Preserving the Nautical Traditions and Maritime Heritage of Venice, Italy

An Interdisciplinary Qualifying Project
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I. ABSTRACT

This Interdisciplinary Qualifying Project focuses on the nautical heritage of Venice, Italy, and is a continuation of a project completed in 2004. The introduction of motorboats has resulted in dwindling usage of traditional boats in Venice. To increase awareness to this important aspect of the city's heritage, we created a catalog and map of nautical elements throughout Venice, including 33 items. In addition, we created multiple inventories of boat-related items at Arzanà, our sponsor, which included a total of 752 items.

II. EXECUTIVE SUMMARY

Venice, Italy is a city that has been unique and rich in history and culture throughout its 1600 years of existence. Since the fifth century, Venice has thrived because of its island location in the Northwest lagoon of the Adriatic Sea just off the coast of Italy. Today, Venice has modernized and evolved in many aspects while still trying to maintain its conventional heritage. Venice possesses a number of distinct aspects that few other cities in the world may claim. These include a broad range of churches and other religious figures, a vast collection of the most sophisticated art and architecture throughout the ages, and most notably its canals which boats navigate on a daily basis for transportation and shipping of goods. The relationship between the city and its canals has been extremely important to the success of the city since the beginning of its existence. This relationship had led to the development of a unique part of Venice's culture, among its many traditional, wooden rowboats.

With the web of canals that intertwine throughout Venice, the city depends upon boats as a primary means of travel. Venice's maritime and nautical backgrounds are perhaps the most important historical and cultural aspects of the city. A lasting piece of this history and culture remains in Venice today among its many traditional boats. With advancements in technology, the boats of Venice have progressively modernized in recent decades. Although efficiency is necessary for the success of the city and the comfort of those who utilize the canals frequently, modernization has resulted in a dwindling quantity of traditional boats. Prior to 1950, very few motorized boats existed in Venice. Today however, the traditional boats are rarely used for the everyday purposes that they once were – instead, they have been replaced by motor-powered boats, an issue that is detrimental to the city's maritime heritage. The need for restoration, preservation, and awareness programs for the traditional boats of Venice continues to increase as technology improves.

Figure 1: Traditional Venetian Boatyard (*Squero)*

Extensive research has been done on the traditional boats of Venice, including documentation of the various types of traditional boats, their uses and levels of threat to them. The organization Arzanà, founded in 1992, specializes in the study and conservation of historical Venetian boats. Arzanà has already implemented programs to research and perform maintenance on the boats. Last year in a WPI project sponsored by Arzanà, a number of historical boats were cataloged; additionally, nearly forty boats have been restored and saved by Arzanà. The catalog produced by last year's project group is an important step forward in the process of preserving the traditional boats of Venice which allows easy access to information about each boat type including the quantity of that boat type in Venice, its relative dimensions and its level of rarity. The information gathered by last year's project has successfully laid the ground work for this year, in which we worked with Arzanà to expand the project initiated by the 2004 project group.

The ultimate goal of this project was to help Arzanà to restore and preserve the nautical traditions of Venice by collecting and organizing information for the development of various fundraising and awareness programs. To accomplish our mission, we identified the following objectives:

1. To expand the existing catalog of Arzanà boats and maritime accessories.
2. To document the elements of the nautical heritage of Venice.
3. To promote awareness of the threat to traditional Venetian boats.
4. To develop fundraising programs for the restoration and preservation of traditional Venetian boats.

The first step that we took in completing our project was to expand the catalog of Arzanà boats and boat-related items that was created and partially completed by the project group of 2004. In order to complete this objective, the direction of necessary work was assessed by looking at the 2004 group's project and database content. Upon examining their work, we determined a means of cataloging the boats and maritime accessories which Arzanà currently possesses. We created detailed Microsoft Access databases of all of the traditional boat-related items owned by Arzanà, including boats, oars, fórcole (oarlocks), and other miscellaneous items. Our catalog of boats owned by Arzanà includes many detailed measurements of these boats, as well as three-dimensional Computer Animated Design (CAD) models created on a program called SurfaceWorks. We were able to catalog two traditional boats currently housed at the Arzanà headquarters in Venice, and the database and forms that we created can be used by

future groups to include each additional boat owned by Arzanà. More importantly, the three-dimensional models and measurements could be used to reconstruct certain boat types in the future, should that boat type eventually become extinct. Therefore, this aspect of our project may eventually assist in the preservation and restoration of traditional boats, an important part of Venice's nautical heritage. Also, the detailed inventory of the other nautical items owned by Arzanà that we created may be used by Arzanà when renting these items to movie producers, a major source of income for the Association. Our inventories will ease the process by which Arzanà rents these items.

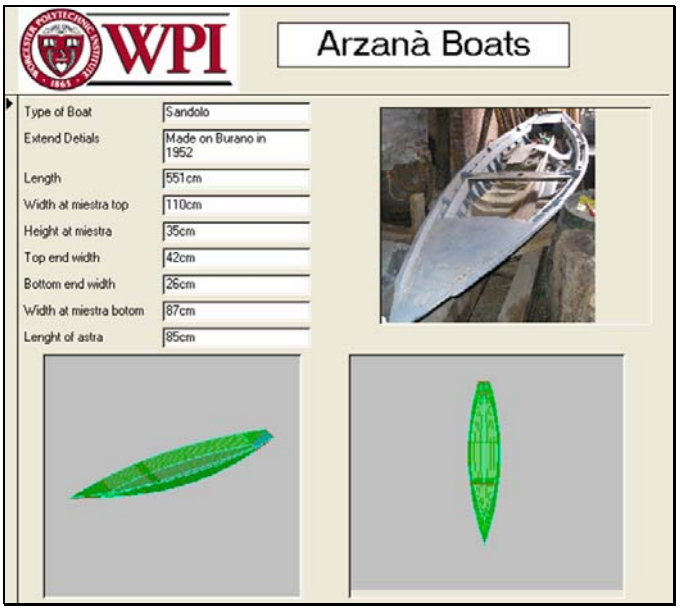

Figure 2: Arzana Boat Catalog Form with 3-D CAD Models

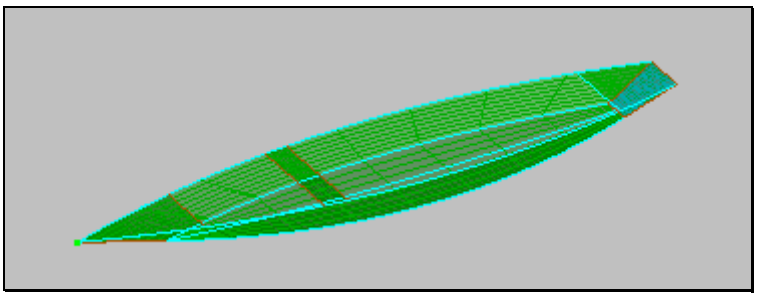

Figure 3: Detailed CAD Model of a *Sandolo* type Traditional Venetian Boat

In addition to creating these inventories, we also constructed a website to be used by Arzanà. This website includes background information about the Association, and displays each of the databases that we created. This website could be used by Arzanà to rent out their nautical items to movie producers, thus creating a much easier process through which the association rents these items. In addition, the website allows the possibility for interested people to make donations to Arzanà, and the money would be put towards various boat restorations. The website also displays links to various organizations both in Venice and in the United States that are geared towards nautical and historic preservation.

The next aspect of our project involved cataloging the various elements of the city's nautical heritage. Our group used last year's project, information provided to us by our advisors and on-site liaisons, information given to use by two registered tour guides in the city and a number of books and online services to research, locate and document the various elements of the city related to the nautical heritage of Venice. These items

included museums, nautical sites such as the Arsenale, squeri (traditional boatyards), and various forms of public art. We then created a detailed catalog of these items using Microsoft Access (**Figure 4**), and created a GIS map of each item with a symbol to denote each type of element. Our database includes 33 elements throughout Venice that have some type of nautical significance. Once this database was completed, we then isolated the major sites, including popular places visited by tourists, such as the Doge's Palace, St. Mark's Basilica, and various museums (this map can be seen on the following page, **Figure 5**). We then designed a brochure (**Figure 6**) to accompany a nautical tour of Venice, which gives descriptions of the nautical elements present at each location and map of the elements. In addition to creating this brochure, we also created a Nautical Heritage website, which also gives detailed information about each nautical location in Venice. This website may also be used to accompany the nautical tour.

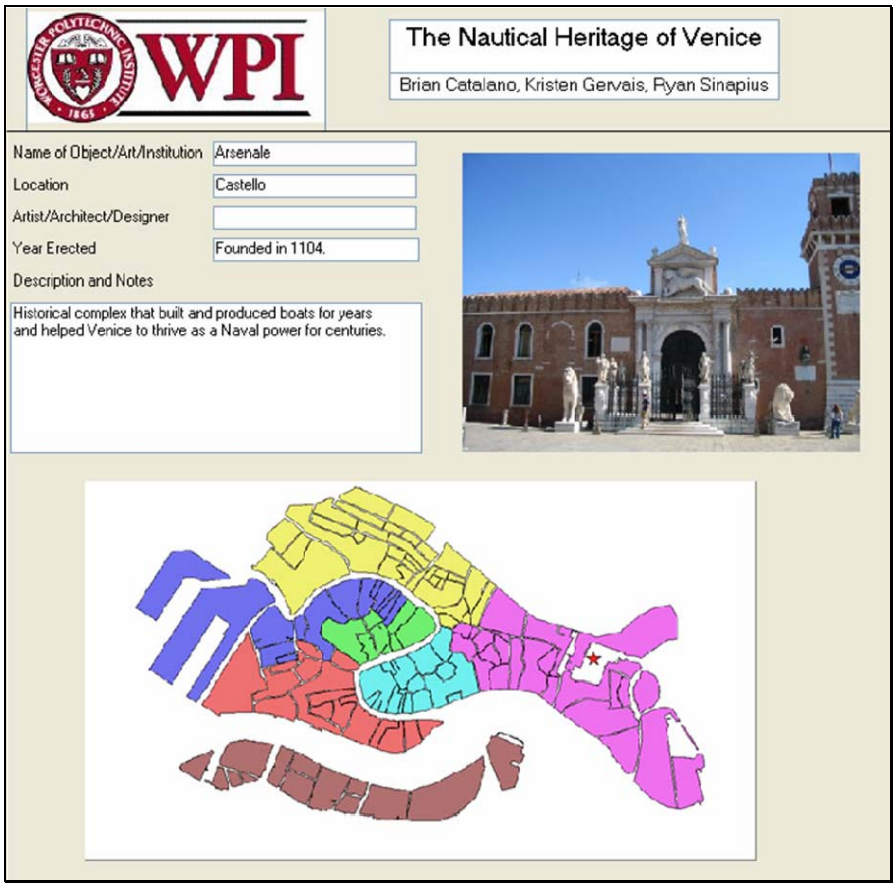

Figure 4: Nautical Elements Microsoft Access Form

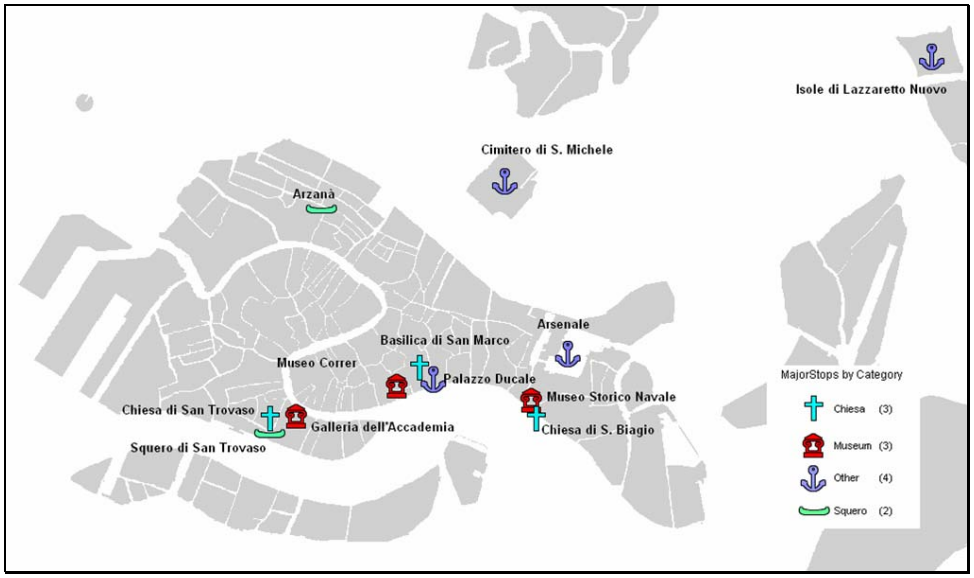

Figure 5: GIS Map of Major Nautical Heritage Sites

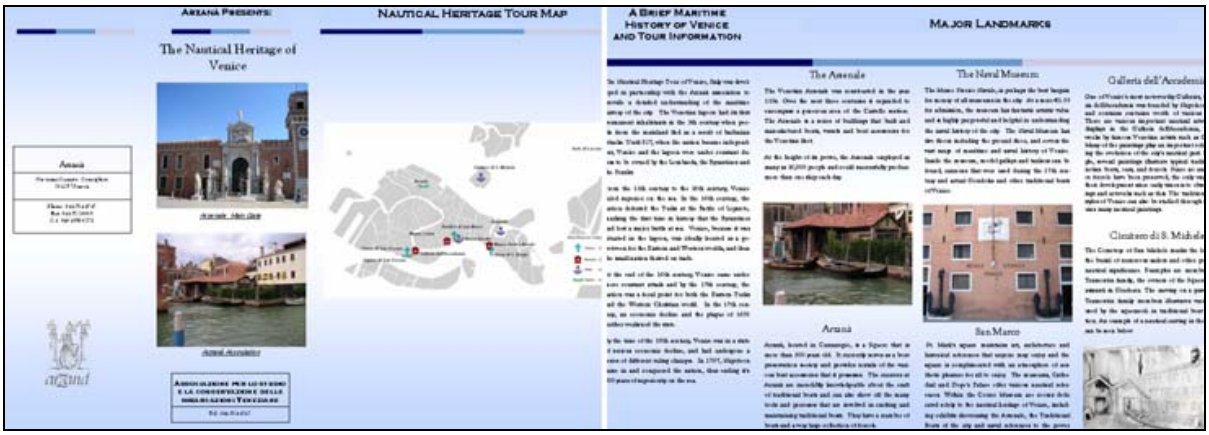

Figure 6: Nautical Heritage Brochure

Traditional Venetian Boats are still used today, though not as widely as they once were. While it is impractical to assume that they will ever regain the dominance they once had, these important and beautiful handcrafted pieces of Venetian history have the potential to expand their usage throughout the city once again. Our project is a testament to the significance of Traditional Venetian Boats and to the purpose they serve to the city. Their functions are still very much useful today for navigating narrow canals, as objects of entertainment for pleasure riding and are in fact still used for transportation, though more so today for people as opposed to goods. Included in this project are extended details about our objectives, recommendations for future groups to expand the awareness of traditional Venetian boats and suggested methods for continuation, in a logical progression, of our project to most successfully help the cause of Arzaná in their expansion of knowledge of the traditional boat of Venice.

III. ACKNOWLEDGEMENTS

We would like to extend our most sincere appreciation and gratitude to those persons and organizations that made themselves available for assistance during the course of our project, thus allowing us to produce a project which will supplement the well-being of traditional Venetian boats in the near future.

Giovanni Caniato- Our on-site liaison, Giovanni provided us with invaluable knowledge about the history, preservation and restoration of the traditional boats of Venice. Giovanni invested a considerable amount of time toward our project, granting us the opportunity to gain a deeper appreciation for the rich history of the boats of Venice and giving us the opportunity to learn to row in the Venetian style. Without Giovanni, our experience in Venice would not have been nearly as gratifying.

Fabio Gherardi- Fabio contributed considerable time and effort into helping our group complete our objective of cataloging the nautical items owned by Arzanà. Fabio was also a fantastic resource for the history of the nautical elements of Venice, and educated our group on the use of the Surface Works program.

Laura Sabbadin- Laura provided our group with contact information for Bruno Nogara, and gave us a thorough overview on how to create and develop a walking tour of Venice. She educated us on what methods would be most successful for attracting tourists and bestowed upon us many of the sites that ended up on our tour.

Bruno Nogara – Bruno provided our group with extensive information about the nautical heritage of Venice, and pointed out many places in Venice where elements of the city's maritime heritage could be found.

Daniela Pavan – Daniela devoted considerable time to gathering information on nautical elements from Bruno Nogara, as well as to assisting us with various Italian translations and gathering various other resources that were essential to the completion of our project. We would also like to thank Daniela for helping to make our stay in Venice extremely enjoyable.

Arzanà Association- We would like to give sincere appreciation to the Arzanà association for their service to us in indoctrinating to us the various tools and items used to build, maintain and restore the traditional boats of Venice as well as providing us firsthand knowledge about the artifacts that were used on vessels and galleys of the Venetians.

Professor John Zeugner – Professor Zeugner devoted considerable time to organizing our project and helping us complete it to the best extent possible. Our stay in Venice was made much more enjoyable by John's presence, and we would like to thank him for his contribution to our project.

Professor Fabio Carerra – We would like to thank Fabio for organizing our project, devoting considerable time to it, and helping us in any way possible. Without Fabio's assistance, we would have been unable to complete our project to the extent that we did. In addition, we would also like to thank him for making our time in Venice extremely enjoyable and an experience like no other.

IV. AUTHORSHIP

This group respectfully declines an authorship page. All members of this group worked together equally in every facet to complete this project.

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1. INTRODUCTION

Preservation of historic and cultural treasures is an extremely important issue throughout the world. In North America alone, there are over 1,300 preservation organizations that are dedicated to preserving elements of historical and cultural significance.[1] In the United States, the National Trust for Historic Preservation, a non-profit organization, has a budget of $40 million per year and its 200,000 members work year-round for historic preservation within the United States.[2] On a global scale, organizations such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) have facilities around the world that work toward protecting the world's cultural and natural diversity. Since 1972, the UNESCO World Heritage Center has named 788 World Heritage sites including Venice.[3] Modes of transportation are no exception to this historic preservation. Automobiles, railways, airplanes and boats have all been crucial to industry and globalization. Because the evolution of motors and gears has caused transportation to become more modernized, many organizations exist to preserve the traditional forms of transportation. In Venice, boats provide the primary means of transportation and thus traditional boats are of focus for preservation. Many programs and organizations with the specific objective of preserving nautical heritage exist throughout the world, including over 600 maritime museums worldwide.[4] The International Congress of Maritime Museums (ICMM) is a professional guild of over 300 associations, organizations and individuals in the maritime preservation field who are dedicated to documenting and preserving nautical traditions, as well as developing programs for public awareness of the importance of nautical preservation.[5] Here in New England, museums such as the Maine Maritime Museum and the Mystic Seaport Maritime Museum collect materials that are of local maritime importance and significance.

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[1] *Preservation Organizations.* http://www.preservationdirectory.com/preservationorganizations_main.html.
[2] *National Trust for Historic Preservation.* http://www.nationaltrust.org.
[3] *UNESCO World Heritage Center.* http://whc.unesco.org.
[4] Smith, Robert. *Smith's Master Index to World Wide Maritime Museums.* http://maritimemuseums.net.
[5] *International Congress of Maritime Museums.* http://www.icmmonline.org/.

With the web of canals that intertwine throughout Venice, the city depends upon boats as a primary means of travel. Venice's maritime and nautical backgrounds are perhaps the most important historical and cultural aspects of the city. A lasting piece of this history and culture remains in Venice today among its many traditional boats. With advancements in technology, the boats of Venice have progressively modernized in recent decades. Although efficiency is necessary for the success of the city and the comfort of those who utilize the canals frequently, modernization has resulted in a dwindling quantity of traditional boats. Prior to 1950, very few motorized boats existed in Venice. As **Figure 1** depicts, rowed traditional boats today only account for 25% of the city's parked boats, which confirms the decline of traditional craft in Venice. Traditional Venetian boats receive inadequate attention, an issue that is detrimental to the city's maritime heritage. The need for restoration, preservation, and awareness programs for the traditional boats of Venice continues to increase as technology improves.

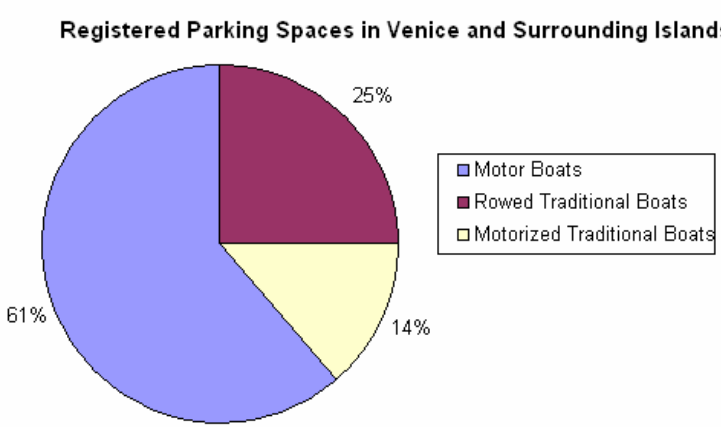

Figure 7: Types of Boats in Venice[6]

Extensive research has been done on the traditional boats of Venice, including documentation of the various types of traditional boats, their uses and levels of threat to them. The organization *Arzanà*, founded in 1992, specializes in the study and conservation of historical Venetian boats.[7] *Arzanà* has already implemented programs to research and perform maintenance on the boats. Last year in a WPI project sponsored by *Arzanà*, a number of historical boats were cataloged; additionally, nearly forty boats have been restored and saved by *Arzanà*.[8] The catalog produced by last year's project group is an important step forward in the process of preserving the traditional boats of Venice which allows easy access to information about each boat type including the quantity of that boat type in Venice, its relative dimensions and its level of rarity. The information gathered by last year's project has successfully laid the ground work for this year, in

[6] Candlish, Sean; Shevlin, Craig; Stout, Sarah. *The Traditional Boats of Venice – Assessing a Maritime Heritage, 45.*
[7] *Ibid, 30.*
[8] *Idem.*

which we will work with *Arzanà* to take the project to the next level and focus on developing programs for the awareness of and fundraising for the threatened traditional boats.

Despite the actions that have been taken to move in the direction of saving the traditional boats of Venice, there is still a substantial gap between what has been done and what other opportunities are available. At the moment, the information contained in the catalog of boats is based on records of registered boat parking spots in Venice. As was observed by last year's project group, some of the parking spots that are registered for traditional boats are not actually housing traditional boats.[9] For this reason, the catalog needs to be updated and expanded with more accurate information about the quantity of each boat in Venice, as well as detailed information about the levels of threat to each boat. There is still a need to catalog items of Venetian nautical heritage that are not boats, including artwork in museums, public art and sculptures, articles belong to *Arzanà* and any other artifacts in Venice that are significant to its nautical heritage. There is an opportunity to begin marketing the idea of preserving the boats, thus generating funds for the renovation and preservation of the boats. To facilitate this project, substantial research will be conducted and a case-study on what is most successful for gathering sponsorship interest will be implemented.

The purpose of our project will be to fill in these gaps and progress toward saving the traditional boats of Venice. We will work to expand the existing catalog of traditional boats in order to make it more accurate and we will document the entities of Venice's nautical heritage in an easily accessible database. We will also work to develop methods of awareness and fundraising for the preservation and restoration of traditional Venetian boats through a number of activities, consequently increasing the effectiveness that *Arzanà* has in protecting the heritage of these boats. Our group will develop ideas for marketing, fundraising and public knowledge about these boats, using resources such as the Maine Maritime Museum for ideas. Through means such as creating an English version of an *Arzanà* website, presenting ideas for an Adopt-A-Boat program and a Nautical Heritage Tour of Venice, we will attempt to enhance public awareness and funding for *Arzanà*. Lastly, we will examine the current constraints, aside from funds, that are preventing *Arzanà* from renovating more boats and deliver a presentation with alternative methods of improving or eliminating those constraints.

[9] *Ibid, 45.*

2. BACKGROUND

The relationship between Venice and its canals and surrounding lagoon and sea has been highly influential in the city since its emergence in the 10th century.[10] The protection and trade opportunities that the lagoon offered to the city helped Venice thrive as a maritime power early in its development. The city's location in the Gulf of Venice made it very well situated for trade between Eastern and Western powers. In the 10th century, the city gained control of the Adriatic Sea as a result of its securing of most of the coast of Dalmatia.[11] The founding of the Arsenal, a shipyard and storage place for arms, in 1104 strengthened the city's influence as a naval authority.[12] After defeating its rival Genoa in the War of Chioggia in 1380, Venice became the leading European sea power and by 1450 more than 3,000 Venetian merchant ships were in operation. At the height of its power in the 15th century, Venice served as the main trade link between Europe and Asia.[13] The founding of the Arsenal and the development of shipbuilding ultimately turned Venice into one of the most powerful maritime nations in the world.

The importance of shipbuilding in Venice led to the founding and creation of *squeri*, the shipyards of Venice. The workers of the *squeri*, the *squerarióli*, performed tasks ranging from repairs of small boats to construction of much larger boats, and sometimes even large ships. The largest and most important *squero* was the Arsenal.[15] The distinctive art forms produced by the *squerarióli*, including Venice's many unique boats and *forcòle* (oarlocks), were influential in establishing a historical maritime background that is unique only to Venice. Today, Venice's nautical history is displayed in many forms throughout the city, preserving what is perhaps the most important aspect of the city's heritage.

Figure 8: The Squero Tramontin on Rio della Avogaria[14]

[10] Knopf, Alfred A. *Knopf Guides – Venice.* (New York, 2001), 30.
[11] *Venice History.* www.encyclopedia.com/html/section/venice_History.asp.
[12] Lane, Frederic C. *Venice, A Maritime Republic.* (John Hopkins U. Baltimore: 1973), 14-15.
[13] *Venice History.* www.encyclopedia.com/html/section/venice_History.asp.
[14] *The squeri of Venice.* www.cheapvenice.com/_squeri-venice.htm.
[15] *Instituzione per la Conservazione della Gondola e la Tutela del Gondoliere.*
http://www.gondolavenezia.it/homeng.asp

2.1 Nautical Elements of Venice

The nautical heritage of Venice is displayed through diverse aspects of Venetian life and culture including museums, buildings, public art, and various traditional boats throughout Venice. Each of the aspects of nautical heritage that can be found in Venice makes a strong statement about the importance of the maritime components of Venice's culture and history.

2.1.1 Artwork, Buildings, and Museums

One of the prominent opportunities for the display of Venice's maritime history is through the city's public artwork, significant nautical buildings, and museum displays. These elements depict various aspects of Venetian maritime history, ranging from everyday life of Venice and its vessels to paintings of Venetian naval battles. The nautical heritage of Venice is displayed in some of the cities largest, most popular museums and attractions, including the Accademia Museum, the Correr Museum, and St. Mark's Basilica. A significant example of such a nautical element can be seen in **Figure 3,** which depicts the *Translatio of St. Mark*, a thirteenth century mosaic that may be seen on the west-wing vault in the San Clemente Chapel in St. Mark's Basilica. Three other similar mosaics exist on the other walls of the vault, and all four mosaics depict the starboard side of a round, three-mast ship.[17] The details of these mosaics shed light on different aspects of the city's maritime history, such as the type of sails, masts, and rudders used, as well as the importance of ships to everyday life.

Figure 9 : *Translatio of St. Mark*, mosaic (XIII century). Venice, St. Mark Basilica.[16]

Another example of a Venetian nautical element is the stone carving illustrated in **Figure 4**. The title of this carving, "Labors of the Months: The Craftsmen", was created by Lombard-Emilian masons and is located on the intrados (inner curve) of an

[16] *Saint Mark and the Virgin Mary,* http://www.muspe.unibo.it/period/MA/index/number1/fenl1/fe1_3.htm.
[17] *Ibid*, p. 33.

arched wall in the main entrance of San Marco. This stone relief represents the many craftsmen of Venice, including shipbuilders.[18]

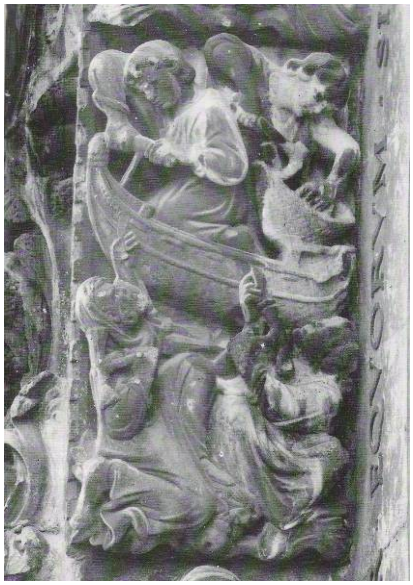

Figure 10: "Labors of the Months: The Craftsmen". San Marco, Venice, 1250.[19]

Further nautical elements include buildings that are important to Venice's aquatic history. One of the most prominent maritime buildings is the Arsenal, the most important shipyard in Venetian history, located in the Castello district of the city. The Arsenal was established in the 8th century, and in 1302, additions were added to the Arsenal so that it was able to build and maintain more of the Venetian naval army.[21] At the height of its power, the Arsenal employed 16,000 people and produced approximately one ship per day. It also produced ropes and developed new weapons used by the Venetian naval force.[22] Today it is used as a research center and is the core area of historic boat preservation.[23] Near the Arsenal is Venice's Naval Historical Museum, which contains significant nautical artifacts such as ship models, World War II artifacts and full-sized Venetian ships.[24]

Figure 11: The Arsenale di Venezia[20]

[18] *Ibid*, p. 127.
[19] Martin, Lillian Ray. The Art and Archaeology of Venetian Ships and Boats (Texas A&M University Press: 2000), p. 129.
[20] *The Arsenale di Venezia.* www.cheapvenice.com/_arsenale-venice.htm.
[21] *Venetian Arsenal.* http://en.wikipedia.org/wiki/Venetian_Arsenal.
[22] *Idem.*
[23] *Idem.*
[24] *The Venice Naval History Museum.* http://goeurope.about.com/cs/venice/l/aa021703a.htm

2.1.2 Parades, Regate, and the Vogalonga

One of the most prominent opportunities to experience the nautical heritage of Venice is through the city's many boat parades and *regate*, or boat races. Ceremonial boat parades take place during various celebrations in Venice, including holy days, the acquisition of a new ruler, or the arrival of distinguished guests to the city.[26] When the city celebrates the arrival of spring with its annual Carnevale (Carnival), a marked event is the procession of decorated and historical boats and gondolas down the Grand Canal.[27] Boat races, or *regate* are also popularly admired. Over 120 of these events occur in Venice, from April to September.[28] The *regate* began as military exercises, and the government of Venice introduced the first official regatta in about 1300 as a method of training oarsmen for war.[29] During the events, hundreds of various boats travel throughout the canals and lagoon of Venice, and the ceremony concludes with a competitive race including the fastest rowers of the region.[30] The annual Historical Regatta (*Regata Storica*) is one of the most well-known *regate* and takes place on the first Sunday of September. Although many of the other *regate* are spontaneous, 11 are promoted by the various rowing clubs of Venice with the aim of displaying the nautical heritage of Venice to the city's natives and tourists alike.[31]


Figure 12: *Vogalonga*[25]

The most noteworthy boat race is the *Vogalonga*, a long-distance, noncompetitive rowing event, which occurs in the month of May (May 15th in 2005[32]), and covers a distance of nearly 18 miles.[33] Designed by a group of people with a passion for rowing, the purpose of the race is to renew the traditional nautical heritage of Venice and testify against the destructive waves caused by the many motorized boats in the city.[34] Since the founding of this event, more than 50 rowing clubs have been established throughout the city with the hope of preserving the threatened maritime heritage of Venice.[35] Any type

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[25] *Vogalonga History.* http://www.vogalonga.com/inglese/history.htm.
[26] Witty, Anne. "Beyond the Gondola". *WoodenBoat.* No. 153, 58.
[27] Simonis, Damien, *Venice, City Guide* (Oakland: Lonely Planet Publications, 2004), 10.
[28] *The Rowing Season.* http://www.comune.venezia.it/turismo/feste/stagioneremiera/en_home.asp
[29] *Knopf Guide – Venice*, 54.
[30] *Idem.*
[31] *The Rowing Season.* http://www.comune.venezia.it/turismo/feste/stagioneremiera/en_home.asp.
[32] Carrera, Fabio.
[33] *Knopf Guide – Venice*, 55.
[34] *Vogalonga History.* http://www.vogalonga.com/inglese/history.htm.
[35] *Idem.*

of row boat may participate and in the last few years the number of boats involved has reached nearly 1000 with over 2500 people from around world partaking in the event.[36]

2.2 Traditional Boats of Venice

A significant aspect of the nautical heritage of Venice is the wide array of traditional boats scattered throughout the city. The traditional boats of Venice differ immensely from those that are used most frequently today because while today's boats are mostly motor-powered, traditional boats are man-powered or sail-driven and built mainly of wood. Although there are many different types of traditional boats that serve various purposes, there are two distinct characteristics common to all traditional boats. These characteristics are the possession of a flat bottom and shallow hull,[37] which allow for easy maneuvering and handling throughout the canals of various depths and widths. Despite these two common threads, the types of traditional boats in Venice are very numerous and perform several various functions. Although some traditional boats are still present in Venice today, many have become extinct. The most common traditional boats that are still present may be organized according to three main purposes: heavy transportation, fishing, and passenger transportation.

Boats functioning for the transport of heavy goods and cargo were quite important in Venice before the arrival of motor-powered boats, as a method for transporting heavy and bulky items was necessary with Venice's lack of cars and other vehicles. One example, the *caorlina*, is one of the more beautiful boats in Venice and is characterized by upswept forward and aft decks.[39] Although its main use in the past has been for transportation of items such as fruits and vegetables and for fishing, it is more frequently seen today as a racing boat. The *caorlina* is often used in the *regate* (boat races) and *Vogalonga*, and is rowed by six oarsmen.[40]

Figure 13: A *Caorlina* in the *Vogalonga*[38]

[36] *Idem.*
[37] Witty, Anne. "Beyond the Gondola". *WoodenBoat.* No. 153, p. 50
[38] *Caorlina.* http://xoomer.virgilio.it/snfriz/barche/caorlina.html
[39] Witty, Anne. "Beyond the Gondola". *WoodenBoat.* No. 153, p. 53
[40] *Knopf Guide – Venice*, 71.

Although nearly extinct, the *batèla* performed the same heavy transportation functions as the *caorlina*. Its characteristics are very similar to the *caorlina*, although it is slightly larger in size.[42] The *batèla* is also very rare in Venice, with only six remaining examples, and this mid-sized boat is sometimes described as a cross between a *sandolo* and a *caorlina*.[43] It is characterized by a straight-cut stern and a curved and extended bow, and is still sometimes used for transport of building materials in Venice today.[44]

Figure 14: A *Batèla*.[41]

The most important boat used for heavy transportation of goods and cargo in the period before motor-powered boats was the *peàta*. Although much larger, it is similar to the *caorlina*, and was traditionally powered by two oarsmen.[46] It transported goods between large ships in the lagoon and Venice and also transported goods destined for ports in other cities. Once the most important heavy transport boat in Venice, there is no longer a single remaining example of the *peàta* in the city today,[47] and indication of the plight of traditional boats. Today, this boat has been replaced by more efficient motor-powered boats, but can still be seen in parades, *regate* and *Vogalonga* where it is powered by up to eighteen oarsmen.[48]

Figure 15: A *peàta* in the *Vogalonga*.[45]

The *topo* and *sanpierota* Venetian boats were designed traditionally for fishing. A distinguishing feature of the oar and/or sail powered *topo* is an open hold into which fish can be thrown.[50] Although traditional *topi* are rare in Venice today, motorized *topi* are commonly used for the transport of

Figure 16: A *Sanpierota*.[49]

[41] Venetian Boats - http://www.venetia.it/boats/
[42] Candlish, Shevlin, Stout. Traditional Boats of Venice p. 22
[43] Ibid, p. 23
[44] Venetian Boats - http://www.venetia.it/boats/
[45] *La Regata Storica di Venezia.* http://venicexplorer.net/tradizione/storica.php?hlangs=it
[46] *Idem.*
[47] Candlish, Shevlin, Stout. *Traditional Boats of Venice*, 41.
[48] *Ibid*, 23.
[49] *RiVivi l'Acqua: i mezzi di trasporto.* http://www.rivivinatura.it/italian/barche.html.
[50] *Idem.*

goods and cargo.[51] The *sanpierota*, a member of the *sandolo* family, still thrives in Venice today primarily because of its stability and reliability.[52] Although the *sanpierota* is commonly found with an attached sail today, it was rowed with two oarsmen in more traditional times.[53]

The class of boats in Venice that performed the main function of transporting passengers, and sometimes light cargo, include the *sandolo* and *gondola.*[55] Because the *sandolo* can perform a wide variety of functions, including fishing, hunting, carrying of passengers, transport of light goods, racing, and recreation, the *sandolo* is the most commonly used traditional boat in Venice today.[56] Ranging from 5 to 9 meters long, most *sandoli* were designed for quick transportation of passengers and light goods, and some are asymmetrical to allow easy steering by a single oarsman.[57]

Figure 17: A *Sandolo*.[54]

The most popular type of *sandolo* is the *mascaréta*, whose popularity results from its lightweight build, easy maneuverability, and inexpensive cost.[59] Ranging from 6 to 8 meters in length, this boat can be rowed by one person or up to as many at four.[60] The *mascaréta* is also often seen in the traditional boat races of Venice, and is often rowed by women.[61]

Figure 18: A *mascaréta.*[58]

[51] *Knopf Guide – Venice*, 73.
[52] Candlish, Shevlin, Stout. *Traditional Boats of Venice*, 25.
[53] *Idem.*
[54] http://rowing.club.suceen.free.fr/galeries/Suce_2004_07_13/index.html
[55] Idem.
[56] Venetian Boats - http://www.venetia.it/boats/
[57] Witty, Anne. "Beyond the Gondola". WoodenBoat No. 153, p. 54.
[58] http://rowing.club.suceen.free.fr/galeries/Suce_2004_07_13/index.html
[59] Candlish, Shevlin, Stout. Traditional Boats of Venice p. 26
[60] Witty, Anne. "Beyond the Gondola". WoodenBoat No. 153, p. 54.
[61] Knopf Guide. p. 71.

The most elegant member of the *sandolo* class is the *puparin*, a lightweight, slim boat that is one of the fastest boats in Venice, second only to the *gondola*. Once considered a symbol of high status, the graceful *puparin* was once used to transport upper-class passengers throughout Venice.[63] The boat's speed and agility makes it a frequent competitor in Venice's boat races, raced most often by oarsmen ranging from 17 to 20 years old, and it is also used for recreational purposes.[64]

Figure 19: A *Puparin*.[62]

The last important member of the *sandolo* family is the *s'ciopón*, a boat that was used for duck-hunting in traditional times because of its low-lying position in the water and ease of maneuverability.[65] Nowadays, it is still used for transportation of passengers through the more shallow canals of Venice.[66]

Figure 20: A *s'ciopón*.[67]

[62] Candlish, Shevlin, Stout. Traditional Boats of Venice pp. 26.
[63] Witty, Anne. "Beyond the Gondola". WoodenBoat No. 153, p. 54.
[64] Idem.
[65] Knopf Guide. p. 71.
[66] Candlish, Shevlin, Stout. Traditional Boats of Venice pp. 26.
[67] Venetian Boats - http://www.venetia.it/boats/

One of the main cultural symbols of the city of Venice is the *gondola*, a type of boat whose style and usage have evolved significantly since they first came into existence.

Figure 21: A *Gondola*.[68]

A typical method of transportation in the more traditional times of Venice, nowadays the *gondole* exist mainly for the pleasure of tourists. The only instance in which *gondole* are not strictly tourist-oriented is during the use of *traghetti*, sturdy *gondole* that serve to transport passengers across the Grand Canal at seven different locations along the Canal.[70] The unique dimensions and specifications for this graceful, handsome boat have evolved over the past six centuries,[71] and the style of rowing performed by the gondoliers is a talent and tradition unique only to Venice. The most important characteristic of the *gondola* is its asymmetry, in which the starboard side is diminished in order to allow the easiest propulsion possible by one oarsman.[72] The *gondolino*, a racing boat based on the *gondola*, often makes appearances in Venice's historical *regate*.[73]

Figure 22: A *Gondolino*.[69]

2.2.1 Traditional Boat Construction

The detailed methods of construction for the traditional boats of Venice that were developed over time by the *squerarióli* indicate the unique artwork that each boat represents and the detailed skills required to construct such a boat.

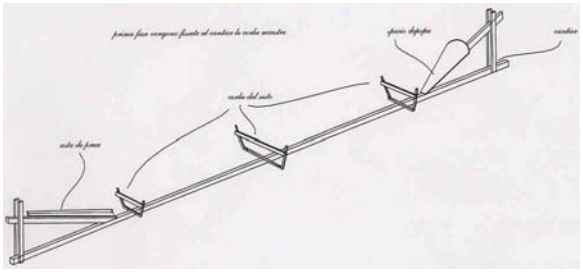

Figure 23: Preliminary Boat Construction

Although the specific methods of construction are different for each type of traditional Venetian boat, the basic sequence of steps is very similar for all types. The first step is to craft a piece of timber to shape the bottom of the boat, which is called the *cantier* and is used for

[68] *Ibid.*
[69] *Ibid.*
[70] Witty, Anne. "Beyond the Gondola". WoodenBoat No. 153, p. 51.
[71] Lanapoppi, Paolo. "Six Centuries of Gondolas". WoodenBoat No. 152, p. 42
[72] *Ibid*, p. 47
[73] Venetian Boats - http://www.venetia.it/boats/

all boats of the same type.[74] The front and back ends of the boat are then attached to the *cantier* and set at the proper angle. The three main frames (*ordinate*), composed of a bottom section (*piana*) and two sides (*sancone*) are then aligned along the cantier.[75] The largest, middlemost *ordinate* is known as the *maestre*. Once the three main frames are attached, each additional rib of the boat is constructed and attached. The covering boards (*nerve*) are then placed over the upper ends of the ribs. Three *trasto*, or thwarts, are then attached over the top of the boat, and function of prevent the boat from collapsing if a collision were to occur.[76]

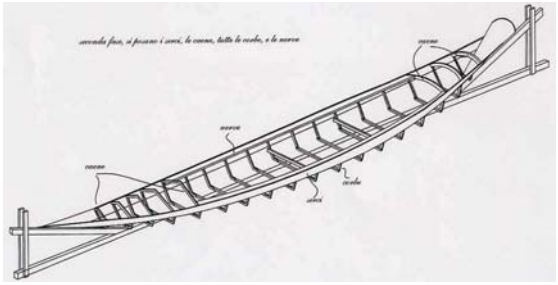

Figure 24: Intermediate Boat Construction

At this stage in the construction process, the entire boat is then turned upside down. The following planks are then attached: the *colonba*, or central board, to the bottom; the *meselune* at the sides; and the *galoni* on the lower part of the ribs.[77] Once each plank is attached and shaped properly, the seams are then caulked using tar, hemp, and various tools, and the boat is painted.[78]

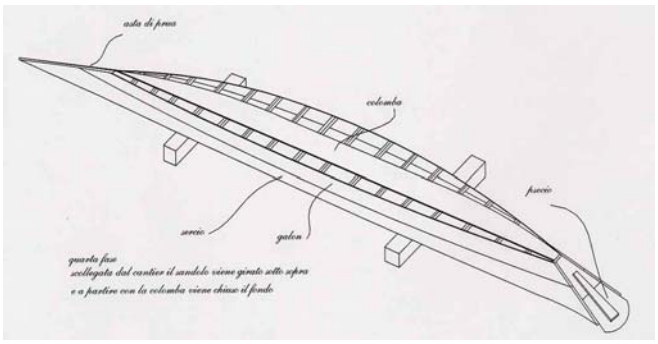

Figure 25: Nearly Complete Boat Construction

2.2.2 Fórcole

Elements of traditional Venetian boats that are as unique as the boats themselves are the oarlocks, or *fórcole*, that are essential for the propulsion of the boats. The construction and design of these oarlocks underwent constant change as time progressed in Venice, adapting to the various needs of the different types of boats and the unique, forward-facing rowing styles utilized by Venetian rowers. The craftsmen who create *fórcole* and oars, or *remeri*, carved the *fórcole* from one piece of wood, most commonly from walnut, and occasionally from cherry, pear, apple, or maple.[79] Today, *fórcole* exist in many

[74] Pergolis and Pizzarello. *Le Barche di Venezia.* p. 34
[75] *Idem.*
[76] *Idem.*
[77] *Ibid,* 35.
[78] *Idem.*
[79] Penzo, Gilberto. *Fórcole, Remi e Voga alla Veneta.* p. 106

various forms depending on their usage, such as for work purposes, recreation, or *regate*, and their shapes and styles continue to evolve for increased efficiency.[80]

Figure 26: Front and Side Views of a Work Forcòle

The different styles and purposes of *fórcole* can be classified into two main categories: those used for work purposes, and those used for leisure.[81] Work *fórcole* were designed to be cheap, durable, efficient, and easy to repair.[82] These conditions required that the oarlocks were constructed with the bare essentials and most readily available resources.[83] The luxury *fórcole* required a much more detailed construction, and are most readily distinguished by the *sanca*, or 'elbow', which curves over the side of the boat. This characteristic required the oarlock to be constructed from a very thick block of wood.[84] Luxury *fórcole* were often finished with fine sandpaper and decorated in various ways, and the most common examples of such luxury *fórcole* are those used for gondolas.[85]

Figure 27: Front and Side Views of a 'Luxury' Forcòle

2.2.3 Oars

In addition to creating and constructing fórcole, the *remeri* also performed the task of constructing oars. A typical traditional Venetian oar is made up of two sections, the *giron* (handle) and the *pala* (blade).[86] Like the fórcole, there are two major classes of oars, an economy type oar and a more refined type. The simpler type consists of the two main pieces of the handle and blade. Although simpler, this type of oar is still highly efficient. The better quality version of the oar is constructed from one piece of wood. The major distinguishing characteristic of the more refined type of oar is the presence of

[80] *Idem.*
[81] Candlish, Shevlin, Stout. Traditional Boats of Venice. p. 19
[82] Penzo, Gilberto. *Fórcole, Remi, e Voga alla Veneta.* p. 105
[83] *Idem.*
[84] *Ibid*, p. 105.
[85] *Idem.*
[86] *Ibid*, 101.

two wooden inserts, or *cortei*, that are attached to either side of the blade (see **Figure 22**). These wooded inserts reinforce the blade and allow the use of a thinner piece of wood for the blade.[87]

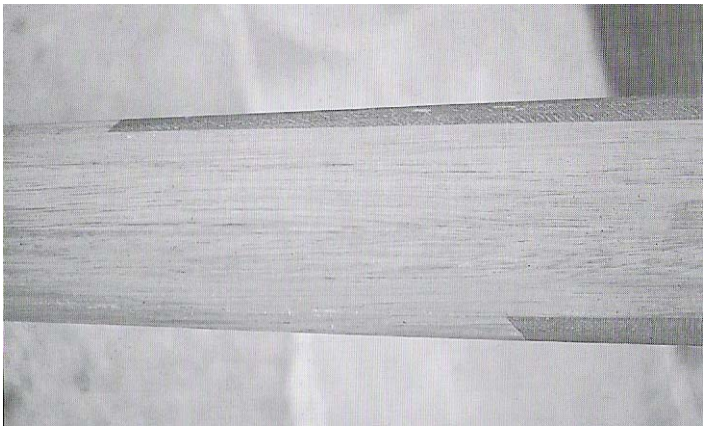

Figure 28: The blade of an oar, with wooden inserts.

Although the structure of a Venetian oar seems relatively simple, the construction of an oar is quite complex. It is important to note that the oar is not symmetrical or straight, and the dimensions of the oar must be extremely precise in order to allow the most efficient use of the oar while rowing.[88] The skills possessed by the *remeri* are extremely unique and essential to the proper construction of an oar.

2.2.4 Fórcole and Oar Construction

The skills required and methods and tools used by the *remeri* to construct the *fórcole* and oars are extremely important and significant to the nautical heritage of Venice. One of the most important tools used by the *remeri* was a wooden vice (**Figure 23**) that could be used to hold the *fórcola* so that it could be shaped on all sides.[89] This type of vice was fixed to the ground in order to provide a strong surface for the *remèr* to work on. During the construction of oars, *cavaletti*, or sawhorses, (**Figure 24**) were often used to support the end of the oar that was not being held in place by the vice.[90]

Figure 29: The *Remer*'s Vice

Figure 30: *Cavaletto*

[87] *Idem.*
[88] *Idem.*
[89] *Ibid*, 100.
[90] *Idem.*

Many various tools were used by the *remeri* to construct oars and *fórcole*. The most important cutting tool is a knife known as the *fero a do maneghi* or *fero da remèr*, which consisted of a straight blade and two knob-shaped handles (see **Figure 25**).[91] These blades were used to shave and cut away small chips of wood, gradually shaping the *fórcole* or oar. Another basic tool is the *fero da rassare*, a simple rectangular piece of steel which is sharpened on one side and used to clean and file the surface of the wood.[92] Another tool, which is no longer used, is a small broadaxe called a *dolaora*. This axe was used to shape a piece of wood into an oar, removing large pieces of wood at once.[93]

Figure 31: *Fero da Remèr*

2.3 Threats to the Traditional Boats and Nautical Heritage of Venice

With the rapid modernization of transportation that has occurred and continues to occur in Venice, the disappearance of many traditional boats is a significant threat to the cultural and historical aspects of the city. Although some traditional boats are still seen in Venice, their original roles have been replaced by other steel-hulled, motor-powered boats such as the *vaporetti*, *motoscafi* and *moto-topos*.[94] While a revival of interest in the traditional boats has been seen through the *regate*, institutions of rowing clubs and flourish of gondolas, the traditional aspects of Venice's maritime heritage are still much endangered. Because of the increasing presence of motorized boats in Venice, the generational tradition of rowing conventional boats is no longer necessary.[95]

The gradual increase of the quantity of motorized boats has resulted in the decline of traditional boats in Venice throughout recent years. Concrete examples of the reduction of traditional boats in Venice are the closings of the *fitabatèle* (rowboat rental facilities) over the years, the openings of motorboat rental facilities, the closings of the *squeri* and decrease in the number of *squerarióli*, and the dwindling number of *traghetti* stations. Although there are a significant number traditional boats in Venice there are not enough spaces to park and store them. *Arzanà* has collected many boats, but many of

[91] *Idem.*
[92] *Idem.*
[93] *Ibid*, p. 101.
[94] Witty, Anne. "Beyond the Gondola". *WoodenBoat.* No. 153, 51.
[95] *Ibid*, 52-53.

them are stacked up in the only available space, due to lack of parking areas within the canals.[96] This method of storage causes substantial damage to the boats as leaving them out of water for lengthy periods of time damages the wood and makes the boats more prone to harm. All of these occurrences indicate the threat to the traditional boats of Venice and serve as testament for the need to develop programs to preserve and restore the boats.

2.4 Previous and Current Restoration/Preservation Programs

As there is a desire to restore and preserve the traditional boats of Venice, it is helpful to understand various preservation and restoration programs throughout the world. Awareness of these different programs will provide a basis on which to gear our objectives for the awareness and fundraising of traditional Venetian boats.

2.4.1 Maritime Museums

As was stated, there are numerous preservation organizations with varying specific objectives. Many programs and organizations with the particular intention of preserving nautical heritage exist throughout the world. The International Congress of Maritime Museums (ICMM) is a professional guild of over 300 associations, organizations and individuals in the maritime preservation field who are dedicated to documenting and preserving nautical traditions, as well as developing programs for public awareness of the importance of nautical preservation.[97]

Here in New England, various maritime and nautical museums exist. The Maine Maritime Museum collects articles that are of importance and significance to the maritime history of Maine. The museum has access to innumerable facts, figures, types of boats and other items of relevance specific to the maritime life of Maine. Some of the attractions include gallery exhibits, a shipyard, narrated cruises and many other educational programs that describe the significance of Maine's nautical past.[99] The Mystic Seaport Maritime Museum in Mystic, Connecticut, is world-renown for its various nautical exhibits and

Figure 32: The Maine Maritime Museum[98]

[96] Carrera, Fabio.
[97] *International Congress of Maritime Museums.* http://www.icmmonline.org/.
[98] *Maine Maritime Museum.* http://www.bathmaine.com.
[99] *Maine Maritime Museum.* http://www.bathmaine.com.

displays. Some examples of these exhibits include full below-deck ship tours, a preservation shipyard and various maritime galleries.[100]

2.4.2 Preservation/Restoration Programs in Venice

Venice itself is home to myriad organizations geared toward historical preservation. As previously mentioned, Venice is a host World Heritage Site of UNESCO, and therefore receives a lot of attention from them. Also, the Venice Charter, an international charter for conserving and restoring artwork and monuments in Venice is geared toward safeguarding the city's fine art. The charter is signed by the majority of nations in the world, because the globe realizes the beauty and exclusivity of the city.[101]

Although nautical preservation needs to be pursued and completed to a further extent, there are groups in Venice who are devoted to this task. *Arzanà*, a non-profit organization founded in 1992, [102] is focused solely toward preserving the traditional boats and boat accessories of Venice. Today, *Arzanà* has collected more than 40 boats and various other nautical elements, has cataloged existing traditional boats in Venice through sponsorship of last year's project and in the future plans to create a working boatyard and nautical museum.[103] *Arzanà*'s objective is to increase awareness of the endangerment of these traditional boats and consequently generate funds to put toward restoring and preserving the traditional Venetian boats.

2.5 Fundraising and Marketing Programs

As one of the main goals of our project will be to develop fundraising and awareness programs for the nautical heritage of Venice, it is useful to first explore existing programs similar to those that we propose to develop.

2.5.1 Adopt-a-Boat

The development of an 'Adopt-a-Boat' program could potentially provide significant funds for the restoration of traditional boats. In order that such a program is facilitated well, knowledge of similar "adopt-a-" programs is necessary. The most suitable and applicable program is Adopt-a-Horse.[104] The Adopt-a-Horse organization is run such that a person contributes a particular one-time expenditure toward a horse and also

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[100] *The Mystic Seaport Maritime Museum.* http://www.mysticseaport.org.
[101] *The Venice Charter.* www.icomos.org/docs/venice_charter.html.
[102] Penzo, Gilberto. <http://www.venetia.it/boats/penzo_eng.htm>
[103] Candlish, Shevlin, Stout. *Traditional Boats of Venice.*
[104] *Adopt-a-Horse.* www.adoptahorse.org.

pays biannual veterinary fees. The benefit of adopting the horse is the capability of being able to ride the horse whenever the sponsor is in the same area as the horse.

Currently, there exists a limited number of Adopt-a-Boat programs that we also looked into. The Coronado Yacht Club uses donated money for repairs to their vessels. The fund donator, as a reward, gets to name the particular boat for a year.[105] While this idea may be presented to *Arzanà*, it is unlikely that it will be used considering the stature of the traditional Venetian boats, and that they rarely if ever have insignia on them. Another Adopt-a-Boat program, the Disabled Sailing Association of British Columbia, places donors' names on a sign in front of their home headquarters.[106] This notion has well conceived intentions, but we will most assuredly have to check with *Arzanà* to see if they have the financial means to cover such a concept and to see if they would be open to a similar idea.

2.5.2 Awareness Brochures and Historical Walks

Awareness brochures are priceless for tourism. Brochures are stored at tourist areas so that visitors may see all the sights and sounds a particular area has to offer; they are low-cost to make and easily accessible by all visitors. As such, we have gathered a collection of varying awareness and tourist brochures. The information in brochures is usually the critical and broad range of information, but leaves something of intrigue to the visitors to make them want to further their knowledge about the subject at hand. That said, our group will look to create a brochure that provides enough information about *Arzanà*, its objectives, and a brief maritime history of Venice but will also provide a gateway of inquiry to tourists. If all is successful, the brochure will effectively enhance the levels awareness and interest in the preservation of traditional Venetian boats.

Figure 33: The Original London Walks Brochure[107]

The Original London Walks[108] are a series of tours throughout the city of London that provide tourists with invaluable information, priceless sights and a deeper understanding and appreciation for the city of London. The cost of the walks is also rather low at only 5.50 British pounds. There are variances of walks in London, but if a similar tour option were adopted in Venice it would pertain solely to the maritime history

[105] *Coronado Yacht Club Junior Sailing Program.* http://juniors.coronadoyc.org/fundraising/donate.php
[106] *The DSA Adopt-a-Boat Program.* http://www.reachdisability.org/dsa/adopt_a_boat_program.shtml
[107] *The Original London Walks.* http://london.walks.com/.
[108] The Original London Walks Brochure – Summer 2005 (March 10-October 31)

of the city. The walks have proven to be fan-favorites as they are non-exclusive, reasonably priced and highly informative.

3. METHODOLOGY

The ultimate goal of this project was to help *Arzanà* and *Soprintendenza Archeologica* to restore and preserve the nautical traditions of Venice by collecting and organizing information for the development of various fundraising and awareness programs. To accomplish our mission, we identified the following objectives:

5. To expand the existing catalog of Arzanà boats and maritime accessories.
6. To document the elements of the nautical heritage of Venice.
7. To promote awareness of the threat to traditional Venetian boats.
8. To develop fundraising programs for the restoration and preservation of traditional Venetian boats.

Our key areas of study for this project varied with dependencies upon particular aspects of our project. The traditional boats of Venice and the nautical artifacts of Arzanà were an integral area of study for the database and cataloging aspect of our assignment; the boats were located at select boatyards and the artifacts were at the Arzanà facility. The various nautical and maritime entities of the city were of extreme importance in developing a nautical tour, and were found all over the city. Our definition of a traditional boat is one that is powered by oars and/or sails. A nautical entity was defined as an artifact that makes an important statement about the nautical history and heritage of Venice. Our area of study included all canals and *squeri* in Venice and its surrounding islands, as seen in **Figure 28** below, with a plentitude of focus on the Arzanà headquarters and the boatyards where Arzana's boats are maintained.

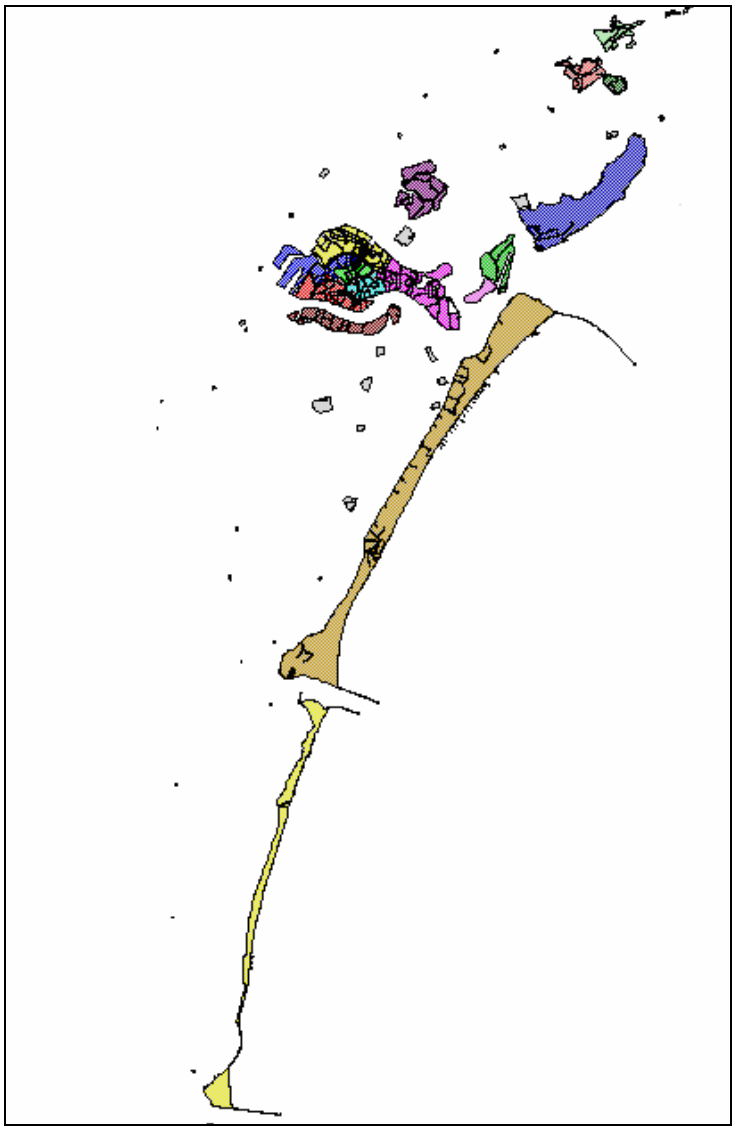

Figure 34: Area of Study: Venice and Surrounding Islands

3.1 Expanding the Existing Catalog of Arzanà Boats and Accessories

The first objective of our project was to expand the catalog of *Arzanà* boats that was created and partially completed by the project group of 2004. In order to complete this objective, the direction of necessary work was assessed by looking at the 2004 group's project and database content. Upon examining their work, we determined a means of cataloging the boats and maritime accessories which Arzanà currently possesses.

3.1.1 Cataloging the Traditional Boats of Arzanà

A focal point of our sponsor this year was to catalog the traditional boats that it currently restores, maintains and uses on a regular basis. As a method for doing this, our group used the 2004 project group database and expanded it. Last year's database included certain average dimensions of boats, including height, width, length and depth. The data gathered by the 2004 project group may be seen in Appendix B and a sample entry to its database is located in Appendix C.

Imperative to our project was to elaborate upon the details the 2004 project group developed with regards to the boats Arzanà maintains. As such, we took specific measurements of the boats and recorded them in our own database. There were a number of measurements that were required for the boats. These measurements facilitated the designing and outlining of the boats. All of the necessary dimensions taken were taught to us by a member of the Arzanà organization. Diagrams of these detailed measurements can be seen in Appendix D. Additionally, various images from different angles of each boat were taken to create a deeper understanding of the shape and designs of these boats.

The details of each boat, including all of the different dimensions, have been put together into a database using the program Microsoft Access, and the form for this database can be seen below in **Figure 29.**

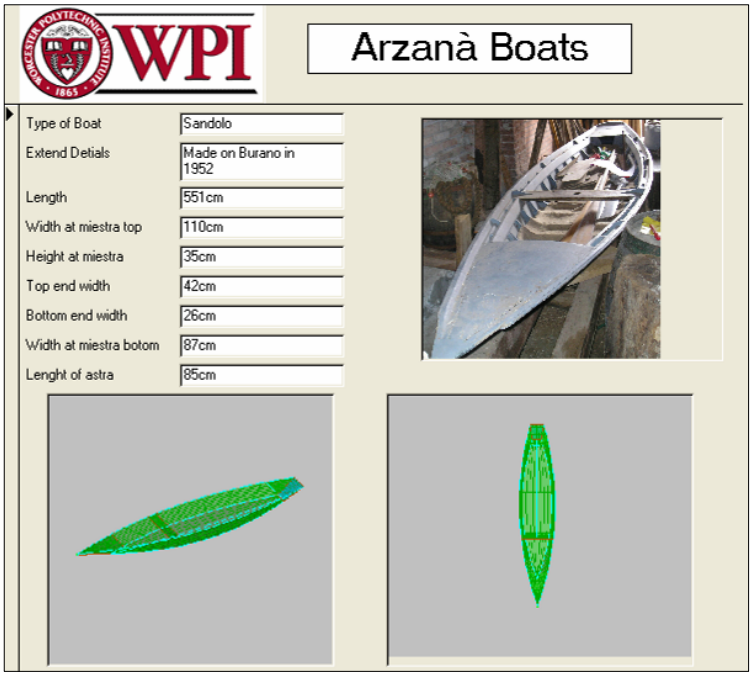

Figure 35: Traditional Boat Measurement Field Form

Combining each image, the CAD drawings (see section 3.1.2) and all the databases, we were able to create a detailed catalog of all of the boats which Arzanà owns. This catalog was created with various purposes in mind:

1. To provide Arzanà with the opportunity to have unlimited access to the database so that they may easily update changes to their boats or their arsenal.
2. To showcase the database on the newly renovated Arzanà website, thus implementing inexpensive advertising and fundraising utilities.
3. To provide on the website an option to rent out the boats which Arzanà leases.
4. To allow future reconstruction of boats that may become extinct, through use of the various measurements and CAD drawings.

While our original intentions were to catalog all of the traditional boats owned by Arzanà, limited access to these boats prevented us from doing so. We were, however, able to take measurements and create CAD models of two boats present at the Arzanà headquarters. The database that we created with these boats can be implemented by future project groups to create a more detailed catalog of each boat owned by Arzanà. The two database entries that we created can be seen in Appendix E.

3.1.2 Creating a CAD Model of the Traditional Boats of Arzanà

In order to provide more specific measurements, our group focused on the actual size of the boats that belong to Arzanà as opposed to the boat type's standard or estimated measurements. As outlined in section 3.1.1, we performed a number of specific measurements to accurately determine the dimensions of each boat in the Arzanà arsenal to the centimeter. Upon collecting this information, we then used a Computer Aided Design (CAD) program called Surface Works to design the boats into a series of blueprint models. Surface Works is a CAD program used particularly for designing boats and ships of all shaped and sizes. A sample Surface Works drawing can be seen in **Figure 30.**

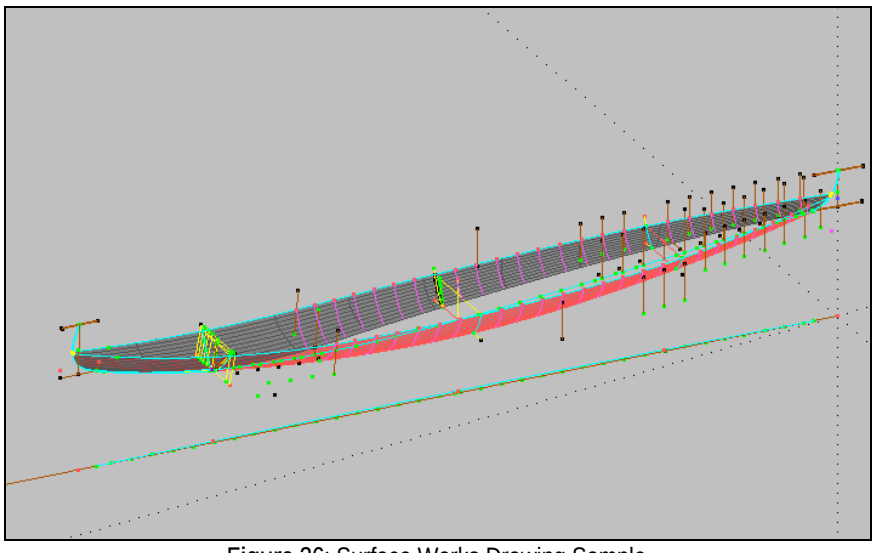

Figure 36: Surface Works Drawing Sample

3.1.3 Cataloging the Rare Traditional Boats of Venice

Upon completion of cataloging the boats owned by Arzanà, it was our mission to document the various other rare traditional boats in Venice. After reviewing the data collected by the 2004 project group, we determined that the catalog needed to be expanded in various ways. Most importantly, the 2004 project group determined that some of the parking spots registered to traditional boats did not house traditional boats at all – rather, they accommodated motorized boats. For this reason, we periodically visited the parking spots of the rarest traditional boats in Venice (those with 10 or less examples) to determine whether or not a traditional boat was actually parked there. The GIS maps of the parked traditional boats in Venice were used to locate the rarest traditional boats in Venice. The rare traditional boat types and parking spots can be seen in Appendices F and G, respectively.

Once we located a boat, we determined as much information as we could about the boat from all available sources, including its specific (or approximated) dimensions, the type of boat it was, its rarity in the city, and the level of damage to that particular boat. Microsoft Access was then used to create a database of the existing rare traditional boats in Venice, a field form for which can be seen in **Figure 31.** If after a number of attempts to locate a traditional boat in an area proved to fail, we marked that area with a symbol denoting the probable lack of the spot's usage as one to park traditional boats. Expanding the catalog in this way provided a more accurate representation of the number of traditional boats in Venice. After our data was gathered, the GIS maps created by the 2004 project group were updated.

Figure 37: Rare Traditional Boat Type Field Form

Unfortunately, due to time constraints we were unable to complete this aspect of our methodology. We attempted to locate the boat parking spots, but identifying the boats proved difficult. Throughout our time in Venice we were able to locate 10 boats. Our partially updated

map can be viewed in Appendix H. It is possible that our database could be completed by future groups.

3.1.4 Cataloging the Maritime Accessories of Arzanà

One of the primary concerns of Arzanà is the revelation to the rest of Venice the importance and significance of the traditional boats and traditional maritime history of the city. Arzanà's possessions go well beyond boats alone, as can be seen in last year's report which revealed the over 70 fórcole that Arzanà owns. It was our mission this year to further expand the catalog of maritime accessories that Arzanà is home to, especially cataloging those which may be rented for movie, theater or other production purposes.

The method through which we documented and cataloged these accessories was dependent upon a specific numbering process; a serial numbering used exclusively by Arzanà. The serial number was based upon a series of three digits. They were assigned to each item in groups according to the type of item, with one number representing each item in the group. For example, the first group of items in the database is mallets. There are 3 mallets, all with inventory code 001.

After assigning a serial number, we took a picture of each accessory that is currently rented out by Arzanà, included a brief description of the article, and created a Microsoft Access database to create the inventory, a sample form of which can be seen below in **Figure 32**. The report of each artifact was dependent upon what the artifact was, but included information such as size dimensions, color, approximate age and various other criteria. Like the Arzanà boat catalog, the databases and images about each

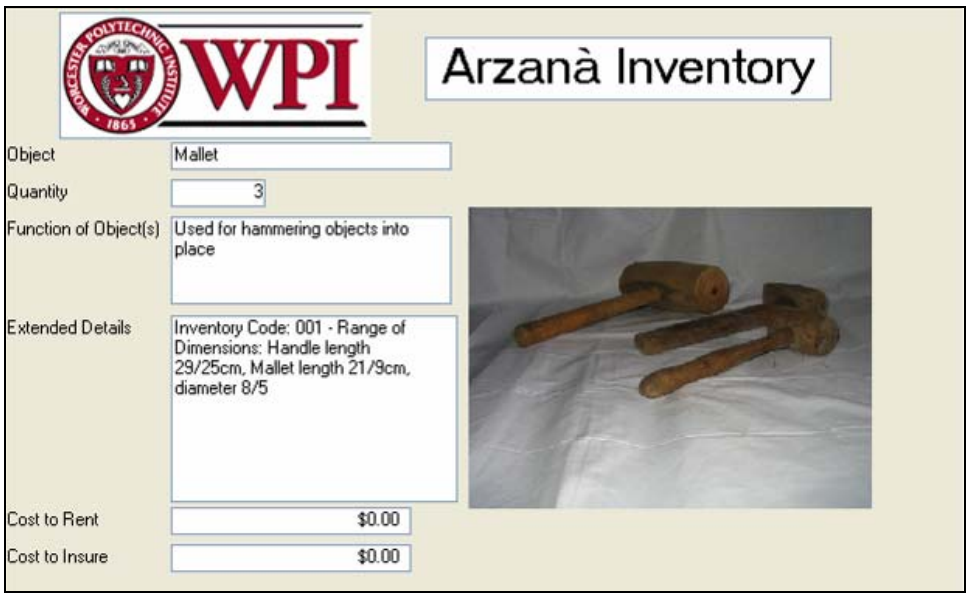

Figure 38: Arzanà Maritime Accessories Form Sample

vessel accessory were placed online for viewing and rental purposes, and Arzanà has their own copy of the database program so that they may easily inventory the items they own. The entire completed database can be seen in Appendix I.

A specific database was also created for the various oars owned by Arzanà. Each oar was assigned a specific inventory number, ranging from numbers 1-96. Photos were then taken for each oar, including a photo of the entire oar and a photo of the paddle. The following measurements were then taken for each oar: total length, paddle length, paddle width, maximum handle circumference, and lengths of the two inserts. The collected data was then entered into a Microsoft Access database, a sample form of which can be seen below in **Figure 33**. The entire database can be viewed in Appendix J.

In addition to inventorying the uncataloged items owned by Arzanà, the

Figure 39: Arzanà Oars Form

inventory of fórcole created by the 2004 project group, which contained 71 fórcole, was expanded upon. Photos of four different angles of each fórcole were taken, and 5 measurements were taken. The measurements included the height from the *tapa* to the oarlocks, the thickness of the *fórcola,* how forward or backwards the oarlock is located, how far in or out the oarlock is located, and the size of the *tapa*. The inventory was expanded to include 96 fórcole. A sample form of the Microsoft Access database can be seen below in **Figure 34**, and the entire database can be viewed in Appendix K.

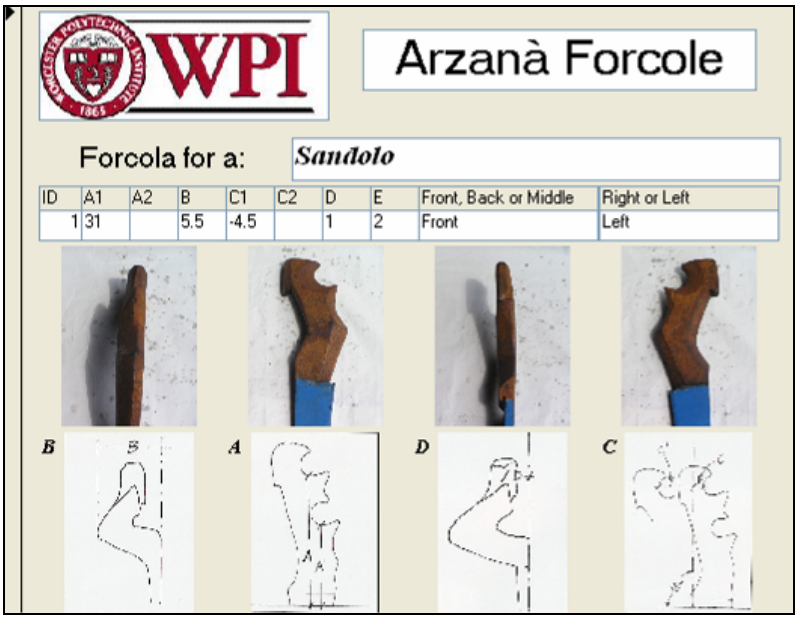

Figure 40: Fórcole Inventory Form

3.2 Elements of the Nautical Heritage of Venice

One of our most important objectives to generate interest of the maritime history of Venice was to document the nautical elements of the city, including artwork in museums, public art and traditional boats. The information collected was then utilized to develop a walking tour of Venice which promotes Venetian nautical heritage.

3.2.1 Researching the Nautical Elements of Venice

Information relating to this objective was gathered in several ways. The first approach in our progress was to scan prior research in Venetian public art. Projects previously completed by WPI students provided valuable sources of information as they are written in English, show correlating images and provide extensive and accurate information. Observation of this previous research paved the way for insight into types of nautical art as well as methods with which to document the nautical entities. An important source for the location of nautical elements was the Traditional Boat project completed by 2004's project group, which revealed the locations of all *squeri*, *remeri*, traghetti, streets with names related to nautical/boat terms, and *regate* routes. We also investigated various sources that were identified for having pertinent information about nautical elements, such as Lillian Martin's *The Art and Archaeology of Venetian Ships and Boats*, which contains a catalog of Venetian nautical artwork.

We further discovered information about Venice's maritime culture by arranging meetings with Venetians who specialize in the nautical history and/or the artistic history of Venice. These persons included those who run museums in Venice, are members or workers at the Arsenal, *Arzanà*, or other *squeri* and any others who have a rich knowledge about the nautical history of the city. As translation was necessary for many of the meetings, the presence of a translator was necessary. Often times, we used our advisor Fabio Carrera as a mediator since he speaks both the English and Italian languages fluently. Information gathered during these interviews included, but was not limited to, locations of nautical elements throughout the city, the artist(s) who created these nautical elements, what the pieces represented, the approximate age of the maritime items and other miscellaneous facts of importance.

3.2.2 Locating and Documenting Nautical Elements

After we collected a considerable bulk of data, our group explored the city of Venice to locate the nautical elements that we had gathered facts for and searched for any other artifacts that are of importance to the nautical heritage of Venice. When any element was found, it was documented in our elements database created with Microsoft Access. The database includes such information as the type of element (museum artwork, public artwork, traditional boat, etc.), a picture of the element, its location in Venice, the condition of the element, its age, the significance it has to the nautical history of Venice and any other pertinent information that could be deduced from the element. The field form for this database can be seen below in **Figure 35**. The entire database can be viewed in Appendix L.

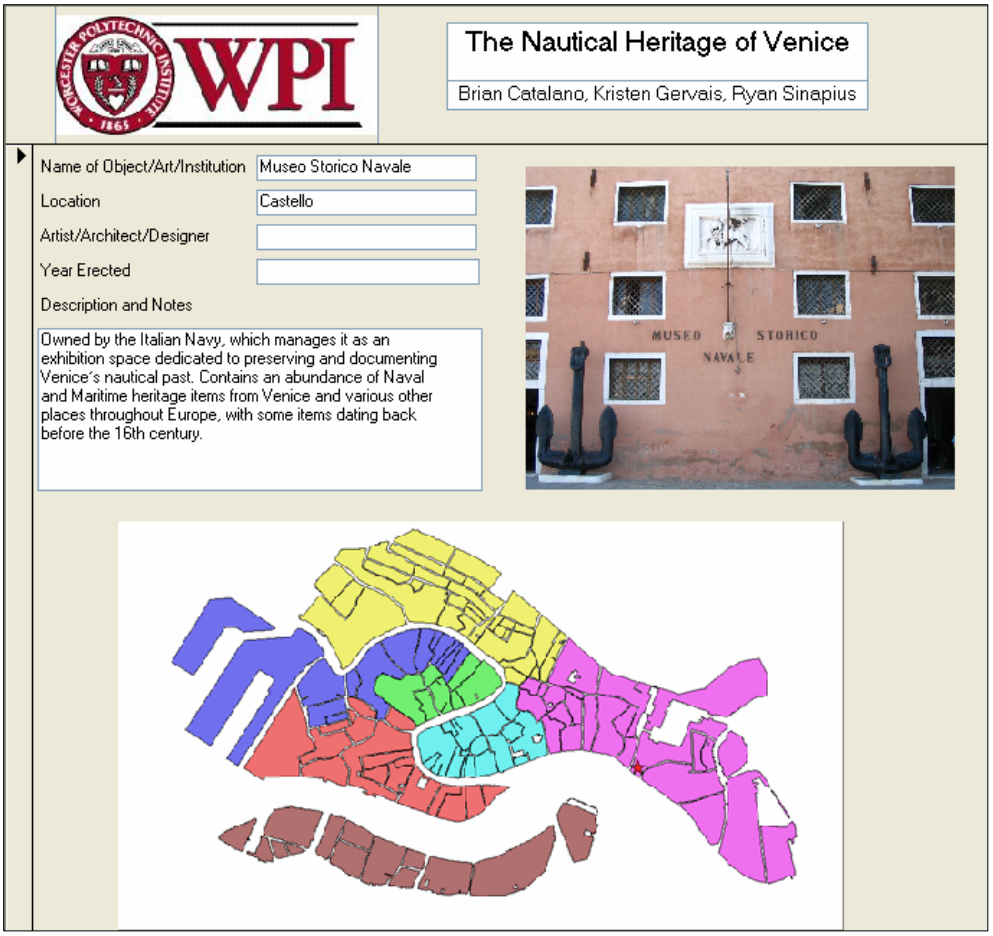

Figure 41: Nautical Elements Database Form

Upon successful completion of creating a Microsoft Access Database, we utilized MapInfo to create a GIS map of the documented nautical elements. The map has different layers and utilizes symbols to indicate different types of artifacts, such as public art, museum artifacts, and paintings. This GIS map can be seen in Appendix M.

3.2.3. Creating Nautical Tours of Venice

Once the Microsoft Access database of nautical entities was completed, it was reviewed and analyzed in order to select the most significant and influential elements. A GIS map of these select elements was created using MapInfo and from this map, a walking Nautical Tour similar to the Original London Walks was created. A brochure was designed to accompany the nautical tour and it includes a brief description of each element with information such as the artist/designer, the age of the element and its significance to the city. The walking tour allows maritime enthusiasts, interested tourists and Venetian natives to gain a deeper appreciation for the nautical history of Venice and observe the number of traditional boats that the city has to offer. The heritage tour

provides the option of traversing the city all over, giving those who take the tour the ability to experience a vast portion of the city. The GIS map of the major tour stops can be seen in Appendix N, and the brochure can be viewed in Appendix O.

In addition to creating a nautical walking tour and the accompanying brochure, a Nautical Heritage website was also created. This website can also be used to accompany the nautical walking tour, as it includes detailed information about each nautical heritage site, as well as maps and information as to how to locate the site. Screenshots of this website can be seen in Appendix P.

3.3 Promoting Awareness and Fundraising

In order that *Arzanà* is to enhance their cause over time, there was a necessity for awareness of their objectives to the general public and efforts to fundraise for the improvement of the boats. Instilling several awareness and fundraising programs enabled us to help *Arzanà* in their labors and provided security to traditional Venetian boats for years to come. The awareness programs are most pertinent for advancing financial support, and so we had to plan accordingly for both awareness and fundraising causes. It was necessary that we first facilitated the marketing campaign in order that potential sponsors understood the severity of the dilemma Arzanà, and all traditional boat yards in Venice, are facing. After sponsors were able to understand the concepts of the situation, the transition to potential fundraising was facilitated with much less difficulty.

3.3.1 Awareness Programs

Our group focused on a number of marketing campaigns and procedures to alert the public, both local and tourist, of the threat to traditional Venetian boats. Our agenda for awareness included brochures that were dispersed at museums, boat docks and other applicable areas, the development of an English version of a website for *Arzanà* and a partnership with museums and boat societies where information about *Arzanà* was posted. The production of the brochure and website was the first priority, however, since they were able to provide immediate impact to the global world, the local Venetians and the tourists in Venice.

The brochure, which was created in Microsoft Publisher, provides background and contact information for *Arzanà*, including the URL for the website. The brochure also includes a brief history of *Arzanà*, information on donations for the organization, a definition and description of what constitutes traditional Venetian boats and a map for a

nautical tour of Venice. The brochure can be seen in Appendix O, and a screenshot of the website can be seen in Appendix P.

Creating an English website for *Arzanà* was an invaluable resource for publicity and marketing. The website includes more extensive information than the brochure and other detailed sources relating to our entire project campaign. Although the website is currently provided only in English, it does provide a skeleton of a website to *Arzanà* who can use it to thus develop an Italian version in the near future. The website provides links to various similar associations, including the Maine Maritime Museum, boating magazines and historic preservation societies. Lastly, the internet gives us the flexibility to post the database of traditional boats, including pictures of boats and wide-ranging details about them such as their use, history and evolution from older times. The website also displays the various inventories of Arzanà items that we created. Uploaded onto the website is the current boat catalog and a catalog of all the artwork and other nautical entities that we have created a catalog of. In order to develop the website, we expanded upon our existing website and our web coordinator continually placed all of our results, analyses and other materials online. A screenshot of the Arzanà website can be seen in Appendix Q.

Forming a partnership with museums, other boat societies in Venice and Italy, historical societies and preservation societies will be highly beneficial to *Arzanà* in their efforts to salvage the boats. A strong bond with these institutions will in turn provide *Arzanà* with free or low-cost publicity. Also, it is the hope that these places will sponsor *Arzanà* financially as well, if they are capable of doing so. We will work to develop close relations with those organizations, and try to persuade them to sponsor *Arzanà*. We will begin our relations with organizations in Venice first and foremost, and try to arrange initial meetings with them to discuss the objectives of *Arzanà*. From organizations that show interest, we will try to further the relations through a number of presentations relating what we would like from a sponsorship, the benefits that the particular organization will receive from the sponsorship, and how the movement for the sponsorship of *Arzanà* is applicable to the aforementioned organization. The presentations will be made in Microsoft PowerPoint and will include detailed graphics, maps, and other datasets that will be easily readable and will show the cause-effect production of the sponsoring organization.

Our group will use any other means of communication about the boat and maritime preservation of Venice that we develop along the way. These ideas may include,

but are not limited to, billboard postings, stereo and television commercials and public campaigns. Our hope is that we will provide *Arzanà* with a secure foundation for publicizing their cause to Venice, and provide a gateway for their expansion outside of Venice.

3.3.2 Fundraising Programs

Generating awareness of the quandary facing the traditional boats of Venice is important. However, awareness alone is not enough for the restoration process if there is no financial means to support the cause. To coincide with the awareness aspect, our group had every intention of helping *Arzanà* in developing a number of programs to raise funds and resources toward the protection of the traditional boats of the city.

First, we created and helped implement an "Adopt-a-Boat" program. We researched similar programs, and concluded that it would be beneficial to follow in the footsteps of a particular Adopt-a-Horse program that is already in place.[109] Our program goals and application were slightly different that Adopt-a-Horse but the founding principles were similar to those of the organization. It was necessary that our program be very explicit in what it does and does not entail. We looked for methods of developing rewards for particular donations and concluded that with a minimum donation a sponsor is able to take his or her traditional boat out on the canals for a certain amount of time each year. The more money that was donated, the more rewards the donor could reap.

It is in the best interest of *Arzanà* that they inherit as much as possible in terms of financial resources toward the preservation of boats. That said, intended to generate sponsorship and partnership programs for *Arzanà* with museums, boat societies, historical preservation societies and other comparable organizations. Our hope is that these organizations will market and provide information about *Arzanà* and their mission in preserving and restoring the boats. As previously mentioned, we worked closely with interested societies and through presentations, were able to stimulate awareness and financial support opportunities that each organization was able to provide.

If there proves to be enough interest in the nautical tour for the future, then a tour similar to the one provided by the Original London walks may be incorporated. Tour guides would most likely be members of *Arzanà* or other persons highly knowledgeable about the nautical history of Venice that share a passion for the maritime culture of the city. If the interest is present, a nominal fee may be induced upon tourists,

[109] *Adopt-a-Horse.* http://www.adoptahorse.org.

or perhaps even a request for donations. As the tour develops and becomes more productive, *Arzanà* may increase the cost of taking the tour or find new ways to generate funds through the walks.

Lastly, the development of a website was certainly critical for marketing and fundraising. The website may allow the option for donations to Arzanà, and details about the Adopt-a-Boat program are also posted. The website contains all of the figures that we were able to produce during our stay in Venice and showcases the various nautical elements of the walking tour, the information about Arzanà's possessions and background facts about the traditional boats of Venice.

4. RESULTS AND ANALYSIS

The results of our project are a conglomeration of data that has been collected from the 2004 project group, outside resources and our own on-site field work. Using the Microsoft Office programs, GIS Mapping, the Surface Works CAD program and various other resources, we were able to gather and visually demonstrate our material through a collection of maps, databases, charts, tables and CAD drawings.

4.1 Arzanà Boats and Accessories Catalog

All productions of results of this section were established from our research into boats and boat accessories, with a large quantity of these results coming directly from the Arzanà headquarters. The resulting data includes images, databases, catalogs and maps.

4.1.1 Catalog of the Arzanà Boat Collection

Because of restricted access to the Arzanà boat collection, we were not able to measure and draw all of the boats that Arzanà owns. However, there were a few boats and boat models at the Arzanà Squeri, thus giving us the ability to record those ones and provide an outline of the procedure for future groups. In order to complete the process, we took all proper measurements of the boats and recorded them in Microsoft Access, along with a picture of the items.

Following that procedure, the CAD drawing was created using the Surface Works software. We were able to measure and produce drawings for 2 boats that are presently at Arzanà. This information was given back to Arzanà and was also placed online with their other catalogs so that interested organizations would have the capability of renting the boats. The most important aspect of this part of our project is that fact that in upcoming years, other groups will be able to implement our database to create a more thorough catalog of the traditional boats that Arzanà owns. The completed forms for each boat that we measured can be seen in Appendix E.

4.1.2 Inventory of other Traditional Boat-Related Objects at Arzanà

Because the Arzanà association makes all of their money nowadays through accessory rentals, it was vital to the organization that an inventory of all their items be made. Because time constraints were too small to create a detailed inventory of every item as was done with the oars and fórcole, our group created a generic database using Microsoft Access for the Arzanà traditional boat tools and accessories.

Each item category in the Arzanà collection has a serial number that denotes which particular item is in each category. Each form for the Arzanà accessories reveals the serial number of each item group, contains a picture of the respective item group, notes about the items in the group and pertinent measurements for the items. The inventory may now be used by Arzanà to more easily keep track of their items and which ones are rented out and the forms are also easily updateable giving the Arzanà organization easy maintenance and an accurate recording of their stock.

The completed database of Arzanà's miscellaneous nautical items can be seen in Appendix I. This data has also been included on the Arzanà website and in the Microsoft Access forms for convenience and inventory purposes.

The information provided in each form is of vital importance not only for Arzanà, but also for other as the forms have all been placed online on the Arzanà website. This option provides persons or groups interested in rentals easy access to what they would like to request for their rentals and gives them a thorough overview of what each item serves as its purpose.

4.1.3 Arzanà Oar Collection

The oars of the Venetian boats are as significant as the fórcole to the history and culture of the city and as vital to the success of the rower. Therefore, it was our intention this year to make a complete and detailed catalog of the Arzanà oars. The Arzanà association has 96 oars in their collection, all of varying sizes for different boats and boat positions.

An inventory of the oars was made using the Microsoft Access program, which took into account various dimensions of the oars and two images of each oar. The first image is of the entire oar and the second image shows only the paddle, which is of extreme importance to the rower so he may know which side to use the oar on and whether it is for the front or back of a particular boat. The completed oar database may be seen in Appendix J.

The database will be used in the same method as the Fórcole inventory. The database will help Arzanà keep an up-to-date record of its oar collection and will also help them to keep track of which oar(s) are currently being used or rented out. The number on each oar also makes it very simple to find that particular oar in the table and to open up that oar's form if necessary.

4.1.4 Inventory of Fórcole at Arzanà

One of the primary concerns of our sponsor was the completion of the fórcole inventory that was begun by the 2004 project group. Fórcole are a unique aspect of Venetian rowing and certainly are deserved of their artistic appreciation. There are only three *remeri*, or fórcole making shops left, and only with these is the survival of fórcole guaranteed. As such, it was integral to Arzanà that the fórcole inventory was completed and sorted so that all persons may appreciate this fine piece of Venetian culture.

This year, we continued the process that the 2004 group used for measuring and cataloging the fórcole. The final product was placed into a Microsoft Access Database, which provides thorough detail about the fórcole including the dimensions of each fórcola, four images of each piece and a locating number that was placed onto each item for easy recognition and inventory purposes.

There were a total of ninety-six fórcole collected and cataloged. The catalog of fórcole reveals the identification number, various measurements, boat type, and photos for each item. The breakdown of the number of fórcole for each particular traditional boat type can be seen in **Table 1** and **Figure 36** respectively. The completed fórcole inventory can be seen in Appendix K.

Forcole Type Breakdown	
Batela	18
Bragozzo	4
Caorlina	32
Caorlina, Homemade	1
Gondola	11
Mascareta	1
Peata	3
Sandolo	18
Topo	2
Miscellaneous	6
Total:	96

Table 1: Fórcole Inventory Breakdown

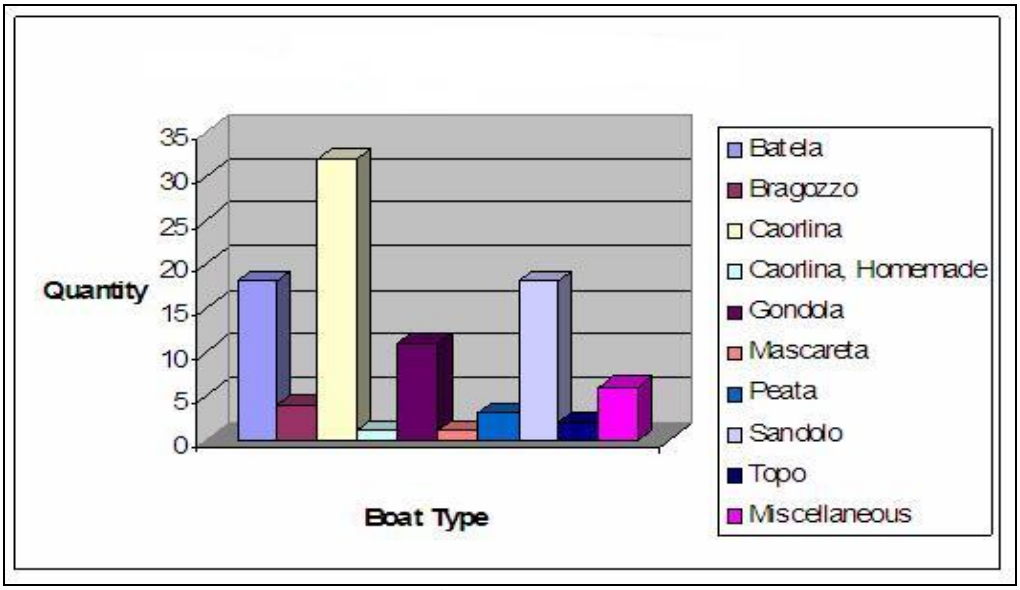

Figure 42: Fórcole Inventory Breakdown

4.1.5 Rare Boat Parking Spots

The first GIS map in Appendix G reveals the rare boat parking spots that are registered in the city of Venice. A rare boat was determined, in coherence with the 2004 project group, as that with 10 or fewer existing examples in Venice. As stated in the methodology, our group went to the registered spots at various times of the day and week over the course of our stay in Venice to determine if the parking spots were indeed holding a traditional boat at any time. If a rare traditional boat was located, a photograph of it was taken, and the boat was entered into a Microsoft Access database. The parking spot was then colored green on MapInfo to indicate the presence of that boat in the parking spot.

Due to time constraints, we were unable to complete this section of our methodology to the full extent. Of the parking spots that we were able to visit, we located 10 boats. The partially updated GIS map can be seen in Appendix H, and the database of the boats that we were able to locate can be seen below in **Table 2**. It would be possible for future groups to complete our database using the forms that we have created.

ID	Category	Boat Type	Length	Width	Motor	Propulsion	District	Existent?
2	Transport of Goods	Batela	10.07	1.97	Onboard		Castello	Yes
5	Transport of Goods	Batela	10.05	1.77	No		San Marco	Yes
7	Other	Beccaccino	4.8	1.5	No		Dorsoduro	Yes
29	Transport of People	Patanino	3	1.5	No		Castello	Yes
30	Transport of People	Pupparino	9	1	No	Oars	Castello	Yes
37	Transport of People	Pupparino	8.6	1.2	No		Santa Croce	Yes
40	Transport of People	Sandoletto	7	1.2	No	Oars	Castello	Yes
44	Transport of People	Sandoletto	6.6	1.05	No		Santa Croce	Yes
48	None	Topetto	6.75	1.8	No		Dorsoduro	Yes
51	Other	Varigola	6.3	1.6	No		Santa Croce	Yes

Table 2: Rare Boat Parking Spot Data

4.2 Showcasing the Nautical Heritage of Venice

Results of this aspect of our project went above and beyond expectations. Through various meetings with our advisors, on-site liaison, tour guides and locals we were able to create a set of walking tours to cover substantial ground over Venice and the surrounding islands of the lagoon. Data produced from this section includes a map and a catalog of the Heritage Tour Elements.

4.2.1 Catalog of Nautical Heritage Elements

Documenting the Elements of Nautical Heritage in Venice, Italy was not an easy task. Locating the areas of study at times proved difficult, and at other times the item for which we were searching was inaccessible. However, after a number of different approaches, added research and talks with Venetian tour guides, we were able to produce a number of select items that reveal the Nautical Heritage of Venice.

The items involved come from a varying array of structures in Venice including, but not limited to, churches, statues and other individual pieces of art, museums, and *squeri*. Upon locating a suitable element for our tour, it was necessary to document it in the correct manner. As such, we wrote down any pertinent information about the object

discovered and captured an image of that object. This documentation proved useful for us to create a catalog of the nautical heritage elements.

The information documented included the address or nearest address of each item, the builder/artist/architect for each item, the year the object was erected and any other significant information that we were able to obtain about the object. Upon locating these items, our group further researched them through a number of texts, internet resources and inquisitions of our on-site liaison Giovanni Caniato and advisor Fabio Carrera. In total, we located 33 places of nautical interest in Venice. The complete database of Nautical Elements can be seen in Appendix L.

In addition to creating a Microsoft Access database of Venice's nautical elements, we also created a GIS map showing the location of the various elements. From this map, we created a thematic map that assigns a symbol to each type of item, including churches, museums, squeri, and other items. This map can be seen below in **Figure 37** as well as in Appendix M.

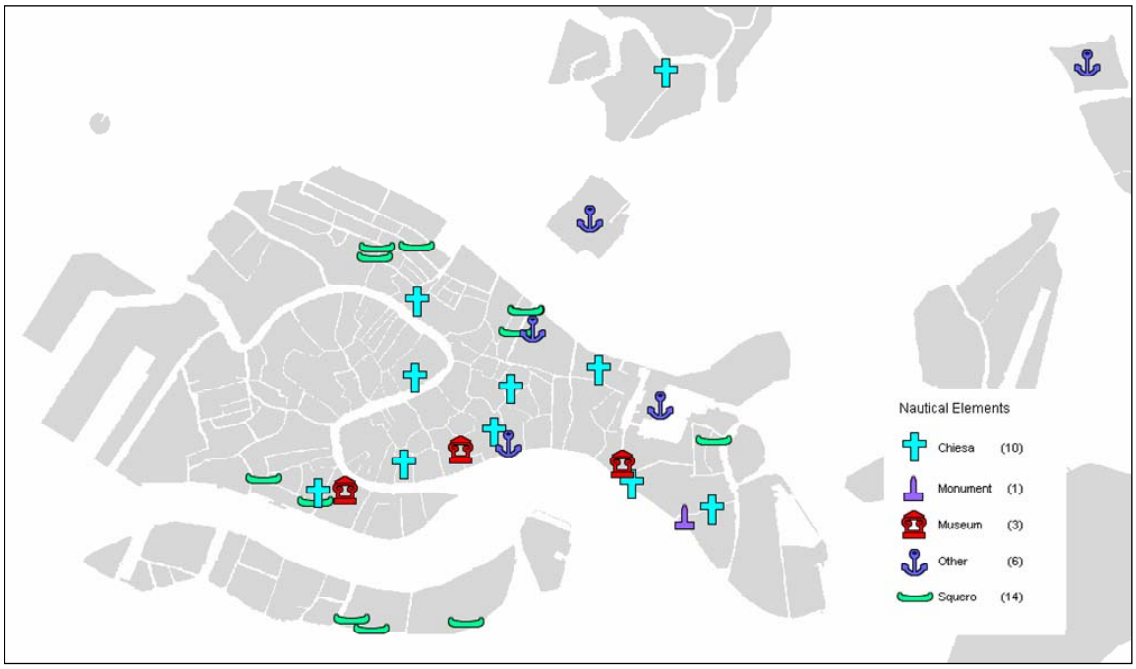

Figure 43: GIS map of Venice's Nautical Elements

4.2.3 Nautical Heritage Tour

By combining the GIS MapInfo program and the Microsoft Inventory of nautical elements, our group was able to create a Nautical Heritage Tour of Venice. We isolated the major nautical elements in Venice, a map of which can be seen below in **Figure 38**. A brochure was designed to accompany the tour, which shows the map of each place's location as well as a description of each major site. It is important to note that each stop on the tour is a site that would normally be visited by any visitor to Venice – for example, San Marco, Palazzo Ducale, and Museo Correr. Our brochure is designed to point out and describe the nautical elements that can be found within these major tourist sites. The brochure can be seen below in **Figure 39** as well as in Appendix O.

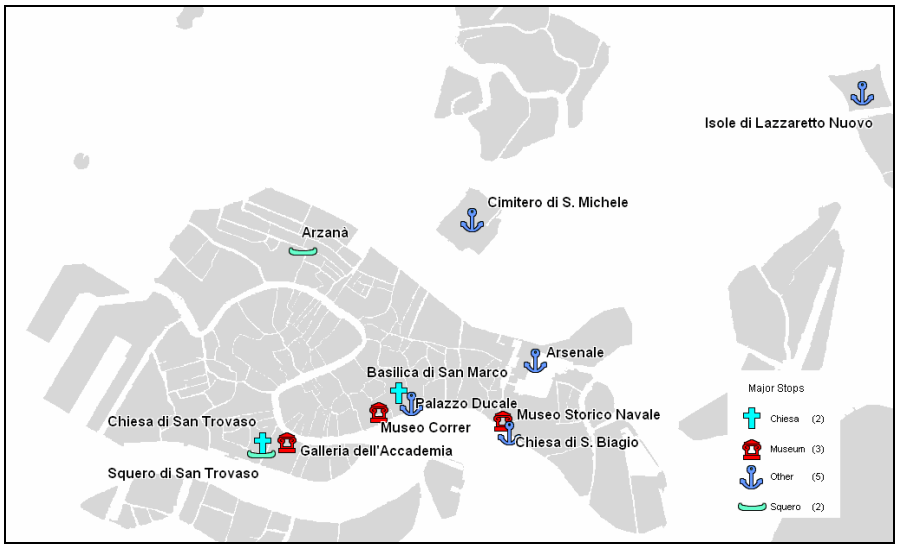

Figure 44: Major Nautical Sites

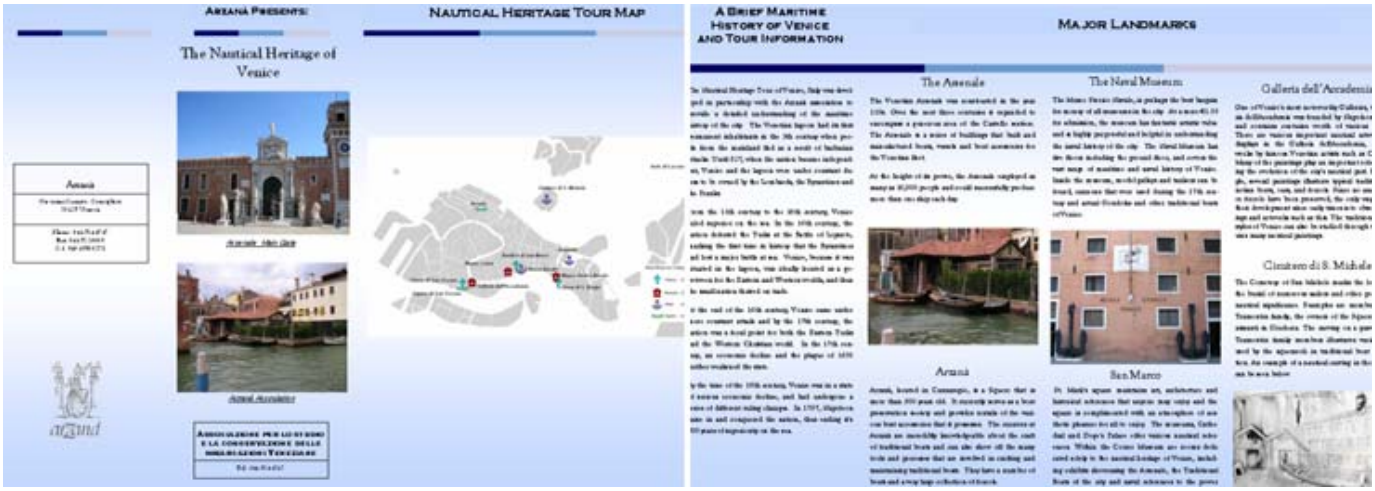

Figure 45: Nautical Heritage Brochure

Although it is likely that there are a number of additional lesser-known nautical elements present in Venice, due to time constraints we were unable to create a complete catalog of every item. However, the form and database that we have created may be implemented by future groups to create a more extensive and detailed database of the nautical elements in Venice.

4.3.4 Nautical Heritage Website

Once all of the data was collected and the Nautical Heritage database and maps were completed, all of the information was placed online for public viewing. This website includes a separate webpage for each nautical element, including various pictures of the element and a detailed description of its nautical significance. This website can be used in addition to the brochure as a supplement to the nautical tour. The URL for this website is:

http://www.wpi.edu/Academics/Depts/IGSD/Projects/Venice/Center/Projects/IQP/E05/E05_Boats/NauticalHeritage.

Screenshots of the website can be seen in Appendix P.

4.3 Awareness and Fundraising

Results of this section come primarily through what our group considered would be the biggest global-awareness program, the internet. Instead of creating one website solely for Arzanà, we developed two websites. Other results for awareness and fundraising include our walking tour brochure which is currently being distributed at

Arzanà and will hopefully be distributed at various museums and historical societies in Venice in the near future.

4.3.1 English Arzanà Website

The Arzanà website will hopefully ultimately prove to be most effective for creating awareness of the organization and their objectives. The Arzanà website provides many various characteristics that make it a powerful tool for awareness, fundraising and business improvement or expansion.

The most beneficial and obvious characteristic of the Arzanà website is that it provides direct publicity for the association. By being online, internet users may come across the Arzanà website and find interest in it. Boat and maritime enthusiasts will have the ability to research the materials provided by the Arzanà website, theater and film industries will be able to search the website for rental items and other users may inadvertently stumble upon the website but find interest in it.

Secondly, the Arzanà website provides images of the diverse tools and accessories that the organization has in their collection and also provides an inventory of the quantity of those tools and accessories. This collection includes the forcóle, oars and other tools in the Arzanà collection. Not only does this help Arzanà to showcase their belongings, it also provides explicit materials that are related to the rich maritime history of Venice, Italy.

Third, the website will allow interested movie producers to rent available Arzanà items online. This aspect of the website will smooth the process with which the association rents its available items to movie producers. There is also the opportunity for people to make donations to Arzanà through the website, a potential source of fundraising for the association.

Lastly, the Arzanà website will provide direct links to the Nautical Heritage Walking Tour Website and various other maritime-related organizations in Venice. This option will give those organizations added exposure to tourists and maritime enthusiasts and will hopefully lead to good ties with those organizations for Arzanà in the very near future.

The success of the website cannot be immediately inferred because it will take some time for its known existence to expand. However, with a little work Arzanà will be able to effectively showcase their website and thus elucidate their purpose as an organization. After a trial period, the success of the website can be assessed based upon

the number of hits it receives; since a hit counter has been included on the website, this information will be easily obtained.

The URL for Arzanà's website is:

http://www.wpi.edu/Academics/Depts/IGSD/Projects/Venice/Center/Projects/IQP/E05/E05_Boats/Arzana.

Screenshots of the website can be seen in Appendix Q.

4.3.2 Nautical Heritage Website

The Nautical Heritage Walking Tour website will be implemented to serve a number of purposes. First and foremost, the tour will vastly improve access globally to the many elements of nautical heritage in Venice outside of the well-known gondola. The website provides an in-depth description of each item on the tour, with an image of each spot to give an understanding of what other nautical elements may be in the area. Lastly, the Nautical Heritage website has a copy of the same brochure which is currently being distributed at Arzanà, a brief maritime history of the city and a number of other historically important contexts.

The Nautical Heritage website is an invaluable resource for Arzanà because it gives them exclusive compliments and provides a link to the Arzanà website. The website is additionally beneficial because it provides links to other boat-related organizations including the Maine Maritime Museum and the Official Gondola website.

As with the Arzanà website, the success of the Nautical Heritage Tour Walking website cannot be immediately evaluated. A trial period must be given in order to assess the success of the website. This will be done by keeping track of the number of hits to the website, e-mails and inquisitions to Arzanà and various other tracking systems.

The URL for this website is:

http://www.wpi.edu/Academics/Depts/IGSD/Projects/Venice/Center/Projects/IQP/E05/E05_Boats/NauticalHeritage.

4.3.3 Nautical Heritage Walking Tour Brochure

The use of the Nautical Heritage Walking Tour Brochure will provide immediate results for the awareness of the use of traditional boats in the city of Venice. The four-fold brochure is currently being distributed at the Arzanà Squero and will hopefully be distributed at various other museums and boat organizations in Venice, including the Naval Museum, in the near future.

The brochure is highly useful because it gives a brief background of the importance of ships and boats for Venice in its history, provides basic details of the major stops on the Nautical Heritage Walking Tour including the Naval Museum, the Arsenale and Arzanà and the brochure provides a GIS Map of the Nautical Walking Tour.

The brochure is useful because it is inexpensive to reproduce, may be easily altered with time and by more experience brochure publishers and can be immediately distributed to tourists and maritime enthusiasts in the city of Venice. It would be beneficial to keep track of the number of brochures distributed over a time period to thus determine if the supplementation of tour guides would be useful and financially feasible to the Arzanà association.

5. CONCLUSIONS AND RECOMMENDATIONS

In order for the preservation of historic Venetian boats to continue, it is important that various preservation efforts continue. There are many opportunities for fundraising for traditional boats, awareness to the threat of traditional boats, and reintroduction of traditional boats to everyday Venetian life.

5.1 Arzanà

Perhaps the most significant source for continued preservation of traditional Venetian boats lies within the Arzanà Association. There are many possible tasks that they might undertake in order to increase preservation efforts, as well as to benefit their association directly. Various ideas may include organization and cleanup of their headquarters, museum displays of their items, and various other fundraising programs.

5.1.1 Arzanà Headquarters

After completion of the Arzanà inventory a few recommendations have been developed to allow Arzanà to have a steadier stream of fundraising. The first recommendation would be for Arzanà to clean up and organize their headquarters. This would allow the association to implement better use of the main building that holds the various nautical items owned by Arzanà.

While inventorying items at Arzanà, we noticed that some items were damaged or there was an excess amount of them. If an item is damaged it would be best to remove the item or fix it. A damaged item will not be able to bring funds for restoration or companies will not want to rent a broken item for a display or movie. Removing some of these items will provide more room in Arzanà, which is already quite crowded with various items. Another task for cleaning up Arzanà would be to remove some items that are in excess. When taking the inventory, there were about 45 baskets in the headquarters. Not all of the baskets were in good shape and not all of them were historical/nautical. Removing some of these excess items and only keeping some of them would help to increase more space in Arzanà, thus making item rental processes easier, smoother, and much more organized.

5.1.2 Public Displays

When the clean up of Arzanà is complete, more fundraising options will become available. One option that might be considered is turning the front room of the Arzanà

headquarters into a display area. With the extra room made from clean up, some of the items could be moved around so that the more significant nautical items can be moved into the front room. In the front room visitors would be able to come to Arzanà and view some very rare and unique aspect of Venetian nautical heritage. The various tools used in making the boats, the old gondola seating cover, and other nautical items would likely interest many people. If a small fee was charged for viewing this exhibition, Arzanà could bring in some more money for the goal of restoration.

In addition to public displays at the Arzanà headquarters, the association might also consider making some of their nautical items available for museum displays. Museums such as the Museuo Historico Navale would likely be very interested in the nautical items owned by Arzanà. Since there are large quantities of many of the various items, donations of a few examples of the more important and significant items to museums could be considered. Perhaps the most important item owned by Arzanà is the gondola da fresco, the last existing gondola of its kind. Significant funding could be brought in by allowing public display of this very important piece of nautical heritage, whether in a museum or at the Arzanà headquarters.

5.1.3 Partnerships

A possible important source of funds may be through partnerships with various nautical organizations in Venice. An important example would be the Museo Historico Navale. Forming a partnership with such a museum would allow public display of Arzanà's various items, as well as publicity for Arzanà. In addition to allowing public display of their nautical items, Arzanà could also distribute brochures at the museum. This brochure would contain information on Arzanà, including its purpose, contact information, and information about making donations to the association. Also, a partnership with a museum would be an outlet for any other various books or articles that could be sold. This money could also be used for funding restoration projects. If Arzanà were to seek out partnerships such as this with various nautical organizations in Venice, important sources of fundraising and publicity could be gained.

5.1.4 Other Fundraising Opportunities

In addition to creating public displays and forming partnerships, many other fundraising opportunities exist for Arzanà. One of these is our proposed 'Adopt-a-Boat' program. The development of an 'Adopt-a-Boat' program could potentially provide significant funds for the restoration of traditional boats. This program would be designed

similarly to existing 'adopt-a' programs, such as the 'Adopt-a-Horse' program.[110] The Adopt-a-Horse organization is run such that a person contributes a particular one-time expenditure toward a horse and also pays biannual veterinary fees. The benefit of adopting the horse is the capability of being able to ride the horse whenever the sponsor is in the same area as the horse. It is possible that Arzanà would gain significant funds by creating this type of program for their various boats, in which the donated money could be used for restorations. The program could be implemented online on the website that we have created for Arzanà. A possible outline of the Adopt-a-Boat specifics can be seen below in **Table 3**.

Amt. Donated	Boat Adopted	Adoption Benefits
$1-$99	-	Name on donor website
$100-$299	Sandolo	Riding benefits for 1 wk/yr, name on website
$300-$499	Batela	2 wks riding/yr, name on website
$500-$999	Gondola	3 wks riding/yr, name on site
$1000+	Choice	Month riding privileges, name on site; invite to annual Arzanà dinner

Table 3: Possible Adopt-a-Boat Specifics

5.1.5 Website

An important opportunity for Arzanà is to increase and continue the use of the website that we have created. It would be possible for Arzanà to use the website to allow for movie prop rentals. An idea would be to create the capability of selecting which item(s) a user would like to rent for varying purposes. Next to each image would be a checkbox, and next to each check box a text box where the user may input specifics of what s/he is looking for, including the quantity of the object requested, the requested dimensions of the object selected and whatever other particulars the user is looking for. Implementing a system such as this would allow for a much easier and smoother rental

[110] *Adopt-a-Horse.* www.adoptahorse.org.

process for Arzanà. In addition to using the website for rental purposes, the publicity that Arzanà would receive through continued usage of the website would be very beneficial.

5.2 Awareness of the Threat to Traditional Boats

The decreased presence of traditional boats in Venetian society is a still increasing problem. There are many opportunities to promote increased awareness to this problem, and implementation of these opportunities may allow for fundraising for the restoration of traditional boats, as well as increased used of these boats in everyday Venetian life.

5.2.1 Online Opportunities

One of the most readily available opportunities for increased awareness to the threat of traditional boats is through the world wide web. The websites that we have created for Arzanà and for the Nautical Heritage of Venice both provide extensive opportunities to spread information about traditional Venetian boats and their decreased presence in Venetian society today. If traditional boats had a powerful presence on the web, people may be more likely to make donations towards the restoration of traditional boats. It is important that the use of our websites is continued, and that many websites relating to the traditional boats are created.

5.2.2 Reintroduction of Traditional Venetian Boats

There are many available opportunities to increase the use of traditional Venetian boats for everyday tasks, rather that just for leisure or sport. Many of these opportunities were presented by the 2004 project group. These opportunities include reopening of rowboat rental facilities, taxi services, use of traditional boats by the *vigili* (Venetian police), and traveling Venetian boat shows.

The possibility of reopening rowboat rental facilities could potentially be an important source of increased use of traditional Venetian boats in the city. It is likely that people interested in traditional Venetian boats would be willing to pay to rent a traditional boat, take a tour on a traditional boat, or receive rowing lessons. In addition to increasing the use of traditional Venetian boats, this could also be an important source of fundraising.

The possibility of creating a taxi service that utilizes traditional boats could create a very convenient method of transportation for many people in Venice. For example, the vaporettos often become crowded, motor-taxis are quite expensive, and gondole have

restricted access to certain areas of the canals. Traditional boats would be able to access areas that are otherwise inaccessible, and possibly provide the quickest and most efficient form of transportation.

Use of traditional boats by the Venetian police, or *vigili*, could be beneficial because it would allow access to areas of the canals that they could not access in motor-powered boats. While use of traditional boats would not replace the use of motor boats, the increased access to areas of the canal could allow the Venetian police to accomplish certain tasks more easily.

An important opportunity for increased use of traditional boats and awareness to their plight is the creation and implementation of traveling boat shows. The *Settemari* Rowing Club is already planning to bring several unique Venetian boats to the United States and present them in various locations.[111] If other organizations were to implement this idea, interest in Venetian boats will increase in areas other than Venice. An existing Venetian rowing club that currently travels with their boats is *Circolo Nautico Generali*, and over the past twenty years has visited places such as New York, Washington, and the Thames River.[112] The increased awareness and interest in traditional boats that could result from traveling boat shows such as this would be extremely beneficial.

5.3 Future Project Work

Because we were not able to complete every aspect of our project to the detailed extent that we would have liked to, there is an opportunity for future groups to extend the work that we have done. The first step would be to ensure the continued usage of our inventories by Arzanà, as this would be very beneficial to the association. The inventories would have to be updated as Arzanà gains possession of new items. Another idea would be to help Arzanà remove items from their inventories that are not useful, such as broken items. Future project groups could also create an extensive database of the traditional boats owned by Arzanà, using the database and forms that we created this year. Creating CAD drawings of these boats on SurfaceWorks would be critical, as it would allow future reconstruction of any boat types that may eventually become extinct.

Another important task that might be undertaken by future project groups is to instill various fundraising and awareness programs. This may including facilitating the creation of partnerships between Arzanà and other nautical societies, implementing

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[111] Candlish, Sean; Shevlin, Craig; Stout, Sarah. *The Traditional Boats of Venice – Assessing a Maritime Heritage,* 61.
[112] *Idem.*

various fundraising programs such as Adopt-a-Boat, and creating and implementing several other fundraising and awareness programs.

The last task that needs to be completed is the creation of an extensive database of the nautical elements in Venice. While we were able to document the major places, the lesser-known and obscure items still need to be documented. The database and form that we created could be implemented, and the GIS layer that we created could be added to.

5.4 Final Thoughts

The founding, development, and success of Venice has been highly dependent on the city's important relationship with the surrounding sea. Throughout history, Venice has depended on the Adriatic for protection and survival. Consequently, the nautical history of Venice became unique from any other, and the nautical traditions of the city became an integral part of Venetian heritage – perhaps the most important aspect of it.

The advances in technology and evolution of motors and gears in the recent years have caused significant changes in Venice's relationship with the sea. No longer do traditional boats populate the canals as they once did not long ago. While more efficient and convenient than traditional rowboats, the introduction of motor-powered boats to the city has resulted in a dwindling presence of traditional boats, aside from disturbing the once calm waters of the lagoon and canals.

Through various means, this project has demonstrated the importance of nautical traditions to the city of Venice. The maritime heritage of Venice can be seen in multiple forms throughout the city – from obscure carvings of boats to buildings and structures as grand as the Arsenale. While the strong presence of the city's nautical traditions is quite evident, measures must be taken to ensure that the struggling aspects of the maritime heritage are preserved. It is with hope that further efforts will be taken to restore and preserve those traditional boats that are in need of safeguarding.

While awareness, restoration, and preservation efforts are necessary for the continued presence of traditional boats in everyday life in Venice, there the ways in which they are still present are very significant. The many rowing clubs throughout Venice, various regate, and other nautical organizations ensure that the presence of traditional boats in the city will be continued. The respect given to rowers of traditional boats by drivers of motor-powered boats indicates that the importance of nautical traditions still lives in Venice. Overall, although efforts must be taken to ensure the

preservation of maritime heritage in Venice, there is no doubt that the presence of nautical traditions will never disappear from the city.

BIBLIOGRAPHY

Candlish, Sean; Shevlin, Craig; Stout, Sarah. *The Traditional Boats of Venice: Assessing a Maritime Heritage*. July 30, 2004

Gazzola, Piero et. al. *The Venice Charter – International Charter for the Conservation and Restoration of Monuments and Sites*. <http://www.icomos.org/docs/venice_charter.html>

Knopf, Alfred A. *Knopf Guides – Venice*. New York, 2001.

Lanapoppi, Paolo. "Six Centuries of Gondolas." *WoodenBoat*. No. 152, Jan/Feb 2000: p 42-49.

Lane, Frederic C. *Venice, A Maritime Republic*. John Hopkins U. Baltimore: 1973.

Martin, Lillian Ray. *The Art and Archaeology of Venetian Ships and Boats*. Texas A&M University Press: 2000.

Penzo, Gilberto. *Fórcole, Remi e Voga all Veneta*. Il Leggio Liberia Editrice: 2002.

Penzo, Gilberto. <http://www.venetia.it/boats/penzo_eng.htm>

Pergolis, Riccardo and Pizzarello, Ugo. *Le Barche Di Venezia*. Liberia Editrice: 1999.

Simonis, Damien. *Venice, City Guide*. Oakland: Lonely Planet Publications, 2004.

Smith, Robert. *Smith's Master Index to World Wide Maritime Museums*. <http://maritimemuseums.net>.

Witty, Anne. "Beyond The Gondola". *WoodenBoat*. No. 153, April 2000: p. 50-59.

Adopt-a-Horse. <http://www.adoptahorse.org>.

Coronado Yacht Club Junior Sailing Program. <http://juniors.coronadoyc.org/fundraising/donate.php>.

The DSA Adopt-a-Boat Program. <http://www.reachdisability.org/dsa/adopt_a_boat_program.shtml>.

International Congress of Maritime Museums. <http://www.icmmonline.org>.

Instituzione per la Conservazione della Gondola e la Tutela del Gondoliere. <http://www.gondolavenezia.it/homeng.asp>

The Maine Maritime Museum. <http://bathmaine.com/>

National Trust for Historic Preservation. <http://www.nationaltrust.org/>

The Original London Walks. <http://london.walks.com/>.

Preservation Organizations.
<http://www.preservationdirectory.com/preservationorganizations_main.html>.

The Rowing Season.
<http://www.comune.venezia.it/turismo/feste/stagioneremiera/en_home.asp>

Saint Mark and the Virgin Mary.
<http://www.muspe.unibo.it/period/MA/index/number1/fenl1/fe1_3.htm>

United Nations Educational and Scientific Organization (UNESCO) – World Heritage Center.
<http://whc.unesco.org>

Venetian Arsenal. <http://en.wikipedia.org/wiki/Venetian_Arsenal>

Venetian Boats. <http://www.venetia.it/boats/>

Venice History. <http://www.encyclopedia.com/html/section/venice_history.asp>

Venice, Italy. <http://www.cheapvenice.com/index-venice.htm>

The Venice Naval History Museum.<http://goeurope.about.com/cs/venice/l/aa021703a.htm>

Vogalonga History. <http://www.vogalonga.com/inglese/history.htm>

APPENDIX A: Annotated Bibliography

Candlish, Sean; Shevlin, Craig; Stout, Sarah. "The Traditional Boats of Venice: Assessing a Maritime Heritage". July 30, 2004

This is the IQP completed last year. This is the most useful source, as it included background information, aspects of the methodology, results, and analysis, field forms, databases, and GIS maps.

Wooden Boats and Traditional Boats of Venice

Evans, Quinn. "A Canal in Venice". <http://www.emich.edu/public/geo/technology.html>

This article discusses the problems with the preservation of Venice as a whole, from buildings to canals and even to traditional boats. It discusses the transition from traditional boats to motorized boats, and the effect that it has had on the city's landscape.
Source: This article was identified from last year's project and was accessed online.

Lanapoppi, Paolo. "Six Centuries of Gondolas." *WoodenBoat*. No. 152, Jan/Feb 2000: p 42-49.

This article found in WoodenBoat provides with a great background on the *Gondola* and how its change in purpose over the years. The article also included information on the *squeri* and *squeri* owners.
Source: This source was identified from last year's project, and the magazine was purchased from WoodenBoat.com.

Martin, Lillian Ray. *The Art and Archaeology of Venetian Ships and Boats*. Texas A&M University Press: 2000.

This book provided background information on the construction of Venetian boats and the uses of Venetian ships and boats in art.
Source: A WorldCat search for "Venetian Boats" was performed, and the book was borrowed through Interlibrary Loan from Boston College.

Penzo, Gilberto. *Fórcole, Remi e Voga all Veneta*. Il Leggio Liberia Editrice: 2002.

This book provided extensive details on Venetian *fórcole* and *remier*. It was useful for taking measurements of the oarlocks at Arzanà as well as determining the uses for various nautical elements at Arzanà.
Source: Fabio Carrera.

Penzo, Gilberto. *La Gondola: Storia, progettazione e construzione della più straordinaria imbarcazione tradizionale di Venezia*. Istituzione per la conservazione della gondola e la tutela del gondoliere: 1999.

This book provided background extensive background information on the gondola and its history and construction.
Source: Fabio Carerra

Pergolis, Riccardo and Pizzarello, Ugo. *Le Barche Di Venezia*. Liberia Editrice: 1999.

This book provided extensive background on the construction of traditional Venetian boats and other information about Venetian boats.
Source: Fabio Carerra

Pizzarello, Ugo. *Barche A Venezia.* L'Altra Rive: 1984.

This Italian book provided some background information and images of the various traditional boats of Venice.
Source: Fabio Carerra

Price, Tom. *Squero Canaletto.* <http://www.squero.com/>.

This website provides background information on how Gondolas are built.
Source: Google search for "Venice Squero".

Vittoria, Eugenio. *The Gondolier and His Gondola.* Editrice EVI: 1981.

This book provided information on the gondolier, gondolas, other traditional boats, and also indicated places of nautical heritage in Venice.
Source: Fabio Carerra

Witty, Anne. "Beyond The Gondola". *Wooden Boat*. No. 153, April 2000: p. 50-59.

This article from WoodenBoat magazine provided extensive background on the different traditional boat types, their uses and decline today, and groups aiming towards preserving traditional boats.
Source: This source was identified from last year's project, and the magazine was purchased from WoodenBoat.com.

Zanelli, Guglielmo. *Squeraroli e squeri.* Stabilimento Grafico G.C. Tonolo: 1986.

Although in Italian, this book provided information about the various methods and tools used by the squerarióli during boat construction.
Source: Fabio Carerra

Zanelli, Guglielmo. *Traghetti Venziani: La gondola al servizio della città*. Il Cardo: 1997.

This Italian book provided information about Venice's traghetti and various traditional boats.
Source: Fabio Carerra

***Instituzione per la Conservazione della Gondola e la Tutela del Gondoliere*. <http://www.gondolavenezia.it/homeng.asp>.**

This site explains the *gondola*, its shape, size and features. It is a good background for information about boat types.
Source: Google search for "Venice gondola".

Penzo, Gilberto. **<http://www.venetia.it/boats/penzo_eng.htm>**

This website provided background information about *Arzanà* and one of its founders, Gilberto Penzo.
Source: Identified from last year's project and accessed online.

The Rowing Season.
<http://www.comune.venezia.it/turismo/feste/stagioneremiera/en_home.asp>

This website provided information about Venice's various rowing clubs, as well as background information on the *regate* and *Vogalonga*.
Source: Identified from last year's project and accessed online.

Vogalonga History. **<http://www.vogalonga.com/inglese/history.htm>.**

This is the official *Vogalonga* website. It provided important background and history on this famous *regate*.
Source: Google search for "Vogalonga".

Venice Background

Knopf, Alfred A. ***Knopf Guides – Venice.*** **New York, 2001.**

This book provided very useful general information about Venice, ranging from historical facts, information about traditional boats, and background on the *regate*.

Lane, Frederic C. ***Venice, A Maritime Republic.*** **John Hopkins U. Baltimore: 1973.**

This book provided extensive background on the maritime history of Venice.
Source: WPI's George C. Gordon Library

Simonis, Damien. ***Venice, City Guide.*** **Oakland: Lonely Planet Publications, 2004.**

This book provide useful background information about Venice, most importantly information about the *regate* and boat parades.
Source: WPI's George C. Gordon Library

Venetian Arsenal. **<http://en.wikipedia.org/wiki/Venetian_Arsenal>.**

This website provided important background information on the Venetian Arsenal.
Source: Google search for "Venice Arsenal".

Venice History.
<http://www.encyclopedia.com/html/section/venice_history.asp>

This provided background information about the maritime history of Venice.
Source: Google search for "Venice".

***Venice, Italy*.** **<http://www.cheapvenice.com/index-venice.htm>**

This website provided background information about various topics, including Venetian boats, history, *squeri*, and *regate*.
Source: Google search for "Venice regate".

Museums, Fundraising and Awareness Programs

Smith, Robert. ***Smith's Master Index to World Wide Maritime Museums*.**
<http://maritimemuseums.net>.

This website provided and approximate estimation of the number of maritime museums that exist worldwide.
Source: Google search for "Worldwide Maritime Museums".

***Adopt-a-Horse*.** **<http://www.adoptahorse.org>.**

This website provided us with important background information on the "Adpot-a-Horse" program, which will serve as a model for our own "Adopt-a-Boat" program.
Source: Google Search for "Adopt-a-Horse".

The Ancient Ships of Pisa. **< http://www.navipisa.it/en/home_en.htm>.**

This is the official website for the Ancient Ships of Pisa Organization, an association that works to preserve traditional ships and boats in Pisa. This website provided us with background on existing nautical preservation programs.
Source: Google search for "Boat Preservation".

Coronado Yacht Club Junior Sailing Program.
<http://juniors.coronadoyc.org/fundraising/donate.php>.

This website provided us with important background information on the "Adpot-a Boat" program, which will serve as a model for our own "Adopt-a-Boat" program.
Source: Google Search for "Adopt-a-Boat".

The DSA Adopt-a-Boat Program.
<http://www.reachdisability.org/dsa/adopt_a_boat_program.shtml>.

This website provided us with important background information on the "Adpot-a Boat" program, which will serve as a model for our own "Adopt-a-Boat" program.
Source: Google Search for "Adopt-a-Boat".

International Congress of Maritime Museums. **<http://www.icmmonline.org**

The official website for the ICMM. This provided us with an important example of programs dedicated to nautical preservation.
Source: Google Search for "Worldwide Maritime Museums".

The Maine Maritime Museum. **<http://www.bathmaine.com>.**

This is the official website for the Maine Maritime Museum. This website provided us with an example of a museum dedicated to preserving nautical heritage, as well as background information on nautical elements.
Source: Google search for "Maine Boat Museum".

The National Trust for Historic Preservation. **<http://www.nationaltrust.org>.**

This is the official website for the National Trust for Historic Preservation, an important historic preservation center in the US.
Source: Google search for "Worldwide Historic Preservation".

The Original London Walks. **<http://london.walks.com/>.**

This website provided us with important background information on walking tours in London, which will serve as a model for our own nautical heritage tour of Venice.
Source: Google search for "Original London Walks".

Preservation Organizations.
<http://www.preservationdirectory.com/preservationorganizations_main.html>.

This website provided us with a rough estimate of the number of historic preservation organizations that exist in North America alone.
Source: Google search for "Worldwide Historic Preservation".

UNESCO World Heritage Center. **<http://whc.unesco.org>.**

This is the official website for the United Nations Educational Scientific and Cultural Organization (UNESCO) World Heritage center.
Source: Google search for "UNESCO", accessed through UNESCO's main website, http://portal.unesco.org.

The Venice Charter. **<http://www.icomos.org/docs/venice_charter.html>.**

This is The Venice Charter in document form.
Source: Google search for "Charter of Venice".

The Venice Naval History Museum.
<http://goeurope.about.com/cs/venice/1/aa021703a.htm>

This website provided us with important background information on the existing Naval History Museum in Venice.
Source: Google search for "Venice Naval Museum".

Figures

The following websites were used only for Figures that appear throughout this document.

***Caorlina*.** **<http://xoomer.virgilio.it/snfriz/barche/caorlina.html>**
Source: Google Image search for "caorlina".

***La Regata Storica di Venezia*.**
<http://venicexplorer.net/tradizione/storica.php?hlangs=it>
Source: Google Image search for "peata".

RiVivi l'Acqua: i mezzi di trasporto.
<http://www.rivivinatura.it/italian/barche.html>
Source: Google Image search for "Sanpierota".

Saint Mark and the Virgin Mary.
<http://www.muspe.unibo.it/period/MA/index/number1/fenl1/fe1_3.htm>
Source: Google Image search for "Translatio of St. Mark".

APPENDIX B: 2004 Traditional Boat Data

Traditional Boats 2004						
Boat Name	**Quantity**	**Notes**	**Traditional**	**Arzana**	**Average Length**	**Average Width**
Batèla	6	Rare	Yes	Similar to Buranella	8.71	1.81
Beccaccino	1	Endangered	Yes		4.80	1.50
Bragagna	1	Endangered	Yes		7.00	1.80
Bragozzetto	5	Rare	Yes		7.41	1.77
Bragozzo	22		Yes		50.17	13.76
Buranella	5	Rare	Yes	Also known as Batela Buranella	8.03	1.57
Burchiello	0	Extinct	Yes	Formally used to transport passengers from Venice to Padova		
Caiccio	35		Yes	Some are made of plastic	4.16	1.49
Caorlina	5		Yes	Most are stored on land	10.13	1.90
Cofanetto	3	Endangered	Yes		5.21	1.36
Colombina	0	Extinct	Yes	?		
Comacina	2	Endangered	Yes		15.11	3.71
Coronet	0	Extinct	Yes	?		
Dogaletto	0	Extinct	Yes	Similar to a Cofano from the southern lagoon		
Gondola	496		Yes		1.24	0.69
Gondola da Fresco	1	Endangered	Yes	Arzaná owns the only one		
Gondolino	1		Yes	Most are stored on land	10.00	1.10
Gozzo	20		Yes	West Italy boat	26.37	9.87
Guscio	1	Endangered	Yes	West Italy boat	2.85	1.35
Mascareta	54		Yes		6.51	1.24
Passera	2	Endangered	Yes		4.52	1.83
Passetto	1	Endangered	Yes		5.00	1.30
Patana	143		Yes	Most are made of plastic	7.60	3.43
Patanella	466		Yes	Most are made of plastic	10.72	3.47
Patanino	1	Endangered	Yes		3.00	1.50
Peàta	1	Endangered	Yes		15.00	3.50
Puparin	8	Rare	Yes		8.53	1.13
Sandoletto	10	Rare	Yes		73.13	26.04
Sandolino	14		Yes		5.95	1.23
Sandolo	252		Yes		6.36	2.36

Traditional Boats 2004						
Boat Name	**Quantity**	**Notes**	**Traditional**	**Arzana**	**Average Length**	**Average Width**
Sanpierota	380		Yes		6.26	1.99
S'ciopòn	51		Yes		6.00	1.24
Sonetto	0	Extinct	Yes	?		
Spigolo	1	Endangered	Yes	?		
Topa	408		Yes		9.71	1.94
Topetta	323		Yes		8.10	2.07
Topetto	3	Endangered	Yes		6.02	1.58
Topo	152		Yes		24.65	5.83
Trabaccolo	0	Extinct	Yes	No longer in Venice, but 2 in Grado and 1 in Istria, 1 wreck on the Sile River		
Varigola	2	Endangered	Yes		5.65	1.55
Vipera	1	Endangered	Yes	Reconstructed in 1980	10.00	1.50

APPENDIX C: Boat Type Catalog

WPI

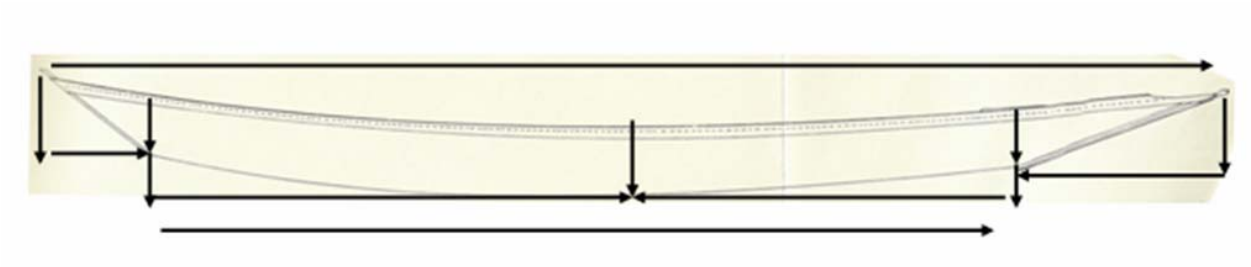
Traditonal Boats of Venice
Assessing a Maritime Heritage

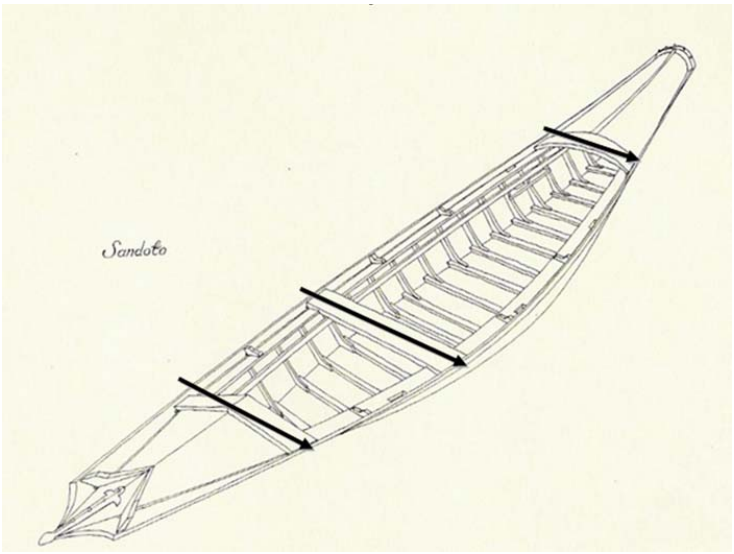
Sean Candlish, Craig Shevlin, Sarah Stout

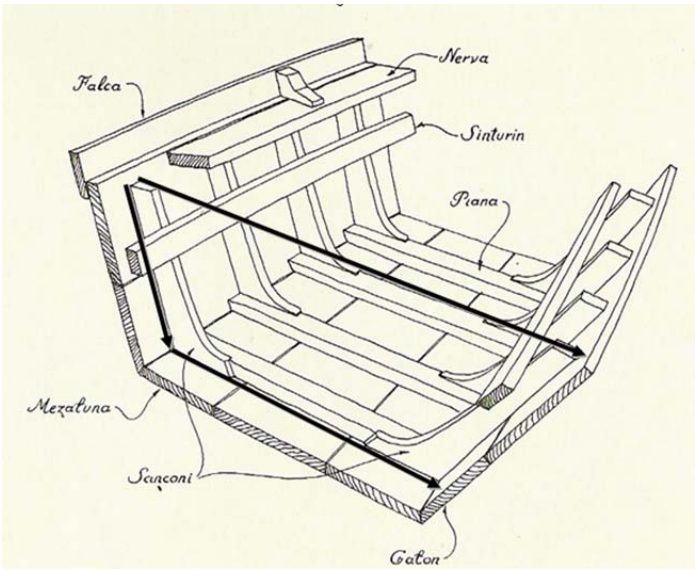
Boat Type	*Batèla*

Quantity
6
Average Length
8.7
Average Width
1.8
Traditional:
Yes
Rarity
Rare
Notes
Similar to Buranella

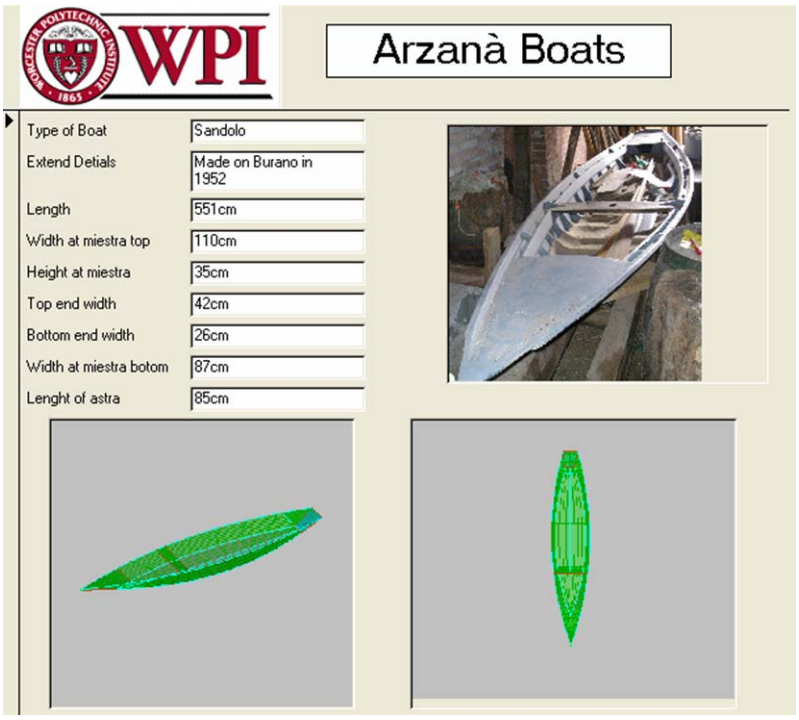
APPENDIX D: Traditional Boat Measurements

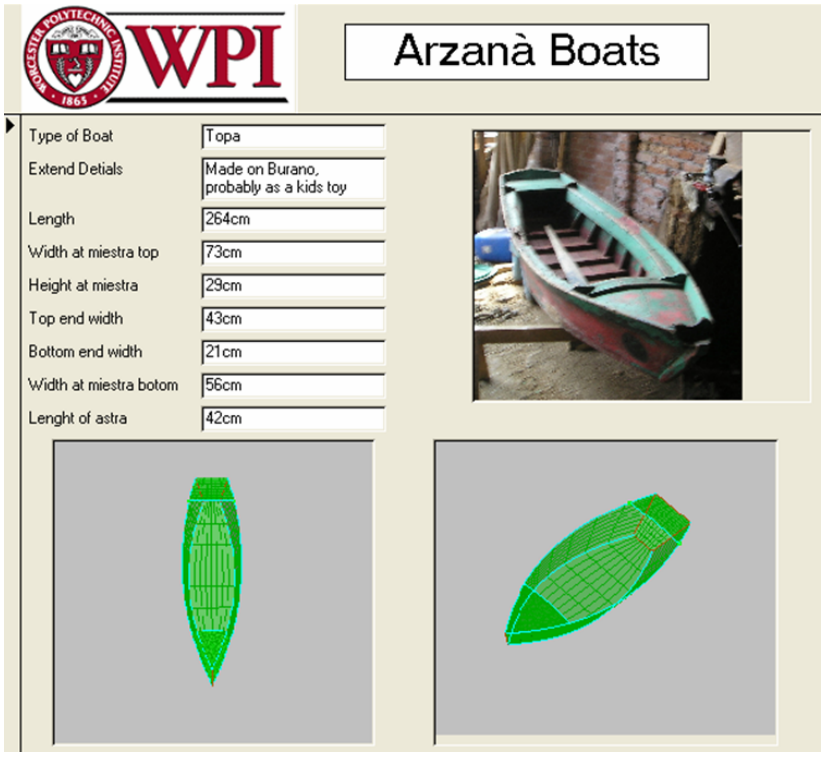






APPENDIX E: Arzanà Boat Catalog

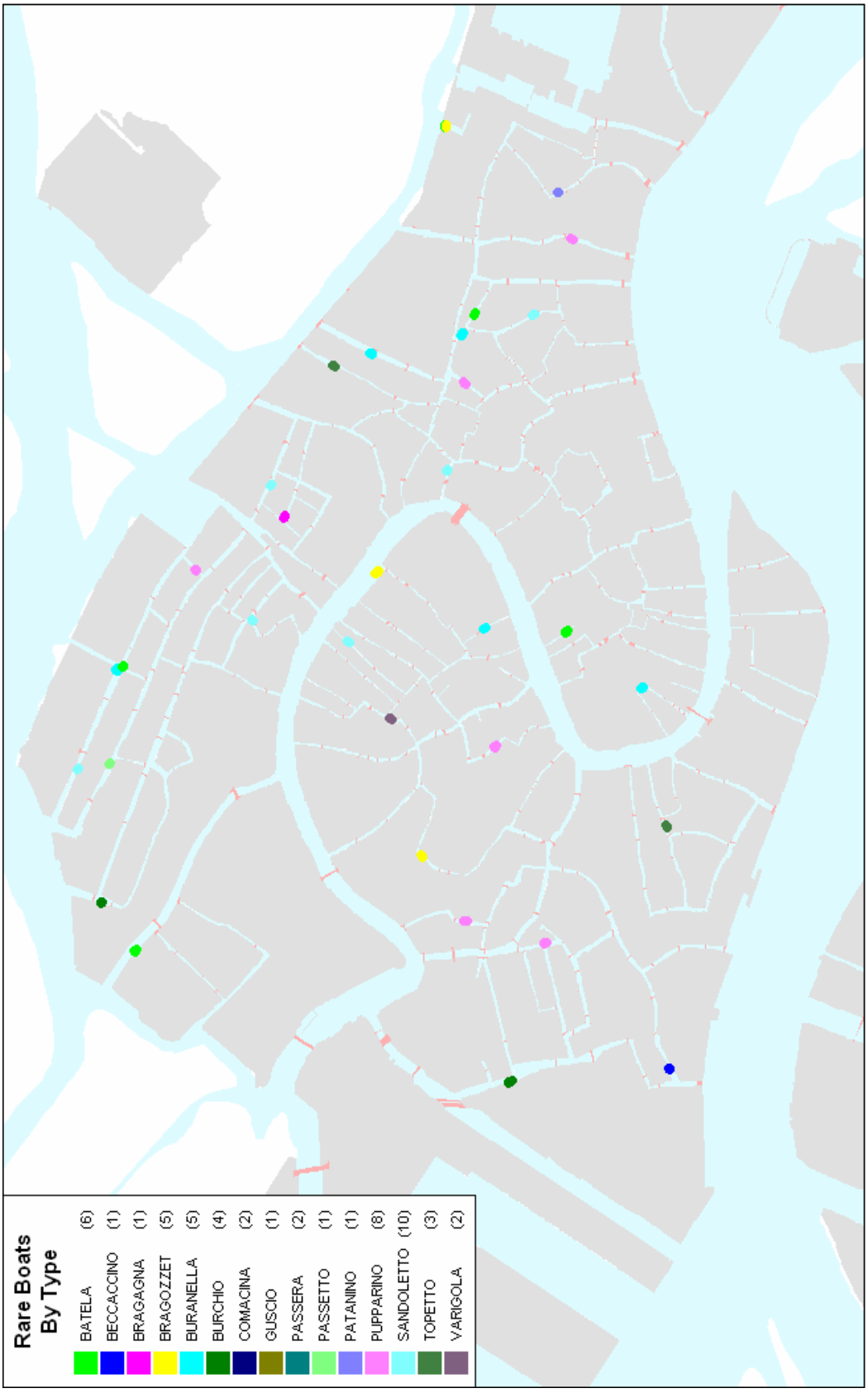




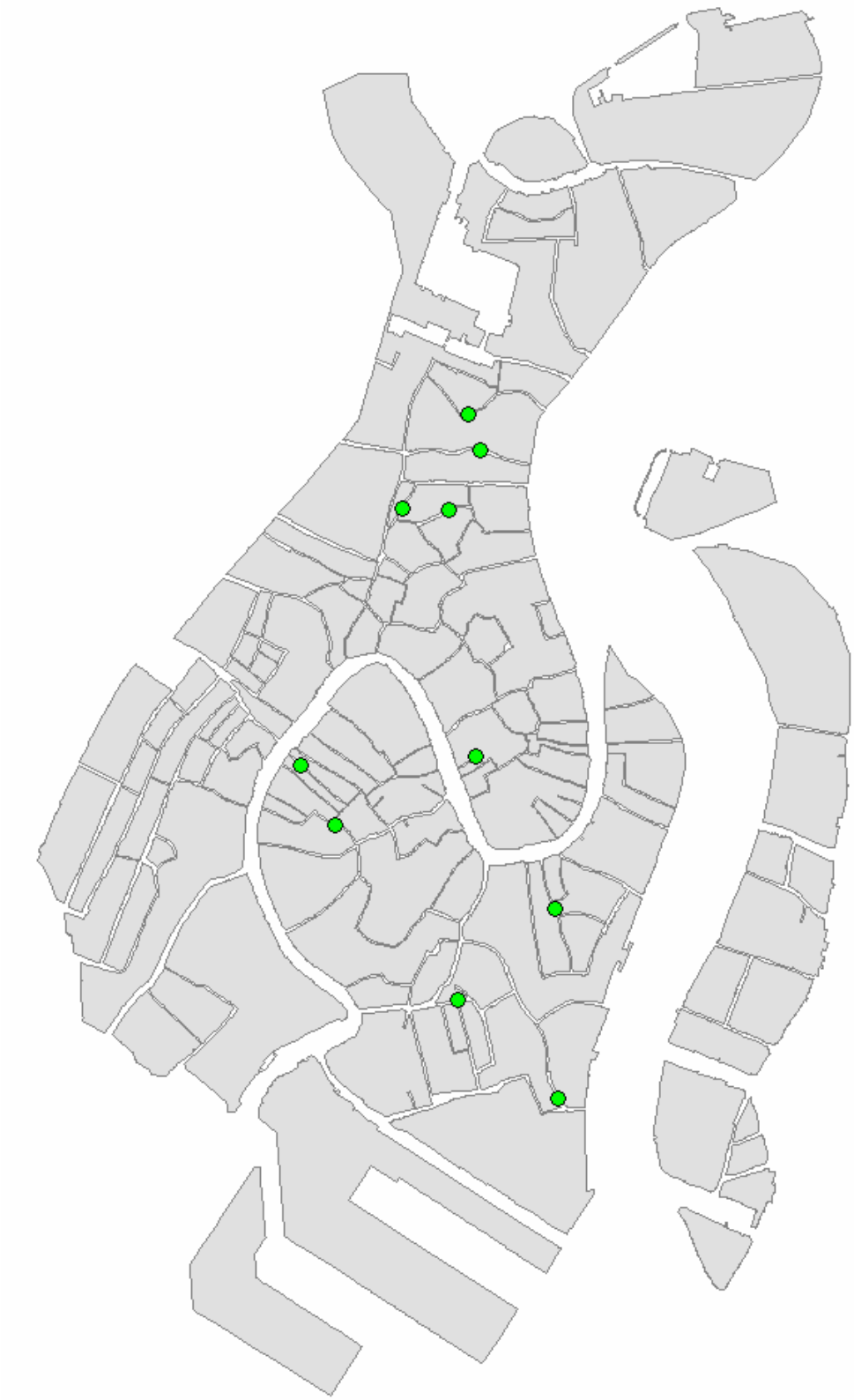
APPENDIX F: Rare Traditional Boat Types

Boat Name	Quantity	Notes	Traditional	Average Length	Average Width
Colombina	0	Extinct	Yes		
Coronet	0	Extinct	Yes		
Dogaletto	0	Extinct	Yes		
Trabaccolo	0	Extinct	Yes		
Sonetto	0	Extinct	Yes		
Burchiello	0	Extinct	Yes		
Guscio	1	Endangered	Yes	2.9	1.4
Patanino	1	Endangered	Yes	3.0	1.5
Peàta	1	Endangered	Yes	15.0	3.5
Passetto	1	Endangered	Yes	5.0	1.3
Bragagna	1	Endangered	Yes	7.0	1.8
Spigolo	1	Endangered	Yes		
Vipera	1	Endangered	Yes	10.0	1.5
Beccaccino	1	Endangered	Yes	4.8	1.5
Passera	2	Endangered	Yes	4.5	1.8
Comacina	2	Endangered	Yes	15.1	3.7
Varigola	2	Endangered	Yes	5.7	1.6
Cofanetto	3	Endangered	Yes	5.2	1.4
Topetto	3	Endangered	Yes	6.0	1.6
Buranella	5	Rare	Yes	8.0	1.6
Bragozzetto	5	Rare	Yes	7.4	1.8
Batèla	6	Rare	Yes	8.7	1.8
Puparin	8	Rare	Yes	8.5	1.1
Sandoletto	10	Rare	Yes	73.1	26.0

APPENDIX G: Rare Traditional Boat GIS



APPENDIX H: Map of Located Rare Boats



APPENDIX I: Arzanà Miscellaneous Items Database

Arzanà Miscellaneous Inventory							
Image Name	**Object**	**Quantity**	**Function of Object(s)**	**Extended Details**	**Cost to Rent**	**Cost to Insure**	**Code**
001	Mallet	3	Used for hammering objects into place	Inventory Code: 001 - Range of Dimensions: Handle length 29/25cm, Mallet length 21/9cm, diameter 8/5	$0.00	$0.00	$0.00
002	Fero Da Remer	5	Used in constructing oars	Inventory Code: 002 - Range of Dimensions: Total length 46/35cm, Blade length 32/24cm, Blade width 3.5/1.5cm, Handle length 13.5/9cm	$0.00	$0.00	$0.00
003	Saw	11	Cuts wood	Inventory Code: 003 - Range of Dimensions: Total length 103/58cm, Blade length 53/34cm, Height 38/34cm	$0.00	$0.00	$0.00
004	Nails/Stakes	26	Used for attaching objects together	Inventory Code: 004 - Range of Dimensions: Diamter 2/.5cm	$0.00	$0.00	$0.00
005	Box	1	used to hold items	Inventory Code: 005 - Dimensions: Length 31cm, Width 17.5cm, Height 6cm	$0.00	$0.00	$0.00
006	Hatchet	13	Chops wood	Inventory Code: 006 - Range of Dimensions: Handle length 76.5/12.5cm, Blade length 24.5/13.5cm, Blade width 5.5/2.5cm	$0.00	$0.00	$0.00
007	Chisels/files	37	For filling and making designs	Inventory Code: 007 - Range of Dimensions: Total Length 53/19cm, Blade length 35.5/5cm	$0.00	$0.00	$0.00
008	Large Saws	4	Cutting wood	Inventory Code: 008 - Range of Dimensions: Length 175/102cm, Width 9/6cm, Handle length 30/29cm	$0.00	$0.00	$0.00
009	Compass	8	Measuring distances	Inventory Code: 009	$0.00	$0.00	$0.00
010	Tenaglia	10	Used for pulling out nails	Inventory Code: 010 - Range of Dimensions: Length 29/12cm	$0.00	$0.00	$0.00
011	Hammer	2	Used for hammering objects into place	Inventory Code: 011 - Range of Dimensions: Length 26/13cm	$0.00	$0.00	$0.00
012	Shears	2	Cutting	Inventory Code: 012	$0.00	$0.00	$0.00

Arzanà Miscellaneous Inventory							
Image Name	**Object**	**Quantity**	**Function of Object(s)**	**Extended Details**	**Cost to Rent**	**Cost to Insure**	**Code**
013	Drills	16	Drilling holes	Inventory Code: 013 - Range of Dimensions: Length 62/38cm, Handle length 35/15	$0.00	$0.00	$0.00
014	S-Drills	5	Drilling holes	Inventory Code: 014 - Range of Dimensions: Length 51/26cm, Width 12/10	$0.00	$0.00	$0.00
015	Morsetto	5	Holding objects	Inventory Code: 015 - Range of Dimensions: Length 61/37cm, Width 19/17cm	$0.00	$0.00	$0.00
016	Saw	2	Cutting Wood	Inventory Code: 016 - Range of Dimensions: Length 60/30cm	$0.00	$0.00	$0.00
017	Ladel	1	Used for removing hot material from stove	Inventory Code: 017 - Dimensions: Length 20cm, Radius 8cm	$0.00	$0.00	$0.00
018	Bindeo	1	Used to lift boat off the ground	Inventory Code: 018 - Dimensions: Height 75cm	$0.00	$0.00	$0.00
019	Bindeo	1	Used to lift boat off the ground	Inventory Code: 019	$0.00	$0.00	$0.00
020	Clamp	1	Holds objects together	Inventory Code: 020	$0.00	$0.00	$0.00
021	Large Saw	1	Cutting Wood	Inventory Code: 021 - Range of Dimensions: Length 123cm, Width 62cm	$0.00	$0.00	$0.00
022	Wool Frame and Stick	1	Used to strecth wool and put around stick	Inventory Code: 022 - Range of Dimensions: Length and Width of Frame 68x72cm, Length of stick 90cm, Length of wool on stick 20cm	$0.00	$0.00	$0.00
023	Pulley	18	A device used to assist lifting objects with ropes	Inventory Code: 023 - Range of Dimensions: Length 47/30cm, Hold 3 to 1 ropes	$0.00	$0.00	$0.00
024	Unknown Item	1		Inventory Code: 024	$0.00	$0.00	$0.00
025	Rope	10	Various uses	Inventory Code: 025 - Range of Thickness 2.5/.5cm	$0.00	$0.00	$0.00
026	Box of Nails	1	Used to store nails	Inventory Code: 026 - Dimensions: Length 32cm, width 51cm, height 9cm	$0.00	$0.00	$0.00
027	Box of Wrenches	1	Used to store wrenches	Inventory Code: 027 - Dimensions: Length	$0.00	$0.00	$0.00

Arzanà Miscellaneous Inventory							
Image Name	**Object**	**Quantity**	**Function of Object(s)**	**Extended Details**	**Cost to Rent**	**Cost to Insure**	**Code**
				49cm, width 31cm, height 9cm			
028	Work Bench	1	Surface for doing work	Inventory Code: 028 - Dimensions: Length 116cm, width 34cm, height 56cm	$0.00	$0.00	$0.00
029	Unknown Item	1	Used for storing rope	Inventory Code: 029 - Dimensions: Height 92cm, width 25cm, radius 5cm	$0.00	$0.00	$0.00
030	Trunk	6	Used for storage	Inventory Code: 030 - Range of Dimensions: Length 108/50cm, Width 50/25cm, Height 82/23cm	$0.00	$0.00	$0.00
031	Unknown Item	1		Inventory Code: 031 - Dimensions: Height 190cm, Width 27cm	$0.00	$0.00	$0.00
032	Unknown Item	1		Inventory Code: 032 - Dimensions: Height 83cm, Width 23cm	$0.00	$0.00	$0.00
033	Basket	47	Used for storage and carrying items	Inventory Code: 033 - Range of Dimensions: Diameter 62/30 cm, height 32/21 cm	$0.00	$0.00	$0.00
034	Netting	4	Used to catch fish	Inventory Code: 034	$0.00	$0.00	$0.00
035	Barrel	8	Used for storage and carrying items	Inventory Code: 035 - Range of Dimensions: Diameter 56/41 cm, height 90/55 cm	$0.00	$0.00	$0.00
036	Oven	1	Cooking	Inventory Code: 036	$0.00	$0.00	$0.00
037	Anchor	7	Used to keep ship in place	Inventory Code: 037 - Range of Dimensions Height 110/34 cm, Width 35/6cm	$0.00	$0.00	$0.00
038	Fish container	1	Used to hold fish during fishing trips	Inventory Code: 038 - Dimensions: height 25cm, length 65cm, width 22cm	$0.00	$0.00	$0.00
039	Unknown Item	1	Used to stretch fleece	Inventory Code: 039 - Dimensions: Length 62cm, Width 20cm, Nail Height 10cm	$0.00	$0.00	$0.00
040	Ferro	1	Decoration for the front of gondola	Inventory Code: 040 - Dimensions: Length 113cm, Width 30cm	$0.00	$0.00	$0.00
041	Verigola	3	Used to drill holes	Inventory Code: 041 - Dimensions: Length 102cm	$0.00	$0.00	$0.00
042	Level	1	Checks for	Inventory Code: 042 -	$0.00	$0.00	$0.00

Arzanà Miscellaneous Inventory							
Image Name	**Object**	**Quantity**	**Function of Object(s)**	**Extended Details**	**Cost to Rent**	**Cost to Insure**	**Code**
			straigthness of surface	Dimensions: Length 80cm, width 3cm, height 3cm			
043	Pick axe	2	Used to demolish objects	Inventory Code: 043 - Range of Dimensions: Length 96/26cm, Blade Length 61/26cm, Blade width 7/3cm,	$0.00	$0.00	$0.00
044	Spade	1	Used for digging	Inventory Code: 044 - Dimensions: Total Length 90cm, Length of shovel 20cm, Width of shovel 22cm	$0.00	$0.00	$0.00
045	Pitch Fork	1	Used for moving material	Inventory Code: 045 - Dimensions: Length 129cm	$0.00	$0.00	$0.00
046	Kettle	2	Boiling liquid	Inventory Code: 046 - Dimensions: Height 30cm, Diameter 18cm	$0.00	$0.00	$0.00
047	Cabnet	1	Storage	Inventory Code: 047 - Dimensions: Height 80cm, Length 50cm, Width 36	$0.00	$0.00	$0.00
048	Unknown Item	1	Storage for rope	Inventory Code: 048 - Dimensions: Height 43cm, Width 32cm	$0.00	$0.00	$0.00
049	pole with net	1	Moving/catching fish	Inventory Code: 049 - Dimensions: Length 250cm, Diameter of net 58cm	$0.00	$0.00	$0.00
050	hook with pole	1	Used to reach and pull objects far away	Inventory Code: 050 - Dimensions: Length 195cm	$0.00	$0.00	$0.00
051	hook with pole	1	Used to reach and pull objects far away	Inventory Code: 051 - Dimensions: Length 190cm	$0.00	$0.00	$0.00
052	Parabordo	1	Used to protect boats parked near other objects	Inventory Code: 052 - Dimensions: Height 55cm, Width 51cm	$0.00	$0.00	$0.00
053	Gondileir Cover	1	Used to cover a gondola	Inventory Code: 053 - Dimensions: Length 208cm, Height 127cm, Width 108cm	$0.00	$0.00	$0.00
054	Gondiler Cover	1	Used to cover a gondola	Inventory Code: 054 - Dimensions: Length 109cm, Height 95cm, Width 11cm	$0.00	$0.00	$0.00
055	Gondola Decoration	8	A decoration to put on a gondola	Inventory Code: 055	$0.00	$0.00	$0.00

Arzanà Miscellaneous Inventory							
Image Name	**Object**	**Quantity**	**Function of Object(s)**	**Extended Details**	**Cost to Rent**	**Cost to Insure**	**Code**
056	Model Birds	25		Inventory Code: 056	$0.00	$0.00	$0.00
057	hook with pole	1	Used to reach and pull objects far away	Inventory Code: 057 - Dimensions: Length 133cm	$0.00	$0.00	$0.00
058	Decoration	2	Decerations for a gondola	Inventory Code: 058 - Dimensions: Length of rod 83cm, Length of horse 36cm	$0.00	$0.00	$0.00
059	model boat	1		Inventory Code: 059 - Dimensions: Length 71cm, Width 18cm	$0.00	$0.00	$0.00
060	model boat	1		Inventory Code: 060 - Dimensions: Length 85cm, Width 15cm	$0.00	$0.00	$0.00
061	model boat	1		Inventory Code: 061 - Dimensions: Length 70cm, Width 14cm	$0.00	$0.00	$0.00
062	Tool Sharpener	1	used to sharpen blades of various tools	Inventory Code: 062 - Dimensions: Width 50cm, Length 17cm, Hieght 25cm, Stone width 5cm, Stone Radius 8cm	$0.00	$0.00	$0.00
063	trap	1	Used to trap shellfish	Inventory Code: 063 - Dimensions: Length 30cm, Diameter 20cm	$0.00	$0.00	$0.00
064	trap	1	Used to trap shellfish	Inventory Code: 064 - Dimensions: Length 85cm, Opening Width 33cm	$0.00	$0.00	$0.00
065	Glass decorations	2	decorations for boats	Inventory Code: 065 - Dimensions: Diameter 12cm	$0.00	$0.00	$0.00
066	Decorations	2	Decorations for boats	Inventory Code: 066 - Dimensions: Length 52cm	$0.00	$0.00	$0.00
067	Part of Gondola decoration	2	decoration for a gondola	Inventory Code: 067 - Dimensions: Length 41.5cm, Width 25cm	$0.00	$0.00	$0.00
068	Drawer	1	storage	Inventory Code: 068 - Dimensions: Length 31cm, Width 21cm, Height 20cm, Height of draw 9cm	$0.00	$0.00	$0.00
069	shovels	3	used to scoop/move material	Inventory Code: 069 - Range of Dimensions: Length 100/88cm, Length of Blade 28/20cm, Width of Blade 22/20	$0.00	$0.00	$0.00
070	Shovel	5	used to	Inventory Code: 070 -	$0.00	$0.00	$0.00

Arzanà Miscellaneous Inventory							
Image Name	**Object**	**Quantity**	**Function of Object(s)**	**Extended Details**	**Cost to Rent**	**Cost to Insure**	**Code**
			scoop/move material	Range of Dimensions: Length 41/35cm, Length of shovel 30/24cm, Width of shovel 18/12cm			
071	bouy	1	used to protect boats parked near other objects	Inventory Code: 071 - Dimensions: Length 44cm, Diameter 11cm	$0.00	$0.00	$0.00
072	Drill	2	used to drill holes	Inventory Code: 072 - Range of Dimensions: 36/20cm	$0.00	$0.00	$0.00
073	tongs	6	Used for grabbing and moving items	Inventory Code: 073 - Dimensions: Length 30/23cm	$0.00	$0.00	$0.00
074	Unknown Item	13		Inventory Code: 074 - Dimensions: Average Length 49cm, Average Width 3cm	$0.00	$0.00	$0.00
075	Unknown Item	1		Inventory Code: 075 - Dimensions: Length 25cm, Width 3cm	$0.00	$0.00	$0.00
076	Unknown Item	1		Inventory Code: 076 - Dimensions: Length 19cm, Width 3cm	$0.00	$0.00	$0.00
077	bench	2	used to sit on	Inventory Code: 077 - Range of Dimensions: Length 118/113cm, Width 60/40cm, Height 73/72cm	$0.00	$0.00	$0.00
078	balance	1	used to determine weight of objects	Inventory Code: 078	$0.00	$0.00	$0.00
079	Model Boat	1		Inventory Code: 079 - Dimensions: Length 160cm, Width 40cm	$0.00	$0.00	$0.00
080	scale	1	used to determine weight of objects	Inventory Code: 080 - Dimensions: Length 82cm, Width 47cm, Height platform 16cm, Total Hieght 63cm	$0.00	$0.00	$0.00
081	Bowl	1	Used for holding items and food	Inventory Code: 081 - Dimensions: Diameter 36cm, Height 6cm	$0.00	$0.00	$0.00
082	Drawers	1	storage	Inventory Code: 082 - Dimensions: Length 130cm, Width 57cm, Height 78cm	$0.00	$0.00	$0.00
083	Unknown Item	1		Inventory Code: 083 - Dimensions: Length 54cm, Height 86cm, Width 14cm	$0.00	$0.00	$0.00

Arzanà Miscellaneous Inventory							
Image Name	**Object**	**Quantity**	**Function of Object(s)**	**Extended Details**	**Cost to Rent**	**Cost to Insure**	**Code**
084	scale	1	used to determine weight of objects	Inventory Code: 084 - Dimensions: Length 70cm, Width 45cm, Height 51cm	$0.00	$0.00	$0.00
085	Unknown Item	1		Inventory Code: 085 - Dimensions: Length 60cm, Width 40cm, Height 12cm	$0.00	$0.00	$0.00
086	Wine Bottle	5	stored wine	Inventory Code: 086 - Dimensions: Average Height 31cm, Average Diameter 20	$0.00	$0.00	$0.00
087	Bucket	1	storage and carrying material	Inventory Code: 087 - Dimensions: Height 24cm, Diameter 32cm	$0.00	$0.00	$0.00
088	Unknown Item	2		Inventory Code: 088 - Dimensions: Length 27cm, Width 5cm, Height 7cm	$0.00	$0.00	$0.00
089	L-shaped measureing stick	1	used to measure/draw items at right angles	Inventory Code: 089 - Dimensions: Length 58cm, Height 22cm	$0.00	$0.00	$0.00
090	Unknown Item	1		Inventory Code: 090 - Dimensions: Length 60cm	$0.00	$0.00	$0.00
091	hand axe	1	used for cutting wood	Inventory Code: 091 - Dimensions: Length of Handle 24cm, Length of Blade 20cm	$0.00	$0.00	$0.00
092	measureing device	2	used for measuring 3 demensional objects	Inventory Code: 092 - Dimensions: Length 46cm	$0.00	$0.00	$0.00
093	Stakes	7	used to attach objects together	Inventory Code: 093 - Range of Dimensions: Length 41/19cm, Diameter 6/2	$0.00	$0.00	$0.00
094	Saw	1	used for cutting	Inventory Code: 094- Dimensions: Total Length 32cm, Blade Length 17cm	$0.00	$0.00	$0.00
095	Tongs	3	used for grabbing and moving objects	Inventory Code: 095- Range of Dimensions: Length 53/32cm	$0.00	$0.00	$0.00
096	Unknown Item	1		Inventory Code: 096 - Dimensions: Length 31cm	$0.00	$0.00	$0.00
097	Unknown Item	2		Inventory Code: 097 - Range of Dimensions: Length 33/14cm, Width 10/4.5cm	$0.00	$0.00	$0.00

Arzanà Miscellaneous Inventory							
Image Name	**Object**	**Quantity**	**Function of Object(s)**	**Extended Details**	**Cost to Rent**	**Cost to Insure**	**Code**
098	Unknown Item	1		Inventory Code: 098 - Dimensions: Length 27cm	$0.00	$0.00	$0.00
099	heater	1	used to provide heat to a room	Inventory Code: 099 - Dimensions: Height 57cm, Diameter 25cm	$0.00	$0.00	$0.00
100	stove	1	cooking	Inventory Code: 100 - Dimensions: Length 55cm, Width 52cm, Height 60cm	$0.00	$0.00	$0.00
101	Parabordo	8	used to protect boats when near other objects	Inventory Code: 101 - Dimensions: Height 30cm, Diameter 33cm	$0.00	$0.00	$0.00
102	Wine Container	2	used for storing wine	Inventory Code: 102 - Dimensions: Diameter 53cm, Height 30cm	$0.00	$0.00	$0.00
103	Model Boat	1		Inventory Code: 103 - Dimensions: Length 151cm, Width 34cm	$0.00	$0.00	$0.00
104	Oil light	1	used to produce light	Inventory Code: 104 - Dimensions: Height 60cm, Diameter 30cm	$0.00	$0.00	$0.00
105	Lantern	4	used to produce light	Inventory Code: 105 - Range of Dimensions: Height 45/19cm, Diameter 20/13cm	$0.00	$0.00	$0.00
106	Ash buckets	2	used to clean ashes out of stove	Inventory Code: 106 - Dimensions: Height 55cm, Length 20cm, Width 20cm	$0.00	$0.00	$0.00
107	unknown item	1		Inventory Code: 107 - Dimensions: Length 34cm	$0.00	$0.00	$0.00
108	unknown item	1		Inventory Code: 108 - Dimensions: Height 26cm, Diameter 8cm	$0.00	$0.00	$0.00
109	lights	3	used to produce light	Inventory Code: 109 - Dimensions: Height 12cm, Width 6cm	$0.00	$0.00	$0.00
110	Oil container	2	part of oil lamp that contained the oil	Inventory Code: 110 - Dimensions: Length 8cm, Diameter 5cm	$0.00	$0.00	$0.00
111	light	1	used to produce light	Inventory Code: 111 - Dimensions: Height 25cm, Width 13cm	$0.00	$0.00	$0.00
112	oar locks	2	used to hold oars while rowing	Inventory Code: 112 - Dimensions: Length 16cm, Width 7cm	$0.00	$0.00	$0.00
113	ring	1	when attached to an object it is a place to grab	Inventory Code: 113 - Dimensions: Length 18cm	$0.00	$0.00	$0.00

Arzanà Miscellaneous Inventory							
Image Name	**Object**	**Quantity**	**Function of Object(s)**	**Extended Details**	**Cost to Rent**	**Cost to Insure**	**Code**
114	door handle	1	used to open doors	Inventory Code: 114 - Dimensions: Length 22cm, Width 6cm	$0.00	$0.00	$0.00
115	Pastecca	2	Used like pulley but can remove rope freely	Inventory Code: 115 - Dimensions: Length 41cm, Width 10cm, Height 10cm	$0.00	$0.00	$0.00
116	Gondola Seating	1	used to sit while in a gondola	Inventory Code: 116 - 2 wooden black chairs Width 43cm, Length 39cm, Height 76cm, 2 large cushions Length 113cm Width 50cm, 1 small cushion Length 56cm Width 30cm, 2 small chairs Length 52cm Width 30cm Height 35cm, 2 back boards Length 107cm Width 50cm	$0.00	$0.00	$0.00
117	Fishing lores	5	used to catch fish	Inventory Code: 117	$0.00	$0.00	$0.00
118	knife	1	used to cut material	Inventory Code: 118 - Dimensions: Length total 35cm, Length Blade 20cm	$0.00	$0.00	$0.00
121	Unknown Item	1		Previously Cataloged: "Crivelo" per Paragal (Palamito)	$0.00	$0.00	$0.00
125	Unknown Item	1		Previously Cataloged: Porte divergenti per temere aperta L'imboccahera di una piccola tortanella da Laguna	$0.00	$0.00	$0.00
124	spool of string	1	used to hold string	Previously Cataloged: Togne	$0.00	$0.00	$0.00
123	trap	1	used to catch fish/selfish	Previously Cataloged: "Cheba da Go" All'interno simettera comi esca del Granchio pesso anduva fissata ad una canna and ogni Barca ne postova da 30 a 70	$0.00	$0.00	$0.00
122	rope	1	various uses	Previously Cataloged: "Lime" in canapa, per armatura direti da potta (trambgli) quelle con, piombi (Lime da Plombo) tengono la rete sal fundo, Quelle senza portuvano l	$0.00	$0.00	$0.00

Arzanà Miscellaneous Inventory							
Image Name	**Object**	**Quantity**	**Function of Object(s)**	**Extended Details**	**Cost to Rent**	**Cost to Insure**	**Code**
				sugheri (Lime da Suro) per temere la rete vorticale. (la coroa è fathla in modo che non si attorciele se Bagnata)			
126	sack	1	used to hold items	Previously Cataloged: Sacco di Rete (Pelèa per tenere a bagno cape o pesci)	$0.00	$0.00	$0.00
127	netting	1	used to catch fish	Previously Cataloged	$0.00	$0.00	$0.00
128	Netting	1	used to catch fish	Previously Cataloged: Rete in Camapa, Fabba industriale, m/w 7 cia, cerviva per serragie, cogolli da anguede chebe da Go, ecc	$0.00	$0.00	$0.00
129	netting	1	used to catch fish	Previously Cataloged: Sacco Delliostregher, (Rete a straccico) con le sue "piombáe," mancante della "messa" che tieme aperta la Bocca della Rete	$0.00	$0.00	$0.00
130	netting	1	used to catch fish	Previously Cataloged: Sacio della rete a strascioo detta "ostregher" mancante del telaío (messa) salliapertura e della corona di Piumbi	$0.00	$0.00	$0.00
131	rope	1	various uses	Previously Cataloged: Sagola di camapa non da Retido Pesca	$0.00	$0.00	$0.00
132	netting	1	used to catch fish	Previously Cataloged: Rete in catone, maglia m/m 22 cia Fabricaz. Industriale Serviva per lo piú per fabbri care reti de posta	$0.00	$0.00	$0.00
133	Pulley	3	uses rope to assit lifting objects	Previously Cataloged: Code: Ca3, CaCp	$0.00	$0.00	$0.00
134	hook	2	used to hang objects from	Previously Cataloged	$0.00	$0.00	$0.00
146	Unknown Item	2		Previously Cataloged: Code: Han 2 / Gruppo 16	$0.00	$0.00	$0.00
145	scraper	1	used to scrap	Previously Cataloged:	$0.00	$0.00	$0.00

Arzanà Miscellaneous Inventory							
Image Name	**Object**	**Quantity**	**Function of Object(s)**	**Extended Details**	**Cost to Rent**	**Cost to Insure**	**Code**
			material	Code: Se4			
144	unknown item	2		Previously Cataloged: Code: Ca5, Ca4	$0.00	$0.00	$0.00
143	unknown item	1		Previously Cataloged: Code: Vp	$0.00	$0.00	$0.00
142	Drills	2	used to drill holes	Previously Cataloged: Code: Va m (3), Va p (3)	$0.00	$0.00	$0.00
141	unknown item	1		Previously Cataloged: Code: S t 7 t	$0.00	$0.00	$0.00
140	saw	1	used to cut material	Previously Cataloged: Code: Sgd	$0.00	$0.00	$0.00
139	hook on pole	1	used to reach and pull objects far away	Previously Cataloged: Code: Hzml	$0.00	$0.00	$0.00
138	Bindeo	1	used to lift boats off the ground	Previously Cataloged: Code: Htt3	$0.00	$0.00	$0.00
137	unknown item	2		Previously Cataloged: Code: Gruppo 15	$0.00	$0.00	$0.00
136	unknown item	1	used to drive palina into lagoon	Previously Cataloged: Code: Bp1	$0.00	$0.00	$0.00
135	unknown item	1		Previously Cataloged: Code: yxx	$0.00	$0.00	$0.00
147	Axe	5	used to chop material	Previously Cataloged: Code: Hs3, As4, As2, As1	$0.00	$0.00	$0.00
148	hammer	9	used to hit objects into place	Previously Cataloged: Code: Ma2, Ma8, Ma6, Ma1, Ma10, Ma7, Ma3, Ma4, Ma9	$0.00	$0.00	$0.00
149	box	3	used for storage	Previously Cataloged: Code: Scpt4/Gruppo14, Scpt1/Gruppo14, Scpt3/Gruppo14	$0.00	$0.00	$0.00
150	rope	2	various uses	Previously Cataloged: Code: Ca	$0.00	$0.00	$0.00
151	box	3	used for storage	Previously Cataloged: Code: CH2, Chxit	$0.00	$0.00	$0.00
152	drill bits	3	part of the drill that is used to cut material	Previously Cataloged: Code: Pt2	$0.00	$0.00	$0.00
153	stakes	7	used to fasten objects together	Previously Cataloged: Code: Sce1(7), Pu/Fg(3)	$0.00	$0.00	$0.00
154	Unknown Item	4		Previously Cataloged: Code: Tep, Teg	$0.00	$0.00	$0.00
155	pick axes	7	used to demolish objects	Previously Cataloged: Code: Ae1, Ae5, Ae7,	$0.00	$0.00	$0.00

Arzanà Miscellaneous Inventory							
Image Name	**Object**	**Quantity**	**Function of Object(s)**	**Extended Details**	**Cost to Rent**	**Cost to Insure**	**Code**
				Ae3, Ae6, Ae4, Ae2			
156	axe heads	4	cutting part of an axe	Previously Cataloged: Code: As, Aesm2, Aesm1, Aesm3	$0.00	$0.00	$0.00
157	large mallet	2	used to hit objects into place	Previously Cataloged: Code: M21/Gruppo2, M22/Gruppo2	$0.00	$0.00	$0.00
158	chisel	1	used to carve material	Previously Cataloged: Code: Cut	$0.00	$0.00	$0.00
159	mallet	4	used to hit objects into place	Previously Cataloged: Code: Me1, Me2, Me3, Me4	$0.00	$0.00	$0.00
160	fills	2	used to fill or carve objects	Previously Cataloged: Code: Se2, Se3	$0.00	$0.00	$0.00
119	Fero De Prua	7	Frame for prow of boat	Inventory Code: 119 - Range of Dimensions: Length 98/34cm	$0.00	$0.00	$0.00
120	Pialla	17	Shaving the wood	Inventory Code: 120 - Range of Dimensions: Length 74/22cm, Width 9/4.4cm, Height 8/7cm	$0.00	$0.00	$18.00

APPENDIX J: Arzanà Oars Database

Arzanà Oars									
ID	Oar Picture	Paddle Picture	Oar Length	Paddle Length	Insert 1 Length	Insert 2 Length	Handle Circumference	Paddle Width	Boat
1	O1	P1	534.5	201	N/A	N/A	15.7	14.5	
2	O2	P2	501	172.5	N/A	N/A	14.5	17.5	
3	O3	P3	431.5	202	123	97	11.1	18.5	
4	O4	P4	420	179	170	170	12.5	17	
5	O5	P5	295	122	N/A	N/A	12.8	10	
6	O6	P6	285	170	78	90	11	11	
7	O7	P7	301	129	129	129	12.5	14	
8	O8	P8							
9	O9	P9	366	150	85	N/A	11.3	16.5	
10	O10	P10	339.5	136	99	86.8	11.3	15.7	
11	O11	P11	412	170	108	124	13.2	17.5	
12	O12	P12							
13	O13	P13	413	180	116.5	98	11.5	16.8	
14	O14	P14	359	158	96	74	10.8	13.5	
15	O15	P15	441	182	N/A	N/A	13.5	16.5	
16	O16	P16	344	129.5	N/A	N/A	11.5	15.2	
17	O17	P17	383	162	60.5	N/A	11.3	16	
18	O18	P18	378.5	171.2	75.5	53.5	11.1	16	
19	O19	P19	366.5	155	91	100	11.4	17.5	
20	O20	P20	360	153.5	N/A	N/A	11.8	14.5	
21	O21	P21	296.5	156	N/A	N/A	13.2	17	
22	O22	P22	348	158	92	N/A	11.5	12.5	
23	O23	P23	414.2	176	116.5	94	10.8	16.9	
24	O24	P24	410.6	169.5	133.5	115	12.2	18.6	
25	O25	P25	365.4	158	96.2	89.2	11.3	17.5	
26	O26	P26	403	163	120.5	102	12.5	18.4	
27	O27	P27	420.5	178	136	119.5	11.8	16.8	
28	O28	P28	343.2	137	96	88	12.5	17.1	
29	O29	P29	320	106.5	100.5	80	12.2	17	
30	O30	P30	456	204	160.5	160.5	13.0	16.6	
31	O31	P31	414.1	180	169.5	169.5	12.8	16.6	
32	O32	P32	406	172	80		12.6	17.5	
33	O33	P33	295	166	108	115	12	17	
34	O34	P34	424.5	180	108	***	12.2	16.5	
35	O35	P35	419	180	N/A	N/A	12.5	18	
36	O36	P36	339.5	148.5	96	75	11.5	14	

Arzanà Oars									
ID	Oar Picture	Paddle Picture	Oar Length	Paddle Length	Insert 1 Length	Insert 2 Length	Handle Circumference	Paddle Width	Boat
37	O37	P37	442	170	145	116.5	11.4	17	
38	O38	P38	427	230	N/A	N/A	13.1	15.5	
39	O39	P39	412	188	109	97	12	14	
40	O40	P40	415	180	109	92	12	15.5	
41	O41	P41	416	198.5	117	106	12	18	
42	O42	P42	359	131	89	?	11	17	
43	O43	P43	419.5	167	148	148	12	17	
44	O44	P44	500	168	N/A	N/A	14.5	18	
45	O45	P45	444	180	118	104.5	15	17.5	
46	O46	P46	462	156	N/A	N/A	14.5	16.5	
47	O47	P47							
48	O48	P48	333	137	N/A	N/A	14.8	10	
49	O49	P49	339	140	94	68	11.9	16	
50	O50	P50	350	130	89	82	12.2	17	
51	O51	P51	360	118	70	N/A	10.1	13.5	
52	O52	P52	334	143	65	N/A	11	15.5	
53	O53	P53	188	68	N/A	N/A	14.8	14.5	
54	O54	P54	325	135	80	61	10.5	16	
55	O55	P55	364	170	113	N/A	11	17.5	
56	O56	P56	426	195	N/A	N/A	13.2	16.3	
57	O57	P57	414	180	115	81	12.5	14.5	
58	O58	P58	409.5	185	106	91	12.5	16.8	
59	O59	P59	430	170	110	122	13	16	
60	O60	P60	611	167	N/A	N/A	16	15	
61	O61	P61	198	55	51	51	13	13	
62	O62	P62	196	47	N/A	N/A	13	13	
63	O63	P63	342	150	N/A	N/A	14	16	
64	O64	P64	310	90	N/A	N/A	14	16	
65	O65	P65	313	157	N/A	N/A	16	15	
66	O66	P66	380	155	N/A	N/A	17	18	
67	O67	P67	325	110	65	66	12	14	
68	O68	P68	279	110	N/A	N/A	12	12	
69	O69	P69	366	139	N/A	N/A	15	19	
70	O70	P70	623	191	N/A	N/A	17	15	
71	O71	P71	620	175	N/A	N/A	16	15	
72	O72	P72	616	180	N/A	N/A	17	16	
73	O73	P73	310	157	N/A	N/A	14	11	
74	O74	P74	344	145	N/A	N/A	14	11	

Arzanà Oars									
ID	Oar Picture	Paddle Picture	Oar Length	Paddle Length	Insert 1 Length	Insert 2 Length	Handle Circumference	Paddle Width	Boat
75	O75	P75	370	184	132	N/A	18	18	
76	O76	P76	300	114	54	N/A	10	12	
77	O77	P77	308	108	N/A	N/A	12	11	
78	O78	P78	338	140	95	78	14	16	
79	O79	P79	380	146	114	N/A	15	17	
80	O80	P80	340	150	67	64	12	16	
81	O81	P81	286	120	100	100	12	14	
82	O82	P82	444	160	136	100	14	20	
83	O83	P83	310	100	N/A	N/A	11	12	
84	O84	P84	339	118	N/A	N/A	12.5	15	
85	O85	P85	310	146	N/A	N/A	12	12.5	
86	O86	P86	306	77	N/A	N/A	14	12	
87	O87	P87	345	140	N/A	N/A	13	16	
88	O88	P88	197	64	N/A	N/A	14	12	
89	O89	P89	332	154	N/A	N/A	15	12	
90	O90	P90	320	86	N/A	N/A	15	17	
91	O91	P91	348	134	N/A	N/A	14	13	
92	O92	P92	263	130	N/A	N/A	14	14	
93	O93	P93	285	86	40	40	11	11	
94	O94	P94	220	75	N/A	N/A	12	13	
95	O95	P95	230	70	61	N/A	12	13	
96	O96	P96	188	60	N/A	N/A	10	10	

APPENDIX K: Arzanà Fórcole Database

Arzanà Forcole														
ID	Back	Side 1	Front	Side 2	A1	A2	B	C1	C2	D	E	Front/Back/Middle	Right/Left	Boat
1	P1A	P1B	P1C	P1D	31		5.5	-4.5		1	2	Front	Left	Sandolo
2	P2A	P2B	P2C	P2D	28	16	4	-3	-5.5	3	0	Back	Right	Sandolo
3	P3A	P3B	P3C	P3D	11		7	-5.5		3	0	Front	Left	Caorlina
4	P4A	P4B	P4C	P4D	11		4	-5		1	0	Front	Left	Topo
5	P5A	P5B	P5C	P5D	10		5.5	-5		2	2	Front	Left	Gondola
6	P6A	P6B	P6C	P6D	29		3.5	.5		1	0	Front	Left	Sandolo
7	P7A	P7B	P7C	P7D	14		4	-3		1	0	Front	Left	Batela
8	P8A	P8B	P8C	P8D	11		6	-5		2	2	Front	Left	Gondola
9	P9A	P9B	P9C	P9D	17		6	-7		1	0	Front	Left	Peata
10	P10A	P10B	P10C	P10D	9		7	-5		5		Front	Left	Gondola
11	P11A	P11B PB	P11C	P11D	14		4	-5		2	0	Middle	Right	Batela
12	P12A	P12B	P12C	P12D	18		4	1.5		4	0	Middle	Right	Sandolo
13	P13A	P13B	P13C	P13D	12		6	-5		2.5	0	Front	Left	Sandolo
14	P14A	P14B	P14C	P14D	16		6	-4		2	1	Front	Left	Unknown
15	P15A	P15B	P15C	P15D	33	20	4	-1	-4	1	0	Back	Right	Sandolo
16	P16A	P16B	P16C	P16D	26	10	6	-2	-3	2.5	1.5	Back	Right	Homemade
17	P17A	P17B	P17C	P17D	29.5	11.5	3.5	-2	-3.5	2	0	Back	Right	Caorlina
18	P18A	P18B	P18C	P18D	20		5	-2		2.5	2	Front	Left	Caorlina (Homemade)
19	P19A	P19B	P19C	P19D	38	22	6	-7	-10	2	0	Back	Right	Sandolo
20	P20A	P20B	P20C	P20D	33	13	5	-5	-7	1	0	Back	Right	Sandolo
21	P21A	P21B	P21C	P21D	30	17	3.5	2	-3	1.5	0	Back	Right	Sandolo
22	P22A	P22B	P22C	P22D	16		3.5	-6		1	0.5	Front	Right	Bragozzo
23	P23A	P23B	P23C	P23D	29	17	4.5	-3	-6	3	0	Back	Right	Batela
24	P24A	P24B	P24C	P24D	13		3	0		0	0	Front	Right	Batela
25	P25A	P25B	P25C	P25D	14		4	-4		1	0.5	Front	Left	(Not Professionally Made)
26	P26A	P26B	P26C	P26D	41	28	5.5	-5	-8	2	0	Back	Right	Batela
27	P27A	P27B	P27C	P27D	10		6	-4		2	0	Back	Right	Peata
28	P28A	P28B	P28C	P28D	44	25.5	8	-13	-14	3	1.5	Back	Left	Caorlina
29	P29A	P29B	P29C	P29D	45	26	7	-9	-12	2.5	1.5	Back	Right	Caorlina
30	P30A	P30B	P30C	P30D	40	24	6	-8.5	-11	3	2	Back	Right	Caorlina
31	P31A	P31B	P31C	P31D	33	19	6	-4	-8	2	0	Back	Right	Batela

Arzanà Forcole														
ID	Back	Side 1	Front	Side 2	A1	A2	B	C1	C2	D	E	Front/Back/Middle	Right/Left	Boat
32	P32A	P32B	P32C	P32D	37	21	7	-2.5	-8	3	0	Back	Right	Caorlina
33	P33A	P33B	P33C	P33D	47	27	4	-4	-7	1	0	Back	Left	Caorlina
34	P34A	P34B	P34C	P34D	38	20	8	-2	-9	0.5	2	Back	Right	Batela
35	P35A	P35B	P35C	P35D	40	24	7	-6	-10	2	0.5	Back	Right	Caorlina
36	P36A	P36B	P36C	P36D	37	19	5	0	-4	1	0.5	Back	Right	Batela
37	P37A	P37B	P37C	P37D	39	21	6	1	-3	2	1	Back	Right	Caorlina
38	P38A	P38B	P38C	P38D	14		4	-8		2	1	Front	Left	Caorlina
39	P39A	P39B	P39C	P39D	38	19	3.5	-4	-7	1	0	Back	Right	Caorlina
40	P40A	P40B	P40C	P40D	40	23.5	5	-7.5	-9.5	1	1	Back	Right	Batela
41	P41A	P41B	P41C	P41D	18		6	-10		1	0	Middle	Right	Peata
42	P42A	P42B	P42C	P42D	26		14	-9		3.5	2.5	Back	Right	Mascareta
43	P43A	P43B	P43C	P43D	11.5		4	-7		2	0.5	Front	Left	Caorlina
44	P44A	P44B	P44C	P44D	11		4.5	-4		2.5	0.25	Front	Left	Batela
45	P45A	P45B	P45C	P45D	11		5	-5.5		3	0	Front	Left	Gondola
46	P46A	P46B	P46C	P46D	37	20	6	-2.5	-5	2.5	0	Back	Right	Caorlina
47	P47A	P47B	P47C	P47D	41	24	6	-10	-12	3.5	1	Back	Right	Caorlina
48	P48A	P48B	P48C	P48D	46	28	6	-3	-7	3	0	Back	Right	Caorlina
49	P49A	P49B	P49C	P49D	12.5		5.5	-5		3	0	Middle	Left	Batela
50	P50A	P50B	P50C	P50D	13		5	-4.5		3	0	Middle	Right	Caorlina
51	P51A	P51B	P51C	P51D	38	20	6	-5.5	-5.5	2	0	Front	Left	Caorlina
52	P52A	P52B	P52C	P52D	16		5	-5		1.5	0	Front	Right	Caorlina
53	P53A	P53B	P53C	P53D	11		5	-5.5		1.5	3	Front	Left	Caorlina
54	P54A	P54B	P54C	P54D	14		5	-7		3	1.5	Front	Left	Caorlina
55	P55A	P55B	P55C	P55D	39	22	6	-3	-6	2.5	0.25	Back	Right	Batela
56	P56A	P56B	P56C	P56D	45	29	5	-7	-9	2	1	Front	Left	Caorlina
57	P57A	P57B	P57C	P57D	43	26.5	5.5	-8.5	-9.5	1.5	2			Caorlina
58	P58A	P58B	P58C	P58D	10.5		5	-8		2	2.5	Front	Right	Caorlina
59	P59A	P59B	P59C	P59D	19		5	-5.5		2.5	0	Front	Left	Batela
60	P60A	P60B	P60C	P60D	19		5	-5.5		2.5	0	Front	Left	Batela
61	P61A	P61B	P61C	P61D	15.5		5	-6		2	0	Front	Right	Batela
62	P62A	P62B	P62C	P62D	10.5		6	-5.5		2	0	Front	Left	Batela
63	P63A	P63B	P63C	P63D	10.5		5	-8		2	2.5	Front	Right	Caorlina
64	P64A	P64B	P64C	P64D	10.5		5	-8		2	2.5	Front	Right	Caorlina
65	P65A	P65B	P65C	P65D	10.5		5	-8		2	2.5	Front	Left	Caorlina
66	P66A	P66B	P66C	P66D	48		24	-11.5		-6	4	Back	Right	Gondola
67	P67A	P67B	P67C	P67D	10		7	-4		4	0	Front	Left	Gondola
68	P68A	P68B	P68C	P68D	32	20	3.5	-1	-4	1.5	0.25	Back	Right	Batela

Arzanà Forcole														
ID	Back	Side 1	Front	Side 2	A1	A2	B	C1	C2	D	E	Front/Back/Middle	Right/Left	Boat
69	P69A	P69B	P69C	P69D	32.5		3.5	-3		1.5	0.5	Front	Left	Sandolo
70	P70A	P70B	P70C	P70D	23		13	-5		6	0.5	Back	Right	Sandolo
71	P71A	P71B	P71C	P71D	31	20	9	-5	-7	2	1.5	Back	Right	Sandolo
72	P72A	P72B	P72C	P72D	5		4.5	-4.5		1.5	0	Front	Right	Sandolo
73	P73A	P73B	P73C	P73D	10.5		6	-4.5		1.5	2.5	Front	Left	Gondola
74	P74A	P74B	P74C	P74D	10		4				0			(Not Venetian)
75	P75A	P75B	P75C	P75D	12		4				0			(Not Venetian)
76	P76A	P76B	P76C	P76D	8		7	-6		4	0	Front	Right	Gondola
77	P77A	P77B	P77C	P77D	8.5		6	-4		3	0	Front	Right	Gondola
78	P78A	P78B	P78C	P78D	9		4	-5		1.5	0	Front	Left	Caorlina
79	P79A	P79B	P79C	P79D	13		7	-6.5		2	2.5	Front	Left	Caorlina
80	P80A	P80B	P80C	P80D	25		5	-4		2	3		Left	Sandolo
81	P81A	P81B	P81C	P81D	8		4.5				0	Front		Bragozzo
82	P82A	P82B	P82C	P82D	11		5	-4.5			1.5	Front	Left	Bragozzo
83	P83A	P83B	P83C	P83D	11		5	-4.5			1.5	Front	Right	Bragozzo
84	P84A	P84B	P84C	P84D	16		5.5	-4.5		1.5	0		Right	Topo
85	P85A	P85B	P85C	P85D	14.5		2.5	-6			4			Unknown
86	P86A	P86B	P86C	P86D	10		6	-4		1.5	0	Front	Left	Caorlina
87	P87A	P87B	P87C	P87D	10		7.5	-5.5		0.5	0	Front	Left	Gondola
88	P88A	P88B	P88C	P88D	13		6	-2.5		1.5	0	Front	Right	Batela
89	P89A	P89B	P89C	P89D	28		7	-3.5		2.5	2.5	Front	Left	Sandolo
90	P90A	P90B	P90C	P90D	28	14	6	-2.5	-4.5	2.5	0	Back	Right	Sandolo
91	P91A	P91B	P91C	P91D	28		8.5	-1.5		2	1.5	Front	Left	Sandolo
92	P92A	P92B	P92C	P92D	14		5.5	-4.5		1.5	2	Front	Right	Gondola
93	P93A	P93B	P93C	P93D	38	21	5.5	-7	-9	1.5	2.5	Back	Right	Caorlina
94	P94A	P94B	P94C	P94D	46	23	6.5	-4	-6	2	9	Back	Right	Caorlina
95	P95A	P95B	P95C	P95D	41	26.5	6	-6.5	-7.5	2	3.5	Back	Right	Caorlina
96	P96A	P96B	P96C	P96D	28		4	-5		1.5	0	Back	Left	Sandolo

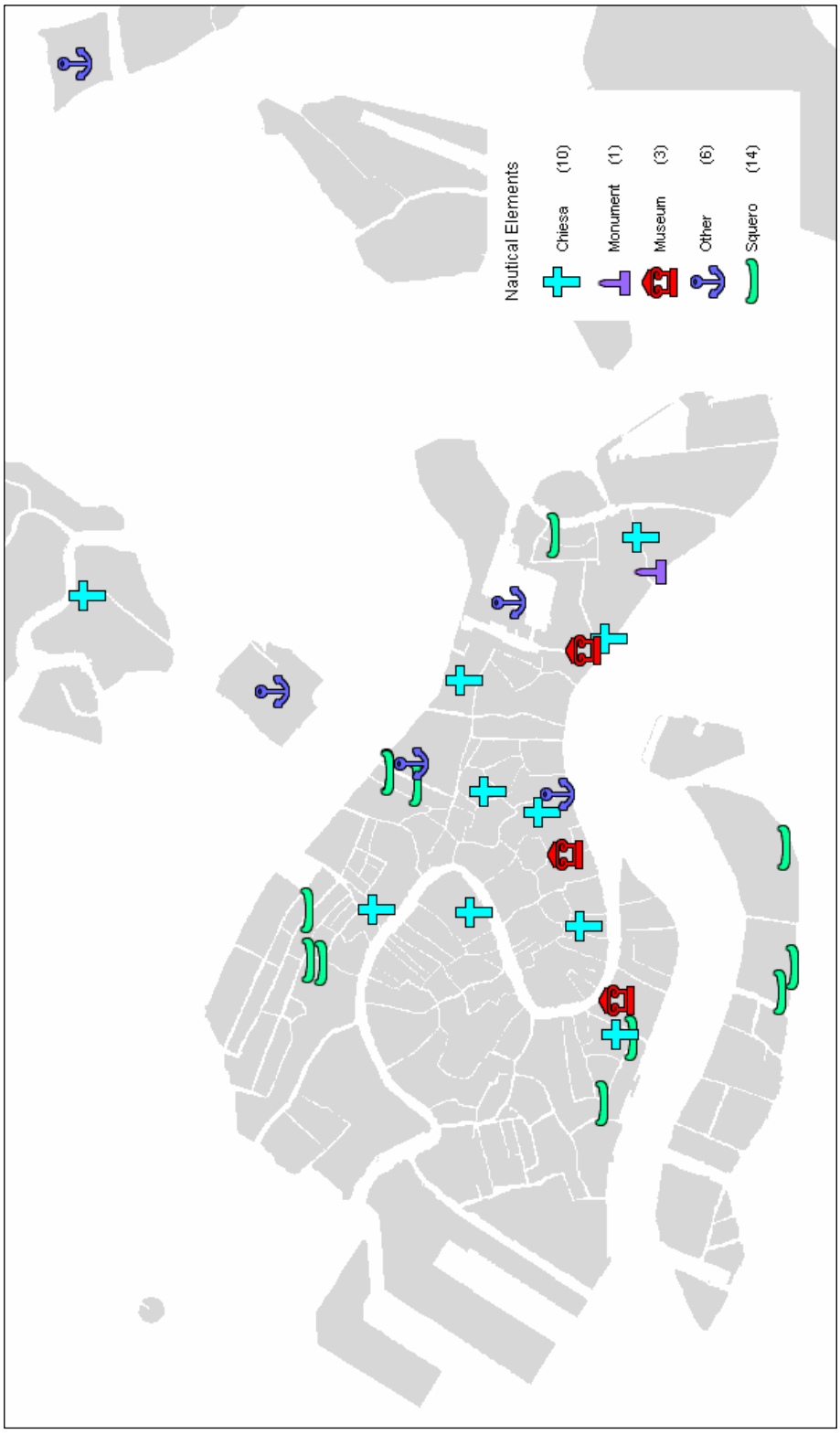
APPENDIX L: Nautical Elements Database

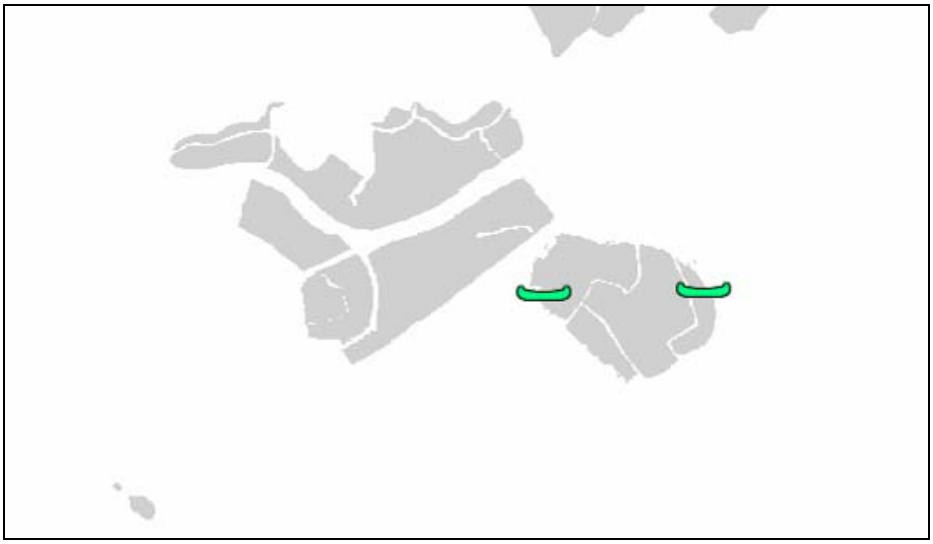
Nautical Heritage				
ID	**Name of Object/Art/Institution**	**Location**	**Year Erected/Age**	**Description and Notes**
1	Galleria dell'Accademia	Dorsoduro	Founded in 1807.	This noteworthy gallery contains many nautical paintings that speak strongly of Venice's maritime heritage, including Carpaccio's 'The Miracle of the Relic of the Cross', which provided historical information about forcole and different traditional rowing positions.
2	Museo Correr	San Marco	Founded in 1830.	Multiple rooms in the Museum are dedicated to works and artifacts involving Venice's nautical past. Items include paintings, cannons and weapons, navigational equipment, and detailed model galleys, ships, and traditional boats.
3	Museo Storico Navale	Castello		Owned by the Italian Navy, which manages it as an exhibition space dedicated to preserving and documenting Venice’s nautical past. Contains an abundance of Naval and Maritime heritage items from Venice and various other places throughout Europe, with some items dating back before the 16th century.
4	Arsenale	Castello	Founded in 1104.	Historical complex that built and produced boats for years and helped Venice to thrive as a Naval power for centuries.
5	Basilica di San Marco	San Marco	Founded in 828.	This famous Basilica possesses numerous nautical elements, including two carvings on the main portal, multiple mosaics, and the Pala D'Oro.
6	Palazzo Ducale	San Marco		Inside the Doge's Palace, the Grand Chancellor's Room was constructed by workers who also constructed ships at the Arsenale. The interior of the room and windows resemble that of a ship. The Palace also possesses many paintings depicting nautical scenes.
7	Isole de Lazzaretto Nuovo	Lazzaretto Nuovo		This island was likely to once have been a strategic checkpoint at the entrance to the lagoon. Under Napoleonic and Austrian rule the isle became a stronghold and was part of the defensive network on the Lido harbor.
8	Chiesa di San Trovaso	Dorsoduro	Originally constructed in 15th century.	In addition to numerous art pieces, the church contains a handful of nautical elements, such as nautical inscriptions and carvings. Nearby to the church is the Squero di San Trovaso, a location of ancient boat construction.
9	Chiesa di Santa Maria Formosa	Castello	Built in XII century.	On the façade of this church can be found a giant oar; inside, the painting of "The Presentation to the Doge of the Bridges by Navelli Pirates" may be found, along with a plentitude of other fine art pieces.
10	Chiesa di San Silvestro	San Polo	Founded in IX century; rebuilt in XIX century.	During earlier times in Venice, members of a certain profession would often join together to form a type of union known as a scuola. Like all professions, the gondoliers and other boatmen grouped together and had their Scuola in the Church of San Silvestro.
11	Chiesa di San Felice	Cannaregio	Founded in X century; rebuilt after 1531.	Window on the outside of the church - stone carving of a Gondola.
12	Chiesa di San Biagio	Castello		This building's façade incorporates the Venetian style of life on the water; located right next to the Naval Museum, it houses the body of Venetian Admiral Angelo Emo, the last Admiral of the Venetian Republic.

Nautical Heritage				
ID	**Name of Object/Art/Institution**	**Location**	**Year Erected/Age**	**Description and Notes**
13	Chiesa di S. Isepo (S. Giuseppe)	Castello	Rebuilt in XVI century.	Is the seat of the Sebastiano Venier Nautical Institute.
14	Santa Maria del Giglio	San Marco	Founded in the 9th century.	The façade of this church depicts the four members of the Barbaro family, who paid to have the façade constructed in order to express the exaltation of the naval and political glories of their family. In addition to the four members of the family, the façade possess many reliefs depicting various galleys and ships.
15	Chiesa di S. Francesco della Vigna	Castello	Founded in 1534.	This church possesses a stone carving of a galley on the interior.
16	Chiesa di S. Pietro Martire	Murano		This church, located on the island of Murano, possesses a ceiling that was crafted to represent the hull of a ship.
17	Pellestrina Carvings	Pellestrina		This building possesses two circular stone carvings of galleys at the base of the building, aside the door.
18	Giardini - Nautical Monument	Castello		Monument with nautical elements such as boats and anchors.
19	Ospedale	Castello		Nautical carvings on door archways.
20	Cantieri Amadi	Burano	130 Years Old	Is currently in operation today - primary service is new boat construction and restoration, as well as miscellaneous repairs. It produces about 1 new boat per year. It is not located in a traditional building, and the methods used for boat construction are not traditional. It is run by Vittorio Amadi.
21	Squero Crea	Giudecca	10 Years Old	Is currently in operation today - performs the primary service of new boat construction and restoration, as well as various miscellaneous repairs. It produces 5-6 new boats annually, and completes many repairs and restorations. Although it is not located in a traditional building, it is the only squero that deals with all traditional boat types. It is run by Gianfranco Vianello "Crea".
22	Squero Canaletto	Cannaregio	1.5 Years Old	Is currently in operation today - performs the primary service of new gondola construction, producing one new gondola per year. This squero, however, is not located in a traditional building, and the methods used to construct the boats are not traditional. It is run by Tom Price.
23	Squero della Giudecca (calle dello squero)	Giudecca		Is currently closed.
24	Squero alla Giudecca (presso il rio S. Eufemia)	Giudecca	100 Years Old	Is currently in operation today - performs the primary service of new gondola construction and restoration, as well as miscellaneous gondola repairs. Annually, it produces 5 new gondole and completes 20 major restorations. It is currently under the ownership of Roberto Dei Rossi, and has been under the same ownership for 15 years.
25	Squero sul canale di San Pietro di	Castello	150 Years Old	This squero no longer functions as a traditional boatyard today; It performs the primary service of motor boat storage and repair.

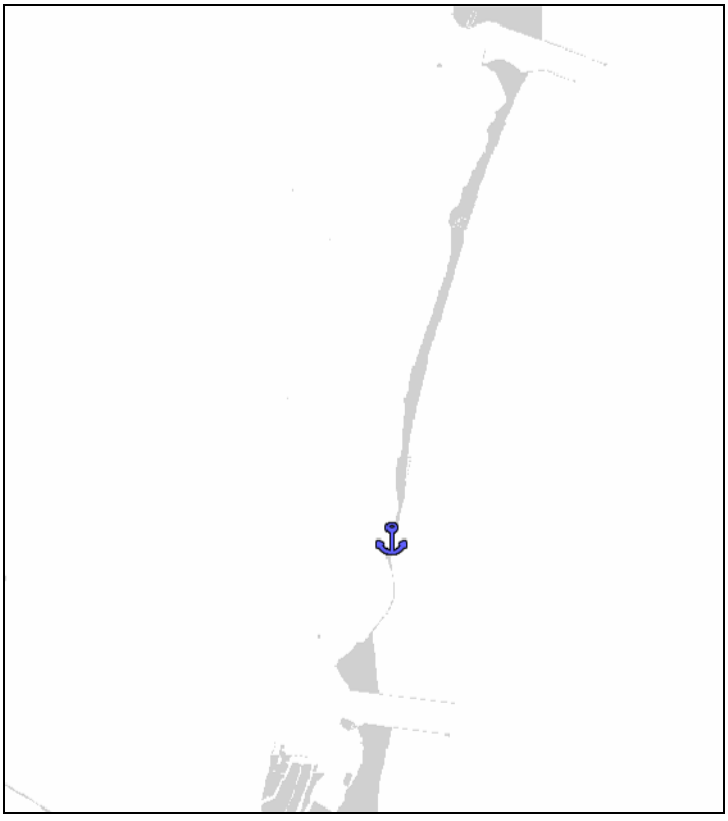
Nautical Heritage				
ID	**Name of Object/Art/Institution**	**Location**	**Year Erected/Age**	**Description and Notes**
	Castello			
26	Squero sul rio dei Mendicanti (Generali)	Cannaregio	350 Years Old	Closed currently; the squero functions today as a rowing club boat house, and also performs occasional private repairs. It is managed by the Circolo Nautico Generali.
27	Squero sul rio dei Mendicanti	Cannaregio		Closed currently; functions as a storage facility.
28	Squero all'Anconeta	Cannaregio		Currently closed.
29	Arzanà - Squero dei Servi	Cannaregio	500 Years Old	Boatyard that maintains a number of maritime-related elements having to do with the nautical history of Venice, including but not limited to boats, shipbuilding tools, paintings and boat accessories.
30	Squero in Corte dei Muti	Cannaregio	150 Years Old	Currently closed for construction.
31	Squero agli Ognissanti	Dorsoduro	500 Years Old	Currently in operation - primary services are new gondola construction and restoration, in addition to miscellaneous repairs. Each year, it produces 2 to 3 new gondola and completes one major restoration. Out of all the squeri in Venice, this squero is the only one with an earthen bank. It is run by Nedis Tramontin, and the owning family has lived there for over 120 years.
32	Squero di San Trovaso	Dorsoduro	400 Years Old	Currently in operation - primary service is construction of new gondolas and repair of damaged ones. The squero produces one gondola per year, and also completes one major restoration per year. In addition to gondola construction and repair, the squero also performs various miscellaneous repairs.
33	Squero Vidal	Burano	50 Years Old	Is currently in operation today - performs new boat construction and restoration, as well as miscellaneous repairs. It produces 4 new boats per year, completes 15-20 major restorations, and deals with sanpierota and topo type traditional Venetian boats. It is run by the Vidal family.

APPENDIX M: Nautical Elements GIS Map



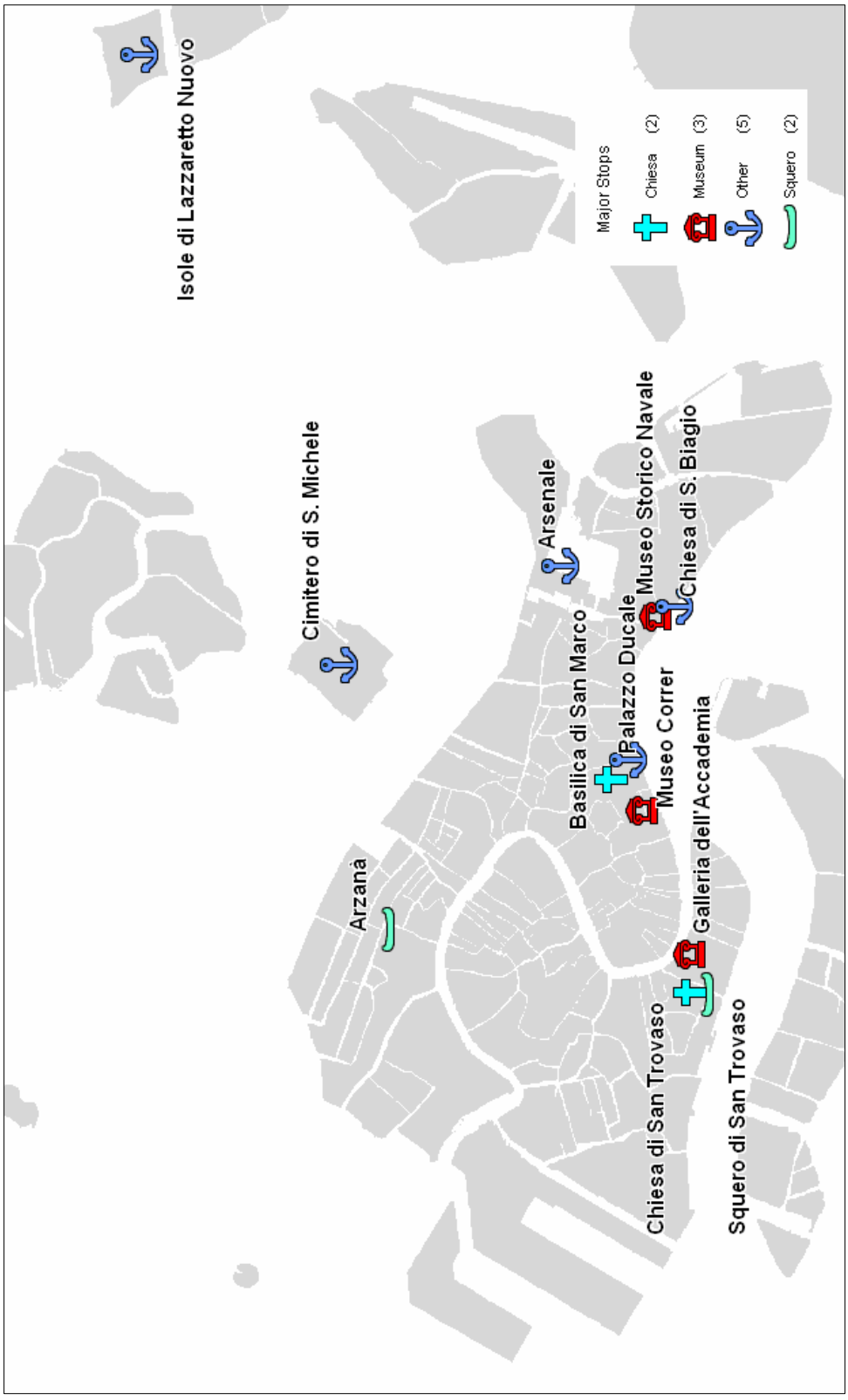


Burano



Pellestrina

APPENDIX N: Major Nautical Tour Stops GIS Map



APPENDIX O: Nautical Tour Brochure

A Brief Maritime History of Venice and Tour Information

The Nautical Heritage Tour of Venice, Italy was developed in partnership with the Arzanà association to provide a detailed understanding of the maritime history of the city. The Venetian lagoon had its first permanent inhabitants in the 5th century when people from the mainland fled as a result of barbarian attacks. Until 827, when the nation became independent, Venice and the lagoon were under constant duress to be owned by the Lombards, the Byzantines and the Franks.

From the 11th century to the 16th century, Venice ruled superior on the sea. In the 16th century, the nation defeated the Turks at the Battle of Lepanto, marking the first time in history that the Byzantines had lost a major battle at sea. Venice, because it was situated in the lagoon, was ideally located as a go-between for the Eastern and Western worlds, and thus the small nation thrived on trade.

At the end of the 16th century, Venice came under more constant attack and by the 17th century, the nation was a focal point for both the Eastern Turks and the Western Christian world. In the 17th century, an economic decline and the plague of 1630 further weakened the state.

By the time of the 18th century, Venice was in a state of serious economic decline, and had undergone a series of different ruling changes. In 1797, Napoleon came in and conquered the nation, thus ending it's 800 years of superiority on the sea.

Major Landmarks

The Arsenale

The Venetian Arsenale was constructed in the year 1104. Over the next three centuries it expanded to encompass a generous area of the Castello sestiere. The Arsenale is a series of buildings that built and manufactured boats, vessels and boat accessories for the Venetian fleet.

At the height of its power, the Arsenale employed as many as 16,000 people and could successfully produce more than one ship each day.

Arzanà

Arzanà, located in Cannaregio, is a Squero that is more than 500 years old. It currently serves as a boat preservation society and provides rentals of the various boat accessories that it possesses. The curators at Arzanà are incredibly knowledgeable about the craft of traditional boats and can also show off the many tools and processes that are involved in crafting and maintaining traditional boats. They have a number of boats and a very large collection of forcole.

The Naval Museum

The Museo Storico Navale, is perhaps the best bargain for money of all museums in the city. At a mere €1.55 for admission, the museum has fantastic artistic value and is highly purposeful and helpful in understanding the naval history of the city. The Naval Museum has five floors including the ground floor, and covers the vast range of maritime and naval history of Venice. Inside the museum, model galleys and tankers can be found, cannons that were used during the 17th century and actual Gondolas and other traditional boats of Venice.

San Marco

St. Mark's square maintains art, architecture and historical references that anyone may enjoy and the square is complimented with an atmosphere of aesthetic pleasure for all to enjoy. The museums, Cathedral and Doge's Palace offer various nautical references. Within the Corner Museum are rooms dedicated solely to the nautical heritage of Venice, including exhibits showcasing the Arsenale, the Traditional Boats of the city and naval references to the power

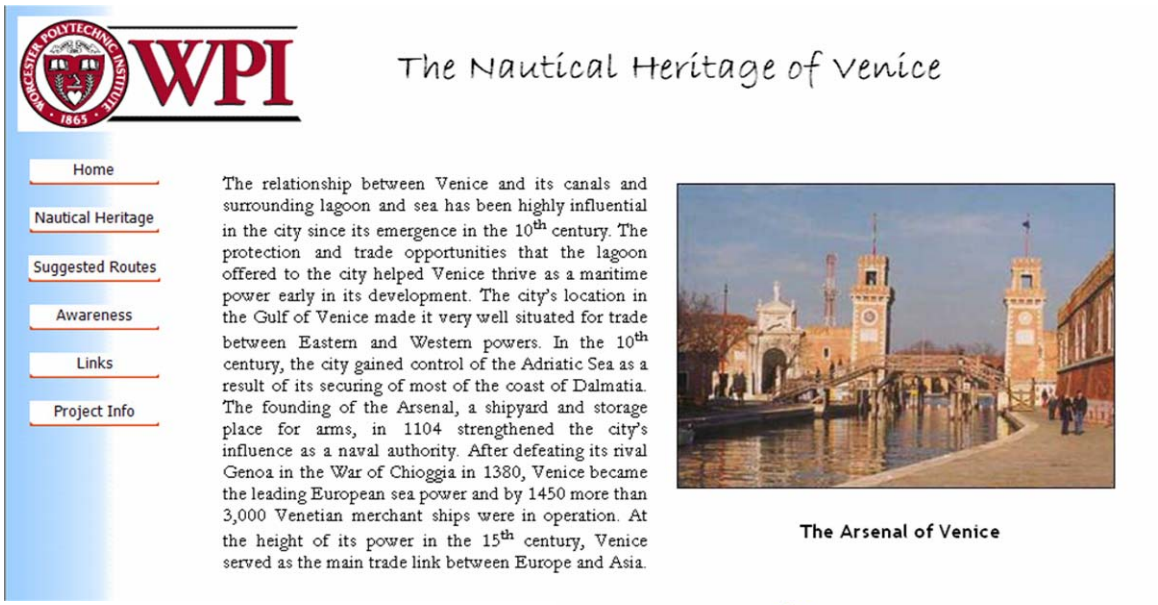
Galleria dell'Accademia

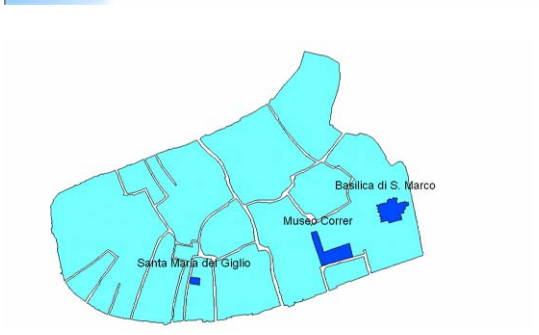
One of Venice's most noteworthy Galleries, t
ria dell'Accademia was founded by Napoleon
and contains centuries worth of various
There are various important nautical artwo
displays in the Galleria dell'Accademia,
works by famous Venetian artists such as C
Many of the paintings play an important role
ing the evolution of the city's nautical past. F
ple, several paintings illustrate typical traditi
netian boats, oars, and forcole. Since no anc
or forcole have been preserved, the only way
their development since early times is to obser
ings and artworks such as this. The traditiona
styles of Venice can also be studied through t
ums many nautical paintings.

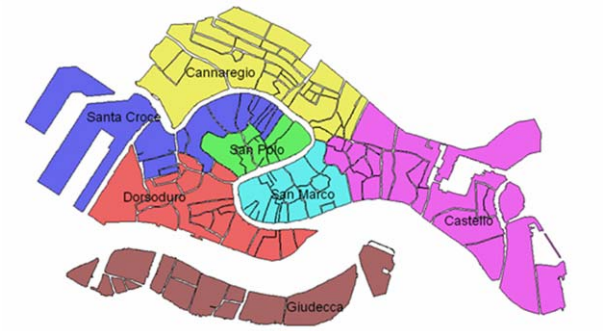
Cimitero di S. Michele

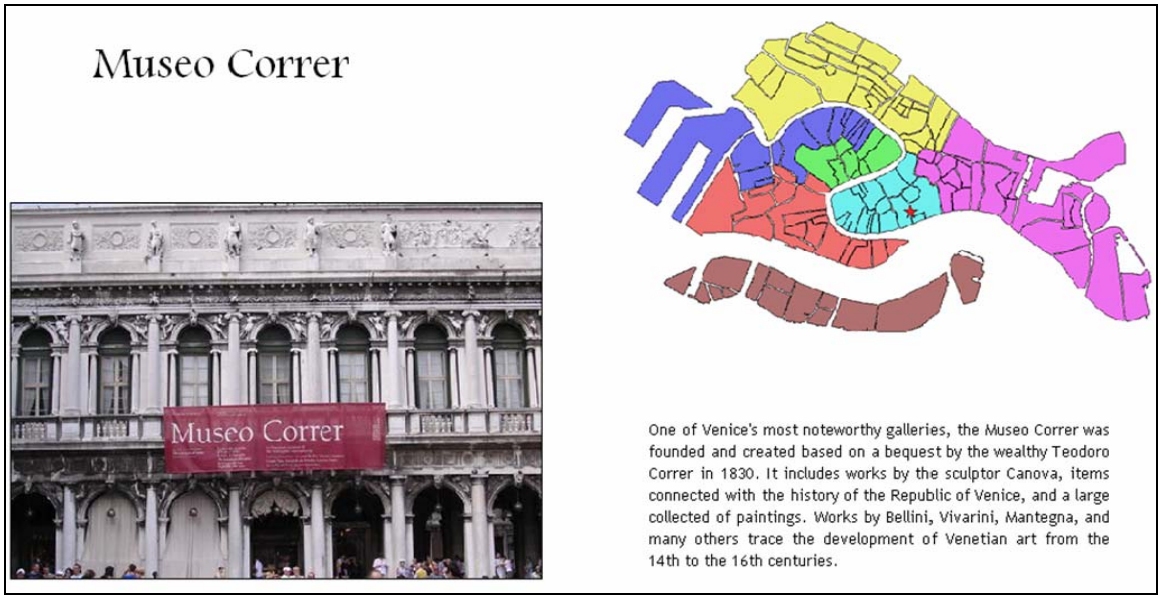
The Cemetery of San Michele marks the loc
the burial of numerous sailors and other peo
nautical significance. Examples are member
Tramontin family, the owners of the Squero
nissanti in Giudecca. The carving on a grave
Tramontin family members illustrates vario
used by the squeraroli in traditional boat c
tion. An example of a nautical carving in the
can be seen below.

APPENDIX P: Nautical Heritage Website

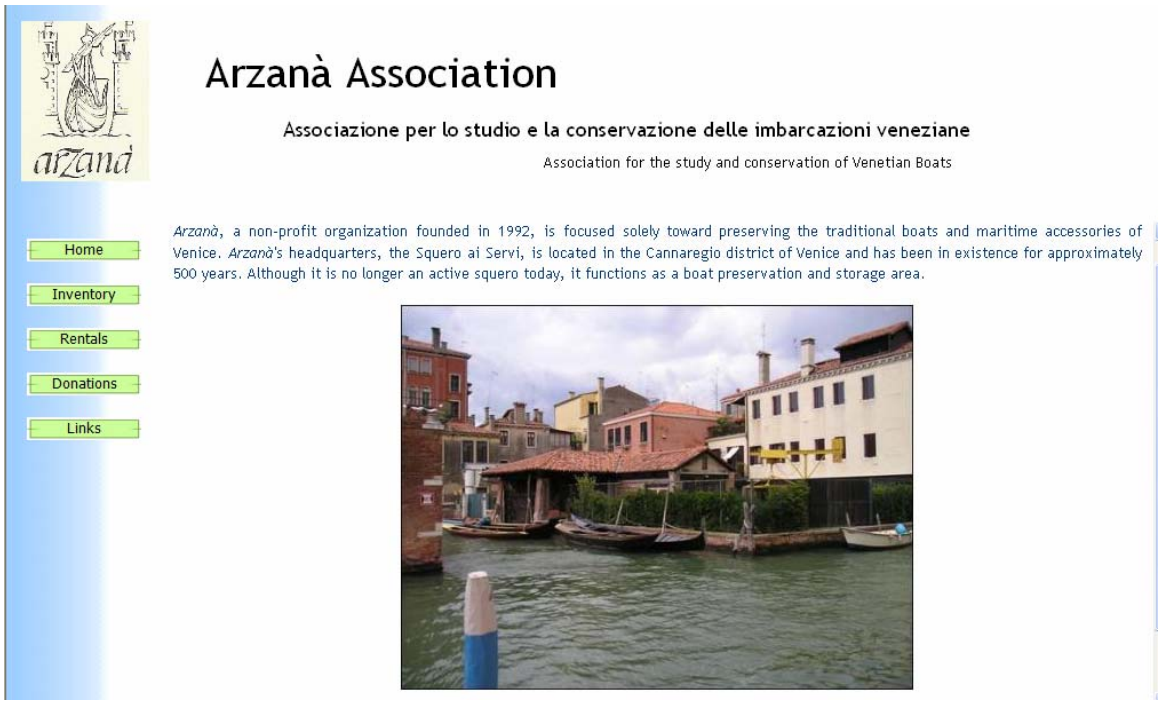








APPENDIX Q: Arzanà Website



APPENDIX R: English Glossary of Boat-Related Terms

Term	English
baonàr	In the larger boats when one of the pilots, at the stern, drops the oar in the water in a direction nearly parallel to the longitudinal axis of the boat and rows backwards to deviate the boat from the straight course. "Cio baona"
Baretèri	They are the hat makers who make summer hats and winter caps for gondoliers.
Batèla Buranèla	The batela buranela is a working boat with the stem similar to that of the topo and the stern like that of a sandoli. It is probably a simplified version of the batela a coa de gambero, an elegant boat which has completely disappeared which had rounded, upward-curving stern.
Caleghèri	They are the shoemakers who make special shoes for gondoliers
Caorlìna	The caorlina was a boat used for transport and for fishing, with symmetrical, crescent-shaped bow and stern, with a length of about 10 meters. Modern versions are used only for show or for regattas with six oarsmen. This and other cargo boats used a special type of forcola with three morsi aligned vertically which allowed oarsmen to maintain a comfortable position when the boat was empty or fully loaded.
cómio	Literally 'elbow', the external curve of the stern *fórcola* for *gondole*; the corresponding internal curve is called the sanca.
cortèlo	Literally 'knife': strip of beech added to one or both edges of the blade of the oar to increase the surface of the blade, and to increase its rigidity and durability.
dolaóra	Type of broadaxe with an off-set handle, used until recently by remeri for the rough cuts of oars.
el fèlze	It is a dynamic system in which the boat, the water and the gondolier participate: the movement in the water gives symmetry to the asymmetry of the boat, balance to imbalance of the boat, man and oar.
félse, félze	Removable canopy in walnut, covered with black cloth with a bow facing door and small, rectangular lateral windows. Now no longer used, it was - until a few decades ago - an indispensable part of the gondola, offering shelter for passengers in the winter or during bad weather.
fero a do maneghi, a do man	Type of knife with a wide, curved blade used by remeri, coopers and others. Also known as a raspa.
Ferro	The decorative metal piece at the bow of the gondola
Forcole	A Venetian oarlock
forcolìn	Oarlock with a single curvature for the oar (morso); also called a forcola a un morso.
Fravi	They are the blacksmiths who make the *ferro* and other items in metal.
gàmba	
girón	The shaft of the oar which terminates at the point where the blade begins (called the entrar).
Gondolìn	The gondolin is similar to the gondola, though smaller and lighter, used only for regattas with two oarsmen.
Indoradòri	They apply gold leaf to the ornamental parts of the gondola. They work in the finishing and decorating phase together with the *Intagiadòri.*
Intagiadòri	They are the engravers of the parts of the gondola that can be carved.
lài	The side of the boat. Merarse al lai or essare al lai, means to move or to be drawn alongside another boat.
lài (avere la barca al)	To have the boats correctly leaning to the right.

lài de mezo	Left side of the gondola.
lài de pope	Right side of the gondola.
lài roverso (stare al)	A boat that, due to an error in construction or for the incorrect position of the load or oarsmen, inclines to the left instead of the right.
Mascaréta	The mascareta is a lighter version of the sandolo without nerve or trasti at the end of the forward deck. It is between seven and eight meters long, for a crew of two, used for fun or for women's regattas.
morso	Upward-curving part of the forcola in which the giron (shaft) of the oar is placed.
naselo	One of the two points of the morso of the forcola
oe!	Call that gondoliers shout when approaching an intersection of canals. In reply, the other gondoliers reply indicating which part of the canal they are moving to with 'a premando' if they intend to move to the left, 'a stagando' if they move to the right and 'de longo' if they move straight forwards.
Ottonài/ Fonditori	They are the craftsmen who make the brass horses and other ornaments in metal.
parada (fare una)	To cross the Grand Canal in a gondola with two oarsmen.
parar	To move the boat with the oar pushing on the canal bottom.
Peàta	The peata was the largest transport boat used in the city canals, up to 15 meters long with a capacity of 37,000 kg. Now completely obsolete, it was rowed by two peateri either using forcole or simpler oarlocks called vogarissi fixed directly to the boat. The oars were in fir-wood, six and a half meters long and made of two pieces.
penola	The wedges which are forced between the gamba of the forcola and the slot in the boat in which the gamba is inserted. These keep the forcola rigid and enable the oarsmen to adjust the inclination of the forcola.
pontapie	Wedge-shaped platform used by oarsmen to support the push given by the back foot. Also called a taparin or tapo.
popier, pupier	The stern oarsman with the oar on the right side who - as well as rowing - steers the boat.
poppa	stern, back
premando	'To the left'. Gondoliers use the word 'premando' in this sense. For example, "tegnive a premando" (turn left)
premer	The 'push' stroke of the oar. The opposite of stalir (return stroke)
provier, provin	Bow oarsman who rows with the oar on the left side of the boat.
Prua	Upward-curving part of the forcola in which the giron (shaft) of the oar is placed.
Puparìn	The puparin is the most elegant of the sandoli, designed for transport for richer families, it is now used for recreation and regattas. It has a very slender stern (from which it takes its name) on which the popiere rows. It is asymmetrical like the gondola.
raspa	See fero a do maneghi
recia	Lierally 'ear': protrusion of the top part of the forcòla.
remèri, remero	Craftsman who makes oars and forcole.
remiera (societa)	Associations of Venetian rowing enthusiasts. They have various types of boats made available to the members, with which they organize excursions, regattas, parades for special occasions. They are identified by the colors of their uniforms and boats.
sanca de la forcola	The inner part of the curve of a forcola (usually the stern forcola of a gondola). It is used in narrow canals when the oar has to be aligned parallel with the length of the boat, and for 'reverse' manouevres (a pope indrio) or (andar in sanca).

Sàndolo	The sandolo is the most commonly used boat of the lagoon, characterized by a flat bottom, and the bow stem which is straight and identical to the stern. A large number of local variants exist, the sandolo ciosoto, buranelo, S. Pietro or sanpierota, as well as those modified for various uses including the puparin, the sciopon, and the mascareta
Sanpieròta	The sanpierota is a boat for recreation. It is derived from the sandolo used by fisherman of San Pietro in Volta, and has been gradually widened to support a larger sail.
Sartòri	They are the tailors who make special clothes for gondoliers.
sata	Literally, 'paw'. See gamba
S'ciopón	The s'cioon is the smallest sandolo of the lagoon. It was designed for hunting with a spingarda (a large gun) and for fishing with a pronged spear. It is usually rowed by a single oarsman.
sia stali, sia premi	Commands used by gondoliers: sia stali move backwards or stop veering to the right; sia premi move backwards or stop turning to the left.
siar, siare	Stopping the boat by levering the oar against the front of the forcola
soraosso	Piece of wood glued to the part of the oar worn down by being in constant rubbing against the forcòla.
Squerariòli	They are the carpenters that specialized in the construction of wooden boats, including the gondola.
stagando!	To the right'. See also premando.
stalir	Return stroke in single-oar rowing; the blade remains in the water and is angled so as to correct the direction of the boat. The opposite of premer.
tapa	1) Horizontal block in the middle of the forcola which seperates the gamba from the upper, visible part of the forcola. 2) Transverse cuts in the blade of the oar in which lateral bands of beechwood (cortei) are fixed.
Tapessièri	They are the upholsterers who make the cushions used in the gondola
tirar (al remo)	Thinning the oar along the shaft; carried out after having used the oar for some time to allow the wood fibers to stabilize.
tirar acqua	Method used to turn the boat by holding the oar vertically with both hands and moving the oar rapidly from side to side.
Tòpo	The topo, also called the batelo a pisso, is the most widely used fishing/transport boat of the lagoon. It is between six and twelve meters long, has the bow stem curved forwards and a rounded stern with a vertical stem.
trastolini	Fir-wood thwarts of the gondola; the pair of trastolini at the bow make up the barcarisso, while the pair at the stern are near the trasto bagagli.
velada	Type of bow forcòla characterized by the part on the opposite side of the morso being partially detached from the body of the forcòla; this part is shaped like the tails of a tailcoat.
vogar a la valesana	Rowing technique used by the lagoon fishermen in which two crossed oars are used by a single oarsman.

APPENDIX S: Italian Glossary of Boat-Related Terms

Term	Italian
baonàr	dicesi quando nelle grosse barche, uno dei guidatori, stando a poppa, tuffa nell'acqua il remo in direzione quasi parallela all'asse longitudinale della barca e voga alla rovescia, per far deviare il natante dalla linea retta che percorre.
Baretèri	Sono i cappellai esecutori dei cappelli estivi e dei berretti invernali dei gondolieri
Batèla Buranèla	La *batèla buranèla* è un' imbarcazione da lavoro con l'asta di prua simile al topo e la poppa con lo specchio come i *sàndolo*. Con tutta probabilità è la versione semplifi della *batela a cóa de gambaro*, un' elegante barca, completamente scomparsa, dalla poppa tonda e ricurva verso l'alto.
Caleghèri	Sono i calzolai creatori di scarpe speciali per gondolieri
Caorlìna	La *caorlìna* era una barca da trasporto e da pesca, dalle estremità simmetriche a mezzaluna, lunga attorno ai dieci metri. Versione moderne sono utilizzate solo per diporto e regarta a sei vogatori. Questo e altre barche da carico utilizzavano anche una particolare fórcola a tre morsi sovrapposti utilizzati in relazione ai differenti assetti di carico.
cómio	lett. gomito, curvatura esterna della forcola poppiera della gondola, il corrispondente incavo interno è detto sánca v.
cortèlo	lett. Coltello, striscia di legno di faggio aggiunta, singolarmente o in coppia, ai lati della pala del remo per aumentarne la superficie, irrigidirla e renderla pui resistente agli urti.
dolaóra	antica ascia di forma rettangolare, con il manico disassato, usata fino a non molto tempo fa dai *rèmeri* per la sbozzatura remi
el fèlze	*El fèlze* Era una cabina mobile posta al centro della gondola, riparo dei passeggeri d'inverno, di notte o in caso di pioggia e vento; veniva imbarcata solo se necessario; aveva un'apertura davanti e una 'portella', finestrelle laterali, la volta a botte. La struttura era complessa, oltre che riccamente decorata (legno e metallo). Ne erano artefici i felzèri, con il concorso di altri artigiani. Presente un tempo in ogni gondola, modesta o ricca che fosse, da alcuni decenni è in disuso, perché poco funzionale all'utilizzo odierno dell'imbarcazione.
félse, félze	cabina mobile della gondola in noce, rivestita di panno nero e dotata di una portèla anteriore di finestrelle rettangolari sugli altri latti. Attualmente in disuso, fino a qualche decennio fa il f. era corredo indispensabile della gondola, offrendo riparo ai passeggeri durante la stagione invernale o in caso di maltempo
fero a do maneghi, a do man	sorta di coltello a lama larga falcata, che usano i bottai, i remai e altri simili artefici.
Ferro	Ornamento in metallo per la prua o la poppa delle gondole o delle barche in genere.
Forcole forcolìn	forcella del remo
	forcella del remo ad sola incavatura *mòrso*; dicesi anche *fórcola a un mòrso.*
Fravi	Sono i fabbri e forgiatori dei ferri da prua e altri acciai. Intervengono nella 'terza fase' del complesso lavoro di costruzione della gondola, dopo che lo scafo è stato costruito, calafato, impeciato.
gàmba	genericamente la parte bassa di un oggetto, come la fórcola ecc.

girón	la parte cilindrica del remo compresa fra l'estremità superiore ed il punto, detto *entràr*, dove nasce la pala.
Gondolìn	il *gondolìn* è una imbarcazione simile alla gondola ma più piccola e leggera utilizzata solo per le regate a due vogatori.
Indoradòri	Sono i doratori degli ornamenti
Intagiadòri	Sono gli intagliatori delle sovrastrutture scolpibili
lài	lato di una imbarcazione. *Mé*tarse al l. o essare al l., significa mettersi o essere affiancati ad un'altra barca.
lài (avere la barca al)	avere la barca corretttamente inclinata sulla destra
lài de mezo	lato sinistro della gondola
lài de pope	lato destro della gondola
lài roverso (stare al)	barca che per un errore di costruzione o per la disposizione del carico o dei rematori e inclinata sulla sinistra, invece che correttamente a destra, v. lài.
Mascaréta	La *mascaré*ta è una versione più leggera del *sà*ndolo, che non ha nèrve ne tràsti al termine delle coperte. Lunga attorno ai sette otto metri e utilizzata, con due persone d' equipaggio, per diporto e per le regate femminili.
morso	incavo della forcola nel quale viene posto il *girone* del remo.
naselo	una delle due punte del *mòrso* delle fórcole.V. anche naso
oe!	richiamo che i gondolieri usano come avvertimento all'approssimarsi di un incrocio di canali o di una curva. All' òe! Di riposta di un altro gondoliere dichiarano da che parte intendono dirigersi, con a *premà*ndo se vogliono andare a sinistra, a *stagà*ndo se vanno a destra e de *lò*ngo se proseguono diritti.
Ottonài/ Fonditori	Sono i creatori dei cavalli e degli altri ornamenti metallici
parada (fare una)	traversata, traghetto, (con gondole).
parar	spingere l'imbarcazione puntando il remo sul fondo del canale.
Peàta	La *pe*àta era la più grossa barca da transporto per I canali interni, arrivando a misurare 15 metri di lunghezza e oltre 370 quintali di portata. Completamente in disuso era vogata da due *peatè*ri, o su fórcole o su scalmi più semplici detti vogarissi fissati all'imbarcazione.
penola	ognuno del cunei di legno forzati tra la gmaba della forcola e l'apertura sulla barca allo scopo di tenerla ben ferma e di trovare l'inclinazione piu redditizia alla voga.
pontapie	pedana a forma di cuneo, usata dai vogatori per sostenere la spinta del piede posteriore. Detta anche *taparìn* o *tà*po.
popier, pupier	il vogatore di poppa, con il remo a destra nella posizione più arretrata, che oltre a spingere la barca ha anche la funzione di dirigerla
poppa	La parte posteriore della barcha
premando	a sinistra. Di pratici si usa sempre in questo senso la parola premando. "per andare in piazza da che parte devo andar?:
premer	la spinta che si imprime sul remo nel movimento di andata. Il contrario di stalìr.
provier, provin	anche *provi*èr, vogatore di prua che ha il remo sul lato sinistro della barca.
Prua	La parte anteriore della gondola

Puparìn	il *puparì*n è il *sàndolo* più elegante, nato per il trasporto di persone delle famiglie denestanti, è ora utilizzato per diporto e per regata. Ha la poppa molto slanciata, (da cui il nome) sopra la quale voga il *popiè*r e, particolare rimarchevole, è asimmmertrico come le gondola
raspa	sin. di *fèro a dó maneghi v*.
recia	lett. orecchia, sporgenza posteriore della testa delle fórcole.
remèri, remero	artigiano che fabbrica remi e fórcole.
remiera (societa)	associazione che riunisce nella laguna di Venezia appassionati di voga alla veneta. Dispongono di imbarcazioni di vario tipo, messe a disposizione dei soci, con le soci, con le quali organizzano uscite, regate o sfilate in occasione di particolari ricorrenze. si distinguono tra di loro dal colore delle divise e delle imbarcazioni.
sanca de la forcola	la parte interna della curva di una fórcola, in genere quella di poppa della gondola. Viene utilizzata nei canali stretti quando bisogna tenere il remo parallelo all'imbarcazione, e quando si voga all'intietro (a pópe indrio) o (andàr in sànca)
Sàndolo	il *sàndolo* è la barca più diffusa in laguna, caratterizzata- oltre dal consueto fondo piatto- dal fianco e asta di prua diritti e specchio di poppa. Ha prondotto una grandissima famiglia di varianti sia locali vedi sàndolo ciosòto, buranèlo, di S. Piero o sanpieròta, che modificate per i diversi impieghi fra cui il puparin, lo s'ciopón, la mascaréta ecc.
Sanpieròta	La *sanpieròta* è un'imbarcazione da diporto, derivata dal *sàndolo* usato dai pescatori di S. Pietro in Volta, progressivamente allargata per sostenere una velatura maggiore.
Sartòri	i calzolai creatori di scarpe speciali per gondolieri
sata	lett. zampa. Sin. di gamba
S'ciopón	Lo *s'ciopó*n è il sàndolo lagunare più piccolo, nata per la caccia con la spingarda (s'ciòpo, da il nome) e per la pesca con la fiocina. Si voga generalmente da soli alla valesàna, le sue fórcole, da sempre le più semeplici ed economiche, ritagliate da una tavoletta di modesto spessore, sono state sottoposte anch'esse ad una cura anabolizzante come si vede dall'illustrazione
sia stali, sia premi	modi di comando usati dai barcaiuoli come sopra, e che valgono il primo: da indietro o fermati, ma volgendosi a destra; ed il secondo: da indietro o fermati, ma volgendosi a sinistra
siar, siare	frenare l' imbarcazione in movimento, anteponendo il remo alla fórcola.
soraosso	pezzo di legno incollato sul *girón* del remo nel punto dove si e logorato per il continuo sfregamento sulla fórcola.
Squerariòli	Sono i carpentieri specializzati nella costruzione di imbarcazioni in legno, e quindi anche di gondole
stagando!	.a destra, nel linguaggio correbte deu gondolieri e barcaioli.
stalir	movimento di ritorno del remo nella voga singola, utilizzato tenendo l'estremita della pala dentro l'acqua, per imprimere alla barca una correzione della rotta verso destra
tapa	1) fascia orizzontale al cento della fórcola, che separa la sàta rimane a contatto con l'imbarcazione. 2) incastro traversale nella pala del remo dove si inserisce il cortèlo.
Tapessièri	Sono i tappezzieri esecutori delle cuscinerie
tirar (al remo)	affinare il remo, alleggerirlo dal *girón* alla pala. Operazione che si esegue in genere dopo averlo vogato per un po' di tempo per fare assestare le fibre.
tirar acqua	metodo per far accostare la barca di lato, immergendo il remo verticalmente e tirandolo a sé con le due mani facendolo oscillare lateralmente.

Tòpo	il *tòpo*, detto anche *batèlo* a pisso, è una delle barche da pesca e trasporto piu diffuse in laguna. Lungo dai sei ai dodici metri, ha l'asta di prua curva distesa in avanti e la poppa tonda con l'asta verticale.
trastolini	dim.di tràsti; tavole mobili di abete, appoggiate di traverso sulla gondola, sono I due de prova che constituiscono il barcarisso, e i due de pope vicino al trasto bagagli.
velada	tipo di forcola di prua, con la parte opposta al *mò*rso, staccata dal corpo della stessa come una di un frac.
vogar a la valesana	condurre un' imbarcazione all'uso dei pescatori lagunari, con due remi incrociati manovrati da un solo vogatore.