



Australian Government

NWPHYS006 Use remote sensing for hydrographic surveying

Release: 1

NWPHY006 Use remote sensing for hydrographic surveying

Modification History

Release 1. This is the first release of this unit of competency in the NWP National Water Training Package.

Application

This unit involves the skills and knowledge required to use remote sensing for hydrographic survey.

It includes using light detection and ranging (LiDAR) for data collection and analysis. It also includes analysing collected data and selecting the most appropriate methods to use.

This unit supports the attainment of skills and knowledge required for leaders with responsibility for performing hydrographic surveying and may lead to certification as a hydrographic surveyor.

Pre-requisite Unit

Not applicable.

Competency Field

Hydrographic Surveyor

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Use LiDAR for data collection and analysis

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

- 1.1** Collect and analyse data using topographic and bathymetric LiDAR for a hydrographic survey according to workplace procedures
- 1.2** Analyse the environmental and operational environments in which bathymetric LiDAR surveys are

complementary to echo sounder surveys

- 1.3** Use appropriate hydrographic equipment to gather data for survey
 - 1.4** Extract high and low water lines from LiDAR data sets
 - 1.5** Use computer aided design (CAD) to graphically represent data sets
 - 1.6** Determine the level of turbidity using appropriate equipment
- 2 Use remotely sensed data**
- 2.1** Calculate data sources in remotely sensed bathymetric data and determine the associated spatial parameters
 - 2.2** Create a shoreline map from images and aerial photographs using geometrical properties
 - 2.3** Analyse the optical characteristics of coastal terrain and floors
 - 2.4** Analyse methods of bottom detection in forming a hydrographic survey
 - 2.5** Analyse remote sensing techniques according to workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Unit Mapping Information

This is a new unit. No equivalent unit.

Links

Companion Volume Implementation Guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037>

Assessment Requirements for NWPHY006 Use remote sensing for hydrographic surveying

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria on at least one occasion and includes:

- analysing the different methods of bottom detection
- analysing the differences in remote sensing techniques
- determining the level of turbidity
- extracting high and low water lines from bathymetric and topographic LiDAR data sets, combining with other spatial data and using computer aided design to represent graphically
- scanning frequency and pattern in relation to power, coverage and spatial density
- using and selecting appropriate hydrographic equipment
- using LiDAR to collect and analyse data

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria and includes knowledge of:

- characteristics of hydrographic equipment including:
 - echo sounders
 - satellite bathymetry
- combined bathymetric and topographic LiDAR systems
- floor optical characteristics and bottom detection
- influence of geometry and waveform on feature detection
- influence of water surface roughness and water column turbidity on the beam pattern and penetration
- integration of components including:
 - attitude compensation
 - networking
 - sensor offsets
 - time stamping
- multispectral imagery including:
 - reflectance in relation to wavelength

- terrain characteristics
- optical characteristics of coastal terrain
- principles, capabilities and limitations of LiDAR systems
- principles of wavelength, water penetration and ground detection
- remote sensing techniques including:
 - hyperspectral
 - multispectral
- satellite derived bathymetry (SDB) techniques and procedures
- spatial resolution and accuracy with relation to multi spectral imagery and satellite derived bathymetry
- Secchi disc and Secchi depth
- techniques for LiDAR systems including:
 - bathymetric
 - topographic
- wavelength performance with different interfaces including water and ground

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in suitable workplace operational situations. Where this is not appropriate, assessment must occur in suitable simulated workplace operational situations reflecting actual workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- relevant and appropriate materials, tools, facilities, equipment and personal protective equipment currently used in industry
- applicable relevant documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice, and operation manuals.

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