

Introduction to Underwater Archaeology for Divers

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**Module 1: What is Underwater Archaeology,
what is out there and why is it important?**

Introduction to Underwater Archaeology for Divers

This course was developed by the UASBC with the goal to provide essential underwater archaeology skills to sport and technical divers so that they can assist with, and eventually lead underwater archaeology surveys and projects.



- ▶ Understand underwater archaeology
- ▶ Conduct research
- ▶ Conduct searches and non-disturbance surveys
- ▶ Record and report results

Introduction to Underwater Archaeology for Divers

By the end of this module you will know:

- What citizen-scientists are and their role in u/w archaeology
- The history of underwater archaeology
- Why underwater archaeology is important
- Archaeological site types and artifacts found in our region
- How underwater archaeology is carried out and
- Which sciences support underwater archaeology work

Introduction to Underwater Archaeology for Divers

What is an avocational archaeologist?

- An avocational archaeologist is a Citizen Scientist with a passion for history as experienced through archaeology but has not chosen to follow a professional career in the subject.
- They are volunteers who use their working knowledge of archaeological methods to document underwater sites on weekends, during vacation or in retirement.

Who can be an Underwater Archaeologist?

- Divers:
 - An open water certification with at least 50 dives for shallow sites.
 - An advanced open water certification or extensive diving experience for sites 18-30 m deep, or locations with challenging conditions.
 - Technical diver training for dives below 40 m*
- Non-divers:
 - Tasks like research, remote sensing work and documentation don't require a dive certification.

Participating in Underwater Archaeology

There are many ways a diver can participate in underwater archaeology.

- Conduct historical research
- Conduct searches for sites in lakes, rivers and the ocean
- Conduct site mapping surveys
- Draw and catalogue artifacts
- Complete Shipwreck site recording forms.
- Conduct photography and photogrammetry

Participating in Underwater Archaeology

- Monitor sites
- Publish research results
- Provide education opportunities
- Lobby for protection of U/W archeological sites
- Report illegal activities that may occur on an archaeological site
- Carry out special projects to further our knowledge about a particular subject.

Citizen Scientist activities in underwater archaeology *must* be **non intrusive and non-disturbance.**

For Professionals

There are some activities which should be conducted or supervised by professionals due to cost, time commitment and availability of resources and equipment.

- Paid work subject to Health and Safety regulations.
- Destructive investigative techniques (excavation, artifact recovery and conservation).
- Major development project surveys requiring complex planning and impact assessment experience.
- Dredging projects, which require knowledge of impact management procedures.
- Unexploded ordinance surveys, e.g. on sunken war ships.
- Artifact conservation requiring specialist training and facilities.

What is Underwater Archaeology?

It is the study of vessels, vessel remains, artifacts, submerged landscapes and submerged structures found underwater in lakes, rivers and the ocean.



North Sea Wreck

J. Marc

What is Underwater Archaeology?

- ▶ Shipwrecks
- ▶ Indigenous heritage sites
(fish weirs and reef-netting sites)
- ▶ Historical structures
(wharves and marine railways)
- ▶ Sunken aircraft
- ▶ Sunken trains
- ▶ Other submerged cultural heritage sites



What is Underwater Archaeology?

Changes in sea level because of local seismic events and larger climatic changes, mean that some sites of human occupation that were once on dry land are now submerged.

Studying the impacts of changing sea levels is an important aspect of archaeology on the coasts of Alaska and British Columbia.



Not Underwater Archaeology

Salvage, treasure hunting and souvenir collecting are not underwater archaeology.

- **Salvage** is generally carried out to recover a sunken ship or its cargo on behalf of an insurer for monetary gain.
- **Treasure** hunters seek to find sunken shipwrecks and retrieve gold, silver, coins and other artifacts of value for financial gain.
- **Souvenir** collectors may have a genuine interest in history, but damage sites when they take artifacts home.



Courtesy Fred Rogers

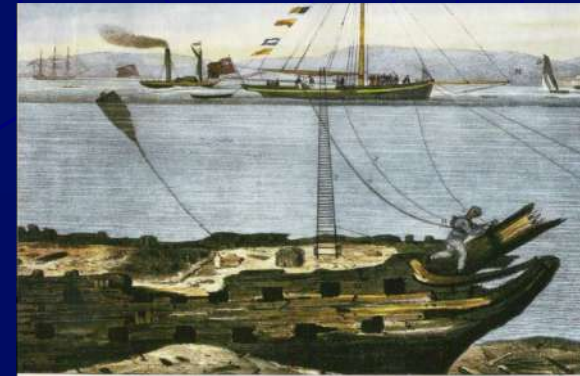
Since the above activities are not carried out to advance our cultural knowledge, and result in the destruction of heritage sites, they are not considered underwater archaeology.

History of Underwater Archaeology

The development of underwater archaeology as we know it didn't really happen until the invention of hard hat diving in the early 19th century. Early diving focused on salvage as there was money to be made.

The first evidence of salvagers documenting their underwater finds came from the Deane Brothers. In 1832 the Deane Brothers were salvaging cannon from the sunken ship Royal George (1782) at which time they had had accurate water colours painted of their operations and finds.

The first systematic archaeological underwater investigation was probably the recovery of the Nemi Ships in 1929-32. Lake Nemi, Italy was drained and two 1st Century Roman Era ships were towed ashore and studied.



National Maritime Museum S4845



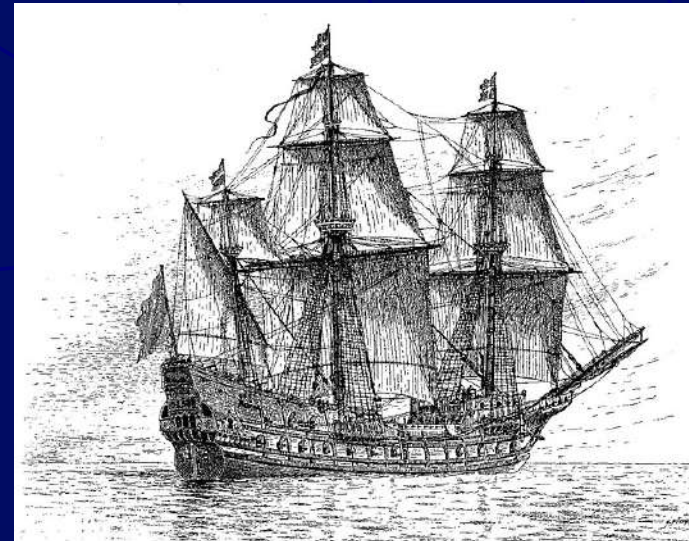
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History of Underwater Archaeology

The first case of diving underwater archaeology may have been 1933-39 when the 50 m-long Swedish warship *Elefanten* (1564) that sank after battle, was partly excavated and salvaged by hard hat divers under the direction of Carl Ekman.

The first scientific excavation of a shipwreck using SCUBA divers occurred on the Grand Congloué (Roman) shipwreck off the coast of Marseilles, France between 1951-57.

Underwater archaeological excavations were initiated by Jacques Cousteau. His team invented dredge pumps to remove the sediment from the wrecks and salvaged thousands of 1st Century BCE amphora and other artifacts.



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History of Underwater Archaeology

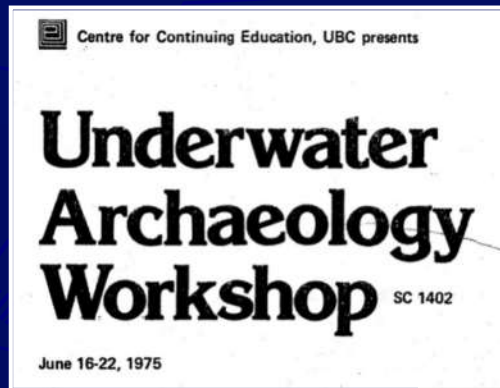
It was not until 1960 that a young archaeologist, George Bass, teamed up with explorer Peter Throckmorton to investigate a Late Bronze Age shipwreck at Cape Gelidonya, Turkey. Bass first had to learn to dive, then directed the excavation showing that archaeology could be done underwater to the same standards as on land. Dr. George Bass became known as the father of underwater archaeology.



Courtesy Institute of Nautical Archaeology

History of Underwater Archaeology in British Columbia

The first recorded underwater archaeological work to be carried out in BC took place during a workshop June 16-22, 1975. During the course, excavation and documentation work was completed on the wreck of the Panther.



MV Bristol Fashion over Wreck Site



Ship Panther wrecked Wallace island January 17, 1874.

What is an Underwater Archaeological site?

An underwater archaeological site is any submerged place which contains physical remains of past human activities. An archaeological site can be a prehistoric submerged settlement, a shipwreck or many other submerged objects.

In British Columbia, any site or object from AD 1846 or earlier, and all shipwrecks are *automatically* protected by law. However, many other archaeological sites like trains, cars and dock sites are not automatically protected.



Lord Western Ballast Pile

Why are Underwater Sites Important?

Underwater archaeological sites preserve clues to our past and we can learn from them.

Sites like shipwrecks can provide important historic information relating to technology and events of the past and are often likened to time capsules.

Submerged sites often preserve material that is destroyed when exposed to air on land.



Rare Steeple Steam Engine Underwater



1853 Hemp Rope Preserved in Mud

Site Types: What's Out There?

The next few slides will illustrate the range of sites that can be found underwater or in a foreshore context in BC:

- Shipwrecks
- Train Wrecks
- Aircraft
- Indigenous Heritage Sites
- Early Settler Sites
- Submerged Sites
- Breakwaters
- Docks
- Other Stuff

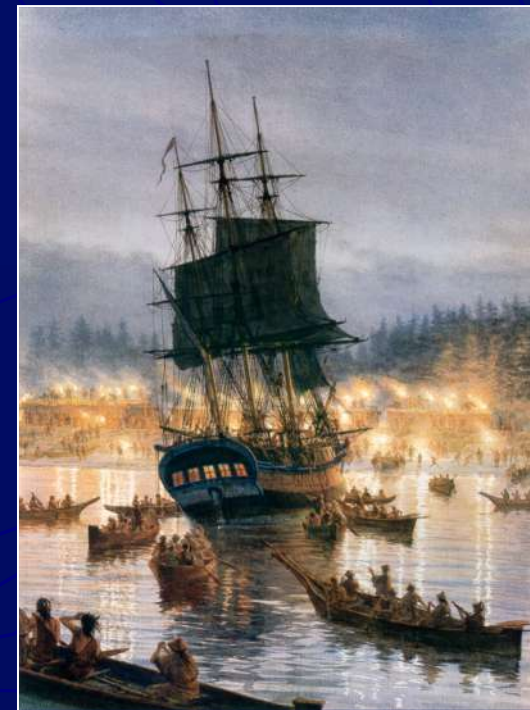
Shipwrecks

Wrecks are probably the most common form of submerged archaeological site in the PNW.

Shipwrecks occur for many reasons:

- Navigation errors: vessels run aground or collide with each other.
- Accidental explosions or fires: ships boilers or cargo explode; vessels burn to the waterline and sink.
- Bad weather: vessels take on water and sink.
- Purposeful sinking: ships sunk in battle or scuttled

All kinds of shipwrecks are present in our region.



Boston 1803

Shipwrecks are protected under the Heritage Conservation Act in BC

Train Wrecks

Underwater train wrecks occur when trains derail near a water body; or train barges sink.

In British Columbia, train engines and cars were routinely moved on barges. In several instances these barges had mishaps and spilled engines and rail cars into the water.

Several of the documented sites contain rail car examples that are not represented on land, which makes them important to document and protect.



Tug Hosmer with 15 Car Barge



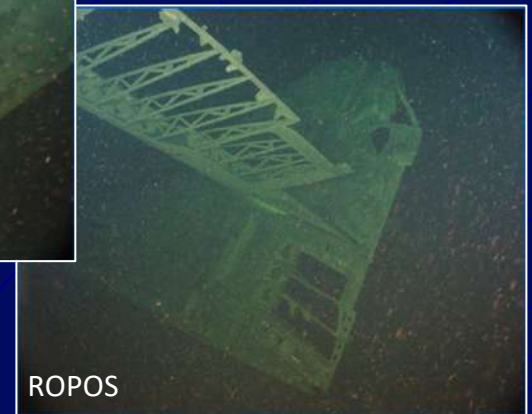
1901 Proctor Box Car Wreck

Aircraft Wrecks

Plane crashes occur when they run into mechanical problems or bad weather. They also occur as a result of pilot inexperience. During World War II several airfields in the province served as training bases. Abbotsford and Victoria were the largest in BC. Planes leaving these bases frequently lost engines and crashed into the sea. Others flew into mountainsides in bad weather. Others like amphibious aircraft landed safely on the water only to strike an object and sink. We have examples of all types of crash sites in deep and shallow water. We just haven't found many of them.



Canadian Forces



ROPOS

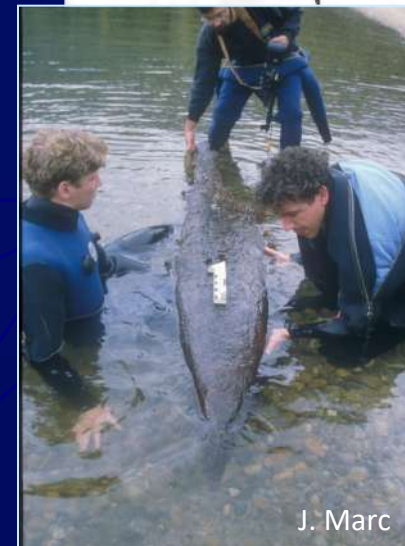
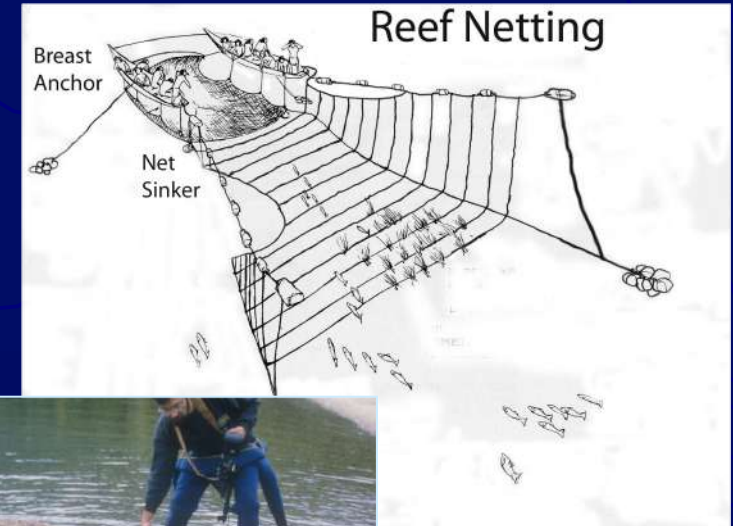
Canso 9701 Crashed at Patricia Bay on February 12, 1945

Indigenous Heritage Sites

Indigenous peoples have lived in our region since time immemorial. For millennia they have used the sea, lakes and rivers for travel, trade, warfare and resource gathering.

The physical evidence of these activities can be difficult to find underwater, although remains of wooden fishing weirs and stone anchors at reef-netting sites can be recognized by a trained eye.

Indigenous underwater archeology in our region is relatively new and there is a lot of learning and work to do.



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Shuswap Lake Canoe

Early Settler Artifacts

Captain Cook arrived off Nootka Sound on March 29, 1778 and indirectly set off the early colonization of what we now know as British Columbia. Fur traders followed and the Spanish built a fort at Nootka in 1790 and Fort Victoria was established in 1846.

During this early period events happened that left archeological evidence. The Spanish left behind material in Friendly Cove and an olive jar was retrieved from the waters off Haida Gwaii. There are many yet to be found artifacts.



Crude Brick from Nootka Fort



Olive Jar found off Haida Gwaii

Submerged Sites

Once located on dry land, sites become submerged due to rising sea levels, changing river courses, or flooding due to hydroelectric dam operations. Today the only way to see these sites is to dive them.

The end of the last Ice Age witnessed huge changes in sea levels throughout our region – some once-dry areas are now over 120 m below current sea level.

In BC, studies focusing on submerged archaeological landscapes have been conducted in the southern Gulf Islands and on Haida Gwaii.



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Dredging Montague Harbour 1989

Breakwaters

In the 1930's, 40's and 50s logging companies purchased surplus ships to sink and use as break water structures to protect their log booming grounds. The largest of these occurred at Royston where 14 vessels were sunk between 1936 and 1963. The Royston breakwater is made up of windjammers, tugs, WW II frigates and whalers.

Additional sites were built at Kelsey Bay, Stillwater, Oyster River, Mud Bay and Powell River. It should be noted that the Powell River breakwater is floating breakwater made up of WW II concrete ships and is still active.



Royston Ship Breakwater



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Powell River Floating Breakwater

Abandoned Dock Sites

Docks were built all over the province during its early development to facilitate commerce. Now many lie abandoned, because either a cannery closed, a community disappeared, technology superseded them or new structures were built. Some docks connected with early commerce or transportation warrant study. Most were not well documented. Conducting archaeological work can fill in the gaps. In Nelson the Canadian Pacific Railway maintained a shipyard and an extensive dock structure to load rail cars and cargo on to barges and paddle wheelers. This infrastructure was abandoned in 1930 when a railway link was completed between Kootenay Landing and Proctor. Mapping sites like this are important as there are few archival records documenting what these sites looked like.



Surveying CPR Wharf in Nelson

Other Stuff

While we have covered numerous site types, there are always surprises.

We have found old logging and mining equipment, old cars and even buggies underwater. These are all part of the greater heritage landscape and it is important to record and document these sites.



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1924 Model T



Kaslo Wagon Wreck



Bronwen Young

Air Compressor on Barge in Slokan Lake

Doing Underwater Archaeology

We do underwater archaeology by:

- conducting historical research
- carrying out visual or remote sensing searches
- completing dive surveys to record sites
- mapping and recording sites
- conducting excavations to access buried information
- conserving and stabilizing artifacts for future generations
- publishing data and conclusions



In addition to archaeological methods, we often lean on other sciences to get answers.

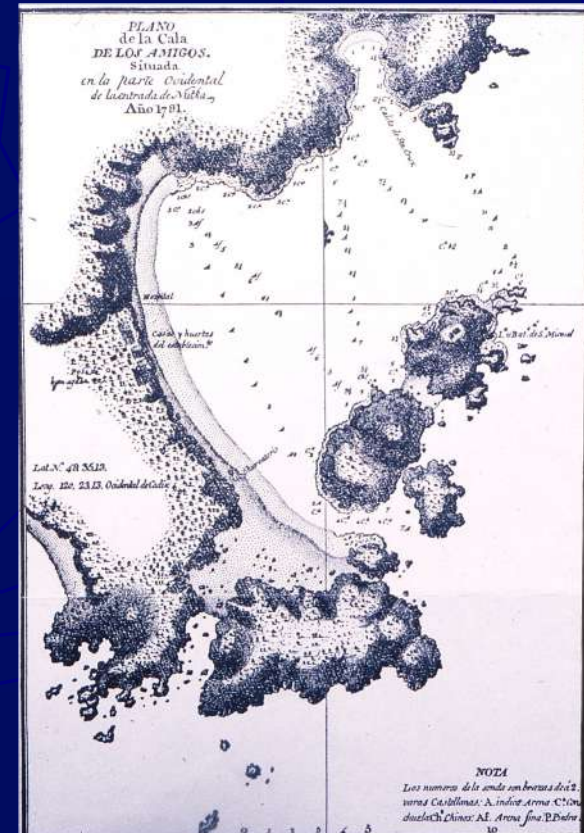
Other Sciences in Underwater Archaeology

History

Through research of historical documents housed in archives, museums and libraries we learn where a vessel was built, where it sailed, how it was wrecked and what was salvaged.

Witness accounts, contemporary news articles and administrative reports also document potential wreck locations and Indigenous sites.

Traditional knowledge (oral histories) are a fundamentally important source of information about Indigenous heritage sites.

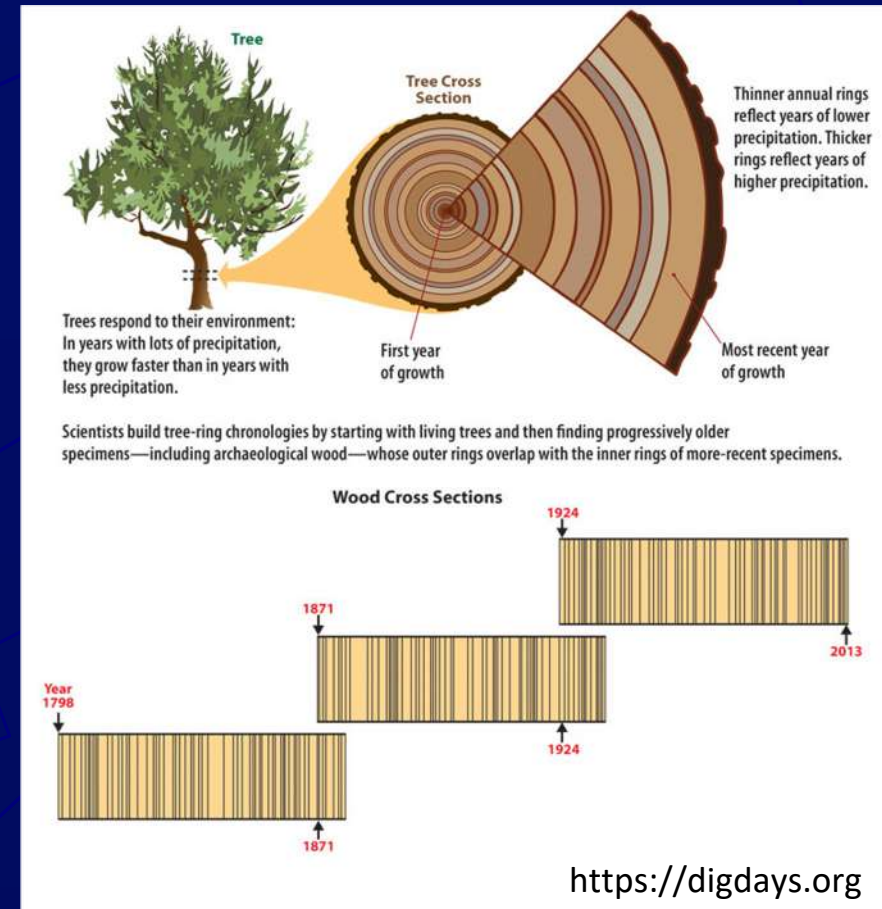


Other Sciences in Underwater Archaeology

Dendrochronology

Dendrochronology is an important technique for dating the timbers of wooden ships. It may also provide additional information, including the region where the timber was harvested (and the vessel was constructed).

Scientists have developed tree ring chronologies which can be compared to the wood in a wreck to determine its age and possible origin.



Other Sciences in Underwater Archaeology

Metallurgy/Radiography

Metal objects are common on shipwrecks, but can be often badly concreted and unidentifiable. Metal objects recovered from underwater sites also require special and often immediate chemical treatment if they are to be preserved.

Metallurgy is concerned with the chemical and physical properties and structures of metals. This science allows us to understand how particular metals react in underwater environments and how concretions form.

We can use radiography (x-rays) to look inside a concretion and learn what the object is.



www.unesco.org

Other Sciences in Underwater Archaeology

Geology

Geological processes can play a role in underwater archaeology. Sites once above sea level are now below it and sites that were once exposed can become buried.

Where would we look for human occupation that was once on dry land and is now submerged? How would we determine how long it took for wreck to become buried in sediment?

Geology is the discipline that can inform about soil movements transforming a site or changes in sea level, erosion or deposition of sediment material. Geology can also speak to stratigraphy on a site.



Other Sciences in Underwater Archaeology

Photogrammetry

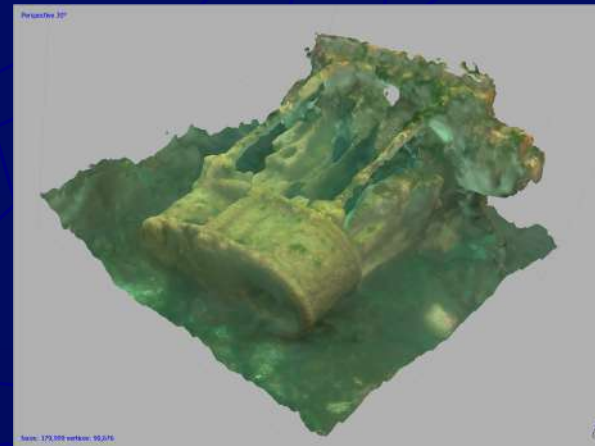
Photogrammetry methods vary, but all involve generating three-dimensional data about an object or scene from photos.

In its most common underwater application, photos of an object are taken from 100s of different positions and analysed by software which estimates their relative positions and generates a 3D model.

3D models can be shared with researchers or specialists who are not divers. Detailed site maps and can also be produced this way.



Photogrammetry Photo Locations



Rendered Image of Storm King Engine

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