WRECK SITE FORMATION

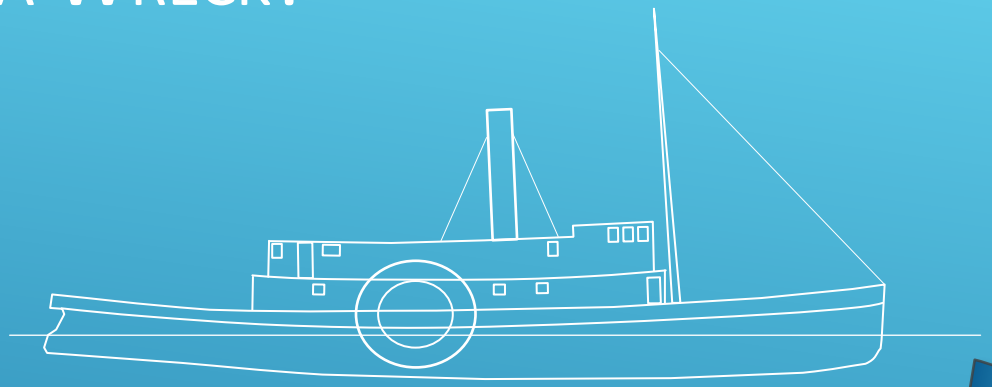
UASBC
Underwater Archaeological Society of BC

Wreck Site Formation

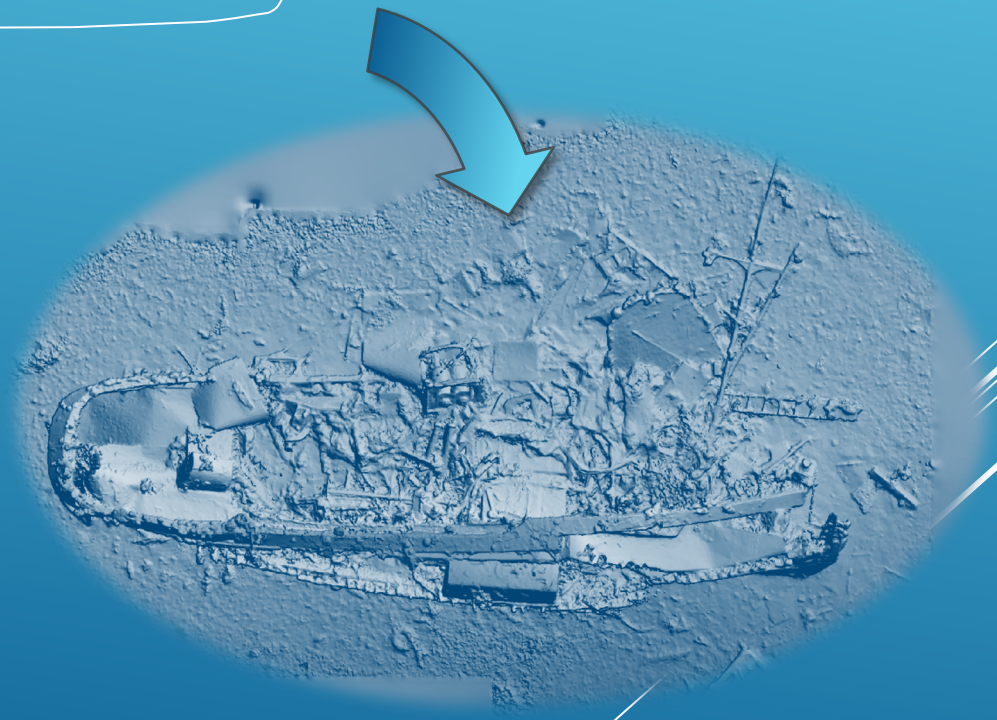
By the end of this module you will know:

- How a sinking event influences **site layout**.
- How **waves and current** affect wreck sites.
- How **various materials** are affected by the underwater environment.
- How maritime **salvage** efforts influence a site.
- How **sediment** can preserve artifacts.

What is a Wreck?



A wreck is an **event** in which a highly organized and dynamic assemblage of artifacts is **transformed** into a **static** and **disorganized** state.
No two wreck sites are the same.



Sinking

The manner in which a vessel sinks often influences a wreck site layout.

If the vessel developed a leak and foundered in deeper water, damage may be minor and the vessel relatively intact.

If the vessel drove ashore, the wind and waves will tear it apart and scatter parts that float. The heavy parts will sink to the bottom and remain on site.

Courtesy Fred Rogers

Water Movement


Courtesy Jeff George

Flowing water is a destructive force . Waves and currents carry off structures, scatter remains and introduce organisms that feed on a wreck.

Water Movement

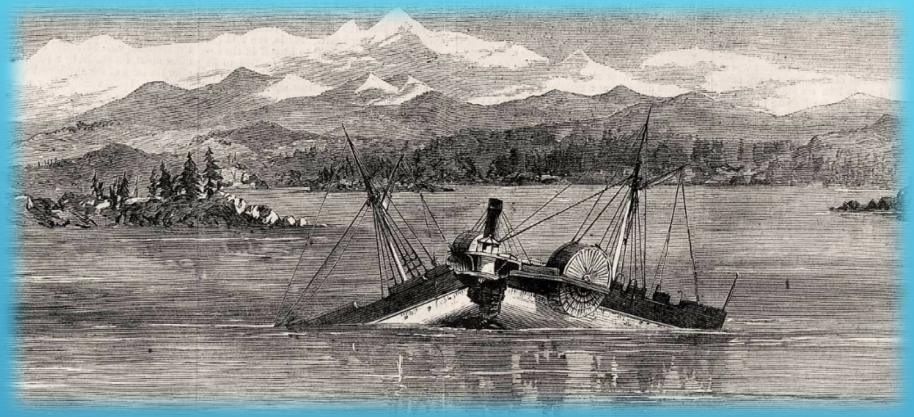
Waves:

Surface waves touch only the shallowest parts of wrecks and generally affect the more lightly built parts of a vessel.

Ocean swells are much more powerful and destructive. They rip wooden or metal ships to pieces in no time.

Courtesy Fred Rogers

Water Movement

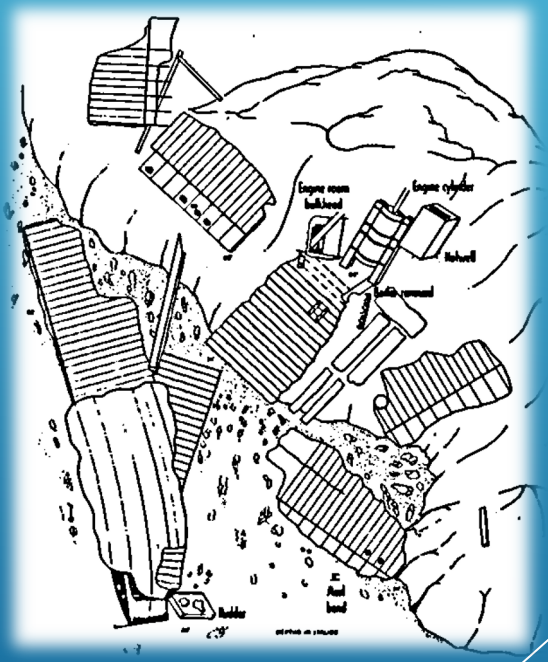


Currents:

Reversing **tidal flows** can thoroughly scramble wrecks and carry artifacts in different directions.

Water **flow in a single direction** such as in a river, will reduce a wreck to a stable configuration with artifacts washing predictably down stream, lightest pieces going furthest.

Currents can **heap sediment** on a wreck or strip it bare depending on speed and topography.



Disintegration & Decay

Underwater Organisms:

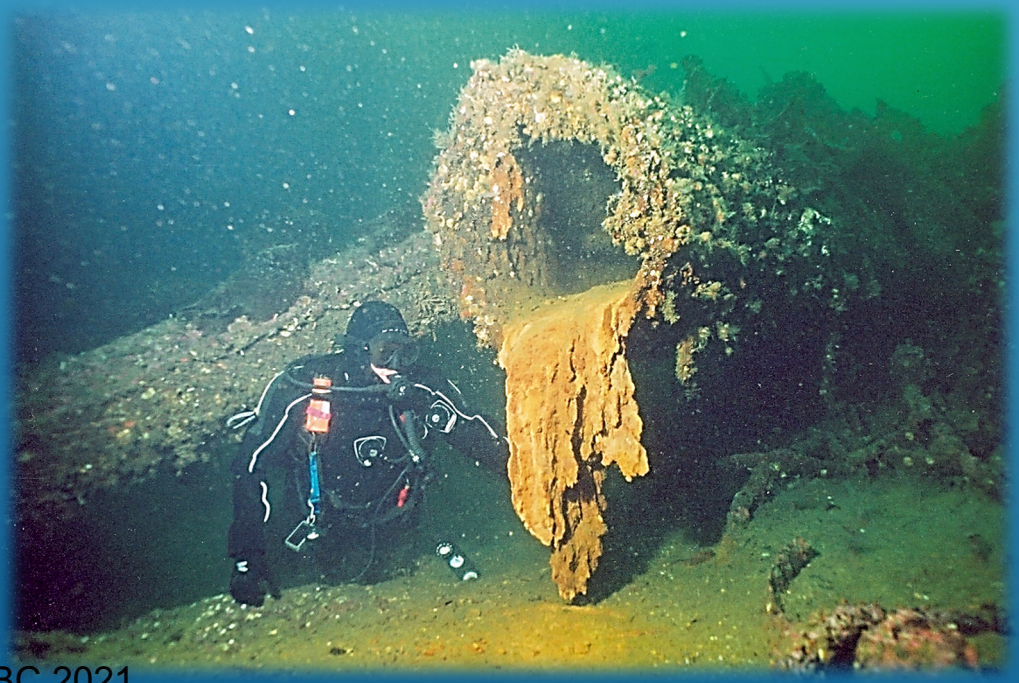
Several species of mollusc and crustacean, collective known as **marine borers**, burrow into all kinds of wood submerged in ocean or estuarine environments. As borers grow, they chew away the wood leaving tunnels and weaking wood structures. Eventually there are more holes than wood and ship planks and beams fall apart.

In the Great Lakes region, **zebra mussels** are an issue. They grow all over everything and can damage shipwreck sites.

Disintegration & Decay

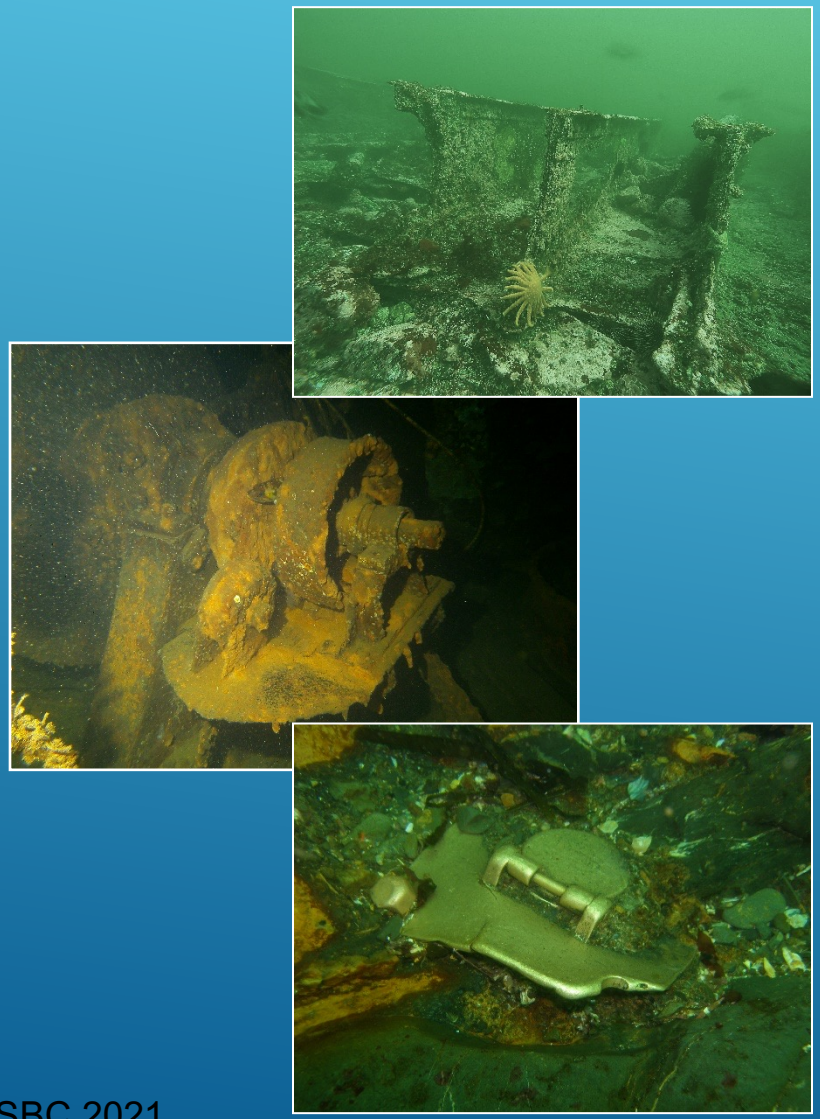
Underwater Organisms:

When the wreck of the *Titanic* was discovered in 1985, it was covered in rust coloured icicles. Microbiologist Roy Cullimore found that the **rusticles** are made of bacteria and fungi that feed on iron. The *Drumrock* on the Central Coast of BC is also covered in iron rusticles.



Parts made of **wrought iron**, such as rivets, appear to be more vulnerable to rusticle growth and deterioration than steel.

Disintegration & Decay



Corrosion:

Most metals corrode in salt water.

- Sheet and **plate iron/steel** go faster than thick objects like frames and beams.
- **Cast iron** rusts deep and crystalline, while **wrought iron** fares somewhat better.
- How steel reacts varies depending on its **nickel content**.
- **Copper** and its alloys become greenish.
- **Lead** coats over with white chlorides.

Salvage

Since ancient times, sunken vessels have been salvaged to retrieve **valuable equipment and cargo**.

It was not uncommon for the **rigging, sails, machinery, anchors and chain** to be salvaged from wooden sailing ships.

With the advent of SCUBA in the 1950's sport divers have also visited sites and retrieved artifacts as **souvenirs**.

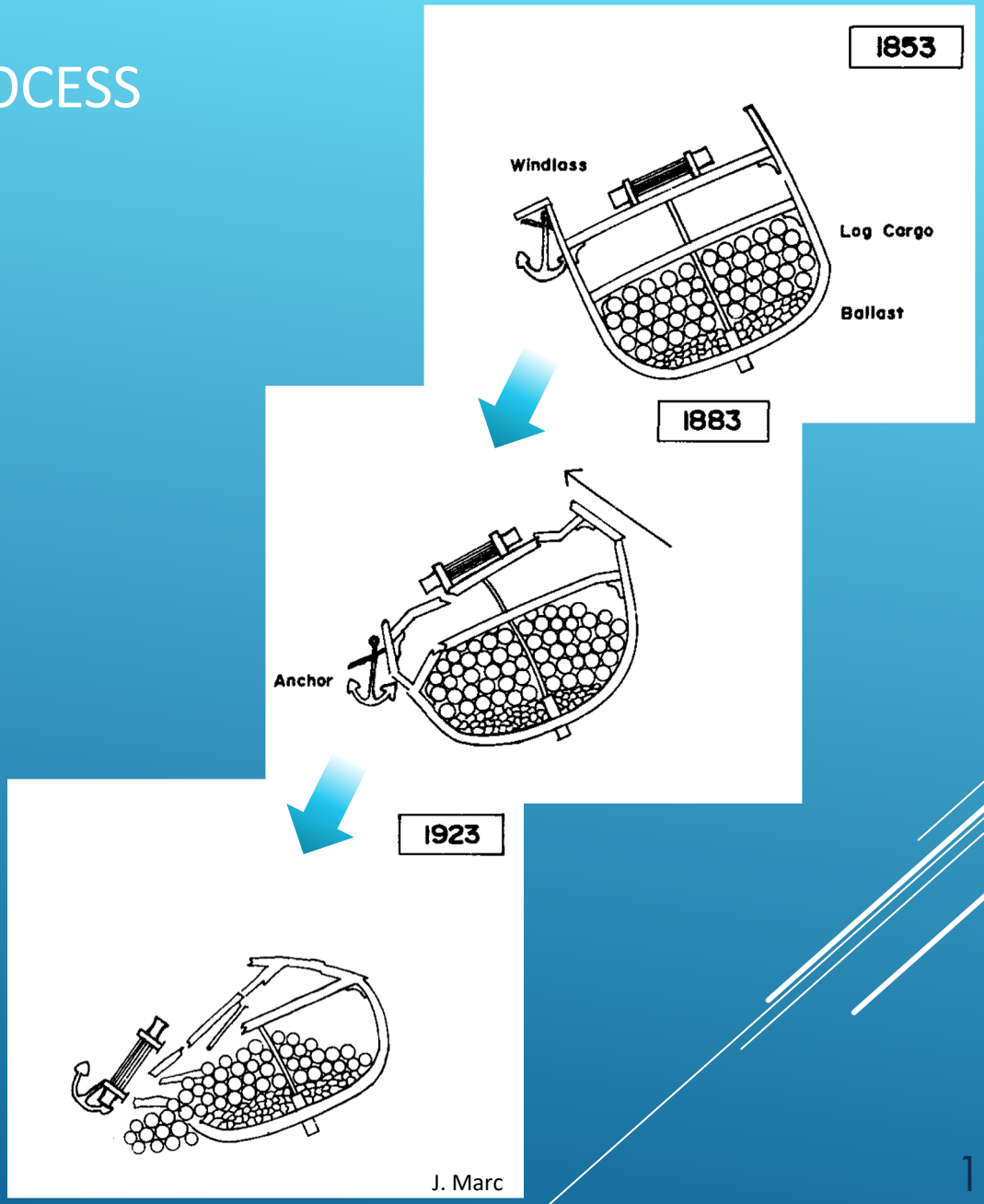
As a result of these actions specific artifacts like anchors, rigging material and portholes will be missing from wreck sites.

Vessel Deterioration Process

A wreck normally lists on one side or **bilge**. On a flat bottom, the hull collapses to the lowest side. On a sloped bottom everything spills downslope.

As wood rots and fastenings corrode, a wreck begins to fall apart. Superstructure, decks and ends are the most vulnerable.

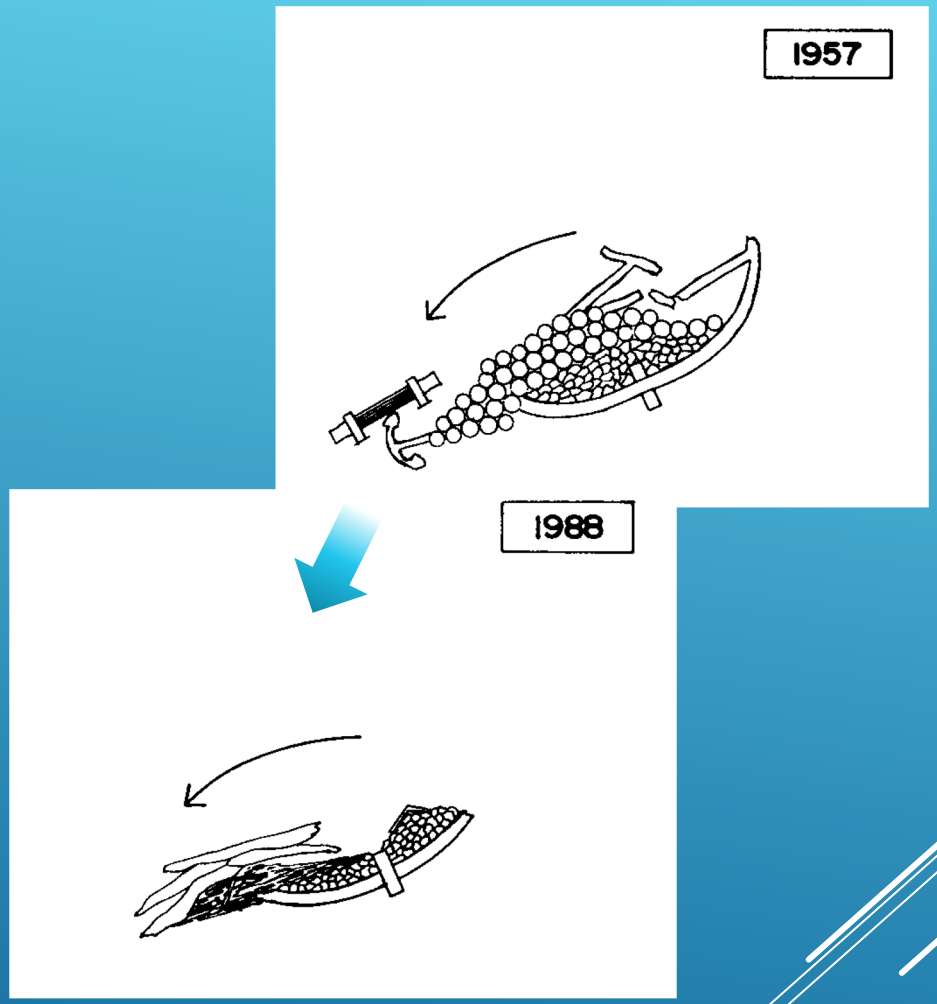
Parts mounted higher up, such as anchors, deck machinery may topple right past the hull, landing beside it.



Vessel Deterioration Process

Eventually the wreck reaches a point of **equilibrium**. The various artifacts and ship material settle into stable locations on the bottom and will remain that way until disturbed.

The final drawing in this series shows the wreck after completion of an archaeological study. The ship fittings visible in 1957 are gone and only the hull and ballast remain.



Sedimentation & Burial

Sedimentation can preserve vulnerable wrecks and artifacts. Layers of fine particles prevent dissolved oxygen from getting to the wood, inhibit marine borers, rot and corrosion. The best-preserved wrecks are cloaked in muck.

Rocky environments have the opposite effect: wrecks are pounded apart until nothing remains except small artifacts lodged between stones. Heavier objects can remain in place, but suspended sand energized by moving water damages even the hardest material.


Hera wreck Buried in Sand

QUIZ

1. A vessel that sinks in deep water will be in better condition than one that runs ashore?

   ❑ True ❑ False

2. What types of organisms are marine borers?

   ❑ Crustaceans ❑ Anthozoa

   ❑ Echinoderms ❑ Mollusks

3. On a steel wreck which parts corrode first?

   ❑ Deck Beams ❑ Hull Plate

   ❑ Stanchions ❑ Frames

QUIZ

4. What are one of the consequences of vessel salvage?

- ❑ Missing artefacts
- ❑ Valuable equipment gone
- ❑ Artefacts scattered.
- ❑ Law Broken

5. The best preserved wrecks are cloaked in mud.

- ❑ True
- ❑ False

- http://www.unesco.org/culture/en/underwater/pdf/UCH-Manual.pdf