ocean environments

All of Oceanthink's requirements were fulfilled with the Vaisala Weather Transmitter WXT536, and they installed the solution on the site. Made of strong anti-corrosive materials, with all

of startup. Oceanthink uses Vaisala's WINDCAP® Ultrasonic Wind Sensor to determine the horizontal wind speed and direction. Air pressure, temperature and humidity measurements are integrated in the PTU model, with capacitive measurement for each parameter. This module is easy to change without any contact with the sensors.

Rainfall measurement is based on Vaisala's RAINCAP® acoustic sensor, which can effectively prevent flooding, clogging, wetting and evaporation loss. The sensor provides a heating mode to prevent icing, with characteristics of low power consumption and no maintenance.

Operational, economic and social benefits

The Weather Transmitter WXT536 is connected to the marine ranch observation system to provide all the meteorological data the marine ranch needs. The system transmits the collected data to the cloud server, which can perform real-time processing, analysis and

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