



AUV Fest 2008
Newport, Rhode Island
May 12 to 23, 2008

Planning
Document

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1. Cruise Overview:

- a. AUV Fest 2008, scheduled for May 12 to 23, will be held in Rhode Island's Narragansett Bay. The event is a demonstration of 14 AUV systems developed by ONR for mine hunting. As part of a collaborative effort to examine the dual use of this technology, approximately half of these systems will be deployed for archaeological purposes on shipwreck sites to evaluate their use for maritime archaeology. Daily operations will be staged from NUWC's Stillwater Basin in Coddington Cove. The AUV systems have been divided among 4 vessel groups. Each group consists of a main support vessel and two auxiliaries. These vessels are either owned by NUWC or under contract including the R/V ENDEAVOR from the University of Rhode Island. Most of the archaeology component will be conducted the first week, from May 12 to May 16. The week prior to AUV Fest will be used to set up and test the AUV systems. OER will invite a group of archaeologists to participate in the daily operations which includes deployment and recovery of the vehicles on the water, data analysis and interpretations at NUWC's Integrated Data Center (IDC), and a workshop at the conclusion of the event to discuss outcomes. OER will also develop the outreach component for the event, mainly through the Ocean Explorer website, and work with the Public Affairs Officers for NUWC and ONR. A production company will be hired by NUWC to record the archaeology component of the Fest on high definition and standard definition video. The story line will include Rhode Island history and archaeology, AUV technology and incorporate interviews with subject matter experts. Data and data products acquired from the Fest will be housed in appropriate NOAA data archives.
- b. Four shipwreck sites have been chosen as the subjects for this demonstration. Their general location is shown on the chart in Appendix B.
 - Site 2. 20th century steel vessel 120 ft long
 - Site 3. 20th century wooden barge 100 ft long
 - Site 4. Revolutionary War British Frigate *H.M.S. Cerberus*
 - Site 8. Revolutionary War British ship *H.M.S. Lark*
- c. Goals and objectives
 - Goals
 - Raise the Maritime Archaeological community's awareness and subsequent use of AUV technology to increase the scope and efficiency of submerged cultural resources discovery and inventory.
 - Broaden the relationship between maritime archaeologists, state and federal resource managers, and technology developers
 - Demonstrate that ONR, NUWC, and NOAA are effectively leveraging public resources to address important needs through a "dual-use" outlook.
 - Expand current proud/buried object detection/classification/identification to other material types based on historic cultural materials
 - Investigate significant US maritime heritage sites in the waters near Newport, RI.
 - Collaborate with NUWC and ONR on outreach initiatives
 - Objectives
 - Apply AUV and MCM technology to survey selected shipwrecks representing a variety of material types and conditions
 - Have maritime archaeologists work with technologists to gain operational experience in AUV/MCM technology and the interpretation of non-typical MCM targets, e.g. materials and objects such as glass, ceramics, and wood artifacts.
 - Provide a forum for archaeologists and vendors to discuss the application of AUV/MCM technology in maritime archaeology and the feasibility of expanding AUV/MCM technology for non-DoD applications
 - Provide public outreach over the Internet and other venues

Comment [JMCD1]: Check schedule

2. Description of operations:

- a. Archaeology: The primary goal of operations is to document four shipwreck sites with multiple AUV systems outfitted with a number of different sensors. This is a non-disturbance activity that will not impact the sites in any physical way. The four shipwrecks represent a range of vessel types, site conditions, preservation conditions, and construction material. These are known sites but the data collected is new information of interest to academic archaeologists and state and federal cultural resource managers. Certain information concerning position and cultural material is sensitive and protected from public disclosure under the National Historic Preservation Act.

- b. AUV : Seven AUV systems will be deployed among the shipwreck sites. The allocation of the systems to each site is presented in the weekly schedule under Itinerary. Each system has 1 to 3 sensors including side scan sonar, synthetic aperture sonar, Didson sonar, blazed array sonar, iPUMA phased array sonar, laser scalar gradiometer, low frequency bottom penetrating sonar, still digital camera, and video. More information on each AUV system is presented in Appendix C. Survey boxes will be defined for each shipwreck site by the AUV technologists in consultation with the archaeologists. Sites 2 and 3 are in close proximity (roughly 300m) and will be combined in one survey box. Sites 4 and 8 will have separate boxes. The AUV teams will have bench space to maintain their systems in a building adjacent to the boat docks. Analysis and interpretation of data products will be done in the Integrated Data Center (IDC).
- c. Video recording: As part of the outreach effort NUWC will contract the services of a production company to document the Fest in high definition (HD) and standard definition (SD) video. David Bellino (NUWC) will develop a story line and shot list in consultation with AUV Fest Steering Committee. Coverage will include operations and interviews with subject matter experts. Products include an Electronic Press Kit (EPK), 8 to 10 minute short form narrative documentary, and Digital Media Library-DML (HD/SD video, audio, photos, CGI)
- d. Boat operations: NUWC is responsible for boat operations through its range department. These boats are either owned by NUWC or under charter/contract. Roughly nine boats will be used during this event and they will be divided into four support groups. Support Groups 1, 3, and 4 will deploy from Stillwater Landing for day time operations between 0600 and 1800. Support group 2, comprised of the R/V ENDEAVOR, will operate from dock #2 near the aircraft carriers in Coddington Cove. Some MCM operations will be held at night but all of the archaeological missions take place during the day.

List of Vessel and Technical Support Groups for each AUV System. See Appendix C for a description of the AUV systems

<i>Support Group and Vessels</i>	<i>Tech Group</i>	<i>AUV System</i>
<u>Support Group 1 (TWR-841, rhib-687, NUWC dive boat)</u>	TECH # 1	REMUS SW MMP
	TECH # 2	BPAUV MMP
<u>Support Group 2 (Endeavor, Endeavor's Rhib, Rhib-85)</u>	TECH # 3	LFBB
	TECH # 6	BOSS
	TECH # 7	SAS 12
<u>Support Group 3 (WB-30, Whaler 8906, Rhib-54)</u>	TECH # 4	SSAM
	TECH # 5	LSG
	TECH # 8	IPUMA
<u>Support Group 4 (WB-825)</u>	TECH # 9	HAUV
	TECH # 10	HULL & HARBOR
	TECH # 14	NEKTON XN
	TECH # 11	NEKTON RANGER
	TECH # 12	TRANSPHIBIAN
	TECH # 13	NPS REMUS

- e. Education and Outreach Events: AUV Fest 2008 will receive Signature coverage on the Ocean Explorer website. This is the primary means of public outreach and will include an education component. Other outreach activity includes film coverage as indicated above and a media day on May 21. There may be an opportunity to pre-schedule major media coverage from network news television that will occur prior to media day. May 22 is Distinguished Visitors Day with invited guests from NOAA, Navy, congressional, and the local community.
- f. Workshop: A workshop is planned at the conclusion of the archaeology portion of AUV Fest, possibly May 17, to discuss the week's activities and examine how archaeologists can gain better access to AUVs. The University of Rhode Island will host this activity on the Bay Campus

3. Itinerary:
 a. AUV Fest Itinerary

Date		Arch Ops	Events	F. Cantelas	F. Gorell	C. Patrick	J. Manley	R. Beach	E. McDonald	C. Martinez	R. Mather	D.K. Abbass	C. Taylor		D. Marx	M. Lawrence	N. Richards	K. Gleason	G. Gilmore	T. Casserley	R. Green	Activities
May 5 Monday	AUV Fest Pre week														I	N	V	I	T	E	S	
6 Tuesday																						
7 Wednesday																						Site Pre-survey during this week
8 Thursday																						
9 Friday																						¹ NOAA team arrives
10 Saturday																						
11 Sunday																						Group 1 Arch arrive: Mather, Taylor, Abbass
12 Monday	AUV Fest																					
13 Tuesday																						Group 2 Arch arrive: Green, Casserley
14 Wednesday																						
15 Thursday																						
16 Friday																						Last arch field day before workshop
17 Saturday			Workshop							?												
18 Sunday																						
19 Monday																						
20 Tuesday																						
21 Wednesday			Media day																			
22 Thursday			DV day							?												
23 Friday																						Depart
24 Saturday																						
88 hotel, 44 car													8		3	3		8			1 2	

¹Arrival of NOAA team on May 9 (or part of the team) is predicated on having one business day to conduct any remaining preparations before field operations begin on Monday May 12.

b. Range Schedule for Archaeology during Week 1 and 2.

WEEK 1	MONDAY MAY 12	TUESDAY MAY 13	WEDNESDAY MAY 14	THURSDAY MAY 15	FRIDAY MAY 16	SATURDAY MAY 17	SUNDAY MAY 18
SITE 2 & 3	BOSS & SAS12 TECH #6 & 7						
SITE 4		HAUV & HULL TECH #9 & 10	BOSS TECH #6	SSAM / LSG / Ipuma TECH #4-5- 8	TRANS / NPS TECH #12-13		
SITE 8		SSAM / LSG / Ipuma TECH #4-5-8		BOSS TECH #6			

WEEK 2	MONDAY MAY 19	MONDAY MAY 19	TUESDAY MAY 20	TUESDAY MAY 20	WEDNESDAY MAY 21	THURSDAY MAY 22	FRIDAY MAY 23
SITE 2 & 3			SSAM / LSG / Ipuma TECH #4-5-8		Media Day	Distinguished Visitors Day	De-Mobe
SITE 4							
SITE 8							

4. Personnel

This is a shore based operation and most personnel will be either staying in local hotels or live in the local area. A list of the primary personnel and their affiliation is provided below.

NOAA	Frank Cantelas	ONR	Bill Schopfel
	Justin Manley		Chuck Laughinghouse
	Rod Mather		Dan Kucik
	Reg Beach		Bob Manning
	Fred Gorell		John McCormick
	Paula Keener-Chavis		Matt Zalesak
	Christine Patrick		Brian Houston
	Emily McDonald		Jose Fernandez
	Kyle Carothers		Ted Clem
	Joe Flood		Clem
			Tony Matthews
NUWC	Denise Crimmins	Charlie Loeffler	
	Ryan Campbell	Jerome Vaganay	
	John Vaillancourt	Tom Austin	
	David Bellino	Ed Matson	
	David Sanders	Robert Hughes	
	Lauren Davis	Dominic Germana	
		Doug Horner	

5. Organizational structure - roles/responsibilities

NOAA	Category	Role	Name
	Lead	Lead	Frank Cantelas
	PAO/Outreach	Lead	Fred Gorell
		Web Coordinator	Christine Patrick

		Web Master	Kyle Carothers
		Web master (backup)	Joe Flood
	Education	Lead	Paula Keener-Chavis
		Writer	Mel Goodwin
	Data Management	Lead	Susan Gottfried
		Data Coordinator	Emily McDonald
	Support	Technology	Justin Manley
			Reg Beach
		Archaeology	Rod Mather
NUWC	Category	Role	Name
	Lead	Lead	Denise Crimmins
	Environmental / EA	Lead	Ryan Campbell
	Ranges	Lead	John Vaillancourt
		Assistant	Rich Kaiser
	Data Management	Lead	David Bellino
	PAO	Lead	David Sanders
	Security	Lead	Neil Pilling
	Networking	Lead	John Trifero
	Facilities	Lead	Ray Perry
	Safety	Lead	Bill Graves
	RF Coordinator	Lead	Chris Duarte
	MARV Pre-survey	Lead	John Babb
	Acoustic Tracking	Lead	Dave Alderman
	Event Coordination	Lead	Lauren Davis
ONR	Category	Role	Name
	AUVFEST 08 Lead	Lead	Bill Schopfel
		Co PI	Chuck Laughinghouse
	Buried Mine Hunting Systems	Systems Lead	Bob Manning
		Program Officer. LFBB	Brian Houston
		Program Officer SSAM	Jose Fernandez
		Program Officer LSG	Ted Clem
		Program Officer BOSS/RTG/EO	Clem
		Program Officer SAS 12	Tony Matthews
		Program Officer iPUMA	Charlie Loeffler
	Neutralization Systems	Systems Lead	Dan Kucik
		Program Officer N. RANGER	Ed Matson
		Program Officer TRANSPHIBIAN	Robert Hughes
		Program Officer N. RANGER XN	Dominic Germana
	MM Systems	Systems Lead	John McCormick
		Program Officer HAUV	Jerome Vaganay
		Program Officer REMUS (Obs Avd)	Doug Horner
	Hull & Harbor Systems	Systems Lead	Matt Zalesak
		Program Officer Hull & Harbor Insp	Tom Austin

6. Equipment List:

- a. Equipment requested from OER
 - i. 1 - Two terabyte hard drive, to be purchased
 - ii. 2 digital cameras. Must obtain approval and clearance from NUWC for use on base
 - iii. Other TBD

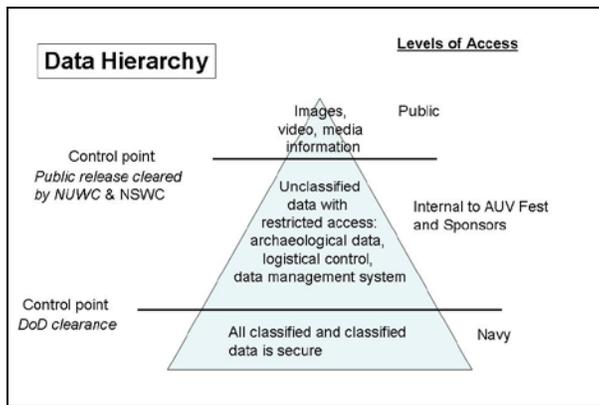
7. Disposition of Data:

- a. Data and samples: Data generated by the maritime archaeology component of AUV Fest must go through a release process which has several steps. NUWC is a secure naval facility and the AUV systems are classified. Data collected by those systems will flow through a release process shown starting at the bottom of the graphic. In the initial classified phase raw data collected by the AUVs is processed into a data product. Once these data are scrubbed of any information that could reveal the capability of the systems it will be clear for public release through the first control point. The Naval Surface Warfare Center in Panama City (NSWC-PC) has agreed to provide a blanket release for data products that go through this scrub which should shorten the time it takes for data to become available to the archaeologists. Once data is released beyond this point it is unclassified according to DoD but is still sensitive from the archaeological perspective due to position information on the sites. Data products at this stage will be available to archaeologists and others participating in the event on a need to

know basis. Data products released to the public through the website, media, or other sources will have all information pertaining to shipwreck location and the character of the site removed.

NUWC has developed a data management plan to acquire and archive all data and data products generated by the archaeology component of AUV Fest (such as emails, HD video, AUV system and sensor data, archaeology logs, and photos). A-TAS, an existing data management tool, will be utilized for AUV Fest. OER intends to archive the unclassified raw data, imagery, and products generated from the AUV data in the NOAA National Data Centers, and provide discovery and access to these data with standard Federal Geospatial Data Committee (FGDC) compliant metadata and geospatial tools. Data will include but is not limited to vehicle navigation data, sidescan sonar images, multibeam data and products, video and still images, and environmental sensor data. It will be housed and transported on an OER-procured two terabyte hard drive.

OER will use the Cruise Information Management System (CIMS) software to manage the raw data sets, multimedia files, and products recorded, collected, or produced from the AUV Fest 2008. NUWC has agreed to provide the raw data, multimedia, and products in a file system format on the hard-drive that will emulate the relational structure of CIMS. OER will populate a CIMS instance customized for the AUV Fest, providing an automated method for generating and publishing FGDC-compliant metadata through the Metadata Enterprise Resource Management Aid (MERMAid) system hosted at NCDDC.



- b. Products
 - i. Background material: historical and technical essays, photos, images, environmental data,
 - ii. AUV System: products from all sensors, see Appendix C.
 - iii. Post processed products: sonar and magnetic mosaics, GIS coverage
 - iv. Signature expedition web coverage
 - v. Education products via website
 - vi. Workshop results
 - vii. Interactive web product – planned
 - viii. Film documentation to include
 1. Digital Media Library-DML (HD/SD video, audio, photos, CGI) for maintaining and distributing reusable assets for PR/news sources, web, DVD, broadcast and internal corporate information
 2. EPK (Electronic Press Kit) news media, regional networks and PBS
 3. Short form narrative documentary with key story threads targeting Navy and NOAA communities (Newport harbor maritime history, marine archaeology Navy technologies/AUV's)
 4. Primary building blocks for long-form national product (Discovery Communications or National Geographic) but minimal cost and risk
- c. Records and reports - Discuss
- d. Real-time products:

- i. Web coordinator will organize daily logs with imagery.

8. Communications

NUWC Newport's Policy on Laptops, PDA's, Cell phones and Cameras

- a. Laptops: A request for Approval for Non-NUWC Computer Form must be completed for any laptop brought on base not issued by NUWC Newport. By 1 April, please complete the form electronically, and forward as an email attachment to Lauren Davis (kellydavis@saic.com).
- b. PDA's: Are allowed on base but may not be connected to any base assets.
- c. Cell phones: Cell phones without cameras are allowed on base. Cell phones with cameras are NOT allowed on base.
- d. Cameras: Personal cameras are not allowed on base. NUWC Public Affairs will provide event photographers.

9. Meals:

- a. Meals are the responsibility of the individual

Appendices:

- A. AUV Fest Brief
- B. Operating area map
- C. AUV System Specs
- D. Contact List

Appendix A. AUV Fest 2008 Briefing Paper

AUV FEST 2008:

Partnership Runs Deep: ONR Unmanned Mine Hunting Technologies help NOAA Explore Sunken History

CONTACT: Frank Cantelas, NOAA Office of Ocean Exploration and Research
Frank.Cantelas@noaa.gov 301-734-1017

PLACE: Newport, RI

DATE: May 12-23, 2008

PURPOSE: AUV Fest 2008 is a collaborative effort between NOAA Office of Ocean Exploration and Research (OER), Office of Naval Research (ONR), and Naval Undersea Warfare Center (NUWC) to demonstrate and enhance the use of Autonomous Underwater Vehicles (AUV) in maritime archaeology. This event will leverage the Navy's investments in technology to demonstrate undersea systems that have a high potential for transition to the scientific and civilian community. The Navy's ability to autonomously survey and identify proud and buried underwater objects in real-time allows for situational awareness and protection of military forces. This ability is a powerful paradigm for military AUV operations and has strong applications to the scientific community as well, particularly to marine archaeologists responsible for mapping historic shipwrecks.

BACKGROUND: Periodically, ONR hosts a demonstration of AUV technology used to find and identify buried and proud undersea mines. Mine counter measure (MCM) sensors mounted on AUVs have direct applications to maritime archaeology that can substantially advance this field. The environmental conditions in Narragansett Bay (temperature, depth, turbidity, currents, and sea state) typify the marine temperate littoral regions that challenge mine hunting operations and archaeologists trying to locate shipwrecks. Standard acoustic sensors and magnetometers are typical tools used for search and discovery in archaeology. The advanced sensors on the AUVs can complete high resolution mapping of broad areas and they can also locate individual targets by their acoustic and magnetic signatures. Several sensors can find and create high resolution images of buried objects. Shipwrecks often contain small buried artifacts made from wood, metals, ceramic, glass, and numerous other organic/inorganic materials that may correlate with today's marine mines. AUV Fest provides a new challenge to the MCM community who has traditionally aimed their tools at specific "mine like" objects. The opportunity to approach a new problem is likely to lead to new understanding of the underlying technology and thus greater innovation.

DISCUSSION: In 2008, NOAA OER is sponsoring the maritime archaeology component of AUV Fest. Approximately eight maritime archaeologists will actively participate with the AUV teams over a two week period, examining four shipwreck sites. Out of the fourteen separate AUV systems participating in the demonstration, seven will have maritime archaeology missions. The event will end with a one day workshop at the University of Rhode Island Bay Campus where archaeologists and AUV technologists will discuss the way ahead for AUV applications in maritime archaeology. Archaeologists can provide a new perspective in using these instruments beyond the intended DoD applications which will demonstrate an expanded use of this advanced technology.

OBJECTIVES: NOAA has the opportunity to engage the marine archaeological community with a new technology rarely used in this field. In doing this we will incorporate a large outreach effort. Specific activities include:

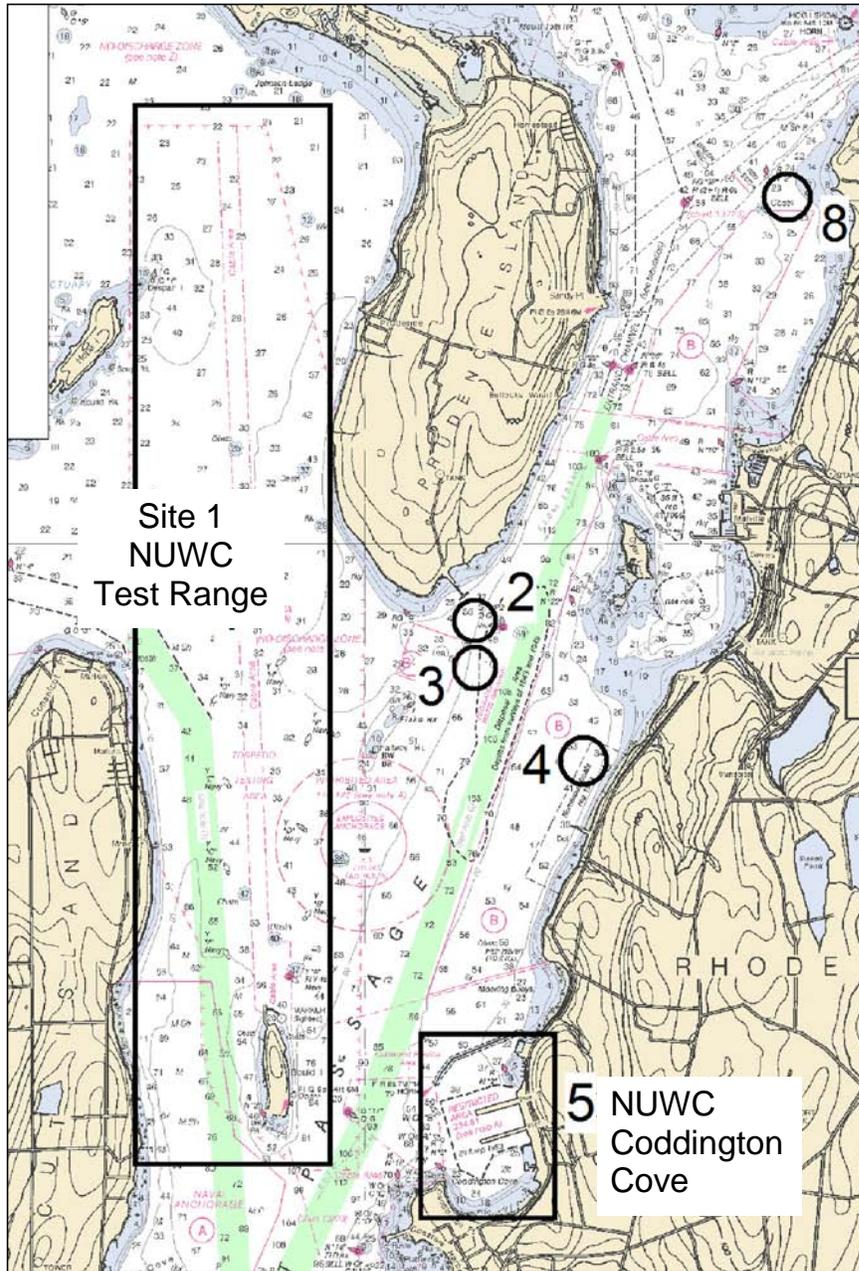
- Maritime Archaeological demonstration/field activities. A group of archaeologists will participate in daily operations including data analysis and interpretations
- Maritime Archaeology Workshop. Hosted by the University of Rhode Island/Bay Campus, archaeologists and AUV technologists will discuss the results of AUV Fest and the way forward to increase use of this technology
- Outreach Activities on the Ocean Explorer website. Extensive coverage of the event with contributions from scientists, technologists, historians.

- Extensive print and broadcast media coverage coordinated by the Public Affairs Officers from OER, NUWC, and ONR.
- Film documentary of the event highlighting all three sponsors
- Participation in Distinguished Visitors (DV) Day. NOAA dignitaries will have a chance to meet high ranking Navy officials such as the Chief of Naval Research.

SHIPWRECKS: Four shipwrecks have been identified as targets for AUV Fest and are shown on the attached chart in Appendix B. Each has characteristics that make it of interest to archaeologists and collectively they represent a range of different vessel types and site conditions.

1. Prudence Island Wreck: early 20th Century vessel of steel construction, roughly 120 feet long. Discovered by NOAA ship RUDE in 2004, little is known about the site which lies in approx. 60ft. of water
2. Wooden barge: near Prudence Island measures roughly 100 feet long and lies in approx. 60ft. of water. A nearby unknown object discovered during the 2004 RUDE survey will be investigated at the same time
3. The British Frigates H.M.S. CERBERUS and H.M.S. LARK (number 8) were scuttled during the Revolutionary War when the French entered Narragansett Bay to assist American forces in 1778. The site contains the buried lower wooden hull, ballast pile, and several cannon. There is likely to be a scatter of small artifact buried under a thin layer of sediment. These artifacts are composed of iron, copper alloys, glass, ceramic, and wood.
4. The commander of the British Frigate H.M.S. LARK ordered her set afire in an attempt to avoid capture by revolutionary forces in 1778. The vessel subsequently exploded and scattered material over a wide area. Site conditions and materials are similar to CERBURUS.

Appendix B. Operating Area Map



Appendix C. AUV System Specs

System	Vehicle	Sensor	File type	Products	Features	Source
MMP REMUS	REMUS	Marine Sonic 900 & 1800 KHz SSS	XTF, MST, GeoTif			
SSAM	REMUS 600	HF High Res imaging BB Med Res imaging	XTF ??? XTF ???	Images (jpg, tif) Images (jpg, tif)	105-135 kHz (2.5cm ²) 10-52 kHz (7.6cm ²) RTP -real time processors	Manning_Fest08
LSG by FEST by FEST	REMUS 600	Laser Scalar Gradiometer Marine Sonic 900 and 1800 kHz SSS 4 m-pixel digital camera	XYZ XTF, MST, GeoTif jpg, tif	Images (jpg, tif) Images (jpg, tif)		Manning_Fest08
BOSS RTGO	Bluefin	buried object scanning sonar Realtime Tracking Gradiometer High Res CCD camera	??? XYZ jpg, tif	Images (jpg, tif) Images (jpg, tif)		Manning_Fest08
SAS 12	Bluefin 12	Synthetic Aperture Sonar	???	Images (jpg, tif)	1 inch resolution	Manning_Fest08
iPUMA		Forward looking phased array sonar	???	Images (jpg, tif)	180° scanning sonar	Manning_Fest08
HAUV		Didson sonar		Images (jpg, tif)	hull inspection hybrid fiber optic teather Autonomous patterns	
Hull and Harbor	REMUS 100	Imagenex 1.7 MHz Delta-T multibeam Optional: SSS, video camera, forward looking sonar-don't know if this will be onboard	???	Images (jpg, tif)	hover capable Rotatable payload	CDC-Tech Brief- WHOI
Transphibian	Transphibian	Blueview Blazed array sonar 900 KHz Video camera	??? tape	Images (jpg, tif) video tape and images	real time data via fiber optic cable hover capable	

Appendix D. Contact List

Name	Organization	Phone	Mobile	Email	Function	
NOAA						
Cantelas	Frank	NOAA-OER	301-724-1017	401-487-7577	Frank.Cantelas@NOAA.gov	Lead
Manley	Justin	NOAA-OER	781-424-1538	781-424-1538	Justin.Manley@NOAA.gov	Technology
Mather	Rod	URI	401-874-4093	401-523-5542	Rorerick@URI.Edu	Archaeology
Beach	Reg	NOAA-OER	301-734-1016		Reginald.Beach@noaa.gov	Support
Gorell	Fred	NOAA-OER	301-734-1016	301-802-8334	fred.gorell@noaa.gov	Outreach
Keener-Chavis	Paula	NOAA-OER	843-762-8818	843-670-9926	Paula.Keener-Chavis@noaa.gov	Education
Patrick	Christine	NOAA-OER	301-734-1030	301-466-4849	christine.patrick@noaa.gov	Web Coordinator
McDonald	Emily	NOAA-OER	301-734-1016		emily.mcdonald@noaa.gov	Data Coordinator
Carothers	Kyle	NOAA-NOS	301-713-3000 x209	301-651-6933	Kyle.Carothers@noaa.gov	Web Master
Flood	Joe	NOAA-NOS	301-713-3000 x201		Joe.Flood@noaa.gov	Web Master (back up)
Goodwin	Mel	NOAA-Contractor		843-830-6480	mgoodwi8@bellsouth.net	Education writer
NUWC-NEWPORT						
Crimmins	Denise	NUWC-Newport	401-832-9411	401-474-9888	CrimminsDM@Npt.NUWC.Navy.mil	Lead
Campbell	Ryan	NUWC-Newport	401-832-4403		CampbellRJ@npt.nuwc.navy.mil	Environmental / EA
Vaillancourt	John	NUWC-Newport	401-832-5729	401-935-5142	VaillancourtJJ@npt.nuwc.navy.mil	Ranges Lead
Bellino	David	NUWC-Newport	401-832-6407	401-714-2174	BellinoDS@npt.nuwc.navy.mil	C2/Data management
Sanders	David	NUWC-Newport	401-832-3611		SandersD@npt.nuwc.navy.mil	PAO
Pilling	Neil	NUWC-Newport	401-832-2052		PillingNB@npt.nuwc.navy.mil	Security
Trifero	John	NUWC-Newport	401-832-4120		Triferoj@npt.nuwc.navy.mil	Networking
Perry	Ray	NUWC-Newport	401-832-2562		perryr@npt.nuwc.navy.mil	Facilities
Graves	Bill	NUWC-Newport	401-832-6998		graveswe@npt.nuwc.navy.mil	Safety
Duarte	Chris	NUWC-Newport	401-832-3649		DuarteDN@npt.nuwc.navy.mil	RF Coordinator
Babb	John	NUWC-Newport	401-832-2316		john.babb@navy.mil	MARV Pre-survey
Kaiser	Rich	NUWC-Newport	401-832-2666		KaiserRM@npt.nuwc.navy.mil	Ranges
Alderman	Dave	NUWC-Newport	401-832-5444		aldermand@npt.nuwc.navy.mil	Acoustic Tracking
Davis	Lauren	SAIC	401-341-2730		kellydavisl@saic.com	Event Coordination
NSWC-PC/SYSTEM						
Kucik	Dan	NSWC-PC	850-230-7169	850-625-0802	Daniel.Kucik@Navy.mil	Lead Neutralization Systems
Manning	Bob	NSWC-PC/ONR	850 890-2196	850-235-5279	Robert.Manning@Navy.mil	Lead BMH Systems

McCormick	John	NSWC-PC	850 234-4877		John.F.McCormick@Navy.mil	Lead MM Systems
Zalesak	Matt	ONR	301-744-6850 x247		Matthew.Zalesak@Navy.mil	Lead Hull & Harbor Systems
NSWC-PC/SYSTEM						
		MMP, REMUS MMP, BPAUV				
Houston	Brian	LFBB	202-404-3840		Houston@NRL.Navy.mil	
Fernandez	Jose	SSAM	850-235-5310		Jose.E.Fernandez@Navy.mil	
Clem	Ted	LSG	850-234-4670		Ted.Clem@Navy.mil	
Clem	Ted	BOSS/RTG/ EO	850-234-4670		Ted.Clem@Navy.mil	
Matthews	Tony	SAS 12	850-234-4090		Anthony.Matthews@Navy.mil	
Loeffler	Charlie	iPUMA	512-835-3494.		Loeffler@arlut.UTexas.edu	
Vaganay	Jerome	HAUV Hull & Harbor Insp	617-489-0157		Vaganay@BluefinRobotics.com	
Austin	Tom		508-289-2894		TAustin@WHOI.edu	
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