

THE INA QUARTERLY

BRINGING HISTORY TO LIGHT THROUGH THE SCIENCE OF SHIPWRECKS



HIGHLIGHTS OF RECENT
**ARCHAEOLOGICAL
FIELDWORK**



**TIDAL WRECKS
IN PATAGONES, ARGENTINA**

**THREE HISTORIC SHIPWRECKS
IN SKANEATELES LAKE, NEW YORK**

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ON THE COVER: Remains of a late 19th/
early 20th-century 9 m (30 ft)-long sailing log
canoe from Patuxent River, Calvert County,
MD. Photo by Susan Langley, Maryland
Historical Trust.

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If you are interested in submitting an article for publication please contact the Editor at inaq@nauticalarch.org

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NEWS & EVENTS

NEWS FROM BODRUM, TURKEY

Congratulations to INA Archaeologist Dr. **Orkan Köyağasıoğlu**, who received his Ph.D. from Anadolu University in Eskişehir, Turkey after defending his dissertation entitled “Evolution of the Ancient Ship Rigging in the Light of Yenikapı Finds.” INA would also like to recognize an important staffing change at the Bodrum Museum of Underwater Archaeology, where Ms. **Hande Savaş** has been appointed Interim Director. Hande has worked closely with the staff of INA’s Bodrum Research Center since 2009 when she joined the Bodrum Museum after earning an undergraduate degree in Archaeology and a Master’s degree in Sanskrit, both from Ankara University. Hande replaces outgoing Bodrum Museum Director **Hüseyin Toprak** who was promoted to regional Director of Culture and Tourism for the province of Muğla, which surrounds Bodrum.



Orkan Köyağasıoğlu

WELCOME NEW NAP FACULTY

INA is pleased to announce that Dr. **Piotr Bojakowski** has joined the faculty of the Nautical Archaeology Program (NAP) at Texas A&M University (TAMU) as a tenure-track Assistant Professor. Piotr graduated from TAMU in 2012, at which time he was serving as Conservator for the National Museum of Bermuda. He later worked as an Archaeologist at the Defense POW/MIA Accounting Agency (DPAA) in Hawaii and received the Meritorius Civilian Service Award in 2020. Piotr’s academic interests include early modern Atlantic shipbuilding, 16th and 17th-century maritime history, and the conservation of artifacts from underwater sites. NAP alumna and INA Research Associate Dr. **Katie Custer Bojakowski** also joins the NAP faculty as an Instructional Assistant Professor. We are excited to welcome the Bojakowskis back to Texas and Aggjeland!



Hande Savaş



Piotr Bojakowski



Anne Darden Self



David Steffy

OLD FRIENDS BECOME NEW DIRECTORS

INA is delighted to welcome two members of the INA Family to the Board of Directors, Director **Anne Darden Self** and Associate Director **David Steffy**! As the daughter of Frank (1926–2001) and Lucy Darden (1930–2021), Anne “wants to carry the torch that will keep their



Katie Custer Bojakowski

INA legacy going.” Anne first visited INA projects in Jamaica and Turkey in the 1980s and currently serves as President of Mercury Exploration Company. Dave is the elder son of ship reconstruction expert and MacArthur “Genius Grant” Fellow J. Richard “Dick” Steffy (1924–2007). Dave received a Bachelor and Master of Science in Aeronautics and Astronautics



Bob Walker

from MIT and is currently Vice President for the Space Systems Sector at Northrop Grumman. We are thrilled to welcome these two dynamic friends to the INA Board!

REMEMBERING BOB WALKER

The INA Family is deeply saddened to announce the death of INA Director and Friend Dr. **Robert “Bob” Walker** (1936–2022), a longtime supporter and advocate of INA and the Nautical Archaeology Program at Texas A&M University (TAMU). Bob graduated from TAMU in 1958 and returned a decade later to serve the University for almost 50 years, much of that time as its chief development officer. In the 1980s, Bob worked with Dr. George Bass to create ten endowments, funded by INA Directors and matched by Texas A&M University, that support NAP faculty and graduate students. Always willing to help when called upon, Bob served as Interim President of INA (2010–11) and Chairman of the Board (2015–16). We will miss Bob’s big smile, optimism, and insightful wisdom. Consider sharing your fond memory or photo of Bob Walker with INA for inclusion in an upcoming *INA Quarterly* tribute, by e-mailing us at inaq@nauticalarch.org.

MEET THE STAFF

of INA's Bodrum Research Center (BRC)

NAME: Meftun Yürek

POSITION: Oilman and *Virazon II* Crew Member, 3 Years

Where were you born? Where did you grow up?

I was born in Kale in Denizli and grew up there as well. Since 2000, I have resided and worked in Bodrum and Didim.

Tell us about your family.

I have two sisters and a brother. My sisters are housewives, and my brother is a farmer. I am married and have two daughters.

What did you enjoy about school?

All the technical things and sports.

Were you interested in archaeology as a child?

I lived in famous ancient cities in Turkey, so I had an interest in archaeology.

What is your first memory of INA? How did you come to work for INA?

Sailing on *Virazon II* and working on the excavation was my first and most important memory with INA. The need for the maintenance and crew of INA's new boat made me want to join.

How long have you worked for INA?

What do you do for INA?

It was three years in January 2022. I am

an oilman for *Virazon II* and assistant mechanic at the BRC.

What do you like most and least about your job?

I love to tend to the technical needs of the *Virazon II* and the BRC, and I love working with the INA team. There is nothing I don't like about my job. If there was something I did not like, I wouldn't do this job.

What has surprised you (good or bad) about your job?

I had been working on land with boats before INA, but now being on the *Virazon II*, sailing and working at sea surprised me and I love it!



NAME: Nevin Tekel

POSITION: Conservation Technician, 8 Years



Where were you born? Where did you grow up?

I was born and grew up in Istanbul.

Tell us about your family.

My family is from Elazığ. I have three siblings. My older sister is a physics teacher and my older brother has a cinema effects company. They live in Istanbul, and I live in Bodrum. I am not married.

What did you enjoy about school?

I enjoyed doing traditional Turkish folk dancing when I was a student.

Were you interested in archaeology as a child?

No, I didn't have an interest in archaeology.

What is your first memory of INA? How did you come to work for INA?

I came to the BRC in 2011 as a

conservation intern. My first memory was meeting all the lab ladies.

How long have you worked for INA? What do you do for INA?

I have been working for INA since 2014. They were happy with me after my internship, so when there was a position open, I was hired. I am a conservator and restoration technician.

What do you like most and least about your job?

I love my job and the working environment. I don't dislike anything about my job.

What has surprised you (good or bad) about your job?

I am still surprised about being excited when I get to work on an object for the first time.





NAME: Seçil Aydar

POSITION: Illustrator, 12 Years

Where were you born? Where did you grow up?

I was born and grew up in Akhisar, Manisa.

Tell us about your family.

I am married and my husband is a butcher. All of my family lives in Akhisar. My older brother is a police officer. Unfortunately, my father is now deceased.

What did you enjoy about school?

I always enjoyed poetry, literature, and painting – these were all encouraged by my father.

Were you interested in archaeology as a child?

While maybe not archaeology, specifically, but I was interested in history and always enjoyed visiting ancient sites.

What is your first memory of INA?

How did you come to work for INA?

My first memory of INA was meeting Cemal Pulak for the first time. He called me “Bilge,” the name of the other illustrator. When I met Bilge, I understood why he confused us because we look very similar. My husband Serkan (my boyfriend back then) always wanted me to move to Bodrum so we could be together. By coincidence, he learned from Esra that INA needed an illustrator. Esra contacted me and invited me to INA for an interview. That is how I started to work at the BRC.

How long have you worked for INA?

What do you do for INA?

This year will be my twelfth year with INA. I am an illustrator. I studied archaeology at university and have been trained as an archaeological object illustrator.

What do you like most and least about your job?

My favorite thing about my job is that

I always loved drawing and studying archaeology. With this job I can combine them and do something I love very much. The fear of damaging an object when I am handling it can be stressful.

What has surprised you (good or bad) about your job?

Seeing one of my illustrations with my name on it in the publications always makes me happy.



2022 PROJECTS

INA Archaeological Committee awards \$100,000 in support



San Nicoletto Shipwreck
Italy | Massimo Capulli (University of Udine)

Shipwrights of the Amalfi Coast
Italy | Luigi Prisco (Koç University)

Fourth-Century B.C. Shipwreck at El Sec, Mallorca
Spain | Carlos de Juan (INA/University of Valencia)

16th-Century Galleon Excavation at Ribadeo, Galicia
Spain | Miguel San Claudio (INA/Universidade Nova de Lisboa)

ONGOING RESEARCH IN TURKEY

Kumluca Bronze Age Shipwreck
Cemal Pulak (INA/Texas A&M University) and Hakan Öñiz (Akdeniz University)

Yassiada Byzantine Shipwreck
Fred van Doorninck (INA)

Uluburun Late Bronze Age Shipwreck
Cemal Pulak (INA/Texas A&M University)

Bozburun Byzantine Shipwreck
John McManamon (INA) and Fred Hocker (INA/Vasa Museum)

Tektaş Burnu Classical Greek Shipwreck
Deborah Carlson (INA/Texas A&M University)

Pabuç Burnu Archaic Greek Shipwreck
Elizabeth Greene (INA/Brock University)

Kızılburun Late Hellenistic Column Wreck
Deborah Carlson (INA/Texas A&M University)

Yenikapı Shipwrecks Project
Michael Jones (INA/Koç University) and Cemal Pulak (INA/Texas A&M University)

NORTH AMERICA

Recording Shipwrecks in Skaneateles Lake
USA | Dana Carris (Texas A&M University)

The Mid-Atlantic Logboat Registry
USA | H. Robert Hayes (Archaeological Society of Virginia) and John Broadwater (INA/Spritsail Enterprises)

MEDITERRANEAN AND BLACK SEAS

Port of Dyrrachium
Albania | Catherine Abadie-Reynal (Lumière-Lyon 2 University)

Documenting Three Post-Medieval Black Sea Shipwrecks
Bulgaria | Kroum Batchvarov (INA/University of Connecticut)

Ma’agan Mikhael B Shipwreck
Israel | Deborah Cvikel (University of Haifa)





TIDAL WRECKS IN PATAGONES, ARGENTINA

Three 19th-century beached vessels

BY ANA CASTELLI AND NICOLÁS C. CIARLO

THE PATAGONES PROJECT

The coastal area covered by the Patagones Project extends more than 200 km between the Negro and Colorado rivers, southern Buenos Aires province, Argentina. On the sea route that connects Buenos Aires and Montevideo in the North to harbors in Patagonia, this

PHOTO: ANA CASTELLI

Opposite page: Recording of the partially excavated remains of Punta Rasa 1, part of a wooden hull side.

coastal area has been sailed by explorers, privateers, scientists, merchants, and whale and seal hunters since the 16th century; today it remains an active area for fishermen and sailors. The historical and archaeological heritage related to these maritime and nautical activities is not only rich but also highly influential on local communities.

Naval accidents were not infrequent along the shores of northern Patagonia. Several shipwrecks are accounted for in 19th-century documents, but they have seldom been studied from an archaeological perspective. The town of Carmen de Patagones played a significant role during the war between the Río de la Plata United Provinces and the Brazilian Empire (1825–1828), which resulted in two naval attacks and several shipwrecks.

The Patagones Project was launched in 2017 and aims to study the maritime cultural heritage of the area with an interdisciplinary team made up of archaeologists, anthropologists, historians, and engineers, led by Nicolás C. Ciarlo. Research has focused on sailing and vessels but also emphasizing the maritime landscape as a whole. The team has recorded and excavated intertidal wreck sites, mostly between Carmen de Patagones and Bahía San Blas, and conducted documentary and oral interviews with local residents. In addition, geophysical surveys were carried out in riverine and coastal areas, searching for the remains of the Brazilian ships lost during the War of the Brazilian Empire. Sites on land, mainly from the 19th century, have also been registered, including a historical lighthouse, beacons, a sailors' graveyard, a pilot's house, and the remains of a campsite (discussed below).

Since 2017, studies have unveiled novel information on sailing and associated activities along the Atlantic coast of South America. This article presents a brief account of the ongoing research and the results obtained during the

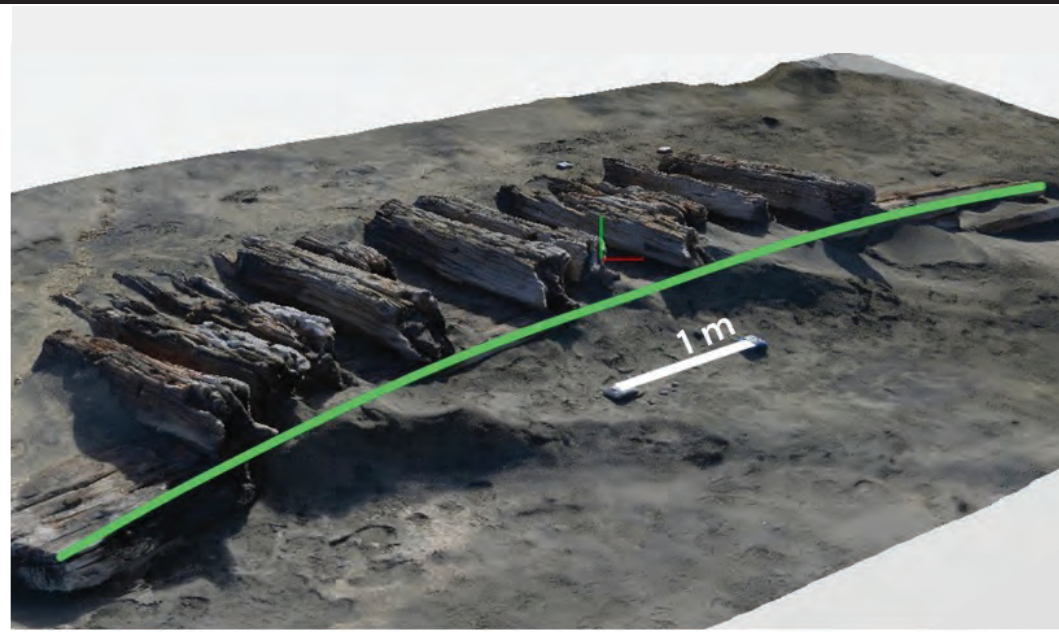
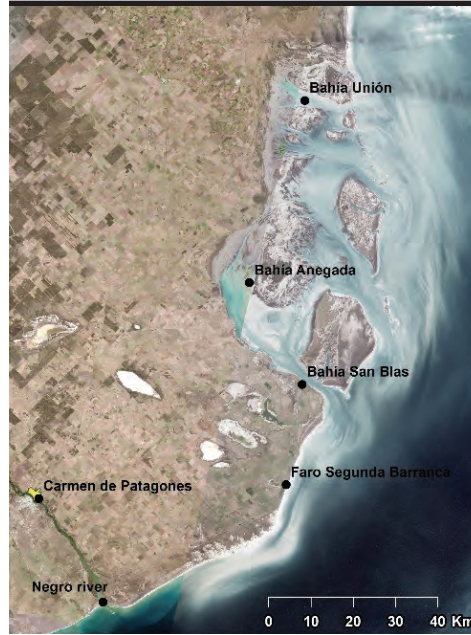
2021 fieldwork season, supported by the Institute of Nautical Archaeology's Discovery Fund.

HISTORICAL SHIPWRECKS UNDER STUDY

South of the Segunda Barranca Lighthouse (Faro Segunda Barranca), several unidentified shipwreck structures from the 19th century have been located, which are currently under study. Four are beached in intertidal areas and two in supratidal areas (the spray zone). Photogrammetric modelling, technical drawings, and analysis of wooden and metal samples, together with documentary records, have helped to assess the shipwrecks' main technological features, materials, construction, date and provenance, as well as the site formation processes that affect them.

Several finds have a clear association with the War of the Brazilian Empire. They include, for instance, the remains of the former Brazilian sloop *Itaparica*





located on the southern shore of the Negro River. A different group comprises several 20th-century wooden and iron/steel shipwrecks located along the riverbank of Carmen de Patagones, either abandoned or in some cases monumentalized; iron guns and anchors can also be found in public squares and parks. This shows how ubiquitous maritime heritage is in the area.

Nineteenth-century construction treatises and historical sources related to shipbuilding provide data on technological changes and geographical variability. These documents were used as a frame of reference for archaeological interpretation. The team is also compiling other sources, such as censuses on shipbuilders, information on shipyards, boarding permits, and travellers' accounts of shipbuilding. Even if by the 19th century shipbuilding had reached a high degree of standardization, smaller vernacular or local vessels did not always abide by rules imposed by certifying agencies.

As for Patagones, large oceanic ships were most likely built following rules that were well documented in constructive treatises while others could have been built locally following regional traditions not well known. Variability can occur based on vessel function, the availability of building

materials, local adaptations of foreign technology, and so on. The richness of foreign and local manifestations of nautical technology and technological trends and changes can be better understood through the study of specific archaeological sites.

EXCAVATION OF INTERTIDAL WRECK SITES

In 2021, the Patagones Project team worked at three of the wreck sites located south of the Faro Segunda Barranca. The lighthouse was built by a French company between 1912 and 1914 and was completely restored in 2015. The fact that several vessels sank in the area attests to the difficulty of sailing these waters before its construction. In this area, post-depositional processes have a significant impact on sites and contexts, and both human and natural factors threaten their preservation. The powerful sea dynamics tear structures apart and disperse materials, and isolated objects are regularly found along the coast. High tidal ranges, moreover, make extensive excavations difficult on intertidal sites, particularly those that lie on flat and wide beaches.

The Faro Segunda Barranca 1 (FSB1) site is a wooden vessel with diagonal iron riders. Very little of FSB1 is exposed, but

in previous seasons two sections were observed and measured. At the southern end, two iron riders and a few wooden futtocks, together with inner and outer planks, protruded above the sediment. These were recorded, and wood samples were collected. The northern structure is seldom exposed, but the team located eight low-lying frames, most likely floor timbers. The remains correspond to the bottom of a vessel's hull which may be preserved to its full length. The existing structure is approximately 33 m (109 ft) long and 10 m (33 ft) in width. At the southern end, the planking is tilted around 50-55 degrees while the iron riders stand almost vertically. At the northern end, frames seem to be lying horizontally, meaning that the southern section is probably broken and detached from the rest of the hull. In 2021, rising tides made it challenging to dig the northern end of the wreck, so instead, we excavated and recorded architectural features at the southern end, where more elements were naturally exposed.

Site FSB2 corresponds to the remains of

Opposite page, left to right: Documenting the main structural elements of site FSB3-a. This page, left to right: Map showing the sites in the article; a photogrammetric model of Site FSB3-a.

a ship's forward portion, comprising the apron, stem, cutwater, independent piece, and a fragment of the lace piece. FSB2 is also located in the intertidal area and only partially exposed. In previous seasons, these remains were measured and sampled. Elements of the apron and stem lie underneath the sediment, as the structure is tilted downwards. In 2021, further elements were excavated and recorded in detail with a levelled grid of 2 x 1 m and a transverse 1-meter bar to allow for longitudinal measurements. A brass plumb-bob was used to take measurements at predefined and tagged points, which helped to understand the position of the buried structure and the angles of the different pieces. The remains were preliminarily identified as a mid-to-late 19th-century shipwreck, possibly related to the FSB3 site, located 230 m (759 ft) south, a hypothesis yet to be confirmed.

Site FSB3 comprises two wooden structures that currently lie more than 100 m (330 ft) apart but were originally joined. Both FSB3-a and FSB3-b sites comprised planking and bevelled double frames, corresponding to an area close to either the stern or the bow. The horizontal curvatures

observed are useful for determining the shape and section of the hull more precisely, as well as its dimensions. Most likely, the preserved planks correspond to the inner planking, and the frames are exposed because the exterior hull planking is missing. Structure FSB3-a was more accessible and was chosen for three-dimensional documentation to assess its shipbuilding characteristics. Once again, key points were tagged and measured with the grid; these measurements will help project the shape of the hull's side, as well as connect FSB3-a and FSB3-b with further precision. Structural pieces and metal fastenings were also sampled for analysis.

The scantlings of these sites were compared with those available on Lloyd's Register of Shipping for 1849. Even if they may not have been built according to those specific standards, this comparison does provide a preliminary approach to the vessels' original sizes. The data show that their scantlings are close to those suggested for 500-ton ships. The tonnage together with the architectural features mentioned above prove that these are the remains of solid oceangoing vessels. All these sites were recorded by photogrammetry.

Three-dimensional models of the sites, furthermore, are being built with Rhinoceros 3D, which will help us to partially reconstruct the hulls virtually.

UNDERWATER SURVEYS

A survey using an echo sounder and side-scan sonar was carried out in Bahía San Blas, focusing on areas where historical sources indicate two Brazilian warships sank. Previously, in 2020, survey work in the Negro River was centered on the *Itaparica* remains and also in the river mouth where the Brazilian sloop *Duquesa de Goyaz* ran aground in 1827. The defined sector for the 2021 survey was a shallow-water area close to the eastern shore of Isla Jabalí at the entrance of the San Blas channel. Based on oral testimony about previous finds, specific areas of the San Blas channel were also surveyed. Anomalies corresponding to small elements located above the seabed were detected and will be assessed through diving to determine their archaeological potential in future fieldwork seasons.

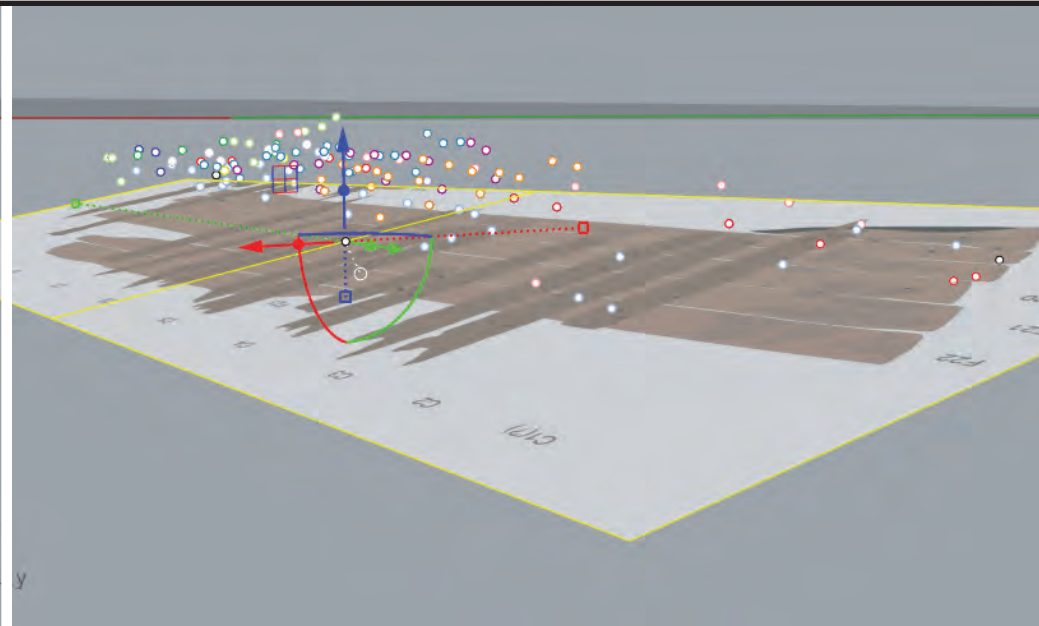
COASTAL AND ISLAND SURVEYS

There have been several reports of material

In this area, post-depositional processes have a significant impact on sites and contexts, and both human and natural factors threaten their preservation.



PHOTOS: THIS PAGE: CARLOS LANDA; OPPOSITE PAGE, FROM LEFT: LUIS COLL; RODRIGO TORRES AND ANNA CASTELLI



The objects include...copper-alloy tacks and nails, different types of iron bolts (including an eyebolt), barrel hoops, and a rich array of early 19th-century pottery, dishes, knives, beads, buttons, and glass bottles.

remains found on the shore between the towns of Bahía San Blas and Carmen de Patagones, an area accessible only by all-terrain vehicles. Each season since 2017, the team covers a larger area with walking surveys. The continental sector south of Bahía San Blas is comprised of sand beaches, dunes, and low rock cliffs. The insular sector is comprised of two main islands (Isla Gama and Isla Flamenco) and a bank (Banco Nordeste) with low grasses surrounded by shallow, muddy waters.

In the continental sector, uncharted supratidal and intertidal areas were surveyed during low tides. In 2021, the team conducted walking surveys on Isla Jabalí, south of Punta Rubia, and frequently accessed by fishermen, and on Banco Nordeste located on the northern margin of the San Blas channel's entrance. The bank is known for the preserved remains of sealer/oiling stations. Even if no material evidence has been found there, our initial exploration provided a clear understanding of the site's context. The area is not only remote but

also highly dynamic with vast areas covered by water during medium and high tides and rarely with a calm sea. Sources report that on Banco Nordeste's northern point, the violence of the sea, storms, and shallow waters created dangerous conditions for sailors.

NEW SITES ON LAND

During 2021, two previously unknown sites were located and preliminarily recorded. The first was identified as the Negro River pilot's house and was found thanks to sources provided by the staff of the "Emma Nozzi" Regional Historical Museum and a walking survey. Survey pits in the location revealed construction materials such as rocks, bricks, and roof tiles; glass, metal, wood, and bone remains were also found. These materials are of value to understanding everyday life and activities related to ocean and riverine sailing in the period under study.

Thanks to a local informant, a site over the dunes a few kilometers north of the

Segunda Barranca lighthouse was located. The **FSB4** site is notable not only because of its integrity and excellent preservation but also because of the combined Creole and European material culture. The objects include remains possibly associated with a shipwreck, such as copper-alloy tacks and nails, different types of iron bolts (including an eyebolt), barrel hoops, and a rich array of early 19th-century pottery, dishes, knives, beads, buttons, and glass bottles. A small shell mound was also registered as well as an abundance of lithic remains.

This site may be preliminarily identified as a *toldería* - the name given to indigenous temporary settlements - whose inhabitants might have acquired and reused material remains from a nearby shipwreck, or a survivor's campsite, occupied by local indigenous people

This page, from left to right: Mounting a transducer for a geophysical survey in Bahía San Blas; a site plan of FSB3-a developed using Rhino 3D software to display recorded grid points. **Opposite page:** View of the FSB4 site.

either shortly before, during, or after the campsite was established. Either way, the relation with an early 19th-century shipwreck is highly likely and makes this site unique in the region.

TO COME

The 2021 Patagones Project fieldwork research provided new data to understand the archaeological richness of the area and the types of vessels that sailed the region, their provenance and date, the activities they engaged in, and the role they played. The Patagones team has been able to access and survey previously unexplored areas and carry out a deeper analysis of previously located wreck sites. Two new sites related to maritime activity, furthermore, have been located and will continue to be studied in forthcoming seasons. This work contributes to knowledge about local and regional nautical technologies and South Atlantic sailing activities. Our interdisciplinary team is committed to contributing to local outreach, particularly in Carmen de Patagones and Bahía San Blas, where tourism is founded on a strong maritime bond.

ACKNOWLEDGMENTS

The authors wish to thank the INA Discovery Fund, which allowed for the 2021 season to be carried out. The authorities and settlers of Bahía San Blas and Carmen de Patagones provided information and resources, as well as Prefectura Naval Argentina, which made every sailing activity possible. The National Hydrographic Service contributed with accommodation at the lighthouse, which made the excavation and survey works much more accessible. The "Emma Nozzi" Regional Historical Museum has supported the research since the very beginning. The authors also thank Alasdair Brooks, Diego Carabias, and Alicia Tapia, for their help with the preliminary assessment of remains from FSB4. Also to Pablo Picca and María Lucchetta for the characterization analyses of wooden and metal remains, respectively. Last but not least, thanks to the Patagones Project team, especially Amaru Argüeso, Silvana Buscaglia, Luis Coll, Leonardo Dam, Carlos Landa, Alejandra Raies, Joaquín Rodríguez Saumell, and Rodrigo Torres, for their continuous and valuable commitment with this research.



PHOTOS: THIS PAGE AND OPPOSITE PAGE: ANA CASTELLI

SUGGESTED WORKS

Argüeso, A., and N.C. Ciarlo. 2017. "Fieldwork Methodology in South American Maritime Archaeology: A Critical Review." *Journal of Maritime Archaeology* 12: 179-97.

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MEET INA ARCHIVIST REBECCA INGRAM



*In Spring 2022 INA welcomed **Dr. Rebecca Ingram** as INA Archivist and Publications Coordinator. Rebecca received an M.A. (2005) and Ph.D. (2013) from Texas A&M's Nautical Archaeology Program and has participated in multiple INA-sponsored excavations, including the Yenikapı Byzantine Shipwrecks project in Istanbul. Previously, Rebecca served as the Curator of Exhibits and Collections at the Brazos Valley Museum of Natural History. She also has experience as an Editorial Assistant for the American Journal of Archaeology and as INA Publications Coordinator will support the needs of researchers and authors working to publish the results of INA fieldwork. Rebecca has lectured extensively for Lindblad Expeditions (aboard Sea Cloud) as well as for the Archaeological Institute of America's National Lecture Program. We are very excited about the years of experience and many strengths and skills that Rebecca brings to INA and future generations of nautical students.*

What interested you in the archives position?

This is an exciting time to work with the Institute of Nautical Archaeology (INA) Archives: as INA prepares to celebrate its 50th year, the INA Archives faces new challenges and new opportunities. This diverse and growing collection houses a wide array of items that chronicle the development of the discipline of nautical archaeology. From the negatives, films, and field notebooks of early INA excavations to the digital models and images created by current INA-affiliated researchers, the Archives reflects INA's decades-long commitment to record, preserve, and publish shipwrecks and other sites of maritime significance worldwide.

What types of items are housed in the INA Archives?

As INA Archivist, I'm tasked with curating and organizing the varied items held in the INA Archives. Most of the Archives' holdings are paper-based items, such as handwritten letters and journals, typed manuscripts, and newspaper clippings, or photographic film, such as negatives, slides, and motion picture film. Alongside these are drawings in various formats (artifact drawings, site plans, and tracings of ship timbers) and a small assemblage

of truly unique objects, like Peter Throckmorton's hand-hewn wooden swim goggles and Dick Steffy's wood carving tools. With such diverse materials represented, environmental conditions in the Archives must be closely monitored.

What challenges are presented by the INA Archives?

One challenging element is INA's collection of nearly 500 films in a variety of formats, spanning the history of INA and covering the transition from analog to digital. The earlier films—primarily color polyester film—are in the process

of digitization; for some of these, archival restoration is needed. While we have some dedicated space for cold storage of these films, we are currently exploring other long-term cold storage solutions to facilitate future growth.

What do you think most people do not know about the INA Archives?

Most people might not realize that physical materials are only part of the INA Archives: as technological advances continue to transform the practice of nautical archaeology, there is a consequent increase in the Archives' digital holdings,



including project files, images, drawings, and models from current INA-sponsored projects as well as digitized films and images from past projects. Maintaining order within these expanding digital files remains an important priority. Meanwhile, the digitization of slides and negatives from past INA projects continues. More than 1,500 slides from the 1970s were digitized in 2022, with a focus on the collections of John Broadwater, a long-time INA scholar and key figure in the 1973 Turkish survey that located so many significant shipwrecks. The INA Archivist facilitates access to materials within the Archives and routinely receives requests for images from INA-sponsored projects, for use in textbooks, magazines, academic journals, and documentary films. The steady progression of digitization facilitates the fulfillment of these requests.

What are some of your main priorities or goals for the INA Archives?

In order to improve organization and maintain up-to-date records, an inventory of the Archives' physical items is currently in progress. One of my primary goals for 2023 is the completion of this inventory and further development of a database to more fully document the Archives' holdings. However, improving and maintaining documentation of the INA Archives is an ongoing process; the collections are constantly growing, as archaeological research continues and as scholars in the field donate their private archival collections. Long-term goals include ensuring physical space for future growth and facilitating access to the Archives' holdings, which will allow the INA Archives to continue to serve as a vital resource for future generations of nautical archaeologists.

Opposite page, from top: Rebecca with Roger and Mazie; Cemal Pulak and Rebecca with late 10th-century wreck YK 1 at Yenikapı in Istanbul, 2005. **This page, from top:** *Kardeşler*, a fishing vessel, carried the heavy equipment for the 1973 survey, including INA's new recompression chamber; A diver explores a partly looted Roman shipwreck on the 1973 survey.



PHOTOS: THIS PAGE: GÖKHAN TAN, MARY ANN CUSIMANO; OPPOSITE PAGE: © INA / JOHN BROADWATER



THREE HISTORIC SHIPWRECKS IN SKANEATELES LAKE, NEW YORK

Exploring the maritime history of a landlocked lake

BY DANA CARRIS

PROJECT BACKGROUND

The Finger Lakes, a series of 11 glacial lakes located in upstate New York, are not often associated with shipwrecks. Carved out by receding glaciers during the last ice age, these narrow north-south lakes are between three and 38 miles (4.8 – 61.2 km) long but only about three miles (4.8 km) wide. Prior to the development of railroads and modern turnpikes, these lakes acted as highways carrying freight and passen-

gers between lakeside settlements and the many canals constructed in the mid-19th century. Over the past 200 years these lakes have hosted private yachts, commercial schooners, canal barges, log rafts, and steamboats.

Until recently the underwater archaeology of the Finger Lakes has been largely overlooked. Historical accounts and surveys indicate over 100 potential shipwrecks throughout the Finger Lakes, but

few have been documented or studied. Many of these sites are at risk of damage by boaters, fishermen, divers, and invasive species such as the zebra mussel (*Dreissena polymorpha*) and quagga mussel (*Dreissena rostriformis bugensis*). The Skaneateles Lake Wreck Modelling Project sought to employ efficient, low-cost methods to digitally document some of these at-risk sites in Skaneateles Lake. The aim of this project was to collect archaeological data

and produce digital media to engage local communities in the stewardship of their cultural heritage.

The three wrecks modeled during this project highlight some of the most iconic industries on the lake during the 19th century. The first wreck, colloquially called the “Log Jam,” consists of a large pile of sawcut logs which are likely the remains of a log raft, or cargo from a barge shipment of lumber. These logs are the only known underwater remains from the logging industry that cleared the lakeside forests during the 19th century. The second and third wrecks are those of the steamboats *Ossahinta* and *City of Syracuse*, respectively. The steamboat

PHOTO: SKANEATELES HISTORICAL SOCIETY ARCHIVES

Opposite page: Postcard of steamboats *Ossahinta* in foreground, *City of Syracuse* back left, and *Glen Haven* back right.

era on Skaneateles Lake lasted from 1831 to 1920, during which eight commercial steamboats plied the waters. These steamboats are the only surviving examples from this period, and they represent the work of the prolific local steamboat builder Alonzo Springstead who constructed steamboats throughout the Finger Lakes.

2022 FIELD SEASON

The goal of the field season was to document three shipwrecks using 3D digital photogrammetry. Photogrammetry is a method of recording that produces a model of an object by aligning overlapping images in 3D space. First a point cloud is developed from the aligned photographs, then a mesh is created by interlacing triangles created from the point cloud. Textures are then extracted from the photos and draped over the model.

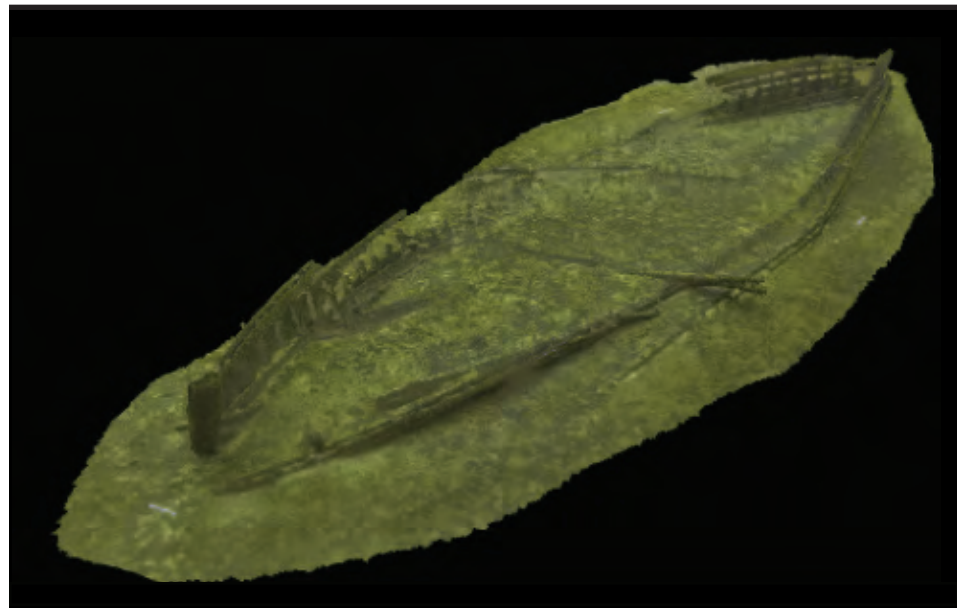
The 2022 field season consisted of three dives over two days with a team of three divers. One diver was tasked with placing four 50-cm scale bars around each site and recording the depths at each end. These depths were later used to triangulate the sites and create a local coordinate system. With scale bars placed, the author swam a predetermined flight path around each site and collected photos using a Go-Pro

Hero 8 in time lapse photo mode set to a half-second interval. Two sites required artificial lights which were mounted to a SeaLife Flex Connect Tray. The third diver acted as a safety diver and monitored the team activities.

A chartered ship operated by the National Aquatic Service was used to access the three sites. The team first visited the “Log Jam,” which sank in the southwest of the lake. This site is located at the base of a 35 ft (10.7 m) high underwater cliff in 71–6 ft (21.6–26.2 m) of water. The model was created with 2409 photographs taken over 20 minutes. All of the photos taken were used to process the models. This method, taking time-lapse photos at 0.5-second intervals, guarantees sufficient photo overlap along the flight path and only takes the time needed to swim the path. While there may be excess data that can be parsed out to make the project size smaller, the number of images did not affect the time taken in the field.

The second site visited was the wreck of the steamboat *Ossahinta* (1878–1914). This 68 ft (20.7 m) long by 11.4 ft (3.4 m) wide propeller-driven steamboat was burned to the waterline near Ten Mile Point on the east side of the lake after being removed from service and par-





This project aimed to engage the local community by creating easily accessible and freely distributable videos and models of the wrecks.

tially salvaged in 1914. The wreck site is located on a slope in 30–64 ft (9.2–19.5 m) of water. To create the model of the *Ossahinta*, 2635 photos were taken over 22 minutes.

The third site was the wreck of the steamboat *City of Syracuse* (1901–1920). This 112 ft (34.1 m) long by 21 ft (6.4 m) wide propeller-driven steamboat was the last steamboat on the lake and was dynamited at the pier in the Village of Skaneateles on November 19, 1920, after the machinery and superstructure were salvaged. The site lies in 8 ft (2.4 m) of water at the north end of the lake. The model of the *City of Syracuse* was created with 5569 photos taken over 46 minutes.

To render each model, the photos were imported into Agisoft Metashape Professional Edition. Prior to aligning the photos, a custom camera calibration file was created using underwater photos of a calibration checkboard taken by the Go-Pro Hero 8 with underwater housing.

This page, from left: Models of the propeller-driven steamboats *Ossahinta* and *City of Syracuse*. **Opposite page:** "Log Jam" model.

This custom calibration calculated and corrected image distortion parameters caused by the combined effects of the Go-Pro lens, underwater housing, and water to improve model accuracy. The Agisoft Metashape built-in error calculations determined an average measurement accuracy of 0.001 m ±0.001 m across the three models.

The photos were first aligned, and inaccurate points were purged from the point cloud utilizing the gradual selection tool. A 3D mesh and texture were then generated from depth maps. Models were scaled using the 50 cm scale bars placed around each site, and the depth measurements combined with distances between scale bars were used to create a local coordinate system using Rhino. Additionally, an orthomosaic and digital elevation model were generated for each site using Agisoft Metashape. After a total of 88 minutes of data collection, the project team was able to create scale-constrained 3D models and site plans of three previously undocumented sites. The results of this project show that 3D photogrammetry can be an effective tool

for rapidly documenting sites with little labor in comparison to traditional recording methods.

PUBLIC OUTREACH AND LOCAL ENGAGEMENT

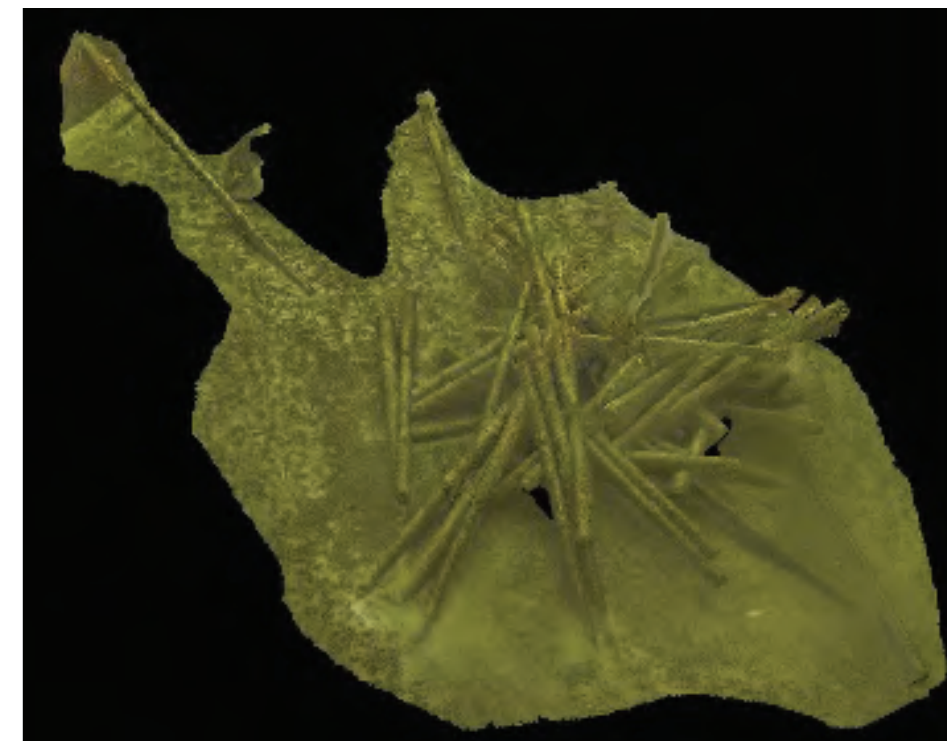
In addition to being an exceptional tool to collect archaeological data, 3D photogrammetry can be used to create digital museum exhibits, educational tools, and to enhance public outreach initiatives. This project aimed to engage the local community by creating easily accessible and freely distributable videos and models of the wrecks. In partnership with the Skaneateles Historical Society, whose museum showcases exhibits for the *City of Syracuse* and *Ossahinta*, animations of all three models were created to augment existing video exhibits.

Additionally, each model was uploaded to Sketchfab, a free web browser-based 3D model clearinghouse which allows anyone to view, manipulate, and download models. This site acts as a digital museum and incorporates a historical background and walkthrough component which identifies important

features of each wreck. QR codes have been added to the existing museum exhibits, which direct patrons to the website. There is also potential to use the web-based models in conjunction with existing historic tour boats and with local dive charters to aid in briefing divers on the surface.

CONCLUSION

As the use of 3D photogrammetry in research continues to grow among archaeologists, so should its use in disseminating information to the general public. Over the course of two days of field work the project team was able to collect sufficient data to study the construction tech-



PHOTOS: DANA CARRIS

SUGGESTED WORKS

Battle, J., and B. Battle. "Steamboats." *Brightwork: 37th Annual Antique & Classic Boat Show*.

Cohn, A., and T. Manley. 2020. *Seneca Lake Archaeological & Bathymetric Survey 2019 Final Report*. Burlington.

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niques of the *Ossahinta*, *City of Syracuse*, and the "Log Jam" while simultaneously creating interactive digital media to share with local stakeholders. It is the author's hope that 3D photogrammetry will continue to be used for shipwreck documentation throughout the Finger Lakes.

ACKNOWLEDGMENTS

I would like to thank the INA Archaeological Committee for awarding the funding that supported this project. Special thanks also go to the project team - Christopher Ryan, Joel Pape, and Kenneth Cameron - for their assistance in the field. Finally, I would also like to thank Benjamin Ioset and Kotaro Yamafune whose experience and advice were instrumental in completing this project.

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PHOTOS: THIS PAGE: BRENDAN BURKE (VDHR); OPPOSITE PAGE: SUSAN LANGLEY; MARY HAYES (MID-ATLANTIC LOGBOAT REGISTRY); ROBERT HAYES (MID-ATLANTIC LOGBOAT REGISTRY)

2022 INA PROJECT SPOTLIGHT

THE MID-ATLANTIC LOGBOAT REGISTRY

BY H. ROBERT HAYES

The Mid-Atlantic Logboat Registry continues to expand, with cooperation from the Virginia, Maryland, and North Carolina State Historic Preservation Offices, regional museums, historical societies, interested private entities and citizens. Since our 2020 publication (*INA Quarterly* 47.1/2), the tri-state registry has documented an additional 60 logboats. Of the 240 logboats now recorded, 124 are multi-log constructed vessels and 116 are single log canoes, 52

Opposite page: Colonial-era single-log canoe, *in-situ*, Mattaponi River, VA. **This page, from left:** Log canoe, late 19th/early 20th century, Patuxent River, MD; the author measuring a nine-log bugeye hull, Accomack Co., VA; dugout canoe, Clover Hill Visitor Center, Randolph, VA.

of which are pre-contact dugouts.

While the COVID-19 pandemic restricted early season field efforts, 2022 was highlighted by significant project work. From April to May of 2022, we teamed with archaeologists from the Virginia Department of Historic Resources (VDHR) to investigate an 1890s-era nine-log oystering bugeye buried on the foreshore in Accomack County, Virginia. We conducted a multi-day trip to the Chesapeake Bay Maritime Museum in St. Michael's, Maryland, and worked with museum archivists to uncover historical information for 15 sailing log canoes.

We added to the registry two single-log canoes found in the Mattaponi River by members of the Mattaponi and Upper

Mattaponi Indian Tribes of King William County, Virginia, that were surveyed by VDHR archaeologists. Two logboats exposed in the tidal waters of Calvert County, Maryland were added to the registry using survey data provided by Maryland Historical Trust archaeologists. The Registry team located and surveyed a single-log canoe that had been previously considered "lost" after being recovered from a creek in central Virginia. We are currently pursuing the location of a single-log canoe documented in the 1970s but left *in situ* in a tidal creek on Virginia's Northern Neck. The canoe may be associated with the African-American logboat builders prominent in the region during the 18th and 19th centuries.



2022 INA PROJECT SPOTLIGHT

THE SENECA LAKE ARCHAEOLOGICAL AND BATHYMETRIC SURVEY

BY ART COHN

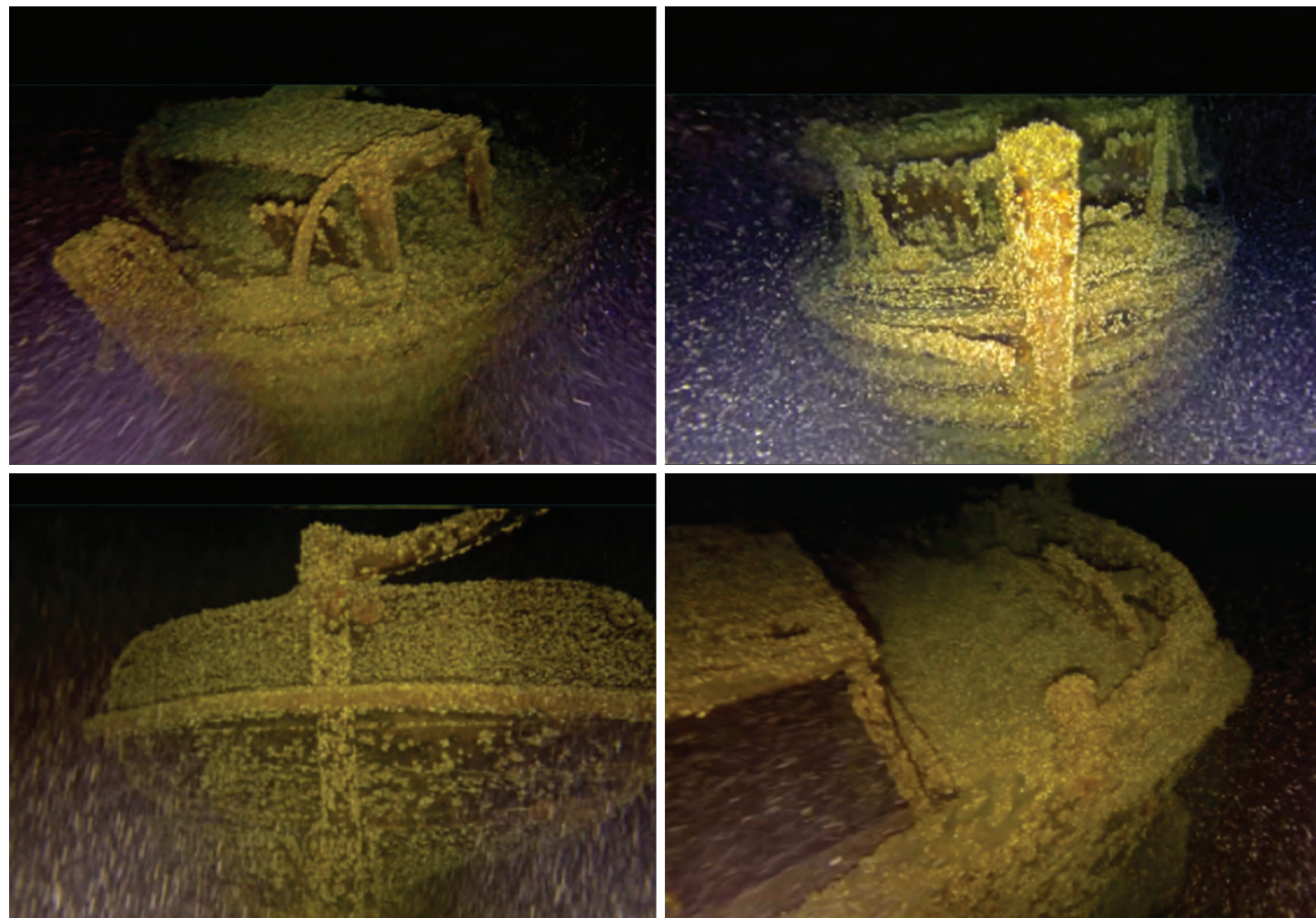
Over the years, I have had the great fortune to travel the New York State canal system aboard the canal schooner *Lois McClure*, an exact replica modeled after a Lake Champlain shipwreck. As I traveled through the Finger Lakes, I began to wonder if the

large volume of canal traffic on Seneca Lake might have resulted in significant canal boat losses.

Throughout the 19th century, Seneca Lake was a 35-mile-long navigable component of the new Erie Canal system; as we approached the 200th anniversary

of the opening of the Erie Canal, it seemed like a perfect opportunity to discover new connections to the nation's most successful public works project.

At the height of the canal era, Seneca Lake teemed with family operated canal boats. Freight boats were the tractor



trailers of their day and “packet boats” were the passenger buses. Both relied on draft animals walking on a towpath to move them through the canal. Packet boats stayed mostly on the canal while freight boats transited waterways like Lake Champlain, the Hudson River, and Seneca Lake, where a squadron of steam-powered towboats rafted them together to tow them to their destination.

A short survey in 2018 quickly revealed seven intact canal boats. Our team returned to Seneca Lake in 2019, 2021, and 2022; using multi-beam sonar as the survey tool, we have succeeded in mapping the entire bottom of Seneca Lake.

The results to date are stunning. The geological record, as captured by sonar, has revealed never-before-seen geophysical landscapes. We have also located 80+ well-preserved early canal-

era shipwrecks that are already adding significant new information about the canal era. One recent discovery (Target #7) has been identified as a “packet boat,” making it the only known example of the passenger carriers which exploded on the scene in 1820 and were driven to extinction some 40 years later by the

railroads. As our team of archaeologists continues to document and evaluate a backlog of shipwreck targets, we look forward to reporting on these exciting new discoveries that connect us to New York State’s dynamic canal era and its Bicentennial.



PHOTOS: ART COHN

Opposite page: Target 16, a packet boat. This page, from top: Replica of the canal schooner *Lois McClure*; 19th-century map of Lake Seneca.

2022 INA PROJECT SPOTLIGHT

THE SAN NICOLETTO SHIPWRECK OF VENICE'S LIDO ISLAND

BY MASSIMO CAPULLI



The first underwater archaeological examination of the island of Lido di Venezia ending in early July 2022 was carried out by the University of Udine in conjunction with the Superintendency of Archaeology, Fine Arts and Landscape for the Municipality of Venice and the Lagoon, with the support of the Institute of Nautical Archaeology. These archeological investigations concerned the remains of a shipwreck from the late Middle Ages that were concentrated in front of the beach of San Nicoletto. The ship was discovered by chance in the spring of 2021, when a boat of the Venice Guardia di Finanza (the Italian police for financial crime and border control) found it during a survey with a sidescan sonar unit.

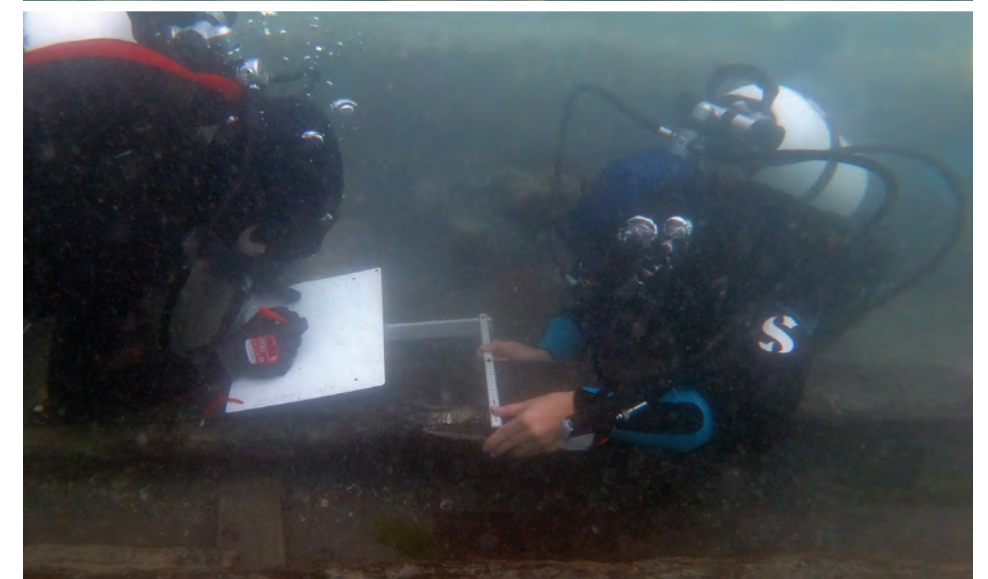
The San Nicoletto shipwreck lies in shallow water, only 4.6 m (15 ft) deep. Here the sea bottom sometimes changes: storms and waves both reveal the site or cover it. However, thanks to an uninterrupted period of good weather, it was possible to excavate for ten consecutive days and eventually uncover a large part of the hull. We were able to take direct measurements of construction details and many pictures to produce a 3D model using Agisoft Photoscan Professional.

The excavated area of the site measures approximately 19 m (62 ft) long, 3.8 m (12 ft) wide, and corresponds to the forward portion of the hull.

The wreck represents the remains of a freighter sailing ship from the end of the 19th century based on the artifacts recovered, which included Venetian-made glass products and ceramics; the main cargo, however, was made up of limestone blocks.

PHOTOS: MASSIMO CAPULLI

This page and opposite page: Divers recording the shipwreck at San Nicoletto.





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About INA

The **Institute of Nautical Archaeology** (INA) is a non-profit international research organization committed to locating, excavating, recording, preserving, and publishing shipwrecks and other archaeological sites of maritime significance. INA was founded 50 years ago by **Dr. George Bass**, who in the 1960s pioneered the science of archaeological excavation under water. Based in College Station, Texas and affiliated with **Texas A&M University**, INA conducts work around the globe on shipwrecks and sites of maritime significance. INA also operates the **Bodrum Research Center** in Bodrum, Turkey where scholars from all over the world gather to conserve, analyze, and research artifacts from INA excavations.

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