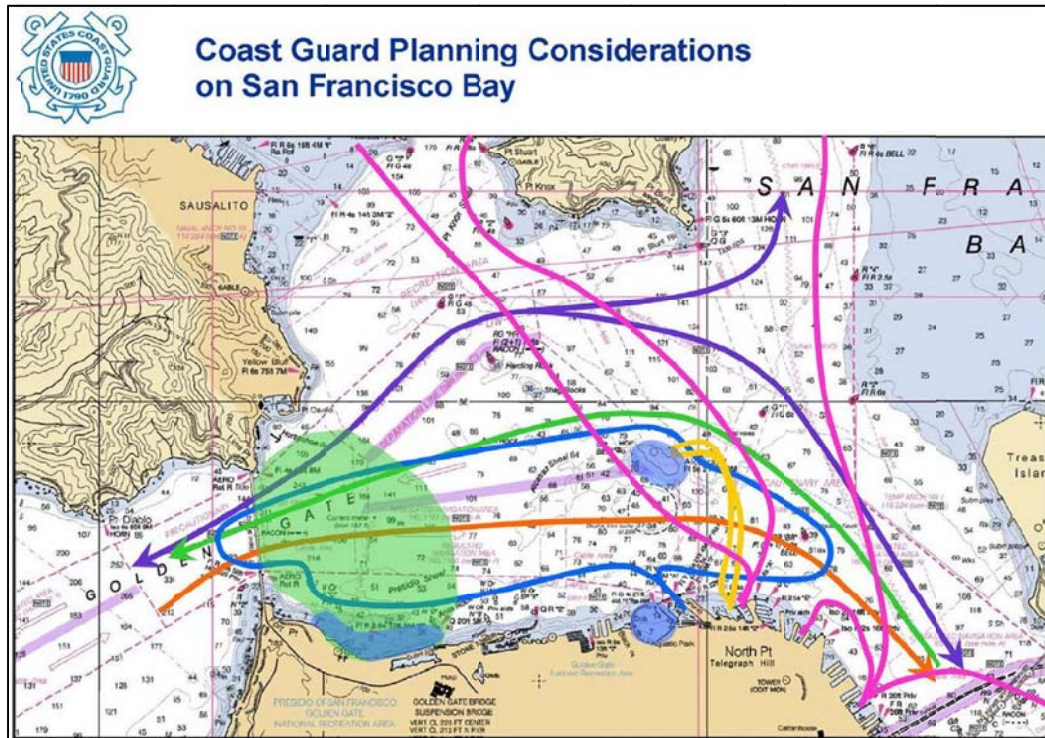


Spatial Planning for Busy Waterways: A Case Study of Innovative Waterways Management in the San Francisco Bay Region



(Map: U.S. Coast Guard Sector San Francisco)

By Tiffany Smythe, Jennifer McCann, Nicole Andrescavage and Christian Fox
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This report is one of three marine spatial planning (MSP) case study reports produced by the Coastal Resources Center/Rhode Island Sea Grant College Program (CRC) at the URI Graduate School of Oceanography. It is part of CRC's broader ongoing research and capacity-building initiative to strengthen the network of marine spatial planning and coastal management practitioners. The purpose of the case studies is to document and share lessons learned from examples of marine spatial planning in the U.S. in order to build the capacity of MSP and coastal management practitioners. Research was conducted in three locations: Rhode Island, Washington State and San Francisco. The Rhode Island case focused on implementation of the Rhode Island Ocean Special Area Management Plan; the Washington case focused on the ongoing development of the Washington Coast Marine Spatial Plan; and the San Francisco study became a two-case analysis of two different Coast Guard-led waterways management initiatives. CRC has produced three technical reports summarizing case study research as well as a series of shorter publications highlighting key findings.

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List of Acronyms

AC:	America's Cup
ACRM:	America's Cup Race Management
AIS:	Automatic Identification System
ASBS:	Area of Special Biological Significance
BCDC:	San Francisco Bay Conservation and Development Commission
CCSF:	The City and County of San Francisco
e-ATON:	Electronic Aids to Navigation
HSC:	Harbor Safety Committee of the San Francisco Bay Region
IMO:	International Maritime Organization
MSP:	Marine Spatial Planning
NEPA:	National Environmental Protection Act
NOAA:	National Oceanic and Atmospheric Administration
NPRM:	Notice of Proposed Rule Making
NPS:	National Parks Service
ONMS:	NOAA Office of National Marine Sanctuaries
PARS:	Port Access Route Study
PATCOM:	Patrol Commander
PCFFA:	Pacific Coast Federation of Fishermen's Associations
PMSA:	Pacific Marine Shipping Association
SAC:	Sanctuary Advisory Council
SLR:	Special Local Regulation
TSS:	Traffic Separation Scheme
USACE:	United States Army Corps of Engineers
USCG:	United States Coast Guard
VTs:	Vessel Traffic Service

I. Purpose

Recent waterways management activities conducted by the U.S. Coast Guard in the San Francisco Bay region illustrate how marine spatial planning (MSP) can reduce conflict between human activities and natural resources and ensure marine events take place without interrupting maritime commerce or impacting the natural environment. This analysis of marine spatial planning in the San Francisco Bay region includes two case studies: (1) the Approaches to San Francisco Bay Port Access Route Study (PARS) (2009 - 2013), and (2) the America's Cup World Series and 34th America's Cup races (2012 – 2013). The purpose of these case studies is to identify lessons learned that can inform future MSP practice. The cases also provide insights into the Coast Guard's use of spatial planning and management techniques to manage busy waterways and illustrate how MSP practitioners can learn from the Coast Guard and partners' experience.

a. Why San Francisco?

The ecological, social and cultural complexity and richness of the San Francisco Bay region make it a suitable location to study the practice and benefits of marine spatial planning. Located in north-central California, San Francisco Bay is the second largest estuary in the United States and the largest on the Pacific coast of both North and South America. A landscape of hills and valleys surround the Bay, formed of highly variable and active geology. Its watershed drains over 75,000 square miles – an area larger than New England – and provides drinking water for more than 25 million inhabitants of the state. The Bay Area includes over 7 million residents, making it one of the most densely-populated urban regions in the U.S.¹

San Francisco Bay is oriented northwest to southeast, with a single opening to the Pacific Ocean at the Golden Gate in its center (see Figure 1). This opening is characterized by strong currents that, over time, have scoured the bottom to a depth of greater than 300 feet. The majority of the Bay, however, is less than 15 feet deep.² This varying topography yields numerous habitat types on the coast and islands, ranging from salt marsh to live-oak woodland.³ The waters and surrounding coastal lands are key habitat for many species of notable and protected marine mammals, birds, fish, and invertebrates, including four species of pinniped and four species of whale.⁴ Well-known protected marine species found in the Bay include harbor seals, sea lions, and harbor porpoises. Offshore, gray, humpback, and blue whales are common transients in the region. The waters outside of the Bay, along the California coast, include numerous national marine sanctuaries, which help protect and manage these marine species and the habitats upon which they rely. These include the Cordell Bank, Greater

Farallones, and Monterey Bay Sanctuaries, which are contiguous, as well as the Channel Islands Sanctuary further south.

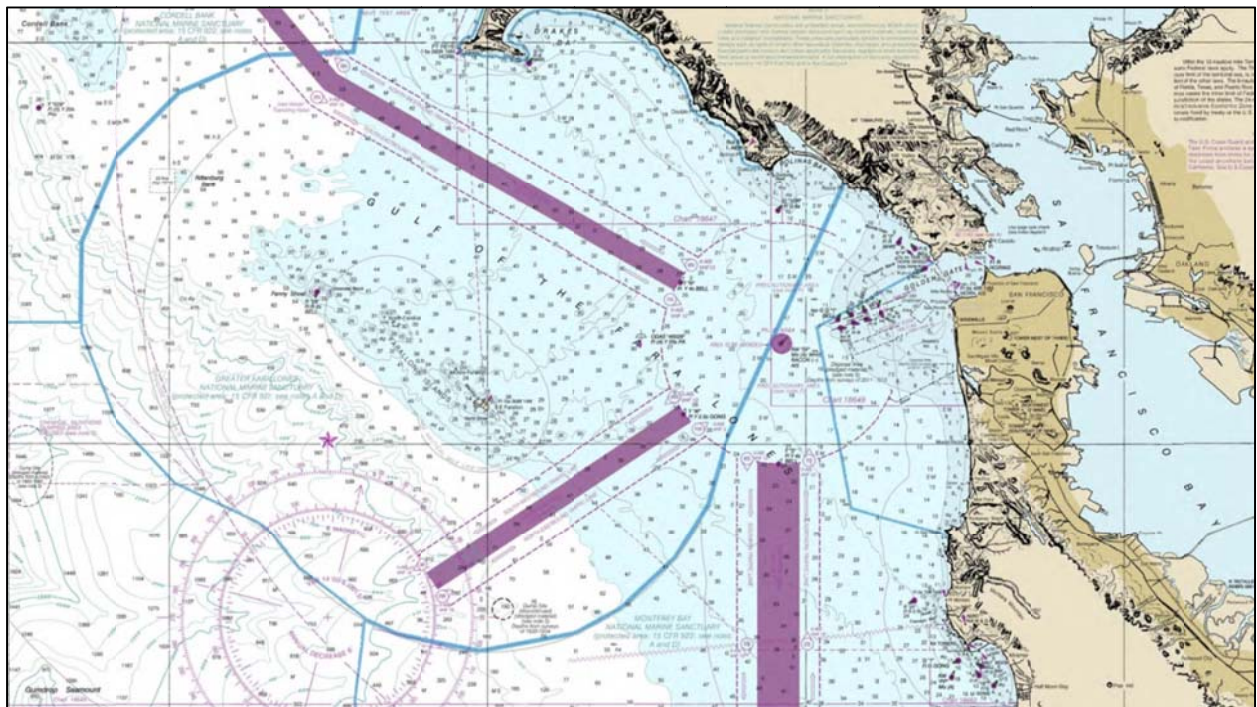


Figure 1. Map of San Francisco Bay Region (Source: NOAA; cropped from chart #18680)

The San Francisco Bay Area comprises one of the largest and most complex deep draft waterway systems in the world. These waters host a wide range of maritime activities – commercial shipping and fishing, passenger transportation, tourism, and recreation – which are key to the region’s history, economy, and culture. Between the Bay and its tributaries, the Sacramento and San Joaquin Rivers, the Bay Area comprises seven different commercial shipping ports: Benicia, Oakland, Redwood City, Richmond, Sacramento, San Francisco, and Stockton. Shipping traffic connected with all seven ports passes through the Golden Gate, which is less than one mile wide at its narrowest point. The American Association of Port Authorities reports that the Port of Oakland, by itself, ranked in the top 10 U.S. and Canadian ports in 2014 by quantity of twenty-foot equivalent units of cargo.⁵ Vessels calling at these ports move predominantly bulk, breakbulk and motor vehicle cargos. Together, activity at all seven of these ports resulted in nearly 7,500 commercial vessel transits (vessels over 300 gross tons) in and out of San Francisco Bay in 2013.⁶ The Bay Area shipping industry is estimated to support nearly 100,000 jobs and contribute \$4.5 billion to the region’s economy.⁷ These figures exclude passenger ferries; Bay Area ferries, which provide commuter services and access to Bay Islands, make over 90,000 trips annually.⁸ Additionally, the Bay hosts a thriving marine

recreation community that swims, paddles, fishes, and sails year round. Every year, Coast Guard Sector San Francisco reviews over 1,500 marine event permit applications and issues 1,000-1,100, permits for recreational users – the most of any waterbody in the country.⁹

This combination of intense marine and land use and sensitive natural resources has led to many past and present conflicts among marine users, and between users and the marine environment. Environmental concerns in and around the Bay include upland non-point sources of pollution, as well as vessel-related threats such as oil spills, invasive species, and ship strikes of whales.¹⁰ One high-profile incident in recent history that illustrates these conflicts was the 2007 *Cosco Busan* oil spill, occurring when the container ship sideswiped a supporting tower on the San Francisco-Oakland Bay Bridge in morning fog and spilled 54,000 gallons of fuel oil into the Bay, resulting in a cleanup effort costing \$32 million.¹¹

Navigation for vessels both in and outside the Bay is complicated by strong currents and dense fog. Large oceanic swells are an additional concern outside the Bay. Fog – caused by the upwelling of cold Pacific bottom water meeting the moisture-laden air – is common in this region.¹² This fog is nearly ubiquitous in the Bay Area throughout half the year, hence San Francisco’s nickname of the “Fog City.”

b. Why Waterways Management Activities?

Typically, marine spatial planning is described as a process that considers the natural resources and human uses in a marine area to identify places that are appropriate for specific uses; to resolve conflicts between uses and resources; and to achieve a range of other management objectives.¹³ Some readers may consider the two case studies – the PARS and the America’s Cup planning process – as unlikely or unconventional MSP examples. Yet, these efforts were selected precisely because they illustrate how elements of the MSP approach have long been in use to manage coastal and ocean space, even if planners and stakeholders did not describe their work as marine spatial planning. Both the PARS and the America’s Cup efforts demonstrate key elements of the MSP approach because they:

- Addressed user-user and/or user-environment conflicts;
- Included extensive spatial analysis;
- Were ultimately multi-objective in scope;
- Sought to integrate decision-making by working closely with other agencies and/or users;
- Included extensive stakeholder engagement components; and
- Resulted in spatially explicit policy decisions.

While the two cases are not directly related, both took place in the San Francisco Bay region around the same time and were led by the U.S. Coast Guard as part of the agency's broader waterways management work. Coast Guard waterways management includes "developing policies, overseeing efforts and conducting activities that (1) facilitate and manage vessel movement; (2) manage waterway infrastructure; (3) communicate waterway and environmental conditions; and (4) support understanding of ocean and waterway environments through marine science and observation."¹⁴ Notably, marine spatial planning is explicitly named in the Coast Guard's Commandant Instruction 16001.1 as a waterways management function.¹⁵ In practice, Coast Guard waterways management activities range from managing vessel routing schemes and aids to navigation to establishing temporary or long-term areas where vessel traffic is restricted, to mitigating obstructions and hazards to navigation, to permitting marine events.¹⁶

The Coast Guard has been conducting these activities long before the term marine spatial planning became commonplace. Arguably, these activities are a form of marine spatial planning. Edward LeBlanc, head of the Waterways Management Division at Coast Guard Sector Southeastern New England, stated: "In many respects, Coast Guard waterways management is the practical application of marine spatial planning principles – observing, measuring, and analyzing myriad demands on navigable waterways, and allocating use of those waterways in a methodical, structured manner that provides the best use to the most users. In allocating waterway uses, the waterways management process simultaneously balances a variety of environmental, economic, political, safety, and maritime security factors."¹⁷

These two case studies illustrate how waterways management activities utilize spatial planning and management techniques, and how MSP practitioners can learn from the Coast Guard and partners' experience in this regard. Further, these case studies reveal not only how MSP techniques can be integrated into mainstream marine management – but, how they are already well-established in some communities of practice.

c. Research Questions, Methods and Interview Participants

The research team identified areas of research focus to shape this study, based on a 2014 assessment of MSP practitioner needs¹⁸ and subsequent informal discussions with MSP practitioners and scholars. The case studies described in this report focus on: the original driving problem, or driver; the role of relevant agencies, stakeholders and authorities and key leaders; interagency collaboration and stakeholder participation; history and context; the process and tools used to facilitate plan implementation and adaptive management; and lessons learned. Both cases are built on the output of semi-structured interviews with 15 key participants who were identified with assistance from Coast Guard Sector San Francisco, which led the America's Cup planning process and implemented the outcome of the PARS process.

Four participants were involved in the PARS, and 13 were involved in America's Cup planning (see Table 1).ⁱ Interviewees represent a broad range of agency, user, and stakeholder participants. Direct quotations from interviewees are included in order to provide a richer understanding of each case.

In the interviews, case study authors asked each individual the following: How did participants influence plan development and/or implementation? How did participants coordinate with each other and with planning leaders to conduct this work? How did history, both political and personal, play into the process? How were information sources like geospatial data and local knowledge included into the process? Ultimately, how effective did participants find the process? The findings, anecdotes and lessons learned reported in both case studies are based on these interviews as well as a review of the public record (e.g., Federal Register notices, public meeting minutes, planning documents, technical reports, and news articles) on each initiative to date.

Table 1. Interview Participants and their Role in Each Case Study

Name	Affiliation	Title and Role
<i>Case Study 1: Approaches to San Francisco Port Access Route Study (PARS)</i>		
John Berge*	Pacific Marine Shipping Association (PMSA)	<ul style="list-style-type: none"> • Vice President, PMSA • Member of Joint Working Group, representing dry cargo maritime industry stakeholders
Michael Carver	Cordell Bank National Marine Sanctuary	<ul style="list-style-type: none"> • Deputy Superintendent for the Sanctuary • Staffed Joint Working Group on Vessel Strikes and Acoustic Impacts; helped prepare and provided initial Sanctuary comments to the United States Coast Guard (USCG); facilitated collaboration between both agencies; as of this writing, leading the effort to implement workgroup recommendations
Mike Van Houten	U.S. Coast Guard District 11	<ul style="list-style-type: none"> • Aids to Navigation Section Chief • Led PARS process for District 11
Commander Amy Wirts,	U.S. Coast Guard Sector San Francisco (2012-	<ul style="list-style-type: none"> • Chief of Waterways Management, Sector San Francisco

ⁱ Two interview participants were involved in both of the cases.

Name	Affiliation	Title and Role
USCG*	2015); U.S. Coast Guard Eleventh District (present)	<ul style="list-style-type: none"> Worked on implementation of Traffic Separation Scheme (TSS) modification recommended by PARS
<i>Case Study 2: Planning for the 34th America's Cup Races</i>		
John Berge*	Pacific Marine Shipping Association (PMSA)	<ul style="list-style-type: none"> Vice President, PMSA Vice Chair, San Francisco Harbor Safety Committee (HSC) representing dry cargo maritime industry stakeholders
Captain Matt Bliven, USCG (ret.)	U.S. Coast Guard Sector San Francisco (2011-2013)	<ul style="list-style-type: none"> Principal Coordinator, 34th America's Cup Coordinated USCG efforts to plan and manage 34th America's Cup race events
John Craig	America's Cup Event Authority	<ul style="list-style-type: none"> America's Cup Principle Race Officer America's Cup staff in charge of all on-the-water race activities; America's Cup representative in planning process
Captain Tom Dougherty	Blue & Gold Fleet Ferries	<ul style="list-style-type: none"> Operations Supervisor Represented ferry operator stakeholders on HSC
Aaron Golbus	Port of San Francisco	<ul style="list-style-type: none"> Wharfinger (Maritime Facilities Manager) Responsible for management of physical property supporting race infrastructure at the Port
Captain Bruce Horton	San Francisco Bar Pilots	<ul style="list-style-type: none"> Harbor pilot; Chair, HSC Navigation Work Group Represented harbor pilot stakeholders on HSC
Captain Lynn Korwatch	San Francisco Marine Exchange	<ul style="list-style-type: none"> Executive Director, Marine Exchange; Chair, HSC Represented Marine Exchange on HSC; helped facilitate communication about America's Cup planning with HSC members
Rob Lawrence	U.S. Army Corps of Engineers (USACE)	<ul style="list-style-type: none"> Chief of Dredged Materials Management Office

Name	Affiliation	Title and Role
		<ul style="list-style-type: none"> Responsible for issuing USACE permits for temporary and permanent race structures in the Bay
Commander Aaron Lubrano, USCG Reserve	Coast Guard Sector San Francisco (2011-2013)	<ul style="list-style-type: none"> U.S. Coast Guard Reserve officer activated as America's Cup Planning Section Chief, Coast Guard Sector San Francisco Led National Environmental Policy Act (NEPA)-mandated environmental review process for USCG; assisted in implementing management plans
Jim McGrath	San Francisco Boardsailing Association; San Francisco Bay Conservation and Development Commission (BCDC)	<ul style="list-style-type: none"> Vice President, Boardsailing Association; appointed commissioner, BCDC Represented board sailing and recreational stakeholders on HSC
Deb Self	San Francisco Baykeeper	<ul style="list-style-type: none"> Former Executive Director/Advisory Board Member Member, HSC Coordinated a coalition of 30 organizations addressing potential environmental impacts of the America's Cup
Alan Steinbrugge	San Francisco Marine Exchange	<ul style="list-style-type: none"> Director of External Operations for Marine Exchange; HSC member Represented Marine Exchange on HSC; helped facilitate communication about AC planning with HSC members
Commander Amy Wirts, USCG*	U.S. Coast Guard Sector San Francisco (2012-2015); U.S. Coast Guard District 11 (present)	<ul style="list-style-type: none"> Chief of Waterways Management, Sector San Francisco Head of staff responsible for writing and promulgating the Special Local Regulation (SLR); assisted in implementing management plan
<i>*Interviewed for their involvement in both case studies</i>		

For each case study, we present relevant context, including the issue driving the spatial process and the relevant agencies, stakeholders, and authorities; a description of the process itself; and discussion of lessons learned about spatial planning based on participant interviews. Lessons learned between the two cases touch on the role and influence of the driver; the efficiencies achieved in inter-organizational collaborations and partnerships; the importance of local knowledge; the strength of informal stakeholder engagement; the importance of pre-existing relationships, established long before the planning process; and, the presence of an honest broker.

II. Case Study #1: The Approaches to San Francisco Bay Port Access Route Study

a. Overview

Whereas the Approaches to San Francisco Bay Port Access Route Study (San Francisco PARS) ultimately addressed multiple navigation safety and marine environmental protection objectives, study participants explained that it began with a distinct focus on navigation safety and as a response to a marine casualty. In July 2007, the 291-foot container ship *Eva Danielsen*, struck the 29-foot wooden fishing boat *Buona Madre* off the coast of Point Reyes, California, outside of San Francisco Bay (see Table 2). The collision sunk the *Buona Madre*, and the boat's sole crew member, commercial fisherman Paul Wade, drowned. The collision happened in foggy conditions that are common in this region and took place outside the northern terminus of the "Northern Approach," the shipping lane approaching San Francisco Bay from the north.¹⁹ This shipping lane was part of the "Off San Francisco: Offshore Traffic Separation Scheme" (see Appendix I) guiding commercial ship traffic to and from the Bay, whose northern terminus was located in commercial fishing grounds. Both cargo ships and fishing vessels regularly traverse this heavily-used, often fogged-in area.

The U.S. Coast Guard (USCG) conducted an investigation into its response to the *Buona Madre* collision and the resulting search and rescue. The Final Action memo, issued by Rear Admiral Paul Zukunft (Eleventh District Commander at the time) in 2008, called for a series of remedial actions. One of these was that the Eleventh District "shall consider extending San Francisco Bay's Northern Traffic Lane by five to ten miles." This was recommended because it would "minimize commercial vessel course changes within a popular offshore fishing location, thereby ensuring more predictable commercial vessel movements and facilitating navigational safety."²⁰

It was this collision, and the actions laid out in the Final Action memo, that drove the Eleventh Coast Guard District to initiate the Approaches to San Francisco PARS. In order for the Coast Guard to modify existing or establish new fairways or traffic separation schemes (TSS), the agency must conduct a port access route study in accordance with the Ports and

Waterways Safety Act of 1972.²¹ A PARS is intended to help provide safe access routes for the movement of vessel traffic moving to or from U.S. ports and other areas under U.S. jurisdiction (see Appendix II).²² According to the Act, a PARS must include an analysis of vessel traffic density and the need for safe access routes, and must consider other uses of the area, including offshore energy development, deepwater ports, or other offshore structures, recreational and commercial fisheries, and marine sanctuaries. The Act requires consultation with other relevant federal and state agencies when considering these uses. It also stipulates that, while the designation of TSS “recognizes the paramount right of navigation over all other uses,” PARS shall, “to the extent practicable, reconcile the need for safe access routes with the needs of all other reasonable uses of the area involved.”²³

Table 2. Timeline of Events in Approaches to San Francisco Port Access Route Study Process

Date	Event
July 2007	M/V <i>Eva Danielsen</i> and F/V <i>Buona Madre</i> collision. ²⁴
November 2008	Eleventh Coast Guard District issues Final Action memo on the <i>Eva Danielsen</i> and <i>Buona Madre</i> collision, which includes considering extending the northern traffic lane in the Approaches to San Francisco. ²⁵
December 2009	Eleventh Coast Guard District begins the Approaches to San Francisco Port Access Route Study (PARS) process. ²⁶ The NOAA Office of National Marine Sanctuaries (ONMS) attends the first meeting and a cooperative relationship begins to develop between the Coast Guard PARS team and the Cordell Bank and Greater Farallones Sanctuaries.
February 2010	Coast Guard PARS team, Sanctuary staff, and fishermen meet regarding the PARS process; the ONMS, representing the Cordell Bank and the Greater Farallones Sanctuaries, submits a comment letter in response to the PARS Federal Register notice; ONMS begins assembling GIS data layers that could inform the PARS process.
April 2010	Cordell Bank and Greater Farallones Sanctuary Advisory Councils approve the establishment of a Joint Working Group to address Vessel Strikes and Acoustic Impacts (“Working Group”). ²⁷ Some members of the Working Group informally commence research and data analysis on ship strikes and acoustic impacts of vessel traffic on marine mammals.
October 2010	Coast Guard convenes PARS public meeting and proposes six TSS alteration scenarios. ONMS reads comment letter at the meeting, and collaboration continues between the Coast Guard PARS team and Cordell Bank and Greater Farallones Sanctuaries.
January 2011	Phone calls take place between NOAA and the Coast Guard PARS team. NOAA advocates for the proposal that leaves the southern lane untouched, extending the western lane and pushing it further from Southeast Farallon Island, and adding a dog-leg turn to the northern lane while also pushing it further from Point Reyes.
May 2011	Building on previous informal work, the Working Group officially begins research and data analysis on ship strikes and acoustic impacts of vessel traffic on marine mammals. ²⁸
June 2011	Eleventh Coast Guard District publishes final PARS analysis including a final

Date	Event
	recommendation for altering the Approaches to San Francisco TSS. Final recommendation addresses marine safety concerns and reduces potential for ship strikes. ²⁹
June 2011-April 2012	Coast Guard and NOAA work together to clarify mapping of final recommended TSS modifications for submission to the International Maritime Organization (IMO) for approval.
April 2012	Coast Guard and NOAA develop and submit proposed TSS alteration to the IMO for approval.
June 2012	Working Group concludes its work and issues final report. The Cordell Bank and Greater Farallones Sanctuary Advisory Councils unanimously approve the report and recommendations. ³⁰
December 2012	IMO issues final approval of alterations to the Off San Francisco TSS. ³¹
June 2013	TSS alteration enters into effect in international law and into practice. ³²
<i>Source unless otherwise noted: Carver, pers. comm., 2015</i>	

b. PARS Phase I: The Coast Guard Eleventh District

The Eleventh Coast Guard Districtⁱⁱ initiated the Approaches to San Francisco Bay PARS in late 2009, publishing a Notice of Study and a request for comments in the Federal Register. The notice states that “the goal of the study is to help reduce the risk of marine casualties and increase the efficiency of vessel traffic in the study area.”³³ In particular, the notice explains that:

“The Coast Guard plans to study whether extending the traffic lanes of the Traffic Separation Schemes off San Francisco would increase safety in the area just outside the radar range of Vessel Traffic Service (VTS) San Francisco. Because the VTS does not monitor this region, extending the traffic lanes may increase the predictability of vessel movements and encounters and improve navigation safety. In addition, the study will also assess whether extending the traffic lanes may interfere with fishing vessels

ⁱⁱ The Eleventh Coast Guard District encompasses the states of California, Arizona, Nevada, and Utah, the coastal and offshore waters out over thousand miles and the offshore waters of Mexico and Central America down to South America.

operating in the area. Furthermore, the present traffic lanes go through the Gulf of the Farallones National Marine Sanctuary and, if extended, will go into the Cordell Bank National Marine Sanctuary. The increased predictability of vessel traffic using established traffic lanes may decrease the potential for oil spills, collisions and other events that could threaten the marine environment.”³⁴

The PARS study area was defined as including the TSS off San Francisco, extending out to the limit of the Coast Guard VTS area (see Appendix III) and including traffic patterns of ships entering or exiting the traffic lanes. The VTS area includes the seaward area within a 38 nautical mile radius of Mount Tamalpais, located on the California coast north of the entrance to San Francisco Bay (see Figure 1 above). Importantly, this PARS built upon a history of previous such studies, including a 1979 PARS that, in combination with a report issued in connection with the newly-established Monterey Bay National Marine Sanctuary, led to a shift in the southern approach of the San Francisco TSS.³⁵

Whereas the incident involving the *Buona Madre* may have led to the Coast Guard’s decision to start a PARS process, the Coast Guard had a range of marine traffic issues to consider – not only shipping/fishing vessel conflicts. For example, in 2009 the California Air Resources Board Ocean-Going Vessel Fuel Rule had gone into effect; this rule required vessels to use low-sulfur fuels within 24 nautical miles of the California coast. As a result, vessel traffic patterns in the TSS had changed beginning in 2009 with more vessels using the western approach in order to minimize the amount of time they would need to use the low-sulfur fuel.³⁶ It was not clear whether this traffic pattern change would remain in effect over the long term or whether it was so pronounced as to require a TSS modification.

Drawing upon its extensive experience conducting PARS, the Coast Guard approached the process with a clear focus on their study objectives and the amount of time needed to accomplish this work. This Approaches to San Francisco Bay PARS was envisioned as a six- to twelve-month study involving analysis of previous studies, vessel traffic density, fishing vessel information, and agency and stakeholder experience in vessel traffic management, navigation, ship handling, and weather.³⁷ The Coast Guard planned for consultation with other federal and state agencies and for public meetings as needed.³⁸ This included a public meeting in late 2010, following a public comment period. According to Mr. Mike Van Houten of the Eleventh Coast Guard District, this also included a presentation to the Harbor Safety Committee of the San Francisco Bay Region (HSC) and targeted informal outreach in one-on-one and small-group meetings with key industry representatives from the fishing industry, the San Francisco Bar Pilots, and other maritime professionals. The Coast Guard, in San Francisco Bay and elsewhere, has well-established working relationships with maritime professionals and other waterways users, and these relationships were leveraged in this case. Van Houten explained that the

meetings drew upon the Coast Guard's existing maritime industry contacts, noting that they had "several informal discussions" which were "beneficial for understanding perspectives from the maritime industry."

To develop this PARS, the Coast Guard utilized in-house data sources as well as vessel transit statistics from the San Francisco VTS. Van Houten, who led the PARS for the District, explained that the Coast Guard has limited resources to conduct such studies and the associated stakeholder outreach. However, he explained that they make good use of the resources they do have – not only the data sources mentioned above, but the knowledge and professional experience held in-house by Coast Guard staff as well as that of other agencies and stakeholders. He explained that Coast Guard VTS staff played an important role in conducting the PARS by interpreting Automatic Identification System (AIS) data, based on their first-hand knowledge of vessel transit patterns and the San Francisco VTS area, and making suggestions based on their professional knowledge and expertise in waterways management. VTS staff "provided some of the story behind the pictures," said Van Houten. He also noted: "It was helpful to get the background or amplifying information to help us interpret the data we were seeing on the density plots [of vessel traffic]." It is through this process, and relying on AIS data and the first-hand experience of VTS staff and industry professionals, that the Coast Guard developed its initial recommendations – six different options for changes to the TSS – which it presented at a public meeting in late 2010 (see Figure 2). These options were generated through the Coast Guard's data analysis and stakeholder engagement process and provided varying approaches for mitigating the navigation safety concerns the PARS was intended to address.

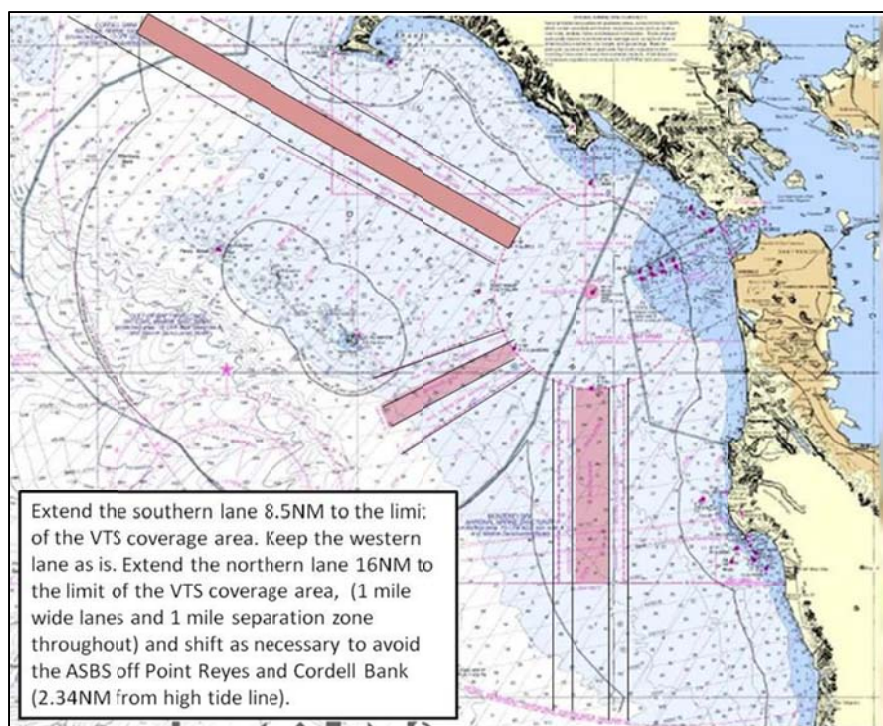


Figure 2. Example of One Proposed TSS Modification from PARS Process (Source: U.S. Coast Guard 2010)

c. PARS Phase II: Sanctuary Involvement

Although targeted stakeholder outreach and engagement assisted the Coast Guard with generating the six initial options, the response to the agency's call for public comments and an invitation to attend this October 2010 public meeting, listed in the Federal Register, elicited a somewhat low response. Prior to the meeting, the Coast Guard received only five public comment letters, representing government, industry, and environmental non-governmental organizations. As Mike Van Houten described it: "We went out with our notice and we did get some comments, but we had a sense that a lot of people were waiting . . . were looking for ideas from the public, but I think they were waiting for us, saying, 'OK, Coast Guard, come up with some options and ideas and we'll tell you what we think.' So that was one of the reasons for doing the meeting." He also noted it was at this meeting that some members of the public brought forth relevant data and information to help inform the PARS. For example, Van Houten explained how commercial fishermen from the port of Half Moon Bay came forward with concerns about the northern and southern traffic lanes and areas they fish around these heavily-trafficked areas.

At the public meeting, two parties – representatives of the National Oceanic and Atmospheric Administration's (NOAA) Cordell Bank and from the Gulf of the Farallones National Marine Sanctuaries (see Appendix IV) – attended with great interest and to follow up on previously submitted comments. These two Sanctuaries, whose missions are focused on marine

environmental protection, both overlap the PARS study area. Perhaps more importantly, both Sanctuaries had recently begun work on a marine traffic issue of particular relevance to their missions – ships striking whales. As Michael Carver, Deputy Superintendent of the Cordell Bank National Marine Sanctuary, explained it, low attendance at this meeting provided an opportunity for the Sanctuaries to actively engage: “That [meeting] started the relationship with the Coast Guard [in developing the PARS].”

The Sanctuaries’ interest in and concern about ship traffic in the study area was established well before the PARS process began. Michael Carver explained that the Sanctuaries were receiving reports of ship strikes of blue whales in the waters off southern California as far back as 2007. In 2010, after additional reports of ship strikes off northern California affecting blue, fin and humpback whales, some marine scientists began collaborating with the Sanctuaries to collect data related to this issue, and later that year, the Sanctuaries decided to establish a working group to formally study the problem. In April 2010, the Cordell Bank and the Greater Farallones Sanctuary Advisory Councils (SACs) established the Joint Working Group on Vessel Strikes and Acoustic Impacts (“Working Group”; see box below).³⁹ The Working Group included representatives from the scientific community, the shipping industry, and conservation groups, and received technical support from government agency staff, scientists, and other conservation groups. Its purpose was to examine and make recommendations about the impacts of vessel traffic on marine mammals, including ship strikes and acoustic impacts, and its formal work took place from May 2011 to May 2012 – coinciding with part of the PARS process.⁴⁰ Given the PARS’ focus on analyzing and potentially redirecting vessel traffic patterns, Sanctuary staff explained how they saw a golden opportunity – why not work with the Coast Guard through the PARS process, which was well under way, to address the Sanctuaries’ marine mammal/vessel traffic concerns? “There was this low-hanging fruit in front of us,” Carver commented. For the Sanctuaries, the PARS process provided an opportunity for them to address the issue of ship strikes much faster than may have been possible through other regulatory processes.

The Sanctuary Advisory Councils and the Joint Working Group on Vessel Strikes and Acoustic Impacts: Offering Stakeholder and Expert Input into the PARS Process

NOAA's National Marine Sanctuaries often have well-established relationships with a broad range of local stakeholders and experts through their Sanctuary Advisory Councils (SACs). The National Marine Sanctuaries Act explains that the purpose of a SAC is "to advise and make recommendations to the Secretary regarding the designation and management of national marine sanctuaries." SAC members can represent a range of different natural resource-related sectors.⁴¹ SAC members often include scientists, citizens, sanctuary users, and representatives from the conservation and education sectors. Both the Cordell Bank and the Greater Farallones Sanctuaries have SACs, and some individuals are members of both SACs.⁴² The SACs thus provide sanctuary managers with regular access to a broad range of stakeholders and experts who can advise on multiple aspects of sanctuary management.

The Cordell Bank and Greater Farallones Sanctuaries' SACs established the Joint Working Group on Vessel Strikes and Acoustic Impacts. It was chaired by two SAC members and included other experts and stakeholders.⁴³ The Working Group thus broadened the Sanctuaries' access to stakeholder and expert input. Its charge was to make recommendations to the SACs, which were then able to use these recommendations to provide input to the Sanctuary managers. The Working Group was particularly focused on marine traffic contributions to natural resource management issues, including ship strikes and acoustic impacts on marine mammals. The final Working Group report, *Vessel Strikes and Acoustic Impacts: Report of a Joint Working Group of Gulf of the Farallones and Cordell Bank National Marine Sanctuaries Advisory Councils*, states that the group would "take a marine spatial planning approach to evaluating impacts and determining recommendations."⁴⁴

Although the Working Group's research concluded after the PARS process was finished, the Working Group worked closely with NOAA and the Coast Guard to contribute to the PARS process and to suggest alternative TSS modifications that would both address marine safety and marine environmental protection concerns. The Working Group's final report explains that, in contributing to the PARS process, its members "placed special emphasis on reducing the co-occurrence of whales and ships through lane modification, as well as extending the western traffic lanes beyond the continental shelf edge in order to move vessels quickly and efficiently through the area of highest whale concentrations."⁴⁵

The Working Group was disbanded in 2012 after completing its report. However, Michael Carver of the Cordell Bank Sanctuary indicates that a SAC subcommittee may be reconvened to conduct additional work on original Working Group recommendations.

Whereas marine mammals were a primary focus of the Sanctuaries' input on the PARS process, the Sanctuaries raised other issues as well. These included previously-designated Areas of Special Biological Significance (ASBS) located within the area. ASBS are designated based on their location in California ocean waters, their intrinsic or recognized value, and their need for special protection. They are managed by the California State Water Control Board for the purpose of preventing waste discharge within these sensitive areas.⁴⁶ Two ASBS are located within the boundaries of the Sanctuaries, and thus protected under federal law as well, such that cargo vessels are prohibited from traveling within two nautical miles of these sensitive areas. Moreover, one of these two-nautical mile areas where cargo vessels are prohibited – around Point Reyes Headland – overlapped with the TSS as it existed at the time, thus conflicting with this regulation. In their February 2010 comment letter, the Sanctuaries pointed out that the existing TSS ran directly through this area, and encouraged the Coast Guard to consider TSS modifications that would enable compliance with this regulation.⁴⁷

Following the sparsely-attended public meeting in late 2010, the two Sanctuaries and the Coast Guard began working in close coordination to share information and to consider how the Coast Guard's options for modifying the TSS to address navigation safety could also address the Sanctuaries' ship strike concerns. Michael Carver explained how the Sanctuaries offered technical support by contributing GIS data layers showing whale density and commercial fishing effort to inform and enhance the study. They were also able to leverage the Sanctuaries' and NOAA's in-house GIS and data analysis skills and expertise – including those of the Stellwagen Bank National Marine Sanctuary in Massachusetts (see Appendix V) – which complemented the Coast Guard's vessel traffic expertise. Using these data and skills, the Sanctuaries developed a layered PDF document (see Figure 3), including these data as well as the Coast Guard's vessel traffic data and existing and proposed traffic lanes, to facilitate further discussion between the agencies. Using the layered PDF, the Sanctuaries suggested an alternative TSS modification that would both address navigational safety concerns and steer traffic clear of sensitive habitats, thus minimizing the overlap of ship traffic with preferred whale habitat and traditional fishing grounds.

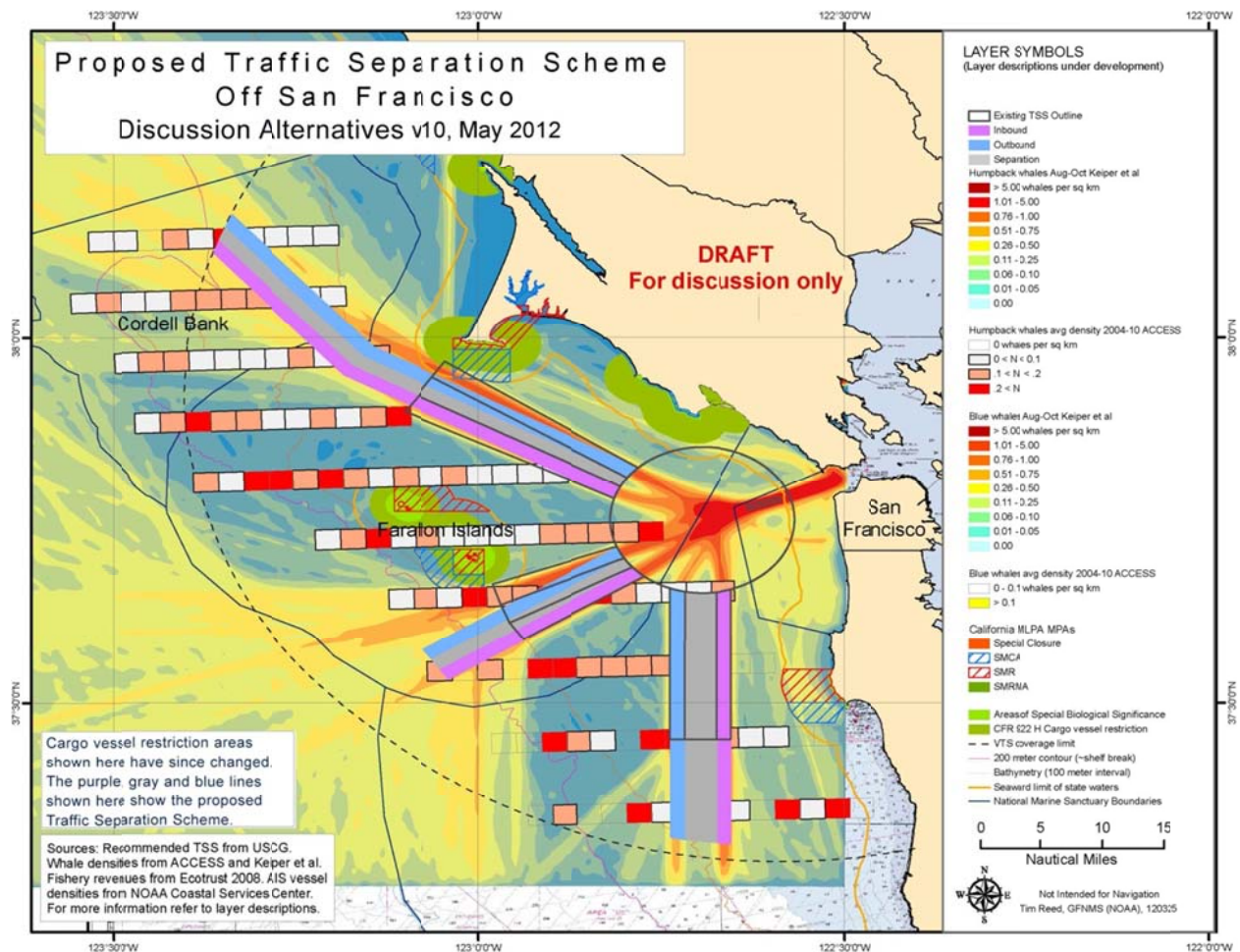


Figure 3. View of Layered PDF Showing Vessel Traffic, Marine Mammal Density and Other Data Layers (Source: Greater Farallones National Marine Sanctuary)

The Sanctuaries also brought their constituents to the table. Michael Carver explained how, through both the SAC and the Working Group, the Sanctuaries brought a different set of stakeholders and experts into the PARS process. Van Houten explained that while the Coast Guard had brought maritime industry representatives into the process, using its pre-existing relationships with these groups, the Sanctuaries brought in scientists, conservation groups, and additional fishermen. Some of these stakeholders are connected to the Sanctuaries, but not necessarily to the Coast Guard, because of differences in the agencies' missions. "So we had folks from the [maritime] industry, from Chevron and APL [American President Lines], from the shipping companies; we had Greenpeace and NRDC [Natural Resources Defense Council]. We had a number of researchers and other folks to advise us . . . And these were all folks trying to help us drill down and solve the ship strike issue as best we could," commented Carver. The Sanctuaries gathered feedback from these constituents, shared it with the Coast Guard PARS team, and used it to negotiate a TSS modification that addressed their concerns. Moreover, many of these constituents shared feedback directly with the Coast Guard, adding 15 more

public comment letters from scientists and private citizens to the five original letters. The Working Group composition itself was diverse, including scientists affiliated with universities, non-profit organizations, and government; and other representatives from the government, industry, and conservation sectors. Further, the group's ship strike research was funded by non-profit science- and conservation-oriented foundations.

One key participant, who was a member of both the Cordell Bank SAC and the Working Group, was John Berge of the Pacific Merchant Shipping Association (PMSA). Berge described how his and others' roles in the Working Group contributed information about their respective expertise. From his standpoint: "a lot of people in the room didn't know much about the maritime industry, and so we hoped to educate them." He further described the process of working together with this group through this consensus-driven process: ". . . I think it was a good group, there was a lot of trust. Obviously, there were some gaps between the desires of some stakeholders and others, but everyone recognized that, and we . . . worked on a consensus basis." Michael Carver noted: "We have a great working relationship with PMSA [Berge]. Just recently, we collaborated with PMSA to get posters onto the bridges of ships to educate mariners about marine mammals. The perspective that John brings to our Advisory Council is invaluable. John provides insight into what is feasible from the maritime industry perspective, which helps inform the management of the Sanctuary."

Although the Coast Guard had already engaged the commercial fishing industry, the Sanctuaries brought additional fishermen into the process. Michael Carver explained how the Greater Farallones Sanctuary shares an office building with the Pacific Coast Federation of Fishermen's Associations (PCCFA), the largest and most active trade association of commercial fishermen on the west coast. "Thanks to our close relationship with PCFFA," Carver explained: "The Sanctuaries were able to gather fishermen to sit around the table on the 3rd floor of our office with the USCG PARS team. The USCG was able to hear and talk to folks from the larger fisheries like salmon and crab as well as smaller fisheries, like hag fish and slime eel. No fisherman wanted the traffic lanes to cross their fishing grounds, but it gave the Coast Guard a chance to talk to users and drill down into the details. Bringing stakeholders together to voice their concerns and tackle tough issues is one of the Sanctuaries' greatest strengths."

d. PARS Recommendations and the TSS Change

Before the Sanctuaries were involved, the Coast Guard had developed six different scenarios for modifying the TSS. Scenarios considered extending some or all of the traffic lanes to the extent of the VTS coverage area; shifting and adding a dog-leg turn to the northern lane to avoid popular fishing areas and sensitive habitats; or even leaving the TSS as it was.⁴⁸ All scenarios were designed primarily to address navigation safety issues such as those brought into focus through the *Buona Madre* collision and fatality and were generated through the

Coast Guard's own data analysis and stakeholder process. Michael Carver explained that, using the layered PDF that included whale density data, fishing effort data and other biological considerations, the Sanctuaries advocated for a proposal that would adopt and expand upon some elements of these scenarios: leave the southern lane untouched; extend the western lane and shift it south, further from Southeast Farallon Island; and add a dog-leg turn to the northern lane while also pushing the lane further offshore from Point Reyes. This, explained Carver, would minimize the potential co-occurrence of ships and whales as much as was reasonably possible. Mike Van Houten explained that the final recommended change was largely consistent with what the Coast Guard felt was optimal given its own data analysis and input from VTS staff and maritime industry professionals. For example, Van Houten explained, the dog-leg turn in the northern traffic route solved many problems. It directed ship traffic away from Cordell Bank and away from "some pretty densely populated fishing grounds," while also addressing the Sanctuaries' concerns about whales.

Ultimately, the Approaches to San Francisco PARS process concluded in June 2011 with the Coast Guard recommending a change to the TSS that adopted many of the above ideas and addressed both vessel traffic and ship strike concerns. The final PARS document's recommended changes would keep cargo vessels on a clearly-defined path through prime fishing grounds, concentrating previously scattered ship traffic and thus improving predictability – a key navigation safety objective. They would also direct ships away from Cordell Bank and Southeast Farallon Island as well as the ASBS off of Point Reyes. The PARS also recommended extending and narrowing the western lane to enhance navigation safety and extending the southern lane to enhance navigation safety and improve predictability of shipping traffic in popular fishing grounds.

While the final PARS document clearly states that the Coast Guard does not have the authority to control vessel traffic in order to protect marine mammals *per se*, it clearly acknowledged ship strikes and Sanctuary-related concerns when making this final recommendation. It noted that the northern lane changes "will keep vessels on a straightened course to the edge of the continental shelf, reducing the risk of whale strikes in an area of potential high whale density." Further, it explained that all recommended modifications will "enhance predictability of vessel traffic patterns while transiting through an environmentally sensitive area which includes three national marine sanctuaries. Vessel collisions or groundings in any of the national marine sanctuaries could have catastrophic environmental impacts."⁴⁹

In 2012, the International Maritime Organization (IMO) approved the recommended TSS change (see Figure 4) and it went into effect internationally on June 1, 2013. While it has yet to be adopted into U.S. law through the federal rule-making process, Coast Guard Commander Amy Wirts – who joined Coast Guard Sector San Francisco after the PARS study process had

concluded – explained that the new route is already being used in practice, with a very high rate of compliance because the Coast Guard and partners had already done extensive outreach to the maritime industry. “We had a pretty robust outreach strategy for implementation, and we saw instantaneous compliance. The revised scheme went into effect and there was not one non-complier – accidentally or otherwise – in any of the approaches. It was amazing. Essentially, the high rate of compliance demonstrates that if you put the lines in place for safety, ship captains will follow them because they know that no other vessel will be headed the opposite way or stopped fishing in the lane. Compliance is very high, even though it’s voluntary.” The TSS change has also helped mitigate some of the impacts of vessel traffic on marine mammals by reducing the overlap between the shipping lanes and humpback whale foraging habitat by roughly 65-75 percent.⁵⁰

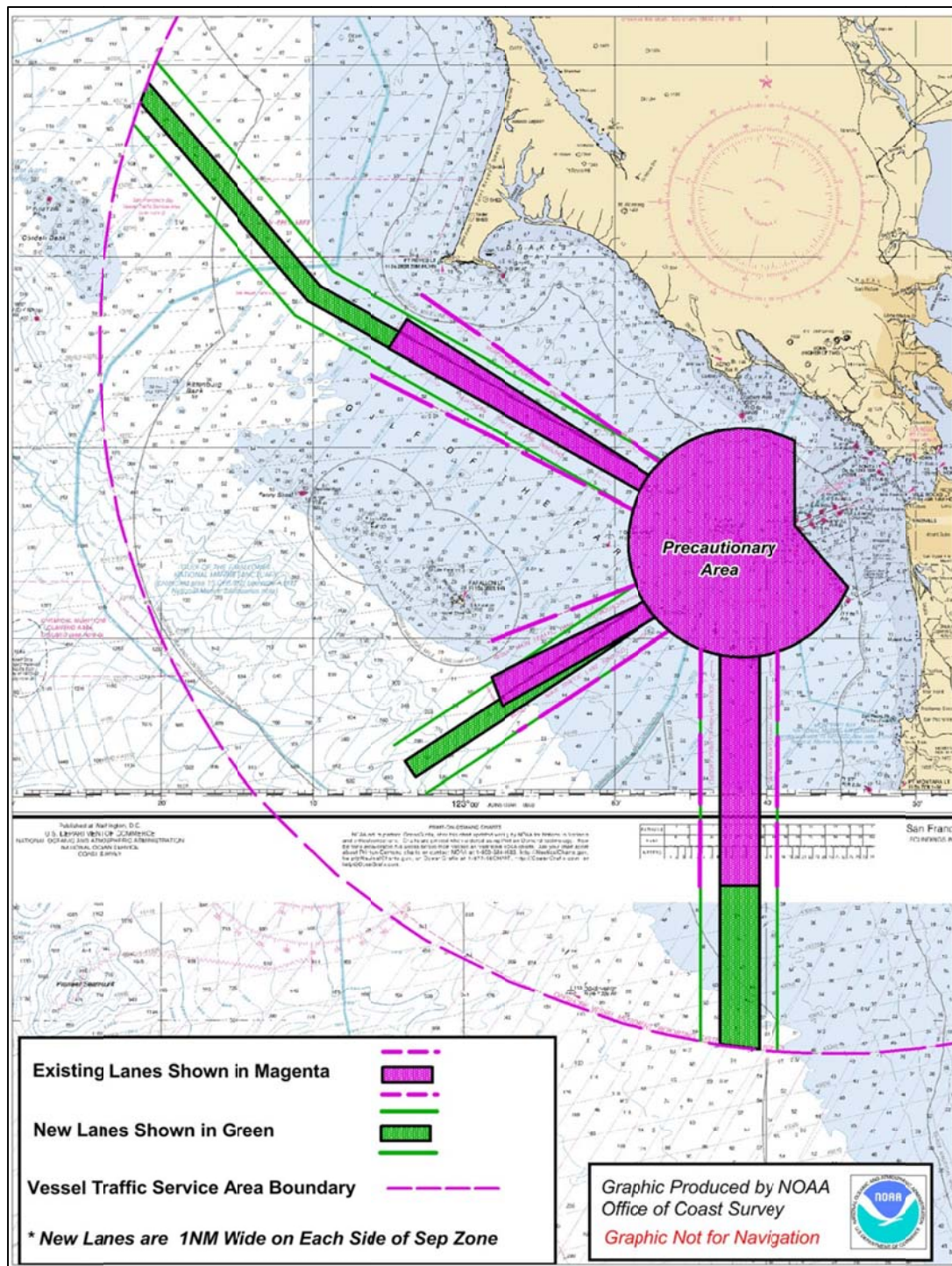


Figure 4. Final Approved Change to Approaches to San Francisco (Source: NOAA Office of Coast Survey)

II. Analysis: Lessons Learned from the San Francisco PARS

Analysis of the San Francisco PARS revealed a number of lessons that will benefit marine spatial planners. These include the role and influence of the driver, the efficiencies achieved in inter-organizational collaborations and partnerships, and the importance of local knowledge.

Lesson #1: Stay agile and allow your plan to respond to multiple pressing issues

As is evident in the Coast Guard's Final Action memo, the collision involving the *Buona Madre* and the *Eva Danielsen* was the driver that prompted the Coast Guard to initiate the Approaches to San Francisco PARS. Moreover, it is clear that this PARS, like all such studies led by the Coast Guard, was focused on navigational safety concerns, consistent with the Coast Guard's missions and its authorities under the Ports and Waterways Safety Act.

However, several study participants described how public perception of the PARS' driver and primary focus somewhat shifted later in the process and after it was completed. They explained how, in communicating about the PARS and the TSS change, the topic of whales and ship strikes seemed to expand because it resonated with the media and the public. For example, Michael Carver explained that: "We had to remind certain constituents that the primary driver was safety of navigation and that, as much as possible, the routes chosen minimized the overlap of commercial traffic with traditional fishing and whale feeding grounds." Given this, some observers may have differing opinions about what problem actually drove the PARS process.

Because the PARS process is completed and has achieved its stated objectives, it is debatable whether or not public opinions about its driver really matter. In fact, this case illustrates how a driver – in this instance, a pressing navigational safety concern – can trigger planning because it concerns and interests people, but does not need to determine or limit the scope of the problems addressed through a study or a spatial planning initiative. Although the PARS began with a clear and appropriate focus on navigation safety and utilized the Coast Guard's authority in this regard, it coincided with the Sanctuaries' work on whales and ship strikes. Both problems are related to vessel traffic. Thus, it became an opportunity for multiple parties to work together to address multiple problems. In practice, the PARS ultimately addressed several objectives: cargo vessel safety, fishing vessel safety, marine mammal protection, and broader Sanctuary protection. Moreover, addressing these problems together was logical and relatively straightforward. As Commander Amy Wirts explained: "the right thing for vessel safety was also the right thing to decrease the likelihood of whale strikes." Arguably, a planning process that is initiated to solve one problem, but is adapted to address multiple problems with relatively little additional effort, is a particularly efficient process as well as an illustration of the benefits of comprehensive marine spatial planning.

Lesson #2: Figure out what others have and you don't

The PARS also illustrates the value of building collaborations between agencies or organizations that have complementary goals, expertise, and constituencies. Whereas the PARS started as a routine Coast Guard-led initiative, it became much more collaborative when the NOAA Sanctuaries became involved, and both agencies saw the benefits of working together to address multiple issues related to each of their missions. The Coast Guard's Mike Van Houten commented that the Sanctuaries' active participation was "all very welcome – they did help to provide more input and became very involved. It helped add information, and it was definitely helpful to have the [stakeholder] interest." "We inserted ourselves into the Coast Guard process," explained Michael Carver from the Cordell Bank Sanctuary. This interagency collaboration was ad hoc, and while it may have been unexpected to some, interview results suggested that it was effective in helping the PARS address multiple objectives without delaying or derailing the process. Such collaborations can be difficult to facilitate. To make this one work, Michael Carver explained from the Sanctuary perspective that: "We [the two Sanctuaries] tried to add value by providing the fishing and biological data that the Coast Guard didn't have."

The Coast Guard-NOAA Sanctuaries collaboration may have worked well precisely because each agency had something the other did not – a unique area of expertise and associated data and stakeholders to offer to the process. Simply put, the Coast Guard understands vessel traffic, and the Sanctuaries understand whales. According to Michael Carver: "In this case, the Coast Guard has a mandate for maritime safety as well as the marine environment, but unless someone who is tasked with managing the marine environment steps up to assist the Coast Guard, it [the environment] may not get the attention that it needs." He further commented: "This collaborative process is how government, as far as I'm concerned, should work . . . [The PARS] is a story about government synergy and collaboration." For the Sanctuaries, the Coast Guard-led PARS process presented an opportunity for the Sanctuaries to address the issue of ship strikes much faster than otherwise would have been possible.

This interagency collaboration helped bring a broad range of constituents into the PARS through multiple mechanisms, both formal and informal, resulting in a rich and multi-faceted stakeholder process. The stakeholders and experts who ultimately participated in the process comprised a much broader, diverse group than might have been the case if only one agency had been involved. In the initial phase of the PARS, the Coast Guard successfully engaged maritime industry stakeholders, whose input was essential for identifying realistic vessel traffic routing solutions and for building public support and the ultimate compliance of this critical user group. When the Sanctuaries joined the process, they brought in scientists, conservation groups, fishermen, and others with whom they work regularly on marine resource management issues. These Sanctuary-related experts and stakeholders contributed to the analysis of the ship

strike problem and helped build political will in support of a TSS modification that would reduce the interactions between ships and whales.

Lesson #3: Listen to the locals

Finally, the San Francisco PARS case illustrates how both local and expert knowledge are necessary to inform realistic, practical decisions that have stakeholder support and can resolve conflicts. While the PARS utilized scientific and geospatial data, local and expert knowledge played a critical role in informing the data analysis and final recommendations. The Coast Guard relied heavily on the first-hand experience and professional expertise of its staff, as well as professional mariners, in interpreting data and identifying realistic vessel rerouting alternatives. In particular, it relied on the expertise of VTS staff whose job it is to monitor live ship traffic data and communicate directly with vessels every day in order to eliminate potential user conflicts and ensure the safe flow of vessel traffic in and out of San Francisco Bay. Van Houten explained that VTS staff “have the actual interface with the vessel operators. They talk to them on a daily basis, and have some discussion about where they’re transiting and why . . . Just to talk to somebody who can validate what you’re looking at on the AIS data is helpful.”

Additionally, both the Coast Guard and the Sanctuaries relied on the input of local users, such as commercial fishermen, who provided input on heavily-used fishing grounds and vessel traffic solutions that would minimize the impact on fishing activities. This input led to the development of solutions that were realistic and had stakeholder support and which, therefore, would be relatively straightforward to implement.

III. Case Study #2: Planning for the 34th America’s Cup Races

a. Overview

From a waterways management perspective, planning for the 34th America’s Cup Races began in 2010 when San Francisco was selected to host the 2012 - 2013 race series (see Table 3). Oracle Team USA, the American yacht racing syndicate backed by businessman Larry Ellison and which had won the Cup in 2010, selected the city for multiple reasons. Ellison is a member of San Francisco’s Golden Gate Yacht Club, which meant that the Club was Oracle Team USA’s “home port” as well as the holder of the Cup at the time. Moreover, San Francisco was widely considered a desirable venue. Strong and steady winds, coupled with the natural amphitheater of the Bay – the visually appealing backdrop of the Bay itself and its iconic features including the city skyline, the Golden Gate Bridge, the Marin Headlands, and Alcatraz – would make for a great event to be broadcast widely on television and Internet to a much wider audience than past races.

The America's Cup is not an ordinary sailboat race. Dating back to 1851, it is arguably the most famous and iconic yacht race in the U.S., and certainly one of the oldest and the most competitive in the international yacht racing community. Moreover, the 34th America's Cup was to be anything but 'your grandmother's America's Cup.' For the first time in the Cup's history, the racing yachts designed for this event, the AC72s, were catamarans (double-hulled boats). These 86-foot carbon fiber vessels were equipped with 131-foot wing sails about the size of a jetliner's wing⁵¹ and could move at speeds up to 40 knots.⁵² This would also be the first America's Cup Finals race to take place within the confines of a semi-enclosed waterbody and busy harbor, rather than in open ocean. Managing competitive races between boats like these – as well as the crowds that were expected and the support services required – demanded planning far beyond the norm. Moreover, the America's Cup name, and Larry Ellison's Oracle Team USA, came to San Francisco with a big international reputation, financial backing, and a strong sell, arguing that the races would bring as many as 8,840 new jobs and \$1.372 billion in economic impact to the City of San Francisco over the two years.⁵³

Planning for and running the 34th America's Cup was a region-wide endeavor spanning land and water. While the races themselves took place on the water in San Francisco Bay, a great deal of activity took place ashore in the city of San Francisco, thus involving the City and County of San Francisco, the Port of San Francisco, the National Parks Service (which owns and manages parks and recreational areas on the city's waterfront) and numerous non-governmental organizations and stakeholders. While this case study acknowledges those shore-side efforts, it focuses on the on-the-water planning and management efforts, which involved the marine spatial planning (MSP) approach. As such, this case study focuses primarily on the role and activities of U.S. Coast Guard Sector San Francisco, the Harbor Safety Committee of the San Francisco Bay Region ("HSC"), and other agencies and stakeholders with clear jurisdiction over or interest in San Francisco on-the-water activities (see Tables 4 and 5 in Appendix VIII for a list of the agencies and organizations involved in this case).

Table 3. Timeline of Events in America's Cup Planning and Implementation

Date	Event
November 2010	America's Cup bid for San Francisco first discussed at a Harbor Safety Committee of the San Francisco Bay Region meeting ⁵⁴
December 2010	San Francisco approves host agreement with America's Cup Event Authority ⁵⁵ and Golden Gate Yacht Club selects San Francisco as host city ⁵⁶
July 2011	U.S. Coast Guard and partner federal agencies begin Environmental Assessment process pursuant to the National Environmental Policy Act (NEPA) ⁵⁷
August 2011	Three public open houses and one federal agency scoping meetings held to provide information and receive in-person suggestions for Environmental Assessment prior to public comment period ⁵⁸
October 2011	Coast Guard holds six outreach meetings with user groups, including ferry operators and deep-draft vessel operators, to help develop Special Local Regulation (SLR) ⁵⁹
January 2012	Coast Guard releases Notice of Proposed Rule Making (NPRM) for draft SLR ⁶⁰
March 2012	Coast Guard holds three public meetings, in addition to the 90-day public comment period, for proposed safety zones and SLR ⁶¹
June 2012	Draft Environmental Assessment released for public comment, ⁶² and one public meeting held ⁶³
July 2012	Temporary Final Rule for SLR and Safety Zones released ⁶⁴
August 2012	Final Environmental Assessment released with Finding of No Significant Impact; the first regatta held ⁶⁵
August - October 2012	2012 races held ⁶⁶
May 2013	Race crew member Andrew Simpson drowns following training accident involving structural failure aboard one vessel ⁶⁷
June 2013	Coast Guard runs tabletop exercise with HSC members which results in Traffic Management Plan; ⁶⁸ Coast Guard issues 2013 Marine Event Permit ⁶⁹
July 2013	Coast Guard releases revised regulated area as Temporary Interim Rule ⁷⁰
July - September 2013	2013 races take place, including final 34 th America's Cup race between defender and challenger teams ⁷¹

b. The Event, the Players, and the Rules

i. The America's Cup Event Authority and the Proposed Event

After the City of San Francisco was selected for the race and signed a contractual agreement with the Port of San Francisco and the America's Cup Event Authority, planning got underway in early 2011. The event co-sponsors, the America's Cup Event Authority and the City and County of San Francisco, initially came forward with a bold proposal for a series of international, high-profile yacht racing events over a two-year period. They proposed to host a series of races in both 2012 and 2013, all inside San Francisco Bay: two America's Cup World Series regattas in August-September 2012, and in 2013, both the America's Cup Challenger Series and the final AC34 Match — a race between the Cup defender and the challenger. This would mean 12 race days and six reserve race days in mid-2012, and as many as 45 race days and 38 reserve race days in mid-2013, with a maximum of four races per day.⁷² These races were expected to draw large crowds of spectators on the water and ashore. For the 2012 races, 128 spectator vessels were expected on the water during the busiest weekdays and 340 during the busiest weekend days; for 2013, 147 spectator vessels were expected during the busiest weekdays and 880 during the busiest weekend days. Spectator vessels were expected to include recreational vessels, commercial charters, and private yachts of all sizes.⁷³ Additionally, the sponsors proposed a series of modifications to port and waterfront facilities that would include in-water construction and dredging activities, in order to accommodate the race boats along the San Francisco waterfront.

The most significant item requested was the designation of a sizeable racing area, which occupied the vast majority of San Francisco Bay as well as the entrance to the Bay under the Golden Gate Bridge. The initial proposed area (see Figure 5), dubbed “the amoeba” by many planning participants, was sizeable. “The initial documentation that the America's Cup put out was basically that they were going to take up the whole Bay,” recounted Coast Guard Commander Aaron Lubrano. America's Cup Principal Race Officer John Craig explained their logic: “The first [approach] was ‘ask for as much as you can get, we don't know what the boats are going to do, so ask for a big footprint.’” If implemented as proposed, a racing area this size could have effectively closed the entrance to San Francisco Bay to most other maritime traffic for multiple hours each day for two months of 2012 and three months of 2013. The event presented the possibility of significant and costly disruptions to maritime commerce and marine recreation.



Figure 5. Original Proposed Race Area, Dubbed “The Amoeba” (Source: U.S. Coast Guard et al., 2012)

The America’s Cup Event Authority established a team, America’s Cup Race Management, to manage the implementation of the races and appointed local sailor John Craig as the Principal Race Officer. Craig, an internationally-known racer, San Francisco resident, and 13-year race manager for San Francisco’s Saint Francis Yacht Club was selected to manage both the America’s Cup World Series (which took place in multiple locations) as well as the 34th Cup in the Bay. Several interview participants commented that this was a strategic move by the Event Authority: “John’s run those races for years, he’s extremely good at what he does and that’s why they hired him . . . and John knew all the players,” commented Jim McGrath of the San Francisco Boardsailing Association. “He’s really well respected . . . in terms of on-the-water conflict resolution, John was a huge leader.”

ii. Managing Marine Events: The Role and Authority of the U.S. Coast Guard

Facilitating an America’s Cup event on San Francisco Bay’s busy waters required careful planning and effective coordination among the many agencies and stakeholders with jurisdiction over or interest in the Bay. At the center of this activity was U.S. Coast Guard Sector San Francisco, which has jurisdiction over marine events such as the America’s Cup as part of the Coast Guard’s broad authorities to manage activities on and in the water. Coast Guard Sector San Francisco has a long history of managing on-the-water events, ranging from small regattas to large-scale events like Fleet Week, and of working closely with other agencies.

However, the America's Cup event presented numerous challenges. Through their initial discussions with America's Cup organizers, the Coast Guard realized that such a large, complex and high-profile event would require the use of extraordinary waterways planning and management tools. While the Coast Guard typically issues Marine Event Permits for yacht racing events, which is a routine task performed at the sector level, the agency has a broad suite of tools available to manage large-scale events, including the issuance of Special Local Regulations (SLRs) and the establishment of Safety Zones (see Appendix VI). As such, the Coast Guard initiated a large-scale, multi-year planning and permitting process that would ultimately result in issuing Marine Event Permits for the separate events in 2012 and 2013 and in establishing SLRs and Safety Zones to facilitate these events. These vessel control measures would define temporary areas, or zones, in which event-related activities such as racing and spectating could take place. Thus began a comprehensive and spatially explicit planning and management process.

Because SLRs and Safety Zones constitute new "field regulations," they must be established through a federal rulemaking process. As such, the Coast Guard planned to issue a Notice of Public Rulemaking (NPRM) in the Federal Register in order to establish these management areas for the America's Cup races. This notice would allow for a public comment process pursuant to the Administrative Procedures Act.⁷⁴ Additionally, the scope and reach of this event would require the Coast Guard to conduct an Environmental Assessment pursuant to the federal National Environmental Protection Act (NEPA), and to conduct the associated formal public process before the Coast Guard could issue a final rule.ⁱⁱⁱ The Coast Guard ultimately conducted the NEPA review jointly with a team of "federal partners," including the National Parks Service and the U.S. Army Corps of Engineers, each of which needed to issue separate federal permits or approvals for various aspects of the America's Cup event.

To accomplish this work, Coast Guard Sector San Francisco brought on board additional staff resources from within the agency for the duration of race planning and implementation. These included a high-ranking and experienced officer, Captain Matthew Bliven, to be the Sector's Principal Coordinator for the 34th America's Cup and reservist Commander Aaron Lubrano, who was designated the America's Cup Planning Section Chief and charged with leading the NEPA environmental review process. Last, the sector leveraged other in-house expertise in high profile marine event management by reaching out to Coast Guard Sector Southeastern New England, which includes Newport, Rhode Island, the historic home of the America's Cup races and a popular location for other high-profile yacht racing events (see Appendix VII).

ⁱⁱⁱ By contrast, the NEPA review for small-scale marine events, and the typical Marine Event Permit, concludes at a "Categorical Exclusion" because of their minimal impact.

iii. The Role of the Harbor Safety Committee

In preparing for the America's Cup, Coast Guard Sector San Francisco sought to work side-by-side in close collaboration with those who know the most about San Francisco Bay – its users. This is in keeping with the Coast Guard's long history, in San Francisco and elsewhere, of working collaboratively in commercial ports with other agencies and with maritime stakeholders, or port partners, on planning for and responding to large events ranging from Fleet Week events to major storms and terrorist attacks. In San Francisco, many interview participants explained that this is simply how the San Francisco maritime community does business. Thus, from Day 1, the Coast Guard worked closely with the local HSC (see Appendix IX) to plan for the two-year event. Coast Guard Commander Aaron Lubrano explained: "[Starting] a year and a half before the races, we met with all the port partners in the Bay area. They have a formal process through the Harbor Safety Committee – they're a very developed, long-standing group that has all of the port partners and law enforcement agencies in the Bay area. We took that as the initial starting point . . . and we used that to not circumvent the NEPA process, which has a very formalized communication and public notice [process], but . . . so we could meet with partners through the Harbor Safety Committee and not wait for the NEPA process to catch up." Through the HSC, the Coast Guard ultimately undertook a long and rigorous, though fruitful, communication and coordination process with maritime stakeholders that sought to meet the America's Cup sponsors' needs while ensuring the continuity of maritime commerce, recreational boating, and other activities in San Francisco Bay.

c. The Process: Developing and Approving the Plan

i. The Goal: A Series of Spatial Management Tools

Through this two-year planning process, the Coast Guard and partners sought to develop a series of spatial management strategies that would enable the separate 2012 and 2013 America's Cup racing events to take place, while ensuring navigation safety for all users, the continued flow of maritime commerce, and protection of the Bay's natural resources. While there were many management challenges, chief among these were the many different types of maritime traffic that regularly flow through the proposed racing area (see Figure 6). This includes large commercial ships passing under the Golden Gate Bridge, bound to or from one of the seven ports within the San Francisco Bay region; passenger ferries moving commuters throughout the Bay and bringing visitors to and from Bay islands including Alcatraz; and excursion boats and recreational activities ranging from large sailing and motor yachts to wind surfers and kite boarders. Captain Lynn Korwatch, HSC Chair, explained some of the many concerns:

"The [America's Cup] Event Authority just wanted to run the race, but other things came up that had to be dealt with. With vessel traffic, could the big ships re-route themselves

during the race period north of Alcatraz? Because two directions would be going in almost one traffic lane – would that be acceptable to the community? Was it environmental? Was it going to impede ferry traffic, for example? What about those small boat owners who want to get in and out of a marina during race time? Because the area off of the waterfront was originally going to be fully blocked off with no traffic. How would you manage all of the boats anticipated to go out on the water to watch? How do you manage the recreational craft in an area clear of the racecourse? How do you provide security, and will it be stretched too much?”

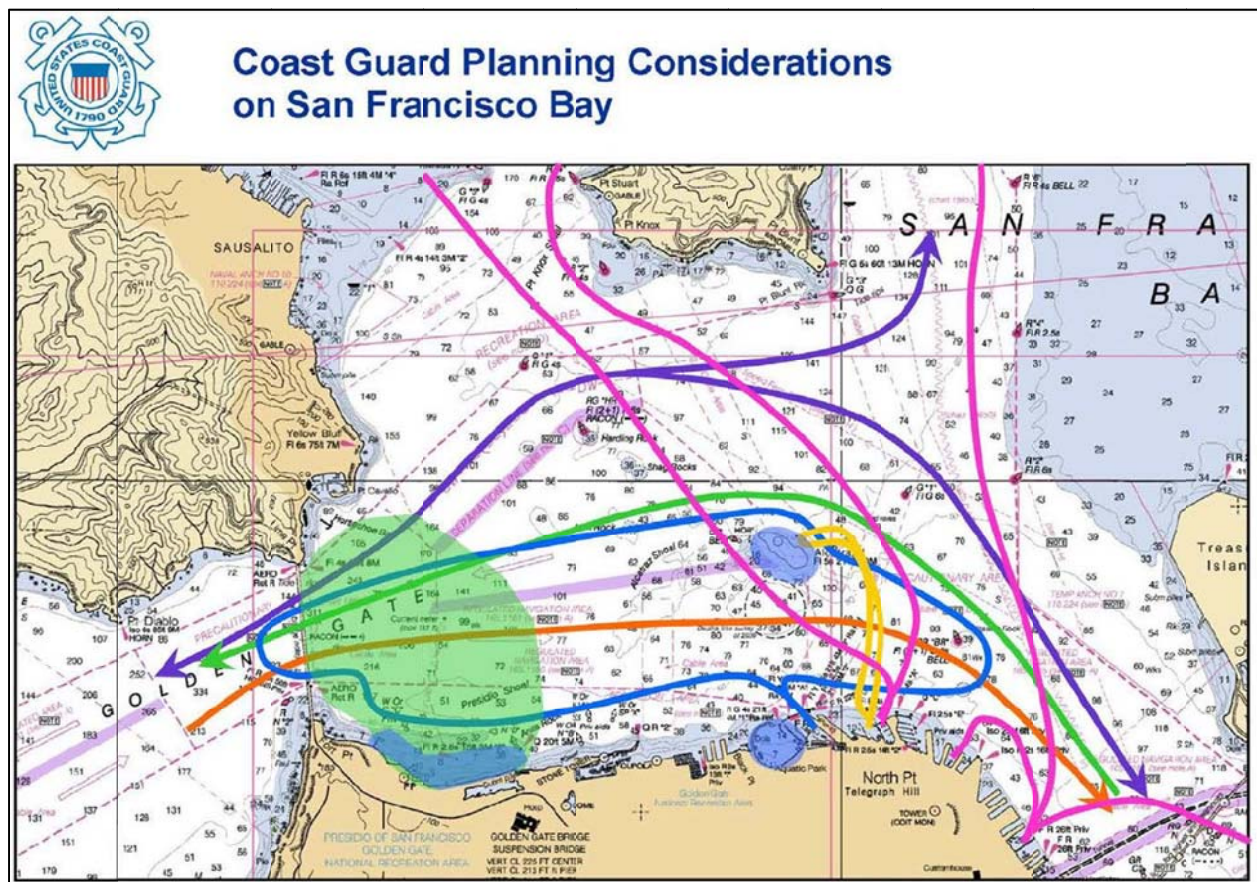


Figure 6. San Francisco Bay Vessel Traffic Patterns and Other Planning Considerations (Source: U.S. Coast Guard Sector San Francisco)

There were also environmental concerns associated with these on-water activities. One was the potential impacts of a proposed large, floating, gas-powered “jumbotron” viewing screen to be sited in the water along the San Francisco waterfront. Another was the anticipated number of spectator boats. Deb Self of San Francisco Baykeeper explained: “Another concern was protecting San Francisco Bay from additional bacterial pollution. Hundreds of visiting

spectator yachts were projected to anchor in San Francisco Bay throughout the summer. Baykeeper wanted to ensure onboard toilets were locked to prevent discharges to the Bay and that mobile pump-out services would be provided."

To address these issues, the waterway planning process sought to identify areas that would be designated for racing, while identifying separate areas for transit zones and other uses, and strategies including traffic management considerations, to manage these activities. While this planning officially took place through a formal rule-making process, the actual data analysis and stakeholder process included far more than is mandated. As Commander Amy Wirts explained it: "The iterative process of engagement, across industry and recreational sectors, was more than was required by the regulatory process, but it was also what was necessary to make an event like this work in San Francisco Bay."

ii. Informal Stakeholder Engagement: Gathering Industry and User Input

Working with the HSC, the Coast Guard began communicating with stakeholders about the America's Cup races even before San Francisco was officially selected as the venue for the 34th Cup. Meeting minutes indicate the Coast Guard was communicating with the HSC about this event as early as November 2010, long before the rule-making process had begun. Then, in January 2011, it was announced that Coast Guard Sector San Francisco and HSC leaders had met and agreed to utilize the HSC as a forum for communicating with the maritime community about the race. From that point onward, America's Cup updates were provided to HSC members and meeting attendees by both the Coast Guard and America's Cup Race Management staff, and by July 2011, the America's Cup had a regular place on HSC meeting agendas so that the Coast Guard could field questions and discuss concerns regarding the event.⁷⁵ Meeting content included planning updates, permit application status, and various aspects of race operations, and each briefing was followed by an opportunity for public questions and input on the planning process as it unfolded. These meetings and updates became an important means of informal stakeholder outreach and engagement.⁷⁶

In addition to these communications at HSC meetings, beginning in early 2011, the Coast Guard utilized their contacts throughout the HSC network to engage more informally with stakeholders. This involved reaching out to individual maritime user groups, such as recreational boaters, to begin a dialogue about potential use conflicts between existing maritime uses and the America's Cup races. The Coast Guard, in turn, provided the HSC with updates about this informal outreach.

Following these informal dialogues with members of the HSC network, in October 2011, the Coast Guard hosted a series of public outreach meetings for six different maritime stakeholder groups: deep draft vessel operators, ferry vessel operators, the recreational boating community, commercial fishing vessel operators, the towing vessel industry, and small

passenger vessel operators. These sectors were targeted because of the unique ways in which each would potentially be affected by the race. The primary purpose of these meetings was to provide stakeholders with the opportunity to offer their input and concerns on the races. At each meeting, stakeholders were briefed on the America's Cup planning process, including an overview of some "notional" racing, transit, and other regulated areas that might ultimately be established through the federal rulemaking process.⁷⁷ These meetings also enabled the Coast Guard to better understand how these different groups use the Bay and how the America's Cup races could impact these activities.⁷⁸ Coast Guard Commander Aaron Lubrano explained:

"We set up a specific meeting through the Harbor Safety Committee with the harbor pilots – outside of talking about it with the whole committee. They represent the commercial shipping industry, so they brought some of those major companies in as well. We met with the tug boat operators, we met with the ferry operators. There's commuter ferries and there's excursion ferries and other people taking tours of the Bay. We didn't get to all of those people through the Harbor Safety Committee, but we got to the major players in the Committee and then got some of the smaller players in the NEPA process. We sat down and told them our initial thoughts, and asked them what their concerns were."

It is important to emphasize that all of the stakeholder engagement described here took place before the public processes mandated in connection with NEPA and the rulemaking process. Public meetings connected with these formal processes included three scoping meetings for the Environmental Assessment and public hearings in response to both the Environmental Assessment and the NPRM. These largely occurred in late 2011 or in 2012 during the formal public review processes for both draft documents. But prior to these formal public meetings, the Coast Guard used input received informally through the HSC meetings, through informal contact with members of the HSC network, and at these sector-specific public outreach meetings to inform the draft SLRs and Safety Zones that were ultimately considered through the regulatory process. In fact, HSC meeting minutes indicate how the Coast Guard intentionally held these meetings before drafting the SLRs. As late as October 2011, the Coast Guard reported that "outreach to recreational boaters and the maritime industry over the America's Cup event was in the final stages before writing the Notice of Proposed Rulemaking."⁷⁹

iii. Using Data and Local and Expert Knowledge

In addition to stakeholder consultation, the Coast Guard conducted a good deal of data analysis to develop a plan comprising racing areas, transit zones, and other management areas. To develop this plan, they utilized vessel traffic and other data as well as local and expert knowledge about San Francisco Bay and its users.

To identify the above-mentioned racing areas, the Coast Guard started with the “amoeba” – the large area originally requested by the America’s Cup event organizers – and worked to reduce this to an area that would facilitate a safe race event while ensuring the safe passage of other types of ships. They first conducted an in-depth examination of vessel traffic patterns through that part of the Bay. This relied most heavily on AIS data, which were disaggregated into vessel types so the Coast Guard could consider the different usage patterns of each maritime user group – passenger ferries, deep draft commercial vessels, and others. Commander Aaron Lubrano explained: “For example, [using AIS data] I looked at all the ferries, and all of their tracks, to see which ones really cut across that area. It ended up being not that many, so through the AIS data we were able to give the America’s Cup a large area. And the few times a ferry actually needed to cross, we’d schedule it and they would cross and we would manage that . . . The AIS data was the scientific data I was able to use to qualify what [maritime user groups] really needed.”

The Coast Guard also utilized other data sources to inform their analysis. Lubrano explained that this included San Francisco VTS radar images of the Bay from past large-scale events such as Fleet Week. These images, which reveal areas of recreational boat traffic, provided the Coast Guard with a rough idea of the number of spectators possible for the America’s Cup. Also used in this assessment were summary recreational boat counts, which had been collected by a contractor during Fleet Week in 2012 for the purpose of informing this analysis. A broad suite of environmental data was also reviewed for inclusion in the Environmental Assessment.

As for drawing upon local and expert knowledge to inform their plan, the Coast Guard collected the input of VTS operators (see Appendix IX) in evaluating vessel traffic data and developing possible solutions for maintaining the flow of commercial traffic throughout racing activities. They also solicited input from Bay user groups, which was critical both in validating vessel traffic and other data and in shaping an ultimate plan that would accommodate everyone involved. Commander Amy Wirts explained that in many cases it was the unique combination of data and local knowledge that mattered: “It was a combination, because the data informs the way you approach the problem, but local knowledge is also part of the data. For building the race area, John [Craig] probably took the same approach . . . with a lifetime of sailing on the Bay, he knows the wind and current patterns. He knows the Bay and how environmental conditions on the Bay change throughout the day without referencing data sets. It was that knowledge that shaped the timeframe of when the races were going to be. John brought the knowledge of when the wind dies, when it would be impossible to sail. So yes, there is a need for data, but you also need local, first-hand knowledge.”

d. The Outcome

i. The Spatial Management Plan: Zoning for the Races

The result of this process was a two-part spatial management plan – one part for 2012 and one for 2013 – each scaled to the race events planned for those years. In both years, the Coast Guard used the SLR process to designate primary regulated areas that were larger than the prescribed racing areas. In 2012, a relatively small primary regulated area, the majority of which was also the primary racing area, was designated to accommodate the smaller AC45 race boats (see Figure 7). For 2013, a considerably larger primary regulated area was designated for the larger AC72s. The 2013 area included a primary racing area and a similar inshore area for small recreational craft, as well as a “transit zone” for vessels needing access to piers and facilities along the San Francisco waterfront (see Figure 8). Additionally, for both years, the Coast Guard designated a contingent regulated area that would be used in the unlikely circumstances that prevailing winds made the primary regulated area unsuitable for a sailing race. They also designated accompanying “no loitering” and “no loitering/anchoring” zones in especially important areas surrounding the racing area.

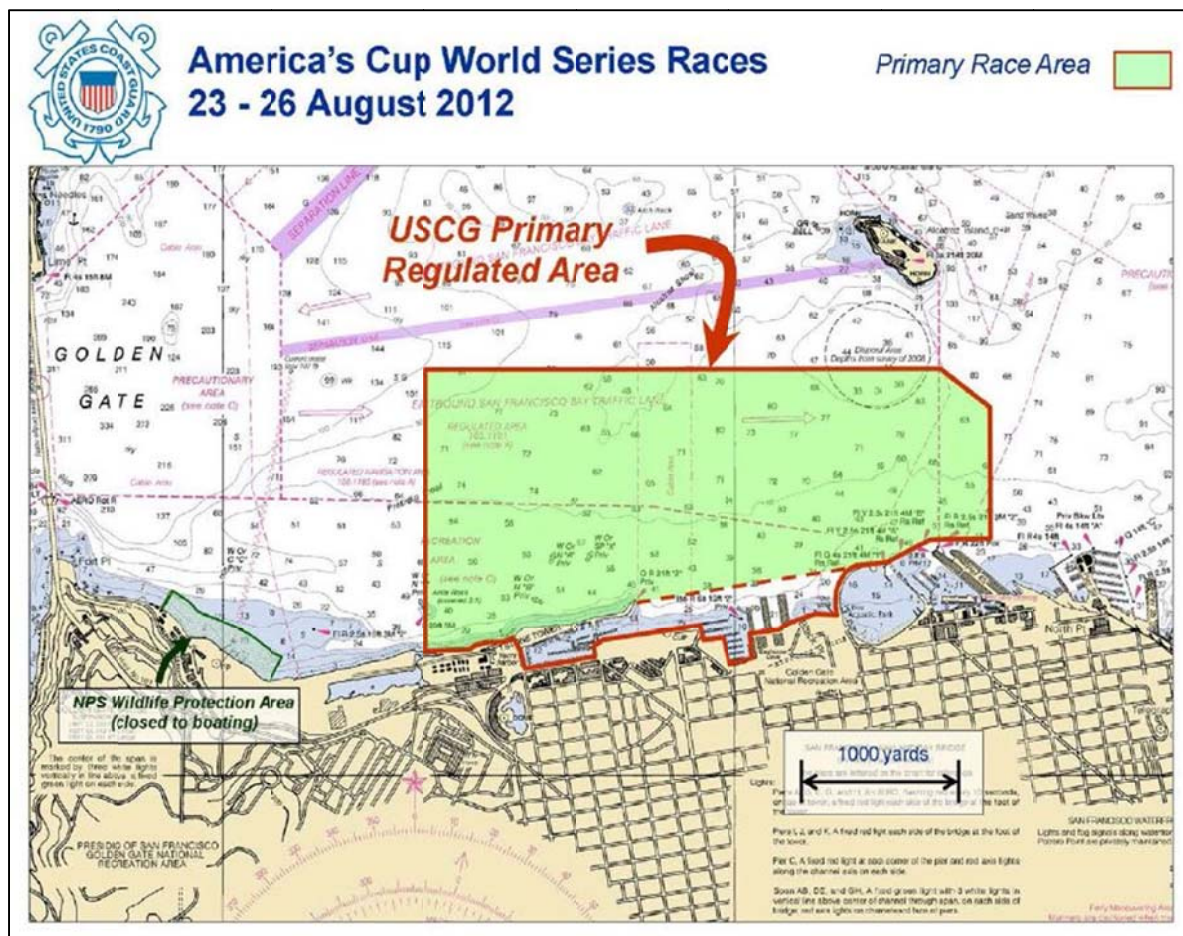


Figure 7. Final 2012 Primary Regulated Area (Source: U.S. Coast Guard Sector San Francisco)

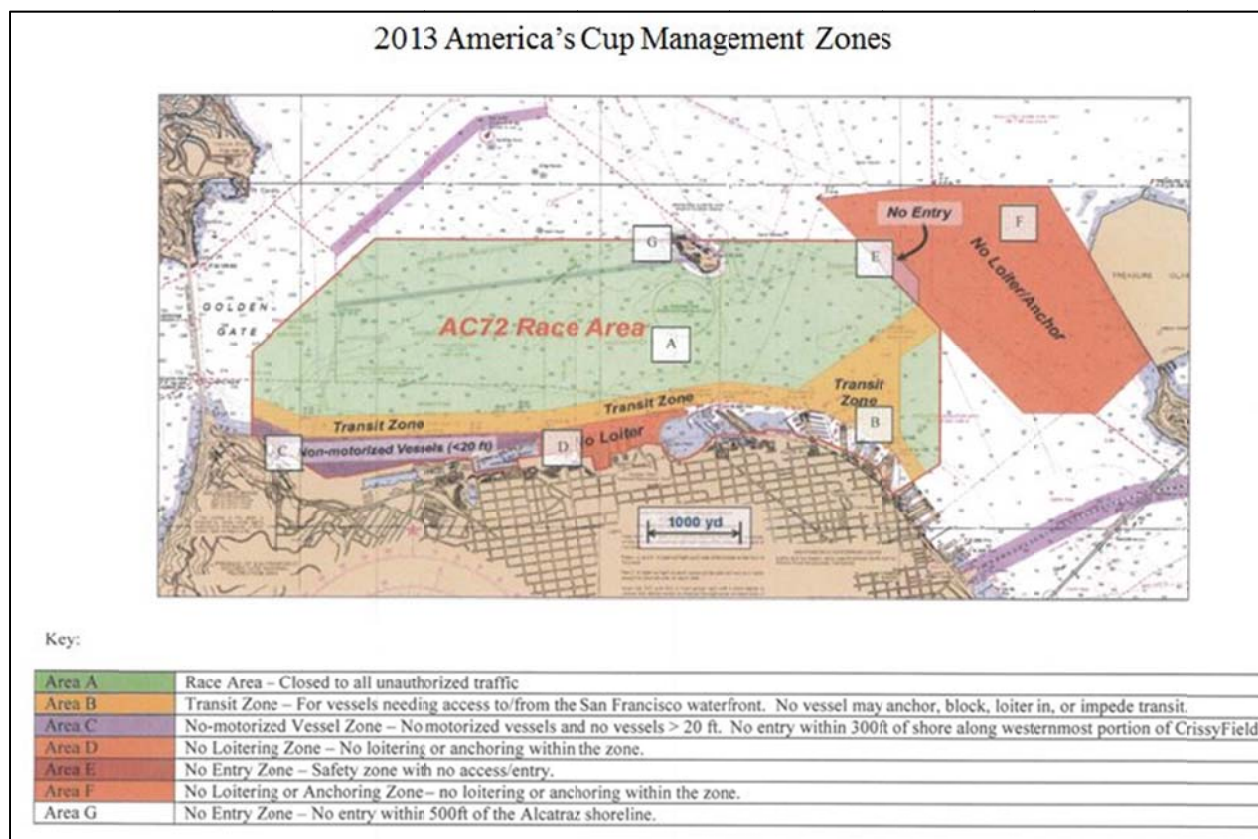


Figure 8. Final 2013 Race Area and Other Management Zones (Source: U.S. Coast Guard Sector San Francisco)

Under this management plan, primary racing areas were closed to unauthorized vessel traffic between 12 noon and 5 pm on designated race days, with provisions to allow vessels to pass through in some circumstances. This included large commercial ships that would otherwise be bound in or out of San Francisco Bay through this area. In addition to the designated management areas, the Coast Guard established a temporary Safety Zone of 100 yards around each America's Cup vessel. This Safety Zone, which was intended to protect other waterway users from the race boats, would move with each vessel as it moved and was intended for the rare circumstance in which an America's Cup vessel was outside of the designated racing area.⁸⁰

This scheme of management areas was designed to address many vessel traffic management challenges. Chief among these was ferry traffic. Passenger ferries provide vital commuter services throughout the Bay and are the only means by which tourists and visitors can reach locations such as Alcatraz. Ferries would be impacted by the America's Cup under nearly all management scenarios, so the inclusion and design of the transit zone was especially important for this industry. Ferry captain Tom Dougherty of the Blue & Gold Fleet commented that: "... the transit corridor along the waterfront ... [provided] a northerly detour that

allowed [ferry] vessels to get to Fishermen's Wharf. That was an important accommodation [for the ferry industry]."

The final areas and associated management provisions were adjusted slightly through the rulemaking process in response to public comments, including those of recreational users and representatives of other maritime industries. However, it is important to note that the draft management plan put forth for formal public review had already addressed the vast majority of users' concerns about conflicts between the race and other Bay activities. "The main feedback through the NEPA process focused on windsurfers and kiteboarders . . . The reason we didn't get a lot of comments from others was because we preempted it by interacting with all the other players," explained Commander Aaron Lubrano.

ii. Planning for Implementation: The Vessel Traffic Management Plan

While the resultant management areas were considerably smaller than the original proposed "amoeba," and had been shaped through a comprehensive data analysis and stakeholder process, the race was still expected to impact commercial traffic in the Bay. This was particularly true for 2013, when the primary regulated area overlapped with both the eastbound and westbound San Francisco Bay shipping lanes. Given this, after completing the necessary planning and regulatory processes to establish the SLRs and Safety Zones, the Coast Guard also worked with stakeholders to develop a Vessel Traffic Management Plan to facilitate the safe and efficient movement of traffic around the races. While this plan was not required, it was deemed important in order to accommodate the races and other uses of the Bay.

Like all other elements of the America's Cup planning process, the traffic management plan was designed through extensive stakeholder input, which included informal meetings with specific industry segments and a comprehensive tabletop exercise (a simulation of an actual traffic management scenario). Commander Amy Wirts explained that the traffic management plan and tabletop exercise engaged the same stakeholders who had helped create the SLR described above. "Developing the operational traffic management plan involved individually engaging all of the same players to bounce ideas off of them informally. Then we brought everyone together in one room, representatives from the tugs, the ferries, deep draft vessels, the bar pilots to conduct a table top exercise. That table top really let us game out scenarios: what is it going to look like if we have the busiest day imaginable in terms of commercial traffic while the races are going on, and visibility gets limited and we have other smaller regattas going on in other parts of the Bay. Doing that – having smaller targeted discussions and a tabletop with all of the right players at the table – is what allowed us to come up with a very manageable traffic management plan to accommodate both the races and all other waterway uses."

The traffic management plan established provisions for managing commercial traffic both within and outside of the regulated area. Traffic passing outside of the regulated area was

managed by San Francisco VTS. The VTS coordinated the movement of large commercial ships through a deepwater traffic lane that existed outside of the regulated area and coordinated with commercial traffic to implement other management provisions designed to facilitate the safe flow of traffic around the event. Traffic passing through the regulated area, i.e., through the transit zone or possibly through the racing area, was coordinated through an inter-organizational team posted on the water aboard the America's Cup race committee boat. This team was led by the Coast Guard's Patrol Commanders (PATCOM), a team of officers assigned to oversee the implementation of the SLRs, and included the America's Cup Principal Race Official, John Craig, and other race management staff, as well as a liaison vessel traffic specialist from San Francisco VTS. This team was assembled to facilitate the best possible coordination between race management and other Bay activities. The VTS liaison, in particular, played an important role by facilitating direct communication between PATCOM and commercial ships in a manner consistent with regular VTS activities. Ferry captain Tom Dougherty described the on-water teams as "kind of like a war room on a boat . . . The vessel used as a base for on-the-water race management had on board Johnny Craig, the Principle Race Officer; a Coast Guard representative; VTS; and race operations staff." Captain Dougherty noted they were so effective because "I could call the vessel, or they could call me to respond in real time to situations." In practice, the traffic management plan involved re-routing a great deal of traffic – deep draft vessels, ferries, and tug and barge traffic – during race periods while minimizing schedule impacts for these commercial vessels.

Additionally, the traffic management plan included provisions for regular port coordination team planning calls at 6 pm the day before each race day. These inter-organizational calls included Coast Guard staff representing PATCOM, Sector San Francisco's Sector Command Center and Enforcement Division, VTS staff, representatives of America's Cup Race Management, and representatives of key Bay user groups/HSC members – the San Francisco Bay Pilots, the San Francisco Bay Marine Exchange, and the HSC's tug and ferry working groups. These daily conference calls were designed to identify and proactively mitigate potential vessel traffic conflicts before they took place, by consulting with the pilots about inbound/outbound commercial traffic and determining how best to route vessels through the Bay. Commander Amy Wirts explained that during those calls: ". . . the race committee could say how big the race area would probably be for tomorrow, and the real timeframe for the races, and we'd look at the schedules." She continued: "With the pilots, it could be as easy as saying we're not going to get this container ship underway from Anchorage 9 until 20 minutes after we planned to so that this other ship has time to pass through the central bay before we meet them. It allowed for advanced planning and I think we can say that we never, in the heat of the moment, had a conflict that we had to make a snap decision about."

Last, to help implement and enforce the SLRs, America's Cup Race Management and the Coast Guard decided to use electronic Aids to Navigation (e-ATON) to mark the regulated area boundary and make it as visible as possible for mariners. E-ATON are a relatively new innovation. They are virtual buoys – i.e., they do not exist as a physical buoy in the water, but are visible as virtual points on electronic chart displays and radar used by commercial mariners. This meant vessel operators could clearly see the racing area boundary in relation to their own positions. The locations of and information about these virtual buoys are transmitted through the Coast Guard's National Automatic Identification System, a system that includes both AIS data and other government information/sensor data that the Coast Guard uses to monitor marine safety and security. Commander Amy Wirts explained that e-ATON was an especially appropriate solution for the America's Cup races, given the temporary and dynamic nature of the race event, and also served as a means of introducing this technology into San Francisco Bay. She noted that the America's Cup was the first use of this technology in the Bay; was the first public-private partnership to implement e-ATON; and that e-ATON has since been used in a number of other settings given its proven success within the context of the America's Cup races.

iii. Implementation and Adaptive Management: Running the Races in 2012 and 2013

America's Cup races took place in 2012 and 2013 as scheduled, managed through the spatial management plan and traffic management measures described herein. While some race activities took place on a smaller scale than originally anticipated – for example, fewer racing teams participated in 2013 than expected, and the race attracted fewer spectators, generating only 27% of predicted economic impacts⁸¹ – racing still took place in the middle of San Francisco Bay on 80 different days over the two years. All interview participants involved in operationalizing this plan – including those who participated in the on-the-water teams and in the 6 pm daily calls – spoke about the effectiveness of the plan and implementation mechanisms. However, as with all management plans, the Coast Guard's final plan for managing the 2012 and 2013 races, completed in 2012, required a form of adaptive management. The two-year timeframe of this race allowed the Coast Guard and partners to adapt their plan in 2013 in response to lessons learned from 2012. For example, in 2013, in response to comments received and informal engagement with stakeholders, the Coast Guard fine-tuned the various management areas to ensure minimal impact on maritime industry uses while also responding to their evolving understanding of the new AC72s' capabilities and constraints.

One of the most important moments requiring adaptive management occurred in May 2013, when a high-profile fatal accident took place, prompting the Coast Guard and partners to reevaluate existing plans and operating procedures for managing the 34th America's Cup. The accident happened during a practice session of the Artemis Racing team. The team's 72-foot

winged racing catamaran capsized and crew member Andrew Simpson drowned. This tragic accident followed an earlier incident in October 2012 when another team capsized their 72-foot catamaran. This earlier accident had not resulted in loss of life or serious injury, but did result in the complete loss of the capsized vessel. The 2013 accident also made it evident that the AC72s (which were not raced in 2012) were much faster than initially projected and considered during the 2011-2012 planning and permitting process. Whereas this 2013 incident took place during an unregulated practice session and thus was not officially part of the “Marine Event” permitted by the Coast Guard, this accident, coupled with the one preceding it, led the Coast Guard and partners to re-examine the original management plan.

In re-examining the regulated area, the Coast Guard considered whether the designated racing area should be expanded slightly to better accommodate the larger, faster vessels that would be racing in 2013. To do this, they reengaged in discussions with HSC members and other stakeholders to gain additional input on the AC72 event and on the possibility of expanding the racing area. They also re-examined AIS data and worked with VTS staff and maritime stakeholders to determine the potential impact on marine traffic if the racing area’s eastern boundary were expanded. Through this process, the Coast Guard ultimately issued a relatively minor modification to the SLR, which included expanding its northeastern boundary (see Figure 9). This modification was performed extremely quickly, in roughly two months, in order to be in place prior to the start of the 2013 races. As it does with other complex marine events, the Coast Guard issued the America’s Cup organizers their final 2013 Marine Event Permit once this process was completed, fairly close to that year’s first race date, in order to ensure all last-minute changes could be accommodated and documented.

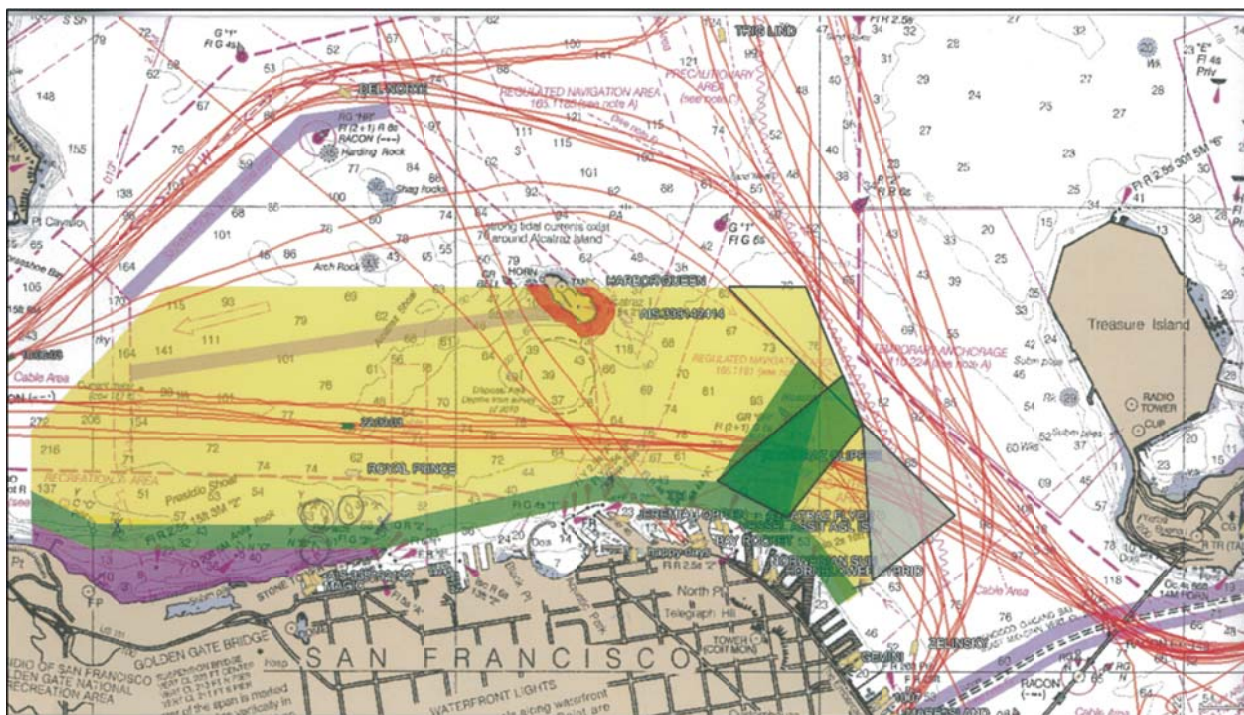


Figure 9. AIS Vessel Tracks Analyzed to Alter 2013 Race Area (Source: U.S. Coast Guard Sector San Francisco)

e. The Final Assessment

Every participant interviewed for this study described the America's Cup on-the-water plan development and implementation process as a success and said it was effective at minimizing conflicts that might have taken place in connection with these races. Although, as described above, there were two accidents connected with these races, both took place during unregulated practice times and thus were not managed by the Coast Guard through the plan described here. All official races took place without incident and with minimal impacts to other maritime activities, as well as minimal schedule impacts to commercial shipping. Captain Lynn Korwatch, HSC Chair, commented:

“From the maritime world, everybody was delighted at how well it went. I don’t think I’ve heard any fallout from adverse impacts at all. There was no traffic or ship arrivals that were delayed. The Coast Guard was very proactive with briefing the community for what lane closures there would be. They specifically changed the race days and race times so that they didn’t interfere with the traffic hours during the day . . . so nobody was really hampered or slowed down in any way.”

As indicated in the San Francisco HSC’s successful nomination for Harbor Safety Committee of the Year in 2012-2013, planning for the America’s Cup races ultimately ensured the safety of over 800,000 spectators and competitors and facilitated the “uninterrupted flow of \$15 billion

in maritime commerce over 80 days of racing.”⁸² This further illustrates the success of this planning exercise.

IV. Analysis: Lessons Learned from the America’s Cup

Analysis of the America’s Cup planning case revealed additional lessons learned that will benefit MSP practitioners. These include the strength of informal stakeholder engagement; the importance of pre-existing relationships, established long before the planning process; and the presence of an honest broker.

Lesson #1: Engage stakeholders informally to build commitment and legitimacy

Every participant interviewed for this study emphasized how planning for and running the America’s Cup was a success with regard to stakeholder engagement and outreach. At the core of this success was the Coast Guard’s use of informal stakeholder engagement, which far exceeded formal regulatory requirements. This was facilitated in large part through the HSC.

The Coast Guard went above and beyond the formal public participation requirements associated with this race. Although there were public hearings conducted in connection with NEPA and the rulemaking process, the Coast Guard engaged port stakeholders sooner and in a more meaningful manner than may have happened if they simply adhered to the legal requirements for public process. As Commander Amy Wirts explained it: “We did a lot of ‘meeting before the meetings’ . . . We had so many meetings that towards the end people stopped showing up, which is good! If everyone was worried about what the impact on their business was going to be, they would have been there in droves.” Because of this, the final management plan approved through the rulemaking process required minimal revisions before being published as a final rule.

Industry and stakeholder participants interviewed for this study appreciated this early and proactive stakeholder process. For example, John Berge of the PMSA commented that: “The Coast Guard early on . . . realized there were a lot of potential impacts . . . So, they put together a pretty good outreach to a bunch of stakeholders. They put together work groups that would meet on occasion and communicate semi-regularly, to look at what type of impacts there might be and how we could mitigate it.” These interview participants corroborated Commander Wirts’ observation that participation lessened over time only because it was so intensive and effective in the pre-planning phase.

Much of the Coast Guard’s success in this informal stakeholder engagement effort was in leveraging an existing stakeholder forum – the HSC – rather than creating a new one. The HSC, which the Coast Guard co-chairs, provided the agency with the necessary infrastructure for meaningful stakeholder engagement. The group is firmly established, well-known, and

widely respected within the port community; it includes representation from all of the relevant port and maritime stakeholder groups, including the different sectors of the maritime industry and representatives of the environmental community; it is publicly funded, with requirements that meetings be advertised and open to the public and records be publicly available; and it is well-organized, through the leadership of the Marine Exchange of the San Francisco Bay Region, which helps convene monthly HSC meetings and facilitates communication among HSC members and the broader maritime community. Moreover, the Coast Guard and a number of the other relevant government agencies were already regular, established participants in these meetings. Importantly, the Coast Guard used the HSC in multiple ways – providing updates and soliciting input at HSC meetings, and also tapping the HSC member network outside of the meetings.

Ferry captain Tom Dougherty, an HSC member, explained the value of planning for the America's Cup through the HSC:

“The pre-planning [through the HSC] took care of 95 percent of everything . . . “Those meetings [with HSC members] were all the professionals involved, the leaders of the different groups. We were able to sort out things because we were involved with our representative groups. The bar pilots representative knew all the other bar pilots. He knew how they operated and was familiar with all the ships. The tug representative was familiar with all the different types of tugs and tows and makeups, and I was familiar with all the different types of passenger vessels. So we were able to work together as a team to coordinate what we needed to have happen to protect our interests and safety.”

Finally, the success of this proactive informal stakeholder engagement process was based on how the Coast Guard utilized and responded to stakeholder concerns. For example, Jim McGrath of the San Francisco Board Sailors' Association explained how, in dealing with recreational stakeholders, including some particularly angry ones, the Coast Guard “were thorough professionals . . . The Coast Guard was flexible enough to add in other venues [for meetings] and they listened well. And it wasn't just to us. I heard in the Harbor Safety Committee meetings the kinds of ways they accommodated the shipping interests, recreational boaters, and the like. So it was very clear that they listened well.”

Based on the success of this informal stakeholder engagement, Commander Amy Wirts noted: “[The way to do this is] not to go into the process with what you think the answer is and let people respond to it, but engaging really early, showing you are willing to have conversations and are open to it! . . . Constantly pushing information and staying ahead of questions that could arise and engaging with the right people so that when questions from other sectors did come up we had the answers.”

Lesson #2: Don't meet your colleagues and constituents for the first time during a crisis

Several interview participants offered some variation of the advice “don’t wait to meet them in a crisis.” This is considered conventional wisdom throughout much of the Coast Guard and emergency response communities, but is applicable to marine spatial planners as well. A long history of strong working relationships between agencies, organizations, and stakeholders provides a strong foundation for crisis management or, in this case, a potentially controversial new use. Most participants interviewed for this study emphasized how pre-existing relationships between the Coast Guard and maritime industry representatives, and a general spirit of collaboration and partnership, contributed to the success of the America’s Cup planning effort. Through this process, Sector San Francisco leveraged its network of port partners – maritime users, including representatives of the local pilots’ associations; the passenger ferry industry; and the dry cargo industry, with whom the agency collaborates regularly on all manner of issues related to the Bay. Importantly, many interview participants explained that these strong relationships are simply the norm in San Francisco Bay. Captain Lynn Korwatch, Chair of the HSC, explained this dynamic:

“I think that San Francisco prides itself on being very collaborative. In other port regions, I see that’s not always the case. I think often some interests have more sway than collaboration, and everyone wants to be the winner in some battle. That’s really not our reality here. I think we’ve been very successful because we do understand that everybody’s got a perspective . . . [and] we listen to their opinion and comments and try to work with them. It has worked for us very well.”

Many of the relationships that helped facilitate the America’s Cup planning had been developed through the longstanding HSC. As explained by Captain Lynn Korwatch:

“The fact that you’re not standing a new group up in order to deal with this one event serves the event and the community well. Because the Coast Guard could begin the process and they didn’t have to go out to the community – they already knew the community. And [America’s Cup] Race Management, while they didn’t know the community to the same degree, they could leverage the relationship that the Coast Guard and the Harbor Safety Committee have with the community and use it as a forum.”

Other participants explained how strong working relationships helped them work through this complex planning and permitting process. For example, America’s Cup Race Management staff John Craig explained: “In the end, a lot of the relationships I had from being in the Bay so long as a marine permit user with the ferries and the commercial users” was how he got things done. “It was more just me going and talking with them informally. The formal meetings were

great because they were organized through the federal authorities so everyone showed, whereas the informal meetings were me dealing with the contacts that I knew.” He added: “I think how long I’d been on the Bay gave me the ability to go and just talk to the pilots, who’d then go talk to the commercial guys and say ‘hey this is what we’re planning, are you ok with that?’ ”

An important type of pre-existing relationship was the one the Coast Guard had established with its port partners. Some interview participants described the Coast Guard as a “neutral arbiter” or an honest broker – an individual or organization who is considered trustworthy and neutral, facilitates the flow of information in an open and transparent manner, and works toward a fair outcome. Nearly all interview participants described the Coast Guard as playing this type of key role, and attributed their comfort with the process to the Coast Guard. For example, Captain Bruce Horton, a member of the San Francisco Bar Pilots, described how he “worked really closely with all the folks over at the Coast Guard right from the very beginning of it . . . We’ve always had a great working relationship with the Coast Guard throughout the years. We’re able to just pick up the phone and talk to the Captain of the Port, or whoever we need to with the Coast Guard, if we see any kind of issue arise or something we’re not comfortable with.” He further explained that he valued working with the Coast Guard because “they always try to get things squared away before it turns into a bigger problem down the road . . . When America’s Cup said they might be coming to San Francisco, the Coast Guard called us right away. They wanted us to get involved and see if there would be any problems if they got here, if we would be receptive to it, and if we would work together with them to make it happen. I think that was the most important relationship there.” Ferry Captain Tom Dougherty attributed the success of the planning effort to the Coast Guard’s trustworthiness:

“If we did not have the Coast Guard involved – if it was just the yacht clubs organizing this, or just [America’s Cup] event management, I think it would have been much more difficult to get buy-in from all the stakeholders.” He continued: “This one, I think, is a requirement [for future planning efforts] – that the US Coast Guard leadership provides the core authority to get things done. Without U.S. Coast Guard involvement, it’s hard to get stakeholders to agree on anything . . . So, if you were to do this in New York or San Diego, if it’s not run by the Coast Guard, I think it would be difficult to be this successful at this scale.”

Noting the importance of pre-existing relationships, Commander Amy Wirts commented:

"The fact that we had those relationships through the Harbor Safety Committee and our daily presence in the community really made our work smoother in this effort because we are a known entity. It wasn't as if we just arrived in the Bay as an unknown, wanting

to put on a major, potentially disruptive event. Although they may have been a little nervous about it after some initial presentations because of the scope and the potential implications for the maritime industry, people knew from the beginning that the Coast Guard would be fair and equitable."

Based on this, Commander Wirts suggests that future planners "Know people, get out!" She noted that, once these relationships are established, planners should: "Leverage your partners! Really, that's the biggest thing. As much as we all like to think we bring expertise to certain things, any individual entity's perspective is not going to give you the complete picture. The success of this event being held in the Bay was really because of the extensive outreach and incorporation of input . . . Having that partnership approach, with a diversity of input from all the industry segments, was really the key."

V. Conclusion

Overall, both the Approaches to San Francisco PARS and the 34th America's Cup planning process provide useful examples of marine spatial planning and management applied to comparatively small-scale and, in the case of the America's Cup, time-limited management issues. For the broader community of MSP practitioners, both cases illustrate how multi-objective, spatially-explicit planning can help develop innovative solutions for conflicts that ensure all stakeholders' interests are accommodated to the maximum extent possible. The PARS case illustrates how a driver can kick off a relatively small-scale spatial planning process without limiting its scope; how agencies and organizations can partner together, leveraging complementary missions, expertise and constituencies to solve problems of mutual concern; and how local and expert knowledge can help planners develop realistic and pragmatic policy solutions. The America's Cup case illustrates how informal stakeholder engagement can enhance the effectiveness of a plan, both through development and implementation; how a history of strong working relationships, established well before a problem arises, provides a solid planning foundation; and how an honest broker can be the lynchpin of a planning process.

These cases highlight the many different tools available to marine spatial planners – including ones they may not yet have recognized – for efficiently and effectively solving spatial management challenges. Both cases describe smaller-scale initiatives that were not originally labeled as marine spatial planning. They used existing authorities, in this case primarily those already held by the U.S. Coast Guard, which have been in existence for years and are applied regularly in ports, harbors and waterways throughout the U.S. They involved relatively little special funding or staffing, required a limited amount of new data or research, and did not necessitate the establishment of new stakeholder advisory groups, inter-agency councils, or

other new organizational structures. Both planning efforts concluded with plans or recommendations that were, or are being, successfully implemented, and both ultimately achieved multiple management objectives. In sum, these cases illustrate how marine spatial planning and management can be – and has already been – successfully applied in a variety of settings, led by different agencies at different scales and in response to different drivers.

Perhaps the most important theme of these cases is that engaging all parties in both plan development and implementation is central to an effective process. As Commander Amy Wirts explained it, within the context of the America's Cup: "Because the Bay is so dynamic, with so many users who are invested in the Bay, both economically and environmentally, it is very important to have an open, transparent process when you are making decisions that impact someone's livelihood or way of life. You cannot get to the right, workable solution without having sought out and heard all of the voices. That means listening as equitably to the guy who lives on his sailboat in the Bay, and has every right to do so, as to the maritime industry reps and the event sponsors. Maybe everyone wasn't thrilled, but they were at least happy, and could see that their compromises in the big picture allowed everyone to have their piece of the pie, even if it's not as big as the pieces they normally get."

VI. Works Cited

Office of National Marine Sanctuaries, National Oceanic and Atmospheric Administration.

"Subject: Response to request for comments on Port Access Route Study off San Francisco (Docket No. USCG-2009-0576; 74 FR 65543)." *Regulations.gov*. February 3, 2010.

<http://www.regulations.gov/#!documentDetail;D=USCG-2009-0576-0003> (accessed December 8, 2015).

Budget and Legislative Analyst, City and County of San Francisco. "Analysis of the Impact of the 34th America's Cup to the City." *San Francisco Board of Supervisors*. February 10, 2014.

<http://www.sfbos.org/Modules/ShowDocument.aspx?documentid=47894> (accessed December 10, 2015).

California Department of Fish and Wildlife. *Cosco Busan*. January 1, 2015.

<https://www.wildlife.ca.gov/OSPR/NRDA/cosco-busan> (accessed December 8, 2015).

City and County of San Francisco, San Francisco America's Cup Organizing Committee, and America's Cup Event Authority, LLC. "34th America's Cup Host and Venue Agreement by and among America's Cup Event Authority, LLC, San Francisco America's Cup Organizing Committee, and The City and County of San Francisco." *NPS.gov*. United States National Parks Service. December 14, 2010. <http://www.nps.gov/goga/learn/management/upload/Host-and-Venue-Agreement.pdf> (accessed December 8, 2015).

Commandant of the United States Coast Guard. "Commandant Instruction 16001.1- Subj: Waterways Management (WWM)." *United States Coast Guard*. July 6, 2012.

https://www.uscg.mil/directives/ci/16000-16999/CI_16001_1.pdf (accessed December 8, 2015).

—. "Commandant Instruction M16751.3- Permitting of Regattas & Marine Events." *United States Coast Guard*. March 2013. https://www.uscg.mil/directives/cim/16000-16999/CIM_16751_3.pdf (accessed December 9, 2015).

Cordell Bank and Gulf of the Farallones National Marine Sanctuaries. "Final Environmental Impact Statement: Cordell Bank and Gulf of the Farallones National Marine Sanctuaries Expansion." *Cordell Bank & Gulf of the Farallones Expansion*. December 2014.

http://farallones.noaa.gov/manage/pdf/expansion/CBNMS_GFNMS_FEIS_Expansion_122014.pdf (accessed December 9, 2015).

Cordell Bank National Marine Sanctuary. *About the Sanctuary*. n.d.

<http://cordellbank.noaa.gov/about/welcome.html> (accessed December 8, 2015).

Cordell Bank National Marine Sanctuary Advisory Council. "2010 2nd Quarter West Coast Region Sanctuary Advisory Council Report." *National Marine Sanctuaries*. April 10, 2010. http://sanctuaries.noaa.gov/about/pdfs/1st_quarter_wcr10.pdf (accessed December 8, 2015).

Cordell Bank National Marine Sanctuary. *Sanctuary Advisory Council Members*. September 1, 2015. <http://cordellbank.noaa.gov/council/members.html> (accessed December 8, 2015).

Cote, John. *America's Cup: Financials from San Francisco fall short of projections*. December 10, 2013. <http://www.sailingscuttlebutt.com/2013/12/10/americas-cup-put-san-francisco-5-5-million-red/> (accessed December 8, 2015).

CupInfo. *Detailed Schedule for 34th Defense of the America's Cup in 2013*. April 10, 2013. <http://www.cupinfo.com/en/americas-cup-2013-dates-and-schedule-detailed-01.php> (accessed December 8, 2015).

Douve, Fanny, and Charles Ehler. "New perspectives on sea use management: Initial findings from European experience with marine spatial planning." *Journal of Environmental Management* 90 (2009): 77-88.

Dransfield, Andrea, et al. "Where the whales are: using habitat modeling to support changes in shipping regulations within National Marine Sanctuaries in Central California." *Endangered Species Research* 26 (2014): 39-57.

Greater Farallones National Marine Sanctuary. *Cordell Bank & Gulf of the Farallones Expansion*. August 12, 2015. http://farallones.noaa.gov/manage/expansion_cbgf.html (accessed December 8, 2015).

—. *Sanctuary Advisory Council Members*. October 30, 2015. http://farallones.noaa.gov/manage/sac_members.html (accessed December 8, 2015).

Harbor Safety Committee of the San Francisco Bay Region. "Harbor Safety Committee of the Year Nomination Form." San Francisco, CA: Harbor Safety Committee of the San Francisco Bay Region, 2014.

Harbor Safety Committee of the San Francisco Bay Region. *San Francisco, San Pablo, and Suisun Bays Harbor Safety Plan*. Management Plan, San Francisco, CA: Harbor Safety Committee of the San Francisco Bay Region, 2015.

International Maritime Organization. *Ships' routing*. 2015. <http://www.imo.org/en/OurWork/Safety/Navigation/Pages/ShipsRouting.aspx> (accessed December 8, 2015).

International Maritime Organization Sub-Committee on Safety of Navigation. *58th Session, Report to the Maritime Safety Committee*. Session Report, London, United Kingdom: International Maritime Organization, 2012.

International Maritime Organization. *Vessel Traffic Services*. 2015.
<http://www.imo.org/en/OurWork/Safety/Navigation/Pages/VesselTrafficServices.aspx>
(accessed December 8, 2015).

Joint Working Group on Vessel Strikes and Acoustic Impacts. *Vessel Strikes and Acoustic Impacts: Report of a Joint Working Group of Gulf of the Farallones and Cordell Bank National Marine Sanctuaries Advisory Councils*. Working Group Report, San Francisco, CA: Office of National Marine Sanctuaries, 2012.

Lenhart, Gloria. *Everything You Need to Know About the America's Cup*. SF City Guides. 2013.
http://www.sfcityguides.org/public_guidelines.html?article=1544&submitted=TRUE&srch_text=&submitted2=&topic=Ships (accessed December 8, 2015).

Marine Exchange of the San Francisco Bay Region. *Harbor Safety Committee*. 2010.
<http://www.sfmex.org/support/hsc/> (accessed December 8, 2015).

—. *Harbor Safety Committee Minutes, 2010-2013*. November 2015.
<http://www.sfmex.org/support/hsc/minutes> (accessed December 8, 2015).

McCann, Jennifer, Tiffany Smythe, Grover Fugate, Kate Mulvaney, and Daniel Turek. *Identifying Marine Spatial Planning Gaps, Opportunities, and Partners: An Assessment*. Narragansett: Coastal Resources Center and Rhode Island Sea Grant College Program, University of Rhode Island Graduate School of Oceanography, 2014.

Morris, Steven, and agencies. *Olympic sailing champion Andrew Simpson's death accidental: coroner*. May 21, 2014. <http://www.theguardian.com/uk-news/2014/may/21/british-olympic-sailing-champion-andrew-simpson-death-accidental> (accessed December 8, 2015).

National Marine Sanctuaries. *Press Releases: NOAA's National Marine Sanctuaries: Preserving and Protecting Oceans' Natural Treasures*. 23 October, 2012.
<http://sanctuaries.noaa.gov/news/press/2012/pr102312a.html> (accessed December 8, 2015).

National Oceanic and Atmospheric Administration. *Reducing Ship Strike Risk to Whales*. September 29, 2015. <http://sanctuaries.noaa.gov/protect/shipstrike/policy.html> (accessed December 8, 2015).

- National Sailing Hall of Fame. *Science of the 34th America's Cup*. 2015.
http://www.nshof.org/index.php?option=com_content&view=category&id=179:science-of-the-34th-americas-cup&layout=blog&Itemid=281 (accessed December 8, 2015).
- Northern California Area Maritime Security Committee. "Weather, San Francisco Bay." *Nor. Cal. Area Maritime Security Committee*. n.d.
<http://www.sfmex.org/support/amsc/archivedocs/Weather%20in%20the%20San%20Francisco%20Bay.pdf> (accessed December 8, 2015).
- San Francisco Bay Area Wildlife. *Marine Mammals of the Bay Area*. 2015.
http://www.sfbaywildlife.info/species/marine_mammals.htm (accessed December 8, 2015).
- Scuttlebutt Sailing News. *U.S. Coast Guard Issues Permit for America's Cup Racing*. June 30, 2013. <http://www.sailingscuttlebutt.com/2013/06/30/u-s-coast-guard-issues-permit-for-americas-cup-racing-2/> (accessed December 8, 2015).
- Smrcina, Anne, Teri Frady, and Ben Benson. *Press Releases: NOAA & Coast Guard Help Shift Boston Ship Traffic Lane to Reduce Risk of Collisions with North Atlantic Right Whales*. National Ocean Service, National Oceanic and Atmospheric Administration. June 28, 2007.
<http://sanctuaries.noaa.gov/news/press/2007/pr062807.html> (accessed December 9, 2015).
- State Water Resources Control Board of California. "State Water Resources Control Board Resolution No. 2012-0012." *2012 Resolutions*. March 20, 2012.
http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0012.pdf (accessed December 8, 2015).
- The Port Authority of New York & New Jersey. "2014 Trade Statistics." *Port Authority of NY & NJ*. April 2015. https://www.panynj.gov/port/pdf/2004_2014_trade_stats_charts.pdf (accessed December 8, 2015).
- United States Coast Guard. *Port-Access Route Studies (PARS)*. October 31, 2014.
<http://www.uscg.mil/hq/cg5/cg553/NAVStandards/PARS.asp> (accessed December 8, 2015).
- . *Sector San Francisco Vessel Traffic Service History and Fact Sheet*. September 19, 2013a.
<http://www.uscg.mil/d11/vtssf/history.asp> (accessed December 8, 2015).
- . *Sector San Francisco Vessel Traffic Service User's Manual*. September 9, 2013b.
<http://www.uscg.mil/d11/vtssf/vtssfum.asp> (accessed December 10, 2015).
- . "TIR: Special Local Regulations: Revision of 2013 America's Cup Regulated Area, San Francisco Bay; San Francisco, CA (Federal Register Publication)." *Regulations.gov*. United States

Coast Guard. July 2, 2013c. www.regulations.gov/#!documentDetail;D=USCG-2011-0551-0107 (accessed December 8, 2015).

—. *NPRM: Special Local Regulations and Safety Zones: America's Cup Sailing Events, San Francisco, CA (Federal Register Publication)*. United States Coast Guard January 30, 2012a. <http://www.regulations.gov/#!documentDetail;D=USCG-2011-0551-0001> (accessed December 8, 2015).

—. "Temporary Final Rule, Special Local Regulation and Safety Zone; America's Cup Sailing Events, San Francisco, CA." *Government Publishing Office*. United States Coast Guard. July 17, 2012b. www.gpo.gov/fdsys/pkg/FR-2012-07-17/html/2012-17305.htm (accessed December 8, 2015).

—. "Port Access Route Study; Availability: Approaches to San Francisco (Federal Register Publication)." *Regulations.gov*. United States Coast Guard. June 20, 2011a. <http://www.regulations.gov/#!documentDetail;D=USCG-2009-0576-0025> (accessed December 8, 2015).

—. "Port Access Route Study: In the Approaches to Los Angeles-Long Beach and in the Santa Barbara Channel: Notice of Availability of Study Results." *Federal Register*. November 1, 2011b. <https://www.federalregister.gov/articles/2011/11/01/2011-28270/port-access-route-study-in-the-approaches-to-los-angeles-long-beach-and-in-the-santa-barbara-channel> (accessed December 9, 2015).

—. "Port Access Route Study: The Approaches to San Francisco. Notice of Study Results." *Regulations.gov*. United States Coast Guard. June 21, 2011c. <http://www.regulations.gov/#!documentDetail;D=USCG-2009-0576-0026> (accessed December 8, 2015).

—. "Subj: Meeting Minutes For America's Cup Public Outreach To Deepdraft Vessel Operators." San Francisco: United States Coast Guard, October 20, 2011d.

—. "Port Access Route Study: the Approaches to San Francisco." *Regulations.gov*. PowerPoint Presentation. October 2010. <http://www.regulations.gov/#!documentDetail;D=USCG-2009-0576-0007> (accessed December 8, 2015).

—. "Port Access Route Study: Off San Francisco, CA, Notice of study; request for comments." *Federal Register*. Vol. 74. no. 236. San Francisco, CA: United States Coast Guard, DHS, December 10, 2009. 65543-65545.

—. "Memorandum: Final Action on Board of Investigation of Coast Guard Response to the Collision of F/V Buona Madre and M/V Eva Danielsen." Alameda, California: United States Coast Guard, November 4, 2008.

—. *Report of Investigation Into the Circumstances Surrounding the Incident Involving F/V Buona Madre & M/V Eva Danielsen/Collision/ on 07/13/2007*. Report of Investigation, San Francisco, CA: United States Coast Guard, 2007.

United States Coast Guard Headquarters. "Harbor Safety Committee Desk Reference." *United States Coast Guard*. August 2008.

<http://www.uscg.mil/d17/sectoranchorage/prevention/wwwdocs/HSC%20Desk%20Ref%20of%20August%202008.pdf> (accessed December 9, 2015).

United States Coast Guard Judge Advocate General. "Preparation of Field Regulations-COMDTINST M16704.3A." *USCG Directives*. United States Coast Guard. July 2009.

https://www.uscg.mil/directives/cim/16000-16999/CIM_16704_3A.pdf (accessed December 8, 2015).

United States Coast Guard Navigation Center. *Vessel Traffic Services*. July 30, 2014.

<http://www.navcen.uscg.gov/?pageName=vtsMain> (accessed December 8, 2015).

United States Coast Guard, United States National Parks Service, United States Army Corps of Engineers, and The Presidio Trust. *Environmental Assessment: 34th America's Cup Races, June 7, 2012*. Environmental Assessment, San Francisco, CA: National Parks Service, 2012.

United States Environmental Protection Agency. *San Francisco Bay Delta: About the Watershed*. November 10, 2015. <http://www2.epa.gov/sfbay-delta/about-watershed> (accessed December 8, 2015).

—. *What Are The Challenges?* November 10, 2015. <http://www2.epa.gov/sfbay-delta/what-are-challenges> (accessed December 8, 2015).

—. "Port Access Route Studies: Atlantic Coast from Maine to Florida: Notice of availability; interim report." *Regulations.gov*. United States Environmental Protection Agency. September 11, 2012. <http://www.regulations.gov/#!documentDetail;D=USCG-2011-0351-0132> (accessed December 9, 2015).

United States Geological Survey. *Travels with Sediment in the San Francisco Bay, Delta, and Coastal System*. January 6, 2014. http://www.usgs.gov/blogs/features/usgs_top_story/travels-with-sediment-in-the-san-francisco-bay-delta-and-coastal-system/ (accessed August 14, 2015).

United States House of Representatives. "16 U.S.C. 32 § 1431 - Findings, purposes, and policies; establishment of system." *Cornell University Legal Information Institute*. November 13, 2000. <https://www.law.cornell.edu/uscode/text/16/1431> (accessed December 8, 2015).

—. "16 U.S.C. 32 § 1445a - Advisory Councils." *Cornell University Legal Information Institute*. November 13, 2000. <https://www.law.cornell.edu/uscode/text/16/1445a> (accessed December 8, 2015).

—. "33 U.S.C. 25 § 1222 - Definitions." *Cornell University Legal Information Institute*. August 9, 2004. <https://www.law.cornell.edu/uscode/text/33/1222> (accessed December 2015, 2015).

—. "33 U.S.C. 25 § 1223 - Vessel operating requirements." *Cornell University Legal Information Institute*. July 11, 2006. <https://www.law.cornell.edu/uscode/text/33/1223> (accessed December 8, 2015).

Appendix I. Traffic Separation Schemes

Traffic Separation Schemes (TSSs) are a form of ship routing often used near major ports and in major thoroughfares that are “aimed at the separation of opposing streams of traffic by appropriate means and by the establishment of traffic lanes.”⁸³ Traffic lanes are delineated on nautical charts and typically include a one-way inbound lane, a one-way outbound lane, and a separation zone between the two.

TSSs and other ship routing systems have been in use worldwide since the late nineteenth century, and associated provisions are included in the International Convention for the Safety of Life at Sea (SOLAS), first adopted in 1914.⁸⁴ The International Maritime Organization (IMO) is identified in the SOLAS Convention as the only international organization which can establish TSSs and other ship routing schemes.⁸⁵ Under U.S. law, the U.S. Coast Guard is authorized through the Ports and Waterways Safety Act of 1974 to establish these and other designated fairways.⁸⁶ The Act explains that traffic separation schemes, fairways, or other elements of a vessel traffic system may be operated, maintained, improved, or expanded “for controlling or supervising vessel traffic or for protecting navigation and the marine environment.”⁸⁷ Therefore, the establishment of a new or modification of an existing TSS must be approved and implemented through both the federal rule-making process, pursuant to the Coast Guard’s authority, and the IMO approval process.

A TSS is not necessarily mandatory. IMO-approved TSSs and other ship routing systems can be approved as either mandatory, mandatory for certain vessel classes or cargo types, or recommended for safe navigation. Additionally, “A ship shall use a mandatory ships' routing system adopted by the Organization [IMO] as required for its category or cargo carried and in accordance with the relevant provisions in force *unless there are compelling reasons not to use a particular ships' routing system.*”⁸⁸ Under the Ports and Waterways Safety Act, the U.S. Coast Guard may make TSSs or fairways mandatory, to the extent “reasonable and necessary,” for any vessel operating in the U.S. territorial sea (12 nautical miles offshore) and for specific types and sizes of U.S.-flagged vessels operating beyond the territorial sea.⁸⁹ In the case of the Approaches to San Francisco, the Offshore TSS is not mandatory.

Appendix II. Port Access Route Studies

The U.S. Coast Guard has conducted numerous Port Access Route Studies (PARS) in locations throughout the U.S. in order to reduce the risk of marine casualties, improve the efficiency of marine traffic, and reconcile safe vessel access with other reasonable waterways uses.⁹⁰ According to the U.S. Coast Guard, PARS overall objectives include, but are not limited to, determining present vessel traffic density and movement; potential vessel traffic density; if existing vessel routing measures are adequate or require modifications; what modifications or new vessel routing measures may be needed, and why; and whether such routing measures must be mandatory for certain vessels.”⁹¹

One example, conducted around the same time as the San Francisco case described here, is a PARS in the Approaches to Los Angeles-Long Beach and in the Santa Barbara Channel (2010 – 2011). In this case, the Coast Guard identified and examined four space-use concerns: vessel traffic taking place in a Navy test range; vessel traffic’s threat to whale species due to ship strikes; health risks associated with pollutants emitted through commercial ships’ exhaust; and potential changes in vessel traffic patterns in response to forthcoming IMO emission control standards. Data analysis included consideration of ongoing biological research conducted by NOAA’s Channel Islands National Marine Sanctuary program (Carver pers. comm. 2015). Analysis of these and other data, and consideration of stakeholder input, led the Coast Guard to recommend narrowing one traffic lane to reduce the risk of ship strikes and adding a second set of traffic lanes to accommodate increased vessel traffic.⁹²

A final example is the ongoing Atlantic Coast PARS, a broad study of navigational uses from Maine to Florida, which was initiated to support the Department of Interior’s “Smart from the Start” initiative as well as to provide data that could inform future MSP efforts.⁹³ This PARS includes a broad assessment of current and potential future navigational uses of Atlantic Coast waters as well as focused consideration, in close collaboration with the Bureau of Ocean Energy Management, of the potential impact that proposed offshore renewable energy development may have on vessel traffic.⁹⁴

Appendix III. Vessel Traffic Services

According to the International Maritime Organization, a Vessel Traffic Service (VTS) is a body that will contribute to making high-volume or high-risk ocean areas within a nation's territorial seas as safe and efficient for navigation as possible, as well as to help protect the marine environment.⁹⁵ The U.S. Coast Guard states that the purpose of a VTS is "to provide active monitoring and navigational advice for vessels in particularly confined and busy waterways."⁹⁶

The U.S. Coast Guard operates multiple VTSs in busy ports throughout the U.S. under the authority of the Ports and Waterways Safety Act of 1972.⁹⁷ Examples of VTS locations include the ports of New York, New Orleans, and Puget Sound. A VTS uses a variety of tools and techniques to prevent vessel collisions, groundings, and other incidents, as well as to create expeditious and efficient vessel movements and to support safe vessel passages during all weather events. A VTS may be either surveilled, meaning it uses sensors like AIS or RADAR to monitor traffic, or non-surveilled, in which vessels report in at designated stations.⁹⁸ A VTS maintains contact with vessel operators via VHF radio, and may advise on course and speed and provide coordinating information. In some cases, such as times of heightened security concern or dangerous conditions, VTS operators may even direct vessel traffic in order to ensure vessel safety.⁹⁹

The San Francisco Vessel Traffic Service monitors 133 miles of waterways out to 38 nautical miles offshore, a total of approximately 6,400 square miles, coordinating approximately 250 vessel movements per day. The station is the country's oldest, established in August of 1972. The Bay Area was the location for the nation's first VTS because of the high occurrence of fog that creates treacherous navigational conditions, resulting in accidents such as the 1971 *Arizona Standard/Oregon Standard* tanker collision which resulted in an 800,000 gallon oil spill.¹⁰⁰ VTS San Francisco's primary purpose is to facilitate "the safe and efficient transit of vessel traffic," with the secondary purpose of assisting with other Coast Guard missions such as search and rescue operations.¹⁰¹ VTS operators ("Vessel Traffic Management Specialists") in San Francisco and elsewhere are required to undergo specialized training to monitor and manage such busy environments using a range of technologies and skills. In San Francisco, operators' initial training is a phased program lasting approximately six to eight months and includes developing detailed geographic and waterways knowledge of the port, plus spending hundreds of hours in a VTS simulator and as a trainee in a real VTS operations center.¹⁰² Operators are also required to attend a national training program.¹⁰³

Additionally, VTS operators typically have hands-on knowledge of the maritime environment. Prospective traffic managers usually have extensive experience in ship handling

and navigation – often gained in previous experience in the Navy, Coast Guard, or as merchant mariners aboard commercial ships. Many operators also complete the same professional trainings (such as Radar Observer or Electronic Chart Display and Information Systems) that are required of professional mariners. VTS operators are also required to complete a series of rides on commercial vessels; in San Francisco, each VTS operators must make at least one trip annually with a piloted vessel, a tug and tow, and two passenger or ferry vessels.¹⁰⁴

Appendix IV. Cordell Bank and Greater Farallones National Marine Sanctuaries

The Cordell Bank and Greater Farallones National Marine Sanctuaries^{iv} are two of several such sanctuaries located in the California Current ecosystem off the California coast. A National Marine Sanctuary is an area designated by the federal government as a Sanctuary in order to “protect its natural and cultural features while allowing people to use and enjoy the ocean in a sustainable way.”¹⁰⁵ Sanctuaries are designated pursuant to the National Marine Sanctuaries Act of 1972. The Act authorizes the creation of a National Marine Sanctuary System, comprising individual sanctuaries, that together will “improve the conservation, understanding, management, and wise and sustainable use of marine resources,” grow public understanding of and respect for the marine environment, and maintain the areas for future use and enjoyment.¹⁰⁶ While each Sanctuary has its own regulations, many sanctuaries prohibit activities such as discharges of material, disturbance or alteration of the seabed, disturbance of cultural resources, and oil and gas exploration and production.^v

The Cordell Bank National Marine Sanctuary was established by Congress in 1989. It was established because the waters and submerged lands of Cordell Bank as well as Bodega Canyon (added with the Sanctuary’s 2015 expansion) were recognized as significant areas for biological diversity. Cordell Bank is a rocky, submerged reef and Bodega Canyon is a submarine canyon; both features are located at the edge of the continental shelf west of Point Reyes National Seashore, north of the entrance to San Francisco Bay. These unique habitats allow for many kinds of marine species to thrive, and bring migratory birds and marine mammals to its waters. With the 2015 expansion, the Sanctuary encompasses 1,286 square miles of open ocean space.¹⁰⁷

The Greater Farallones National Marine Sanctuary (known as the Gulf of the Farallones National Marine Sanctuary prior to its 2015 expansion) was designated by Congress in 1981. The Sanctuary currently encompasses 3,295 square miles of open water, wetlands, tidal flats, reefs, beaches, and other ocean and coastal features. This area, located north and west of San Francisco Bay, is characterized by a tremendous amount of upwelling, which feeds the large number of megafauna that pass through these waters. Prior to its 2015 expansion, the Sanctuary was less than half of its current size at 1,279 square miles.¹⁰⁸

^{iv} The Greater Farallones National Marine Sanctuary was named the Gulf of the Farallones National Marine Sanctuary throughout the entire time period discussed in this case study. It is referred to here as “Greater Farallones” for consistency with contemporary usage.

^v <http://sanctuaries.noaa.gov/protect/regulations/welcome.html>

Appendix V. The Stellwagen Bank National Marine Sanctuary's Role Assisting in the PARS

The Approaches to San Francisco PARS involved collaboration of all types – between government agencies, between stakeholders, and even between programs within the same government agency. The Cordell Bank and Greater Farallones Sanctuaries relied on the expertise of another Sanctuary 3,000 miles away – the Stellwagen Bank National Marine Sanctuary, located near Boston, Massachusetts. To analyze the impacts of vessel traffic on whales, the Sanctuaries' Joint Working Group needed to conduct the best possible analysis to understand the co-location of whales (based on individual points representing whale sightings) and ships (based on AIS data, which comprises numerous individual points representing individual ship locations). For advice on this issue, Cordell Bank's Michael Carver reached out to Mike Thompson, a GIS analyst at Stellwagen Bank. Thompson had conducted a similar analysis a few years earlier in support of another MSP effort – Stellwagen Bank's work with maritime industry and other partners to mitigate the impacts of vessel traffic on right whales in the Approaches to Boston traffic lanes.¹⁰⁹

Carver convinced Thompson to help the Cordell Bank and Greater Farallones Sanctuaries process and analyze all of the data. "He totally got where we were in the process because he had been through it a few years earlier," commented Carver. "[Thompson] got all the data and produced this incredible report for us." This analysis was ultimately critical in not only supporting the Sanctuaries' Joint Working Group, but in making precise, credible, science-based recommendations to the Coast Guard on TSS modifications that could mitigate the ship strike issue.

Appendix VI. Coast Guard Authorities to Manage Marine Events

The U.S. Coast Guard has the authority to manage regattas and marine parades (collectively “marine events”) as part of its broad suite of authorities to manage activities in, on, and under the water. Three tools available to the Coast Guard in this regard are Marine Event Permits, Special Location Regulations (SLRs), and Safety Zones.

A **“Marine Event Permit”** is required for a regatta, marine parade, or similar organized on-the-water activity that could potentially create an “extra or unusual” safety hazard. While determinations of such hazards are made at the district level, possible examples may include events including over 50 participating vessels, vessels moving at high speeds, or events that will block or interfere with commercial shipping traffic. In such cases, the Event Sponsor is required to apply for a permit, and in doing so provide the Coast Guard with detailed information regarding the planned event. The Coast Guard will then review the event’s potential to affect navigation safety and may or may not issue a permit. In connection with reviewing a marine event, the Coast Guard may also determine whether there is a need to promulgate any temporary “field regulations,” or local rules, to ensure navigation safety before, during and immediately after the event.¹¹⁰

An **SLR** is a “field regulation,” or local rule or set of rules that the Coast Guard may choose to establish to promote navigation safety before, during and immediately after a marine event. An SLR often temporarily limits or alters activity within a given water space, or “Regulated Navigation Area.” This temporary area may be established by the Coast Guard only in association with a permitted marine event, and is established solely for the duration of that event. For example, “To promote safety of life on navigable waters immediately before, during and immediately after the power boat race, the District Commander issued special local regulations establishing three areas: (1) a “spectator area” restricting vessels to operate at No Wake Speed; (2) a “buffer zone” excluding all vessels; and (3) a “race area” limiting access to all vessels except those participating in or conducting the race.”¹¹¹ All SLRs must accompany a Marine Event Permit, but not every Marine Event Permit requires an SLR. Establishing an SLR requires a federal rulemaking process.¹¹²

A **Safety Zone** is another “field regulation” (local rule) and one of several types of limited access areas that the Coast Guard can establish in order to maintain navigation safety. A Safety Zone is an area of water and/or land designated for a limited period of time for safety and/or environmental purposes. Safety Zones typically exclude access for all users unless a vessel has explicit permission to enter this area. Safety Zones are not unique to marine events and do not require the issuance of a Marine Event Permit, though they are established through a federal rulemaking process.¹¹³

Appendix VII. Coast Guard Sector SE New England's Role in 34th America's Cup Planning

In planning for the 34th America's Cup, the U.S. Coast Guard utilized its own agency's prior experience planning for this type of marine event through a bi-coastal collaboration. U.S. Coast Guard Sector San Francisco, which was responsible for managing the races in San Francisco Bay, was able to draw upon work previously completed by Sector Southeastern New England (Sector SENE), headquartered in Rhode Island. "We didn't start from scratch," explained Coast Guard Commander Aaron Lubrano, who was part of the America's Cup planning team. "We looked at other [Coast Guard] Sectors for similar events – we went to San Diego and Rhode Island when they had races there. So we tried to use other experiences, information, and knowledge from similar things that have happened."

Sector SENE has had extensive experience with large-scale yacht racing events, given the amount of high-profile racing that takes place in Newport and just outside of Narragansett Bay in Rhode Island Sound. When the America's Cup World Series races were held off of Newport in 2012, Sector SENE invited members of Sector San Francisco to Rhode Island to observe the planning and execution of the races. Edward LeBlanc, head of the Waterways Management Division at Sector SENE, explains his thought that Sector San Francisco could observe what worked and did not work during the 2012 America's Cup World Series, as well as hear about lessons learned from Sector SENE's prior experiences, and use those to shape their own planning process. We wanted them to have "an unvarnished look — complete transparency," explained LeBlanc.

Ultimately, however, the two sectors employed different management approaches in response to the geographies and the types and intensity of uses in the two locations. LeBlanc explained that in Rhode Island: "We didn't treat the America's Cup World Series and commercialized vessel traffic as mutually exclusive." Rather, in Rhode Island, the Coast Guard asked the race officials to adjust their schedule if they needed to accommodate ships that could only pass the Bay at high tide. LeBlanc explains that they were able to do this because of the geography of Narragansett Bay and the type of traffic which needed to pass through the vicinity of the races. In San Francisco, by contrast, the size, type, and frequency of commercial traffic required designating a racing area that was closed to other traffic during a prescribed time each day. Other key differences shaping the two events included different environmental and weather considerations and different local and state authorities. The difference in the approaches used by the Coast Guard for similar events on opposite coasts illustrates how spatial planning cannot employ a one-size-fits-all approach, but rather must be adapted to each unique geography, combination of uses, and governance setting.

Regardless of these differences, Coast Guard Sector San Francisco staff found it useful to learn how others have managed similar such events. “Government agencies . . . [can] get very insular and you forget to try to look beyond yourself,” commented Commander Aaron Lubrano. “Everything’s been done before, so why don’t we use some of that history and knowledge gained to benefit your event or specific situation?”

Appendix VIII. Key Agencies and Organizations Involved in 34th America's Cup Planning

Table 4. Key Agencies and Organizations Involved in the America's Cup Planning Process

Name	Role
I. Government	
City and County of San Francisco (CCSF)	<ul style="list-style-type: none"> Incorporated city government with jurisdiction over city lands and property Entered into Host and Venue Agreement with America's Cup Event Authority; event co-sponsor; co-applicant with America's Cup Event Authority on permit applications
National Park Service (NPS)	<ul style="list-style-type: none"> Federal agency responsible for managing nationally-designated parks and preservation sites; in San Francisco, owner and manager of waterfront sites including Golden Gate National Recreation Area, the Presidio, the San Francisco National Maritime Historic Park, and Alcatraz Island With Coast Guard, co-led federal Environmental Assessment for AC activities in San Francisco Bay
Port of San Francisco	<ul style="list-style-type: none"> An agency of the City and County of San Francisco charged with managing maritime public, industrial, and commercial activities on the San Francisco waterfront Entered into agreement with the city of San Francisco for the event; port facilities physically hosted AC activities; port staff managed labor, security, and logistics during event
Presidio Trust	<ul style="list-style-type: none"> Semi-governmental federal entity formed by Congress to manage and protect Presidio lands in conjunction with the National Parks Service Member of federal team for NEPA review; hosted race viewers on Presidio lands
San Francisco Bay Conservation and Development Commission (BCDC)	<ul style="list-style-type: none"> State agency federally designated to conduct coastal management activities for the San Francisco Bay segment of the California coast Evaluated and approved permit applications for AC-related waterfront improvements and structures
U.S. Army Corps of Engineers (USACE)	<ul style="list-style-type: none"> Federal agency responsible for maintenance of navigable waterways Member of federal team for NEPA review; handled all in-water construction and dredging activities permits for AC-related infrastructure
U.S. Coast Guard Sector San Francisco (USCG)	<ul style="list-style-type: none"> Regional sector of federal agency responsible for navigational safety on U.S. waterways, with the goals of maintaining safety, waterway accessibility, and maritime commerce Lead federal agency overseeing on-the-water aspects of 34th America's

Name	Role
	Cup; this included issuing a Marine Event Permit, Special Local Regulations (SLR) designating race areas and Safety Zones for AC vessels
II. Stakeholder Organizations	
Harbor Safety Committee of the San Francisco Bay Region (HSC)	<ul style="list-style-type: none"> Public forum dedicated to improving safety of navigation and operation of all vessel traffic within San Francisco Bay; members include representatives from maritime industry sectors, non-profit environmental groups, port authorities, and relevant government agencies Primary forum for maritime industry input and communication during planning process
San Francisco Baykeeper	<ul style="list-style-type: none"> Non-profit organization seeking to enhance water quality in the Bay through advocacy, monitoring, and legal action; member of HSC Led coalition of more than 30 environmental non-profits and neighborhood groups to address potential environmental impacts of the America's Cup
III. Marine Event Proponent	
America's Cup Event Authority (ACEA)	<ul style="list-style-type: none"> Corporation formed to manage the commercial aspects of the 34th America's Cup; acted as independent agent for the cup's Trustee (Golden Gate Yacht Club) Permit applicant, in partnership with the City/County of San Francisco, for race-related activities including the Marine Event Permit
America's Cup Race Management (ACRM)	<ul style="list-style-type: none"> A subsidiary of the America's Cup Event Authority which oversaw race management for the 34th America's Cup Oversaw operational aspects of on-the-water racing activities, including coordinating with the Coast Guard, VTS and other maritime industry stakeholders

Appendix IX. Harbor Safety Committees

A Harbor Safety Committee is a port- or harbor-based group that facilitates coordination of marine transportation system activities among local public and private stakeholders. Many large and mid-sized ports and harbors throughout the United States have such groups – according to the Coast Guard, there were 82 committees nationwide in 2008,¹¹⁴ though many are known by alternate names (e.g., New York Harbor has a “Harbor Ops Committee” and Narragansett Bay (Rhode Island and Massachusetts) has a “Port Safety and Security Forum”). These groups also vary widely in scope and structure, and there is no national mandate or set of guidelines to structure or coordinate these groups’ activities. Moreover, the Coast Guard does not lead or inform the governance of these groups, but does promote and encourage their establishment and expansion.

The HSC of the San Francisco Region was established pursuant to a California state law, the Oil Spill Prevention and Response Act of 1990, which “created harbor safety committees for the major harbors of the State of California to plan for safety of navigation and vessel movement in each harbor.”¹¹⁵ The San Francisco committee was established in the following year and currently comprises 37 members representing 28 different government agencies, non-governmental organizations and private businesses. Representatives of the Marine Exchange of the San Francisco Bay Region serve as Chair and Executive Secretary of the committee. The committee, which convenes monthly for meetings that are open to the public, also includes seven work groups focused on topics including navigation, ferry operations, dredging, and tugboat operations.

The Coast Guard awarded the San Francisco HSC the 2012-2013 “Harbor Safety Committee of the Year” award. Award documents indicate that the recent accomplishments of this HSC include installing the West Coast’s first maritime fog sensor at the Port of Oakland; analyzing data and developing an arrival protocol for Ultra Large Container Vessels; developing Best Maritime Practice guides for safety during dead ship tows and for designated anchorage drop points; and creating guidelines for operation during reduced visibility in the Bay. The HSC also acted as the forum for discussions and dissemination of information throughout the planning and execution of the 34th America’s Cup races.¹¹⁶ By their own account, “the San Francisco Bay Harbor Safety Committee was instrumental to safely executing the most complex America’s Cup races in the event’s 162-year history, and the first races to be held within the confines of a busy, dynamic port.” The HSC acted as the forum for collaboration during planning, and their role “was vital to ensuring the safety of over 800,000 spectators and competitors, preserving access for diverse users, and facilitating the uninterrupted flow of \$15 billion in maritime commerce over 80 days of racing.”¹¹⁷

Table 5. Members of the Harbor Safety Committee of the San Francisco Bay Region

Sector	Agency/Organization/Company
Barge Operators	Starlight Marine Services; Westar Marine Services
Commercial Fishing	California Dungeness Crab Task Force
Dry Cargo Operators	General Steamship Corporation; Horizon Lines, Inc.; National Cargo Bureau, Inc.; Pacific Merchant Shipping Association
Federal Government Members	National Oceanic and Atmospheric Administration; U.S. Army Corps of Engineers; U.S. Coast Guard; U.S. Navy
Ferry Operators	Baylink Ferry; Blue & Gold Fleet
Labor Organizations	Inlandboatmen's Union; International Organization of Masters, Mates, and Pilots
Maritime Information Exchange Community	Marine Exchange of the San Francisco Bay Region
Non-Profit Environmental Organizations	San Francisco Baykeeper
Pilots Organizations	San Francisco Bar Pilots
Pleasure Boat Operators	National Boating Federation
Port Authorities	Port of Benicia; Port of Oakland; Port of Richmond; Port of San Francisco; Port of Stockton
State Government Members	San Francisco Bay Conservation and Development Commission
Tanker/Marine Oil Terminal Operators	Shell Martinez; Tesoro Refining and Marketing Affairs
Tanker Operators	Chevron Shipping Company LLC
Tug Operators	AMNAV Maritime Services; Foss Maritime Company
Non-Member Participants	California Department of Fish and Wildlife Office of Spill Prevention and Response

END NOTES

- ¹ United States Environmental Protection Agency, “About,” 2015.
- ² United States Geological Survey, 2014.
- ³ United States Coast Guard et al., 2012.
- ⁴ San Francisco Bay Area Wildlife, 2015.
- ⁵ The Port Authority of New York & New Jersey, 2015.
- ⁶ Cordell Bank and Gulf of the Farallones National Marine Sanctuaries, 2014.
- ⁷ Harbor Safety Committee of the San Francisco Bay Region, 2015.
- ⁸ Commander Amy Wirts, United States Coast Guard, personal communication, December 4, 2015.
- ⁹ Commander Amy Wirts, United States Coast Guard, personal communication, November 10, 2015.
- ¹⁰ United States Environmental Protection Agency, “What,” 2015.
- ¹¹ California Department of Fish and Wildlife, 2015.
- ¹² Northern California Area Maritime Security Committee, n.d.
- ¹³ Douvere and Ehler, 2009.
- ¹⁴ Commandant of the United States Coast Guard, 2012, 2.
- ¹⁵ Commandant of the United States Coast Guard, 2012, 3.
- ¹⁶ Commandant of the United States Coast Guard, 2012, 4.
- ¹⁷ Edward G. LeBlanc, Waterways Management Division at Coast Guard Sector Southeastern New England, personal communication, August 2015.
- ¹⁸ McCann, 2014.
- ¹⁹ United States Coast Guard, 2008.
- ²⁰ United States Coast Guard, 2008.
- ²¹ United States House of Representatives, 33 U.S.C. 25 § 1223, 2006.
- ²² United States House of Representatives, 33 U.S.C. 25 § 1223, 2006.
- ²³ United States House of Representatives, 33 U.S.C. 25 § 1223, 2006.
- ²⁴ United States Coast Guard, 2008.

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- ²⁵ United States Coast Guard, 2008.
- ²⁶ United States Coast Guard, 2009.
- ²⁷ Joint Working Group on Vessel Strikes and Acoustic Impacts, 2012.
- ²⁸ Joint Working Group on Vessel Strikes and Acoustic Impacts, 2012.
- ²⁹ United States Coast Guard, 2011c.
- ³⁰ Joint Working Group on Vessel Strikes and Acoustic Impacts, 2012.
- ³¹ International Maritime Organization Sub-Committee on Safety of Navigation, 2012.
- ³² National Oceanic and Atmospheric Administration, 2015.
- ³³ United States Coast Guard, 2009.
- ³⁴ United States Coast Guard, 2009.
- ³⁵ United States Coast Guard, 2011c.
- ³⁶ Joint Working Group on Vessel Strikes and Acoustic Impacts, 2012.
- ³⁷ United States Coast Guard, 2009.
- ³⁸ United States Coast Guard, 2010.
- ³⁹ Cordell Bank National Marine Sanctuary Advisory Council, 2010.
- ⁴⁰ Joint Working Group on Vessel Strikes and Acoustic Impacts, 2012.
- ⁴¹ United States House of Representatives, 16 U.S.C. 32 § 1445a, 2000.
- ⁴² Greater Farallones National Marine Sanctuary, "Sanctuary," 2015; Cordell Bank National Marine Sanctuary, 2015.
- ⁴³ Joint Working Group on Vessel Strikes and Acoustic Impacts, 2012.
- ⁴⁴ Joint Working Group on Vessel Strikes and Acoustic Impacts, 2012, 30.
- ⁴⁵ Joint Working Group on Vessel Strikes and Acoustic Impacts, 2012, 10.
- ⁴⁶ State Water Resources Control Board of California, 2012.
- ⁴⁷ Office of National Marine Sanctuaries, National Oceanic and Atmospheric Administration, 2010.
- ⁴⁸ United States Coast Guard, 2010.
- ⁴⁹ United States Coast Guard, 2011a.

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- ⁵⁰ Dransfield et al., 2014.
- ⁵¹ National Sailing Hall of Fame, 2015.
- ⁵² United States Coast Guard, 2012a.
- ⁵³ Budget and Legislative Analyst, 2014.
- ⁵⁴ Marine Exchange of the San Francisco Bay Region, “...2010-2013,” 2015.
- ⁵⁵ City and County of San Francisco et al., 2010.
- ⁵⁶ United States Coast Guard et al., 2012.
- ⁵⁷ United States Coast Guard et al., 2012.
- ⁵⁸ United States Coast Guard et al., 2012.
- ⁵⁹ United States Coast Guard, 2011d.
- ⁶⁰ United States Coast Guard, 2012b.
- ⁶¹ United States Coast Guard, 2012b.
- ⁶² United States Coast Guard et al., 2012.
- ⁶³ United States Coast Guard et al., 2012.
- ⁶⁴ United States Coast Guard, 2012b.
- ⁶⁵ CupInfo, 2013.
- ⁶⁶ CupInfo, 2013.
- ⁶⁷ Morris and agencies, 2014.
- ⁶⁸ Commander Amy Wirts, United States Coast Guard, personal communication, June 25, 2015.
- ⁶⁹ Scuttlebutt Sailing News, 2013.
- ⁷⁰ United States Coast Guard, 2013c.
- ⁷¹ CupInfo, 2013.
- ⁷² United States Coast Guard et al., 2012.
- ⁷³ United States Coast Guard et al., 2012.
- ⁷⁴ Commandant of the United States Coast Guard, 2013.

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- ⁷⁵ United States Coast Guard, 2012a.
- ⁷⁶ Marine Exchange of the San Francisco Bay Region, 2015.
- ⁷⁷ United States Coast Guard, 2011d.
- ⁷⁸ United States Coast Guard, 2012a.
- ⁷⁹ Marine Exchange of the San Francisco Bay Region, 2015.
- ⁸⁰ United States Coast Guard, 2012a.
- ⁸¹ Budget and Legislative Analyst, 2014.
- ⁸² Harbor Safety Committee of the San Francisco Bay Region, 2014.
- ⁸³ International Maritime Organization, "Ships'," 2015.
- ⁸⁴ International Maritime Organization, "Ships'," 2015.
- ⁸⁵ International Maritime Organization, "Ships'," 2015.
- ⁸⁶ United States House of Representatives, 33 U.S.C. 25 § 1223, 2006.
- ⁸⁷ United States House of Representatives, 33 U.S.C. 25 § 1223, 2006.
- ⁸⁸ International Maritime Organization, "Ships'," 2015.
- ⁸⁹ United States House of Representatives, 33 U.S.C. 25 § 1223, 2006.
- ⁹⁰ United States Coast Guard, 2014.
- ⁹¹ United States Coast Guard, 2014.
- ⁹² United States Coast Guard, 2011b.
- ⁹³ United States Environmental Protection Agency, 2012.
- ⁹⁴ United States Environmental Protection Agency, 2012.
- ⁹⁵ International Maritime Organization, "Vessel" 2015.
- ⁹⁶ United States Coast Guard Navigation Center, 2014.
- ⁹⁷ United States House of Representatives, 33 U.S.C. 25 § 1222, 2004.
- ⁹⁸ United States Coast Guard Navigation Center, 2014.
- ⁹⁹ United States Coast Guard, 2013b.

-
- ¹⁰⁰ United States Coast Guard, 2013a.
- ¹⁰¹ United States Coast Guard, 2013a.
- ¹⁰² Thomas Boone, United States Coast Guard, personal communication, September 10, 2015.
- ¹⁰³ Commandant of the United States Coast Guard, 2013.
- ¹⁰⁴ Thomas Boone, United States Coast Guard, personal communication, September 10, 2015.
- ¹⁰⁵ National Marine Sanctuaries, 2012.
- ¹⁰⁶ United States House of Representatives, 16 U.S.C. 32 § 1431, 2000.
- ¹⁰⁷ Cordell Bank National Marine Sanctuary, n.d.
- ¹⁰⁸ Greater Farallones National Marine Sanctuary, "Cordell," 2015.
- ¹⁰⁹ Smrcina et al., 2007.
- ¹¹⁰ Commandant of the United States Coast Guard, 2013.
- ¹¹¹ United States Coast Guard Judge Advocate General, 2009.
- ¹¹² Commandant of the United States Coast Guard, 2013.
- ¹¹³ Commandant of the United States Coast Guard, 2013.
- ¹¹⁴ United States Coast Guard Headquarters, 2008.
- ¹¹⁵ Marine Exchange of the San Francisco Bay Region, 2010.
- ¹¹⁶ Marine Exchange of the San Francisco Bay Region, 2015.
- ¹¹⁷ Harbor Safety Committee of the San Francisco Bay Region, 2014.