

MAHS Field School 2008



***Slobodna* Wreck Site,
Molasses Reef,
Key Largo**

MAHS held a field school in underwater archaeology on Molasses Reef off Key Largo in July 2008.

Previous research suggests that the site is the wreck of the *Slobodna*, a sailing ship that grounded on the reef in 1887.



The site lies in approximately 30 feet of water on a sandy bottom surrounded by low coral heads.



The purpose of the MAHS field school is to train sport divers who have taken the MAHS Basic Underwater Archaeology class in the practice and techniques of underwater mapping and site documentation.





Let's start with a little about the ship. *Slobodna* was reportedly built in 1884 in what is now the republic of Croatia, on the Adriatic Sea. At that time the port was part of the Austro-Hungarian Empire and was known as Lussinpiccolo.

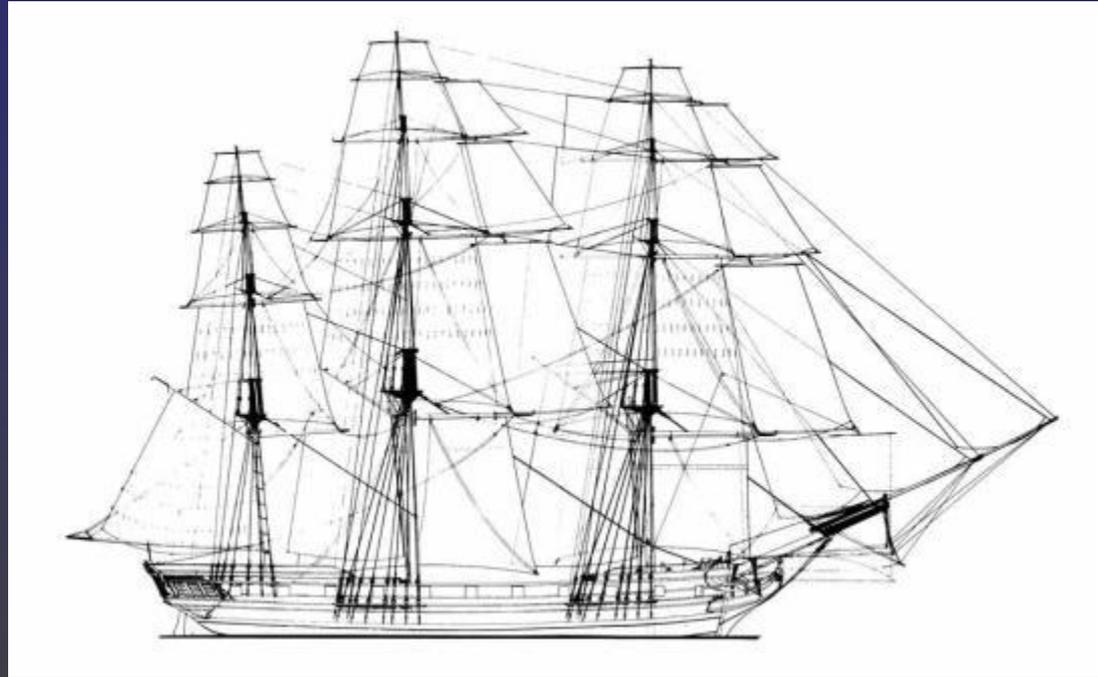
Below are photochrom prints of Lussinpiccolo around the turn of the 20th century, soon after *Slobodna* was built. Above is a photo of the modern harbor.



Photochrom prints, by the way, are colorized images created from early black and white photographs through a lithographic process.

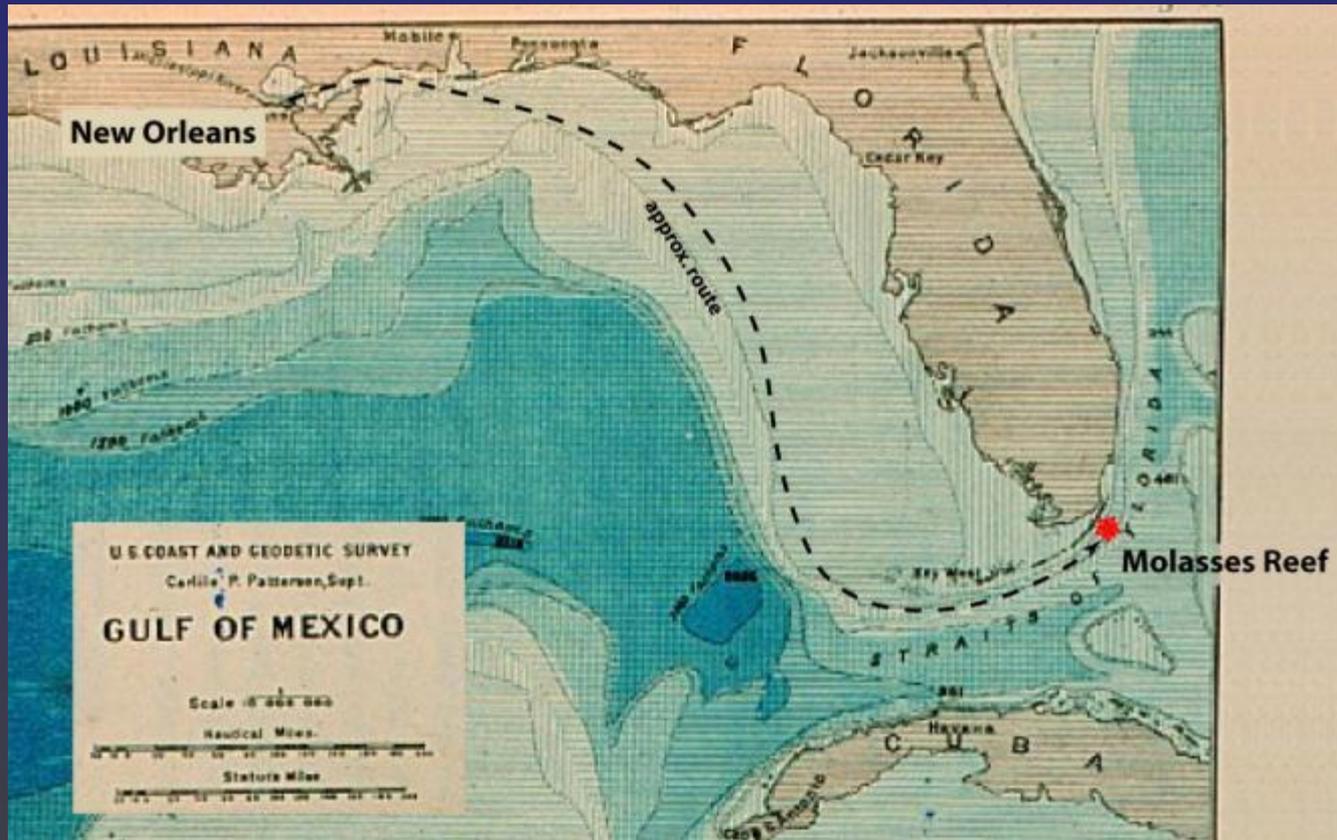
The vessel was of composite construction, the frames and planking of wood while the knees and other internal supports were iron, as were portions of the masts and much of the rigging.

Slobodna was ship-rigged, meaning she had three masts all of which carried square sails, except for the lowest sail on the aft mast or mizzen mast, which was fore-and-aft rigged.



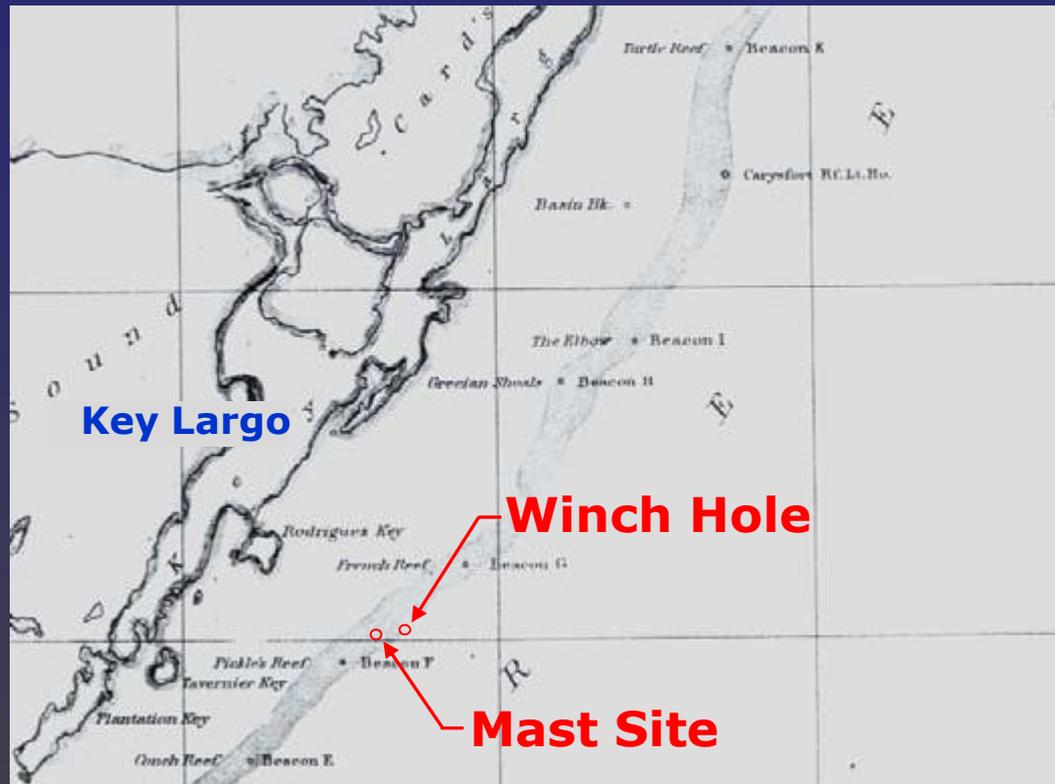
This is a typical ship rig from the mid-19th century, although at about 500 tons the vessel depicted was only about half the size of *Slobodna*, which was over 1,100 tons.

Contemporary reports indicate that *Slobodna* was running close to the reef through the Florida Straits on her way to the Atlantic. The ship was loaded with 4,500 bales of cotton from New Orleans bound for the textile mills of Europe. She grounded on the reef in a storm and was unable to work her way off.

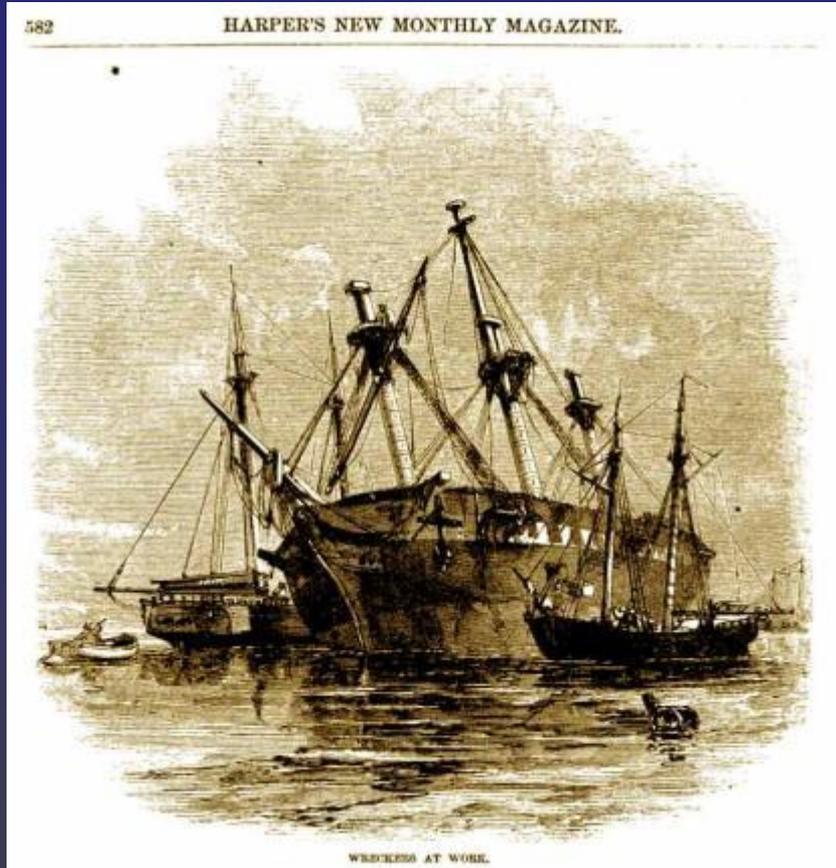


As water ran into the hold, the cotton began to expand and soon split the hull apart. Some of the cargo was salvaged, as was part of the rigging, but eventually the ship was abandoned.

Today portions of the wreck lie in at least two locations – the Mast Site, so-called from the large metal mast that is the main feature at that location; and the Winch Hole, which contains a large metal windlass. The two sites are separated by approximately 0.75 nautical miles.



Researchers from Indiana University and the PAST Foundation who have worked at the site have developed a theory about the wreck. The Winch Hole appears to have been the site of the original grounding. Contemporary accounts of the wreck noted that the ship was listing badly to port during salvage operations. It is thought that the windlass, or winch, and some of the other heavy material fell from the vessel at this location.



WRECKED AT WORK.

As the theory goes, the abandoned hull stayed on the reef until the following year when a hurricane came through the Keys, breaking the vessel apart. The bow drifted to the west, eventually sinking at the Mast site, where the base of the foremast and some of the rider and lodging knees associated with the bow of the vessel have been identified.

The remainder of the *Slobodna* wreck has yet to be located – the researchers suggest that it drifted to the south or the southwest, off the reef and eventually sank in deeper water.



As is typical in a MAHS field school, the class began with a review of baseline trilateration, the mapping process that MAHS uses most consistently.

The review was followed by a walk through on dry land to practice the technique. In our mock shipwreck site, coconuts served as cannon balls and plastic deck chairs as sunken gun carriages.





Next it was down to Quiescence dive shop and the boats, ready to head out to the wreck site.

The boats captains were there and ready to take good care of us.

To the left, Tim Shaw...

...and right, Rob Bleser.





First stop – the Mast Site. The large object in the photos is believed to be the base of the foremast. It's a little over 55 feet long and as much as three feet in diameter.





Currents were running unusually high at the site the day we arrived. The class did a quick reconnaissance dive, but given the strong current, the conditions were judged to be too difficult to work in effectively.



After a hasty conference, Rob was quick to suggest that we move to the Winch Hole, which lies in a shallow sand basin that is somewhat protected by surrounding coral heads.



The site was indeed less dynamic – less current and more appropriate for the planned training exercises. Tom and Dennis installed a baseline through the approximate center of the site, while Jim followed up straightening the measuring tape connected to the line. The baseline was about 42 meters in length.



Meanwhile, the class participants began their reconnaissance dive, drawing a sketch map of the site, selecting important features to map, and tagging the features with bright orange flagging tape.

Then it was on to several dives worth of trilateration mapping.



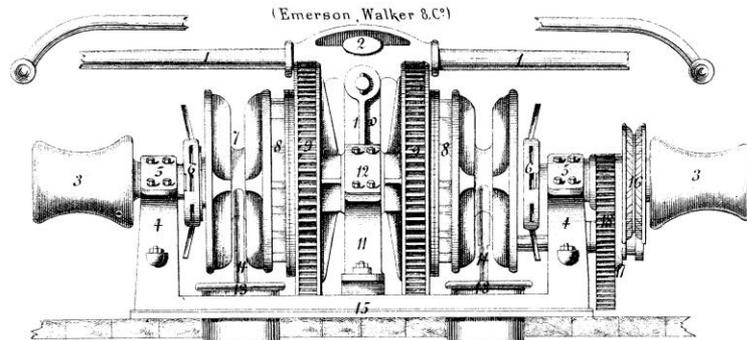


The Winch Hole site takes its name from this feature, a large metal windlass sitting upright on the bottom. It appears to be complete except for one of the hubs (on the left in this photo).



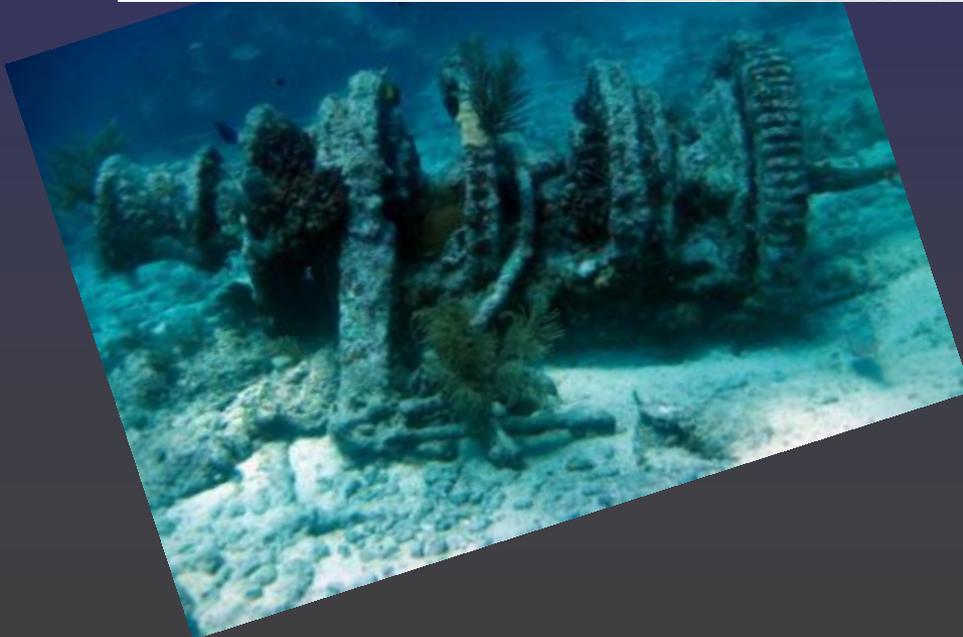
It is a distinctive feature of the site and provides lots of opportunity for practicing measurement and documentation techniques.

PATENT WINDLASS.—GUINDEAU BRÉVETÉ.—PATENT SPILL.



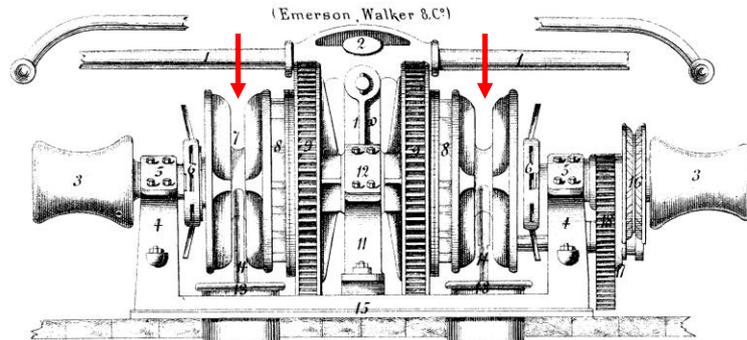
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|---------------------|---------------------------|---|
| 1 Hand Power Levers | 7 Cable-lifter | 13 Chain Pipes |
| 2 Cross-head | 8 Pistol Block | 14 Cable Release |
| 3 Winding Ends | 9 Main Cone Driving Wheel | 15 Bed Plate |
| 4 Side Bitts | 10 Cross-head Bracket | 16 Chain Wheel for messenger from Steam Winch |
| 5 Side Bitt Keeps | 11 Centre Bitt | 17 Clutch for attached Steam Power |
| 6 Screw Brake Nut | 12 Centre Bitt Keep | 18 Gearing for Steam Power |

The illustration above is of a typical windlass in Paasch's Marine Dictionary of 1885. The windlass in the drawing is steam powered.



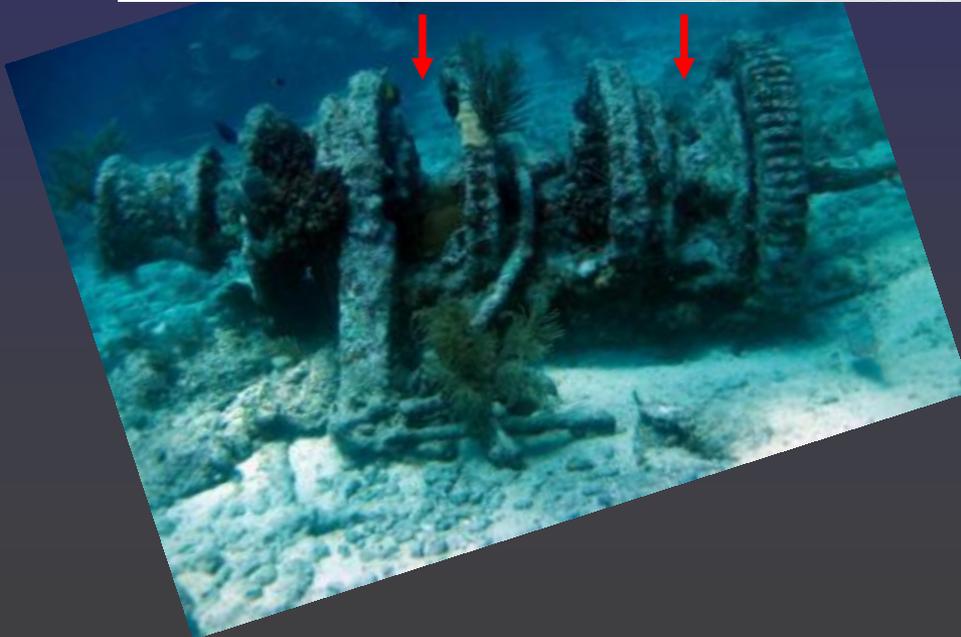
We don't have any indication as to how the *Slobodna's* winch was powered, but there do appear to be cams in the right location.

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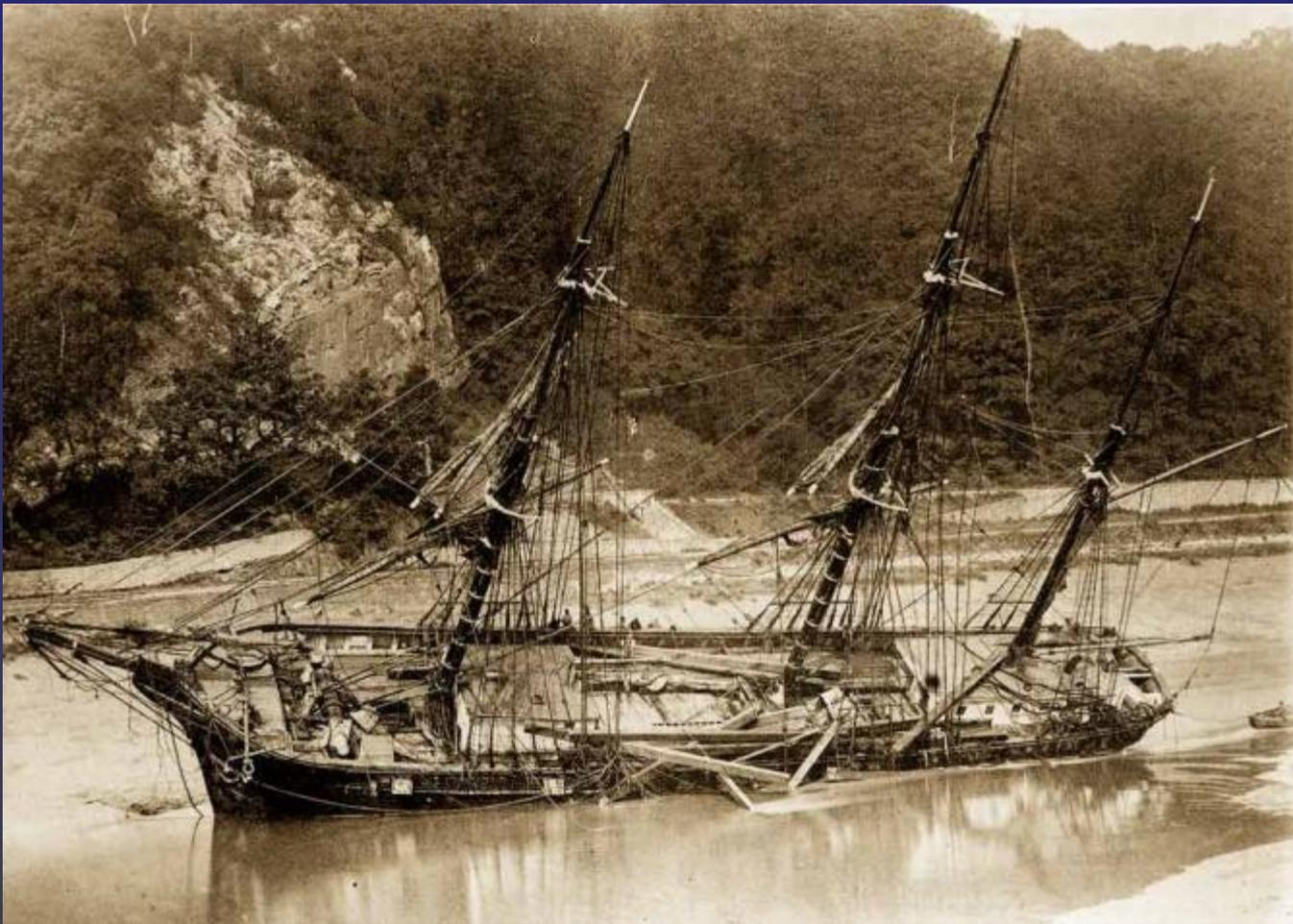


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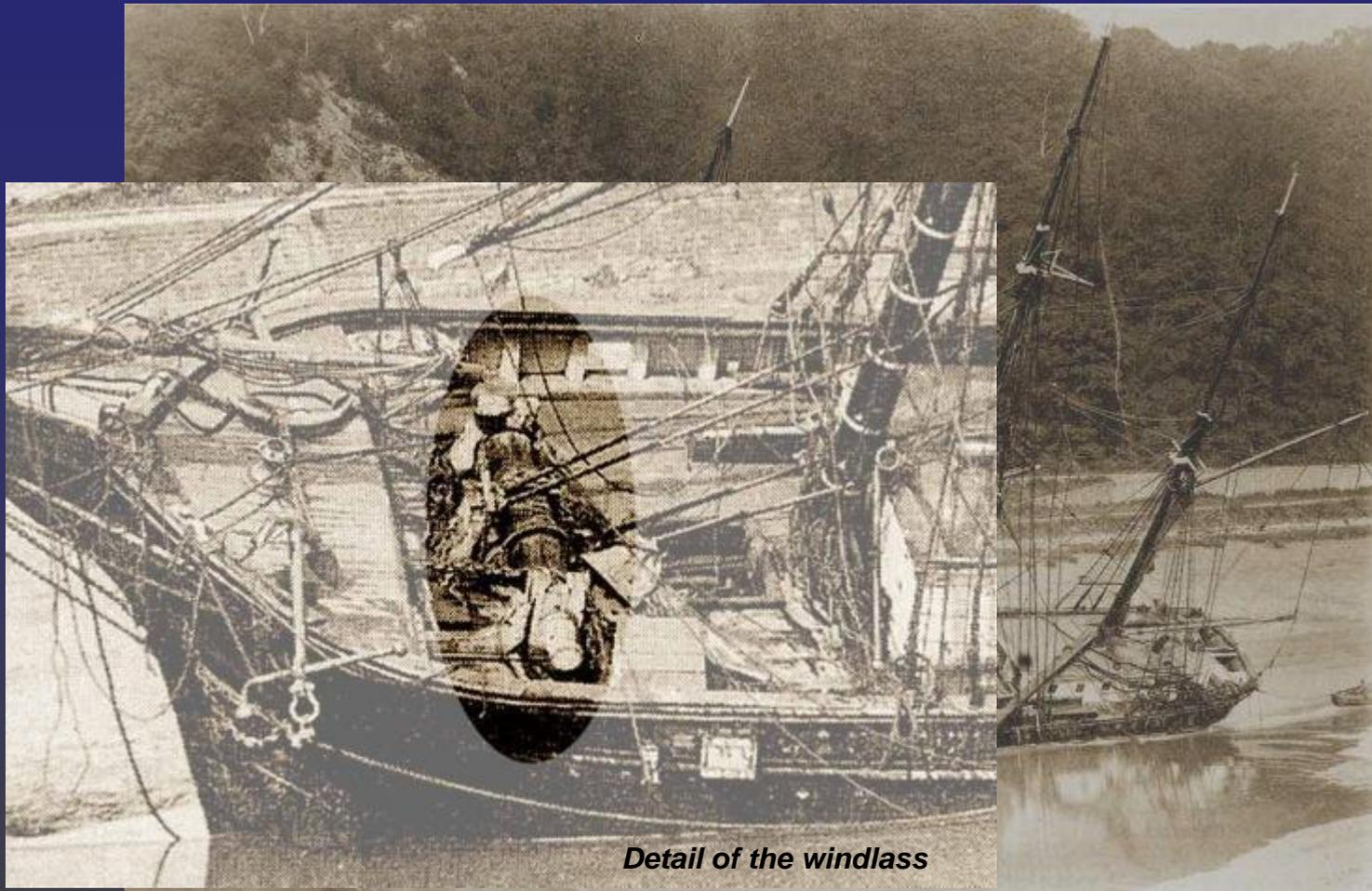
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This is a smaller vessel than *Slobodna* but it is from the same time period and is rigged the same. It has a windlass at the forward end of the deck. According to contemporary reports, *Slobodna* was listing badly to port when grounded on the reef, as is this vessel.



Detail of the windlass

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D Fittings

D4 WINDI ASS (no scale)

D4/1 Power train to windlass

- 1 Forward bulkhead of forward deckhouse
- 2 Gypsy head
- 3 Levelling block
- 4 Powered winch head
- 5 Pawl post
- 6 Main driving gear
- 7 Wildcat for 1/16" chain
- 8 Compressor (controls the wildcat brake band)
- 9 Wildcat brake drum
- 10 Hawse pipe (inboard end)
- 11 Gypsy head
- 12 Messenger chain

- 13 Clutch
- 14 Hoister gypsy head
- 15 Power transmission shaft
- 16 Hoister motor: American Buffalo 5 hp make & break gasoline engine
- 17 Port bitt
- 18 Center bitt
- 19 Starboard bitt
- 20 Chain pot

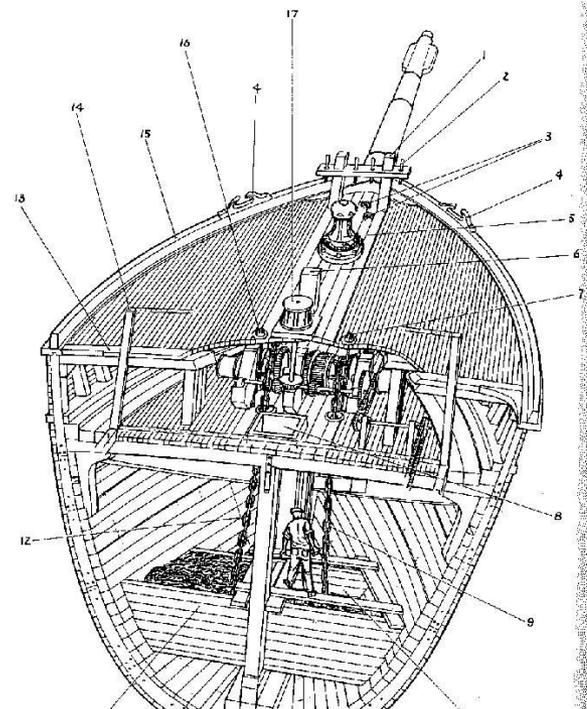
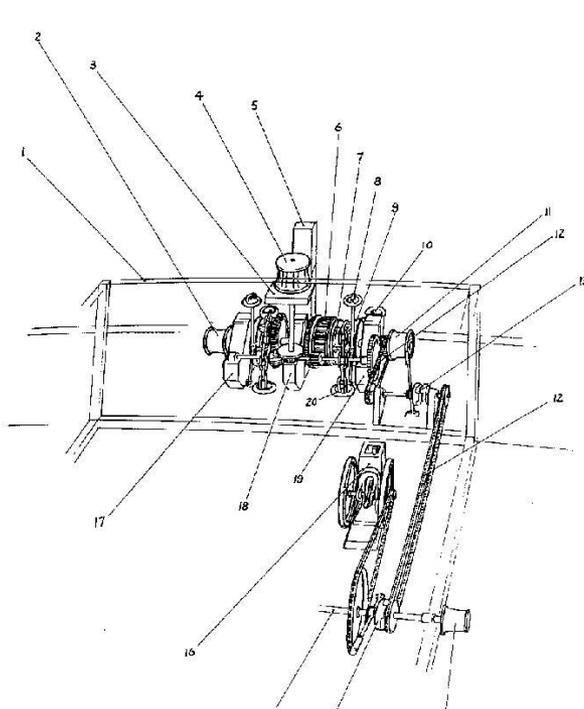
"A messenger chain would lead from the engine, forward to the windlass. Gasoline and kerosene drums might be stowed under the forecassle head. These rules were sometimes stowed in the engine room. That was a good place for fires to start." (Capt. Biff Bowker, private correspondence)

D4/2 Forecassle deck arrangement

- 1 Krughthead bitt
- 2 Belaying pin
- 3 1/2 sheet fairleads
- 4 Bow check
- 5 Hand capstan
- 6 Pawl post
- 7 Brake drum compressor, starboard anchor chain wildcat
- 8 Access hatch to chain locker
- 9 Starboard anchor chain
- 10 Starboard anchor chain locker
- 11 Port chain locker
- 12 Port anchor chain
- 13 Margin plank, topgallant forecassle deck

- 14 Corner post, forward deck house
- 15 Check rail
- 16 Brake drum compressor
- 17 Powered winch head

"This drawing needs some sort of platform for the man stowing chain. [Done - within limits of viewability - SPM] Only an idiot would stand in the locker because chain often slipped on the wildcat and a few links would fly out. This was usually due to twists in the chain if she had swung in the tide for a period of time. . . . The *Downs* was probably not large enough to have a "head" under the forecassle deck. A bucket in the engine room would serve." (Capt. Biff Bowker, commenting on an earlier draft of this drawing).



Here is another example of a windlass from a turn-of-the-century sailing ship, *Bertha Downs*. This one was powered by a small gasoline engine.



And here is yet another example – no date on this one. I found it in an image search on the Internet, but it does seem to have similar sets of gears and sprockets as the *Slobodna* winch. The caption on the picture indicated that it was taken at a shipyard in Seattle. Too bad we can't read the plaque over on the right.



This may be another piece of the windlass broken off the spindle. It may also be another part of the drive train.

This feature lay a little over 20 meters away from the winch.

The class also made scale drawings of individual features. Each team chose one of the mast caps as a subject.

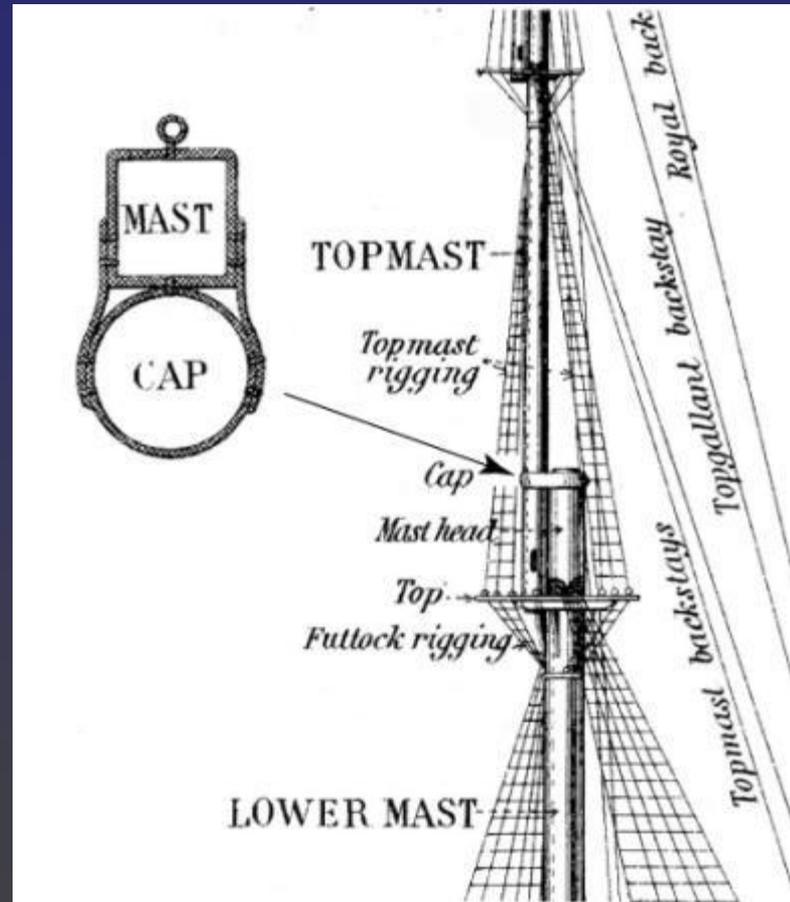




Two large metal objects at the site were identified as mast caps. Masts were constructed in sections and the mast caps served as couplings between the sections.

These were pretty large objects – the inset photo provides a sense of scale.

Here is another illustration from Paasch. This one shows the mast sections and how the mast cap connected them.



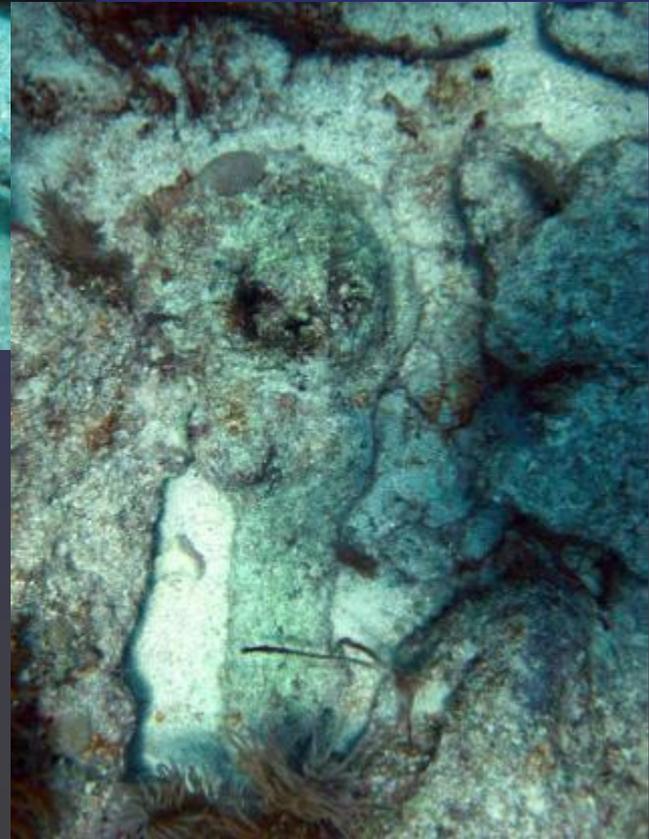


Large stud-link anchor chain lead away from the area of the windlass.





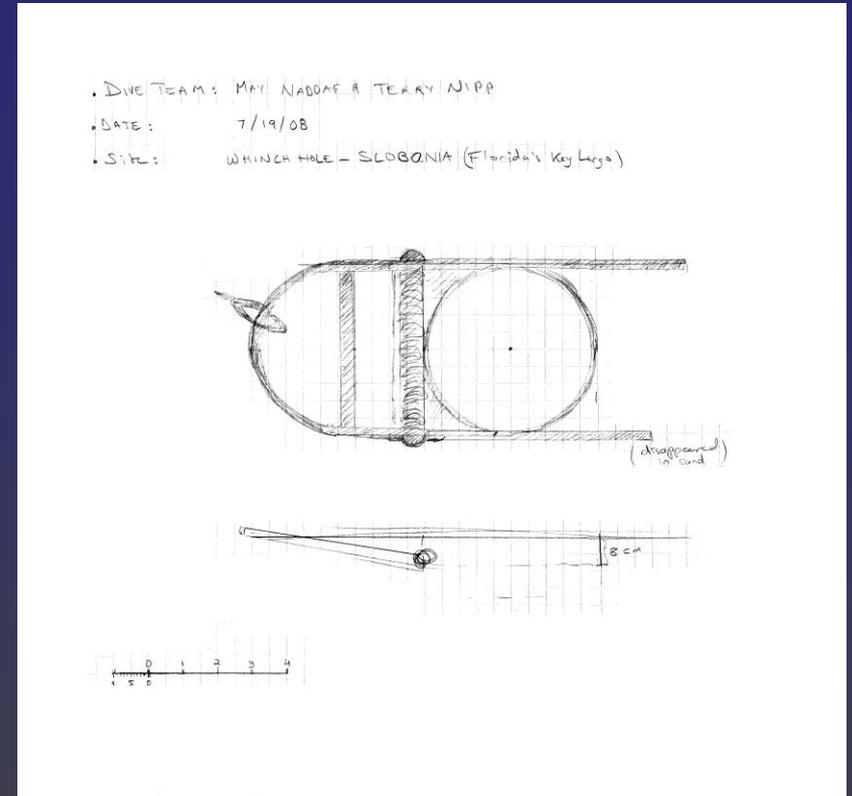
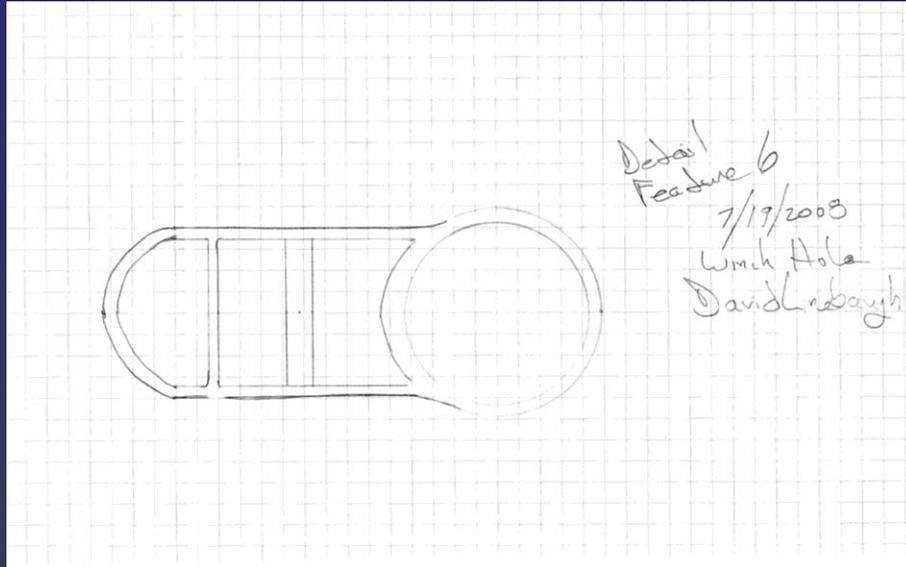
Miscellaneous fittings above
and dead-eye and strap to the right.



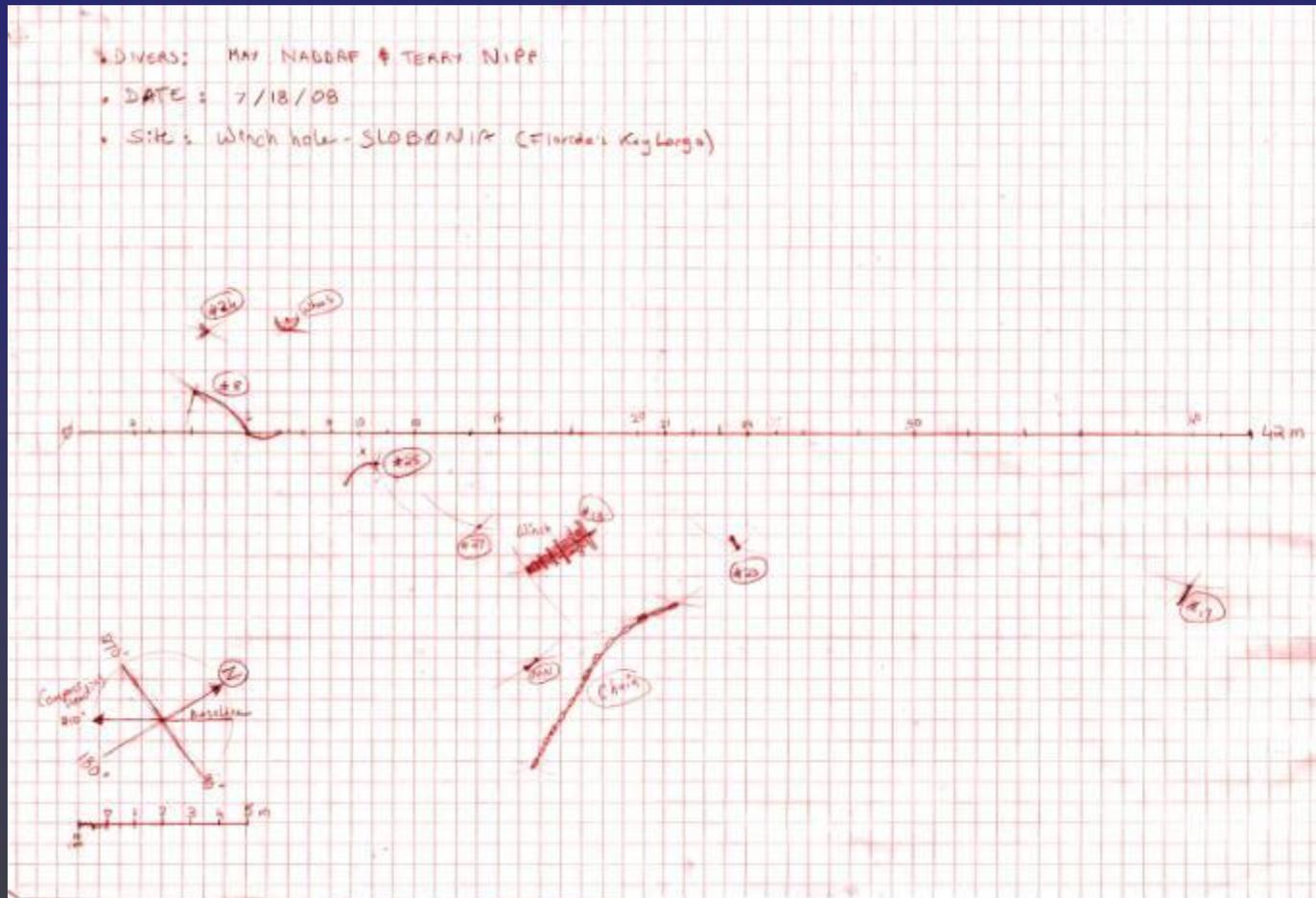


After collecting data in the field, the class returned to home base (Largo Lodge) to plot trilateration points and draw features.

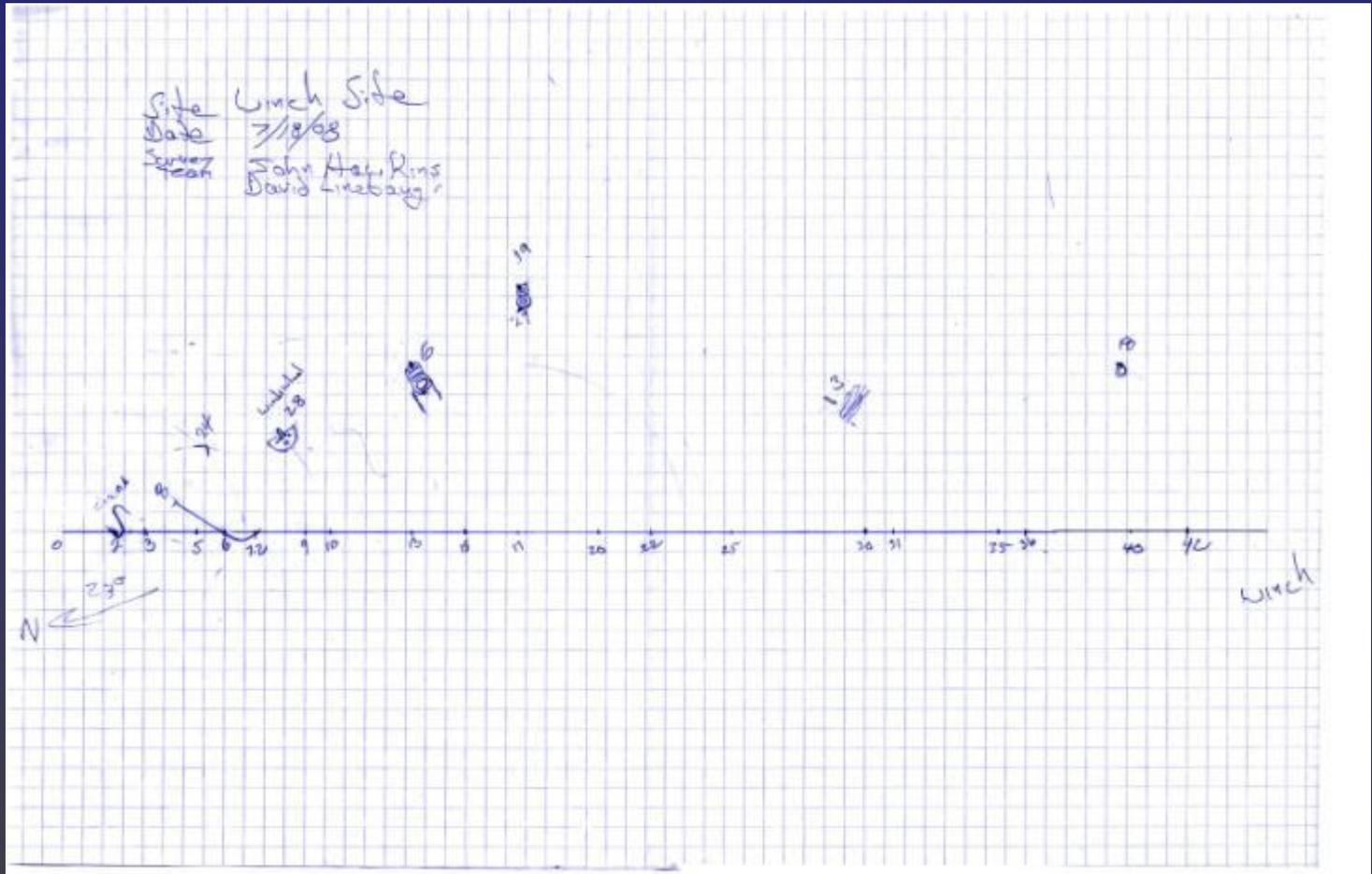




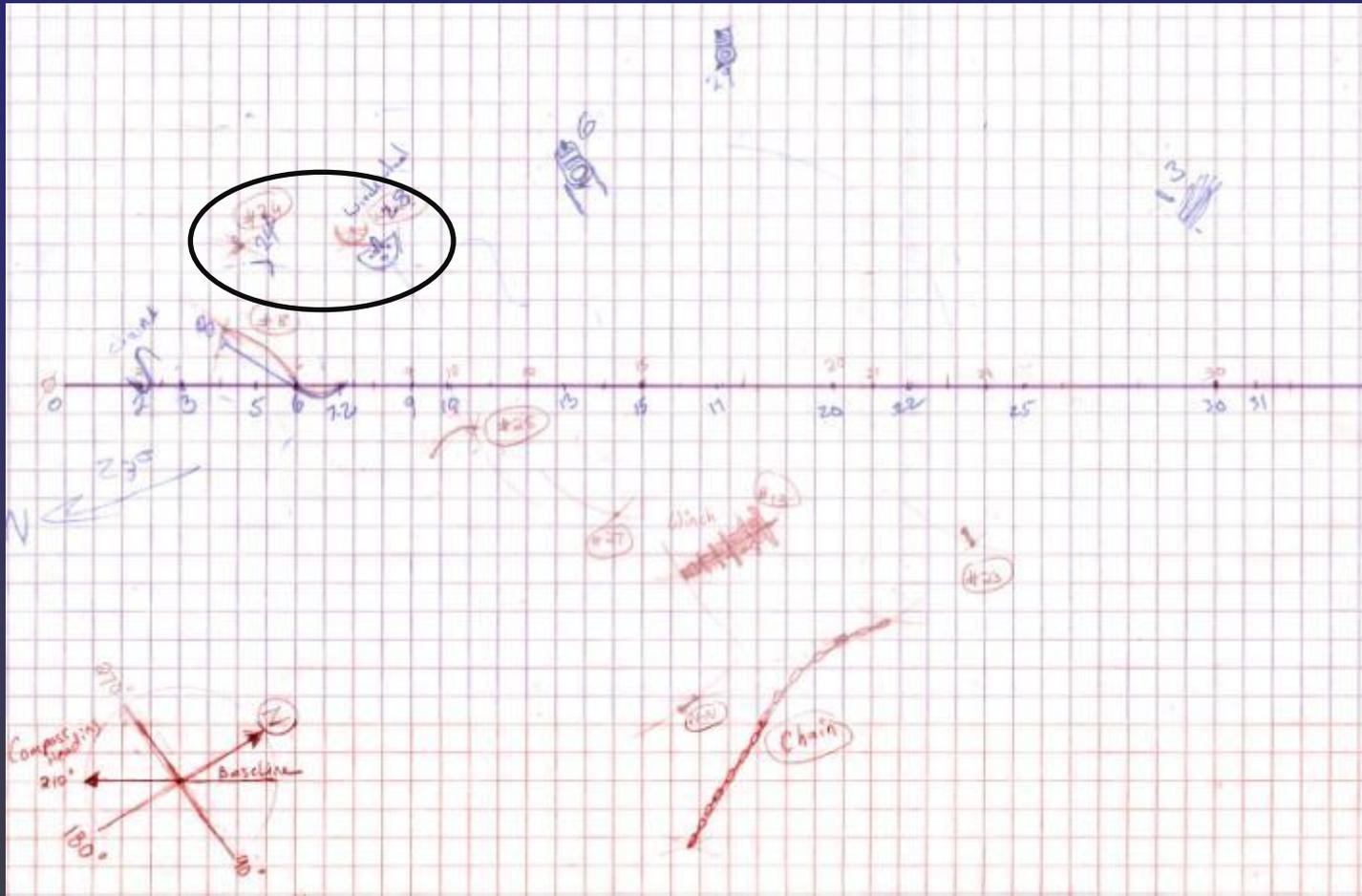
Here are drawings of the two mast caps.



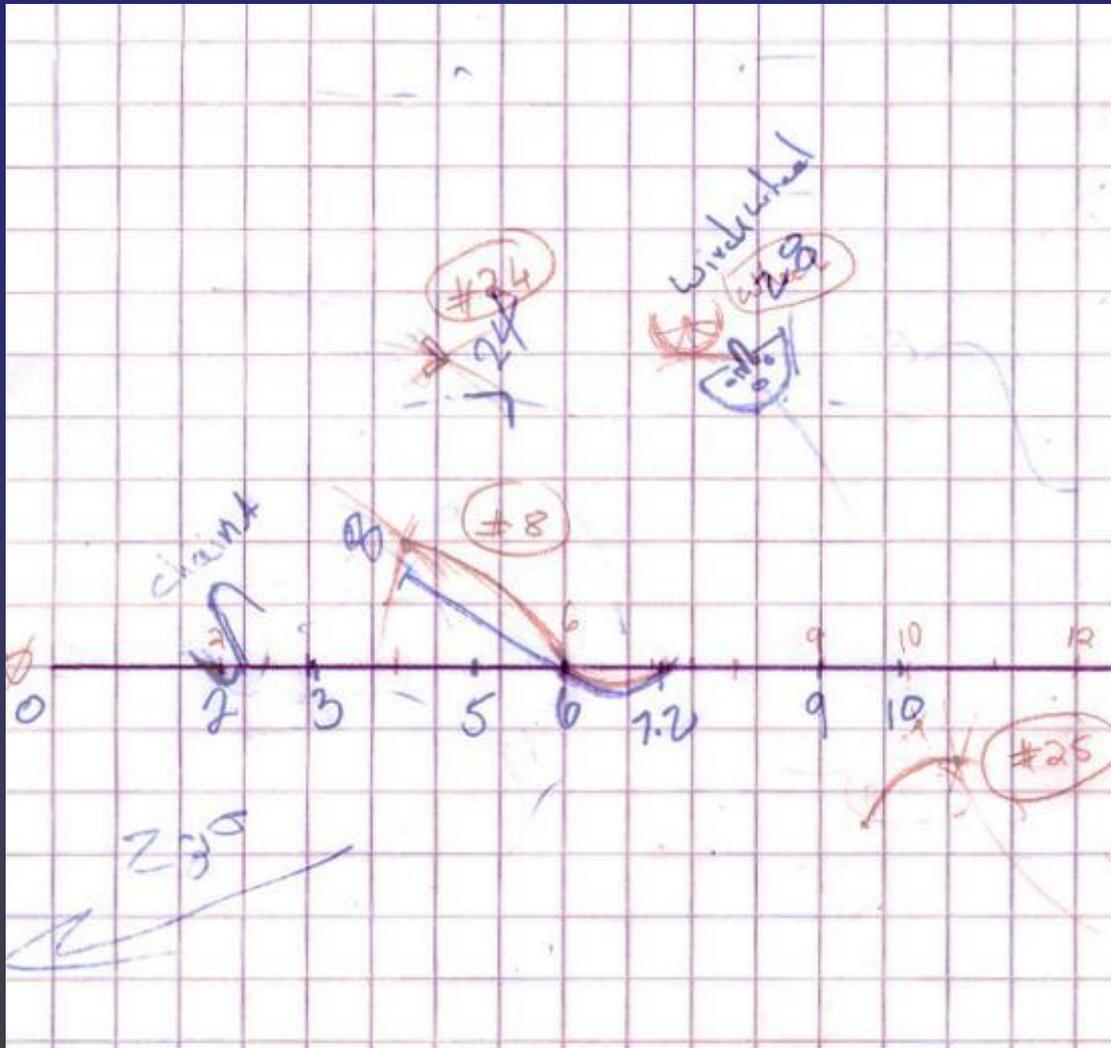
For the mapping exercise, each team was assigned one side of the baseline – here is the map one team drew of the left side.



Here's the map the second team drew of the right side of the baseline.



Each team plotted two features on the right side near the origin or zero end of the line. This allowed us to judge how well the teams were doing – in effect calibrating the maps.



Here's an enlargement. The two features came out about a meter apart – not bad. The orientation of the knee, Feature 24, doesn't match though. Looking at some photographs that I took for context, it is clear that the blue version is the correct orientation.



The class also practiced photo-documentation using disposable cameras designed for snorkeling and shallow dives.

These are some of the photos -- the windlass above and a knee to the right.

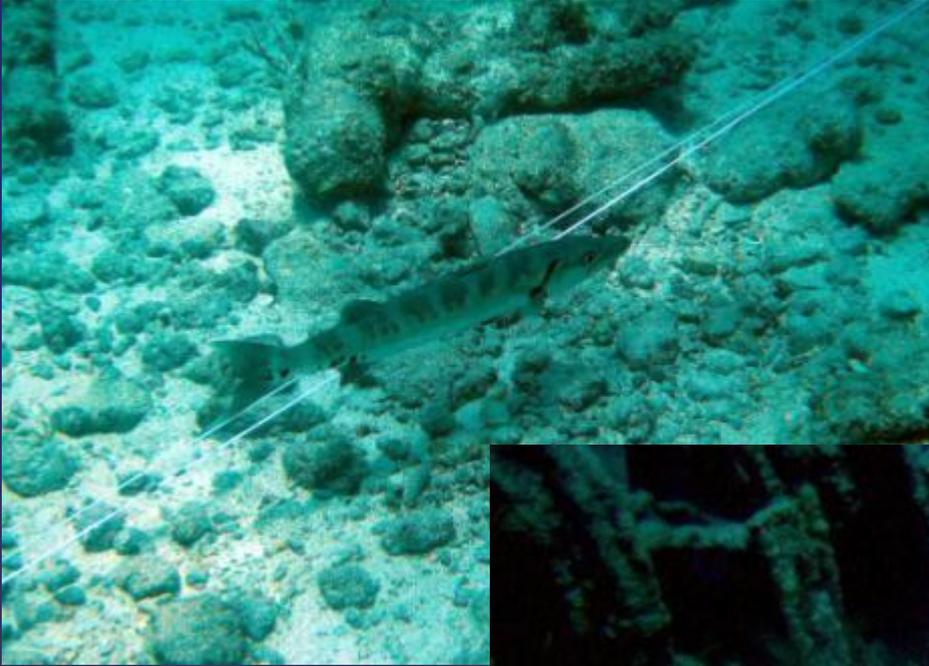




Composition is something that can be learned...



Above is a shot with a disposable camera and to the right using a slightly more sophisticated digital camera -- not bad by comparison. Both have been enhanced a little with a photo editor.



You know, if you work long enough in one location in tropical waters it seems that you always attract a barracuda or two. They usually tend to keep their distance, but are always hanging around watching.



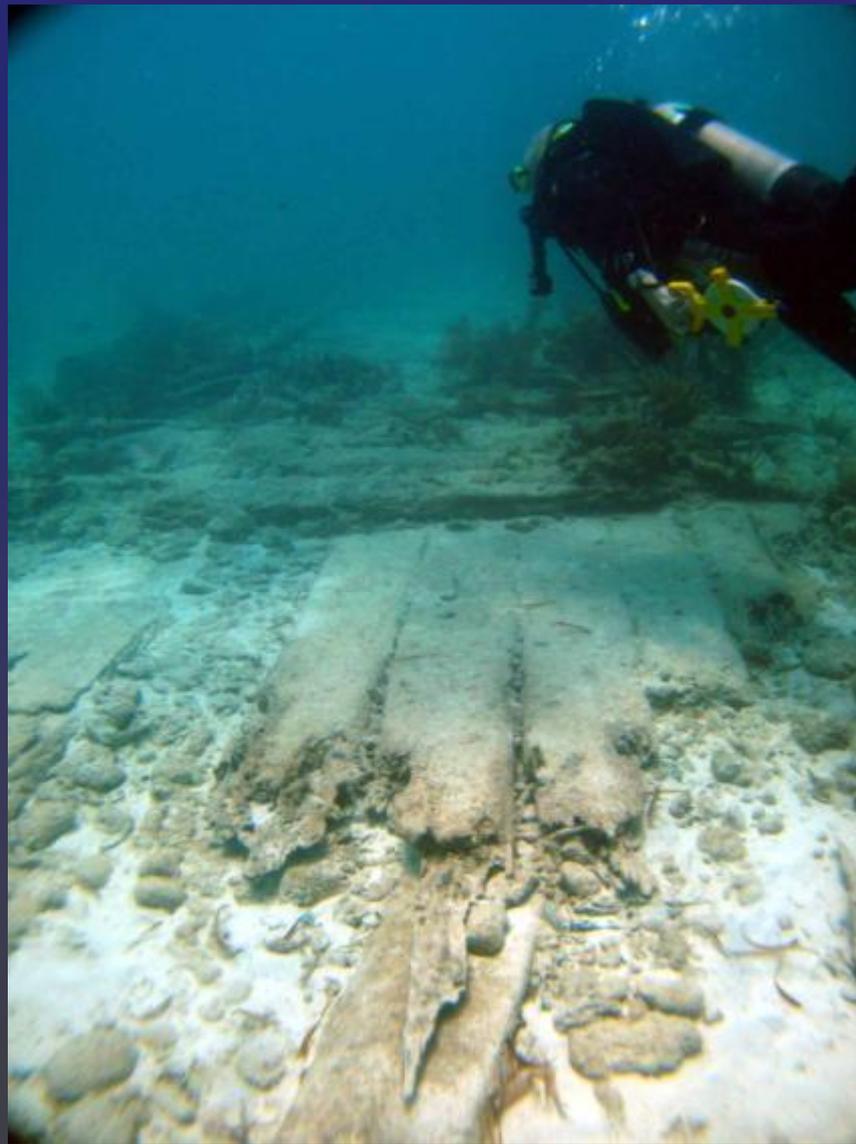
Packing up gear after a day on the site.



On the way back from the last dive at the Winch Hole, we stopped on French Reef at the *Excelsior* wreck, where MAHS held a field school in 2003. We retrieved the rebar left at the site as datum points in anticipation of a return to the site the following year, an event that did not happen.

There is a lot of wooden hull structure remaining at this site – frames, longitudinal timbers, ceilings, and hull planking.







One of the most distinctive features is the large capstan that lies at the approximate center of the site.

Using the 2003 site map and the capstan as a landmark, Tom took off with the tape measure to find the rebar.



And we found them both.



Here is some hull sheathing.





Frames and frame ends.





Copper fasteners.





Pretty fish, sponges
and coral.





And some divers...





As a final check on the disposable cameras, on the left is an un-edited image from the *Excelsior* site on French Reef. Not much to see.

Below is an enhanced version of the same image, which can only bring out a little detail.





Below is the same enhanced image, and on the left an image taken at the same time with a better digital camera.





The personnel.





It was a good field school and we plan to go back.



I'll be waiting...

These are the organizations involved in the field school.



MAHS – Maritime Archaeological
and Historical Society,
Washington, D.C.



NOAA / Florida Keys
National Marine
Sanctuary



Quiescence Diving
Services



**Tom Berkey, Jim Smailes, Heather Price, May Nadaff, Terry Nipp, Dave Linebaugh,
and Dennis Knepper contributed photos for this presentation.**

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