

# Coastal Erosion and MetOcean Data for Port Construction

RD Sea and Teledyne RD Instruments Collaborate to Provide Real-Time Environmental Monitoring Data for Port Construction

## OVERVIEW

APM Terminals Moin has announced a number of port project updates enabling Costa Rica's future economic growth needs through a safe, world-class, high-productivity and environmentally-sustainable container terminal designed to serve the larger vessels entering the Latin American trades, in particular the temperature controlled containers through which fresh fruit is now being transported to North America and Europe. Costa Rica is currently the world's largest exporter of pineapples, and the third-largest exporter of bananas; sugar, coffee and beef are also major export products. Costa Rica's exports totaled US\$11.75 billion in 2014, with the US its largest export market, the destination of nearly 40% of all Costa Rican exports. In the first six months of 2015, Costa Rica shipped over a billion tons of pineapples, 473,000 tons of which were destined for the USA. Costa Rica's exports account for 40% of the Central American nation's GDP



Artist's rendition of the completed port in Moin, Costa Rica.

Data Collection Date  
March – July, 2016

# Teledyne RD Instruments

## Instruments

### Product:

Express WH-ADCP, 600kHz

### Application:

MetOcean surface buoy with surface Met, water column currents and turbidity. 16m depth, Caribbean Sea, east of Costa Rica, Latin America

### Project:

New Shipping Container Port in Moin, Limon Province, Costa Rica, Caribbean Sea

### Organization:

APM Terminals, Netherlands (AMPT), Central Cientifical Tropical (CCT), San Jose, Costa Rica, Campbell Scientific Central Carib (CSCC), San jose, Costa Rica and RDSEA International, Inc. St Pete Beach, FL

### Contact:

Ing. Henan Villalopos, CSCC, Costa Rica, Rick Cole, RDSEA, FL

### Data Collection Date:

March – July, 2016, deployment #01 for a 3 year scheduled project

### Location:

Moin, Limon, Costa Rica

## OVERVIEW

The existing port of Limon was constructed over 30-years ago and with the increase of import/export activities of Costa Rica and Latin America in general, a new, up to date container port must be constructed to handle the steady stream of vessel traffic in and out of the country. In parallel to all the pre and present construction involved, dredging, seawall manufacturing and permanent pier support, all environmental conditions must be monitored, both terrestrial and marine related. Coastal erosion and offshore MetOcean parameters are required to be measured during the construction phase of the project and are to begin in the Spring of 2016 for a duration of 3-years. Costa Rica is very “environmentally conscience”. All parties involved in this project must adhere to strict environmental standards.

## SOLUTION

A met-station has been installed on the beach close to the construction site and a MetOcean surface buoy system has been designed, shipped and deployed 1km offshore from the new port facilities. Full meteorology at the sea surface; wind speed and direction, pressure, air temperature and relative humidity along with water column current velocity and direction (Teledyne RD Instruments, TRDI) and turbidity (Campbell Scientific OBS) are to sample over an hourly basis with data transmitted to the shore via the cell phone network of the region. A TRDI Sentinel V WH-ADCP is also employed close to the buoy system to collect wave spectra; height, frequency and direction (self-contained data, non real-time). Buoy data will be received at the client’s main office in San Jose and disseminated to all parties for viewing. Both offshore systems are to be serviced on a 4-month schedule.

## Highlights:

- Coastal erosion and offshore MetOcean parameters are required to be measured during the construction phase of the project and are to begin in the Spring of 2016 for a duration of 3-years.
- Full meteorology at the sea surface; wind speed and direction, pressure, air temperature and relative humidity along with water column current velocity and direction and turbidity are to sample over an hourly basis with data transmitted to the shore via the cell phone network of the region.
- A TRDI Sentinel V WH-ADCP is also employed close to the buoy system to collect wave spectra; height, frequency and direction (self-contained data, non real-time).



RDSEA President and CEO, Rick Cole with Completed AMPT-CCT Buoy System in Florida. Ready for Shipment

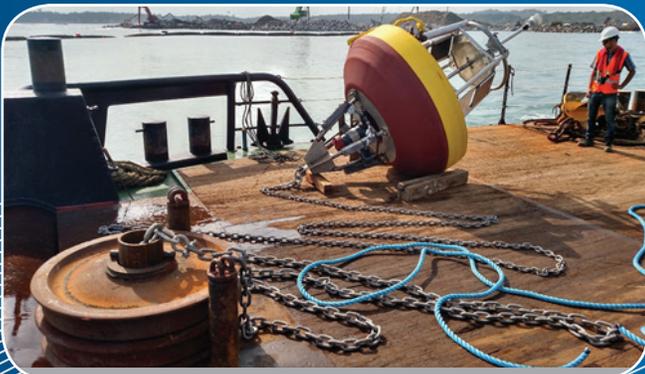
# Teledyne RD Instruments

## RESULTS

In March of 2016 the offshore plan for environmental monitoring the new port construction in Moin was established. Once all logistics to transport, build, test and make ready for sea were completed, the system was loaded aboard the project's work vessel MAGGIE-M and taken offshore for deployment. Depth is shallow, 16-meters and only 1km from the pier. Deployment took less than an hour pier-to-pier and was a complete success. Weather was perfect with no wind and calm seas. Wet-data transmission was confirmed immediately due to the CSCC App on the project leads' smart phone. All parameters were coming in as planned. Further monitoring took place for the next few days to make sure all was well before project personnel departed the region. Data continues to report daily. Sentinel V data will be downloaded manually upon recovery in July.

### Highlight:

- In March 2016, the Met Ocean Buoy and Sentinel V were successfully deployed, with daily data reports
- The Buoy system is an RDSEA design taking decades of experience in the ocean climate monitoring community both in blue-water and coastal monitoring.



## SUMMARY

After nearly a year of planning the initial phase of the monitoring project, everything was a complete success. All sensors, including the Express WH-ADCP performed perfectly and continue to do so. The Buoy system is an RDSEA design taking decades of experience in the ocean climate monitoring community both in blue-water and coastal monitoring. RDSEA also has over 30-years of working with RD Instruments and ADCPs ("Ocean Climate, Off the Shelf" Cole et al, Marine Technology Society (MTS) Journal, Jan/Feb,2013, Vol 47, No 1). Partnering with Campbell Scientific, Logan, UT, Campbell Scientific Central Carib, San Jose, Costa Rica and Teledyne RD Instruments made this project complete and entirely successful. We have never seen happier clients!



Contact RD Instruments  
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