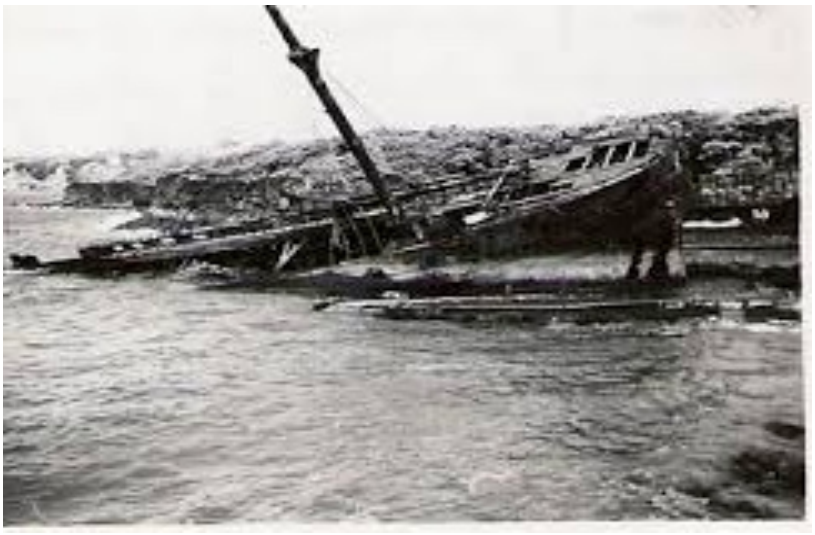
Underwater Archaeology

Distinctive

Specialty Course

Instructor Outline



This course is an introduction to the historic importance of our maritime and underwater heritage in both its global and local aspects.

1. Course Objectives and Standards

A. Course Goals

The goals of the Underwater Archaeology course are to:

a) Introduce the student to the importance of our marine and underwater heritage

b) Introduction to relevant organizations dedicated to the preservation of this heritage

c) Review globally significant underwater archaeological sites

d) Review samples of local underwater archaeological sites in New Zealand and Australia

e) List methods used for preservation of artifacts

f) Outline specific details regarding the conduct of underwater archaeological dive sites

B. Underwater Archaeology Course Requirements

1. Minimum prerequisite certification: PADI Open Water Diver (or equivalent)

2. Minimum age of 15

3. Student to Instructor ratio: 8:1

4. Maximum depth 18 meters [30m if certified as PADI Advanced Open Water or Adventure diver with deep diving experience (or equivalent)]

5. Two (2) Open water dives

6. Minimum course duration is dependent on class size. As a guideline – a nominal duration for a class size of eight (8) students would be two (2) hours for theory; eight hours for practical exercises.

7. Minimum Instructor rating: Open Water Scuba Instructor and Specialty Instructor in the Distinctive Specialty of Underwater

Archaeology Diver

C. Student and Instructor Equipment Requirements

1. Student equipment

a. All standard diving equipment

b. Slate

c. Camera

2. Instructor equipment

a. All standard diving equipment

b. SMB

c. Slate

d. Camera

e. Student Record File

f. Class Roster

(ii) References

a. https://en.wikipedia.org/wiki/Category:Archaeological_organisations
b. Marine Archaeological Association of New Zealand: http://maanz.org.nz
c. Australian Institute for Marine Archaeology: http://www.aima-underwater.org.au
d. What education is needed to become a marine archaeologist? http://work.chron.com/education-needed-become-marine-archaeologist-10489.html

(iii) Recognition materials

a. PIC envelopes (or PICs on-line)

b. Specialty Diver Certificates

D. Knowledge Development Topics

The following is an actual presentation outline. Directions to, or comments for, the instructor are enclosed in [brackets]

Introductions, welcome to the course and course overview:
a. Introduce yourself and your assistants
b. Student introductions
c. Course goals

2. Course overview
a. Classroom presentations. [Note to instructor: Academic information will be via a short classroom discussion but essentially covered on-site at the dive site location/s. Other academic background will be reviewed through reading web-based text. Give the dates and locations of venue.]
b. Open water training dives.
c. Performance assessment. [Note to instructor: You are to ensure that all performance requirements have been met. Skills performed onsite are to be directly observed. Academic assessment may be accomplished through discussions with students and oral quizzes. Tell the class how their performance will be evaluated.]
d. Certification: Upon successful completion of the course, you will be awarded the PADI Distinctive Specialty Diver Certification as an Underwater Archaeology Diver.
e. Class requirements: Course costs [Explain all course costs], Equipment needs, and materials used during the course and attendance requirements.
f. Administration: Collect course fees, enrolment forms, [Continuing

Education Administrative Document or Standard Safe Diving Practices Statement of Understanding, PADI Medical Statement, Liability Release and Express Assumption of Risk].

3. Why Underwater Archaeology diving?

It's just so interesting!

There are many reasons why underwater archaeology can make a significant contribution to our knowledge of the past. In the shipwreck field alone individual shipwrecks can be of significant historical importance either because of the magnitude of loss of life (such as the Titanic), or circumstances of loss (Housatonic was the first vessel in history sunk by an enemy submarine - https://en.wikipedia.org/wiki/Sinking_of_USS_Housatonic).

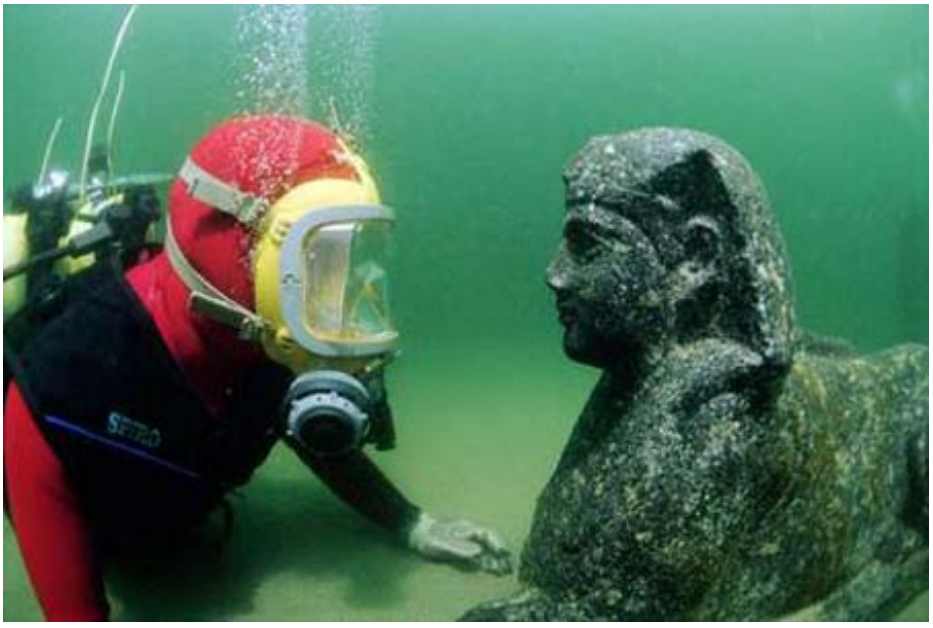
Shipwrecks, such as The Mary Rose, can also be important for archaeology because they can form a kind of accidental time capsule, preserving an assemblage of human artifacts at the moment in time when the ship was lost.

Sometimes it is not the wrecking of the ship that is important, but the fact that we have access to the remains of it, especially where the vessel was of major importance and significance in the history of science and engineering (or warfare), due to being the first of its type of vessel.

Underwater Archaeology often involves research that we are often used to doing on land because the two are often linked by such as geographic, social, political, economic and other considerations. As a result, a study of an archaeological landscape can involve a multidisciplinary approach requiring the inclusion of many specialists from a variety of disciplines including prehistory, historical archaeology, maritime archaeology, and

anthropology. There are many examples. One is the wreck of the VOC ship Zuytdorp lost in 1711 on the coast of Western Australia, where there remains considerable speculation that some of the crew survived and, after establishing themselves on shore, intermixed with indigenous tribes from the area. The archaeological signature at this site also now extends into the interaction between indigenous people and the European pastoralists who entered the area in the mid-19th century. [http://www.crystalinks.com/underwaterarch.html]

Leading of course to further inquiries into both global and local maritime and aquatic history. This knowledge can be pursued through many organisations dedicated to underwater archaeology. Some of those relevant to this courses are listed below.



4. Organisations dedicated to underwater archaeology:

a. Marine Archaeological Association of New Zealand: http://maanz.org.nz
b. Australian Institute for Marine Archaeology: http://www.aima-underwater.org.au
c. AIMA/NAS Training - Australian Institute for Maritime Archeology
www.aima-underwater.org.au/parts-i-iv/
d. Australian Historic Shipwreck Preservation Project: http://www.ahspp.org.au/the-project/public-involvement/
e. Society for Historical Archaeology: https://sha.org

5. Globally significant underwater archaeology sites:

Refer to:

https://sha.org

http://weburbanist.com/2013/04/22/submerged-cities-7-underwater-wonders-of-the-world/

http://www.allday.com/amazing-underwater-archaeological-digs-2180789544.html

6. Local archaeological sites [two sites have been chosen appropriate for training during this course from both New Zealand and Australia. One each from both marine and freshwater environments]

a. New Zealand:

(i) Rangitoto Island

Rangitoto Island Historic Conservation Trust:

http://rangitoto.org/pages/shipwrecks.html

(ii) Lake Waikeremoana

http://themeetingplacenz.blogspot.com.au/2012/08/waikaremoana-lake-and-lands-short.html

https://nzhistory.govt.nz/keyword/te-kooti

b. Australia:

(i) Lady Bowen

Explore Queensland's historic underwater heritage:

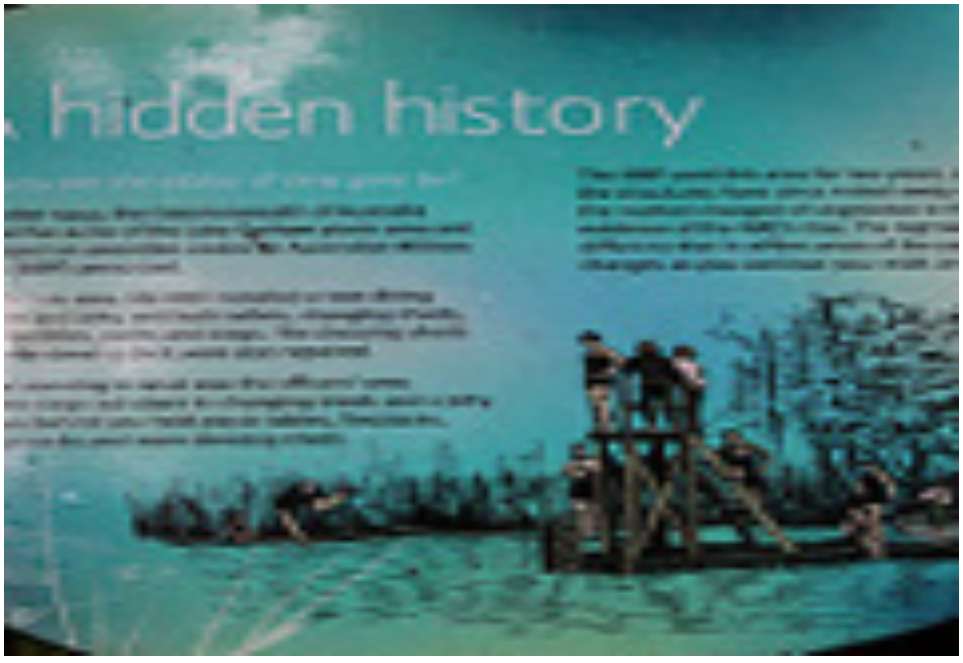
http://www.ehp.qld.gov.au/assets/documents/land/heritage/dive-qld-shipwreck-lady-bowen.pdf

http://fnqdive.com/pdf/issue112ladyBowen.pdf

(ii) Lake Eacham

Department of National Parks, Sport and Racing:

https://www.npsr.qld.gov.au/parks/lake-eacham/culture.html



7. Methods used for preservation of artifacts

Reference:

http://www.cawreckdivers.org/preservation.htm

http://nautarch.tamu.edu/CRL/conservationmanual/ConservationManual.pdf

http://www.denix.osd.mil/cr/archaeologicalresources/underwaterarchaeology/reports/basic-methods-of-conserving-underwater-archaeological-material-culture-report-legacy/

8. Planning and organizing underwater archaeological dives

This should be performed not much differently than any other dive but with a few exceptions.

In reference to PADI's regard to the standards relevant to "Local Diving", it's a smart idea to start with some homework regarding the specific area that you intend to investigate.

For instance, when choosing to dive and investigate the wreck graveyard on Rangitoto Island, it would be important to not only Google information, but to visit such as the Auckland Public Library. Here there may be texts and information that have not yet been digitally archived http://www.rangitoto.org/pages/books.htm and yet provide abundant knowledge regarding your expedition.

http://www.aucklandlibraries.govt.nz/EN/Pages/home.aspx

Local knowledge may also be obtained from those who have visited the site in the past.

Once appropriately informed, planning this particular adventure should follow all usual dive preparatory practice including regard to permissions that may be required to visit the site and the limitations imposed by the

NZ Antiquities Act (1975)
http://www.nzlii.org/nz/legis/hist_act/aa19751975n41181/
and the Historic Places Act (1993)
http://www.legislation.govt.nz/act/public/1993/0038/latest/DLM300511.html

[Sites in Australia would be governed by Australian World Heritage laws http://www.environment.gov.au/heritage/laws/world]

On the dive, buoyancy control is a very important issue as care should be taken in particular with feet (fins) and hand
placement to avoid injury from sharp, exposed wreckage and equally, to avoid damaging sensitive organisms (or getting injured
one's self from contact with such invertebrates as fire coral or hydroids).

Attending a Peak Performance Buoyancy workshop (better still, the specialty course) is recommended to improve this ability.

Because of possible separation (it's an exciting, engrossing adventure!), it is suggested that consideration be given to purchasing and using a redundant air system. Better still, when suitably experienced, attend a PADI Self-Reliant diver specialty course. In the meantime, get into the habit of keeping an eye out on your buddy as much as the other things you may wish to discover.

9. Open Water Dives

1. Open Water Training Dive One - Photos

Learning Objectives.
By the end of this dive, you will be able to:
• Assemble equipment
• Demonstrate appropriate streamlining of dive equipment.
• Perform an appropriate entry.
• Correct weighting and adjust buoyancy as required at depth.
• Stay clear of historic wreckage/objects and note/sketch/take photos of same
• Perform an ascent rate of no more than 18 metres/minute or as indicated by the divers' computer.
• Perform a 3-minute safety stop at 5 metres.

a. Briefing
• Evaluate conditions
• Facilities at dive site
• Entry technique to be used-location
• Exit technique to be used-location
• Bottom composition, expected features and points of interest
• Depth range
• Planned air supply limit
• Review communication
• What to do if separated from class/buddy
• What to do if an emergency arises
• Buddy assignments

b. Plan Dive

• Assign depth; have students determine theoretical depth (if dive site at altitude and/or using enriched air) and no-decompression limit [Instructor note: you should check these]
• Record no-decompression limit, maximum actual depth and maximum theoretical depth on slates
• Review depth gauges and instrumentation; each student should know how to account for behaviour of his/her instrument while diving
• Assign maximum planned dive time

c. Predive

• Prepare personal equipment including cameras and accessories and all extra emergency equipment
• Don equipment
• Predive safety check
• Proper entry
• Weight adjustment for neutral buoyancy
• Maintain buddy contact

d. Open Water Training Dive One

• Descend in buddy teams
• Sketch/notate/photograph significant site details
• Ascent not to exceed 18 metres/minute with a three-minute safety stop at depth of 5 metres.

e. Post dive

• Proper exit
• Remove and stow equipment

f. Debrief

• Assess performance, make suggestions, give positive reinforcement
• Students calculate their ending pressure groups—review for correct calculation
• Log dive (Instructor signs log)

2. Open Water Training Dive Two

Learning Objectives. By the end of this dive, you will be able to: • Demonstrate appropriate streamlining of dive equipment. • Correct weighting and adjust buoyancy as required at depth • Sketch/note/photograph/video significant site details • Perform an ascent rate of no more than 18 metres/minute or as indicated by the divers' computer. • Perform a 3-minute safety stop at 5 metres.

a. Briefing

• Evaluate conditions
• Facilities at dive site
• Entry technique to be used-location
• Exit technique to be used-location
• Bottom composition, expected features and points of interest
• Depth range
• Planned air supply limit
• Review communication
• What to do if separated from class/buddy
• What to do if an emergency arises
• Buddy assignments

b. Plan Dive

[Instructor note: Have students plan this dive in buddy teams for your assessment and approval]

• Ensure that students record no-decompression limit, maximum

actual depth and maximum theoretical depth on slates (if dive site at altitude and/or using enriched air).

c. Predive

• Prepare personal equipment including action camera and requisite accessories
• Don equipment
• Predive safety check
• Proper entry
• Weight adjustment for neutral buoyancy
• Maintain buddy contact

d. Open Water Training Dive Two

• Descend in buddy teams
• Take notes/sketch/photographs of significant site details
• Ascent not to exceed 18 metres/minute with a three-minute stop at a depth of 5 metres.

e. Post dive

• Proper exit
• Remove and stow equipment
• Rinse cameras

f. Debrief

• Assess performance, make suggestions, give positive reinforcement
• Students calculate their ending pressure groups—review for correct calculation

- Log dive (Instructor signs log)
- Complete certification paperwork

9. KNOWLEDGE REVIEW

1. Describe how an underwater archaeology diver should avoid damaging sensitive aquatic organisms

2. What are two of the greatest concerns performing this form of adventure dive?

3. List two preparatory issues prior to performing an underwater archaeological dive

4. List at least one legislative Act relating to underwater archaeological dive sites?

5. State one specific general diving skill of great importance to the conduct of this type of adventure dive

6. In either New Zealand or Australia, who would you inform regarding a discovery that you may consider of archaeological/historical significance?

7. List at least two significant accessories useful for this type of dive

8. List at least two continuing education courses that would be recommended to support preparation for this course

9. How would you preserve artifacts made of unglazed pottery?

I have had explained to me and I understand the questions I missed.
Student Signature _____ Date _____

10. ANSWER KEY KNOWLEDGE REVIEW

1. Describe how an underwater archaeology diver should avoid damaging sensitive aquatic organisms

Using appropriate buoyancy control and keeping well clear of protruding artifacts

2. What are two of the greatest concerns performing this form of adventure dive?

(i) Injury to self from getting too close to sharp objects or injurious marine life

(ii) Damage to marine organisms from poor buoyancy control and clumsiness

3. List two preparatory issues prior to performing an underwater archaeological dive

(i) Research

(ii) Improvements to appropriate diving skills (such as buoyancy control, if necessary)

4. List at least one legislative Act relating to underwater archaeological dive sites?

In New Zealand:

NZ Antiquities Act (1975)

http://www.nzlii.org/nz/legis/hist_act/aa19751975n41181/

and the Historic Places Act (1993)

http://www.legislation.govt.nz/act/public/1993/0038/latest/DLM300511.html

In Australia :

Australian World Heritage laws

http://www.environment.gov.au/heritage/laws/world]

5. State one specific general diving skill of great importance to the conduct of this type of adventure dive

Exemplary buoyancy control

6. In either New Zealand or Australia, who would you inform regarding a discovery that you may consider of archaeological/historical significance?

a. ***Marine Archaeological Association of New Zealand: http://maanz.org.nz***
b. ***Australian Institute for Marine Archaeology: http://www.aima-underwater.org.au***

7. List at least two significant accessories useful for this type of dive

(i) Slates

(ii) Camera

8. List at least two continuing education courses that would be recommended to support preparation for this course

Peak Performance Buoyancy

Self-Reliant diver

9. How would you preserve artifacts made of unglazed pottery?

Firstly, prevent from drying out. Soak in freshwater for about eight

weeks, changing the water every few days. Then, after the freshwater treatment, soak in a bath of rubbing alcohol for three to four hours. After this allow the object to completely dry out and then coat with a clear polyurethane spray.