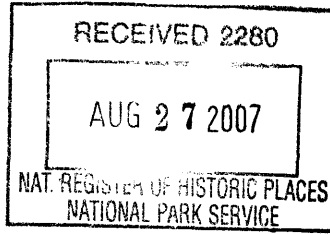


United States Department of Interior
National Park Service



1082

National Register of Historic Places
Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900A). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Alexander Bache U.S. Coast Survey Line
other names/site number _____

2. Location

street & number Edisto Beach State Park, 8377 State Cabin Road not for publication _____
city or town Edisto Island Vicinity _____
state South Carolina code SC county Charleston/ Colleton code 019/029 zip code 29438

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this X nomination request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property X meets _____ does not meet the National Register criteria. I recommend that this property be considered significant X nationally _____ statewide _____ locally. (See continuation sheet for additional comments.)

Elizabeth M. Johnson 8/24/2007
Elizabeth M. Johnson, Deputy State Historic Preservation Officer, S.C. Department of Archives & History

Signature of certifying official/Title Date

In my opinion, the property _____ meets _____ does not meet the National Register criteria. (See continuation sheet for additional comments.)

Signature of commenting official/Title Date

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that the property is:
X entered in the National Register.
____ See continuation sheet.
____ determined eligible for the National Register.
____ See continuation sheet.

Fonda McMillan 10/5/07

Name of Property	County and State
<input type="checkbox"/> determined not eligible for the National Register. <input type="checkbox"/> See continuation sheet. <input type="checkbox"/> removed from the National Register. <input type="checkbox"/> other, (explain:) _____	_____ _____ _____ _____
Signature of the Keeper	Date of Action

5. Classification

Ownership of Property (check as many boxes as as apply)	Category of Property (Check only one box)	Number of Resources within Property (Do not include previously listed resources in the count)		
		contributing	noncontributing	
<input checked="" type="checkbox"/> private	_____ building(s)	0	0	buildings
_____ public-local	_____ district	0	0	sites
<input checked="" type="checkbox"/> public-State	<input checked="" type="checkbox"/> structure	4	0	structures
_____ public-Federal	_____ site	0	0	objects
	_____ object	4	0	total

Name of related multiple property listing: (Enter "N/A" if property not part of a multiple property listing.) _____ N/A	Number of contributing resources previously listed in the National Register _____ 0
--	---

6. Function or Use

Historic Functions (Enter categories from instructions) <u>Cat: Transportation Sub: Water-related</u> <u>Cat: Commerce/Trade Sub: Business</u>	Current Functions (Enter categories from instructions) <u>Cat: Recreation and Culture</u> <u>Sub: Monument/Marker</u>
--	---

7. Description

Architectural Classification (Enter categories from instructions) Other: no style _____ _____ _____	Materials (Enter categories from instructions) Foundation _____ N/A walls _____ N/A roof _____ N/A other : Stone (Granite); Metal (Copper)
---	--

Narrative Description
 (Describe the historic and current condition of the property on one or more continuation sheets.)

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Alexander Bache U.S. Coast Survey Line

Name of Property

Charleston/Colleton, South Carolina

County and State

Section 7 Page 5

The Alexander Bache U.S. Coast Survey base line is located on Edisto Island in Charleston and Colleton Counties, South Carolina. Alexander Dallas Bache and his assistants worked thirteen days in January 1850 to measure the line, which is approximately six and two-thirds miles long. When they completed the line, they buried granite blocks at each endpoint and then placed a granite monument on top of each block. They also placed blocks of granite in the ground to mark each mile of the line.

This U.S. Coast Survey Line is composed of four structures grouped into two parts. The first part includes those structures on state park property: the west end monument and the fifth mile marker. They are located in wooded land on South Carolina State Park property. The end monument is approximately 1,000 feet northwest of the Edisto Beach State Park visitor's center and 300 feet west, southwest of marshland. As the base line runs northeast, it passes out of park property briefly. At one point in time, this private property included the sixth mile marker, which state park employees found removed from the ground and tossed into the woods near a newly constructed house. Therefore, it is not included in this nomination. After the sixth mile marker, the base line enters back into park property and includes the fifth mile marker.

The second part of the Bache U.S. Coast Survey Line includes two structures as well: the east end monument and second mile marker. These are located on the Botany Bay Plantation of Mrs. Pepper. While it is private property, the land will become Heritage Trust property upon Mrs. Pepper's death. Wooded land surrounds the endpoint monument. It is approximately 2,000 feet northwest of the Botany Bay Plantation Property Manager's house and 245 feet from marshland. Woods also surround the mile marker. No one has found mile marker one, but it would have been on Mrs. Pepper's land. Trees now cover the supposed location determined by Global Positioning Systems. Bruce Rawls, the Botany Bay Land Manager, said the general area of mile marker one used to be farmland.

The monuments that mark each endpoint of the survey line are of exactly the same design. The granite blocks are 3'x3'x3' and buried three feet six inches beneath the ground's surface. On the top surface of the block is a copper bolt pinpointing the precise location of the endpoint? The monuments atop the granite blocks are approximately three feet tall and four feet square.¹ The top of each monument is cut to resemble a low-pitched obelisk. The following inscriptions are inscribed on each monument: "A.D. Bache Supt." on the north face; "U.S. Coast Survey" on the east face; "1849" on the south face; and "Base No. 6" on the west face.

The markers that denote each mile of the survey line are composed of a granite block approximately two and a half feet tall, one foot deep, and one foot wide. The U.S. Coast Survey buried the markers approximately one foot in the ground. From the surface, the markers appear as roughly 1'x 1'x 1' blocks with a copper bolt on top.

¹ Alexander Bache, "Letter From the Secretary of the Treasury- Communicates the Report of the Superintendent of the U.S. Coast Survey 1850 Exec. Doc. No. 7, 34," U.S. Coast Survey Report 1850. and presumably Alexander Bache, "Cross section of the monuments," U.S. Coast Survey Superintendent Report 1850.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Alexander Bache U.S. Coast Survey Line

Name of Property

Charleston/Colleton, South Carolina

County and State

Section 7 Page 6

While there are missing components to this U.S. Coast Survey Line, the missing mile markers do not harm the base line's integrity. The endpoint monuments are the most important components of this base line. Without these endpoint monuments, the base line would have been useless.

8. Statement of Significance

Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for the National Register listing.)

- A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- B Property is associated with the lives of persons significant in our past.
- C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- D Property has yielded, or is likely to yield, information important in prehistory or history.

Areas of Significance

(Enter categories from instructions)

Commerce, Maritime History, Transportation

Period of Significance

1850

Significant Person

(Complete if Criterion B is marked)

N/A

Significant Dates

January 3-18, 1850

Cultural Affiliation

N/A

Narrative Statement of Significance (Explain the significance of the property on continuation sheets.)

9. Major Bibliographic References

(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous Documentation on File (National Park Service):

- preliminary determination of individual listing (36 CFR 67) has been requested
- previously listed in the National Register
- previously determined eligible by the National Register
- designated a National Historic landmark
- recorded by Historic American Buildings Survey # _____
- recorded by Historic American Engineering Record # _____

Primary location of additional data:

- State Historic Preservation Office
 - Other State Agency
 - Federal Agency
 - Local government
 - University
 - Other
- Name of repository: S.C. Department of Parks, Recreation, and Tourism, Columbia, S.C.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Alexander Bache U.S. Coast Survey Line
Name of Property
Charleston/Colleton, South Carolina
County and State

Section 8 Page 7

The Alexander Bache U.S. Coast Survey line is eligible for the National Register of Historic Places under Criterion A based upon its significant role in improving the navigation of U.S. waterways. As part of the geodetic survey in America, this base line is representative of the most advanced scientific methods available in 1850.²

In the early 1800s, the U.S. government began the U.S. Coast Survey to chart the waterways of the United States with the goal of improving navigation and consequently spurring the economy that greatly depended upon maritime travel. The coast survey extended along the entire Atlantic coastline, as well as the Gulf and Pacific shores.³

To create these maps of the waterways surveyors relied on a process known as triangulation. This process comes from the idea that if one knew the length of one side of a triangle, as well as the measurements of two of the three angles, then the lengths of the other two sides could be determined. The mapping process began with determining longitude and latitude through astronomical observations. Surveyors then established a base line from which all of the other measurements were drawn. When creating maps, the cartographer drew numerous triangles detailing distances, thus the process was called triangulation.⁴

Prior to 1845, measurements for the survey's base lines and triangulations were often extremely inaccurate because surveyors measured with inaccurate equipment. Before 1845, surveyors measured these base lines with iron bars approximately twenty feet in length that were supported by tripods at various points along the line. These iron bars expanded and contracted as the air temperature changed and created inaccuracies in measuring and mapping. Because temperature changes could not be precisely determined, there were no means for accurately accounting for these changes in their measurements.⁵ A new process needed to be developed.

President John Tyler appointed Alexander Bache, the great-grandson of Benjamin Franklin, as the second superintendent of the U.S. Coast Survey on December 11, 1843 following the death of Superintendent Ferdinand Rudolph Hassler. Bache held the position until his death in 1867. During his time as superintendent, Bache worked to build upon the foundation Hassler had developed during his years with the U.S. Coast Survey by revising and formalizing the Survey's chain of command, disbursement procedures and compensation rates.⁶

² Miller, "Edisto's Line," 35

³ Miller, "Edisto's Line," 35 and E.B. Hunt, "Appendix No. 35," *Report of the Superintendent of the United States Coast Survey for 1854*, 103.

⁴ Miller, "Edisto's Line," 35.

⁵ Miller, "Edisto's Line," 35. and Hunt, "Appendix," 105.

⁶ Captain Albert E. Theberge, "The Coast Survey 1807-1867: Volume I of the History of the Commissioned Corps of the National Oceanic and Atmospheric Administration," available online at www.lib.noaa.gov/edocs/CONTENTS.htm#CONTENTS accessed on November 18, 2005.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Alexander Bache U.S. Coast Survey Line
Name of Property
Charleston/Colleton, South Carolina
County and State

Section 8 Page 8

In 1850, Bache set to work establishing a base line in South Carolina on Edisto Island. For this line, Bache used new, more accurate bars he had created and put to the test during numerous experiments in 1845 and 1846.⁷ Bache's bars were actually composed of two separate bars, one of brass and the other of iron, approximately twenty feet long. The two sat parallel to one another and connected at one end with a rivet. The other end was unattached to allow for expansion. The two bars had equal absorbing surfaces and masses inversely proportioned to their heat. This regulated temperature, and the entire bar remained a consistent length throughout the entire measuring process.⁸

Bache's assistant, James S. Williams, explored the Edisto area in late 1848 to prepare for the project. Williams determined the line's endpoints, and Bache confirmed them in April 1849. The line was to run from a point on John F. Townsend's Bleak Hall plantation near North Edisto River and continue southwest to a point on Edding's estate near Spanish Mount and the South Edisto River. The area chosen for the line was mostly corn and cotton fields and void of any creeks.⁹

After assistant Charles O. Boutelle made preliminary arrangements in December 1849, which included grading the land to make it easier for measuring, ten men set to work on the line. Over thirteen days in January 1850 (Jan. 3-18), these men set 1,787 bars on tripods end to end. When they were finished, they had successfully mapped out a base line approximately six and two-thirds miles long. Before and after these workers measured the line, Bache and his men measured it using standard iron bars to allow for comparisons between the two measuring devices. This involved setting the iron bars atop two granite pillars, which sunk into the ground about two feet. They attached thermometers to monitor temperature changes, and they made one hundred and five observations over five days to compare changes at temperatures ranging from 32° to 63° Fahrenheit.¹⁰

While measuring the base line with Bache's new bars, the team kept records about the distance accomplished each day. The greatest distance they recorded in one day was roughly three quarters of a mile in nine hours and twenty-five minutes. The shortest distance recorded was a little over a quarter of a mile in six hours.¹¹

After the base line's completion, Bache determined the probability of an error in measurement to be a tenth of an inch.¹² With the past fifteen years, modern technology has proved the remarkable accuracy of his line. In 1978, South Carolina established the Geodetic Survey, and they discovered the base line Bache created in 1850 soon after. They questioned the accuracy of the line considering the knowledge base available on technology in the late nineteenth century. With the development of Global Positioning Systems, the South Carolina Geodetic Survey

⁷ Hunt, "Appendix," 105.

⁸ Miller, "Edisto's Line," 36.

⁹ Bache, "Survey Report 1850," and Miller, "Edisto's Line," 36.

¹⁰ Bache, "Survey Report 1850," 34-35.

¹¹ Bache, "Survey Report 1850," 35.

¹² Bache, "Survey Report 1850," 36.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Alexander Bache U.S. Coast Survey Line

Name of Property

Charleston/Colleton, South Carolina

County and State

Section 8 Page 9

measured the distance between the two endpoints of Bache's base line in 1992. To their amazement, Alexander Bache's base line differed from their measurement by only 2.4 inches.¹³

Throughout Alexander Bache's tenure as the Superintendent for the U.S. Coast Survey, he measured base lines on Kent Island, Maryland (1845); Dauphin Island, Alabama (1847); Bodie Island, North Carolina (1848); Edisto Island, South Carolina (1849-50); Key Biscayne and Cape Sable, Florida (1855); and Epping Plains, Maine (1857).¹⁴ Like the base line on Edisto Island, he measured these lines to map the waterways and improve navigation. Doug Stover of the National Park Service is presently working on a nomination to the National Register of Historic Places for the Bodie Island base line. This base line is located entirely on National Seashore property. The monuments at each end and half of the mile markers are still in place.

While the Alexander Bache U.S. Coast Survey Line on Edisto Island is significant in how the U.S. Coast Survey mapped Edisto Island's waterways for improved navigation, of even greater significance 157 years later is that the granite monuments the workers placed at each end of the line remain. Upon completion of the base line, workers buried a granite marker three feet six inches beneath the ground's surface at each end. To indicate the precise point where the line ended they inserted a copper bolt into the top of each marker. They placed the monuments for each end of the line on top of the markers. Each monument is approximately three feet tall and four feet square. Additionally, there are stones placed every 268th bar, which corresponds to one every English mile (essentially one mile today).¹⁵ In March 2006, mile markers two and five were found located on Botany Bay Plantation and South Carolina State Park property respectively.

This U.S. Coast Survey Line is eligible for listing in the National Register of Historic Places under Criterion A based upon its role in improving the navigation of U.S. waterways. It is also representative of the most advanced scientific methods available in 1850.¹⁶ Alexander Dallas Bache and his assistants worked thirteen days in January of 1850 to measure the line, which is approximately six and two-thirds miles long. When they completed the line, they buried granite blocks at each endpoint and then placed a granite monument on top of each block. They also placed blocks of granite in the ground to mark each mile of the line.

This U.S. Coast Survey Line is composed of four structures grouped into two parts. The first part includes those structures on state park property: the west end monument and the fifth mile marker. They are located in wooded land on South Carolina State Park property. The end monument is approximately 1,000 feet northwest of the Edisto Beach State Park visitor's center and 300 feet west, southwest of marshland. As the base line runs northeast, it passes out of park property briefly. At one point in time, this private property included the sixth mile marker, which

¹³ Miller, "Edisto's Line," 34.

¹⁴ Theberge, "The Coast Survey," www.lib.noaa.gov/edocs/CONTENTS.htm#CONTENTS

¹⁵ Bache, "Survey Report 1850," 35. and presumably Bache, "Cross section of the monuments," U.S. Coast Survey Superintendent Report. The stones were apparently made in New England and shipped by sailboat. The part below the ground is 3 ft. X 3 ft. X 3 ft. and weighs several tons. The top monument weighs approximately 600 pounds.

¹⁶ Sid Miller, "Edisto's Marvelous Line," *South Carolina Wildlife* (September/October 1995): 35

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Alexander Bache U.S. Coast Survey Line

Name of Property

Charleston/Colleton, South Carolina

County and State

Section 8 Page 10

state park employees found removed from the ground and tossed into the woods near a newly constructed house. Therefore, it is not included in this nomination. After the sixth mile marker, the base line enters back into park property and includes the fifth mile marker.

The second part of the Bache U.S. Coast Survey Line includes two structures as well: the east end monument and second mile marker. These are located on the Botany Bay Plantation of Mrs. Pepper. While it is private property, the land will become Heritage Trust property upon Mrs. Pepper's death. Wooded land surrounds the endpoint monument. It is approximately 2,000 feet northwest of the Botany Bay Plantation Property Manager's house and 245 feet from marshland. Woods also surround the mile marker. No one has found mile marker one, but it would have been on Mrs. Pepper's land. Trees now cover the supposed location determined by Global Positioning Systems. Bruce Rawls, the Botany Bay Land Manager, said the general area of mile marker one used to be farmland.

While there are missing components to this U.S. Coast Survey Line, the missing mile markers do not harm the base line's integrity. The endpoint monuments are the most important components of this base line. Without these endpoint monuments, the base line would have been useless.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Alexander Bache U.S. Coast Survey Line
Name of Property
Charleston/Colleton, South Carolina
County and State

Section 9 Page 11

Works Cited

Bache, Alexander. "Cross section of the monuments," U.S. Coast Survey Superintendent Annual Report 1850.

Bache, Alexander. "*Letter From the Secretary of the Treasury- Communicates the Report of the Superintendent of the U.S. Coast Survey 1850 Exec. Doc. No. 7, 34.*" U.S. Coast Survey Report 1850, 33-38.

Hunt, E.B. "Appendix No. 35," *Report of the Superintendent of the United States Coast Survey for 1854*, 103-108.

Miller, Sid. "Edisto's Marvelous Line." *South Carolina Wildlife* (September/October 1995), 34-37.

Theberge, Captain Albert E. "The Coast Survey 1807-1867: Volume I of the History of the Commissioned Corps of the National Oceanic and Atmospheric Administration," National Oceanic and Atmospheric Administration Library, online at

www.lib.noaa.gov/edocs/CONTENTS.htm#CONTENTS, accessed on November 18, 2005.

Name of Property _____ County and State _____

10. Geographical Data

Acreeage of Property Less than one acre (approximately one-third acre at Edisto Beach State Park;
approximately one-third acre at Botany Bay Plantation)

UTM References (Place additional UTM references on a continuation sheet.)

X See Continuation Sheet

Verbal Boundary Description (Describe the boundaries of the property on a continuation sheet)
Boundary Justification (Explain why the boundaries were selected on a continuation sheet)

11. Form Prepared By

<u>name/title</u>	Lindsay Crawford (and Al Hester)	<u>date</u>	February 7, 2007
<u>organization</u>	S.C. Department of Parks, Recreation & Tourism	<u>telephone</u>	(803) 734-5539
<u>street & number</u>	1205 Pendleton St.	<u>zip code</u>	29201
<u>city or town</u>	Columbia <u>state</u> SC		

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

- Maps** A USGS map (7.5 or 15 minute series) indicating the property's location.
A sketch map for historic districts and properties having large acreage or numerous resources.
- Photographs** Representative black and white photographs of the property.
- Additional Items** (Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of SHPO or FPO.)

<u>name/title</u>	S.C. Department of Parks, Recreation and Tourism	<u>telephone</u>	(803) 734-2159
<u>street&number</u>	1205 Pendleton St.	<u>zip code</u>	29201
<u>city or town</u>	Columbia <u>state</u> South Carolina		

<u>name/title</u>	Botany Bay Plantation	<u>zip code</u>	29438
<u>city or town</u>	Edisto Island <u>state</u> South Carolina		

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P.O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Projects, (1024-0018), Washington, DC 20503.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Alexander Bache U.S. Coast Survey Line
Name of Property
Charleston/Colleton, South Carolina
County and State

Section 10 Page 12

UTM References

	Zone	Easting	Northing
1 (East Endpoint Marker):	17	572640	3601944
2 (Second Mile Marker):	17	563274	3596735
3 (Fifth Mile Marker):	17	565496	3597956
4 (West Endpoint Marker):	17	569577	3600359

Verbal Boundary Description

The nominated boundary is restricted to the four contributing resources: 1) the east endpoint marker; 2) the second mile marker; 3) the fifth mile marker; and 4) the west endpoint marker.

Boundary Justification

These four markers are the only known physical resources associated with the Alexander Bache U.S. Coast Survey Base Line.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Alexander Bache U.S. Coast Survey Line
Name of Property
Charleston/Colleton, South Carolina
County and State

Section PHOTOGRAPHS Page 13

The following information is the same for photographs 1-5:

Name of Property: Alexander Bache U.S. Coast Survey Line
Location of Property: 8377 State Cabin Road Charleston County, South Carolina
Botany Bay Plantation Edisto Island, South Carolina 29438
Name of Photographer: Lindsay Crawford and David Jones
Date of Photographs: October 2005 and May 2006
Location of Original Negatives:

- 1) SC_CharlestonCounty_Bache1
East endpoint marker on Botany Bay Plantation
- 2) SC_CharlestonCounty_Bache2
East endpoint marker and its surroundings
- 3) SC_CharlestonCounty_Bache3
Second mile marker, Botany Bay Plantation
- 4) SC_ColletonCounty_Bache4
Fifth mile marker
- 5) SC_ColletonCounty_Bache5
Fifth mile marker, close up

The following information is the same for photographs 6-9:

Name of Property: Alexander Bache U.S. Coast Survey Line
Location of Property: 8377 State Cabin Road Charleston County, South Carolina
Botany Bay Plantation Edisto Island, South Carolina 29438
Name of Photographer: Lindsay Crawford and David Jones
Date of Photographs: February 6, 2007
Location of Original Negatives:

- 6) SC_ColletonCounty_Bache6
West endpoint marker on Edisto Beach State Park

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Alexander Bache U.S. Coast Survey Line
Name of Property
Charleston/Colleton, South Carolina
County and State

Section PHOTOGRAPHS Page 14

- 7) SC_ColletonCounty_Bache7
Another view of west endpoint marker, showing detail
- 8) SC_ColletonCounty_Bache8
Another view of west endpoint marker, detail
- 9) SC_ColletonCounty_Bache9
West endpoint marker and its surroundings

Bache Line Location

Topographical Maps:
Edisto Island
Edisto Beach
Rockville

