NORBIT Bathymetric Multibeam Survey Training

A comprehensive, hands-on training course in multibeam surveying.

Overview

The NORBIT Bathymetric Multibeam Survey Training Course is an opportunity for beginner and experienced surveyors to engage with experienced hydrography instructors in a hands-on training environment.

On the morning of the first day, we conduct a high-resolution bathymetric survey while highlighting and discussing industry best-practices. The data collected will be processed immediately following completion of the field module.

In the subsequent days, attendees will participate in practical classroom and field modules to learn best-practice surveying and data processing techniques and tips to improve quality and efficiency while carrying out multibeam hydrographic surveys.

Course Topics

- **SONAR Practical Theory (SBES, MBES, SSS & SBP)**
- **GNSS & INS Theory and Operation**
- **Installation, Integration and Configuration**
- **Hydrographic Project Planning**
- **System Calibrations and Validations**
- **System Operations (All Third-Party Software)**
- **Data Processing**

Location: Portland, Oregon USA
Dates: April 08-12, 2024
Format: In-Person
Tuition: $3,500*

**Price excludes travel*

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Course Topics in Detail

Project Planning

Time and tide wait for no one. This topic explains contributors that affect project duration estimation and means to account for known unknowns in survey planning. Considerations of depth, vessel speed, human and environmental conditions, etc. and necessary tasks are discussed. The group will carry out a thorough time, cost and error budget to complete a project survey to specifications.

SONAR Practical Theory

Students will learn relevant acoustic and sonar theory for correct operations in various environments. This will include the fundamentals of acoustics from initial sound generation to beamforming and influence of sonar parameters on bottom detection determination. Lessons on practical theory provides critical knowledge for field and office personnel. Topics include the importance of surface and profile sound speed for multibeam operations, power, gains, pulse length, frequency selection and resulting impact on data

GNSS & INS Theory and Operation

The fundamentals of GNSS and INS positioning and motion measurements will be explained. At the end of training, students will be able to understand the differences between various GNSS correction types, impact to project requirements, differences in motion sensor types, specs, spotting errors and how to best employ each type of sensor for the varying conditions.

Installation, Integration, and Configuration

Where you mount your sensors matters! We will teach you why, explain the pitfalls of improper mounting and how to avoid a bunk survey. Techniques for measuring offsets on a variety of vessels while avoiding measurement errors is demonstrated. System integration including wireless, ethernet and serial communications is explained and how to best configure for timely and sufficient records.

System Calibration and Validation

How do we ensure that our system is correctly installed, offsets determined and the orchestra is in sync? System calibrations, precision and accuracy validation procedures will be discussed including INS heading alignments, MBES alignment, pre-survey checks and how to carry out fully independent, repeatable and objective verifications. The net accuracy determination is compared against the sensor suite error budget and requirements.

System Operations

Once confident of system suite accuracy, we focus on acquiring clean data to meet project precision requirements. Sensor settings based on taught theory is employed while the group carries out a small example project survey. Focus is on maximizing sensor performance. Objectively know when to change system parameters. Know what data to log, recognizing gremlins, note taking, safe/efficient vessel operation techniques and ensuring data acquired exceeds final deliverable requirements.

Troubleshooting and Maintenance

Discussion of common and uncommon issues that (may) arise with emphasis on linear troubleshooting techniques, how to avoid/limit field troubleshooting with proper setup, operation and care of the sensor suite. Focus on safe handling, inspection, cleaning and storing to keep your gear in top shape and ready for every survey. Our training employs various tools and techniques that follow a process-oriented approach.

Other Key Subjects

Backscatter data processing, seafloor characterization and classification, watercolumn data processing and analysis, channel design and volumetric computations, specialized session on dredging operations etc.

Third-party software fully covered and (as per quorum) includes:

Hypack. QPS QINSy and Qimera, CARIS, HydroOffice, AMUST, POSPAC, Inertial Explorer, QINERTIA, Global Mapper etc.

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Student Testimonials

The students who attend this course come from a wide range of geographical locations, educational backgrounds, and experience levels. Past attendees include members of government agencies, private companies, small business owners, and academic researchers. Below are a sample of personal testimonials previous students have provided upon completing our course.

" The seahorse training course enlightened me on potential error sources and gave me a better understanding of multibeam sonar. It was also a great networking opportunity."

"Once again thank you for the training I received in May of 2017. The course was most helpful in our day to day operations. To anyone that is considering taking your next course I would say that the training you will receive from Seahorse is excellent. It would be beneficial to a surveyor of any experience. The information was delivered in such a way that it was easy to understand no matter your previous knowledge. The Seahorse Geomatics team were very helpful and patient while ex plaining any question I may have had. I would love to attend again."

"Seahorse Training was a complete, uncanned, and outside the box training for multibeam that covers everything needed to know from acquisition of the instrumentation to visualization and analysis of the data collection. Attendees will leave this training ready to do bathymetric data collection projects from beginning to end and they will feel well prepared to handle all troubleshooting that will arise. Cheers to Seahorse Training! "

"Benefits:
- *Amount of material covered in a short period of time*
- *Overall knowledge of key instructors*
- *'Hands on' time spent aboard the boats was especially beneficial*
- *The Bathymetry Chapter was both informative and enjoyable*
- *Having such a diverse class with different purposes for using multi-beam data helped keep things interesting and is also probably challenging to organize a course around"*

"This class helped me look at data collection with a "global" approach. I believe you can get the basics of individual system elements (Software/Sonar/Position) from field training, but knowing the limitations of each item will make you excel in all environments."

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