

# GPS-Based Miniature Oceanographic Wave Measuring Buoy System

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## BACKGROUND

Oceanic monitoring helps coastal communities, economies, and ecosystems thrive. The coastlines and open oceans prove to be very important to maritime countries for recreation, mineral and energy exploitation, shipping, weather forecasting and national security. As solar power, GPS, and telecomm improvements have been made, directional wave buoys have emerged and set the standard in wave monitoring. Non-directional and directional wave measurements are of high interest to users because of the importance of wave monitoring for successful marine operations. Wave data and climatological information derived from the data are also used for a variety of engineering and scientific applications.

## TECHNOLOGY DESCRIPTION

CORDC's Miniature Wave Buoy (MWB) is a GPS-based miniature oceanographic wave measuring buoy system that's low cost, expendable, can be deployed and recovered quickly or moored, and offers equivalent accuracy to current market options. The buoys can withstand harsh and varying ocean conditions. The full system includes satellite data telemetry, web based command and control center, and end user data delivery.

The MWB provides research quality real-time wave measurement and reporting of directional wave spectra, with relatively little operational overhead. They can be deployed from ships of opportunity for long term monitoring applications or air deployed in quick response to maritime operations such as search and rescue or oil spill response.

Software provides near real-time processing, monitoring, management and services for wave buoys. Near real-time processing is event triggered, which minimizes data latency. Data can be relayed from the processing server in several protocols and formats including email, SMS, FTP, SFTP and Delorme IPC. Automated monitoring utilities can be configured to provide notification to operators about deployment events. Automated bi-directional communication provides users the option of pre-configuring a unit prior to deployment.

## APPLICATIONS

This invention is a useful for the following:

- ▶ Coastal engineering
- ▶ Government departments for coastal protection and maritime safety
- ▶ Marine constructors / Oil Industry
- ▶ Environmental monitoring
- ▶ Weather monitoring
- ▶ Shipping
- ▶ Process-study and operational oceanographic research
- ▶ Validating and guiding wave model forecasts

## ADVANTAGES

- ▶ Near real-time data uploads
- ▶ Easy to deploy and recover
- ▶ Lower cost with similar accuracy to market alternatives

## STATE OF DEVELOPMENT

The Coastal Observing Research and Development Center (CORDC) at the Scripps Institution of Oceanography has designed, developed, tested, and validated a GPS-based miniature oceanographic wave measuring buoy system. Over 200 MWBs have been deployed by/for ONR, NAVSEA, NAVAIR, NAVO, NOAA, UK-MOD, on a global basis, under various requirements for the real time measurement and reporting of directional wave spectra.

## INTELLECTUAL PROPERTY INFO

The technology is available for licensing.

## CONTACT

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## OTHER INFORMATION

### KEYWORDS

GPS monitoring, wave measuring  
buoy, weather, maritime safety, wave  
model forecast

### CATEGORIZED AS

- ▶ **Communications**
  - ▶ Other
- ▶ **Computer**
  - ▶ Software
- ▶ **Environment**
  - ▶ Sensing
- ▶ **Security and Defense**
  - ▶ Other

### RELATED CASES

2017-818-0

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