OXTS

CASE STUDY

Southern Cross University

Southern Cross University partners with multiple organisations to embark on a coral reef restoration project using an OXTS GNSS/INS.

PROJECT AIM

Southern Cross University, a partner in the Reef Restoration and Adaption Program (RRAP), wanted to estimate the emission of specific compounds from the Great Barrier Reef under a variety of conditions. To do this, they needed to combine data from their sonic anemometer (which records three-dimensional wind velocity) with data from an Inertial Measurement Unit (IMU) to calculate wind speed.

CHALLENGES

+ Use data from an IMU to compensate for the movement of the ship carrying the sonic anemometer in order to get a clear measurement of wind speed.
+ Synchronise the data from each sensor in order to combine the two datasets correctly.
+ Configure the system to make the data processing workflow as simple as possible.

SUMMARY

Company:
Southern Cross University

Industry:
Environmental Science

Country:
Australia

Website:
www. scu.edu.au

OXTS Hardware:
xNAV650 GNSS/INS

OXTS Software:
NAVsuite

Partner:
Industrial Measurement Solutions (IMS)

THE SOLUTION

One of the collaborators on the project, Airborne Research Australia (ARA), suggested that the university use an OXTS xNAV650 GNSS/INS. Southern Cross University contacted Australian OXTS channel partner IMS, who helped them navigate the commercial process.

The xNAV650's MEMS IMU allowed Southern Cross University to accurately measure the motion of the ship. The GNSS/INS was configured to 'displace output' to the location of the 3D wind measurement instrument (the sonic anemometer), allowing the project team to record the movement of the instrument directly, thus avoiding any additional complicated processing steps.

In addition, the IMU was configured to output a PPS signal via serial connection. This enabled the project team to connect the IMU to the data logger of the sonic anemometer so they could sync the time between the two instruments. This was vital on such a rapidly moving platform.

PAYLOAD SPEC

The specification of the xNAV650 is:

+ Position accuracy: 0.02 m (RTK/PPK)
+ Roll/pitch accuracy: 0.05°
+ Heading accuracy: 0.01°
+ Data processed using NAVsuite

RESULTS

The system, using OXTS technology, worked as expected and allowed the team to gather the data they required. Feeding the wind speed data into their models allowed the team to accurately model the emissions under different conditions, and the impact of those emissions on the local climate.

"We managed to accurately record ship motion for the entire length of our second voyage. The reliability and accuracy of the xNAV650 has had a real impact on our ability to collect meaningful data"

Liz Deschaseaux,
RRAP