

# THE SeaSonde®



COASTAL

LONG RANGE

HIGH RESOLUTION

For automated, real-time surface current mapping and wave monitoring

## See The Ocean from an Amazing Perspective

The **SeaSonde** HF radar system by CODAR Ocean Sensors is your solution for making continuous, wide-area ocean observations. The SeaSonde will provide you with years of real-time data over large coverage areas, with ranges up to 200 km -- This is not possible with any other technology!

The **SeaSonde** is a **compact, non-contact** surface current and wave measurement system that can be deployed and maintained easily, and will perform even during extreme weather conditions such as hurricanes.

## High Quality Data

CODAR Ocean Sensors' patented technologies, including our processing algorithms, allow the **SeaSonde** to produce **extremely accurate** 2-D surface current velocity maps and measures the most important wave parameters. Patented antenna design and processing algorithms enable the system with up to 360° coverage. The patented pulsed FMCW eliminates the range aliasing and antenna wind-vibration noise inherent to other HF system designs.

## Focus on Your Application

The **SeaSonde** is an off-the-shelf tool that allows you to focus on applying the data rather than the technology of collecting it. Whether your work efforts involve guiding search and rescue operations, providing critical information to maritime vessels, or driving and improving numerical circulation models, the SeaSonde will be an immense aid.

## System Highlights:

**Convenient:** Nothing in the water: a truly non-contact sensor. All hardware is located on the coast or an offshore structure. The patented compact antenna design greatly simplifies siting requirements.

**Reliable:** All system hardware and software are developed by our own staff specifically for continuous, long-term field operations, and consistent data outputs.

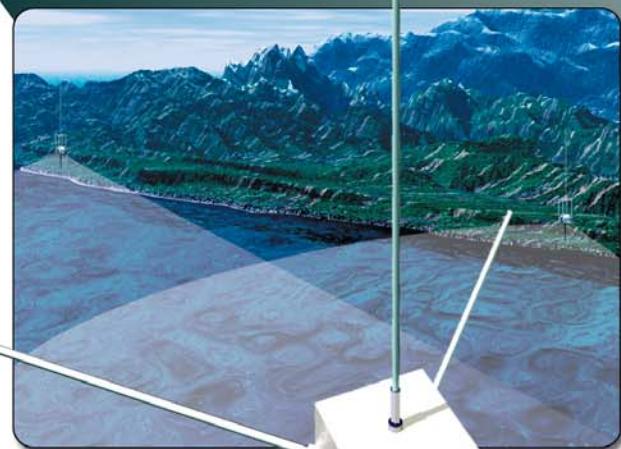
**Flexible:** The software parameters are highly flexible, yet designed to work smoothly, eliminating any need for you to become a computer programmer or radar expert.

**Automated:** Data can automatically arrive at your office at your preferred intervals, and can also be sent directly to the Web for public viewing.

**Remote Access:** Data retrieval, system monitoring, parameter modifications and even factory support are all conducted through system remote access.

**Low Power:** SeaSondes' low power consumption allow for working off-the-grid with alternative energy sources.

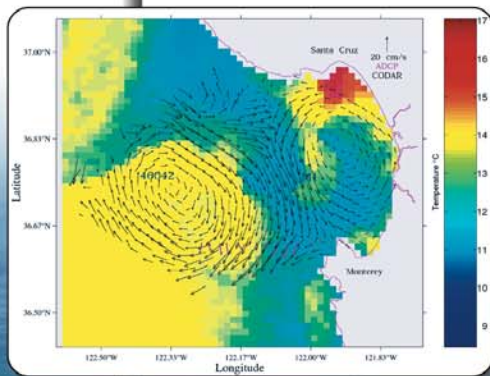
**Cross-Platform Data Format:** All data products are stored as ASCII files for convenient data transfer to various computer platforms, incorporation into numerical models and GIS programs.



2-radar SeaSonde network at coast



SeaSonde® Station Hardware



Monterey Bay, California.  
Data courtesy of  
J. Paduan & L. Rosenfeld,  
Naval Postgraduate School.

SeaSondes deployed in  
San Diego area  
by Scripps Institute  
of Oceanography.

# CODAR OCEAN SENSORS

## SeaSonde® General Specifications†

SeaSonde Configuration:	Standard	Hi-Res	Long-Range
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### Spatial Range (typical)

Alongshore:	20-60 km	15-30 km	100-220 km
Offshore:	20-75 km	15-20 km	140-220 km

• Ranges achieved vary with environmental conditions and antenna placement. Note: Two radars are normally required for creating 2-D surface current maps of direction and speed.

### Range Resolution

	500 m - 3 km	200-500 m	3-12 km
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• Resolution is user selectable.

**Angular Resolution:** 1-5 degree grid; user selectable.

**Current Accuracy:** Varies with environment. Comparisons with ADCPs located in close proximity to the surface are typically < 7 cm/s of the total current velocity and 1-2 cm/s of the tidal component.

**Wavefield Products** (measured at each radar): Local on-shore wave conditions in ring centered ~3 km from coast around each radar. Significant Waveheight: typical accuracy: 7-15%; Dominant On-Shore Direction: typical accuracy: 5 degrees -12 degrees; Dominant Wave Period: typical accuracy: 0.6 s; Other spectral wave parameters available. Wave information is limited by environmental conditions and operating frequency.

### Frequency Range (antennae tuned to operate within):

	Standard	Hi-Res	Long-Range
	one of either: 11.5-14 MHz or 24-27 MHz	one of either: 24-27 MHz or 40-44 MHz	4.3-5.4 MHz

- Patented technology permits the simultaneous operation of multiple radars on a single frequency, thereby minimizing frequency requirements and interference.
- Operators must adhere to their country's radio communications regulations regarding radiated signal specifications, and receive proper authorizations prior to operation. *Consult company.*

### Equipment Dimensions:

Transmit Antenna Height:	4.8 m for 11-14 MHz	Combined with RX	9 m
Transmit Antenna Post	4 m	N/A	N/A

Receive Antenna weatherproof box 13H x 25W x 25D cm. Weight: 4.5 kg.  
 Receive Antenna box for all configurations resides upon a 4 m support post  
 Receive Chassis: 13H x 49W x 53D cm. Weight: 14 kg  
 Transmit Chassis: 13H x 49W x 53D cm. Weight: 15 kg

### Maximum Distance Between Adjacent Radars:

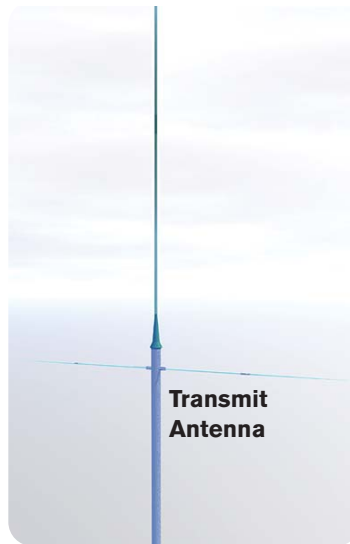
Recommend 40-60% of the radar's offshore range.

### Power Requirements:

Either 120 VAC or 220 VAC, 50-60 Hz; total onsite electronics varies between 350 and 500 watts depending upon peripherals desired.  
 [24 volt DC versions also available]

### Output Radiated Power: 80 watts peak, 40 watts average

† For complete system specifications, please consult Technical Specification sheets available on Company website.



Transmit Antenna

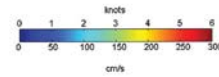
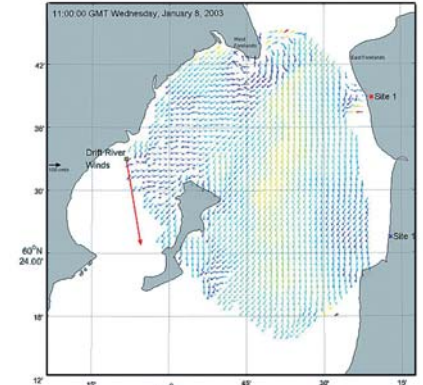
Receive Antenna



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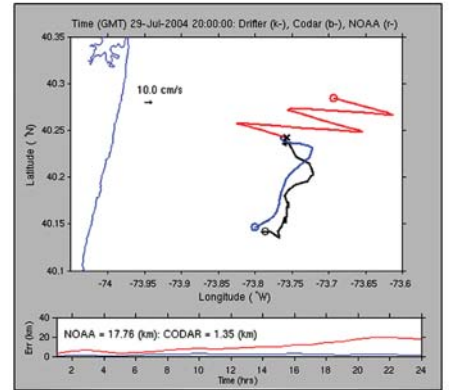
### SeaSonde® Surface Currents - Cook Inlet - Alaska



Courtesy of D. Musgrave,  
 U. Alaska Fairbanks



### SeaSonde® Search & Rescue Exercise



Red = Drifter/lost person track based on older models  
 Black = Actual track of the GPS drifter  
 Blue = Predicted path based on models using real-time SeaSonde data

The US Coast Guard, in collaboration with the University of Connecticut and Rutgers University, set search parameters for a drifting body off the New Jersey coast using data obtained from Long-Range SeaSondes.

### About CODAR

CODAR Ocean Sensors personnel are the inventors and original developers of HF radar technology for ocean monitoring applications, some having been in this field for nearly 40 years. CODAR staff continue to make advancements in radar physics theory as well as product engineering refinements, and apply them so to ensure the SeaSonde its rank as most advanced yet reliable HF radar system in the world. Staff are also skilled in analysis and interpretation of data in oceanographic terms, allowing the company to provide Top Level client support.

SeaSondes are deployed in over 15 countries, with over 200 systems in operation.

Additional information is available on our Company web site at [www.codar.com](http://www.codar.com). Enquiries should be directed to Company headquarters or Local Representative.