

ForSEAdiscovery ITN Meeting – UWTSD Lampeter

# *In Situ* Timber Sampling in the Silty Solent ... and other dirty research

Sara Rich

ER2

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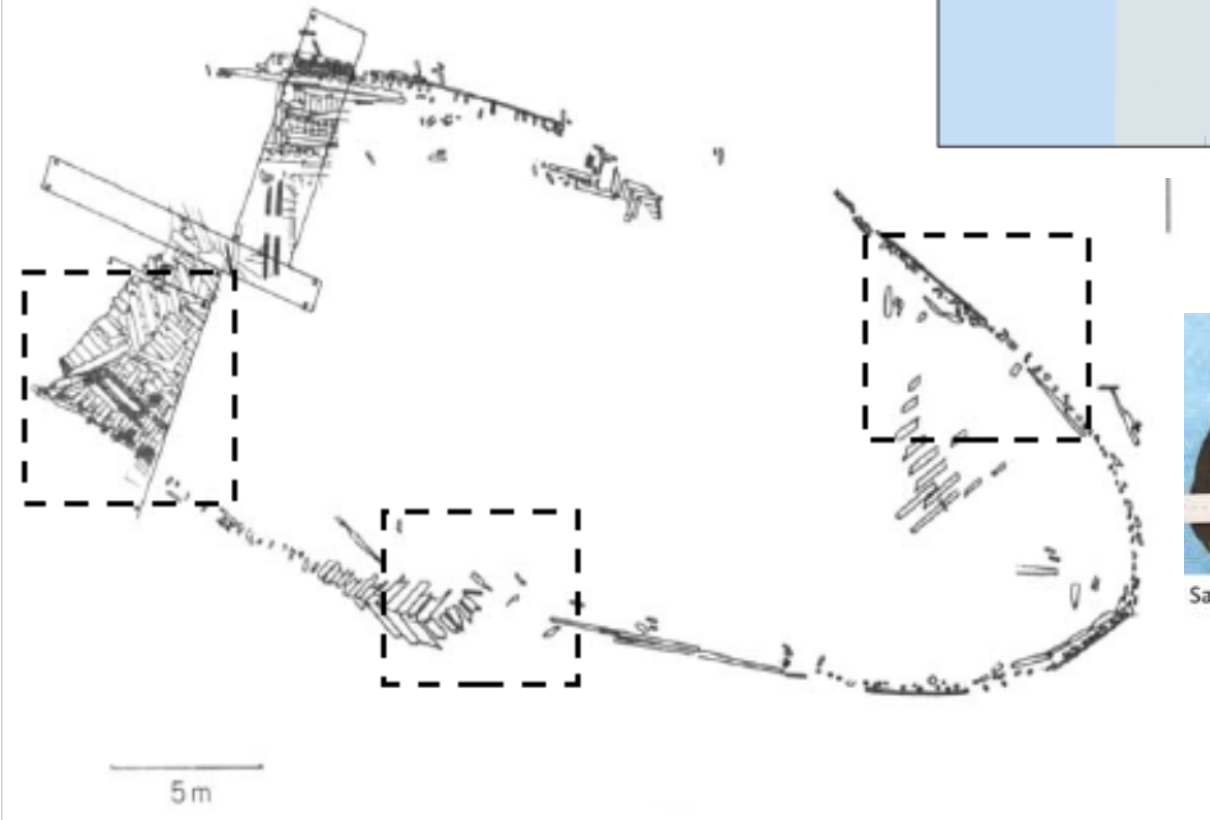
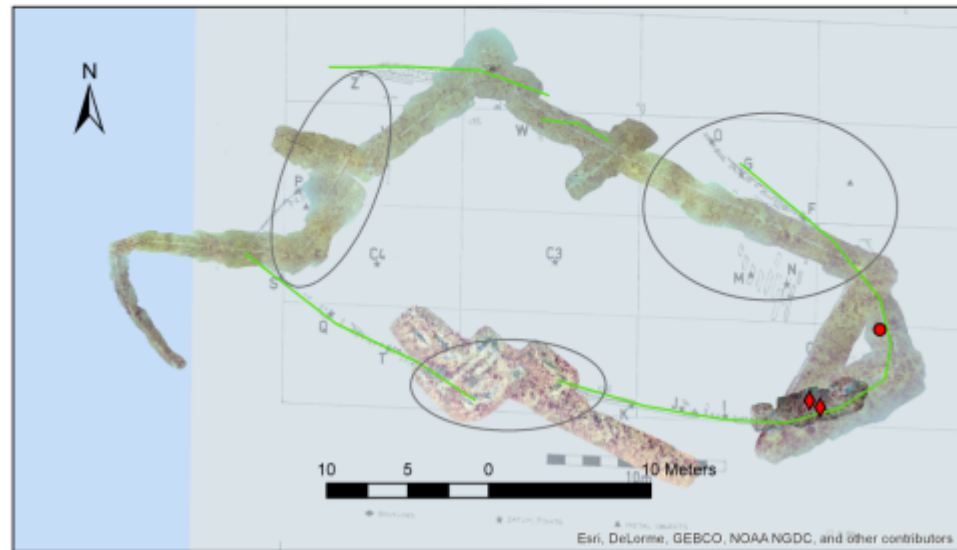
Southampton, UK





# Yarmouth Roads Protected Wreck

Site plan with initial photomosaic, timbers sampled in 2015, and focus areas for 2016



Sample 1.



Sample 2.



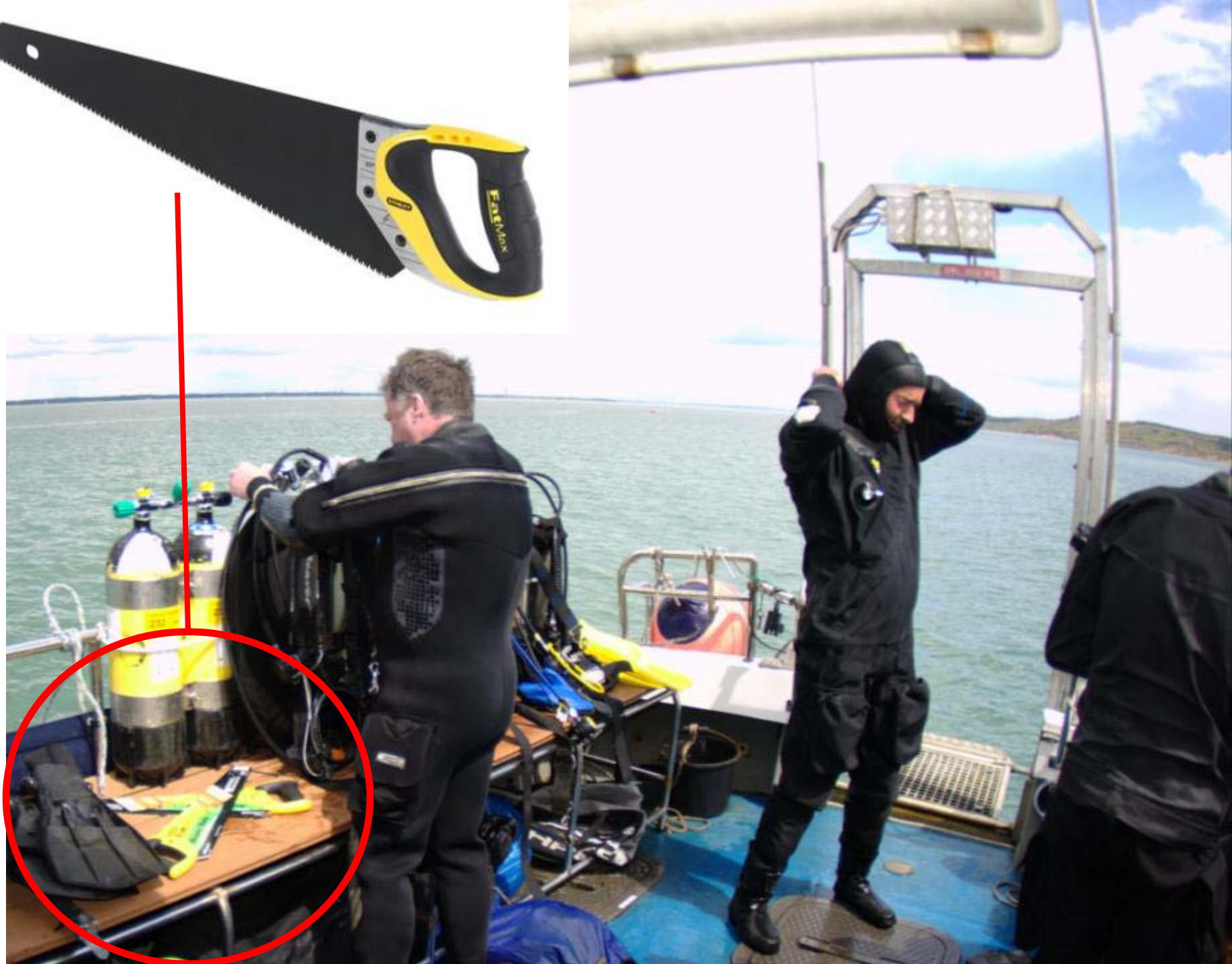
Sample 3.

April 14-18

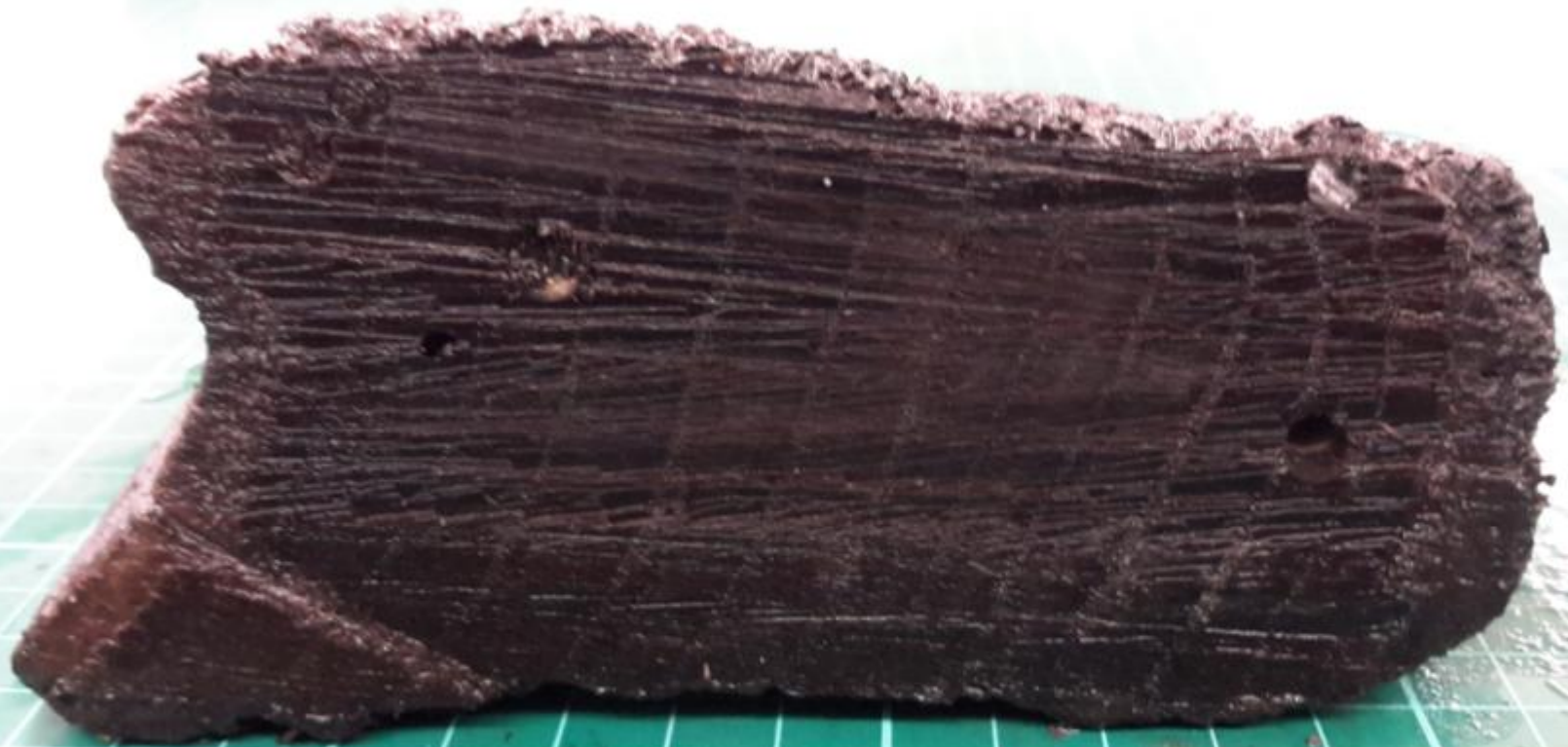
April 27-29

May 12

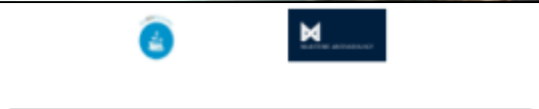




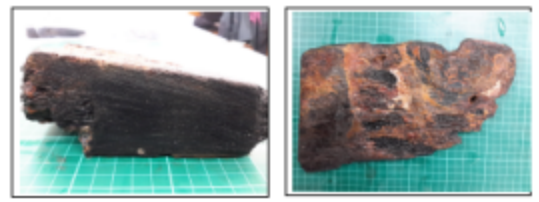
26 new samples,



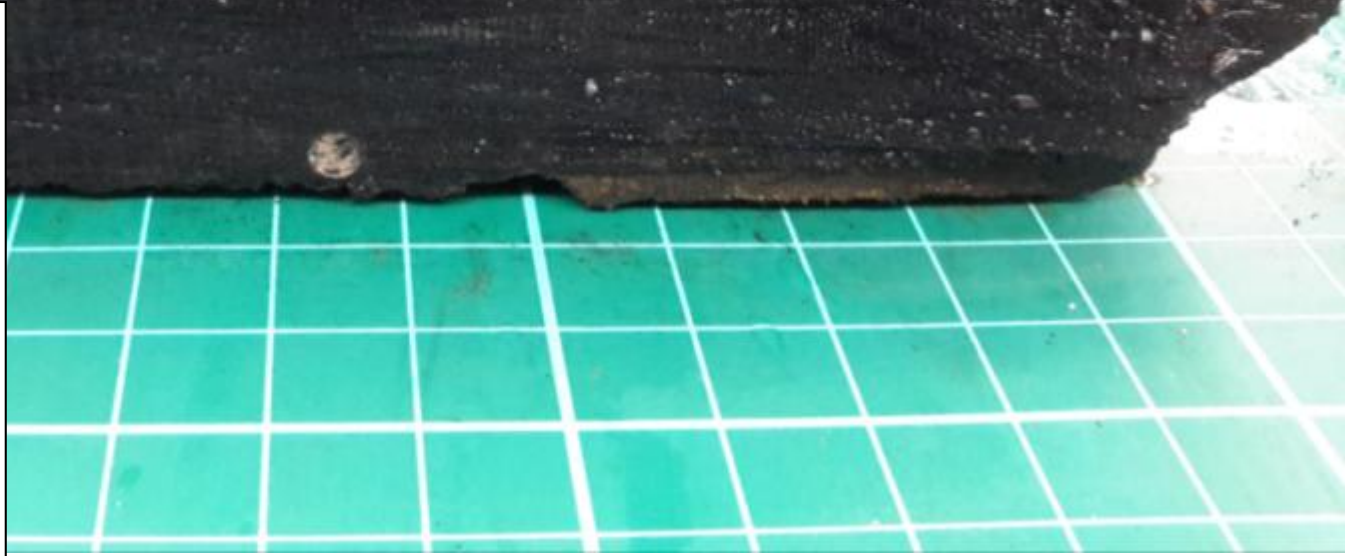
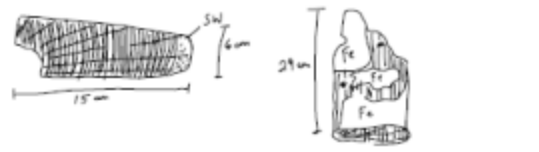
but most of them look like this, ... or worse.



Date	Sample ID	Name
20-5-2016	A-YARD1-015W-001S (-M323)	S. Rich



Description Fibre from (?) of charred wood, taken by NHAS on 29-5-2016-3. Slightly (?) oak with approx. (?) radial, concentric (!!). Galls damage have pits, Fe concretions on one side, galls on other.





Long live the Queen!  
Oh Right, she already is long-lived...

Date	Sample ID	Name
20-5-2016	A-YARD1-015W-001S (-M323)	S. Rich




Description Fibre from (?) of steelhead on sidewalk, taken by NNAS on 29-5-2016-3. 51mm-gena(?) oak with approx. (?) radius, covered (!!). Gable damage has a pit, Fe concentration on one side, gabbled on other.

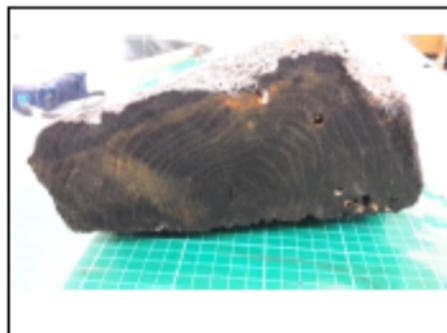




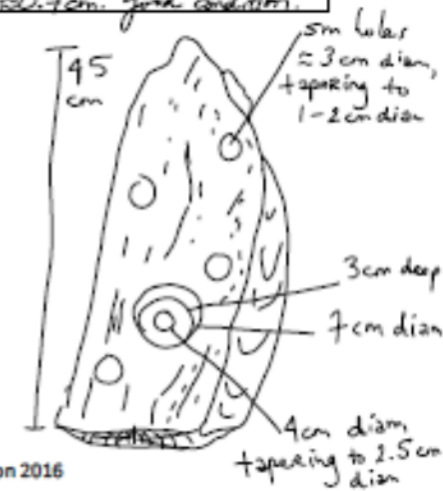
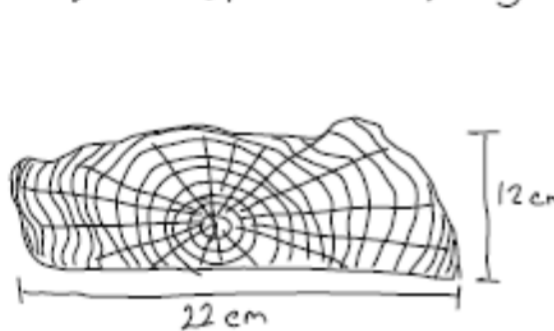

# Streamlining the sample recording methodology

- Clean
- Measure
- Photograph
- Draw
- Describe
- File
- Store
- Deliver

Date	Sample ID	Name
20-5-2016	A-VARD1-015W-001S (= M32A)	S. Rich



Description Sampled 28-4-2016-1 by GM+BE at the Starboard transom amidships. 4 smaller fastening holes (tapered) & 1 (g) one of Rebate for Fe bolt, also tapered. Fast-grown oak, pith + ~15 rings, avg RWd. 7cm. good condition.





Bouldnor Cliff, 8000-year-old next door neighbor of the Yarmouth Roads Shipwreck



Does the worked wood assemblage suggest a logboat construction site?



Council for  
British  
Archaeology

EXBURY  
GARDENS  
& STEAM  
RAILWAY



*Butser Ancient Farm*

[www.MesolithicWoodworking@blogspot.com](http://www.MesolithicWoodworking@blogspot.com) -- @MesolithicWood

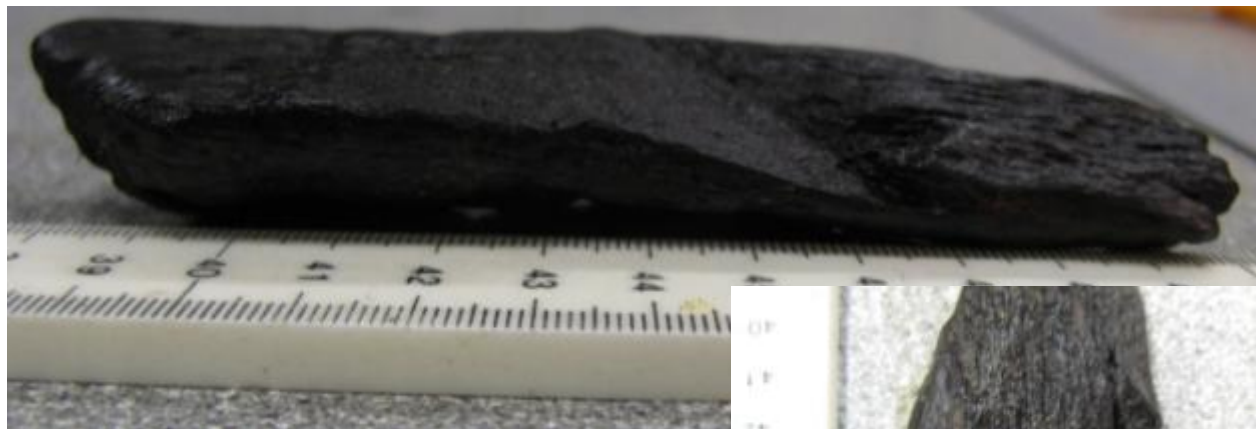
# Artifacts – Bouldnor Cliff



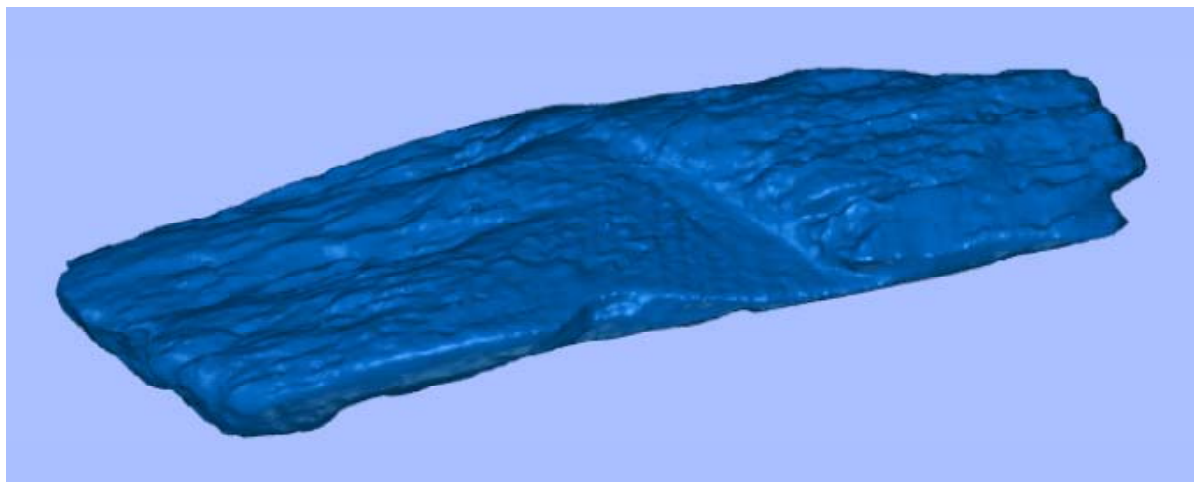
Digital photography

Structured light scanning

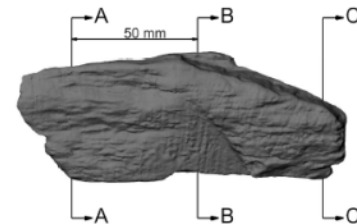
# Artifacts – Bouldnor Cliff



Digital photography



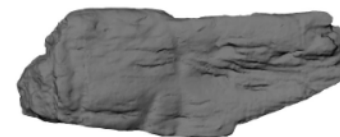
Bouldnor Cliff  
Timber ID: No ID 4



Top View



Front View



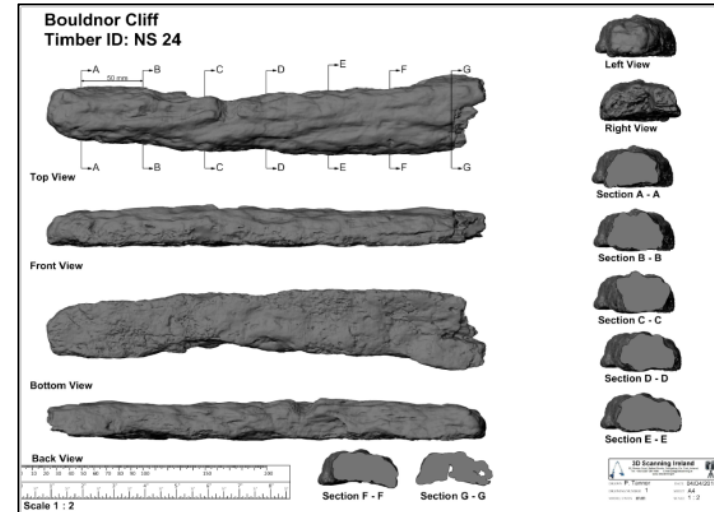
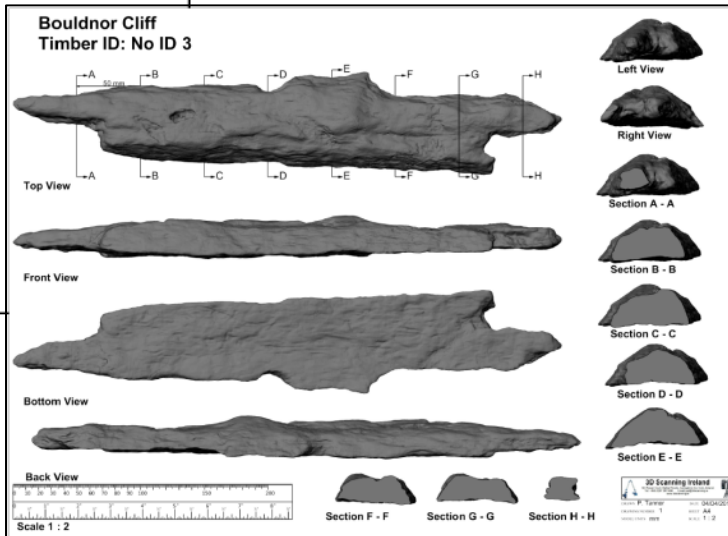
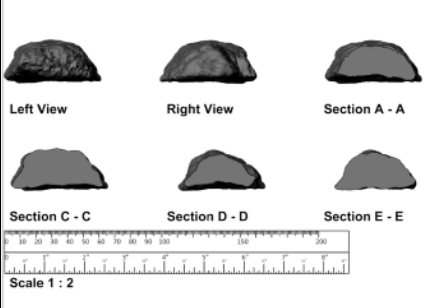
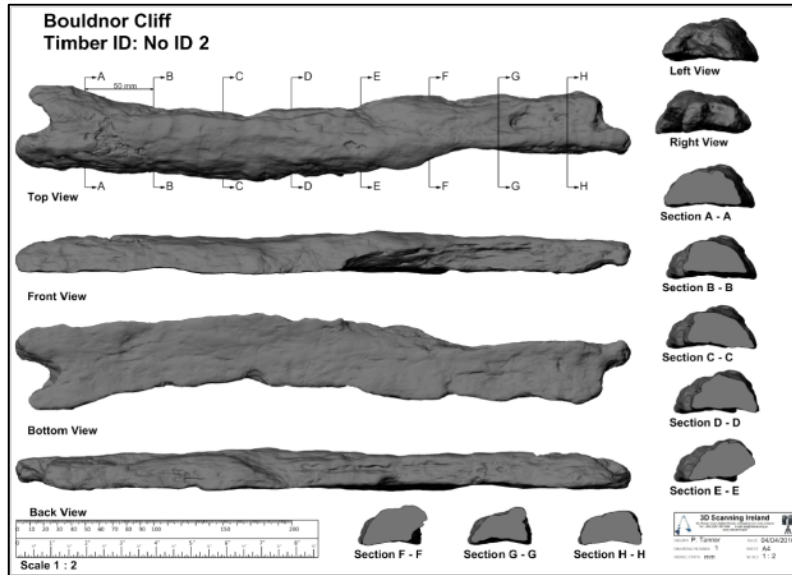
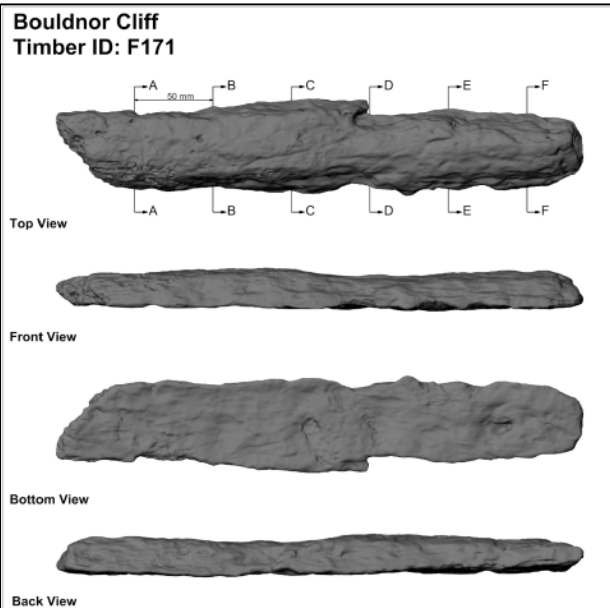
Bottom View



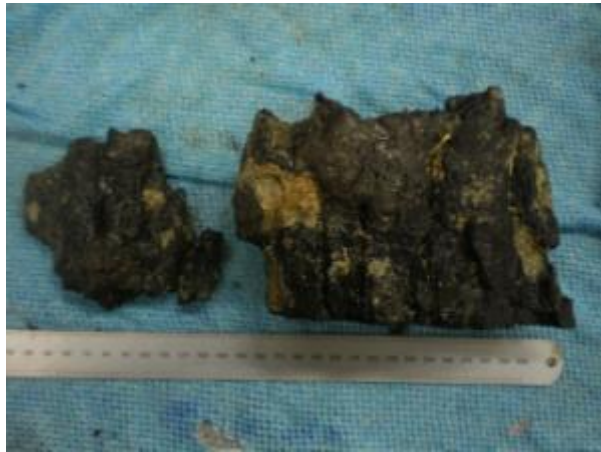
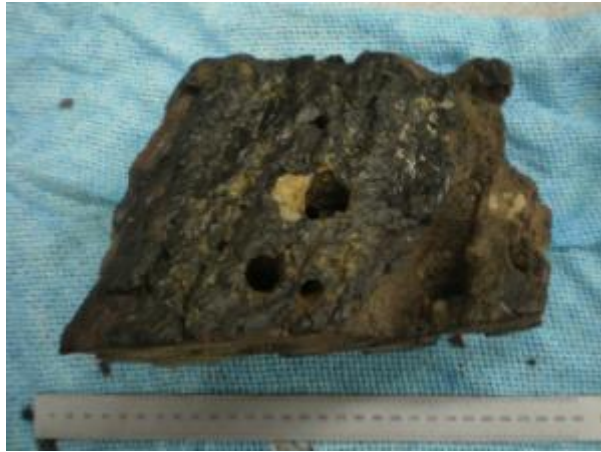
FARO laser scanning

# Artifacts – Bouldnor Cliff

FARO laser scans of 'half-moon profile' series



# Oak (*Quercus* sp.) samples for DNA analysis



At 8,000 years old, they look pretty good for their age, don't you think?

# The Database

# Timber sampling protocols

## Shipwrecks and dendroprovenance Protocols for *in-situ* timber sampling with a focus on Early Modern 'Iberian' wrecks

### 1. The 'Age of Discovery'

In an era of unprecedented globalization, it is sometimes difficult to imagine our world without interconnections that circumnavigate the planet. The roots of trade networks and global colonization are of course as old as humans are, but the foundations of truly global mobility were laid in the Age of Discovery during the 16<sup>th</sup> to 18<sup>th</sup> centuries, when Spanish and Portuguese sailing vessels plied the earth's waterways to stretch their empires around the globe. Fueled by trade in spices and slaves, and post-Reconquista (1492) and Battle of Lepanto (1571) religious fervor, the Iberian empires of Spain and Portugal conquered, converted, and controlled territory dispersed across five different continents: North and South America, Europe, Africa, and Asia.

The kings of Spain and Portugal signed treaties that divided up newly "discovered" (albeit already inhabited) lands between them: the Treaty of Tordesillas (1494) and the Treaty of Zaragoza (1529). The efficacy of these treaties and the demarcations they intimated were often disputed, and the Church frequently intervened. However, the Protestant explorers to the north, namely English and Dutch, like the Muslim Ottomans to the east, disregarded the border allocations altogether, as the Pope had no legitimate control over their seafaring endeavors. As such, much of the European land race was conducted over water. This fact led to ambitious shipbuilding regimes, swapping of trade secrets, and rapid changes to traditional ship architecture.

This paper aims to highlight some characteristics that are thought to be unique to Iberian ships of this period, and which could make these vessels easier to identify *in situ*. Mostly, it provides archaeological researchers with a set of protocols as to when and why *in-situ* timber sampling may be called for, how to go about it, and what to do with the samples afterward (for sampling *ex situ*, see Orton 2000, 191-209). In this way, the guidelines are meant to complement and supplement existing guidelines on shipwreck excavation, dendrochronological sampling, and handling waterlogged wood artifacts (see Historic England 2015a [1998], 2015b [2010a], 2015c [2010b]).

#### 1.1. Emergent oceangoing ship types

The origins of Renaissance-period ship design are still under debate by nautical archaeologists and maritime historians. There are three main lines of thought: 1) Mediterranean caravel-built ships spread into the Atlantic in the 15<sup>th</sup> century; 2) Spanish and Portuguese shipwrights were more influenced by English and Nordic traditions even before the advent of carvel planking; or 3) the geographical location of the Iberian peninsula made it a confluence of ship design and construction practices hailing from both the Mediterranean and the North Seas, along with Arab influences (Loewen 1998; Castro 2008). There are three main types of oceangoing ship in use during this period in Iberia, each with its own set of functions and qualities, although these could and did often overlap. These ships are all hybrid forms, and at the time of writing, the only form attested in the archaeological record is the galleon. The other two could be attested at various sites around the world but are confirmed only in iconographical and historical attestations, and it seems that at times, the Iberian *nao* or *nao* was synonymous with the pan-

4

European form of the caravel.

#### 1.1.1.

The mainmast was three or four times the length of the fourth mast, or longer than the mainmast. The mainmast was high aft.

#### 1.1.2. Nao

*Nao* (the "ship" but also with 'carack' (from Italian 'caracca') and four decks, fore and stern castles, three masts and a bonnet, except the mainmast with its lateen sail. From iconography, the stem can be square or round, and its proportions are typical of Mediterranean round ships. 1 length to breadth. These vessels could be enormous in size and had an alleged carrying capacity of 500 to 600 tons, which facilitated long voyages to India or the Americas. Their average burden though was around 100 metric tons, doubling from the 16<sup>th</sup> to 17<sup>th</sup> century. Although their primary function was as merchantmen, 16<sup>th</sup>-century commentators said that a capacity of 400 tons would allow the vessel to be effective both in commerce and war. Fleets of merchantmen were always armed and were requisitioned by the navy when needed.

#### 1.1.3. Caravel

The caravel developed out of an older Mediterranean prototype (compare *caravalius* in Latin, *καράβος* [karavos] in Greek, and *قاراب* [qarab] in Arabic) and was adapted in 16<sup>th</sup> c. Iberia to suit the needs of the *avulsada*. It typically featured four masts with all but the foremast supporting lateen sails. With a length to breadth ratio of 3.5:1, they were lightweight (about 50 tons compared to the 100 tons of a carack), fast, and readily maneuverable. Because they were adapted to different sailing circumstances on the Mediterranean and Atlantic coasts, and because of the ship type's antiquity and regional evolution, its telltale characteristics, even its favoring of lateen sails, change from place to place and time to time, rendering it perhaps more difficult to identify in the archaeological record. However, it may also be more prevalent, as the caravalius is noted in historical sources as the ship of choice from the 15<sup>th</sup> to 17<sup>th</sup> centuries, eventually being traded in for the carack.

#### 1.2. What it means to be 'Iberian'

The idea of an Iberian shipbuilding tradition is a modern descriptor constructed to categorize the origins of wrecked vessels. Those involved in the design and construction of ships during this period would likely not have thought of themselves as Iberian or Atlantic, or their methods as falling into these categories either. However, contemporaneous historical and iconographical accounts assert that all Iberian oceangoing vessels shared a few common characteristics: they were built empirically without architectural plans (at least until the mid-16th century) but based on proportion and scale; and they

WANTED

\*  
Readers



# FORSEADISCOVERY

Research fellows of ForSEAdiscovery reporting live from archives, forests, labs & shipwrecks.

HISTORY / NAUTICAL ARCHAEOLOGY / WOOD SCIENCE / FORSEADISCOVERY

## FORSEADISCOVERY RESOURCES FOR IBERIAN EMPIRES: ECOLOGY & GLOBALIZATION IN THE AGE OF DISCOVERY

JULY 21, 2015 / LEAVE A COMMENT

WANTED

\*

Writers

What impact did the European Age of Discovery have on forests in Iberia? In the 18th c., what characterized an 'Iberian' ship? How are individual trees represented in the shipbuilding records of the period? How do wood science, nautical archaeology, and historical narratives come together to address these myriad questions?

ForSEAdiscovery is a Marie-Curie ITN project (PITN-GA-2013-607545) that is revolutionizing interdisciplinary and multidisciplinary research. Within this framework, interdisciplinarity examines a phenomenon from different



# Applications

## Application Manager

Application Package Status: Complete

Job Title: Archeologist  
Vacancy Identification Number: 1684577  
Announcement Number: [MSF-16-228-1684577T]  
USAJOBS Control Number: 436621400  
Applicant: SARA A RICH

Closing Date: Friday, May 20, 2016  
Contact: Teresa Inch - (505)988-6068

RESEARCH & INNOVATION  
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### European Researchers' Night (NIGHT)

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It is a Europe-wide public event dedicated to popular science and fun learning. It takes place each year on the last Friday in September. More than 30 countries and over 300 cities are involved.

The events showcase what researchers really do for society, in interactive and engaging ways, and promote research careers to young people and their parents.

For further information about how to associate your event to the NIGHT, please refer to the How do we section below.

See the [frequently asked questions](#) (333 kB) on the European Researchers' Night.



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### Research Grants

The Royal Archaeological Institute has research funds available each year as follows:

- **RAI Research Fund**  
Awards up to £5,000 are available each year.
- **The Tony Clark Memorial Fund**  
Up to £500 is available each year for scientific elements of archaeological projects.
- **The Bunnell Lewis Research Fund**  
Up to £750 is available each year for projects which preferably involve the excavation and exploration of Roman sites.

### Eligibility

Applications will be considered for archaeological fieldwork, survey, aspects of excavation and post-excavation research; architectural recording and analysis, and artefact and art-historical research. Documentary research per se will NOT be eligible, but can be considered as an element of the other categories. Preference will be given to



LOTTERY FUNDED

# CEDAR FORESTS, CEDAR SHIPS

ALLURE, LORE, AND METAPHOR  
IN THE MEDITERRANEAN  
NEAR EAST

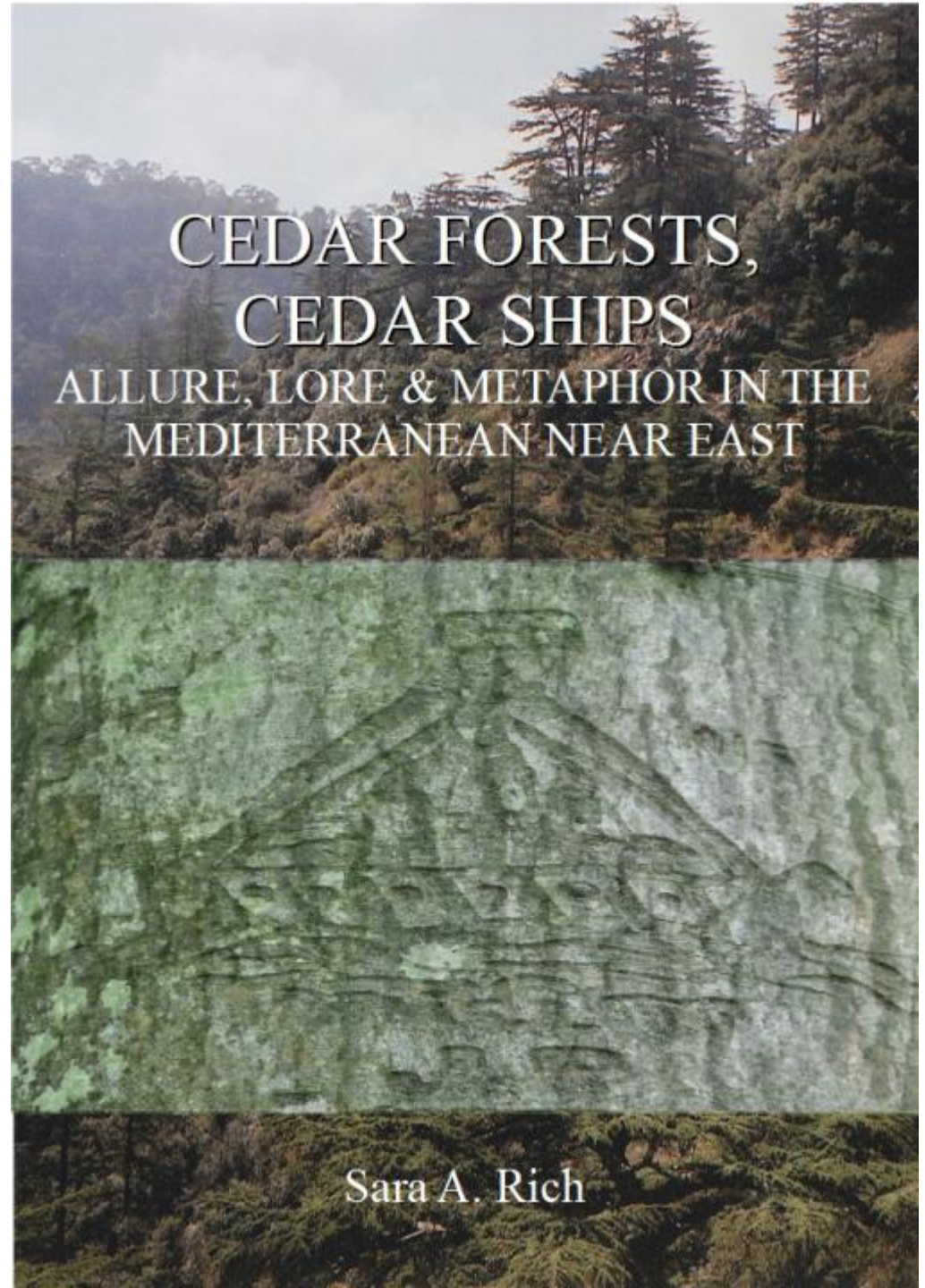
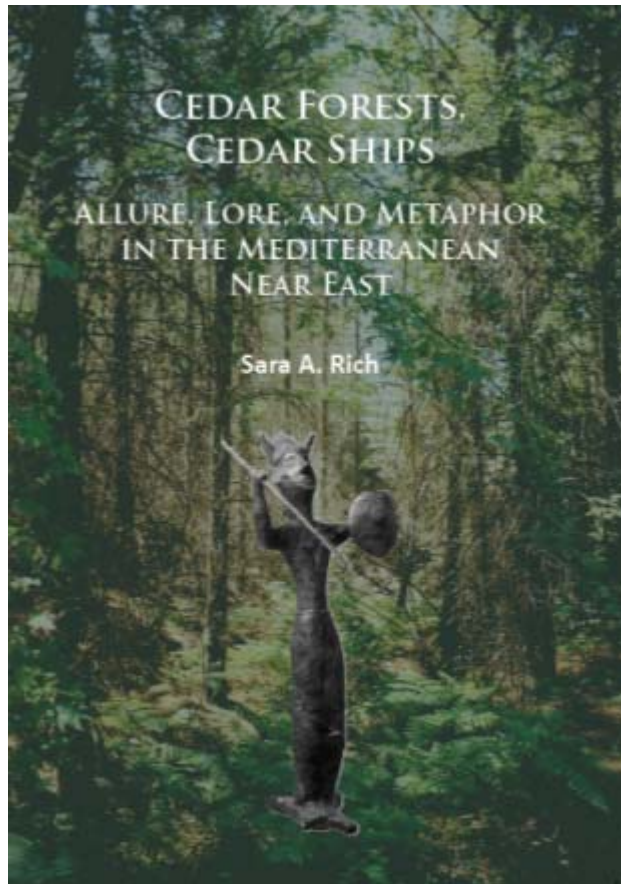
Sara A. Rich



Rich

Cedar Forests, Cedar Ships

ARCHAEOPRESS



# ***What's next?***

## In press:

- “Shiver Me Timbers! No Cedar Ships in the Medieval Mediterranean?” Royal Academy of Overseas Sciences of Belgium
- Book Review: *Travelling Prehistoric Seas*, by Alice Beck Kehoe
- Book Review: *On Sea and Ocean: New Research in Phoenician Seafaring*, Ralph Pedersen, ed.

## In peer review:

- “Dendroprovenance and Double Entendres: The Athlit Ram.” *Archaeology & Text*
- “ ‘Ontography of an Ordinary Shipwreck: Paradox, Appellation, Provenance, Apparition.’ *Coriolus: Interdisciplinary Journal of Maritime Studies*
- “To Put an Ancient Cedar Ship in a Bottle: Dendroprovenancing with Strontium Isotope Ratios.” *Journal of Archaeological Sciences: Reports*
- “Mesolithic Woodworking, Experimental Archaeology & Underwater Heritage in Hampshire and the Isle of Wight.” *Mesolithic Miscellany*

## Abstracts accepted:

- “The Heterotopian, Holobiontic Shipwreck: Engaging Eco-Narratives in Maritime Archaeology.” *Roots & Legacies*, Oxford (September)
- “Maritime Archaeological Timber Sampling: Methods and Results from the Silty Solent.” IKUWA6, Freemantle (December)



Underwater archaeology short story – with dendroprovenance ref! – to appear in next totally gorgeous Egaeus Press edition!