Case Study:

What can the seafloor tell us about World War Two?

Examining Regional Environmental Characterisation surveys (RECs)

Lesson

This case study provides a real-life example of history and archaeology in the workplace. It examines marine archaeological research, focusing on World War Two at KS3.

Using this lesson

Check out our website http://ets.wessexarch.co.uk/teachers/history for the accompanying teacher pack and resources.

The colour-coded boxes indicate downloadable activities, discussion ideas and opportunities and links to find out more.

Details are provided in the teacher pack.

FILM

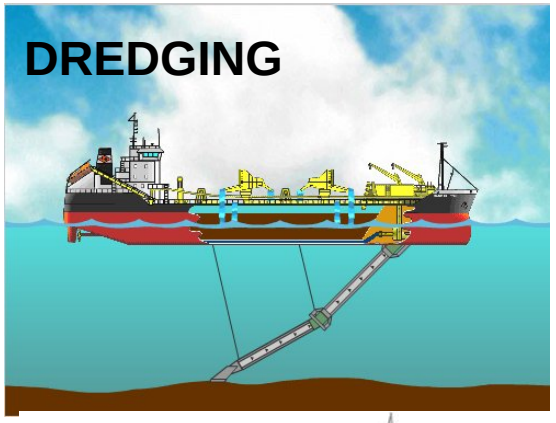
ACTIVITY

DISCUSSION

FIND OUT MORE

What is an REC?

A scientific multidisciplinary marine study of the **geology, biology** and **archaeology** of different areas of the British coast.



[Be a Seafloor Explorer]

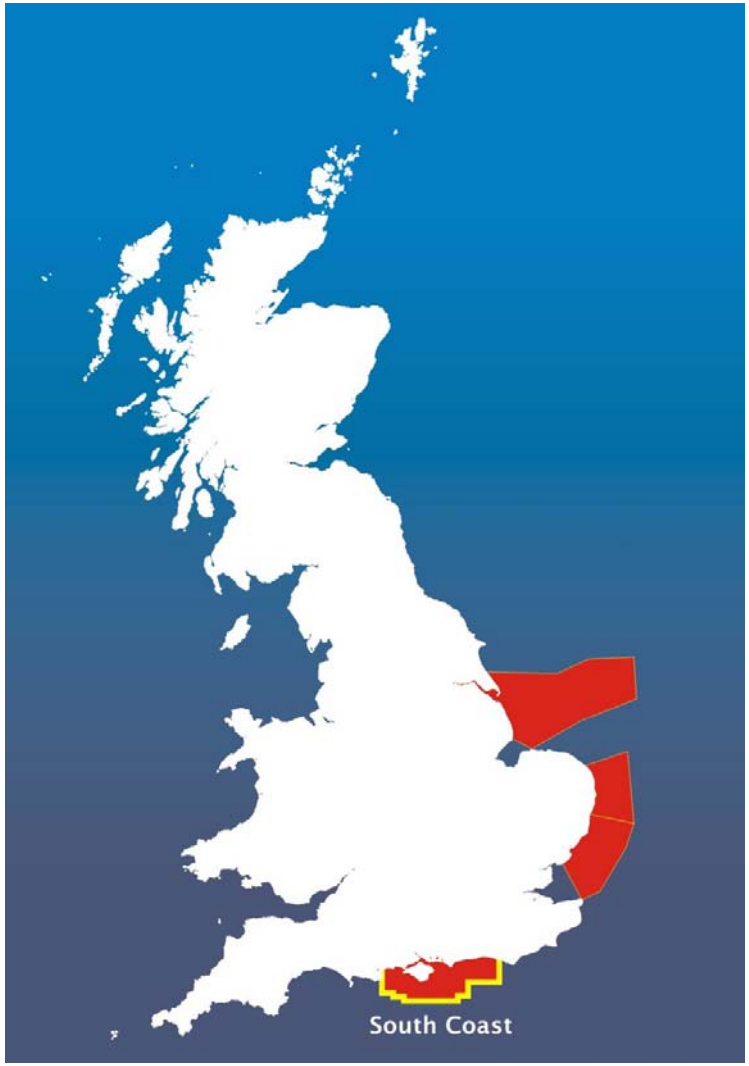
Main Objective

To provide integrated maps of the seafloor, to allow the sustainable management of offshore resources now and in the future.

Funded

Marine Aggregate Levy Sustainability Fund (MALSF)

South Coast REC Archaeology



This lesson focuses on the South Coast REC survey and the archaeological element of the scientific research.

Archaeological Study Aims

- To create seafloor maps of potential areas of prehistoric archaeology
- To create seafloor maps of significant archaeological sites e.g. ship and aircraft wrecks
- To inform marine planning to use the sea sustainably without damaging archaeology

Size of study area: 5600km2

Date: 2008 - 2010

Background information

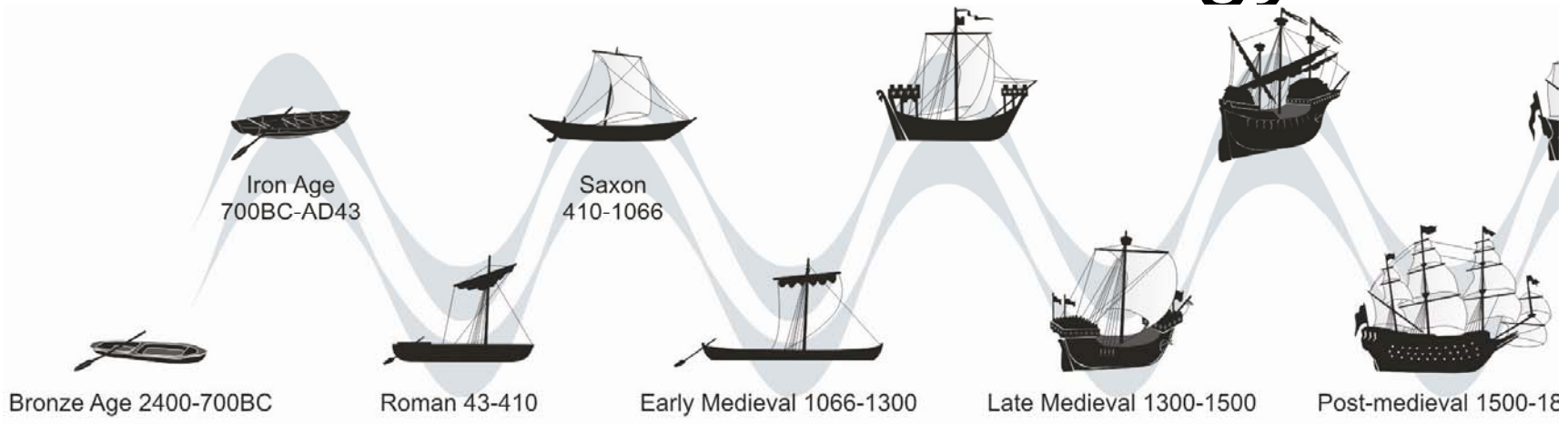
Submerged Prehistoric Landscapes

Reconstructed landscape

Mammoth's tooth

Download our Geography Lesson

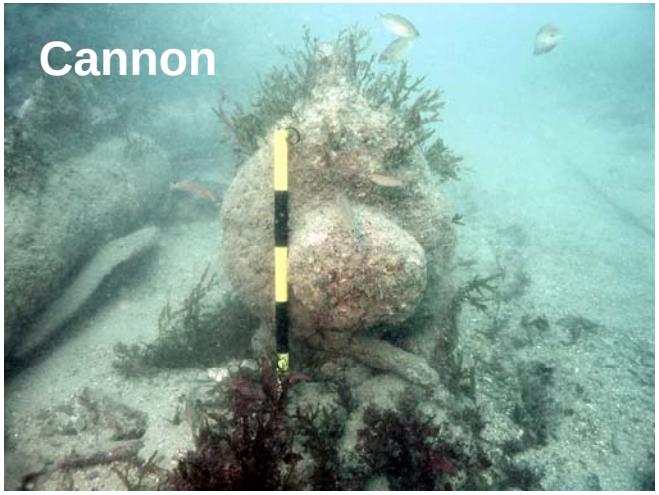
Maritime Archaeology



British boats and ships timeline

Evidence on or from the seafloor

What did you find on the seafloor?

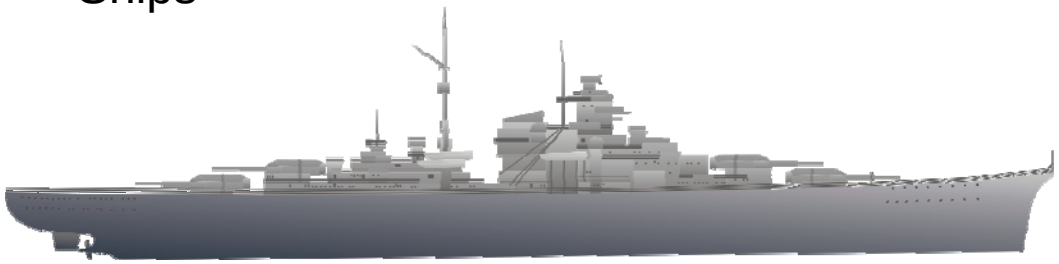


Silverware

Focus: World War Two

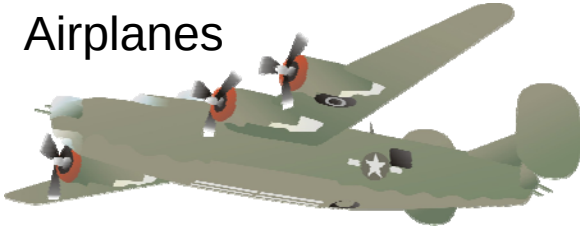
Why is there a lot of WWII evidence found on the seafloor?

Ships



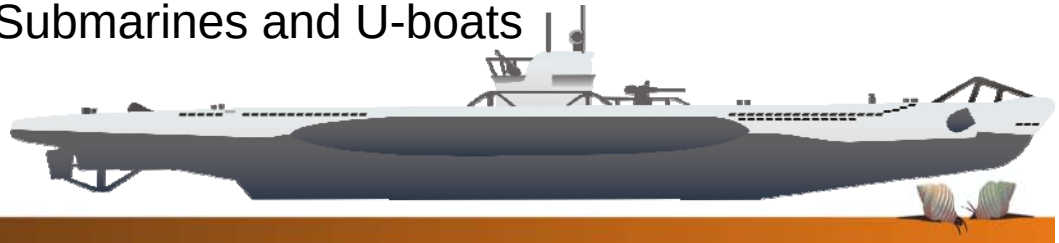
Structures

Airplanes



Small objects

Submarines and U-boats



REC Methodology

There are three main stages to the archaeological research for the South Coast REC.

Stage 1	Collecting Data	• Desk Based Assessment • Fieldwork
Stage 2	Results – using the data	• Creating maps • Final report
Stage 3	Recommendations	Highlighting what is special about the South Coast REC study area.

Stage 1: Collecting data

Issues for researching REC study

- Covers a large area
- Looking to get a general picture of what is there
- Limited by time and money

What the archaeologists did

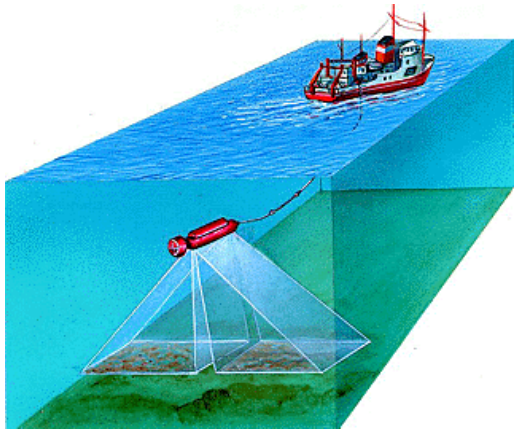
The programme of work suits the study aims

- Fieldwork: Geophysical Survey
- Desk Based Assessment

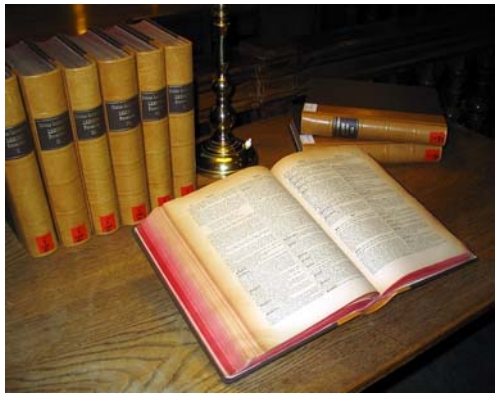
What they did not do

More detailed study

- Underwater excavation
- Remote vehicle operation



Fieldwork



Desk Based Research

Fieldwork: Geophysical Survey

Geophysical survey collects information about the physical properties of the seafloor and create images.

Archaeologists used several techniques

Discover more about Marine Careers

Download our Physics Lesson

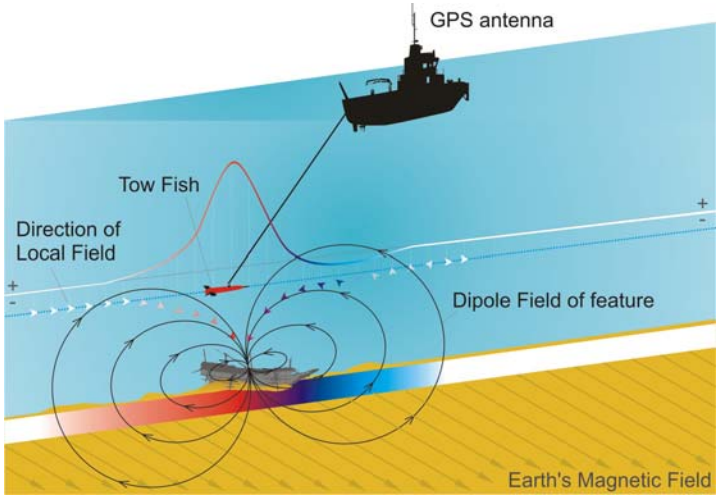
Sonar

Uses sound waves to record the seafloor
Archaeologists used several different acoustic survey methods

- Sidescan Sonar
- Bathymetry Multibeam Sonar
- Sub-Bottom Profiler

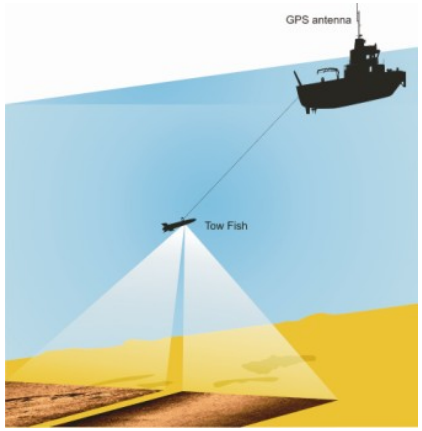
Magnetometry

Measures magnetic changes, which is good for detecting iron (e.g. shipwrecks)



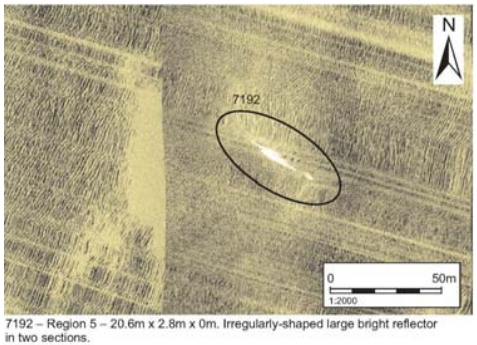
Magnetometry

Sonar techniques



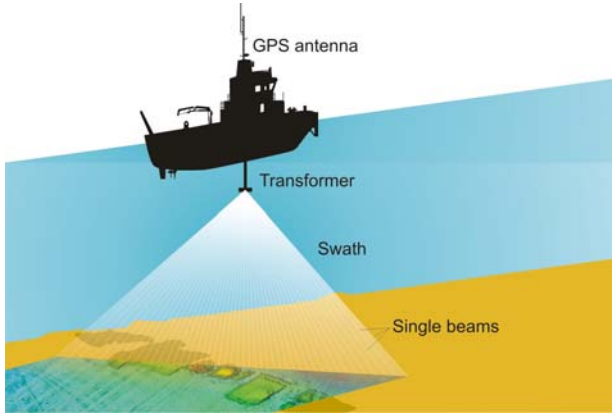
Sidescan sonar

Measures the intensity of the reflected soundwaves



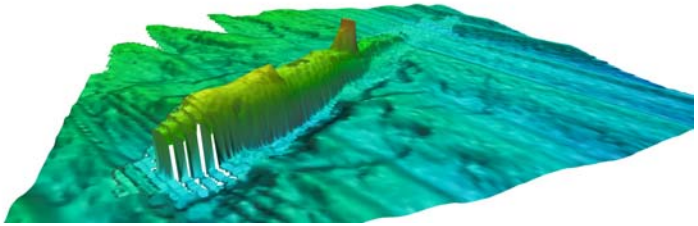
7192 – Region 5 – 20.6m x 2.8m x 0m. Irregularly-shaped large bright reflector in two sections.

Shipwreck

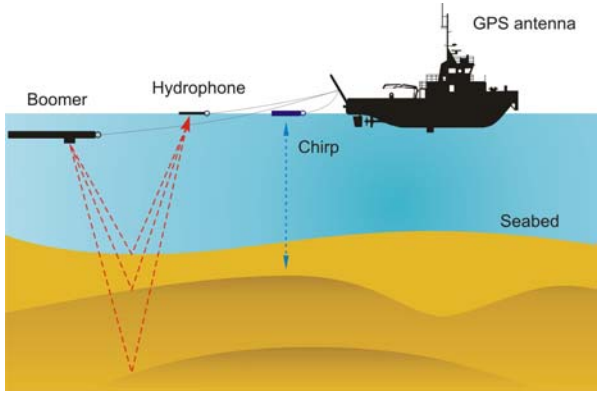


Multibeam Bathymetry sonar

Measures the time it takes for sound waves to travel down and bounce back. It can create 3-D images of the seafloor.

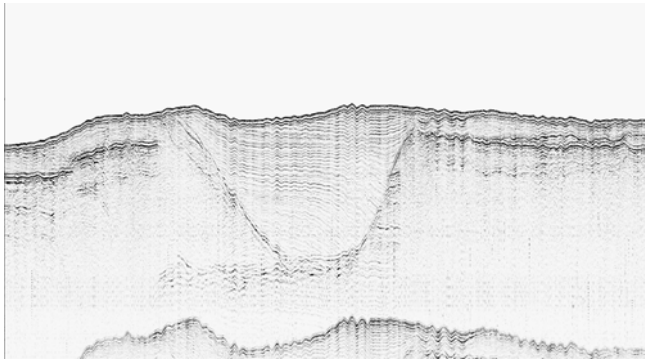


Submarine



Sub-bottom profiler

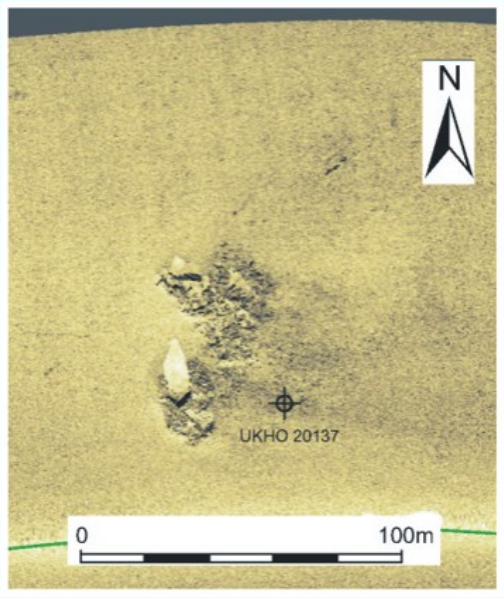
Records a section of the seafloor, can see changes underneath.

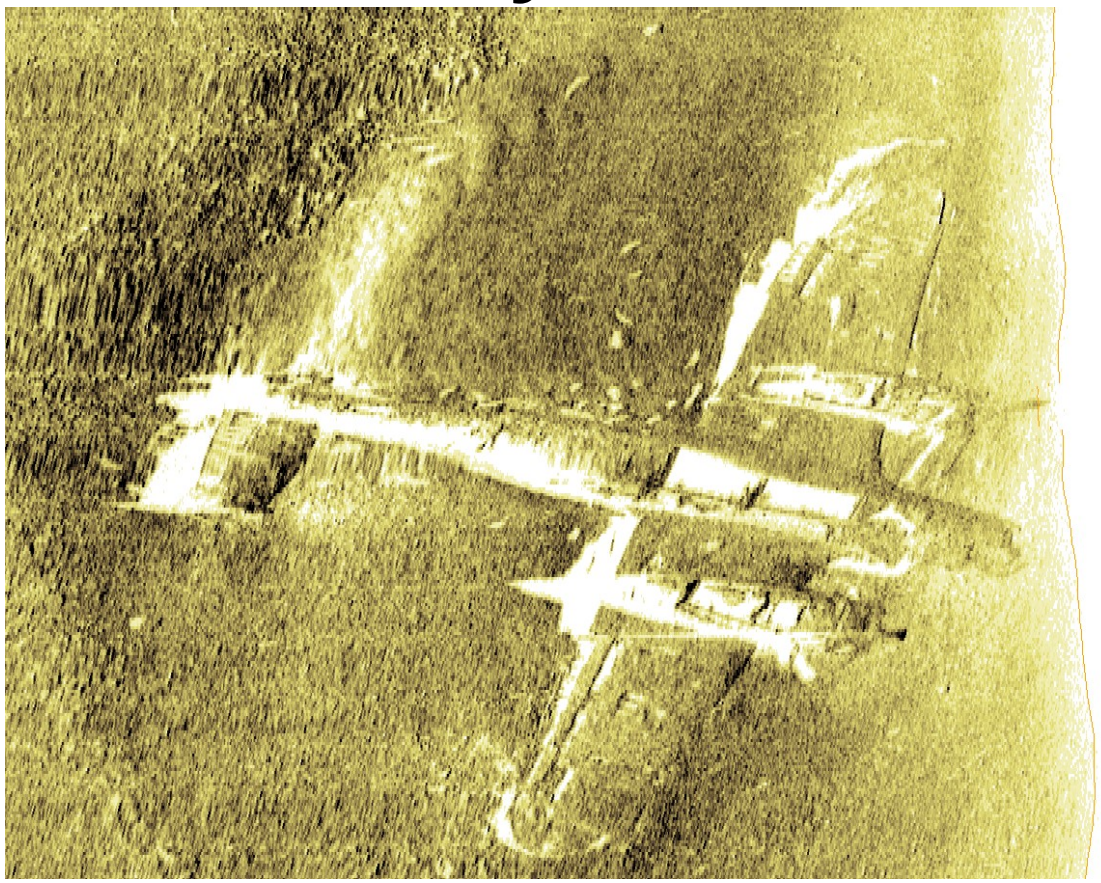


Seafloor channel

Results vary

This anomaly shows the remains of the ship called the HMT *Inverclyde*. It takes expertise to be able to tell if an anomaly is a ship or aircraft wreck rather than a geological feature, like rocks, on the seafloor.





Covering the study area

What do the lines on the map represent? Do they provide a representative coverage of the study area?

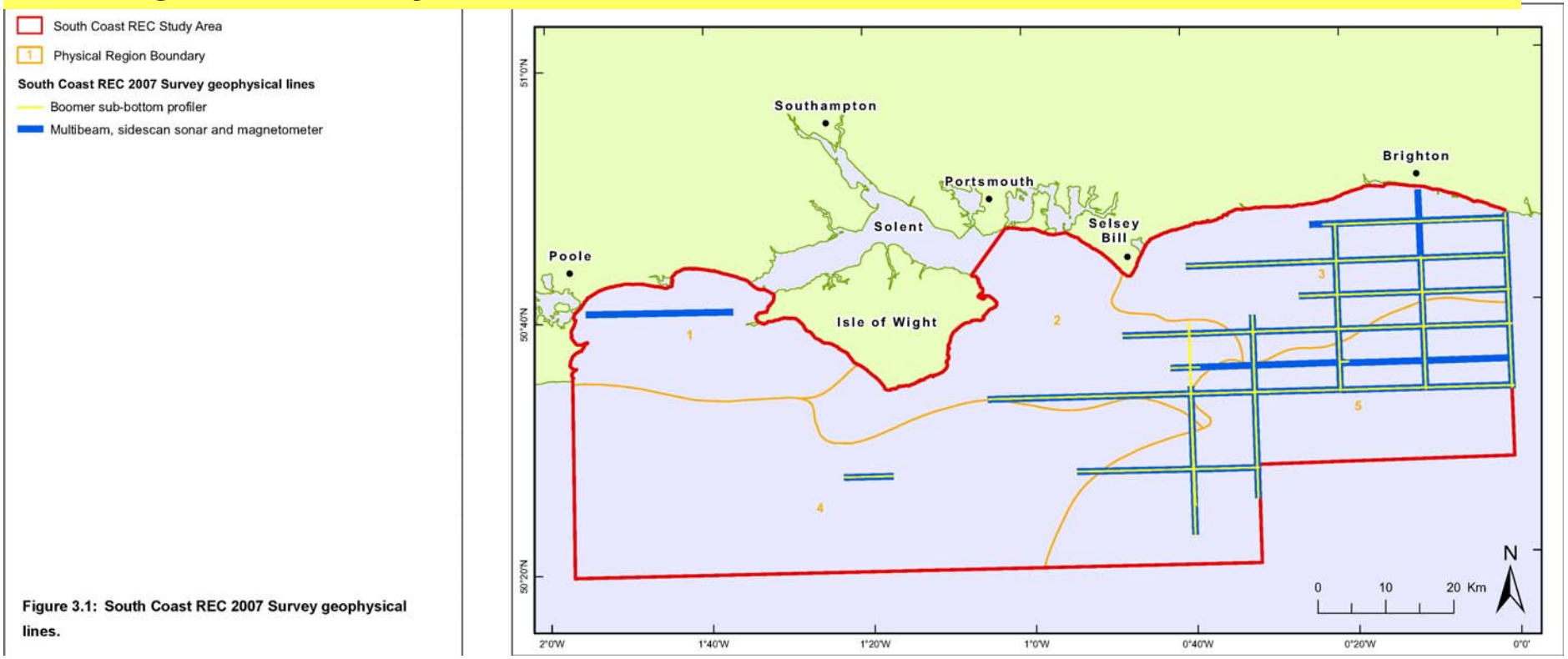


Figure 3.1: South Coast REC 2007 Survey geophysical lines.

Filling in the gaps

Archaeologists used geophysical survey collected in the past to fill in the gaps.

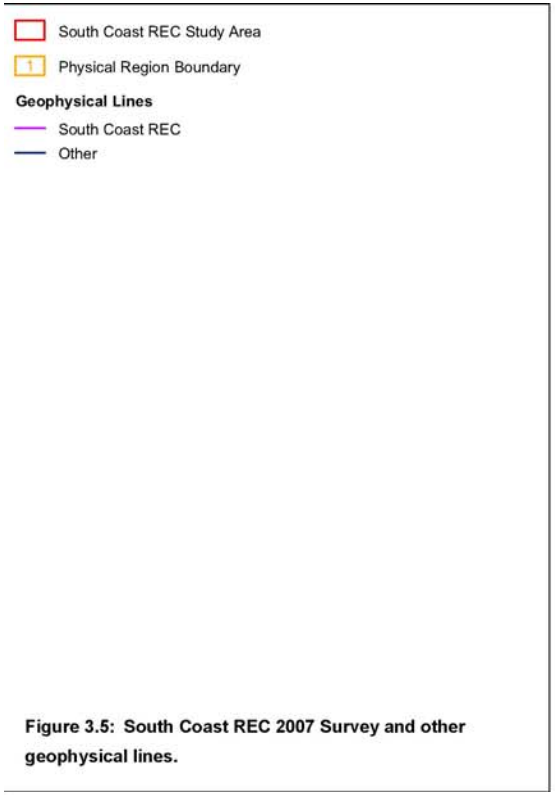
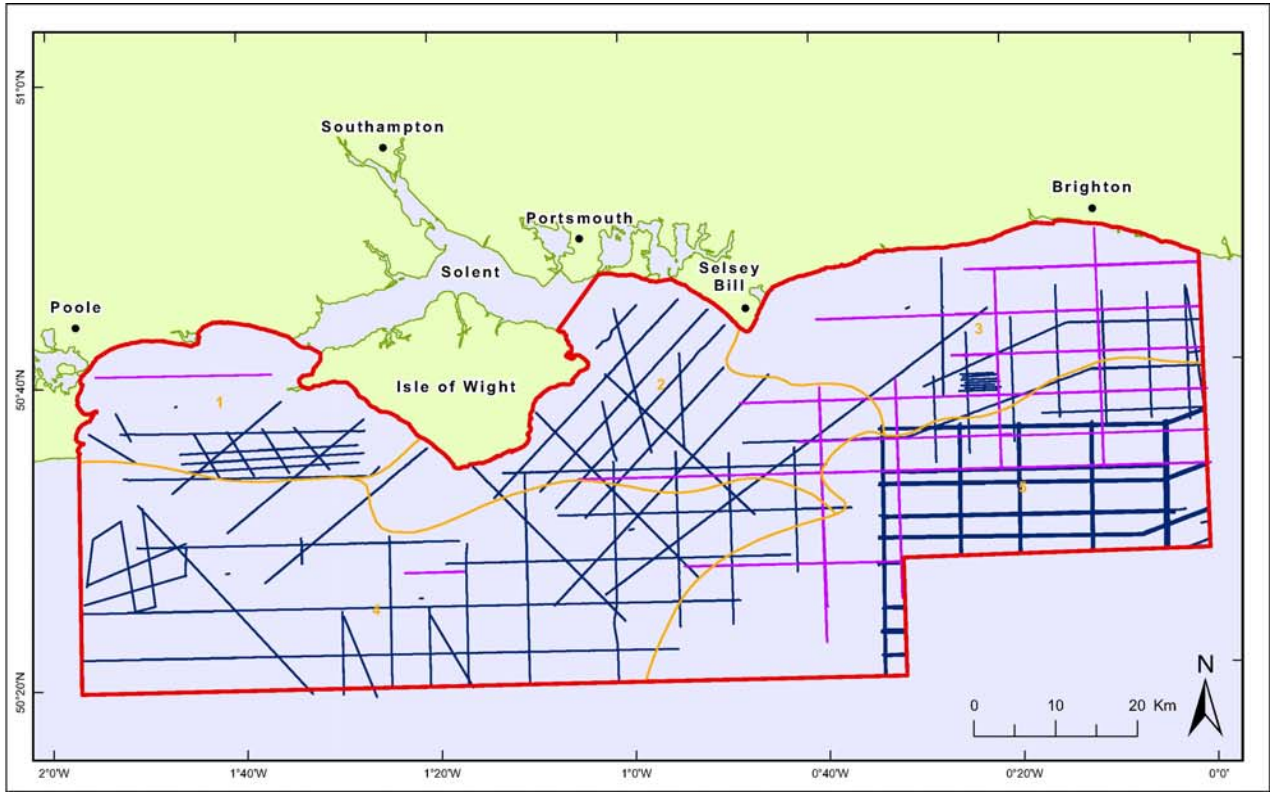


Figure 3.5: South Coast REC 2007 Survey and other geophysical lines.



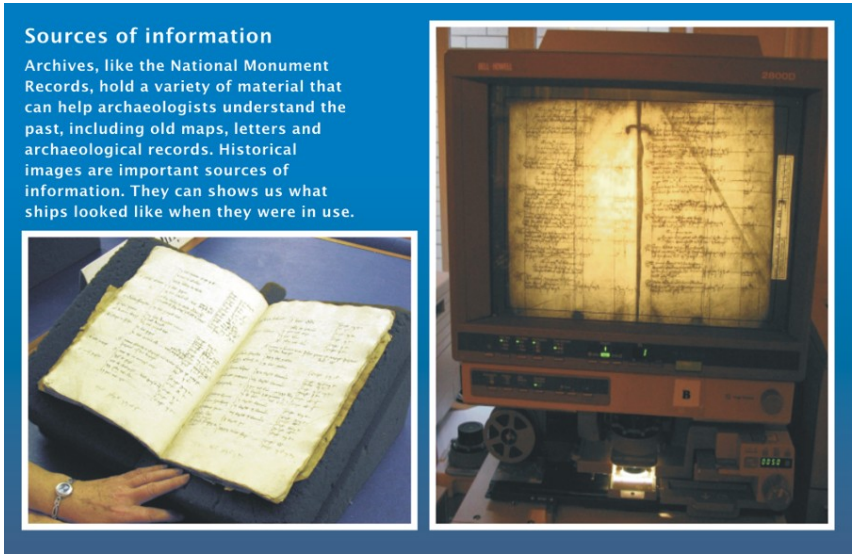
Taken from the South Coast REC report © Crown Copyright

What are some of the considerations and issues when undertaking fieldwork?

Desk Based Assessment

What is a DBA?

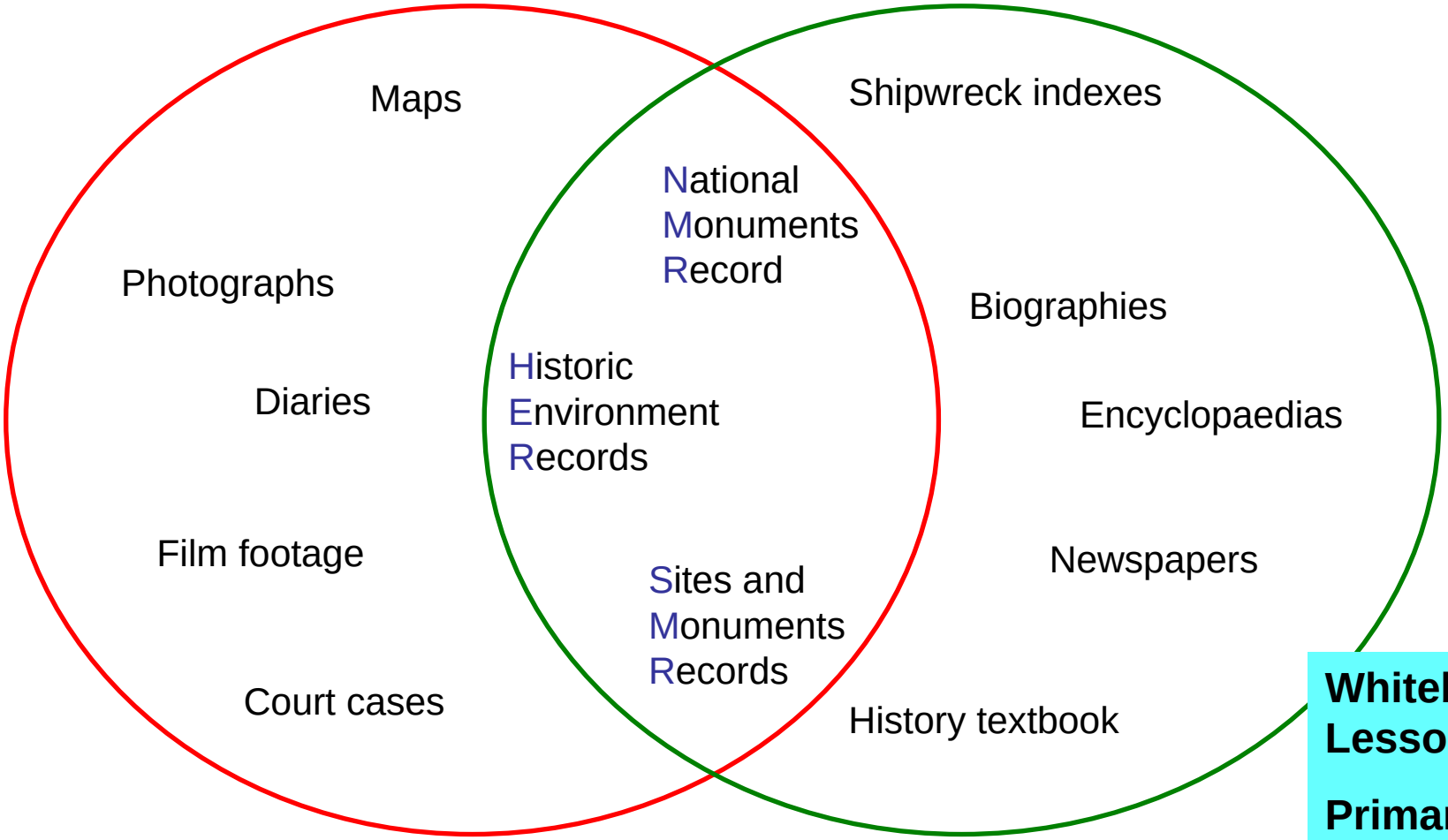
A DBA collects together and **summarises in a report** any relevant research already undertaken and other sources of information about the archaeology for the study area, parts of the study area or areas in the study area's vicinity.



Sources of information:

- Historical research
- Previous archaeological work
- Artefacts found in the sea by industries

Historical sources for wrecks



Whiteboard Lesson:

Primary or Secondary sources

Historical sources for wrecks

Source	Type	World War Two example
Maps	Primary	Military maps of waters
Photographs	Primary	Aerial photography
Film footage	Primary	Films of aerial fights
Diaries	Primary	Personal accounts of sailors
Court cases	Primary	Insurance claims
Newspapers	Secondary	Accounts of wrecking
History textbooks	Secondary	General wreck information
Encyclopaedias	Secondary	Wreck characterisations
Biographies	Secondary	Analysis of individuals' experiences
Shipwreck indexes	Secondary	Evaluated individual losses
National Monuments Record	Primary and Secondary	Aircraft casualties
Historic Environment Records	Primary and Secondary	Locations of wreck remains
Sites and Monuments Records	Primary and Secondary	Find spots indicating a possible wreck

Example: World War II aircraft section of the DBA

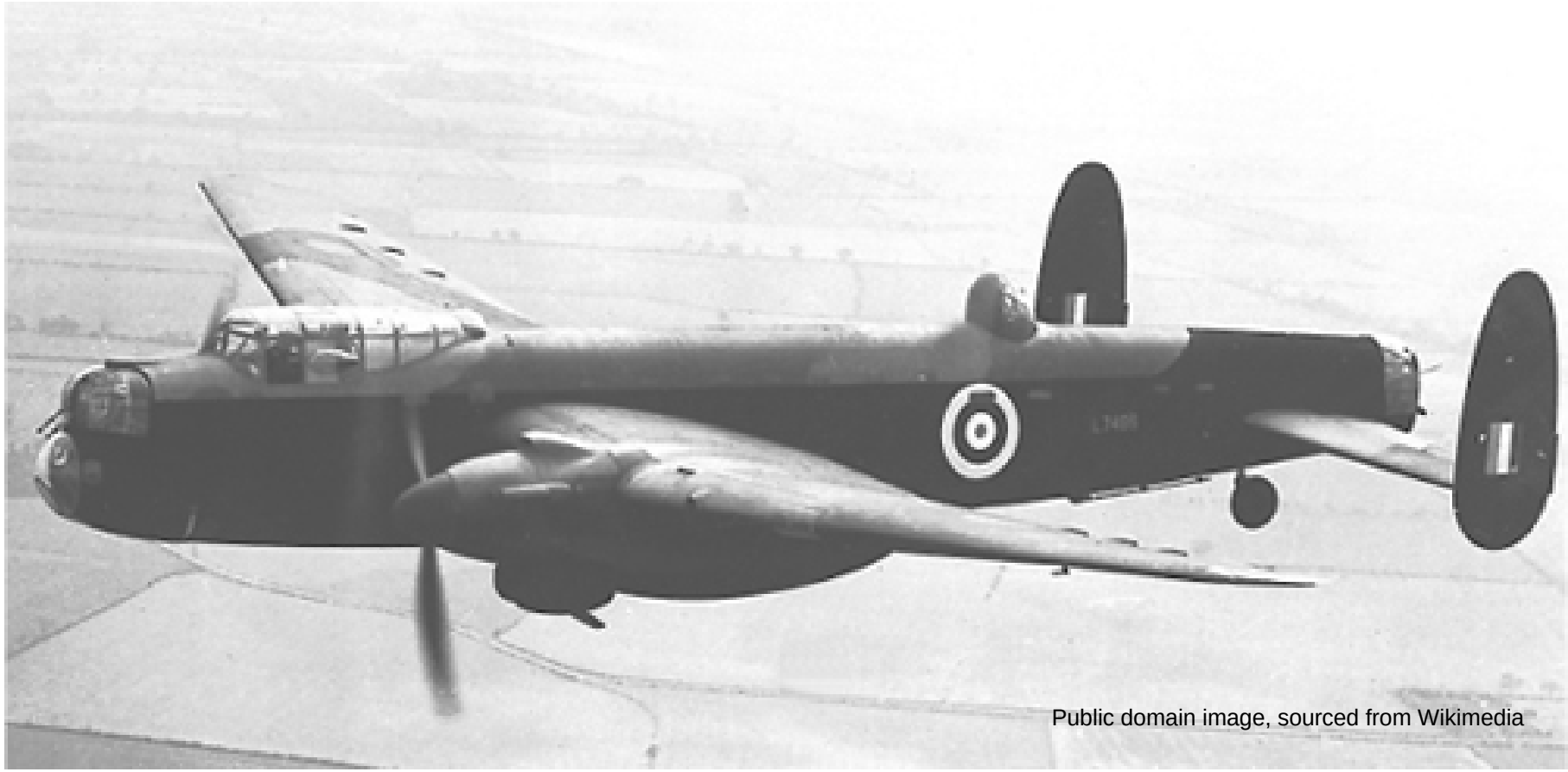
Specific area of the South East coast	Number of aircraft casualties recorded by the military (in the National Monuments Record)	Number of aircraft wrecks found (in the United Kingdom Hydrographic Office)
1	125	1
2	131	2
3	86	3
4	35	1
5	7	1
Total	384	8

Taken from the South Coast REC Report

Why are there more National Monument Records for aircraft wrecks than United Kingdom Hydrographic Records? What does this tell us?

Website: Visit English Heritage's online NMR - Pastscape

Visual sources



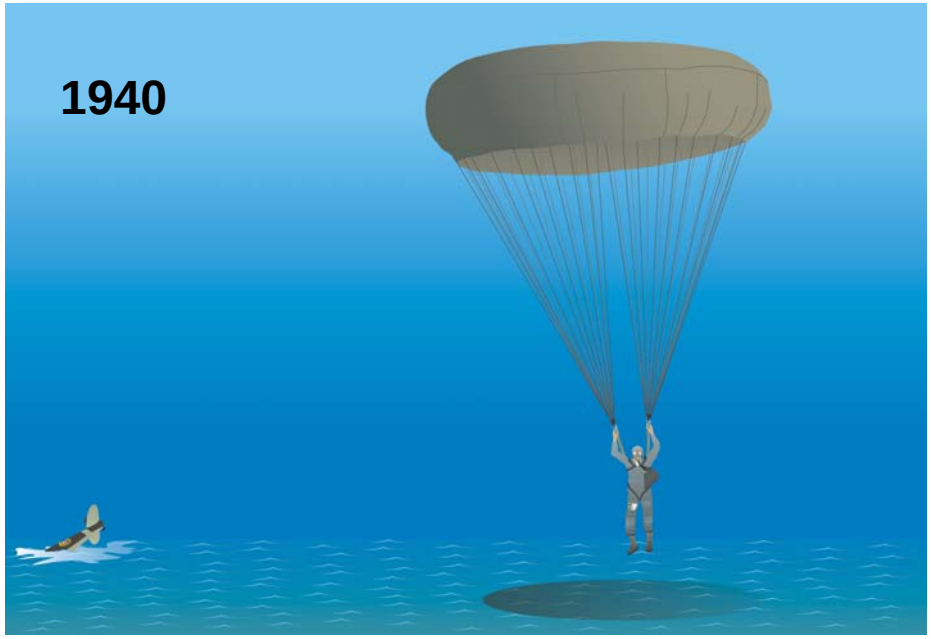
Public domain image, sourced from Wikimedia

Oral sources

2011

Website: BBC's WW2 People's War

Why is oral history an important source of information for World War II?



Archaeological Evidence

Why do most South Coast aircraft wrecks date to World War Two?

Aircraft changed the way wars were fought.

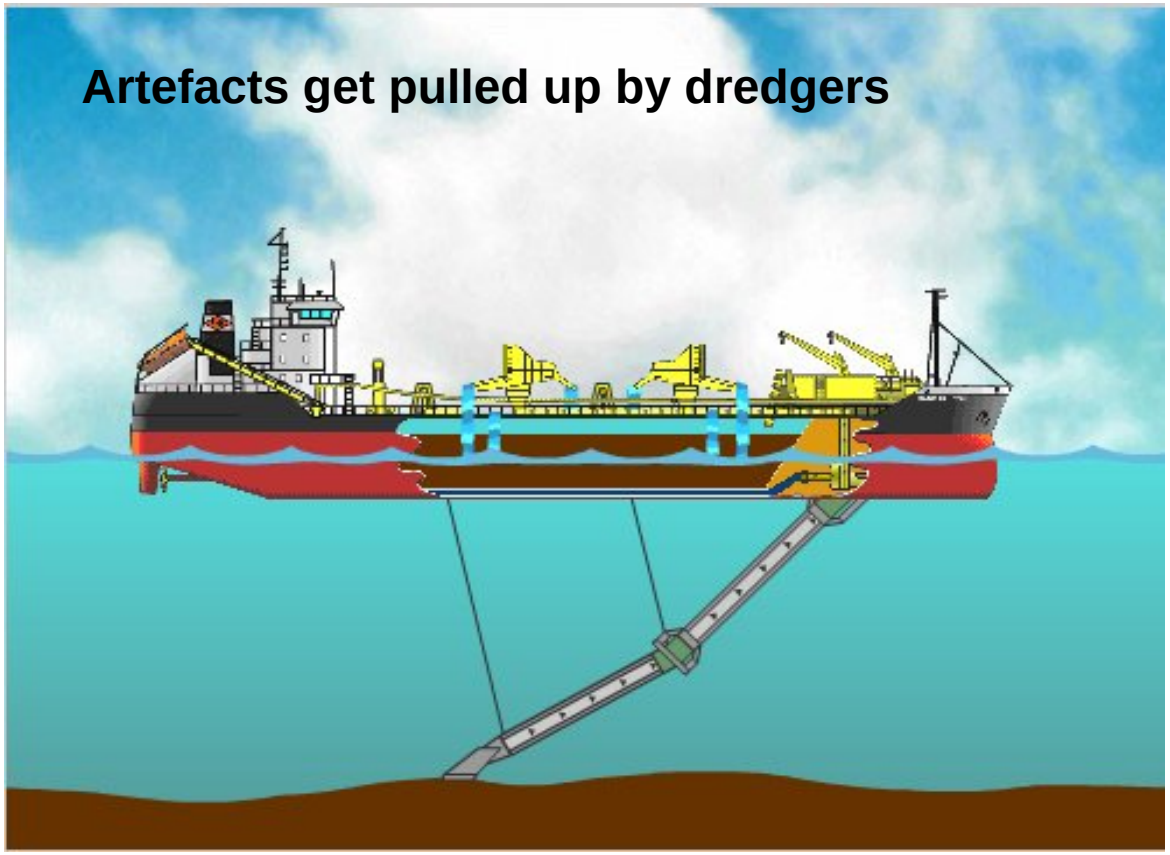
World War One

- How was this war fought?
- In World War One, planes could not safely cross large areas of water, so bombing raids were not common
- The English Channel was an important defence for Britain up until World War Two

World War Two

- Plans formed a key part of the German invasion plan
- Planes were used in the Blitz and the Battle of Britain

Artefacts found on the seafloor



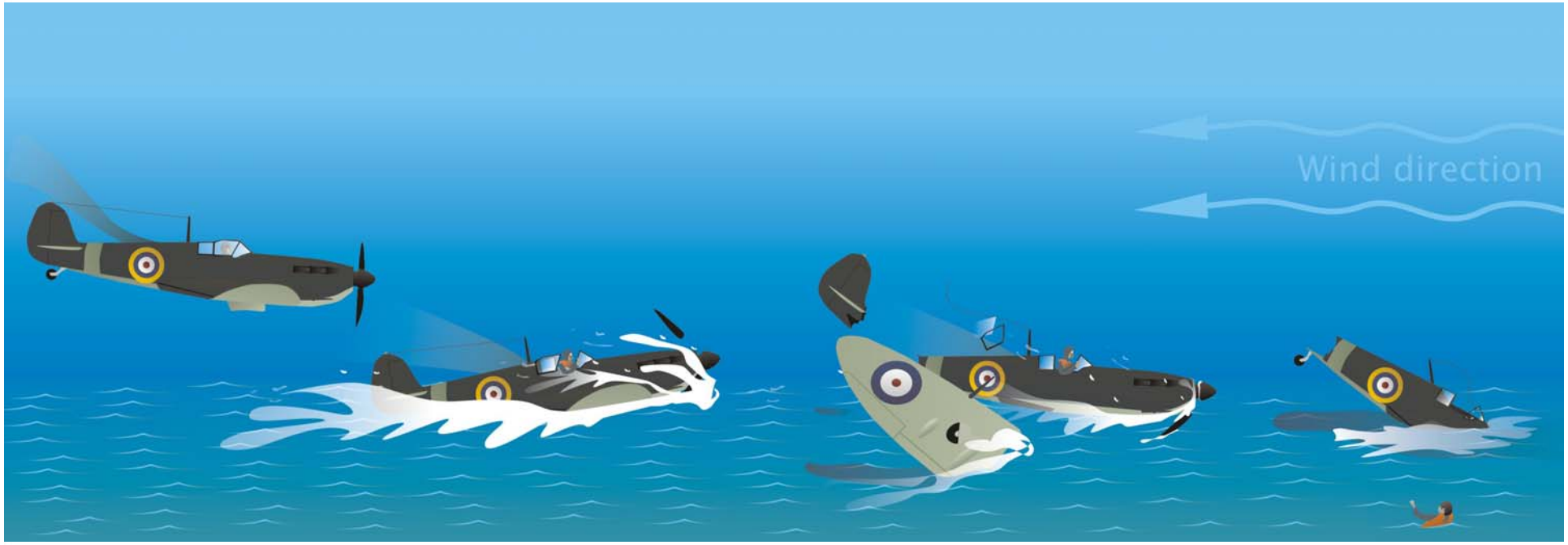
Website: Marine Aggregate Industry Protocol

Cowling from an Attacker engine

Wing spar from an Attacker

Industries working at sea find artefacts and report them to archaeologists. This can lead to discovering the location of an aircraft wreck.

Aircraft ditching



Why might ditching be an issue for identifying the location of a wreck?

Past archaeological projects

There have been lots of archaeological research projects in this area in the past

Why are they useful?

- These are usually more focused on a small area or a significant wreck
- They can provide information that the REC cannot do itself due to lack of funds or time
  - More detailed research
  - More detailed geophysical survey
  - Underwater investigations, e.g. dive surveys or excavation

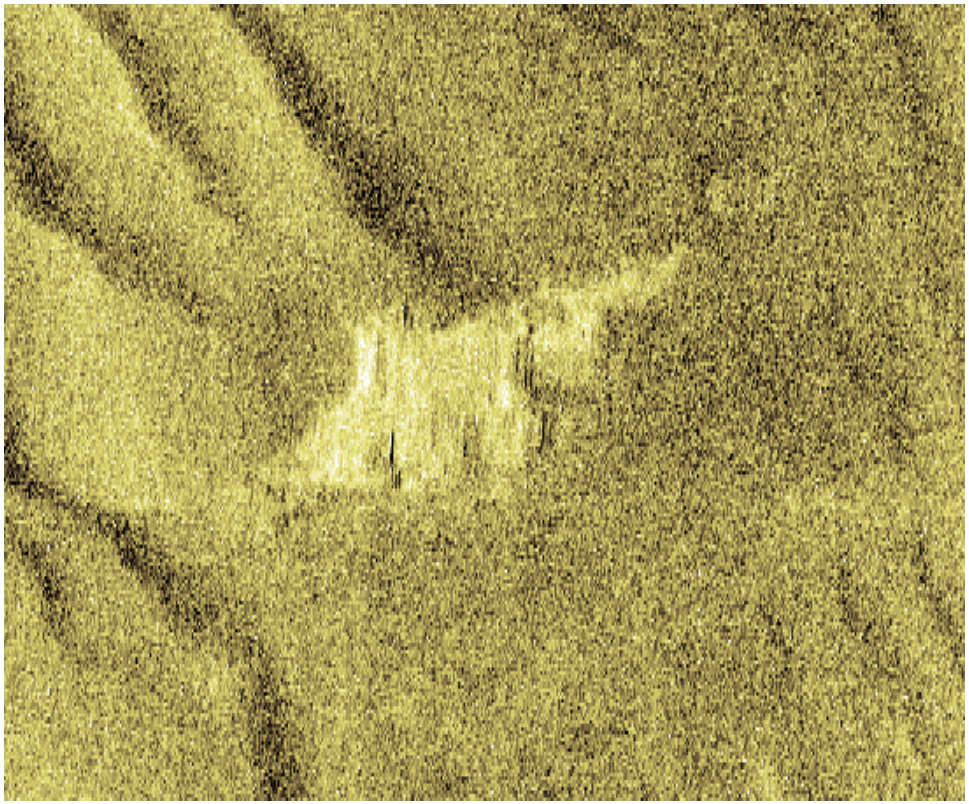
Example: Wrecks on the Seabed Project

The project tested and developed ways of assessing and recording wreck sites

What is this picture?

Geophysical survey found this anomaly in the South Coast REC study area.

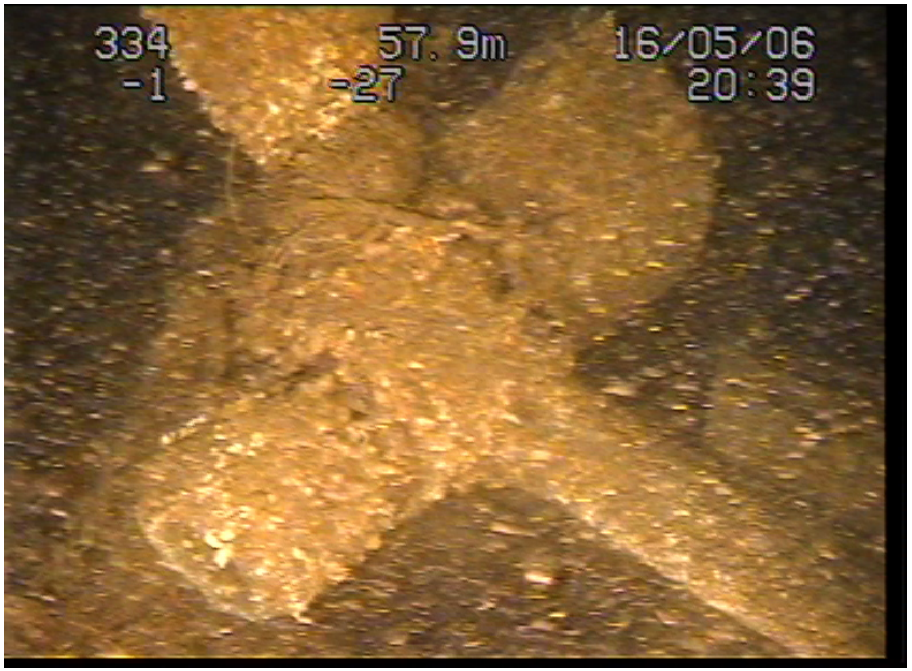
The archaeologists thought it might be a wooden shipwreck



Remote Operated Vehicles (ROV)

These images taken by a remote controlled underwater vehicle helped identify the anomaly as a B24 Liberator bomber

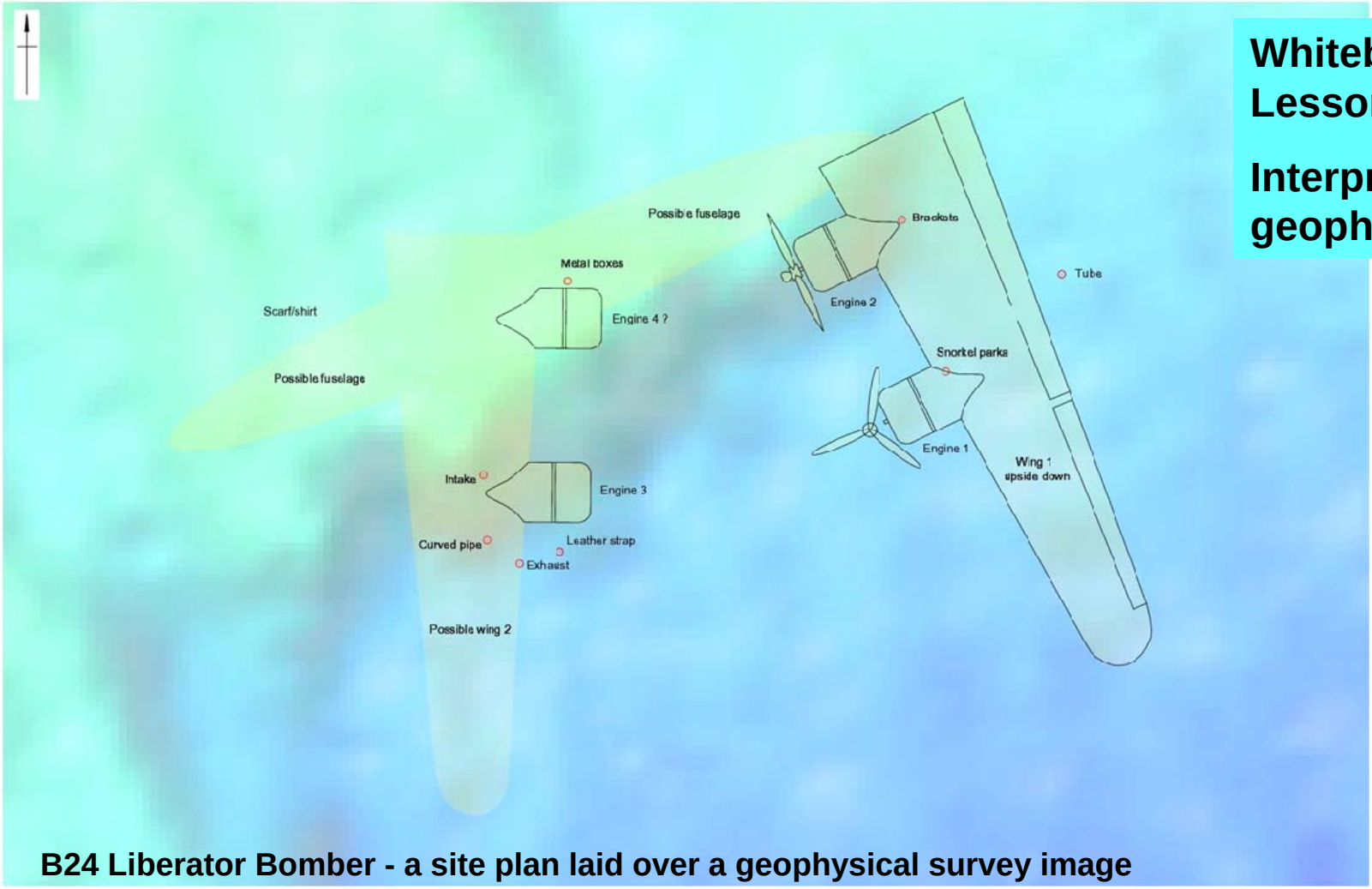
Watch the ROV film – exploring an aircraft wreck



Hydromatic propeller

Engine block

Geophysical Interpretation

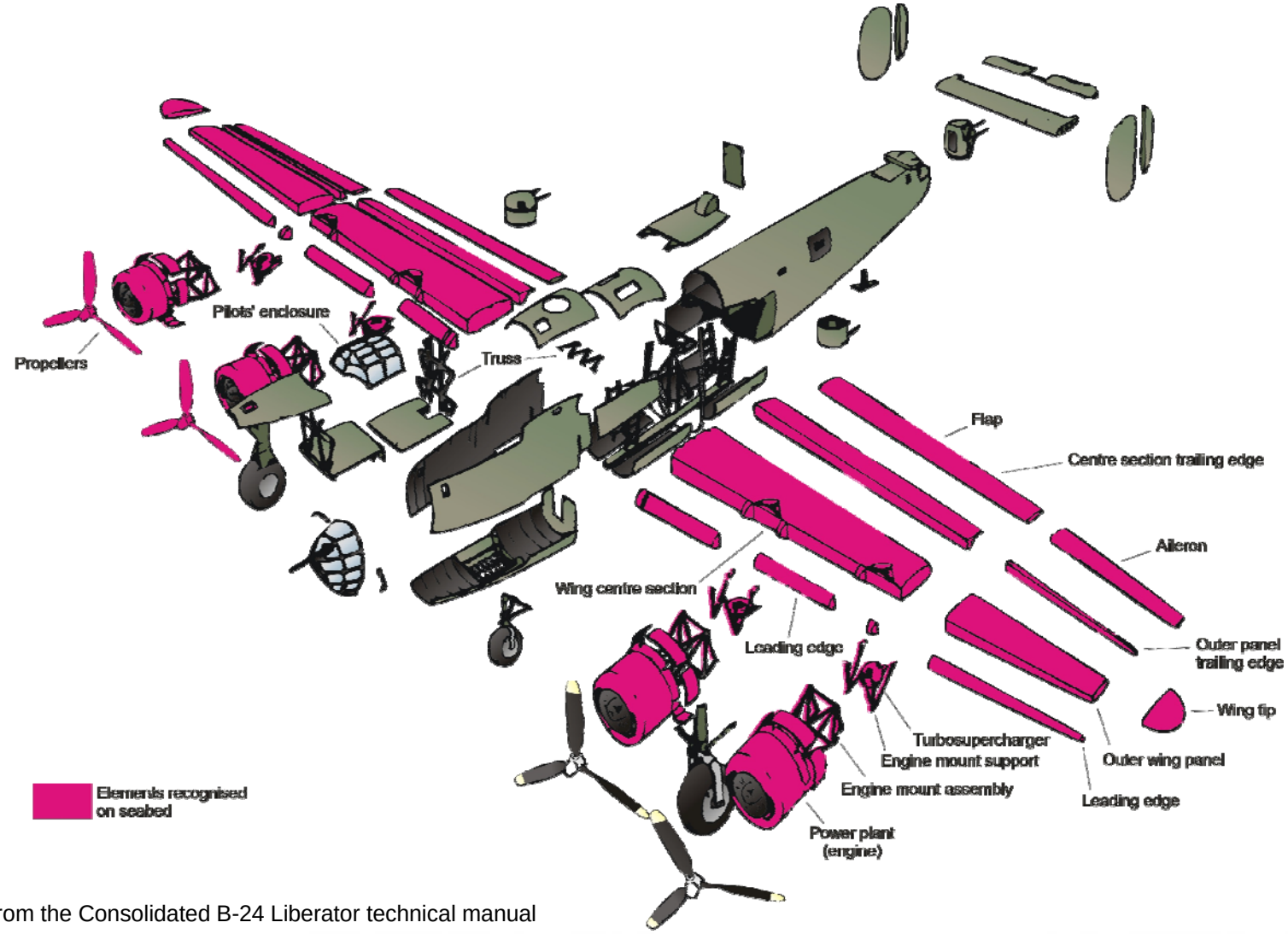


B24 Liberator Bomber - a site plan laid over a geophysical survey image

Whiteboard Lesson:

Interpreting geophysics

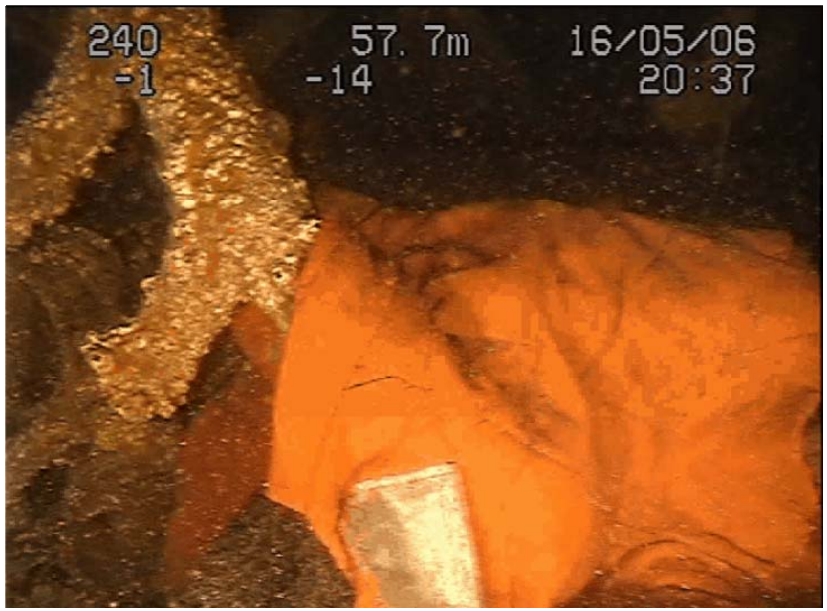
Plane elements



Reproduced from the Consolidated B-24 Liberator technical manual

Flying jacket

This style of jacket dated the plane to 1947, but there were prototypes made in 1942 until 1945. So what does this tell us about when the plane crashed?



It is very unusual that textiles survive this well in water. Textiles underwater are only preserved if they are buried. Aerobic organisms that break down fabric need air to live, so if textiles are buried by silt no air can get to them and the items are preserved. These are called anaerobic conditions.

Archaeologists study a wide variety of material remains.

Escape scarf

Flying helmet

Knife

Gloves

Map pocket

First aid kit

Activity Sheet 2: What can clothes tell us about being a World War II airman?

Diving

Website: Royal Air Force Museum Dornier dive film

This is useful for checking areas that look interesting on the geophysics results, and getting more information.

A detailed inspection can be done with measurements and photographs taken of the site

These can help date and identify unknown wrecks.

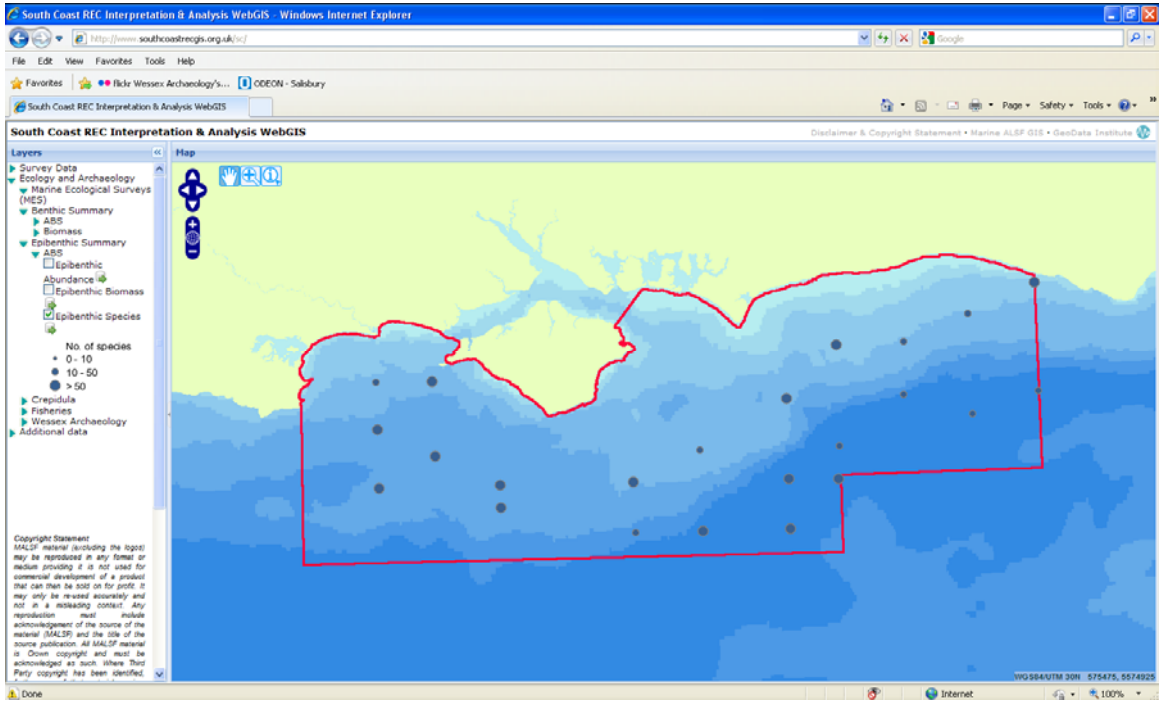
Stage 2: Results

The final report covered

- Prehistory
- Maritime
- Aircraft

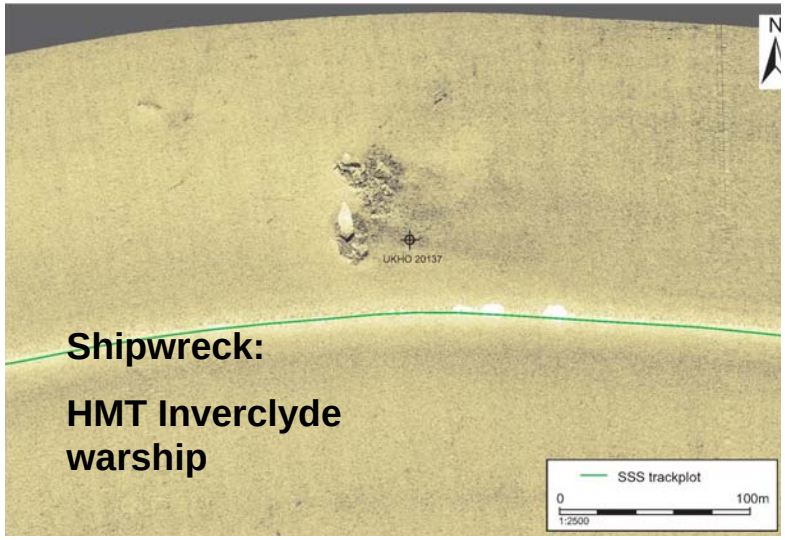
To create these maps the archaeologists used GIS.

GIS stands for Geographic Information System



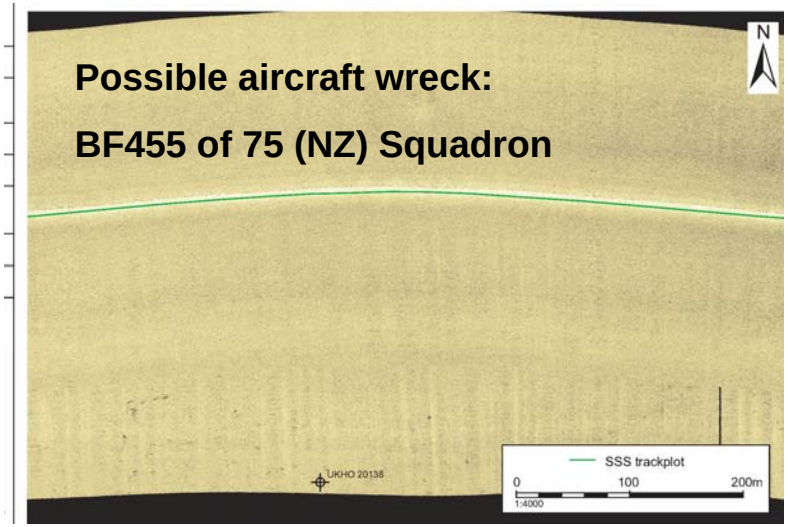
Website: South Coast REC GIS

World War II geophysics results



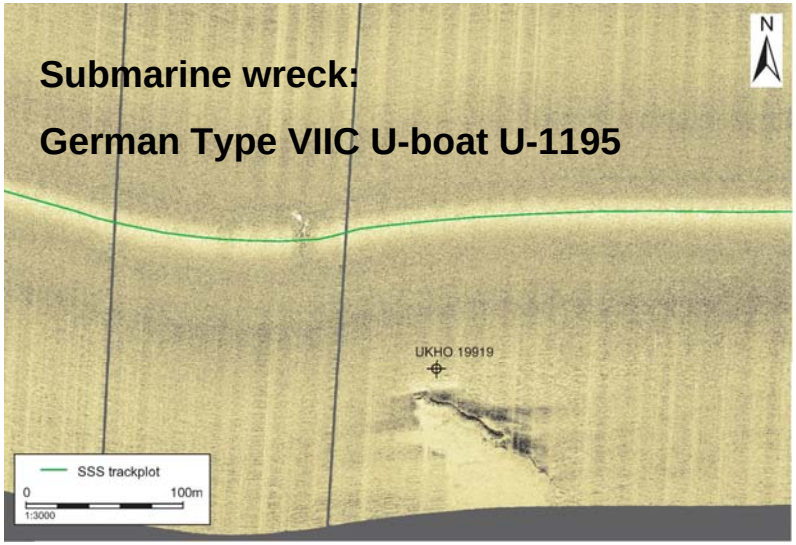
Shipwreck:

HMT Inverclyde warship



Possible aircraft wreck:

BF455 of 75 (NZ) Squadron



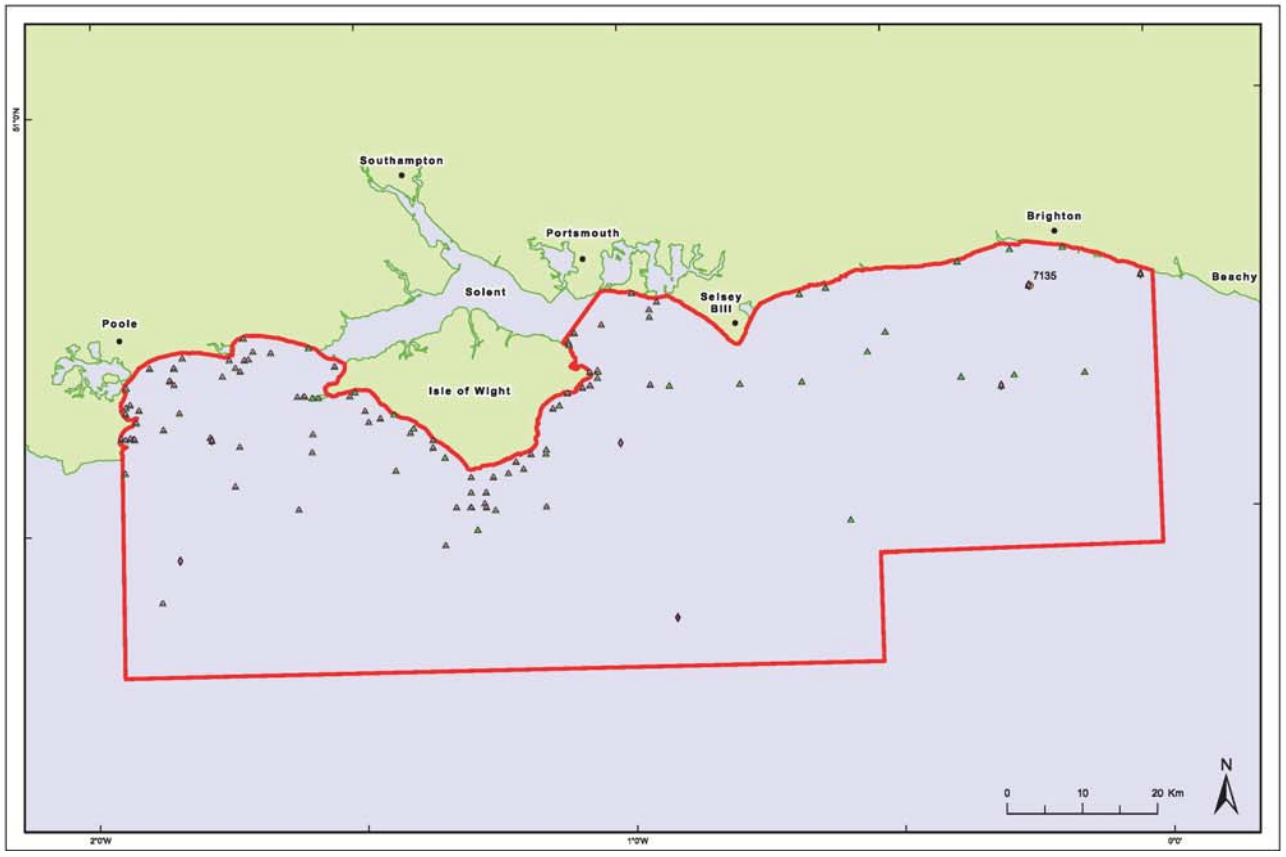
Submarine wreck:

German Type VIIC U-boat U-1195

How useful is geophysical survey for finding WWII shipwrecks? Why?

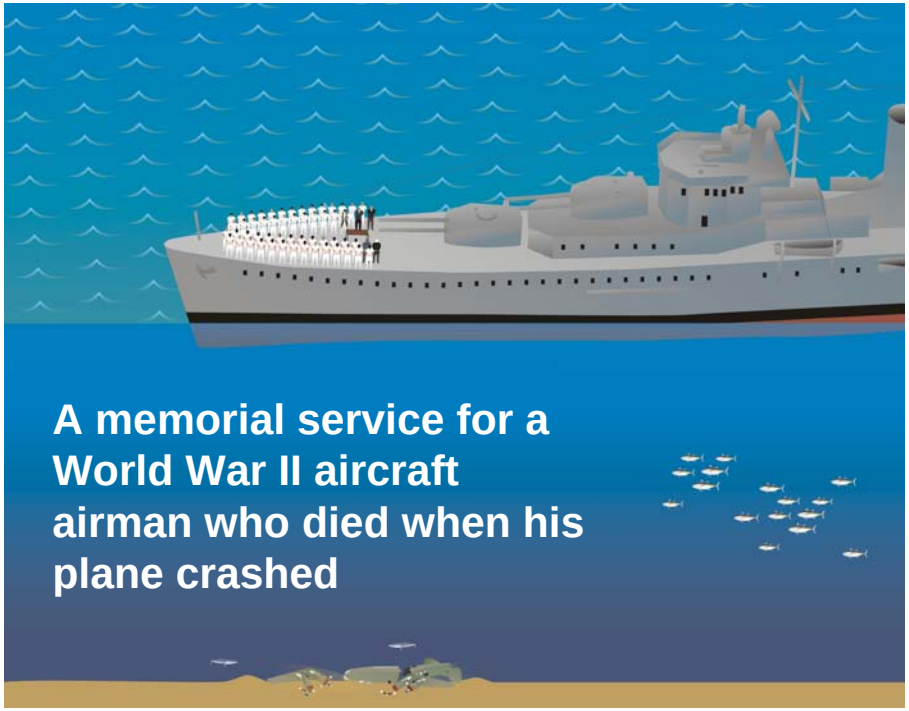
Aircraft Results

Figure 5.43: Known and potential aircraft crash sites.



Stage 3: Recommendations

Grading importance



The criteria for assessing a wreck

- Period
- Rarity
- Documentation
- Group Value
- Vulnerability
- War Grave
- Diversity
- Potential

This aircraft is a War Grave and so is protected by law.

Discussion

- **So, what can the seafloor tell us about World War Two?**
- Name the different ways and sources that archaeologists used to find out about aircraft wrecks on the seafloor
- Discuss some of the advantages and disadvantages of these methods for collecting evidence about World War Two
  - Marine geophysical survey
  - Historical sources
  - Diving wrecks
- Why might an archaeologist assess a WWII shipwreck as being of high importance in a report?
- Do you think it is important that we research the archaeology of the seafloor? why?

Activity Sheet 3: Case Study Review