UNIT 2

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Back to Basics

The Nautical Archaeology Society's Courses:
Introduction and Certificate in Foreshore and Underwater Archaeology

UNIT 2

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Back to Basics

The Nautical Archaeology Society's Courses:
Introduction and Certificate in Foreshore and Underwater Archaeology

Core Knowledge of the Unit

This unit introduces students to the basics of underwater and foreshore archaeology, using the first two modules from the Nautical Archaeology Society's Training Programme as frameworks.

Upon completion of the Back to Basics unit, students will have an understanding of the:

- *Scope of cultural heritage sites found underwater or on the foreshore*
- *Terms nautical, maritime and underwater archaeology*
- *Techniques used to date cultural heritage material*
- *Techniques that are used to survey underwater and foreshore cultural heritage sites*
- *Structure and components of a project design*
- *Factors that are considered in the planning of the safety and logistics of underwater and foreshore archaeological field work*
- *Techniques that are used for searching underwater sites*
- *Remote-sensing equipment that is used to carry out searches for underwater sites*
- *Techniques for fixing the geographic position of sites*

Introduction to the Unit

The Nautical Archaeology Society (NAS) is a non-profit, non-governmental organization (NGO) that was formed in 1981. It has a network of more than 600 members worldwide that include archaeologists, conservators, historians, divers and non-divers.

The Nautical Archaeology Society aims to:

- *Act as a forum for nautical archaeology*
- *Promote the preservation of nautical heritage*
- *Promote research and the publication of the results*
- *Promote education, training and information for improving techniques of scientific excavation, recording and conservation*

Although the Society has a range of initiatives, it is best known for the peer reviewed *International Journal of Nautical Archaeology,* first published in 1972 and the NAS Training Programme.

The NAS Training Programme first began in 1986 when the Nautical Archaeology Society started to facilitate a small number of training courses each year for recreational divers, who have a tradition of involvement in underwater archaeology in the United Kingdom (see *Additional Information* 1). By 1991, government funding had enabled a full-time training officer to increase the frequency and availability of courses. The main aim of these courses was to reduce the impact of recreational diving on underwater cultural heritage by raising awareness of the importance of sites (see *Additional Information 2*).

As the training programme became more established, overseas organizations showed interest in using it. A number of individual courses were run overseas, with one of the first being in Goa, India (1990). To enable independent NAS Training Programmes to be facilitated overseas, a licensing scheme was developed. The License Agreement sets out the terms of the partnership, is normally valid for an initial period of five years and is subject to several important qualifying criteria:

- The partner is a bona fide organization (normally archaeological)
- Tutors are expected to abide by NAS' statement of principles (ethical code)
- A competent person will be appointed to run the courses to ensure that the archaeological integrity and standards of the courses are maintained on payment of an agreed fee.

The License Agreement specifies a geographic region (agreed between NAS and the applicant) where the courses can be run and includes a copy of the Teaching Pack Tutor CD which is the educational resource used in this unit. It is also agreed that some aspects of the programme can be amended to take account of national heritage management issues and local archaeological perspectives.

Over time the programme has evolved from its original focus on divers, to include non-divers. A range of public participation projects have also been developed (see Unit 17: *Raising Awareness and Public Participation Projects in Underwater and Maritime Archaeology*).

Nowadays the NAS Training Programme has five units, beginning with the entry level introductory course. The focus of this course is on raising awareness of the importance of underwater cultural heritage and developing student's skills progressively, rather than on academic training which is offered by tertiary education programmes.

The first two units of the NAS Training Programme, the Introduction and the Certificate in Foreshore and Underwater Archaeology (NAS Part I), are taught during the first week of the six-week foundation course (see *Additional Information 3*).

ADDITIONAL INFORMATION

1 Over two hundred recreational divers took part in the Mary Rose Project between 1972 and 1982 when the hull was recovered.

2 The funding for the NAS training programme resulted from a policy document presented to the UK government proposing improvements in the management of the UK's underwater cultural heritage. One proposal stated that 'education could play almost as important a role as legislation in the protection of underwater cultural heritage' and that divers should be educated to mitigate the threat that they posed to the preservation and protection of underwater cultural heritage.

In 2001 the UK's Receiver of Wreck held a three month amnesty during which wreck material could be declared without fear of prosecution for not having previously declared the objects under the statutory duty specified in the Merchant Shipping Act 1995. Over 30,000 objects were declared, of which 840 objects were 'historic wreck' (over 100 years old). This probably represents only a very small percentage of the objects removed from wrecks over the past 50 years.

3 For more information visit: http://www.nauticalarchaeologysociety.org/training/index.php

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Suggested reading

Bowens, A. (ed.). 2009. *Underwater Archaeology: The NAS Guide to Principles and Practice.* Second Edition. Nautical Archaeology Society. Blackwell, pp. 213-215.

Flinder, A. and Rule, M. 1981. The Nautical Archaeology Society. *The International Journal of Nautical Archaeology and Underwater Exploration.* 10.4. Nautical Archaeology Trust Ltd, pp. 213.

Underwood, J.C. 2008. The Development of the Nautical Archaeology Society's Training Program and Diving with a Purpose. *Collaboration, Communication & Involvement: Maritime Archaeology & Education in the 21st Century.* Pydyn, A. and Flatman, Joe (eds.). Nicolaus Copernicus University. Toruń.

1 Back to Basics

Due to varying professional backgrounds and experiences of students, units from the National Archaeology Society's Training Programme are used to provide a fundamental base of knowledge on a broad range of topics specifically relating to underwater cultural heritage and archaeology on the foreshore and underwater (see *Additional Information 4*).

Having established a firm base of understanding, students will continue to acquire more detailed knowledge contained in later units of the foundation course. Participants also get the opportunity to gain further practical field experience in surveying and recording skills (see Unit 12: *Practical Dive Session of the Foundation Course).*

1.1 Teaching Resource

The NAS Teaching Pack Tutor CD is the fundamental educational resource required to facilitate this unit.

ADDITIONAL INFORMATION

4 Some topics that are normally part of the NAS course syllabi are covered in other foundation course units in more detail. Legal and ethical issues are covered in Unit 1: *Introduction to the UNESCO Convention,* Unit 11: *Finds Handling and Conservation,* Unit 18: *Archaeological Publication* and Appendix D: *How to Use Site Recorder.*

The CD includes:

- *Generic PowerPoint presentations that can be used to develop customised training material*
- *Notes for each presentation that set out the topics to be covered and teaching objectives*
- *Descriptions of how to organise the teaching objectives and the practical sessions*
- *Prepared recording forms for the survey and drawing grid (planning frame) exercises*
- *Student handouts for the NAS Introduction Course*
- *Student handouts for the NAS Certificate in Foreshore and Underwater Archaeology (NAS Part I)*
- *Information relating to other NAS training units and project initiatives*

Each student will also receive a copy of the NAS Handbook, *Underwater Archaeology: the NAS Guide to Principles and Practice* that provides additional background reading on the topics introduced in this unit.

2 NAS Introduction to Foreshore and Underwater Archaeology

The following section outlines the topics covered during the NAS Introduction course.

2.1 The Scope of Underwater and Foreshore Archaeology

- Comparison between underwater archaeology and archaeology on land
- Definitions relating to the study of underwater archaeology
- Type of evidence found on underwater and coastal sites
- Potential of archaeological research on underwater sites
- Characteristics of underwater cultural heritage sites
- Identification of the various threats to the preservation and protection of underwater cultural heritage sites

Suggested Reading

Adams, J. 2002. Maritime Archaeology. *Encyclopedia of Historical Archaeology.* C. Orser (ed.). Oxford.

Bass, G.F. 1990. After the Diving is Over. *Underwater Archaeology: Proceedings of the Society of Historical Archaeology Conference.* Carrell, T.L. (ed.). Tucson, Arizona.

Bowens, A. (ed.). 2009. *Underwater Archaeology: The NAS Guide to Principles and Practice,* Second Edition. Nautical Archaeology Society. Blackwell, pp. 2-10.

Delgado, J.P. (ed.). 2001. *Encyclopedia of Underwater and Maritime Archaeology,* New Edition. London.

Gamble, C. 2006. *Archaeology: the Basics,* New Edition. Oxford.

Green, J. (ed.). 2004. *Maritime Archaeology: a Technical Handbook.* London.

McGrail, S. (ed.). 1984. *Aspects of Maritime Archaeology and Ethnology.* London.

Muckelroy, K. 1978. *Maritime Archaeology.* Cambridge University Press.

Renfrew, C. and Bahn P. 2004. Archaeology: the Key Concepts, Fourth Edition. Oxford.

Throckmorton, P. 1990. The World's Worst Investment, the Economics of Treasure Hunting with Real Life Comparisons. Carrell, T.L. (ed.). *Underwater Archaeology: Proceedings of the Society of Historical Archaeology Conference 1990.* Tucson, Arizona.

2.2   Underwater and on the Foreshore Site Types

- Watercraft
- Aircraft
- Ports and anchorages
- Coastal defences
- Dwellings
- Submerged landscapes
- Fish traps
- Sites in lakes, rivers and canals (including bridges)
- Caves and wells
- Individual finds (although not usually considered sites)

Suggested Reading

Bowens, A. (ed.). 2009. *Underwater Archaeology: The NAS Guide to Principles and Practice,* Second Edition. Nautical Archaeology Society. Blackwell, pp. 17-22.

Delgado, J.P. (ed.). 2001. *Encyclopedia of Underwater and Maritime Archaeology,* New Edition. London.

Muckleroy, K. 1978. Maritime Archaeology. Cambridge.

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2.3 Dating Archaeological Material

- Stratigraphy
- Typology
- Radiocarbon
- Dendrochronology
- Historical association
- Thermoluminescence (extra NAS curricula)
- Palaeomagnetism (extra NAS curricula)
- Optical stimulated dating (extra NAS curricula)

Suggested Reading

Aitken, M.J. 1998. *An Introduction to Optical Dating.* Oxford, Oxford University Press.

Ashmore, P. 1999. Radiocarbon Dating: Avoiding Errors by Avoiding Mixed Samples. *Antiquity Journal,* Vol. 73, pp. 124–30.

Bayliss, A., McCormac, J. and Van Der Plicht, F.G. 2004. An Illustrated Guide to Measuring Radiocarbon from Archaeological Samples. *Physics Education.* No. 39, pp. 137–44. http://cio.eldoc.ub.rug.nl/FILES/root/2004/PhysEduc Bayliss/2004PhysEducBayliss.pdf (Accessed November 2011.)

Bowens, A. (ed.). 2009. *Underwater Archaeology: The NAS Guide to Principles and Practice,* Second Edition. Nautical Archaeology Society. Blackwell, pp. 24-28.

Bowman, S. 1990. *Radiocarbon Dating.* London, British Museum.

English Heritage. 2006. *Archaeomagnetic Dating: Guidelines on Producing and Interpreting Archaeomagnetic Dates.* English Heritage. http://www.english-heritage.org.uk/publications/archaeomagnetic-dating-guidelines (Accessed November 2011.)

English Heritage. 2004. *Dendrochronology: Guidelines on Producing and Interpreting Dendrochronological Dates.* English Heritage. http://www.helm.org.uk/upload/pdf/Dendrochronology.pdf (Accessed November 2011.)

English Heritage. 2008. *Luminescence Dating: Guidelines on Using Luminescence Dating in Archaeology.* English Heritage. http://www.english-heritage.org.uk/content/publications/docs/luminescencedating.pdf (Accessed November 2011.)

Harris, E.C. 1989. Principles of Archaeology and Stratigraphy, Second Edition. London.

2.4 Introduction to 2-Dimensional Survey Techniques

- Radial
- Offsets
- Trilateration
- Ties
- Drawing grid (planning frame)

Suggested Reading

Bowens, A. (ed.). 2009. *Underwater Archaeology: The NAS Guide to Principles and Practice,* Second Edition. Nautical Archaeology Society. Blackwell, pp. 114-127.

Green, J. and Gainsford, M. 2003. *Evaluation of Underwater Survey Techniques.* International Journal of Nautical Archaeology.

Holt, P. 2003. An Assessment of Quality in Underwater Archaeology Surveys Using Tape Measurements. *International Journal of Nautical Archaeology*, Vol. 32.2, pp. 246-31. http://www.3hconsulting.com/publications.html (Accessed November 2011.)

2.5 Practical Training Sessions

As the emphasis of the NAS Introduction Course is on the development of student's field skills, the introductory unit features both 'dry' (in the classroom) and 'wet' (in the swimming pool) practical training sessions.

2.5.1 Dry Practical Session

The aim of the dry practical session is to provide students with the opportunity of practising survey techniques without the complications of diving. Students will learn how to use a number of 2-dimensional site survey techniques including:

- Offsets
- Trilateration
- Ties
- Drawing grid (planning frame)

A view of the general layout of the 'dry' 2-dimensional survey practical session at the centre in Chanthaburi. There are two baselines with one pair of surveyors working on each side.
© Christopher J. Underwood

The surveyors are using the survey board to check the 90° offset during the 'dry' practical session. © Christopher J. Underwood

Recording a tie (trilateration using a baseline) during the 'dry' 2-dimensional survey practical session. A measurement is taken from a known point on the artefact to a convenient point on the baseline. A second tie is required to position the point on the artefact. © Christopher J. Underwood

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BELOW: Participants being given a safety briefing before the underwater 2-dimensional survey practical session.
© Christopher J. Underwood

2.5.2 Swimming Pool Practical Session

Once students have gained a firm understanding of 2-dimensional (2-D) site survey techniques, they then test their knowledge underwater. Here, they practice in a swimming pool each of the techniques learned in the classroom including:

- Offsets
- Trilateration
- Ties
- Drawing grid (planning frame)

2.5.3 Transferring the Results of the Dry 2-D Survey Practical Session to Paper

- Offsets
- Trilateration
- Ties

2.5.4 Transferring the Results of the Swimming Pool 2-D Survey Practical Session to Paper

- Offsets
- Trilateration
- Ties

3 NAS Certificate in Foreshore and Underwater Archaeology (NAS Part I)

Upon completion of the introductory unit, students will begin the second unit of the NAS Training Programme, the NAS Certificate in Foreshore and Underwater Archaeology. The following section outlines the topics covered during this module.

3.1 Project Designs

This section provides students with an introduction to project design and understanding of:

- The types of archaeological projects that are undertaken
- The sources of information that can help in the formation of a project plan
- The phases of an archaeological project
- The importance of clear aims and objectives for a project
- Aspects that are included in a project plan with reference to Rule 10 of the Annex to the UNESCO Convention on the Protection of Underwater Cultural Heritage (Paris 2001)

📖 **Suggested Reading**

Bowens, A. (ed.). 2009. *Underwater Archaeology: The NAS Guide to Principles and Practice,* Second Edition. Nautical Archaeology Society. Blackwell, pp. 34-37.

Elkin, D. et al. 2007. Archaeological Research on HMS *Swift*: a British Sloop-of-War Lost Off Patagonia, Southern Argentina, in 1770. *International Journal of Nautical Archaeology,* Vol. 36, pp. 32-58.

English Heritage. 2006. *Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide.*

English Heritage. 2005. *Management of Research Projects in the Historic Environment (MAP II).*

3.2 Area Search, Survey and Position Fixing

This section provides students with an understanding of topics related to area search, survey and position fixing.

3.2.1 Diver Search Techniques

- Jackstay
- Corridor
- Circular
- Snag-line
- Towed diver
- Diver propulsion vehicle
- Metal detectors

📖 **Suggested Reading**

Bowens, A. (ed.). 2009. *Underwater Archaeology: The NAS Guide to Principles and Practice,* Second Edition. Nautical Archaeology Society. Blackwell, pp. 96-102.

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3.2.2 Remote Sensing Search Equipment

- Magnetometer
- Side Scan sonar
- Sub-bottom sonar
- Multi beam sonar
- Single beam sonar
- Sector-scanning sonar
- Remotely operated vehicles (ROVs)

Suggested Reading

Bowens, A. (ed.). 2009. *Underwater Archaeology: The NAS Guide to Principles and Practice*, Second Edition. Nautical Archaeology Society. Blackwell, pp. 103-113.

Dean, M. 2006. Echoes of the Past: Geophysical Surveys in Scottish Waters and Beyond. *Going Over Old Ground – Perspectives on Archaeological Geophysical and Geochemical Survey in Scotland*. Oxford, BAR British Series 41, pp. 80-87

Fish, J.P. and Carr, H.A. 1990. *Sound Underwater Images: A Guide to the Generation and Interpretation o f Side Scan Sonar Data*. Boston, MA.

Judd, P. and Brown, S. 2006. *Getting to Grips with GPS: Mastering the Skills of GPS Navigation and Digital Mapping*. Leicester.

Momber, G. and Green, M. 2000. The Application of the Submetrix ISIS 100 Swath Bathymetry System to the Management of Underwater Sites. *International Journal of Nautical Archaeology,* 29.1, pp. 154-162.

Papathedra, G., Geraga, M. and Ferentinos, G. 2005. The Navarino Naval Battle Site, Greece: an Integrated Remote-sensing Survey and a Rational Management Approach. *International Journal of Nautical Archaeology,* 34, pp. 95–109.

Quinn, R. Breen, C. Forsythe, W. Barton, K. Rooney, S. and O'Hara, D. 2002a. Integrated Geophysical Surveys of the French Frigate *La Surveillante* (1797) Bantry Bay, County Cork, Ireland. *Journal of Archaeological Science,* No.29, pp. 413-22.

Quinn, R., Breen, C. Forsythe, W., Barton, K., Rooney, S. and O'Hara, D. 2002b. Comparison of the Maritime Sites and Monuments Record with Side Scan Sonar and Diver Surveys: a Case Study from Rathlin Island, Ireland. *Geoarchaeology,* 17.5, pp. 441-51.

Quinn, R., Dean, M. Lawrence, M., Liscoe, S. and Boland, D. 2005. Backscatter Responses and Resolutions Considerations in Archaeological Side-scan Sonar Surveys: a Controlled Experiment. *International Journal of Science,* Vol. 32, pp. 1252-64.

3.2.3 Position Fixing Techniques

- Global Positioning System (GPS)
- Differential Global Positioning System (DGPS)
- Total station
- Bearings
- Transits

Suggested Reading

Ackroyd, N. and Lorimer. R. 1990. *Global Navigation: A GPS User's Guide*. London.

Betts, F. 1984. *Surveying for Archaeologists*. Durham.

Bowens, A. (ed.). 2009. Underwater Archaeology: *The NAS Guide to Principles and Practice,* Second Edition. Nautical Archaeology Society. Blackwell, pp. 83-95.

Boyce, J.L., Reinhardt, E. G., Raban, A. and Pozza, M. R., 2004. Marine Magnetic Survey of a Submerged Roman Harbour, Caesaria Maritima, Israel. *International Journal of Nautical Archaeology,* Vol 33, pp. 122-36.

English Heritage. 2003. *Where on Earth Are We?* English Heritage. http://amaxus.english-heritage.org.uk/upload/pdf/where_on_earth_are_we.pdf (Accessed November 2011.)

3.3 Project Logistics and Safety

- The importance of safety and risk analysis on all archaeological sites
- The different roles that need to be filled on an archaeological project and why each is important
- The need to develop a recording system before starting work on a site
- Pre-prepared forms and how they can be used

Suggested Reading

Bowens, A. (ed.). 2009. Underwater Archaeology: *The NAS Guide to Principles and Practice,* Second Edition. Nautical Archaeology Society. Blackwell, pp. 38-44.

Underwood, J. C. 2011. Excavation Planning and Logistics (HMS *Swift* 1770). *Oxford Handbook for Maritime Archaeology*. USA, Oxford University Press.

3.4 NAS Training Review

To complete the Back to Basics unit, a review of the main topics and themes that have been covered during the NAS syllabus is presented.

Unit Summary

Although some of the foundation course participants have previous underwater archaeological experience and therefore are familiar with the information presented in this unit, others are either not familiar with it or still lack confidence. Those with limited prior knowledge are most likely to find that these modules provide a useful and thorough introduction to the theme of underwater archaeology. This unit also serves as a useful refresher of the fundamental principles and techniques applied in underwater archaeology, even for those with previous experience.

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Suggested Timetable

Introduction to Foreshore and Underwater Archaeology

90 mins	Scope of Underwater and Foreshore Archaeology
	Break
90 mins	Site Types and Dating Archaeological Material
	Break
90 mins	Introduction to 2-Dimensional Survey Techniques
	Break
60 mins	2-Dimensional Survey Practical (Dry)
	Break
60 mins	2-Dimensional Survey Practical (Dry)
	Break
240 mins	2-Dimensional Survey Practical (Wet) and Debrief (including the travel time to the pool)

NAS Certificate in Foreshore and Underwater Archaeology

90 mins	Project Designs
	Break
90 mins	Area Search, Survey and Positioning Fixing
	Break
90 mins	Project Safety and Logistics
30 mins	Concluding Remarks and Closure

Teaching Suggestions

Nautical Archaeology Society Courses:
Introduction and Certificate in Foreshore and Underwater Archaeology

Trainers are expected to use the generic presentations found on the NAS Teaching Pack Tutor CD as a framework to help develop their own customized teaching materials. Trainers should note that the images sometimes illustrate examples from the United Kingdom (UK), so they should consider also integrating local images and examples where they can.

Where possible the presentations should also be linked to the relevant parts of the UNESCO Convention on the Protection of the Underwater Cultural Heritage (Paris 2001) and the Rules of its Annex. For example, the presentation entitled Project Designs is referenced to Rules 9 and 10 of the Annex to the Convention providing a useful framework for the development of a project design.

Included below are the file names for each of the teaching units that can be found on the NAS Teaching Pack Tutor CD. They can be located by opening the CD using 'Auto Run' and selecting from the menu options, or by opening the CD manually 'Open View Files' and searching for the required PowerPoint or PDF document.

NAS Introduction to Foreshore and Underwater Archaeology:
What to Use in the Theory Sessions

The Scope of Underwater Archaeology
- *PowerPoint presentation: Intro_Session2*
- *Trainer's notes file: F:/introduction_course/Intro_Session2.pdf*

Underwater and on the Foreshore Site Types
- *PowerPoint presentation: Intro_Session3*
- *Trainers notes file: F:/introduction_course/Intro_Session3.pdf*

Dating Archaeological Material
- *PowerPoint presentation: Intro_Session4*
- *Trainer's notes file: F:/introduction_course/Intro_Session4.pdf*

Introduction to 2-Dimensional Site Survey Techniques
- *PowerPoint presentation: Intro_Session6*
- *Trainer's notes file: F:/introduction_course/Intro_Session6.pdf*

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NAS Introduction to Foreshore and Underwater Archaeology:
What to Use in the Practical Sessions

All the information required to facilitate the practical training sessions can also be found on the NAS Teaching Pack Tutor CD.

2-Dimensional Site Survey Techniques

• *PowerPoint presentation: Intro_Session6*

• *Trainer's notes file: F:/introduction_course/Intro_Practical_Sessions.pdf*

• *The NAS survey recording forms file: F:/introduction_course/proforma%20intro.pdf*

Student Objectives

• *Plan a survey*

• *Agree on a system of hand signals for communication*

• *Survey a minimum of four artefacts on one side only of the baseline using two survey techniques (e.g. offsets, trilateration and ties)*

• *Use a drawing grid (planning frame) to record a cluster of objects. If there is time this exercise can also be practiced. The grid can either be used as part of the baseline exercise or set up independently*

How to Organise the Practical Sessions

For both the dry and wet practical sessions an artificial site is created using baselines, control points and artefacts. The number of tape measures and artefacts is dependent on the number of students. For example, if students work in pairs (one pair on each side of a baseline) a typical course of sixteen students will require four tape measures, a number of artefacts and using 4 to 5 metre long baselines.

Equipment Required for Each Baseline (Two Pairs of Surveyors)

• *1 tape measure to create a 4 to 5 metre baseline*

• *A hook or alternative method of attachment at each end of the baseline to create the control points*

• *2 non-slip mats (used in showers or baths) to be placed at either end of the baseline to help prevent the control points from moving and to protect the pool bottom from being damaged by the weights*

• *Divers weights or alternative weights to help maintain the straightness and tension of the baseline*

• *8 artefacts (4 metres each side of the baseline)*

• *4 (or more) objects to be placed under each drawing grid (planning frame)*

If the drawing grids are used it is practical to have two grids that can be shared between the groups. Pairs are required to coordinate with each other so that each pair has some time using a grid during the practical session.

Equipment Required for Each Pair of Participants

• *1 tape measure (10 metres)*

• *1 board for the printed A4 recording forms*

• *Recording forms for the survey tasks and drawing grid exercise*

• *Pencil and eraser*

ADDITIONAL INFORMATION

5 The diving technicians of the Thai Underwater Archaeology Division (UAD) organized and provided the logistical support for the practical sessions, as well as assistance for those students with limited prior diving experience.

Although 10-metre tapes are specified, the realistic maximum will be approximately 7 metres. The same measuring tapes will be used during the diving sessions.

Recording Forms

The printed forms required for the swimming pool survey exercise need to be waterproof. This can be achieved by printing them directly on to Mylar (plastic paper used by architects) which should have a minimum thickness of 300 microns. Alternatively, the printed forms can be laminated.

Briefing for the Practical Sessions

During the briefing for the practical sessions, trainers should instruct students to:

• *Work in pairs. Pairing can be the same for the dry and wet session depending on the diving ability of the students*

• *Plan the survey*

• *Draw a simple sketch of the site before starting the measured survey (this is particularly helpful for planning the survey and avoiding errors during the survey)*

• *Decide on a method of hand signals (it is good practice to use hand signals in the dry session before the diving session. Students can be asked not to talk to each other to simulate working underwater)*

• *Survey four objects using two of the selected survey methods. To enable a comparison of the relative positions of objects when they are plotted on paper, it is important that the same points on each of the objects are surveyed using the selected survey methods*

• *Circular objects can be surveyed to their centre point and a measurement of the object's diameter will provide the shape*

• *If an object has a length (such as a cannon) both ends of the object (as a minimum) need to be surveyed to fix its position relative to the baseline, resulting in a minimum of four measurements*

• *Sketch the cluster of objects under the drawing grid (planning frame)*

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Depending on the availability of diving equipment or the size of the swimming pool it might be necessary to divide the students into two groups.

*IT IS CRUCIAL THAT THERE IS AN EXTENSIVE SAFETY BRIEFING
BEFORE THE SWIMMING POOL PRACTICAL SESSION.*

Transferring the Results of the 2-D Survey Practical Sessions to Paper and Analysis: *What to Use*

- *PowerPoint presentation: Intro_Session6*
- *Trainer's notes file: F:/introduction_course/Intro_Session6.pdf*

Student Objectives
- *Understand how to transfer the survey results to paper to create a site plan*
- *Understand how a scale rule is used*
- *Understand the advantages and disadvantages of each survey method*
- *Understand the reasons for and characteristics of typical errors*
- *Understand the need to plan a survey*
- *Understand the need for an effective method of communicating underwater*

Equipment Required for Each Pair of Students
- *1 x drawing compass (15cm radius)*
- *1 x 90 degree set-square (15cm height/length)*
- *1 x metric scale rule*
- *1 x sheet of A3 paper or equivalent*
- *1 x pencil and eraser*

Briefing for the Task

During the briefing for the practical sessions, trainers should instruct students to:
- *Work in the same pairs as during the practical sessions.*
- *Use the recommended scale of 1:20*
- *Ensure that the length of the baseline should be drawn along one edge of the paper to avoid the transferred scale measurements not fitting on the paper*
- *Ensure that the results of the two selected techniques are transferred onto paper using one baseline resulting in two marks for each point that has been surveyed*

NB. Students may need more instruction on how to use the scale rule.

Analysis of the Results

Students may most likely find that the two sets of survey points do not overlap. This is normal and illustrates the difficulty in achieving a perfect right angle for the offset survey and the problems associated with acute or obtuse angles for the trilateration and ties. Errors are also expected.

The most common errors are:
- *Recording the wrong measurement*
- *Recording the right measurement but writing the result in the wrong column on the recording form*
- *Forgetting to record the whole number before the decimal point, for example, writing 0.154 instead of 3.154*
- *Placing the decimal point in the wrong position, for example, 1.540 instead of 1.054*
- *Reading numbers on the tape measure upside down: 6's look like 9's and 4's can look like 7's depending on the quality of the tape measure and underwater visibility*
- *Forgetting to take a measurement*

NAS Certificate in Foreshore and Underwater Archaeology (NAS Part I): *What to Use in the Theory Sessions*

Project Designs
- *PowerPoint presentation: P1 Session 1 Case study*
- *Trainer's notes file: F:/Part_1/P1Session_1.pdf*

Area Search, Survey and Position Fixing
- *PowerPoint presentation: P1 Session 3 Search and survey*
- *Trainer's notes file: F:/Part_1/P1Session_3.pdf*

Project Safety and Logistics
- *PowerPoint presentation: P1 Session 4 Safety & Logistics*
- *Trainer's notes file: F:/Part_1/P1Session_4.pdf*

NAS Training Review: *What to Use*

The NAS PowerPoint presentations and trainer notes include a summary of the presentation or a list of assessment questions relating to core knowledge. This summary in bullet points can be used to review key points of the unit or trainers can develop their own questions in other formats.

Training Manual for the UNESCO Foundation Course on the Protection and
Management of Underwater Cultural Heritage in Asia and the Pacific

UNIT 2 BACK TO BASICS

UNIT
2

Suggest Reading: Full List

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