

7.50  
#8

# Patterns and Trends of Land Use and Land Cover on Atlantic and Gulf Coast Barrier Islands

---

GEOLOGICAL SURVEY PROFESSIONAL PAPER 1156





# Patterns and Trends of Land Use and Land Cover on Atlantic and Gulf Coast Barrier Islands

*By* Harry F. Lins, Jr.

---

G E O L O G I C A L S U R V E Y P R O F E S S I O N A L P A P E R 1 1 5 6



---

UNITED STATES GOVERNMENT PRINTING OFFICE: 1980

**UNITED STATES DEPARTMENT OF THE INTERIOR**

**CECIL D. ANDRUS, *Secretary***

**GEOLOGICAL SURVEY**

**H. William Menard, *Director***

---

**Library of Congress Cataloging in Publication Data**

Lins, Harry F.

Patterns and trends of land use and land cover on Atlantic and Gulf Coast barrier islands.

(U.S. Geological Survey professional paper ; 1156)

Bibliography: p.

Supt. of Docs. no.: I 19.16:1156

1. Coastal zone management--United States. 2. Land use--United States.

I. Title. II. Series: United States. Geological Survey. Professional paper; 1156.  
HT392.L55 333.78'4 80-607144

---

**For sale by Superintendent of Documents, U.S. Government Printing Office  
Washington, D.C. 20402**

## CONTENTS

	Page		Page
Preface .....	VII	References .....	12
Abstract .....	1	Appendices .....	13
Introduction .....	1	I Tables (9-27) summarize area values of land use and land cover on Atlantic and Gulf coast barrier islands, 1945-55 and 1972-75, with changes.	
Methodology .....	2	II Land use and land cover maps (figs. 2-125) of Atlantic and Gulf coast barrier islands, 1972-75.	
Data description and regional analysis .....	2		
Statistical significance .....	10		
Conclusions .....	11		

## TABLES

	Page		Page
TABLE 1. Land use and land cover classification system for use with remotely sensed data .....	2	Area values of Level I land use and land cover on Atlantic and Gulf Coast barrier islands in 1945-55 and 1972-75, with changes:	
2. Area values of Level I land use and land cover on barrier islands for 1945-55, by State .....	3	9. For 9 barrier islands off the Maine coast .....	15
3. Area values of Level I land use and land cover on barrier islands for 1972-75, by State .....	4	10. For 2 barrier islands off the New Hampshire coast ..	15
4. Changes in area values of Level I land use and land cover on barrier islands between 1945-55 and 1972-75, by State .....	5	11. For 27 barrier islands off the Massachusetts coast ..	16
5. Area values of Level I land use and land cover on barrier islands for 1945-55, by regional group .....	7	12. For 6 barrier islands off the Rhode Island coast .....	18
6. Area values of Level I land use and land cover on barrier islands for 1972-75, by regional group .....	7	13. For 2 barrier islands off the Connecticut coast .....	18
7. Changes in area values of Level I land use and land cover on barrier islands between 1945-55 and 1972-75, by regional group .....	8	14. For 15 barrier islands off the New York coast .....	19
8. Statistical significance of land use and land cover area changes by regional group .....	11	15. For 10 barrier islands off the New Jersey coast .....	20
		16. For 2 barrier islands off the Delaware coast .....	21
		17. For 2 barrier islands off the Maryland coast .....	21
		18. For 11 barrier islands off the Virginia coast .....	22
		19. For 23 barrier islands off the North Carolina coast ..	23
		20. For 34 barrier islands off the South Carolina coast ..	25
		21. For 15 barrier islands off the Georgia coast .....	27
		22. For 80 barrier islands off the Florida coast .....	28
		23. For 5 barrier islands off the Alabama coast .....	33
		24. For 5 barrier islands off the Mississippi coast .....	33
		25. For 18 barrier islands off the Louisiana coast .....	34
		26. For 16 barrier islands off the Texas coast .....	36
		27. Summary of changes for all barrier islands in the 8 regional groups .....	37

## ILLUSTRATIONS

	Page		Page
FIGURE 1. Map of regional groupings of Atlantic and Gulf coast barrier islands .....	6	Land use and land cover maps of the New England and New York Bight barrier islands (figs. 8-27):	
Indexes to land use and land cover maps (figs. 2-7):		8. Of the coastal area near Bath, Me., with associated barrier islands .....	43
2. Of the New England and New York Bight barrier islands (figs. 8-27) .....	41	9. Of the coastal area near Portland, Me., with associated barrier islands .....	44
3. Of the Mid-Atlantic barrier islands (figs. 28-48) ..	42	10. Of the coastal area near Gloucester, Mass., with associated barrier islands .....	45
4. Of the Mid-Atlantic, Sea Islands, and Florida Atlantic barrier islands (figs. 49-70) .....	43	11. Of the coastal area near Boston, Mass., with associated barrier islands .....	46
5. Of the Florida Atlantic and Eastern Gulf barrier islands (figs. 71-95) .....	44	12. Of the coastal area near Plymouth, Mass., with associated barrier islands .....	47
6. Of the Eastern Gulf and Louisiana barrier islands (figs. 96-112) .....	45		
7. Of the Texas barrier islands (figs. 113-125) .....	46		

	Page		Page
FIGURE 13. Of the coastal area near Cape Cod, Mass., with associated barrier islands .....	48	FIGURE 42. Of the coastal area near Ocracoke, N.C., with associated barrier islands .....	77
14. Of the coastal area near Provincetown, Mass., with associated barrier islands .....	49	43. Of the coastal area near Atlantic, N.C., with associated barrier islands .....	78
15. Of the coastal area near Nantucket, Mass., with associated barrier islands .....	50	44. Of the coastal area near Cape Lookout, N.C., with associated barrier islands .....	79
16. Of the coastal area near Martha's Vineyard, Mass., with associated barrier islands .....	51	45. Of the coastal area near Morehead City, N.C. with associated barrier islands .....	80
17. Of the coastal area near New Bedford, Mass., with associated barrier islands .....	52	46. Of the coastal area near Jacksonville, N.C., with associated barrier islands .....	81
18. Of the coastal area near Newport, R. I., with associated barrier islands .....	53	47. Of the coastal area near Hampstead, N.C., with associated barrier islands .....	82
19. Of the coastal area near Mystic, Conn., with associated barrier islands .....	54	48. Of the coastal area near Wrightsville Beach, N. C., with associated barrier islands .....	83
20. Of the coastal area near New Haven, Conn., with associated barrier islands .....	55		
21. Of the coastal area near Bridgeport, Conn. with associated barrier islands .....	56	Land use and land cover maps of the Mid-Atlantic, Sea Islands, and Florida Atlantic barrier islands (figs. 49-70):	
22. Of the coastal area near New London, Conn., with associated barrier islands .....	57	49. Of the coastal area near Cape Fear, N.C., with associated barrier islands .....	84
23. Of the coastal area near Southampton, N.Y., with associated barrier islands .....	58	50. Of the coastal area near Seaside, N.C., with associated barrier islands .....	85
24. Of the coastal area near Brookhaven, N.Y., with associated barrier islands .....	59	51. Of the coastal area near Georgetown, S.C., with associated barrier islands .....	86
25. Of the coastal area near Fire Island, N.Y., with associated barrier islands .....	60	52. Of the coastal area near Cape Romain, S.C., with associated barrier islands .....	87
26. Of the coastal area near Lindenhurst, N.Y., with associated barrier islands .....	61	53. Of the coastal area near Isle of Palms, S.C., with associated barrier islands .....	88
27. Of the coastal area near New York, N.Y., with associated barrier islands .....	62	54. Of the coastal area near Charleston, S.C., with associated barrier islands .....	89
		55. Of the coastal area near Edisto Island, S.C., with associated barrier islands .....	90
Land use and land cover maps of the Mid-Atlantic barrier islands (figs. 28-48):		56. Of the coastal area near Beaufort, S.C., with associated barrier islands .....	91
28. Of the coastal area near Sandy Hook, N.J., with associated barrier islands .....	63	57. Of the coastal area near Hilton Head, S.C., with associated barrier islands .....	92
29. Of the coastal area near Toms River, N.J., with associated barrier islands .....	64	58. Of the coastal area near Savannah Beach, Ga., with associated barrier islands .....	93
30. Of the coastal area near Atlantic City, N.J., with associated barrier islands .....	65	59. Of the coastal area near St. Catherines Island, Ga., with associated barrier islands .....	94
31. Of the coastal area near Ocean City, N.J., with associated barrier islands .....	66	60. Of the coastal area near Sapelo Island, Ga., with associated barrier islands .....	95
32. Of the coastal area near Rehoboth Beach, Del., with associated barrier islands .....	67	61. Of the coastal area near Brunswick, Ga., with associated barrier islands .....	96
33. Of the coastal area near Ocean City, Md., with associated barrier islands .....	68	62. Of the coastal area near Cumberland Island, Ga., with associated barrier islands .....	97
34. Of the coastal area near Assateague Island, Md., with associated barrier islands .....	69	63. Of the coastal area near Fernandina Beach, Fla., with associated barrier islands .....	98
35. Of the coastal area near Chincoteague, Va., with associated barrier islands .....	70	64. Of the coastal area near Jacksonville, Fla., with associated barrier islands .....	99
36. Of the coastal area near Cape Charles, Va., with associated barrier islands .....	71	65. Of the coastal area near St. Augustine, Fla., with associated barrier islands .....	100
37. Of the coastal area near Virginia Beach, Va., with associated barrier islands .....	72	66. Of the coastal area near Marineland, Fla., with associated barrier islands .....	101
38. Of the coastal area near Kitty Hawk, N.C., with associated barrier islands .....	73	67. Of the coastal area near Daytona Beach, Fla., with associated barrier islands .....	102
39. Of the coastal area near Nags Head, N.C., with associated barrier islands .....	74	68. Of the coastal area near Titusville, Fla., with associated barrier islands .....	103
40. Of the coastal area near Waves, N.C., with associated barrier islands .....	75	69. Of the coastal area near Merritt Island, Fla., with associated barrier islands .....	104
41. Of the coastal area near Cape Hatteras, N.C., with associated barrier islands .....	76	70. Of the coastal area near Cocoa Beach, Fla., with associated barrier islands .....	105

# CONTENTS

V

## Land use and land cover maps of the Florida and Eastern Gulf barrier islands (figs. 71-95):

FIGURE 71. Of the coastal area near Vero Beach, Fla., with associated barrier islands .....	106
72. Of the coastal area near Fort Pierce, Fla., with associated barrier islands .....	107
73. Of the coastal area near Jupiter, Fla., with associated barrier islands .....	108
74. Of the coastal area near West Palm Beach, Fla., with associated barrier islands .....	109
75. Of the coastal area near Boca Raton, Fla., with associated barrier islands .....	110
76. Of the coastal area near Fort Lauderdale, Fla., with associated barrier islands .....	111
77. Of the coastal area near Miami, Fla., with associated barrier islands .....	112
78. Of the coastal area near Cape Sable, Fla., with associated barrier islands .....	113
79. Of the coastal area near Alligator Cove, Fla., with associated barrier islands .....	114
80. Of the coastal area near Everglades, Fla., with associated barrier islands .....	115
81. Of the coastal area near Marco, Fla., with associated barrier islands .....	116
82. Of the coastal area near Naples, Fla., with associated barrier islands .....	117
83. Of the coastal area near Fort Meyers, Fla., with associated barrier islands .....	118
84. Of the coastal area near Venice, Fla., with associated barrier islands .....	119
85. Of the coastal area near Sarasota, Fla., with associated barrier islands .....	120
86. Of the coastal area near St. Petersburg, Fla., with associated barrier islands .....	121
87. Of the coastal area near Tarpon Springs, Fla., with associated barrier islands .....	122
88. Of the coastal area near Chassahowitzka, Fla., with associated barrier islands .....	123
89. Of the coastal area near Cedar Key, Fla., with associated barrier islands .....	124
90. Of the coastal area near Panacea, Fla., with associated barrier islands .....	125
91. Of the coastal area near Saint Teresa, Fla., with associated barrier islands .....	126
92. Of the coastal area near Carrabelle, Fla., with associated barrier islands .....	127
93. Of the coastal area near Apalachicola, Fla., with associated barrier islands .....	128
94. Of the coastal area near Port St. Joe, Fla., with associated barrier islands .....	129
95. Of the coastal area near Panama City, Fla., with associated barrier islands .....	130

## Land use and land cover maps of the Eastern Gulf and Louisiana barrier islands (figs. 96-112):

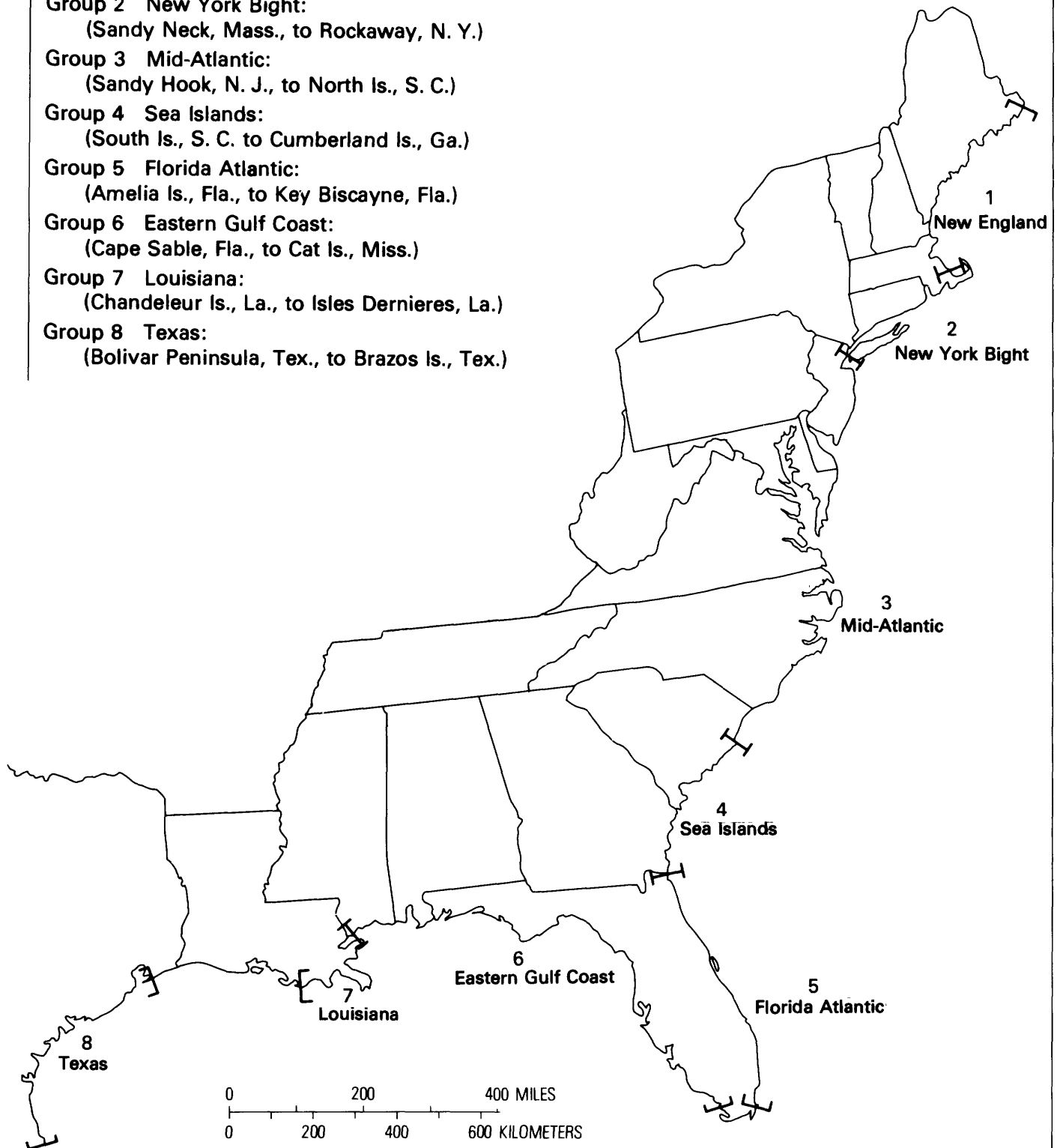
96. Of the coastal area near Fort Walton Beach, Fla., with associated barrier islands .....	131
97. Of the coastal area near Mary Esther, Fla., with associated barrier islands .....	132

FIGURE 98. Of the coastal area near Pensacola, Fla., with associated barrier islands .....	133
99. Of the coastal area near Warrington, Fla., with associated barrier islands .....	134
100. Of the coastal area near Gulf Shores, Ala., with associated barrier islands .....	135
101. Of the coastal area near Dauphin Island, Ala. with associated barrier islands .....	136
102. Of the coastal area near Pascagoula, Miss., with associated barrier islands .....	137
103. Of the coastal area near Biloxi, Miss., with associated barrier islands .....	138
104. Of the coastal area near Gulfport, Miss., with associated barrier islands .....	139
105. Of the coastal area near Chandeleur Islands, La., with associated barrier islands .....	140
106. Of the coastal area near Breton Island, La., associated barrier islands .....	141
107. Of the coastal area near Venice, La., with associated barrier islands .....	142
108. Of the coastal area near Pilottown, La., with associated barrier islands .....	143
109. Of the coastal area near Grand Isle, La., with associated barrier islands .....	144
110. Of the coastal area near Caminada Pass, La., with associated barrier islands .....	145
111. Of the coastal area near Leeville, La., with associated barrier islands .....	146
112. Of the coastal area near Isles Dernieres, La., with associated barrier islands .....	147

## Land use and land cover maps of the Texas barrier islands (figs. 113-125):

113. Of the coastal area near Galveston Island, Tex., with associated barrier islands .....	148
114. Of the coastal area near Jamaica Beach, Tex., with associated barrier islands .....	149
115. Of the coastal area near Freeport, Tex., with associated barrier islands .....	150
116. Of the coastal area near Matagorda, Tex., with associated barrier islands .....	151
117. Of the coastal area near Palacios, Tex., with associated barrier islands .....	152
118. Of the coastal area near Port O'Connor, Tex., with associated barrier islands .....	153
119. Of the coastal area near Austwell, Tex., with associated barrier islands .....	154
120. Of the coastal area near Corpus Christi, Tex., with associated barrier islands .....	155
121. Of the coastal area near Laguna Vista, Tex., with associated barrier islands .....	156
122. Of the coastal area near Griffins Point, Tex., with associated barrier islands .....	157
123. Of the coastal area near Lopena, Tex., with associated barrier islands .....	158
124. Of the coastal area near Padre Island South, Tex., with associated barrier islands .....	159
125. Of the coastal area near Port Isabel, Tex., with associated barrier islands .....	160

- Group 1 New England:  
(Sheepscot, Me., to Long Beach, Mass.)
- Group 2 New York Bight:  
(Sandy Neck, Mass., to Rockaway, N. Y.)
- Group 3 Mid-Atlantic:  
(Sandy Hook, N. J., to North Is., S. C.)
- Group 4 Sea Islands:  
(South Is., S. C. to Cumberland Is., Ga.)
- Group 5 Florida Atlantic:  
(Amelia Is., Fla., to Key Biscayne, Fla.)
- Group 6 Eastern Gulf Coast:  
(Cape Sable, Fla., to Cat Is., Miss.)
- Group 7 Louisiana:  
(Chandeleur Is., La., to Isles Dernieres, La.)
- Group 8 Texas:  
(Bolivar Peninsula, Tex., to Brazos Is., Tex.)



REGIONAL GROUPINGS OF ATLANTIC AND GULF COAST BARRIER ISLANDS



## PREFACE

Reconciling the conflicts arising from alternative uses of natural resources is one of the preeminent problems facing the United States now. It is only through cooperation between Federal, regional, State and local agencies, that this problem can be addressed effectively. In the 1960's and early 1970's the Federal government took numerous legislative steps toward promoting such cooperation. The Coastal Zone Management Act is a prime example. In his May 1977 Environmental Message to Congress, President Carter stated "Intelligent stewardship of the environment on behalf of all Americans is a prime responsibility of government. Congress has in the past carried out its share of this duty well—so well, in fact, that the primary need today is not for new comprehensive statutes but for sensitive administration and energetic enforcement of the ones we have. Environmental protection is no longer just a legislative job, but one that requires—and will now receive—firm and unsparing support from the Executive Branch." The scope of this commitment is vast and covers the preservation of wilderness, wildlife, natural and historical resources, and concerns the effects of pollution, toxic chemicals, and potential damage caused by energy resource extraction.

One of the specific problems considered by the Carter administration is the uncontrolled, and often hazardous, development on coastal barrier islands. Within the Department of the Interior a work group was established in 1977 to develop an effective plan for protecting the barrier island resource. This group was composed of specialists from various disciplines, agencies, and institutional levels. With only one year allotted to prepare its plan, the work group utilized existing data bases from the operational programs of participating agencies. The data in this report, which are from the U.S. Geological Survey's nationwide land use and land cover mapping program, represent the USGS contribution to the barrier island study. Thus, this report indicates the commitment of the U.S. Geological Survey to applying earth science information to environmental management and problem-solving.

Since data are primarily being presented for analysis, rather than as being analyzed in this report, the text has been kept brief by summarizing why and how the data were prepared, what statistical significance these data have, and finally, by a general discussion of regional patterns. The basic land use and land cover data are compiled in two appendices: the one tabular—of area statistics

by individual barrier island; and the other one graphic—of sections of the 1972–75, 1:250,000-scale USGS open-file land use and land cover maps showing the barrier islands and adjacent coastal land. Using this format, a complete, although generalized, data set on barrier island land use and land cover conditions and trends is presented herein for use in resource and environmental analysis.

Care should be exercised in the interpretation and use of the land use and land cover area values. Any limitation in the utility of these data results from several factors characteristic of the photointerpretation and area measurement techniques used. For example, the 1945–55 data were derived from unrectified aerial photographs. Without planimetric control, measurements made from these photographs contain inherent geometric inaccuracies. Similarly, the planimeter technique used in measuring the area of each land use and land cover category may contain a degree of inaccuracy. Also, there are "selectivity" errors intrinsic to mapping limitations necessarily specified for any land use and land cover classification system. A prime example is minimum mapping sizes. Using the criteria applied to Geological Survey maps, a beach 10 miles long and 500 feet wide will not appear on the maps because the USGS rule is that linear features must be at least 660 feet wide in order to be mapped. Similarly, some small residential or commercial areas will go unmapped since the minimum mapping unit for all urban or built-up areas is 10 acres. Thus, a small housing development (15 to 20 houses on 7 or 8 acres) built along the primary dune line would be mapped as beach, and appear in the area summary as part of the barren land acreage.

Several other problems complicated the compilation of the land use and land cover data. The boundary of each barrier island, for example, was not precisely delineated by the Department of the Interior work group. In some cases the barrier islands were actually barrier beaches, with no distinct landward boundary. In such instances arbitrary delineations had to be made by the land use data compilers. Since the photographs used for the 1945–55 data were of lesser optical quality than the 1972–75 data, consistent boundary determinations between the two time periods, for each barrier island, were often not possible. This frequently resulted in differences in the total area of barrier islands between the two time periods. In many cases these differences were insignificant, but in others they might be quite

significant. It should be recognized, therefore, that a difference in the total area of a barrier island between these two time periods is not necessarily attributable entirely to actual land area change.

Similarly, area differences could result from variations in tidal conditions between the two periods. It is possible that the 1945-55 photographs were obtained during high tide and the 1972-75 photographs during low tide, or vice versa. Although this may have a small effect on the measured area for most islands, in some cases (where there is a high tidal range or a low beach profile) it may be significant.

Clearly, problems and differences like those stated

above make difficult the precise measurement of land use and land cover acreage at two points in time. With all such factors operating simultaneously, the area measurement task is a complex one, and the acreage values obtained are inexact. Nevertheless, the author believes that the percentage values of land in each category reflect the true surface condition.

Several members of the U.S. Geological Survey made substantial contributions to this report. Karen Letke, Robert DeAngelis, Thomas Johnson, and David Wolf compiled and planimetered the 1945-55 land use and land cover maps. George Rosenfield provided the statistical method by which the data were analyzed.

# PATTERNS AND TRENDS OF LAND USE AND LAND COVER ON ATLANTIC AND GULF COAST BARRIER ISLANDS

By Harry F. Lins, Jr.

## ABSTRACT

Data prepared as part of the U.S. Geological Survey's nationwide land use and land cover mapping program have been applied to a Federal study designed to provide recommendations to the President on methods for protecting undeveloped coastal barrier islands. These land use and land cover data covered two time periods, 1945-55 and 1972-75, and included information on intervening changes. They were used by the Federal study group in an inventory and assessment of developed and undeveloped barrier islands. In addition, state and regional summaries were prepared to facilitate area analysis. Based on the 1972-75 data, several general patterns of land use and land cover were discerned along the Atlantic and Gulf coast barrier islands. Wetlands were found to cover nearly one-half of the total area of all barrier islands. Urban and built-up land, and barren land each occupied almost 14 percent of the total area, while forest land covered about 10 percent. In combination, these four categories accounted for nearly 90 percent of the total 1972-75 barrier island land area. Changes in land use and land cover between 1945-55 and 1972-75 were significant along the entire coastline from Maine to Texas. With the exception of urban or built-up land, all categories of land use and land cover decreased between the two time periods. Urban or built-up land increased by nearly 140,000 acres, while wetlands, the category most affected by this urban growth, declined by almost 80,000 acres.

## INTRODUCTION

On May 23, 1977 President Carter presented a broad and comprehensive environmental message to the Congress (Carter, 1977). The President proposed actions to control pollution and protect health, assure environmentally sound energy development, improve the urban environment, protect natural resources, preserve national heritage, protect wildlife, affirm our concern for the global environment, and improve the implementation of environmental laws. As part of his plan for protecting natural resources the President specifically included coastal barrier islands when he said:

Coastal barrier islands are a fragile buffer between the wetlands and the sea. The 189 barrier islands on the Atlantic and Gulf Coasts are an integral part of an ecosystem which helps protect inland areas from flood waves and hurricanes. Many of them are unstable and not suited for development, yet in the past the federal government has subsidized and insured new construction on them. Eventually, we can expect heavy economic losses from this shortsighted policy.

About 68 coastal barrier islands are still unspoiled. Because I believe these remaining natural islands should be protected from unwise development, I am directing the Secretary of the Interior, in consulta-

tion with the Secretary of Commerce, the Council on Environmental Quality, state and local officials of coastal areas, to develop an effective plan for protecting the islands.

His report should include recommendations for action to achieve this purpose.<sup>1</sup>

In following the President's directive, the Secretary of the Interior established the Barrier Island Work Group consisting of representatives from the Heritage Conservation and Recreation Service (HCRS, formerly the Bureau of Outdoor Recreation), the Fish and Wildlife Service (FWS), the National Park Service (NPS), the Office of Coastal Zone Management (OCZM), the Council on Environmental Quality (CEQ), and the Barrier Island Coalition (a consortium of private conservation organizations), with the Heritage Conservation and Recreation Service functioning as lead agency. The Geological Survey was subsequently invited to participate by the HCRS through the Secretary of the Interior and the Assistant Secretary for Energy and Minerals.

The work group's mandate included the development of protection methods, and recommendations for their implementation. This required detailed scientific and resource information on each barrier island, in addition to an evaluation of the numerous possible legal forms of protection. The group's first step was to separate those islands which were developed from those undeveloped or unspoiled. The undeveloped islands then had to be separated into protected and unprotected classes. A barrier island classification system was established with Category I, developed; Category II, undeveloped and unprotected; and Category III, protected. This classification system formed the basis for protection planning.

Island categorization (developed versus undeveloped) could most easily be determined by using recent information on land use and land cover. The U.S. Geological Survey was asked to provide these data, which were being compiled as part of its nationwide land use and land cover mapping program. Since the Geological Survey

<sup>1</sup> Although the President's message specified 189 barrier islands, the total number of islands included in the resulting study was 282, reflecting broader definitional guidelines established by the work group.

had given priority to the mapping of coastal areas in the preceding three years, nearly all of the Atlantic and Gulf coastal barrier islands had been mapped before the HCRS request.

In addition to providing land use and land cover statistics for the 1972–75 period for use in determining the developed state of barrier islands, an assessment of land use and land cover changes on the barrier islands was also made. The purpose of this assessment was to provide data on the location, types, and magnitude of land use and land cover changes on barrier islands which could be used as a guide for estimating future trends in land use change.

### METHODOLOGY

The barrier island land use and land cover area statistics depict land conditions for both 1945–55 and 1972–75, and the attendant changes between these two time periods. These data are presented as Appendix I. Sections of the maps, from which the 1972–75 data were compiled, are presented as Appendix II. The area values of land use and land cover were determined from two series of maps that had been compiled from remotely sensed data.

This study was initiated with land use and land cover information being interpreted from, and mapped directly on, a series of 1945–55 aerial photographic indices.<sup>2</sup> This interpretation was based on the Level I categories of the USGS classification system designed specifically for use with remotely sensed data (Anderson and others, 1976) (table 1). Area measurements of land use and land cover on each barrier island were then compiled using an electronic digitizer as a planimeter.

A similar technique was then used to compile the statistical data for the 1972–75 period. Maps were not compiled, however, since mapped data were already available for this time period from the Geological Survey's nationwide land use and land cover mapping program. These maps, compiled from remotely sensed data using the Level II categories of the USGS classification system, were similar to the maps of the 1945–55 period. To facilitate comparisons between the two time periods, however, all data were recorded at Level I.

Because of the dissimilarities in the aerial photographs for the two time periods, and the medium to small mapping scales used (approximately 1:63,360 for 1945–55, and 1:250,000 for 1972–75), the accuracy of the Appendix I data varies. This problem is complicated by the 10-acre minimum mapping unit used in compiling both sets of maps. Some land features, such as pocket beaches, wooded parcels, and residential areas are often

TABLE 1.—*Land use and land cover classification system for use with remotely sensed data*

[Single-digit classes (**boldface type**) represent Level I categories; two-digit classes (lightface) represent Level II categories]

---

<b>1. Urban or Built-up Land</b>	
11. Residential	
12. Commercial and Services	
13. Industrial	
14. Transportation, Communications and Utilities	
15. Industrial and Commercial Complexes	
16. Mixed Urban or Built-up Land	
17. Other Urban or Built-up Land	
<b>2. Agricultural Land</b>	
21. Cropland and Pasture	
22. Orchards, Groves, Vineyards, Nurseries, and Ornamental Horticultural Areas	
23. Confined Feeding Operations	
24. Other Agricultural Land	
<b>3. Rangeland</b>	
31. Herbaceous Rangeland	
32. Shrub and Brush Rangeland	
33. Mixed Rangeland	
<b>4. Forest Land</b>	
41. Deciduous Forest Land	
42. Evergreen Forest Land	
43. Mixed Forest Land	
<b>5. Water</b>	
51. Streams and Canals	
52. Lakes	
53. Reservoirs	
54. Bays and Estuaries	
<b>6. Wetland</b>	
61. Forested Wetland	
62. Nonforested Wetland	
<b>7. Barren Land</b>	
71. Dry Salt Flats	
72. Beaches	
73. Sandy Areas other than Beaches	
74. Bare Exposed Rock	
75. Strip Mines, Quarries, and Gravel Pits	
76. Transitional Areas	
77. Mixed Barren Land	
<b>8. Tundra</b>	
81. Shrub and Brush Tundra	
82. Herbaceous Tundra	
83. Bare Ground Tundra	
84. Wet Tundra	
85. Mixed Tundra	
<b>9. Perennial Snow or Ice</b>	
91. Perennial Snowfields	
92. Glaciers	

---

smaller than 10 acres and thus are not mapped, resulting in inaccurate area values.

### DATA DESCRIPTION AND REGIONAL ANALYSIS

In addition to the compilation of area statistics of land use and land cover by individual barrier island, state summaries of these data were also prepared for the Barrier Island Work Group (tables 2–4). The State summaries were useful to the work group in two ways. First,

<sup>2</sup> These data included USGS photo indices (scale 1:62,500 to 1:68,500) and high-altitude black and white photographs (1:30,000 and 1:60,000), Agricultural Stabilization and Conservation Service (ASCS) photo indices (1:63,360) and black and white photographs (1:20,000), Soil Conservation Service (SCS) photo indices (1:63,360), and National Ocean Survey (NOS) black and white photographs (1:10,000 and 1:20,000).

TABLE 2.—Area values of Level I land use and land cover on barrier islands, 1945–1955, by State

[Acres in thousands (**boldface type**); percents below (lightface); dashes (-----) indicate negligible or no mapping data available; NA indicates category not applicable]

Island location by State	Urban or built-up land	Agricultural land	Rangeland	Forest land	Water bodies	Wetland	Barren land	Total acres
Maine -----	<b>593</b>	NA	<b>105</b>	<b>206</b>	-----	<b>531</b>	<b>213</b>	<b>1,648</b>
	36.0	NA	6.4	12.5	-----	32.2	12.9	
New Hampshire ---	<b>467</b>	NA	NA	NA	NA	<b>546</b>	NA	<b>1,013</b>
	46.1	NA	NA	NA	NA	53.9	NA	
Massachusetts ----	<b>4,519</b>	<b>11</b>	<b>4,793</b>	<b>1,310</b>	<b>528</b>	<b>9,608</b>	<b>13,511</b>	<b>34,280</b>
	13.2	0.1	14.0	3.8	1.5	28.0	39.4	
Rhode Island -----	<b>773</b>	<b>184</b>	<b>153</b>	<b>74</b>	<b>243</b>	<b>1,334</b>	<b>566</b>	<b>3,327</b>
	23.3	5.5	4.6	2.2	7.3	40.1	17.0	
Connecticut -----	<b>264</b>	NA	NA	NA	NA	<b>778</b>	<b>185</b>	<b>1,227</b>
	21.5	NA	NA	NA	NA	63.4	15.1	
New York -----	<b>8,140</b>	<b>358</b>	<b>1,524</b>	<b>2,228</b>	<b>357</b>	<b>7,455</b>	<b>9,813</b>	<b>29,875</b>
	27.2	1.2	5.1	7.5	1.2	25.0	32.8	
New Jersey -----	<b>17,746</b>	<b>88</b>	NA	<b>1,323</b>	<b>1,603</b>	<b>15,701</b>	<b>10,881</b>	<b>47,342</b>
	37.4	0.2	NA	2.8	3.4	33.2	23.0	
Delaware -----	<b>1,507</b>	<b>101</b>	NA	<b>696</b>	<b>114</b>	<b>5,711</b>	<b>1,957</b>	<b>10,086</b>
	15.0	1.0	NA	6.9	1.1	56.6	19.4	
Maryland -----	<b>820</b>	NA	NA	<b>484</b>	<b>100</b>	<b>6,413</b>	<b>4,208</b>	<b>12,025</b>
	6.8	NA	NA	4.0	0.9	53.3	35.0	
Virginia -----	-----	-----	NA	<b>3,360</b>	<b>2,554</b>	<b>51,703</b>	<b>9,398</b>	<b>67,015</b>
	-----	-----	NA	5.0	3.8	76.8	14.0	
North Carolina ----	<b>5,862</b>	NA	NA	<b>14,148</b>	<b>1,118</b>	<b>88,925</b>	<b>40,812</b>	<b>151,195</b>
	3.9	NA	NA	9.4	0.9	58.8	27.0	
South Carolina ----	<b>1,654</b>	<b>9,766</b>	NA	<b>26,133</b>	<b>1,731</b>	<b>107,802</b>	<b>7,792</b>	<b>154,878</b>
	1.1	6.3	NA	16.9	1.1	69.6	5.0	
Georgia -----	<b>5,161</b>	<b>1,116</b>	<b>4,724</b>	<b>43,577</b>	<b>3,297</b>	<b>106,786</b>	<b>6,774</b>	<b>171,435</b>
	3.0	0.7	2.8	25.4	1.9	62.3	3.9	
Florida -----	<b>32,007</b>	<b>3,057</b>	<b>593</b>	<b>69,505</b>	<b>75,722</b>	<b>281,186</b>	<b>52,835</b>	<b>514,905</b>
	6.2	0.6	0.1	13.5	14.7	54.6	10.3	
Alabama -----	-----	NA	-----	<b>4,301</b>	<b>3,398</b>	<b>13,288</b>	<b>5,494</b>	<b>26,481</b>
	-----	NA	-----	16.2	12.8	50.2	20.8	
Mississippi -----	NA	NA	NA	—0—	NA	<b>5,946</b>	<b>3,732</b>	<b>9,678</b>
	NA	NA	NA	0.0	NA	61.4	38.6	
Louisiana -----	<b>1,651</b>	NA	NA	NA	<b>1,419</b>	<b>26,447</b>	<b>7,611</b>	<b>37,128</b>
	4.5	NA	NA	NA	3.8	71.2	20.5	
Texas -----	<b>9,246</b>	<b>65</b>	<b>89,127</b>	<b>816</b>	<b>9,508</b>	<b>187,855</b>	<b>80,545</b>	<b>377,162</b>
	2.5	0.02	23.6	0.2	2.5	49.8	21.4	
Totals: All States -	<b>90,410</b>	<b>14,746</b>	<b>101,019</b>	<b>168,161</b>	<b>101,992</b>	<b>918,015</b>	<b>256,357</b>	<b>1,650,700</b>
	5.5	0.9	6.1	10.2	6.2	55.6	15.5	

many State-level agencies provided information in the form of State summaries. Similarly, cooperating Federal agencies supplied data which were aggregated by State. The State summaries of land use and land cover information were, therefore, more easily correlated with these other data sets. Second, a major part of the work group's investigation focused on barrier island protection. Since the legal protection of land involves a consideration of ownership that, in turn, often involves State law, it was expedient to have the land use and land cover data summarized by State.

Several distinct patterns of land use and land cover can be quickly discerned from table 3. For example, Florida had the largest barrier island area in 1972–75, with more than one-half million acres. Barrier islands in Florida also had the largest area in urban or built-up land with nearly 102,000 acres. This value represents nearly 20 percent of the total barrier island area within the state and about 6 percent of the total or built-up area

on all barrier islands of the Atlantic and Gulf coasts. New Hampshire, in contrast with Florida, has the smallest barrier island area, just under 1,100 acres, with a little less than 800 acres or 72 percent urbanized. Urban or built-up land is found on the barrier islands of every state along the Atlantic and Gulf coasts except Mississippi. Its five islands, all located offshore, are only accessible from the mainland by boat. Moreover, The Mississippi islands are in a natural, undeveloped condition with about 61 percent of their area in wetland, 37 percent in barren land (beaches and dunes), and nearly 2 percent in forest land.

Wetland is the only land use and land cover category consistently found on the barrier islands of every State (table 3). Composing about half of the total barrier island land area, wetland varies from less than 15 percent in Maine to more than 67 percent in Virginia.

Barren land, another ubiquitous category, occupies slightly more area than urban or built-up land (approx-

TABLE 3.—Area values of Level I land use and land cover on barrier islands, 1972–1975, by State

[Acres in thousands (**boldface type**); percents below (lightface); dashes (-----) indicate negligible or no mapping data available; NA indicates category not applicable]

Island location by State	Urban or built-up land	Agricultural land	Rangeland	Forest land	Water bodies	Wetland	Barren land	Total acres
Maine -----	<b>1,165</b>	NA	-----	<b>84</b>	-----	<b>239</b>	<b>134</b>	<b>1,622</b>
	71.8	NA	-----	5.2	-----	14.7	8.3	
New Hampshire ---	<b>780</b>	NA	NA	NA	NA	<b>301</b>	NA	<b>1,081</b>
	72.1	NA	NA	NA	NA	27.9	NA	
Massachusetts ----	<b>8,128</b>	<b>70</b>	<b>4,454</b>	<b>1,220</b>	<b>582</b>	<b>8,900</b>	<b>14,407</b>	<b>37,761</b>
	21.5	0.2	11.8	3.2	1.5	23.6	38.2	
Rhode Island -----	<b>1,226</b>	<b>246</b>	<b>153</b>	<b>162</b>	<b>213</b>	<b>1,430</b>	<b>94</b>	<b>3,524</b>
	34.8	7.0	4.3	4.6	6.0	40.6	2.7	
Connecticut -----	<b>576</b>	NA	NA	NA	NA	<b>563</b>	<b>218</b>	<b>1,357</b>
	42.4	NA	NA	NA	NA	41.5	16.1	
New York -----	<b>11,578</b>	<b>273</b>	<b>1,580</b>	<b>1,508</b>	<b>550</b>	<b>7,368</b>	<b>10,171</b>	<b>33,028</b>
	35.0	0.8	4.8	4.5	1.7	22.4	30.7	
New Jersey -----	<b>22,719</b>	<b>358</b>	NA	<b>627</b>	<b>1,824</b>	<b>13,255</b>	<b>9,172</b>	<b>47,955</b>
	47.4	0.8	NA	1.3	3.8	27.6	19.1	
Delaware -----	<b>2,956</b>	<b>26</b>	NA	<b>64</b>	<b>262</b>	<b>4,115</b>	<b>2,688</b>	<b>10,111</b>
	29.2	0.2	NA	0.6	2.6	40.7	26.7	
Maryland -----	<b>1,848</b>	NA	NA	<b>651</b>	<b>160</b>	<b>5,975</b>	<b>4,850</b>	<b>13,484</b>
	13.7	NA	NA	4.8	1.2	44.3	36.0	
Virginia -----	<b>1,144</b>	<b>51</b>	NA	<b>4,487</b>	<b>2,327</b>	<b>46,404</b>	<b>14,505</b>	<b>68,918</b>
	1.6	0.1	NA	6.5	3.3	67.5	21.0	
North Carolina ----	<b>21,625</b>	NA	NA	<b>11,769</b>	<b>1,224</b>	<b>78,202</b>	<b>42,057</b>	<b>154,877</b>
	14.0	NA	NA	7.6	0.8	50.5	27.6	
South Carolina ----	<b>13,081</b>	<b>5,152</b>	NA	<b>24,994</b>	<b>2,178</b>	<b>100,949</b>	<b>8,234</b>	<b>154,588</b>
	8.5	3.3	NA	16.2	1.4	65.3	5.3	
Georgia -----	<b>8,436</b>	<b>1,459</b>	<b>3,930</b>	<b>42,375</b>	<b>3,903</b>	<b>103,551</b>	<b>7,944</b>	<b>171,598</b>
	4.9	0.9	2.3	24.7	2.3	60.3	4.6	
Florida -----	<b>101,988</b>	<b>2,437</b>	<b>1,260</b>	<b>56,001</b>	<b>73,769</b>	<b>244,791</b>	<b>38,687</b>	<b>518,933</b>
	19.7	0.5	0.2	10.8	14.2	47.1	7.5	
Alabama -----	<b>5,273</b>	NA	<b>2,130</b>	<b>6,951</b>	<b>3,123</b>	<b>6,687</b>	<b>4,049</b>	<b>28,213</b>
	18.7	NA	7.5	24.8	11.0	23.7	14.3	
Mississippi -----	NA	NA	NA	<b>179</b>	NA	<b>5,964</b>	<b>3,584</b>	<b>9,727</b>
	NA	NA	NA	1.8	NA	61.4	36.8	
Louisiana -----	<b>6,746</b>	NA	NA	NA	<b>1,504</b>	<b>24,030</b>	<b>6,238</b>	<b>38,518</b>
	17.5	NA	NA	NA	3.9	62.4	16.2	
Texas -----	<b>19,410</b>	<b>88</b>	<b>85,305</b>	<b>1,152</b>	<b>9,631</b>	<b>186,158</b>	<b>82,209</b>	<b>383,953</b>
	5.3	0.02	23.5	0.3	2.7	51.2	21.0	
Totals: All States -	<b>228,679</b>	<b>10,160</b>	<b>98,812</b>	<b>152,224</b>	<b>101,250</b>	<b>838,882</b>	<b>249,241</b>	<b>1,679,248</b>
	13.6	0.6	5.9	9.1	6.0	50.0	14.8	

imately 249,000 acres). Almost all barren land occurs naturally as beaches or dunes. There are, however, some cases where barren land appears as transitional or "fill" areas, and these are characteristically found along the back-bay margins of barrier islands, marking sites of planned urban or built-up development. Such areas are observable in New Jersey, Delaware, Maryland, Virginia, North and South Carolina, and Florida—especially on the Gulf coast side.

Land use and land cover changes between 1945–55 and 1972–75 on the barrier islands of Atlantic and Gulf coast states have been diverse, reflecting varying social, economic, and political influences. Certain trends, have been uniform (table 4). Urban or built-up land, for example, has increased on barrier islands in every state except Mississippi, which has no urban land, and usually by dramatic proportions. Florida's urbanized land increased by nearly 70,000 acres, North Carolina's by more than 15,000 acres, and South Carolina's by more

than 11,000 acres; however, Connecticut and New Hampshire's urbanized area increased by only 300 acres each. Most of this increase has been oriented toward recreation and second home development, although in Louisiana a part of the urban trend was commercial and industrial, in support of the development of offshore energy resources.

With the exception of small increases in Rhode Island and Mississippi, wetland area decreased considerably in all states between 1945–55 and 1972–75, for a total loss of 80,000 acres. Barren also decreased, by more than 7,100 but this was not in a uniform pattern. In some states—Massachusetts, Connecticut, New York, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Texas—barren land actually increased—primarily as a result of increased transitional land area. Most of these gains, however, were each less than 1,200 acres, although Texas was nearly 1,700, and were readily offset by the sizeable losses in the other

TABLE 4.—Changes in area values of Level I land use and land cover on barrier islands between 1945–55 and 1972–75, by State  
[Acres in thousands (boldface type); percents below (lightface); dashes (-----) indicate negligible or no mapping data available; NA indicates category not applicable]

Island location by State	Urban or built-up land	Agricultural land	Rangeland	Forest land	Water bodies	Wetland	Barren land	Changes mapped between 1945–55 and 1972–75
Maine -----	+572	NA	-105	-122	-----	-292	-79	-26
	+96.0	NA	-100.0	-59.0	-----	-55.0	-37.0	-2.0
New Hampshire ---	+313	NA	NA	NA	NA	-245	-----	+68
	+67.0	NA	NA	NA	NA	-45.0	-----	+7.0
Massachusetts ----	+3,609	+59	-339	-90	+54	-708	+896	+3,481
	+80.0	+536.0	-7.0	-7.0	+10	-7.0	+7.0	+10.0
Rhode Island -----	+453	+62	-----	+88	-30	+96	-472	197
	+59.0	+34.0	-----	+119.0	-12.0	+7.0	-83.0	+6.0
Connecticut -----	+312	NA	NA	NA	NA	-215	+33	+130
	+118.0	NA	NA	NA	NA	-28.0	+18.0	+11.0
New York -----	+3,438	-85	+56	-720	+193	-87	+358	+3,153
	+42.0	-24.0	+4.0	-32.0	+54.0	-1.0	+4.0	+11.0
New Jersey -----	+4,973	+270	NA	-696	+221	-2,447	-1,709	+613
	+28.0	+307.0	NA	-53.0	+14.0	-16.0	-16.0	+1.0
Delaware -----	+1,449	-75	NA	-632	+148	-1,596	+731	+25
	+96.0	-74.0	NA	-91.0	+56.0	-28.0	+37.0	+0.2
Maryland -----	+1,028	NA	NA	+167	+60	-438	+642	+1,459
	+125.0	NA	NA	+35.0	+60.0	-7.0	+15.0	+12.0
Virginia -----	+1,144	+51	NA	+1,127	-227	-5,299	+5,107	+1,903
	+	+	NA	+34.0	-9.0	-10.0	+54.0	+3.0
North Carolina ----	+15,763	NA	NA	-2,379	-194	-10,723	+1,215	+3,682
	+269.0	NA	NA	-17.0	-14.0	-12.0	+3.0	+2.0
South Carolina ----	+11,427	-4,614	NA	-1,139	+447	-6,853	+442	-290
	+691.0	-47.0	NA	-4.0	+26.0	-6.0	+6.0	-0.2
Georgia -----	+3,275	+343	-794	-1,202	+606	-3,235	+1,170	+163
	+63.0	+31.0	-17.0	-3.0	+18.0	-3.0	+17.0	+0.09
Florida -----	+67,981	-620	+667	-13,504	-1,953	-36,395	-14,148	+4,028
	+219.0	-20.0	+112.0	-19.0	-3.0	-13.0	-27.0	+1.0
Alabama -----	+5,273	NA	+2,130	+2,650	-275	-6,601	-1,445	+1,732
	+	NA	+	+62.0	-8.0	-50.0	-26.0	+7.0
Mississippi -----	NA	NA	NA	+179	NA	+18	-148	+49
	NA	NA	NA	+	NA	+0.3	-4.0	+0.5
Louisiana -----	+5,095	NA	NA	NA	+85	-2,417	-1,373	+1,390
	+309.0	NA	NA	NA	+6.0	-9.0	-18.0	+4.0
Texas -----	+10,164	+23	-3,822	+336	+123	-1,697	+1,664	+6,791
	+110.0	+35.0	-4.0	+41.0	+1.0	-1.0	+2.0	+2.0
TOTALS -----	+138,269	-4,586	-2,207	-15,937	-742	-79,133	-7,116	+28,548
	+153.0	-31.0	-2.0	-10.0	-0.7	-9.0	-3.0	+2.0

states. Florida, for example, lost more than 14,000 acres of barren land, New Jersey over 1,700, and Alabama more than 1,400 acres.

For regional and environmental analysis of barrier island land use and land cover data, a systematic morphological grouping based primarily on barrier island geological and geomorphological characteristics, and following in part the coastal classification work of Dolan and others (1975) was prepared. Eight regional groups were delineated along the Atlantic and Gulf coasts (fig. 1). Each has a different set of shoreline configurations, composition, and dynamic properties. The land use and land cover data, summarized according to this regionalization, appear in tables 5 to 7. A description of each regional group follows.

Group 1, consisting of 21 New England barrier islands, is located between Sheepscot, Me., and Long

Beach, Mass. (App. II, figs. 8–12). The shoreline characteristics of this coastal region vary from rocky in Maine, to sandy pocket beaches in Massachusetts. The coastline throughout is essentially low-cliffed and composed primarily of older resistant rocks (Putnam and others, 1960). The 1972–75 data show 18 islands of this group with some level of urban development, 13 of them being more than 50 percent urbanized, and 4 of them,—Pine Point, Goose Creek, Wells Beach, and Nantasket Beach—totally, or 100 percent, urbanized.

This high degree of urbanization is influenced by several conditions. First, barrier islands are aesthetically desirable for recreation and residence. Although these two societal factors exert considerable development pressure on all barrier islands, that pressure is strongly felt in the New England group where all 21 islands total a relatively small 14,769 acres. The size

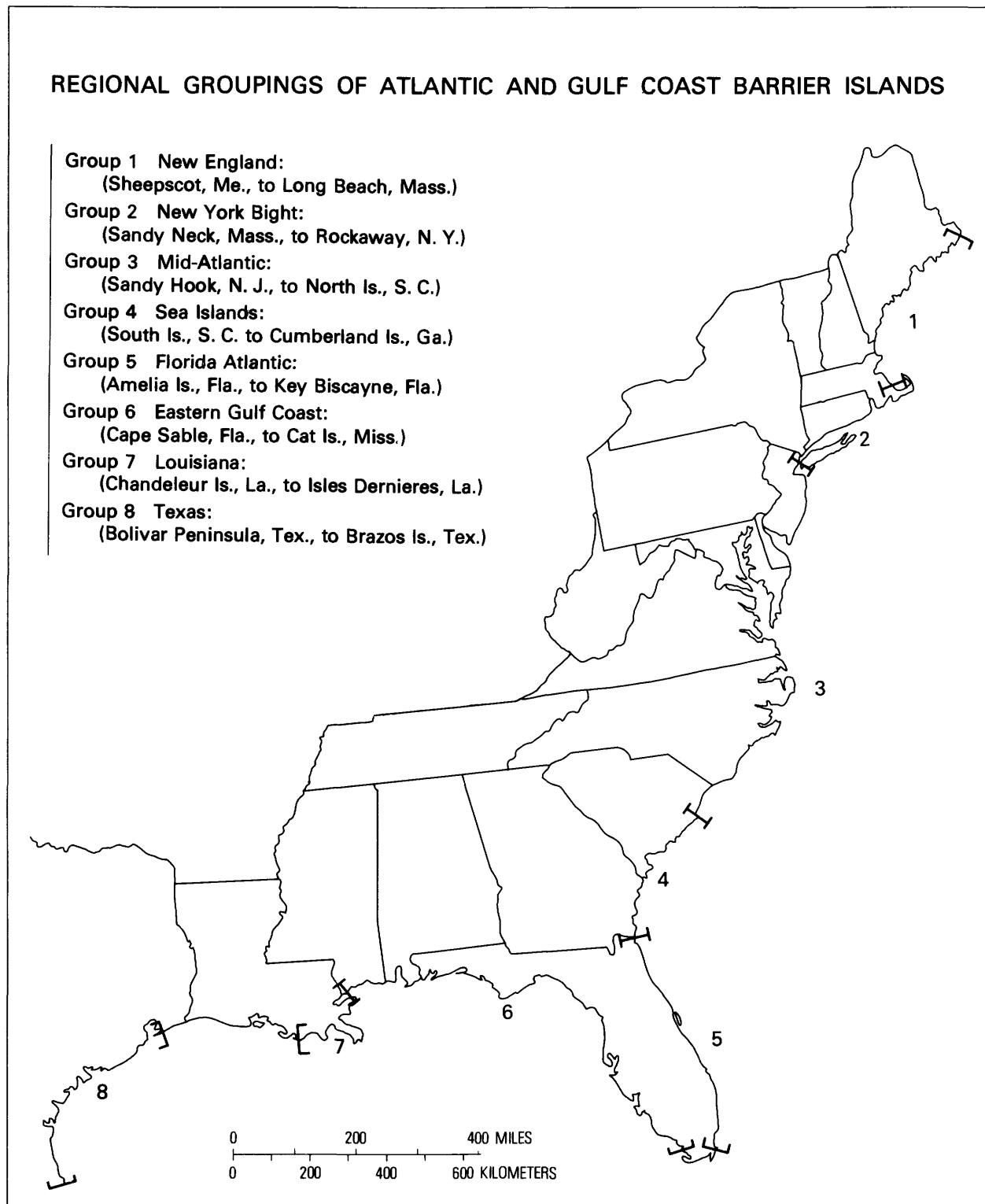


FIGURE 1.—Regional groupings of Atlantic and Gulf coast barrier islands.

becomes even more critical when the area is further influenced by proximity to large coastal cities. Most of these Group 1 barrier islands are located near Bath, Portland, Portsmouth, and Boston, and are linked to these cities by a good transportation network. Finally, the relatively stable geomorphological nature of these

islands enhances their suitability for development, thereby attracting people who might otherwise choose to build in safer areas.

Approximately 43 percent, or nearly 6,300 acres, of the total New England group area is urban or built-up land (table 6). Wetland accounts for 30 percent or nearly



TABLE 5.—Area values of Level I land use and land cover on barrier islands for 1945-55, by regional group

[Acres in thousand (**boldface type**); percents below (lightface); dashes (-----) indicate negligible or no mapping data available; NA indicates category not applicable]

Island location by group	Urban or built-up land	Agricultural land	Rangeland	Forest land	Water bodies	Wetland	Barren land	Total acres
New England -----	<b>4,279</b>	-----	<b>105</b>	<b>726</b>	-----	<b>5,627</b>	<b>2,935</b>	<b>13,672</b>
	31.3	-----	0.8	5.3	-----	41.2	21.4	
New York Bight ---	<b>10,477</b>	<b>553</b>	<b>6,470</b>	<b>3,092</b>	<b>1,128</b>	<b>14,625</b>	<b>21,353</b>	<b>57,698</b>
	18.2	1.0	1.2	5.4	1.9	25.3	37.0	
Mid-Atlantic -----	<b>26,234</b>	<b>189</b>	NA	<b>20,599</b>	<b>6,421</b>	<b>179,341</b>	<b>69,723</b>	<b>302,507</b>
	8.7	0.1	NA	6.8	2.1	59.3	23.0	
Sea Islands -----	<b>6,516</b>	<b>10,882</b>	<b>4,724</b>	<b>69,122</b>	<b>4,396</b>	<b>203,700</b>	<b>12,129</b>	<b>311,469</b>
	2.1	3.5	1.5	22.2	1.4	65.4	3.9	
Florida Atlantic ---	<b>22,646</b>	<b>3,057</b>	-----	<b>45,071</b>	<b>749</b>	<b>54,088</b>	<b>21,130</b>	<b>146,741</b>
	15.4	2.2	-----	30.7	0.5	36.8	14.4	
Eastern Gulf Coast--	<b>9,361</b>	NA	<b>593</b>	<b>28,735</b>	<b>78,371</b>	<b>246,332</b>	<b>40,931</b>	<b>404,323</b>
	2.3	NA	0.1	7.2	19.4	60.9	10.1	
Louisiana -----	<b>1,651</b>	NA	NA	NA	<b>1,419</b>	<b>26,447</b>	<b>7,611</b>	<b>37,128</b>
	4.5	NA	NA	NA	3.8	71.2	20.5	
Texas -----	<b>9,246</b>	<b>65</b>	<b>89,127</b>	<b>816</b>	<b>9,508</b>	<b>187,855</b>	<b>80,545</b>	<b>377,162</b>
	2.5	0.02	23.6	0.2	2.5	49.8	21.4	
TOTALS -----	<b>90,410</b>	<b>14,746</b>	<b>101,019</b>	<b>168,161</b>	<b>101,992</b>	<b>918,015</b>	<b>256,357</b>	<b>1,650,700</b>
	5.5	0.9	6.1	10.2	6.2	55.6	15.5	

4,500 acres of the group area, barren land 22 percent or a little more than 3,200 acres (primarily beaches), and forest land 5 percent or nearly 800 acres. Between 1945-55 and 1972-75 the predominant land use and land cover trend on the New England barrier islands was toward an increase in urban land of 47 percent, or a little over 2,000 acres. This urbanization was primarily at the expense of wetland, which diminished by 21 percent or nearly 1,200 acres.

Group 2, the New York Bight barrier islands, is a quite different island group morphologically. Stretching from Sandy Neck, Mass., to Rockaway, N.Y. (App. II, figs. 12-27), this group is a remnant of Pleistocene glaciation, composed of glacial and fluvioglacial deposits (King and Beikman, 1974). The coastal zone adjacent to the New York Bight is hilly, with moderate local relief and

gentle slopes. The barrier island shorelines are primarily of sandy beach form, although some are characterized by pocket beaches (Putnam and others, 1960). With a total area of nearly 64,000 acres in the 40 islands, 24 evidence some urban development, 9 are more than 50 percent urbanized, and 2—Madaket and North Haven—are totally urbanized.

Although the Group 2 islands had over 17,000 acres of urban or built-up land in 1972-75 (nearly three times that in Group 1; see table 6), this acreage corresponded to 27 percent of the total group area, much less than the 43 percent value in Group 1. One reason for this is that several of the Group 2 islands are physically isolated so access is limited. Muskeget, Nashawena, Cuttyhunk, and Block Islands, as well as parts of Martha's Vineyard and Nantucket, are good examples. Another reason is

TABLE 6.—Area values of Level I land use and land cover on barrier islands for 1972-75, by regional group

[Acres in thousands (**boldface type**); percents below (lightface); dashes (-----) indicate negligible or no mapping data available; NA indicates category not applicable]

Island location by group	Urban or built-up land	Agricultural land	Rangeland	Forest land	Water bodies	Wetland	Barren land	Total acres
New England -----	<b>6,291</b>	-----	-----	<b>779</b>	-----	<b>4,461</b>	<b>3,238</b>	<b>14,769</b>
	42.6	-----	-----	5.3	-----	30.2	21.9	
New York Bight ---	<b>17,162</b>	<b>589</b>	<b>6,187</b>	<b>2,195</b>	<b>1,345</b>	<b>14,340</b>	<b>21,786</b>	<b>63,604</b>
	27.0	0.9	9.7	3.5	2.1	22.5	34.3	
Mid-Atlantic -----	<b>52,173</b>	<b>435</b>	-----	<b>18,469</b>	<b>6,380</b>	<b>158,441</b>	<b>73,681</b>	<b>309,579</b>
	16.8	0.1	-----	6.0	2.1	51.2	23.8	
Sea Islands -----	<b>19,636</b>	<b>6,611</b>	<b>3,930</b>	<b>66,498</b>	<b>5,498</b>	<b>194,010</b>	<b>15,769</b>	<b>311,952</b>
	6.3	2.1	1.3	21.3	1.8	62.2	5.0	
Florida Atlantic ---	<b>69,659</b>	<b>2,281</b>	<b>214</b>	<b>26,618</b>	<b>1,171</b>	<b>39,754</b>	<b>10,745</b>	<b>150,442</b>
	46.3	1.5	0.1	17.7	0.8	26.4	7.2	
Eastern Gulf Coast--	<b>37,602</b>	<b>156</b>	<b>3,176</b>	<b>36,513</b>	<b>75,721</b>	<b>217,688</b>	<b>35,575</b>	<b>406,431</b>
	9.2	0.04	0.8	9.0	18.6	53.6	8.8	
Louisiana -----	<b>6,746</b>	NA	NA	NA	<b>1,504</b>	<b>24,030</b>	<b>6,238</b>	<b>38,518</b>
	17.5	NA	NA	NA	3.9	62.4	16.2	
Texas -----	<b>19,410</b>	<b>88</b>	<b>85,305</b>	<b>1,152</b>	<b>9,631</b>	<b>186,158</b>	<b>82,209</b>	<b>383,953</b>
	5.1	0.02	22.2	0.3	2.5	48.5	21.4	
TOTALS -----	<b>228,679</b>	<b>10,160</b>	<b>98,812</b>	<b>152,224</b>	<b>101,250</b>	<b>838,882</b>	<b>249,241</b>	<b>1,679,248</b>
	13.6	0.6	5.9	9.1	6.0	50.0	14.8	

TABLE 7.—*Changes in area values of Level I land use and land cover on barrier islands between 1945-55 and 1972-75, by regional group*[Acres in thousands (**boldface type**); percents below (lightface); dashes (-----) indicate negligible or no mapping data available; + sign only indicates increase not compared; NA indicates category not applicable]

Island location by group	Urban or built-up land	Agricultural land	Rangeland	Forest land	Water bodies	Wetland	Barren land	Changes mapped between 1945-55 and 1972-75
New England -----	+2,012	-----	-105	+53	-----	-1,166	+303	+1,097
	+47.0	-----	-100.0	+7.0	-----	-21.0	+10.0	+8.0
New York Bight ---	+6,685	+36	-283	-897	+217	-285	+433	+5,906
	+39.0	+7.0	-4.0	-29.0	+19.0	-2.0	+2.0	+10.0
Mid-Atlantic -----	+25,939	+246	-----	-2,130	-41	-20,900	+3,640	+7,072
	+99.0	+130.0	-----	-10.0	-0.6	-12.0	+6.0	+2.0
Sea Islands -----	+13,120	-4,271	-794	-2,624	+1,102	-9,690	+3,617	+483
	+201.0	-39.0	-17.0	-4.0	+25.0	-5.0	+30.0	+0.2
Florida Atlantic ---	+47,013	-776	+214	-18,453	+422	-14,331	-10,385	+3,701
	+208.0	-25.0	+	-41.0	+56.0	-27.0	-49.0	+3.0
Eastern Gulf Coast-	+28,241	+156	+2,583	+7,778	-2,650	-28,644	-5,356	+2,108
	+302.0	+	+436.0	+27.0	-3.0	-12.0	-13.0	+1.0
Louisiana -----	+5,095	NA	NA	NA	+85	-2,417	-1,373	+1,390
	+309.0	NA	NA	NA	+6.0	-9.0	-18.0	+4.0
Texas -----	+10,164	+23	-3,822	+336	+123	-1,697	+1,664	+6,791
	+110.0	+35.0	-4.0	+41.0	+1.0	-0	+2.0	+2.0
TOTALS -----	+138,269	-4,586	-2,207	-15,937	-742	-79,133	-7,116	+28,548
	+153.0	-31.0	-2.0	-10.0	-0.7	-9.0	-3.0	+2.0

that several islands, including Eastham, Nauset, and Monomoy, are protected as national seashores, national wildlife refuges, or state parks. In 1972-75, besides the 17,000 acres in urban or built-up land, the New York Bight islands had approximately 22,000 acres in barren land (primarily beaches), 14,000 acres in wetland, 6,000 acres in rangeland (vegetated dunes), and 2,200 acres in forest land.

Land use and land cover change on these islands was minimal between 1945-55 and 1972-75, except in the urban or built-up category where there was a 39 percent or 6,700-acre increase. Contributing to this were corresponding decreases in forest land (900 acres), rangeland (300 acres), and wetland (300 acres). Interestingly, the total Group 2 area increased by nearly 6,000 acres. Such a large increase in total area is difficult to explain with certainty since it is unlikely that filling operations accounted for so much additional land area. It is more probable that part of this measured change is erroneous, and is the cumulative effect of smaller inaccuracies in interpretation and measurement. Of the changes in total group area, between 1945-55 and 1972-75, Group 2 with 10 percent had the largest percentage area change for all eight groups. Most of the other changes fell within four percent, a range almost entirely attributable to error in interpretation and to mensuration technique. The statistical significance of measured changes is discussed later in the report.

Continuing south along the coast, from Sandy Hook, N.J. to North Island, S.C., are the Group 3 or Mid-

Atlantic barrier islands (App. II, figs. 28-52). This entire group forms a part of the seaward edge of the continent's eastern coastal plain. These islands are characterized by broad sandy beaches, and are primarily composed of Pleistocene marine sediments (Dolan, 1970; King and Beikman, 1974). There are 53 barrier islands in the Mid-Atlantic group, with a total area of over 300,000 acres. Of the 53 islands, 35 contain some urban development. Only 6 however, Sandy Hook, Barnegat, Long Beach, Atlantic City, Ocean City, and Fenwick South, are more than 50 percent urbanized, and none are totally urbanized.

Wetland vegetation is the predominant land cover type throughout this group with nearly 159,000 acres, or just over half the total group area. Wetlands form a nearly continuous strip along the back-bay side of these barrier islands. The next major area, with over 73,000 acres or 24 percent in barren land, is primarily ocean-front beach and dunes. Urban or built-up land is third in extent with 52,000 acres or 17 percent. Most of this consists of resort cities, such as Wildwood, Rehoboth, Bethany, and Ocean City. These areas are characterized by extensive commercial sectors (hotels, motels, and restaurants) and large seasonal population fluctuations. There are, however, some permanent urbanized communities in Group 3 that maintain a more stable population and economy throughout the year. The New Jersey coastline between Atlantic City and Ocean City is the best example. Urban development on these Mid-Atlantic barrier islands has typically located along the primary dune line, and extended back through the adjacent

grassland zone. In highly developed areas, building has continued even farther back-island, into the marshlands bordering the back-bays.

Between 1945-55 and 1972-75 the most significant changes occurring on the Mid-Atlantic islands were in the urban or built-up and wetland categories. As with Group 2, the largest change occurred in the area of urban land, which doubled, increasing by nearly 26,000 acres. Most of this urban expansion was into wetlands, which decreased by nearly 21,000 acres or 12 percent.

Group 4, the Sea Islands, extends from South Island, S.C. to Cumberland Island, Ga. (App. II, figs. 53-62). These 44 islands are also a part of the eastern coastal plain but, unlike their Mid-Atlantic counterparts, are primarily composed of Holocene, not Pleistocene, sediments (King and Beikman, 1974). They are further differentiated from the Group 3 islands by their physical structure. While the Mid-Atlantic islands are primarily a system of elongated sandy beaches, the Sea Islands exhibit no such elongated, interconnecting beach characteristic. These islands stand more as individual outliers of a broad wetland-estuarine system.

Group 4 has a total area of 312,000 acres: of its 44 islands, only 15 have any urban development, and only one, Sullivan's, is more than 50 percent urbanized. The Sea Islands are largely dominated by wetland vegetation which totals over 194,000 acres, or more than 60 percent of their total area. Forest land also occupies a relatively large area with over 66,000 acres. Urban or built-up land, on the other hand, constitutes less than 7 percent of the total area with just under 20,000 acres. Even so, there has been a threefold or 13,000 acre increase in urban land use between 1945-55 and 1972-75. Accompanying this urban area increase were corresponding decreases in the area of agricultural land by over 4,000 acres (-39 percent), and in wetland by over 9,000 acres (-5 percent).

Group 5, the Florida Atlantic barrier islands, begins at Amelia Island and continues to Key Biscayne (App. II, figs. 63-77). The first 12 of its 22 islands, including Hutchinson Island, are composed of Holocene materials, and the remaining 10, from Jupiter Island south, of Pleistocene materials (King and Beikman, 1974). All these islands are more like those in Group 3, and less like those in Group 4, in that they form an elongated beach continuum rather than a series of dissected islands.

Based on the 1972-75 data, 21 of these 22 islands show some urban development. Of these, 11 are more than 50 percent urbanized, and 1 (Hillsboro Beach) is totally urbanized. Out of a total area of about 150,000 acres, almost 70,000 acres are in urban or built-up land. The second largest category is wetland, comprising nearly 40,000 acres or 26 percent of the total area. Forest land occupies about 27,000 acres, or roughly 18 percent of the Group 5 area, while barren land covers nearly 11,000 acres or just over 7 percent of the total.

Between 1945-55 and 1972-75 changes on the Florida Atlantic barrier islands were extensive. As in the Group 4 islands, urban or built-up land, for example, sustained a threefold increase, corresponding in this case to over 47,000 acres. Balancing this urban increase were marked decreases in several other land use and land cover categories. Forest land was most affected, losing over 18,000 acres (-41 percent). Wetland area decreased by more than 14,000 acres (-27 percent), and barren land lost over 10,000 acres (-49 percent).

Immediately adjacent to the Florida Atlantic barrier islands, on the south side, are the Florida Keys. Geologically, the Keys form a break in the chain of Atlantic and Gulf coast barrier islands. Whereas Florida's barrier islands are formed of sand, the Florida Keys are formed of limestone. As a result of this morphological distinction, and since the Florida Keys are a relatively small proportion of all barrier islands, the Barrier Island work group elected not to include these in its study.

The Group 6 or Eastern Gulf Coast barrier islands, form a chain northwestward from the Keys along the Gulf of Mexico, beginning at Cape Sable, Fla., and continuing to Cat Island, Miss., (App. II, figs. 78-104). This group includes 68 islands of varying geological composition. Most of the Florida barrier islands are composed of either Eocene, Miocene, or Pleistocene sediments. However, all the Alabama and Mississippi islands are composed of Holocene materials (King and Beikman, 1974), and many are backed by extensive marshlands.

As a group, the Eastern Gulf Coast barrier islands are much less developed than the Florida Atlantic islands. Of the 68, only 39 or 57 percent have some urban development, and of these only 12 islands (18 percent) are more than 50 percent urbanized. None are totally urbanized. Based on the 1972-75 data, the Group 6 islands have a total area of over 406,000 acres. Wetland, the largest area, amounts to more than 217,000 acres or 54 percent of the total. Water bodies, primarily as embayments, form the next largest area with nearly 76,000 acres (19 percent), while barren land, forest land, and urban or built-up land all total approximately 36,000 acres or roughly 9 percent each.

Between 1945-55 and 1972-75, the greatest change on the Group 6 islands occurred in urban or built-up land, which increased by slightly more than 28,000 acres. This considerable gain (302 percent) coincided with losses of 12 percent in wetland (29,000 acres), of 3 percent in water bodies (-2,600 acres), and 13 percent in barren lands (-5,400 acres). There were also gains of 436 percent in rangeland (+2,600 acres), and of 27 percent in forest land (+7,800 acres).

Farther to the west in the Gulf of Mexico, stretching from the Chandeleur Islands to Isle Dernieres, are the Louisiana, or Group 7, barrier islands (App. II, figs. 105-112). Totalling nearly 39,000 acres, this entire

group is composed of fine-grained deltaic deposits of Holocene age from the Mississippi River (Dolan, 1970; King and Beikman, 1974). Of these 18 islands, only Grand Isle is linked to the mainland by road. Most of the others form the leading edge of an isolated and segmented wetland-estuarine system.

Only 8 of the Louisiana islands contain any urban development and all of those are less than half urbanized. Grand Isle is the most extensively developed, with 48 percent of its area or 1,900 acres in urban or built-up land. The major portion of the group's land area consists of 24,000 acres in wetlands, or 62 percent of the total area. Urban or built-up land is next in extent with just over 6,700 acres or 18 percent. A large part of this usage is related to the offshore oil and natural gas industry, with a comparatively small part devoted to residential or recreational land. Barren land occupies roughly the same area as urban or built-up land, just over 6,200 acres.

The basic pattern of land use and land cover change on the Louisiana barrier islands is typical of most other groups between 1945-55 and 1972-75. Urban or built-up land area has increased, while wetland area has decreased. The magnitude of change was, however, greater in Louisiana than in most other island groups. For example, in the Louisiana group with less than 39,000 total acres, the urban or built-up land area increased by more than 5,000 acres. Whereas in 1945-55 urban or built-up land accounted for 4.5 percent of the total Group 7 area, by 1972-75 this figure had soared to 17.5 percent, an increase of 13 percentage points. Within most other barrier island groups, the percentage of urban or built-up land increased by only 3 to 9 points during the same period. The development of Louisiana's offshore petroleum industry is the primary reason for this difference.

The Texas barrier island group, the eighth and final in this regional stratification, ranges from Bolivar Peninsula to Brazos Island, Texas (App. II, figs. 113-125). Much of the backing coastal zone is composed of Pleistocene materials, although the islands themselves are almost entirely composed of Holocene deposits (King and Beikman, 1974). Their physical appearance is similar to the Mid-Atlantic barrier islands, with an interconnecting system of elongated sandy beaches backed by an extensive wetland-estuarine system.

Of the eight island groups, Texas has the second largest total area with nearly 384,000 acres. Also, with 16 it has the fewest number of islands, making them some of the largest along the Atlantic and Gulf coasts. Of these 16 islands, 11 contain some urban or built-up land. None, however, are more than 50 percent urbanized. Galveston Island is the most extensively developed, with 33 percent of its land area in an urban condition. To put this value in perspective, however, although only one-third of the area, it corresponds to nearly 10,000 acres, giving Galveston one of the largest proportions in

urban or built-up land of all 282 barrier islands. In Group 8, as with most other groups, the largest individual land use and land cover category is wetland, with about 186,000 acres or 49 percent of the total area. This is followed by more than 85,000 acres in rangeland (22 percent), 82,000 acres in barren land (21 percent), and slightly less than 20,000 acres in urban or built-up land (5 percent).

Despite the diversity of land use and land cover types in Group 8, land use and land cover changes between 1945-55 and 1972-75 were dominated by 2 categories, urban or built-up land and rangeland. Urban or built-up land more than doubled during this period, increasing by over 10,000 acres. Rangeland, on the other hand, decreased in area by nearly 4,000 acres.

### STATISTICAL SIGNIFICANCE

At the beginning of the data compilation process it was recognized that inherent error factors exist in photointerpretation, area measurement, and change mensuration procedures. Although some assumptions can be made in assessing the accuracy of a given data set based on consistency factors of interpreters and equipment, these assumptions cannot be applied to all compilation variables. Thus, to validate assessments of land use and land cover changes for the barrier islands, this investigator needed to know if the values of change, as measured by a planimeter, were real, or part of the inherent error involved in the mapping and measuring technique. A particular concern was with the statistical significance of the change values that resulted from mapping work done at two different times, with different types of photography, and at several different scales.

To determine the amount of change which could be attributable to procedural "noise" versus real change, a statistical technique was designed and applied to the land use and land cover change data. Based on the standard error factor for mapping at various scales, and the areas of measured categories, the expected value of area change—that is, the change resulting from inherent technique errors—was calculated. A test of the null hypothesis, which assumes the change in area to be due to measurement error, was then employed to determine whether or not the indicated change was caused by error in measurement alone. If the null hypothesis was rejected (indicating that the change in area was probably real) then an alternative hypothesis, which assumes the change in area to be real, was tested. The alternative hypothesis was evaluated at the 95 percent level of confidence using the Student's t-statistic. Acceptance of the alternative hypothesis indicates that the change in land use area was real. The results of this evaluation are presented in table 8.

As table 8 shows, it is possible to discern several significant statistical characteristics in the study's land

TABLE 8.—*Statistical significance of land use and land cover area changes by regional group*

[The "N" signifies acceptance of null hypothesis meaning that the change measured was probably due to measurement error. The "A" signifies acceptance of the alternative hypothesis meaning that the change measured was probably real, at the 95 percent confidence level]

Island group	Urban or built-up land	Agricultural land	Range-land	Forest land	Water bodies	Wetland	Barren land
New England	A		A			A	N
New York Bight	A	N	N	A	N	N	N
Mid-Atlantic	A	N		N	N	A	A
Sea Islands	A	A	A	A	A	A	A
Florida Atlantic	A	A	N	A	A	A	A
East Gulf Coast	A	A	A	A	A	A	A
Louisiana	A				N	A	A
Texas	A	N	A	N	N	N	N

use and land cover change data. For example, in all 8 of the barrier island regional groups, the measured change in urban or built-up land area was determined to be statistically significant at the 95 percent level of confidence. This determination indicates that most of the area change measured was real, that is, not attributable to inherent measurement error. The relatively large increases in each region's urban or built-up area, which ranged from about 2,000 acres in the New England group to about 47,000 acres in the Florida Atlantic group, accounted for the statistical determination that the changes were real rather than inherently erroneous.

In contrast to this condition, area changes in agricultural land were not as statistically significant. Of the 8 island groups, only 5 contained any agricultural land—New York Bight, Mid-Atlantic, Sea Islands, Florida Atlantic, and Texas. Of these, the Sea Islands and the Florida groups were the only 2 with statistically significant area changes between 1945–55 and 1972–75. In both cases, moreover, the area of change was sizeable. The Sea Islands agricultural area dropped from about 10,900 acres to 6,600 acres, for a 4,300-acre loss during the 25-year period. In the same period, the same land use in the Florida Atlantic islands dropped from 3,100 acres to 2,300 acres, for an 800-acre loss. Comparatively, agricultural land area changes in the other 3 island groups were small, amounting to about 20 acres, 40 acres, and 250 acres respectively for the islands of Texas, New York Bight, and Mid-Atlantic, which accounted for the acceptance of the null hypothesis for these groups.

### CONCLUSIONS

Land use and land cover patterns on barrier islands vary widely in response to geographically diverse natural, cultural, and economic conditions. There are, however, several general patterns which prevail over most of the Atlantic and Gulf coast islands. For example, wetland and barren land (primarily beaches and

dunes) are naturally dominant cover conditions and are often accompanied by sizeable areas of forest land. Of the nearly 1.7 million acres making up the 282 barrier islands, wetland covers roughly half or 840,000 acres. Barren land occupies another 15 percent or 250,000 acres, while forest land covers slightly less than 10 percent or over 150,000 acres. The area of urban or built-up land is slightly less than the area of barren land, which means that four categories—wetland, urban or built-up land, barren land, and forest land—account for nearly 90 percent of the total 2,600-square mile area of Atlantic and Gulf Coast barrier islands.

From a regional perspective, the most developed barrier islands are those in the Florida Atlantic group. Not only do these Group 5 islands have the largest total urbanized acreage, nearly 70,000 acres, but they also have, with more than 46 percent, the largest proportion of urban or built-up area of any group. Identification of the least developed group among the barrier islands depends on the criteria used to determine extent or degree of development. For example, with about 6,300 acres, the New England group has the smallest urban or built-up area. Accounting for nearly 43 percent of the Group 1 land area, however, this value represents the second largest urban area percentage among all the groups. New England also has the smallest total area among the 8 groups. The Texas group, on the other hand, has over 19,000 urbanized acres (more than three times that in New England), yet maintains the smallest urbanized percent of total area at just over 5 percent. Texas has the second largest total group area with over 380,000 acres.

The most significant aspect of barrier island land use and land cover patterns relates to recent changes. During the intervening period from 1945–55 to 1972–75, all categories of land use and land cover decreased except urban or built-up land, which increased by 138,000 acres. Wetlands were most affected by this urban development, losing nearly 80,000 acres. Forest land lost about 16,000 acres, while barren land decreased by 7,000. The most significant regional changes occurred on the Group 5 Florida Atlantic barrier islands where urban or built-up land increased by over 47,000 acres, while forest land, wetland, barren land, and agricultural land all decreased by about 20,000, 15,000, 10,000, and 1,000 acres respectively. The Group 6 Eastern Gulf Coast barrier islands also sustained significant changes during the 1945–55 to 1972–75 period. Urbanized land increased by more than 28,000 acres and forest land increased by nearly 8,000 acres, while wetlands were reduced by 30,000 acres and barren land lost over 5,000 acres. Although the two Florida groups appear to have undergone some of the largest changes recently, the land use and land cover data presented in this report indicate that barrier islands from Maine to Texas have experienced substantial increases in urban land use since World War II.

**REFERENCES CITED**

- Anderson, J. R., Hardy, E. E., Roach, J. R., and Witmer, R. E., 1976, A land use and land cover classification system for use with remote sensor data: U.S. Geological Survey Professional Paper 964, 28 p.
- Carter, J. E., 1977, Presidential message to the Congress on the environment, Office of White House Press Secretary, May 23, 23 p.
- Dolan, Robert, 1970, Coastal landforms: National Atlas of the United States of America, Washington, D.C., Government Printing Office, p. 78-79.
- Dolan, Robert, Hayden, Bruce, and Vincent, Mary, 1975, Classification of the coastal landforms of the Americas: *Zeitschrift fur Geomorphologie*, Supplementband, v. 22, p. 72-88.
- King, P. B., and Beikman, H. M., 1974, Geologic map of the United States: U.S. Geological Survey, scale 1:2,500,000, 3 sheets.
- Putnam, W. C., Axelrod, D. I., Bailey, H. P., and McGill, J. T., 1960, Natural coastal environments of the world: Washington, D.C., Government Printing Office, 140 p. with maps.

## APPENDIX I

Area values of land use and land cover on Atlantic and Gulf Coast barrier islands,  
1945-55 and 1972-75 with changes (tables 9-27).

Throughout the following broad measure tables, acres are in **boldface type**, percents in lightface; dashes (----) indicate negligible mapping data or none available; NA indicates category not applicable; + sign alone indicates increase not compared.









TABLE 11.—Changes in area values of Level I land use and land cover for 27 barrier islands off the Massachusetts coast—Continued

Name of island	Years compared	Urban or built-up land Acres	%	Agricultural land Acres	%	Rangeland Acres	%	Forest land Acres	%	Water bodies Acres	%	Wetland Acres	%	Barren land Acres	%	Year totals
Eastham	1945-55	-0-	0.0	NA	NA	NA	NA	NA	NA	NA	NA	674	82.6	142	17.4	816
	1972-75	166	18.5	NA	NA	NA	NA	NA	NA	NA	NA	730	81.5	-0-	0.0	896
Nauset	1945-55	193	8.6	NA	NA	NA	NA	NA	NA	NA	NA	837	37.2	1,219	54.2	2,249
	1972-75	672	21.5	NA	NA	NA	NA	NA	NA	NA	NA	1,312	41.9	1,146	36.6	3,130
Monomoy	1945-55	+479	+248.0	NA	NA	NA	NA	NA	NA	NA	NA	+475	+57.0	-73	-6.0	+39.0
	1972-75	NA	NA	NA	NA	NA	NA	164	6.1	182	6.7	439	16.1	1,935	71.1	2,720
Coatue	1945-55	NA	NA	NA	NA	NA	NA	-0-	0.0	58	2.2	166	6.3	2,400	91.5	2,624
	1972-75	NA	NA	NA	NA	NA	NA	-164	-100.0	-124	-68.0	-273	-62.0	+465	+24.0	-4.0
Madaket	1945-55	NA	NA	NA	NA	511	29.9	NA	NA	38	2.2	261	15.3	899	52.6	1,709
	1972-75	NA	NA	NA	NA	800	45.6	NA	NA	38	2.2	390	22.2	525	30.0	1,753
Muskeget Island	1945-55	70	23.0	NA	NA	+289	+57.0	NA	NA	-0-	0.0	+129	+49.0	-374	-42.0	+3.0
	1972-75	77	100.0	NA	NA	NA	NA	NA	NA	NA	NA	142	46.6	93	30.4	305
Cape Poge	1945-55	+7	+10.0	NA	NA	NA	NA	NA	NA	NA	NA	-0-	0.0	-0-	0.0	77
	1972-75	NA	NA	NA	NA	30	9.1	NA	NA	NA	NA	-142	-100.0	-93	-100.0	-75.0
Katama Bay	1945-55	NA	NA	NA	NA	-0-	0.0	NA	NA	NA	NA	NA	NA	298	90.8	328
	1972-75	NA	NA	NA	NA	-30	-100.0	NA	NA	NA	NA	NA	NA	346	100.0	346
Edgartown Great Ponds	1945-55	NA	NA	NA	NA	302	56.6	NA	NA	NA	NA	NA	NA	+48	+16.0	+5.0
	1972-75	NA	NA	NA	NA	474	69.2	NA	NA	NA	NA	NA	NA	211	30.8	685
Tisbury Great Ponds	1945-55	NA	NA	NA	NA	+172	+57.0	NA	NA	NA	NA	NA	NA	-21	-9.0	+28.0
	1972-75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	103	100.0	103
Nashawena	1945-55	NA	NA	NA	NA	236	58.6	NA	NA	NA	NA	NA	NA	+76	+74.0	+74.0
	1972-75	NA	NA	NA	NA	320	100.0	NA	NA	NA	NA	NA	NA	204	46.3	440
Cuttyhunk Island	1945-55	-0-	0.0	NA	NA	+84	+35.0	NA	NA	NA	NA	NA	NA	-0-	0.0	320
	1972-75	6	1.9	NA	NA	307	98.1	NA	NA	NA	NA	NA	NA	-204	-100.0	-27.0
Horseneck Beach	1945-55	+6	+	NA	NA	38	16.1	NA	NA	NA	NA	NA	NA	198	83.9	236
	1972-75	NA	NA	NA	NA	307	98.1	NA	NA	NA	NA	NA	NA	-0-	0.0	313
Category totals and Change totals	1945-55	19	2.3	NA	NA	614	91.5	38	5.7	NA	NA	NA	NA	NA	NA	671
	1972-75	19	3.0	NA	NA	608	97.0	-0-	0.0	NA	NA	NA	NA	NA	NA	627
Change totals	1945-55	-0-	0.0	11	0.8	-6	-1.0	-38	-100.0	NA	NA	NA	NA	NA	NA	-7.0
	1972-75	132	9.0	70	4.0	147	8.3	128	7.3	NA	NA	904	61.9	68	4.6	1,463
Change totals	1945-55	8,128	21.5	4,519	13.2	4,454	11.8	1,220	3.2	582	1.5	8,900	28.0	13,511	39.4	34,280
	1972-75	+3,609	+80.0	+59	+536.0	-339	-7.0	-90	-7.0	+54	+10.0	-708	-7.0	+896	+7.0	+10.0

TABLE 12.—Changes in area values of Level I land use and land cover for 6 barrier islands off the Rhode Island coast

Name of island	Years compared	Urban or built-up land Acres	Urban or built-up land %	Agricultural land Acres	Agricultural land %	Rangeland Acres	Rangeland %	Forest land Acres	Forest land %	Water bodies Acres	Water bodies %	Wetland Acres	Wetland %	Barren land Acres	Barren land %	Year totals
Charlestown	1945-55 1972-75 Δ	547 928 +381	23.9 37.1 +70.0	159 221 +62	6.9 8.8 +39.0	NA NA NA	NA NA NA	74 162 +88	3.2 6.5 +119.0	226 196 -30	9.9 7.8 -13.0	815 996 +181	35.6 39.8 +22.0	472 -0- -472	20.5 0.0 -100.0	2,293 2,503 +9.0
Weekapaug	1945-55 1972-75 Δ	117 170 +53	36.1 54.0 +46.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	207 145 -62	63.9 46.0 -30.0	NA NA NA	NA NA NA	324 315 -8.0
Atlantic	1945-55 1972-75 Δ	109 128 +19	25.9 30.7 +17.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	312 289 -23	74.1 69.3 -7.0	NA NA NA	NA NA NA	421 417 -1.0
Napatree <sup>1</sup>	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	103 - - 103	100.0 - - 100.0	103 - - 103
Stonington <sup>1</sup>	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	63 - - 63	100.0 - - 100.0	63 - - 63
Block Island	1945-55 1972-75 Δ	NA NA NA	NA NA NA	25 25 -0-	8.7 8.7 0.0	153 153 -0-	52.9 52.9 0.0	NA NA NA	NA NA NA	17 17 -0-	5.9 5.9 0.0	NA NA NA	NA NA NA	94 94 -0-	32.5 37.5 0.0	289 289 0.0
Category totals and Change totals	1945-55 1972-75 Δ	773 1,226 +453	23.3 34.8 +59.0	184 246 +62	5.5 7.0 +34.0	153 153 -0-	4.6 4.3 0.0	74 162 +88	2.2 4.6 +119.0	243 213 -30	7.3 6.0 -12.0	1,334 1,430 +96	40.1 40.6 +7.0	566 94 -472	17.0 2.7 -83.0	3,327 3,524 +6.0

<sup>1</sup> No photographic coverage for 1945-55; totals do not include data for these islands.

TABLE 13.—Changes in area values of Level I land use and land cover for 2 barrier islands off the Connecticut coast

Name of island	Years compared	Urban or built-up land Acres	Urban or built-up land %	Agricultural land Acres	Agricultural land %	Rangeland Acres	Rangeland %	Forest land Acres	Forest land %	Water bodies Acres	Water bodies %	Wetland Acres	Wetland %	Barren land Acres	Barren land %	Year totals
Hammonasset Point	1945-55 1972-75 Δ	-0- 250 +250	0.0 28.7 +	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	778 563 -215	91.9 64.6 -28.0	69 58 -11	8.1 6.7 -16.0	847 871 +3.0
Black Rock	1945-55 1972-75 Δ	264 326 +62	69.5 67.1 +23.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	116 160 +44	30.5 32.9 +38.0	380 486 +28.0
Category totals and Change totals	1945-55 1972-75 Δ	264 576 +312	21.5 42.4 +118.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	778 563 -215	63.4 41.5 -28.0	185 218 +33	15.1 16.1 +18.0	1,227 1,357 +11.0

TABLE 14.—Changes in area values of Level I land use and land cover for 15 barrier islands off the New York coast

Name of island	Years compared	Urban or built-up land Acres	%	Agricultural land Acres	%	Rangeland Acres	%	Forest land Acres	%	Water bodies Acres	%	Wetland Acres	%	Barren land Acres	%	Year totals
Fisher Island	1945-55 1972-75 Δ	478 718 +240	19.7 30.0 +50.0	NA NA NA	NA NA NA	577 511 -66	23.9 21.3 -11.0	1,267 1,025 -242	52.5 42.7 -9.0	93 119 +26	3.9 5.0 +23.0	-0- 17 +17	0.0 0.7 +	-0- 9 +9	0.0 0.3 +	2,415 2,399 -1.0
Gardiners Island	1945-55 1972-75 Δ	NA NA NA	NA NA NA	358 273 -85	19.8 15.0 -24.0	947 1,069 +122	52.4 58.4 +13.0	93 94 +1	5.1 5.1 +1.0	220 269 +49	12.2 14.7 +22.0	NA NA NA	NA NA NA	189 126 -63	10.5 6.8 -33.0	1,897 1,881 -1.0
Fireplace	1945-55 1972-75 Δ	30 73 +43	30.3 83.0 +143.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	69 15 -54	69.7 17.0 -73.0	99 -88 -11.0
Maidstone Park	1945-55 1972-75 Δ	-0- 36 +36	0.0 31.3 +	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	40 -0- -40	26.6 0.0 -100.0	100 79 -21	73.4 68.7 -21.0	140 115 -18.0
Northwest Harbor	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	90 90 0	100.0 100.0 0.0	90 90 0.0
Shelter Island	1945-55 1972-75 Δ	163 365 +202	32.3 66.4 +124.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	282 134 -148	56.0 24.4 -52.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	59 51 -8	11.7 9.2 -14.0	594 550 -9.0
Orient Beach	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	365 384 +19	100.0 100.0 +5.0	365 384 +5.0
North Haven	1945-55 1972-75 Δ	47 147 +100	31.3 100.0 +213.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	101 -0- -101	68.7 0.0 -100.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	148 147 -1.0
Morton	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	149 183 +34	66.5 82.4 +23.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	75 39 -36	33.5 17.6 -48.0	224 222 -1.0
Southampton	1945-55 1972-75 Δ	75 137 +62	14.4 23.0 +83.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	446 457 +11	85.6 77.0 +3.0	521 594 +14.0
Hampton	1945-55 1972-75 Δ	738 1,028 +290	32.6 38.4 +39.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	799 448 -351	35.2 18.2 -44.0	729 1,159 +430	32.2 43.4 +59.0	2,266 2,635 +18.0
Fire Island	1945-55 1972-75 Δ	935 1,881 +946	14.8 27.1 +101.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	336 72 -264	5.3 1.0 -79.0	NA NA NA	NA NA NA	1,788 1,522 -266	28.4 21.9 -15.0	3,242 3,466 +224	51.5 50.0 +7.0	6,301 6,941 +10.0
Jones Beach Island	1945-55 1972-75 Δ	759 1,191 +432	9.2 12.3 +57.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	44 162 +118	0.5 1.6 +268.0	4,232 5,219 +987	51.3 32.2 +23.0	3,224 3,115 -109	39.0 32.2 -3.0	8,259 9,687 +17.0
Long Beach	1945-55 1972-75 Δ	2,237 2,927 +690	68.6 83.7 +30.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	596 162 -434	18.3 4.6 -73.0	428 410 -18	13.1 11.7 -4.0	428 410 -18	13.1 11.7 -4.0	3,281 3,499 +7.0
Rockaway	1945-55 1972-75 Δ	2,678 3,075 +397	77.1 80.0 +15.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	797 771 -26	22.9 20.0 -3.0	3,475 3,846 +11.0
Category totals and Change totals	1945-55 1972-75 Δ	8,140 11,578 +3,438	27.2 35.0 +42.0	358 273 -85	1.2 0.8 -24.0	1,524 1,580 +56	5.1 4.8 +4.0	2,228 1,508 -720	7.5 4.5 -32.0	337 550 +193	1.2 1.7 +54.0	7,455 7,368 -87	25.0 22.4 -1.0	9,813 10,171 +358	32.8 30.7 +4.0	29,875 33,028 +11.0

TABLE 15.—Changes in area values of Level I land use and land cover for 10 barrier islands off the New Jersey coast

Name of island	Years compared	Urban or built-up land Acres	%	Agricultural land Acres	%	Rangeland Acres	%	Forest land Acres	%	Water bodies Acres	%	Wetland Acres	%	Barren land Acres	%	Year totals
<b>Sandy Hook</b> -----	1945-55	1,355	58.6	NA	NA	NA	NA	613	26.5	NA	NA	132	5.7	214	9.2	2,314
	1972-75	2,406	80.7	NA	NA	NA	NA	96	3.2	NA	NA	154	5.2	326	10.9	2,982
	Δ	+1,151	+78.0					+507	-84.0			+22	+17.0	+112	+52.0	+29.0
<b>Barneget</b> -----	1945-55	3,117	49.2	NA	NA	NA	NA	124	2.0	32	0.5	1,791	28.2	1,277	20.1	6,341
	1972-75	3,302	51.6	NA	NA	NA	NA	83	1.3	64	1.0	1,869	29.2	1,082	16.9	6,400
	Δ	+185	+6.0					-41	-33.0	+32	+100.0	+78	+4.0	-195	-15.0	+1.0
<b>Long Beach Island</b> -----	1945-55	3,138	44.6	NA	NA	NA	NA	NA	NA	NA	NA	1,561	22.2	2,341	33.2	7,040
	1972-75	3,949	58.5	NA	NA	NA	NA	NA	NA	NA	NA	1,216	18.0	1,581	23.5	6,746
	Δ	+811	+26.0					NA	NA	NA	NA	-345	-22.0	-760	-32.0	-4.0
<b>Little Beach Island</b> -----	1945-55	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,081	61.0	691	39.0	1,772
	1972-75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,184	62.3	717	37.7	1,901
	Δ							NA	NA	NA	NA	+103	+10.0	+26	+4.0	+7.0
<b>Brigantine</b> -----	1945-55	715	13.6	88	1.7	NA	NA	301	5.7	26	0.5	2,516	47.9	1,611	30.6	5,257
	1972-75	973	20.0	224	4.6	NA	NA	346	7.1	32	0.7	2,112	43.5	1,171	24.1	4,858
	Δ	+258	+36.0		+154.0			+45	+15.0	+6	+23.0	-404	-16.0	-440	-27.0	-8.0
<b>Atlantic City</b> -----	1945-55	3,511	59.8	-0-	0.0	NA	NA	180	3.1	297	5.0	897	15.3	985	16.8	5,870
	1972-75	4,467	71.2	96	1.5	NA	NA	102	1.6	320	5.1	454	7.2	832	13.4	6,271
	Δ	+956	+27.0	+96	+			-78	-43.0	+23	+8.0	-443	-49.0	-153	-16.0	+7.0
<b>Ocean City</b> -----	1945-55	1,847	40.8	NA	NA	NA	NA	NA	NA	-0-	0.0	1,408	31.1	1,272	28.1	4,527
	1972-75	2,227	50.2	NA	NA	NA	NA	NA	NA	13	0.3	1,082	24.4	1,114	25.1	4,436
	Δ	+380	+21.0					NA	NA	+13	+	-326	-23.0	-158	-12.0	-2.0
<b>Ladlam</b> -----	1945-55	569	16.4	NA	NA	NA	NA	NA	NA	672	19.3	1,511	43.5	721	20.8	3,473
	1972-75	902	25.8	NA	NA	NA	NA	NA	NA	704	20.1	1,197	34.2	698	19.9	3,501
	Δ	+333	+59.0					NA	NA	+32	+5.0	-314	-21.0	-23	-3.0	+1.0
<b>Seven Mile Beach</b> -----	1945-55	1,382	26.5	-0-	0.0	NA	NA	105	2.0	64	1.2	2,586	49.6	1,077	20.7	5,214
	1972-75	2,048	38.2	38	0.7	NA	NA	-0-	0.0	115	2.2	2,054	38.3	1,101	20.6	5,356
	Δ	+666	+48.0	+38	+			-105	-100.0	+51	+80.0	-532	-21.0	+24	+2.0	+3.0
<b>Wildwood</b> -----	1945-55	2,112	38.2	NA	NA	NA	NA	NA	NA	512	9.2	2,218	40.1	692	12.5	5,534
	1972-75	2,445	44.4	NA	NA	NA	NA	NA	NA	576	10.5	1,933	35.1	550	10.0	5,504
	Δ	+333	+16.0					NA	NA	+64	-13.0	-285	-13.0	-142	-21.0	-1.0
<b>Category totals</b> -----	1945-55	17,746	37.4	88	0.2	NA	NA	1,323	2.8	1,603	3.4	15,701	33.2	10,881	23.0	47,342
<b>and</b> -----	1972-75	22,719	47.4	358	0.8	NA	NA	627	1.3	1,824	3.8	13,255	27.6	9,172	19.1	47,955
<b>Change totals</b> -----	Δ	+4,973	+28.0	+270	+307.0			-696	-53.0	+221	+14.0	-2,446	-16.0	-1,709	-16.0	+2.0

TABLE 16.—Changes in area values of Level I land use and land cover for 2 barrier islands off the Delaware coast

Name of island	Years compared	Urban or built-up land Acres	%	Agricultural land Acres	%	Rangeland Acres	%	Forest land Acres	%	Water bodies Acres	%	Wetland Acres	%	Barren land Acres	%	Year totals
<b>Rehoboth</b> -----	1945-55	1,170	17.6	NA	NA	NA	NA	182	2.7	53	0.8	3,976	60.1	1,238	18.8	6,619
	1972-75	1,606	24.0	NA	NA	NA	NA	-0-	0.0	230	3.4	2,995	44.9	1,850	27.7	6,681
	Δ	+436	+37.0					-182	-100.0	+177	+334.0	-981	-25.0	+612	+49.0	+1.0
<b>Fenwick Island North</b> ----	1945-55	337	9.7	101	2.9	NA	NA	514	14.8	61	1.8	1,735	50.0	719	20.8	3,467
	1972-75	1,350	39.3	26	0.8	NA	NA	64	0.6	32	0.9	1,120	32.8	838	24.4	3,430
	Δ	+1,013	+300.0	-75	-74.0			-450	-87.0	-29	-48.0	-615	-35.0	+119	+17.0	-1.0
<b>Category totals</b> ----	1945-55	1,507	15.0	101	1.0	NA	NA	696	6.9	114	1.1	5,711	56.6	1,957	19.4	10,086
<b>and</b> -----	1972-75	2,956	29.2	-26	0.2	NA	NA	64	0.6	262	2.6	4,115	40.7	2,688	26.7	10,111
<b>Change totals</b> -----	Δ	+1,449	+96.0	-75	-74.0			-632	-91.0	+148	+56.0	-1,596	-28.0	+731	+37.0	+0.2

TABLE 17.—Changes in area values of Level I land use and land cover for 2 barrier islands off the Maryland coast

Name of island	Years compared	Urban or built-up land Acres	%	Agricultural land Acres	%	Rangeland Acres	%	Forest land Acres	%	Water bodies Acres	%	Wetland Acres	%	Barren land Acres	%	Year totals
<b>Fenwick Island South</b> ---	1945-55	820	36.4	NA	NA	NA	NA	-0-	0.0	NA	NA	1,111	49.4	320	14.2	2,251
	1972-75	1,848	57.2	NA	NA	NA	NA	22	0.7	NA	NA	155	4.8	1,205	37.3	3,230
	Δ	+1,028	+125.0					+22	+			-956	-86.0	+885	+276.0	+43.0
<b>Assateague Island North</b> --	1945-55	NA	NA	NA	NA	NA	NA	484	5.0	100	1.0	5,302	54.2	3,888	39.8	9,774
	1972-75	NA	NA	NA	NA	NA	NA	629	6.1	160	1.6	5,820	56.8	3,645	35.5	10,254
	Δ							+145	+30.0	+60	+60.0	+518	+10.0	-243	-6.0	+5.0
<b>Category totals</b> ----	1945-55	820	6.8	NA	NA	NA	NA	484	4.0	100	0.9	6,413	53.3	4,208	35.0	12,025
<b>and</b> -----	1972-75	1,848	13.7	NA	NA	NA	NA	651	4.8	160	1.2	5,975	44.3	4,850	36.0	13,484
<b>Change totals</b> -----	Δ	+1,028	+125.0					+167	+35.0	+60	+60.0	-438	-7.0	+642	+15.0	+12.0

TABLE 18.—Changes in area values of Level I land use and land cover for 11 barrier islands off the Virginia coast

Name of island	Years compared	Urban or built-up land	Agricultural land	Rangeland	Forest land	Water bodies	Wetland	Barren land	Year totals
		Acres	Acres	Acres	Acres	Acres	Acres	Acres	
		%	%	%	%	%	%	%	
Assateague Island South	1945-55	-0-	NA	NA	1,579	20.6	3,487	2,411	7,695
	1972-75	67	NA	NA	1,710	23.7	3,147	2,250	7,197
	Δ	+67			+131	+8.0	-340	-161	-6.0
Wallops Island	1945-55	-0-	NA	NA	332	4.6	5,329	559	7,162
	1972-75	562	NA	NA	-0-	0.0	4,129	206	6,001
	Δ	+562			-332	-100.0	-1,200	-353	-16.0
Assawomen Island	1945-55	NA	NA	NA	NA	NA	1,953	109	2,686
	1972-75	NA	NA	NA	NA	NA	2,389	352	3,223
	Δ						+436	+243	+20.0
Metomkin Island	1945-55	NA	NA	NA	NA	NA	2,764	509	3,520
	1972-75	NA	NA	NA	NA	NA	2,636	504	3,374
	Δ						-128	-5	-4.0
Cedar Island	1945-55	NA	NA	NA	NA	NA	4,248	466	4,753
	1972-75	NA	NA	NA	NA	NA	3,614	667	4,318
	Δ						-634	+201	-9.0
Parramore Island	1945-55	NA	NA	NA	1,196	17.4	4,735	775	6,858
	1972-75	NA	NA	NA	611	8.2	4,320	2,347	7,403
	Δ				-585	-49.0	-415	+1,572	+8.0
Hog Island	1945-55	NA	NA	NA	253	5.2	4,063	575	4,891
	1972-75	NA	NA	NA	227	4.1	3,328	1,958	5,542
	Δ				-26	-10.0	-735	+1,383	+13.0
Cobb Island	1945-55	NA	NA	NA	NA	NA	2,341	396	2,737
	1972-75	NA	NA	NA	NA	NA	2,112	953	3,065
	Δ						-229	+557	+12.0
Smith Island	1945-55	-0-	NA	NA	-0-	0.0	16,377	1,302	18,011
	1972-75	38	NA	NA	286	1.5	16,361	2,285	19,247
	Δ	+38			+286	+	-16	+983	+7.0
Fishermans Island	1945-55	NA	NA	NA	NA	NA	337	587	924
	1972-75	NA	NA	NA	NA	NA	338	851	1,489
	Δ						+301	+264	+61.0
Bodie Island North	1945-55	-0-	0.0	NA	-0-	0.0	6,069	1,709	7,778
	1972-75	477	5.9	NA	1,653	0.2	3,730	2,132	8,059
	Δ	+477	+		+1,653	+	-2,339	+423	+4.0
Category totals and Change totals	1945-55	-0-	0.0	NA	3,360	5.4	51,703	9,398	67,015
	1972-75	1,144	1.6	NA	4,487	6.5	46,404	14,505	68,918
	Δ	+1,144	+		1,127	+33.5	-5,299	+5,107	+3.0



TABLE 19.—Changes in area values of Level I land use and land cover for 23 barrier islands off the North Carolina coast

Name of island	Years compared	Urban or built-up land Acres	%	Agricultural land Acres	%	Rangeland Acres	%	Forest land Acres	%	Water bodies Acres	%	Wetland Acres	%	Barren land Acres	%	Year totals
<b>Bodie Island South</b> -----	1945-55 1972-75 Δ	2,227 7,074 +4,847	5.4 15.6 +218.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	2,887 3,185 +298	7.0 6.9 +10.0	821 897 +76	2.0 1.9 +9.0	22,047 20,054 -1,993	53.3 44.1 -9.0	13,362 14,329 +965	32.3 31.5 +7.0	41,344 45,539 +4,195
<b>Hatteras Island</b> -----	1945-55 1972-75 Δ	809 2,224 +1,415	3.6 9.7 +175.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	-0- 162 +162	0.0 0.7 +	568 -0- -568	2.5 0.0 -100.0	13,706 12,477 -1,229	60.5 54.9 -9.0	7,556 7,875 +319	33.4 34.7 +1.3	22,639 22,738 +99
<b>Ocracoke Island</b> -----	1945-55 1972-75 Δ	208 433 +225	3.4 7.0 +108.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	-0- 39 +39	0.0 0.6 +	NA NA NA	NA NA NA	3,734 3,456 -278	60.9 56.7 -7.0	2,191 2,178 -13	35.7 35.7 0.0	6,133 6,106 -27
<b>Portsmouth Island</b> -----	1945-55 1972-75 Δ	113 193 +80	4.9 8.1 +71.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	1,351 765 -586	58.6 32.2 -43.0	841 1,417 +576	36.5 59.7 +68.0	2,305 2,375 +70
<b>Core Banks North</b> -----	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	1,423 1,333 -90	60.6 49.3 -6.0	927 1,372 +445	39.4 50.7 +43.0	2,350 2,705 +355
<b>Core Banks South</b> -----	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	-0- 31 +31	0.0 0.4 +	4,312 4,307 -5	55.9 55.7 -0.1	3,396 3,404 +8	44.1 43.9 +0.2	7,708 7,742 +34
<b>Shackleford Banks</b> -----	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	233 233 -0-	8.5 8.1 0.0	NA NA NA	NA NA NA	817 854 +37	29.9 29.7 +5.0	1,683 1,783 +100	61.6 62.2 +6.0	2,733 2,870 +137
<b>Bogue Banks</b> -----	1945-55 1972-75 Δ	378 3,646 +3,268	4.4 41.7 +865.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	4,060 1,964 -2,096	47.4 22.5 -51.0	-0- 14 +14	0.0 0.1 +	2,157 993 1,164	25.2 11.3 -54.0	1,964 2,132 +168	23.0 24.4 +9.0	8,559 8,749 +190
<b>Hammock Island</b> -----	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	184 145 -39	3.7 2.8 -21.0	NA NA NA	NA NA NA	4,032 4,171 +139	81.3 80.2 +3.0	744 882 +138	15.0 17.0 +16.0	4,960 5,198 +238
<b>Onslow Beach</b> -----	1945-55 1972-75 Δ	45 61 +16	1.2 1.7 +36.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	2,996 2,399 -597	80.6 66.5 -20.0	677 1,145 +469	18.2 31.8 +69.0	3,718 3,605 -113
<b>Ashe Island</b> -----	1945-55 1972-75 Δ	291 2,091 +1,800	3.0 22.3 +619.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	622 156 -466	6.4 1.6 -75.0	NA NA NA	NA NA NA	7,228 6,761 +467	74.3 72.1 -6.0	1,590 377 -1,213	16.3 4.0 -76.0	9,731 9,385 -346
<b>Lee Island</b> -----	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	1,379 1,321 -58	92.3 87.8 -4.0	115 185 +70	7.7 12.2 +61.0	1,494 1,506 +12
<b>Rich Inlet</b> -----	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	1,405 1,462 +57	84.2 94.0 +4.0	263 94 -169	15.8 6.0 -64.0	1,668 1,556 -112
<b>Figure Eight Island</b> -----	1945-55 1972-75 Δ	46 404 +358	1.1 10.4 +778.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	3,490 2,840 -650	85.5 73.5 -13.0	548 620 +72	13.4 16.1 +13.0	4,084 3,864 -220
<b>Wrightsville Beach</b> -----	1945-55 1972-75 Δ	311 577 +266	20.4 37.7 +86.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	1,057 733 -324	69.5 47.9 -31.0	154 221 +67	10.1 14.4 +44.0	1,522 1,531 +9
<b>Masonboro Island</b> -----	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	-0- 119 +119	0.0 3.2 +	NA NA NA	NA NA NA	3,114 2,977 -137	80.3 81.3 +4.0	764 579 -185	19.7 15.7 -24.0	3,878 3,675 -203



TABLE 20.—Changes in area values of Level I land use and land cover for 34 barrier islands off the South Carolina coast

Name of island	Years compared		Urban or built-up land		Agricultural land		Rangeland		Forest land		Water bodies		Wetland		Barren land		Year totals
	1945-55	1972-75	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	
Wailes Island	1945-55	1972-75	-0-	0.0	NA	NA	NA	NA	262	13.6	NA	NA	967	50.1	701	36.3	1,930
			339	24.4	NA	NA	NA	NA	269	19.2	NA	NA	749	53.7	38	2.7	1,995
	Δ		+339	+					+7	+3.0			-218	-23.0	-663	-95.0	-28.0
Murrells Inlet	1945-55	1972-75	98	3.1	NA	NA	NA	NA	NA	NA	529	16.9	2,098	66.9	409	13.1	3,134
			870	28.4	NA	NA	NA	NA	NA	NA	506	16.4	1,558	51.1	128	4.1	3,072
	Δ		+772	+788.0							-23	-4.0	-530	-25.0	-281	-69.0	-2.0
Pawleys Island	1945-55	1972-75	201	14.2	NA	NA	NA	NA	NA	NA	NA	NA	861	61.0	350	24.8	1,412
			595	37.5	NA	NA	NA	NA	NA	NA	NA	NA	973	61.3	19	1.2	1,587
	Δ		+394	+196.0									+112	+13.0	-331	-95.0	+12.0
Debidue Beach	1945-55	1972-75	-0-	0.0	NA	NA	NA	NA	326	18.4	16	0.9	1,144	64.6	286	16.1	1,772
			77	4.9	NA	NA	NA	NA	602	38.4	-0-	0.0	838	53.5	51	3.2	1,568
	Δ		+77	+					+276	+85.0	-16	-100.0	-306	-27.0	-235	-82.0	-12.0
North Island	1945-55	1972-75	NA	NA	NA	NA	NA	NA	NA	NA	87	1.3	5,818	88.2	631	10.5	6,596
			NA	NA	NA	NA	NA	NA	NA	NA	77	1.1	6,362	96.3	173	2.6	6,612
	Δ		NA	NA							-10	-11.0	+544	+9.0	-518	-75.0	+0.2
South Island	1945-55	1972-75	NA	NA	NA	NA	NA	NA	490	11.0	560	12.6	2,976	67.0	414	9.4	4,440
			NA	NA	NA	NA	NA	NA	454	9.4	576	12.0	3,136	65.6	621	13.0	4,787
	Δ								-36	-7.0	+16	+3.0	+160	+5.0	+207	+50.0	+8.0
Cedar Island	1945-55	1972-75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,039	98.1	78	1.9	4,117
			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,205	97.9	90	2.1	4,295
	Δ												+166	+4.0	+12	+15.0	+4.0
Murphy Island	1945-55	1972-75	NA	NA	NA	NA	NA	NA	307	3.8	77	0.9	7,532	92.7	211	2.6	8,127
			NA	NA	NA	NA	NA	NA	557	6.5	51	0.5	7,616	88.5	384	4.5	8,608
	Δ								+250	+81.0	-26	-34.0	-84	+1.0	+173	+82.0	+6.0
Cape Island	1945-55	1972-75	NA	NA	NA	NA	NA	NA	38	2.6	NA	NA	742	51.5	659	45.8	1,439
			NA	NA	NA	NA	NA	NA	45	2.8	NA	NA	877	55.5	417	2.3	1,581
	Δ								+7	+18.0			+135	+18.0	-0-	0.0	+10.0
Raccoon Key	1945-55	1972-75	NA	NA	NA	NA	NA	NA	-0-	0.0	NA	NA	5,004	97.7	115	2.3	5,119
			NA	NA	NA	NA	NA	NA	102	2.0	NA	NA	4,787	96.3	83	1.7	4,972
	Δ								+102	+			-217	-4.0	-32	-28.0	-3.0
Bull Island	1945-55	1972-75	NA	NA	NA	NA	NA	NA	1,363	26.1	70	1.3	3,686	70.4	115	2.2	5,234
			NA	NA	NA	NA	NA	NA	2,368	44.6	45	0.9	2,758	52.2	122	2.3	5,293
	Δ								+1,005	+74.0	-25	-36.0	-1,072	-25.0	+7	+6.0	+1.0
Capers Island	1945-55	1972-75	NA	NA	NA	NA	NA	NA	966	26.2	NA	NA	2,486	67.4	237	6.4	3,689
			NA	NA	NA	NA	NA	NA	1,050	29.4	NA	NA	2,467	69.1	53	1.5	3,570
	Δ								+84	+9.0			-21	-1.0	-184	-78.0	-3.0
Dewees Island	1945-55	1972-75	NA	NA	NA	NA	NA	NA	256	13.9	-0-	0.0	1,342	72.9	243	13.2	1,841
			NA	NA	NA	NA	NA	NA	580	33.9	34	2.0	908	53.0	191	11.1	1,713
	Δ								+324	+127.0	+34	+	-434	-33.0	-52	-21.0	-7.0
Ile of Palms	1945-55	1972-75	333	9.6	NA	NA	NA	NA	1,024	29.5	NA	NA	1,484	42.7	633	18.2	3,474
			979	30.1	NA	NA	NA	NA	909	27.8	NA	NA	1,030	41.8	339	10.4	3,257
	Δ		+646	+194.0					-115	-11.0			-454	-3.0	-294	-46.0	-6.0
Sullivans Island	1945-55	1972-75	672	43.8	NA	NA	NA	NA	NA	NA	-0-	0.0	735	47.9	128	8.3	1,535
			890	53.3	NA	NA	NA	NA	NA	NA	83	4.9	698	41.8	-0-	0.0	1,671
	Δ		+218	+32.0							+83	+	-37	-5.0	-128	-100.0	+9.0
Morris Island	1945-55	1972-75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,674	100.0	-0-	0.0	2,674
			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,880	98.3	51	1.7	2,931
	Δ												+206	+8.0	+51	+	+10.0
Folly Island	1945-55	1972-75	219	10.9	NA	NA	NA	NA	NA	NA	NA	NA	1,440	71.6	352	17.5	2,011
			704	32.1	NA	NA	NA	NA	NA	NA	NA	NA	986	44.9	506	23.0	2,196
	Δ		+485	+221.0									-454	-31.0	+154	+44.0	+9.0



TABLE 21.—Changes in area values of Level I land use and land cover for 15 barrier islands off the Georgia coast

Name of island	Years compared	Urban or built-up land Acres	%	Agricultural land Acres	%	Rangeland Acres	%	Forest land Acres	%	Water bodies Acres	%	Wetland Acres	%	Barren land Acres	%	Year totals
<b>Tybee Island</b>	1945-55	755	18.3	NA	NA	NA	NA	NA	NA	-0-	0.0	3,365	81.7	NA	NA	4,120
	1972-75	806	19.6	NA	NA	NA	NA	NA	NA	51	1.2	3,264	79.2	NA	NA	4,121
	Δ	+51	+7.0							+51	+	-101	-3.0			+0.02
<b>Little Tybee Island</b>	1945-55	NA	NA	NA	NA	NA	NA	549	8.0	292	4.2	5,810	84.6	221	3.2	6,872
	1972-75	NA	NA	NA	NA	NA	NA	666	9.7	288	4.2	5,523	80.3	397	5.8	6,874
	Δ							+117	+21.0	-4	-1.0	+287	-5.0	+176	+80.0	+0.03
<b>Williamson Island</b>	1945-55	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	97	33.0	197	67.0	294
	1972-75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	115	39.1	179	60.9	294
	Δ											+18	+19.0	-18	-9.0	0.0
<b>Wassaw Island</b>	1945-55	NA	NA	NA	NA	382	3.6	2,091	19.7	16	0.2	7,837	74.0	272	2.5	10,598
	1972-75	NA	NA	NA	NA	-0-	0.0	1,843	17.3	-0-	0.0	8,384	78.8	410	3.9	10,637
	Δ					-382	-100.0	-248	-12.0	-16	-100.0	+574	+6.0	+138	+51.0	+0.4
<b>Ossabaw Island</b>	1945-55	26	0.1	55	0.2	NA	NA	7,646	30.2	NA	NA	16,963	67.0	618	2.5	25,308
	1972-75	26	0.1	51	0.2	NA	NA	7,770	30.7	NA	NA	16,435	65.0	1,024	4.0	25,306
	Δ	-0-	0.0	-4	-7.0			+124	+2.0			-528	-3.0	+406	+66.0	-0.01
<b>St. Catherine's Island</b>	1945-55	NA	NA	107	0.7	338	2.2	5,690	36.7	374	2.4	8,615	55.6	368	2.4	15,492
	1972-75	NA	NA	179	1.2	275	1.8	6,003	38.7	384	2.5	8,243	53.2	410	2.6	15,494
	Δ			+72	+67.0	-63	-19.0	+313	+6.0	+10	+3.0	-372	-4.0	+42	+11.0	+0.01
<b>Blackbeard Island</b>	1945-55	NA	NA	NA	NA	534	10.4	2,056	40.1	127	2.5	2,004	39.1	409	7.9	5,130
	1972-75	NA	NA	NA	NA	-0-	0.0	2,323	45.3	179	3.5	2,054	40.1	576	11.2	5,132
	Δ					-534	-100.0	+267	+13.1	+52	+41.0	+50	+3.0	-167	+41.0	+0.03
<b>Sapelo Island</b>	1945-55	388	1.9	489	2.4	1,871	9.3	4,633	23.1	96	0.6	11,717	58.4	862	4.3	20,056
	1972-75	282	1.4	653	3.3	3,117	15.5	4,032	20.1	557	2.8	10,746	53.6	672	3.3	20,059
	Δ	-106	-27.0	+164	+33.0	+1,246	+67.0	-601	-13.0	+461	+480.0	-971	-8.0	-190	-22.0	+0.01
<b>Wolf Island</b>	1945-55	NA	NA	NA	NA	NA	NA	NA	NA	795	10.8	6,533	89.2	NA	NA	7,328
	1972-75	NA	NA	NA	NA	NA	NA	NA	NA	787	10.7	6,541	89.3	NA	NA	7,328
	Δ									-8	-1.0	+8	+0.1			0.0
<b>Little St. Simons</b>	1945-55	NA	NA	NA	NA	307	2.8	1,091	9.9	114	1.0	8,801	79.7	730	6.6	11,043
	1972-75	NA	NA	NA	NA	-0-	0.0	1,120	10.1	166	1.5	8,640	78.2	1,120	10.2	11,046
	Δ					+307	+100.0	+29	+3.0	+52	+46.0	-161	-2.0	+390	+53.0	+0.03
<b>Sea Island</b>	1945-55	470	15.8	NA	NA	NA	NA	468	15.7	NA	NA	1,744	58.5	299	10.0	2,981
	1972-75	704	23.6	NA	NA	NA	NA	378	12.7	NA	NA	1,792	60.1	109	3.6	2,983
	Δ	+234	+50.0					-90	-19.0			+48	+3.0	-190	-63.0	+0.07
<b>Saint Simons Island</b>	1945-55	3022	10.4	103	0.3	NA	NA	6,906	23.7	1,440	5.0	17,640	60.6	-0-	0.0	29,111
	1972-75	4,800	16.4	269	0.0	NA	NA	5,120	17.5	1,440	4.0	17,414	59.7	173	0.6	29,216
	Δ	+1,778	+58.0	+166	+161.0			-1,786	-26.0	-0-	0.0	-226	-1.0	+173	+	+0.4
<b>Jekyll Island</b>	1945-55	445	7.7	NA	NA	NA	NA	1,380	23.9	-0-	0.0	3,742	64.8	207	3.6	5,774
	1972-75	1,696	29.4	NA	NA	NA	NA	1,370	23.7	51	0.9	2,054	35.6	602	10.4	5,773
	Δ	+1,251	+281.0					-10	-1.0	+51	+	-1,688	-45.0	+395	+191.0	-0.02
<b>Little Cumberland Island</b>	1945-55	NA	NA	NA	NA	23	1.0	1,166	48.5	NA	NA	918	38.2	296	12.3	2,403
	1972-75	NA	NA	NA	NA	-0-	0.0	1,075	44.7	NA	NA	1,069	44.4	262	10.9	2,406
	Δ					-23	-100.0	-91	-8.0			+151	+16.0	-34	-11.0	+0.1
<b>Cumberland Island</b>	1945-55	55	0.2	362	1.5	1,269	5.1	9,901	39.7	43	0.2	11,000	44.1	2,295	9.2	24,925
	1972-75	122	0.5	307	1.2	538	2.2	10,675	42.8	-0-	0.0	11,277	45.2	2,010	8.1	24,929
	Δ	+67	+123.0	-55	-15.0	-731	-58.0	+774	+8.0	-43	-100.0	+277	+2.0	-285	-12.0	+0.02
<b>Category totals and Change totals</b>		5161	3.0	1,116	0.7	4,724	2.8	43,577	25.4	3,297	1.9	106,786	62.3	6,774	3.9	171,435
		8,486	4.9	1,459	0.9	3,930	2.3	42,375	24.7	3,903	2.3	103,551	60.3	7,944	4.6	171,598
		+3,275	+63.0	+343	+31.0	-794	-17.0	-1,202	-3.0	+606	+18.0	-3,235	-3.0	-1,170	+17.0	+0.09

TABLE 22.—Changes in area values of Level I land use and land cover for 80 barrier islands off the Florida coast

Name of island	Years compared	Urban or built-up land Acres	%	Agricultural land Acres	%	Rangeland Acres	%	Forest land Acres	%	Water bodies Acres	%	Wetland Acres	%	Barren land Acres	%	Year totals
Amelia Island	1945-55	2,399	14.5	216	1.3	NA	NA	5,392	32.9	NA	NA	6,815	41.6	1,580	9.7	16,372
	1972-75	5,630	34.9	-0-	0.0	NA	NA	6,474	40.1	NA	NA	3,225	20.0	821	5.0	16,150
	Δ	+3,261	+138.0	-216	-100.0			+1,082	+20.0			-3,590	-53.0	-759	-48.0	-1.0
Bird Island	1945-55	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	83	110.0	83
	1972-75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	65	100.0	65
	Δ													-18	-28.0	-28.0
Talbot Island	1945-55	-0-	0.0	NA	NA	NA	NA	1,075	45.6	NA	NA	622	26.4	659	28.0	2,356
	1972-75	102	5.3	NA	NA	NA	NA	1,270	64.2	NA	NA	183	9.2	421	21.3	1,976
	Δ	+102	+					+195	+18.0			-439	-71.0	-238	-36.0	-16.0
Guana	1945-55	136	3.4	NA	NA	NA	NA	1,380	34.6	NA	NA	1,333	33.4	1,140	28.6	3,989
	1972-75	379	9.6	NA	NA	NA	NA	1,511	38.2	NA	NA	1,649	41.6	424	10.6	3,963
	Δ	+243	+179.0					+131	+9.0			+316	+24.0	-716	-63.0	-1.0
Anastasia	1945-55	786	8.2	NA	NA	NA	NA	-0-	0.0	NA	NA	6,259	65.4	2,528	26.4	9,573
	1972-75	1,770	17.3	NA	NA	NA	NA	1,681	16.5	NA	NA	4,667	45.7	2,101	20.5	10,219
	Δ	+984	+125.0					+1,681	+			-1,592	-25.0	-427	-17.0	+7.0
Matanzas	1945-55	96	2.3	104	2.5	NA	NA	1,169	27.8	NA	NA	2,256	53.6	582	13.8	4,207
	1972-75	246	5.8	89	2.1	NA	NA	3,035	72.6	NA	NA	1,378	7.1	571	13.6	4,190
	Δ	+150	+156.0	-15	-14.0			+1,866	+160.0			-2,007	-89.0	-11	-2.0	-0.4
Flagler	1945-55	3,284	27.7	NA	NA	NA	NA	3,515	29.3	-0-	0.0	1,344	11.2	3,858	32.1	12,001
	1972-75	8,806	72.9	NA	NA	NA	NA	1,217	10.1	59	0.4	1,075	7.7	1,075	8.9	12,098
	Δ	+5,522	+168.0					-2,298	-65.0	+59	+	-403	-30.0	-2,783	-72.0	+1.0
Mosquito	1945-55	388	2.5	NA	NA	NA	NA	1,119	7.1	-0-	0.0	11,649	74.4	2,512	16.0	15,668
	1972-75	2,107	13.8	NA	NA	NA	NA	940	6.1	21	0.1	9,502	62.5	2,684	17.5	15,254
	Δ	+1,719	+456					-179	-16.0	+21	+	-2,147	-18.0	+172	+7.0	-3.0
Cape Canaveral	1945-55	605	3.3	NA	NA	-0-	0.0	13,874	74.5	115	0.6	3,117	16.7	908	4.9	18,619
	1972-75	14,905	76.9	NA	NA	214	1.1	1,681	8.6	614	3.1	1,378	7.1	627	3.2	19,419
	Δ	+14,300	+2,364.0			+214	+	-12,193	-88.0	-449	+439.0	-1,739	-57.0	-281	-31.0	+4.0
Cocoa Beach Island	1945-55	2,687	13.3	537	2.7	NA	NA	11,169	55.4	-0-	0.0	5,075	25.2	677	3.4	20,145
	1972-75	13,597	63.2	227	1.1	NA	NA	3,699	17.2	87	0.4	3,022	14.0	891	4.1	21,523
	Δ	+10,910	+406.0	-310	-58.0			-7,470	-67.0	+87	+	-2,053	-40.0	+214	+32.0	+7.0
Vero Beach Island	1945-55	358	2.5	2,093	14.6	NA	NA	4,716	32.8	420	2.9	6,127	42.9	618	4.3	14,332
	1972-75	3,183	21.6	1,965	13.3	NA	NA	3,021	20.4	239	1.6	6,373	43.1	-0-	0.0	14,781
	Δ	+2,825	+789.0	-128	-6.0			-1,695	-36.0	-181	-43.0	+246	+3.0	-618	-100.0	+3.0
Hutchinson Island	1945-55	142	1.9	107	1.5	NA	NA	250	3.4	99	1.3	5,220	71.3	1,506	20.6	7,324
	1972-75	985	13.2	-0-	0.0	NA	NA	217	2.9	-0-	0.0	5,217	70.4	1,003	13.5	7,422
	Δ	+843	+594.0	-107	-100.0			-33	-13.0	-99	-100.0	-3	-0.1	-503	-33.0	+1.0
Jupiter Island	1945-55	778	22.6	NA	NA	NA	NA	438	12.7	NA	NA	2,090	60.6	143	4.1	3,449
	1972-75	904	25.9	NA	NA	NA	NA	322	9.2	NA	NA	2,258	64.9	-0-	0.0	3,484
	Δ	+126	+16.0					-116	-27.0			+168	+8.0	-143	-100.0	+1.0
Lake Worth	1945-55	296	37.9	NA	NA	NA	NA	98	12.5	NA	NA	274	35.1	113	14.5	781
	1972-75	627	77.8	NA	NA	NA	NA	-0-	0.0	NA	NA	179	22.2	-0-	0.0	806
	Δ	+331	+112.0					-98	-100.0			-95	-35.0	-113	-100.0	+3.0
Palm Beach	1945-55	2,368	74.8	NA	NA	NA	NA	312	9.9	NA	NA	142	4.5	342	10.8	3,164
	1972-75	3,104	91.4	NA	NA	NA	NA	240	7.0	NA	NA	35	1.0	22	0.6	3,401
	Δ	+736	+31.0					-72	-23.0			-107	-75.0	-320	-94.0	+7.0
Boca Raton	1945-55	1,522	56.7	NA	NA	NA	NA	NA	NA	NA	NA	849	31.7	312	11.6	2,683
	1972-75	2,371	88.0	NA	NA	NA	NA	NA	NA	NA	NA	326	12.0	-0-	0.0	2,697
	Δ	+849	+56.0									-523	-62.0	-312	-100.0	+0.5

TABLE 22.—Changes in area values of Level I land use and land cover for 80 barrier islands off the Florida coast—Continued

Name of island	Years compared	Urban or built-up land Acres	%	Agricultural land Acres	%	Rangeland Acres	%	Forest land Acres	%	Water bodies Acres	%	Wetland Acres	%	Barren land Acres	%	Year totals
Hillsboro Beach	1945-55 1972-75	485 869	55.3 100.0	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	392 -392	44.7 -100.0	877 869
Fort Lauderdale	1945-55 1972-75	269 1,024	24.4 94.1	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	-392 -392	-100.0 -100.0	1,101 1,089
Miami Beach	1945-55 1972-75	5,623 7,170	87.7 98.0	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	115 151	1.8 2.0	NA NA	NA NA	672 -672	10.5 -100.0	6,410 7,321
Fisher Island	1945-55 1972-75	44 13	20.9 5.8	NA NA	NA NA	NA NA	NA NA	-0- 210	0.0 94.2	NA NA	NA NA	167 -167	79.1 -100.0	NA NA	NA NA	211 223
Virginia Key	1945-55 1972-75	47 588	5.5 50.9	NA NA	NA NA	NA NA	NA NA	564 528	65.4 45.7	NA NA	NA NA	63 -63	7.3 -100.0	188 -148	21.8 -79.0	862 1,156
Key Biscayne	1945-55 1972-75	363 1,279	14.3 54.9	NA NA	NA NA	NA NA	NA NA	-0- 572	0.0 24.0	NA NA	NA NA	686 485	27.1 20.7	1,485 -201	58.6 -100.0	2,534 2,336
Cape Sable	1945-55 1972-75	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	+572 +572	+	NA NA	NA NA	-201 -201	-29.0 -29.0	-1,485 -1,485	-100.0 -100.0	-8.0 -8.0
Mud Bay	1945-55 1972-75	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	-0- 173	0.0 4.2	NA NA	NA NA	4,050 3,931	100.0 95.8	NA NA	NA NA	4,050 4,104
Shark Point	1945-55 1972-75	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	+173 -78	+	NA NA	NA NA	8,095 8,028	100.0 100.0	NA NA	NA NA	8,095 8,028
McLaughlin	1945-55 1972-75	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	5,249 5,171	8.8 8.9	NA NA	NA NA	54,318 52,780	91.2 91.9	NA NA	NA NA	59,567 57,951
Alligator Cove	1945-55 1972-75	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	-78 -125	-1.0 -8.0	NA NA	NA NA	-1,538 -1,538	-3.0 -3.0	NA NA	NA NA	-3.0 -3.0
Duck Rock	1945-55 1972-75	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	1,623 1,498	9.1 7.7	NA NA	NA NA	16,141 17,810	90.9 92.3	NA NA	NA NA	17,764 19,308
Ten Thousand Islands	1945-55 1972-75	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	-125 -125	-8.0 -8.0	NA NA	NA NA	+1,669 +1,669	+10.0 +10.0	NA NA	NA NA	+9.0 +9.0
Cape Romano	1945-55 1972-75	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	5,930 5,788	29.9 32.5	NA NA	NA NA	13,871 12,022	70.1 67.6	NA NA	NA NA	19,801 17,810
Rice Island	1945-55 1972-75	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	-142 -142	-2.0 -2.0	NA NA	NA NA	-1,849 -1,849	-13.0 -13.0	NA NA	NA NA	-10.0 -10.0
Marco Island	1945-55 1972-75	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	12,719 11,421	37.0 36.7	NA NA	NA NA	21,620 19,730	63.0 63.6	NA NA	NA NA	34,339 31,151
Little Marco Group	1945-55 1972-75	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	-1,298 -1,298	-10.0 -10.0	NA NA	NA NA	-1,890 -1,890	-9.0 -9.0	NA NA	NA NA	-9.0 -9.0
		NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	34,981 32,881	64.0 58.5	NA NA	NA NA	19,343 22,919	35.4 40.7	NA NA	NA NA	54,638 56,289
		NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	-2,100 -2,100	-6.0 -6.0	NA NA	NA NA	+3,576 +3,576	+18.0 +18.0	NA NA	NA NA	+3.0 +3.0
		NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	0- 198	0.0 13.5	NA NA	NA NA	1,433 1,264	100.0 86.5	NA NA	NA NA	1,433 1,462
		NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	+198 +198	+	NA NA	NA NA	-169 -169	-12.0 -12.0	NA NA	NA NA	+2.0 +2.0
		NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	1,167 1,191	100.0 100.0	NA NA	NA NA	+24 +24	+2.0 +2.0	NA NA	NA NA	1,167 1,191
		NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	4,325 540	79.1 10.6	NA NA	NA NA	-0- -0-	0.0 0.0	NA NA	NA NA	5,465 5,097
		NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	2,392 2,392	47.1 47.1	NA NA	NA NA	+2,392 +2,392	+7.0 +7.0	NA NA	NA NA	-7.0 -7.0
		NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	2,654 2,983	23.7 0.6	NA NA	NA NA	-609 -609	-97.0 -97.0	NA NA	NA NA	2,654 2,983

TABLE 22.—Changes in area values of Level I land use and land cover for 80 barrier islands off the Florida coast—Continued

Name of island	Years compared	Urban or built-up land Acres	Urban or built-up land %	Agricultural land Acres	Agricultural land %	Rangeland Acres	Rangeland %	Forest land Acres	Forest land %	Water bodies Acres	Water bodies %	Wetland Acres	Wetland %	Barren land Acres	Barren land %	Year totals
Naples Park	1945-55 1972-75 Δ	-0- 281 +281	0.0 22.5 +	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	40 142 +102	3.2 11.3 +255.0	821 680 -141	65.8 54.7 -17.0	386 144 -242	31.0 11.5 -63.0	1,247 1,247 0.0
Bonita Beach	1945-55 1972-75 Δ	145 150 +5	8.8 10.5 +3.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	64 147 +83	3.9 10.2 +130.0	1,213 1,088 -125	73.5 76.3 -10.0	229 43 -186	13.8 3.0 -81.0	1,651 1,428 -13.0
Big Hickory Island	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	129 346 +217	46.2 100.0 +168	150 -0- -150	53.8 0.0 -100.0	279 346 +24.0
Black Island	1945-55 1972-75 Δ	-0- 126 +126	0.0 20.7 +	-0- 21 +21	0.0 3.4 +	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	278 218 -60	76.8 35.8 -22.0	84 244 +160	23.2 40.1 +190.0	362 609 +65.0
Estero Island	1945-55 1972-75 Δ	729 1,069 +367	39.4 67.7 +47.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	27 -0- -27	1.5 0.0 -100.0	697 238 -459	37.7 15.1 -66.0	396 271 -125	21.4 17.2 -32.0	1,849 1,578 -15.0
Sanibel Island	1945-55 1972-75 Δ	-0- 2,310 +2,310	0.0 19.7 +	-0- 135 +135	0.0 1.1 +	NA NA NA	NA NA NA	NA NA NA	NA NA NA	203 271 +68	1.9 2.3 +33.0	10,462 8,256 -2,206	98.1 70.9 -21.0	-0- 701 +701	0.0 6.0 +	10,665 11,673 +9.0
Captiva Island	1945-55 1972-75 Δ	280 541 +261	23.3 43.4 +93.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	-0- 35 +35	0.0 2.8 +	NA NA NA	NA NA NA	504 624 +120	42.0 50.0 +24.0	417 47 -370	34.7 3.8 -89.0	1,201 1,247 +4.0
North Captiva Island	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	181 197 +16	24.8 28.1 +9.0	550 503 -47	75.2 71.9 -8.0	731 700 -4.0
Cayo Costa	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	780 1,154 +374	31.0 43.7 +48.0	NA NA NA	NA NA NA	1,284 974 -310	51.1 36.9 -24.0	449 514 +65	17.9 19.4 +14.0	2,513 2,642 +5.0
Gasparilla	1945-55 1972-75 Δ	618 982 +364	37.1 51.0 +59.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	-0- 462 +462	0.0 24.0 +	NA NA NA	NA NA NA	890 134 -756	53.4 6.9 -85.0	158 349 +191	9.5 18.1 +121.0	1,666 1,927 +16.0
Little Island Group	1945-55 1972-75 Δ	-0- 230 +230	0.0 16.6 +	NA NA NA	NA NA NA	NA NA NA	NA NA NA	80 354 +274	6.0 25.6 +342.0	-0- 43 +43	0.0 3.1 +	841 173 -668	63.2 12.5 -79.0	410 584 +174	30.8 42.2 +42.0	1,331 1,384 +4.0
Manasota Key	1945-55 1972-75 Δ	41 1,065 +1,024	2.5 59.6 +2,497.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	-0- 210 +210	0.0 11.7 +	NA NA NA	NA NA NA	1,068 165 -903	65.5 9.2 -85.0	521 347 -174	32.0 19.5 -33.0	1,630 1,787 +10.0
Casey Key	1945-55 1972-75 Δ	215 461 +246	24.6 46.1 +114.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	-0- 74 +74	0.0 7.4 +	NA NA NA	NA NA NA	572 73 -499	65.5 7.3 -87.0	86 392 +306	9.9 39.2 +365.0	873 1,000 +14.0
Sarasota	1945-55 1972-75 Δ	1,017 2,157 +1,140	42.8 84.4 +112.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	43 -0- -43	1.8 0.0 -100.0	1,015 161 -854	42.7 6.3 -84.0	302 239 -65	12.7 9.3 -21.0	2,377 2,557 +7.0
Lido Key	1945-55 1972-75 Δ	388 841 +453	33.6 73.0 +117.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	-0- 53 +53	0.0 4.6 +	NA NA NA	NA NA NA	581 106 -475	50.3 9.2 -82.0	186 152 -34	16.1 13.2 -18.0	1,155 1,152 -0.2
Longboat Key	1945-55 1972-75 Δ	460 1,695 +1,235	15.8 57.7 +268.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	166 214 +48	5.7 7.2 +29.0	NA NA NA	NA NA NA	1,902 970 -832	65.3 33.1 -49.0	386 60 -326	13.2 2.0 -84.0	2,914 2,939 +1.0
Anna Maria Key	1945-55 1972-75 Δ	1,053 1,927 +874	44.2 74.7 +83.0	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	-0- 127 +127	0.0 4.9 +	936 201 -735	40.4 7.7 -78.0	365 327 -38	15.4 12.7 -10.0	2,354 2,582 -10.0



TABLE 22.—Changes in area values of Level I land use and land cover for 80 barrier islands off the Florida coast—Continued

Name of island	Years compared	Urban or built-up land Acres	Agricultural land Acres	%	Rangeland Acres	%	Forest land Acres	%	Water bodies Acres	%	Wetland Acres	%	Barren land Acres	%	Year totals
Passage Key	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	18 60 +42	100.0 100.0 +233.0	18 60 +233.0
Egmont Key	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	121 147 +26	26.7 31.6 +21.0	NA NA NA	NA NA NA	-0- 318 +318	0.0 68.4 +	333 -0- -333	73.3 0.0 -100.0	454 465 +2.0
Mullet Key Group	1945-55 1972-75 Δ	-0- 525 +525	NA NA	NA NA	NA NA	NA NA	-0- 91 +91	0.0 7.5 +	NA NA NA	NA NA NA	1,069 231 -838	87.8 19.6 -78.0	148 361 +213	12.2 29.8 +144.0	1,217 1,208 -1.0
Cabbage Key Group	1945-55 1972-75 Δ	-0- 326 +326	NA NA	NA NA	NA NA	NA NA	-0- +90 +90	0.0 10.0 +	NA NA NA	NA NA NA	652 561 -561	77.2 10.1 -86.0	193 391 +198	22.8 43.6 +102.0	845 898 +6.0
Long Key	1945-55 1972-75 Δ	516 1,271 +755	NA NA	NA NA	NA NA	NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	593 -0- -593	42.3 0.0 -100.0	293 291 -2	20.7 18.6 -1.0	1,402 1,562 +11.0
Treasure Island	1945-55 1972-75 Δ	306 824 +518	NA NA	NA NA	NA NA	NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	247 67 -180	32.2 6.1 -73.0	213 193 -20	27.8 17.8 -9.0	766 1,084 +41.0
Sand Key	1945-55 1972-75 Δ	2,537 2,412 -125	NA NA	NA NA	NA NA	NA NA	-0- 412 +412	0.0 11.7 +	NA NA NA	NA NA NA	NA NA NA	NA NA NA	653 708 +55	20.5 8.0 +8.0	3,190 3,532 +11.0
Clearwater Beach Island	1945-55 1972-75 Δ	359 1,160 +801	NA NA	NA NA	NA NA	NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	658 199 -459	55.4 14.4 -70.0	170 17 -153	14.3 1.2 -90.0	1,187 1,376 +16.0
Caladesi Island	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	97 231 +134	12.7 35.5 +138.0	NA NA NA	NA NA NA	445 346 -99	53.5 53.2 -22.0	219 74 -145	28.8 11.3 -66.0	761 651 -14.0
Honeymoon Island	1945-55 1972-75 Δ	52 142 +90	NA NA	NA NA	NA NA	NA NA	-0- 187 +187	0.0 26.2 +	NA NA NA	NA NA NA	459 48 -411	66.8 6.7 -89.0	176 337 +161	25.6 47.3 +91.0	687 714 +4.0
Anclote Keys	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	-0- 32 +32	0.0 6.1 +	NA NA NA	NA NA NA	185 303 +118	59.5 58.2 +64.0	126 186 +60	40.5 35.7 +48.0	311 521 +67.0
Bay Port	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	130 139 -0-	100.0 100.0 0.0	NA NA NA	NA NA NA	130 130 0.0
Pine Island	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	105 100 -5	100.0 100.0 -5.0	NA NA NA	NA NA NA	105 100 -5.0
Chassahowitzka	1945-55 1972-75 Δ	-0- 168 +168	NA NA	NA NA	NA NA	NA NA	NA NA NA	NA NA NA	13,414 13,784 +370	27.7 28.4 +3.0	34,967 34,606 -361	72.3 71.3 -1.0	NA NA NA	NA NA NA	48,381 48,558 +177
Seashore Keys	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	-0- 152 +152	0.0 44.7 +	NA NA NA	NA NA NA	342 188 -154	92.4 55.3 -45.0	28 -0- -28	7.6 0.0 -100.0	370 340 -8.0
Cedar Keys	1945-55 1972-75 Δ	184 509 +325	NA NA	NA NA	NA NA	NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	858 440 -418	82.3 46.3 -49.0	NA NA NA	NA NA NA	1,042 949 -9.0
Piney Island	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	1,337 1,409 +72	100.0 100.0 +5.0	NA NA NA	NA NA NA	1,337 1,409 +5.0

TABLE 22.—Changes in area values of Level I land use and land cover for 80 barrier islands off the Florida coast—Continued

Name of island	Years compared		Urban or built-up land		Agricultural land		Rangeland		Forest land		Water bodies		Wetland		Barren land		Year totals
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	
Mashes Island	1945-55	-----	-0-	0.0	NA	NA	NA	NA	-0-	0.0	NA	NA	1,677	94.3	108	5.7	1,785
	1972-75	-----	146	9.0	NA	NA	NA	NA	749	46.5	NA	NA	749	36.5	129	8.0	1,611
	Δ	-----	+146	+					+749	+			-1,090	-65.0	+21	+19.0	-10.0
Alligator Point	1945-55	-----	-0-	0.0	NA	NA	NA	NA	1,984	49.0	106	2.6	1,153	28.4	810	20.0	4,053
	1972-75	-----	746	19.4	NA	NA	NA	NA	1,911	50.0	80	2.0	1,911	21.8	262	6.8	3,835
	Δ	-----	+746	+					-73	-4.0	-26	-24.0	-317	-27.0	-548	-68.0	-5.0
Dog Island	1945-55	-----	-0-	0.0	NA	NA	NA	NA	74	4.1	NA	NA	1,181	65.4	551	30.5	1,806
	1972-75	-----	388	31.4	NA	NA	NA	NA	80	4.4	NA	NA	1,012	55.9	331	18.3	1,811
	Δ	-----	+388	+					+6	+8.0			-167	-14.0	-220	-40.5	+0.3
St. George Island	1945-55	-----	-0-	0.0	NA	NA	NA	NA	3,180	49.5	-0-	0.0	941	14.6	2,310	35.9	6,431
	1972-75	-----	578	8.8	NA	NA	NA	NA	2,792	42.6	46	0.7	883	13.5	2,255	34.4	6,554
	Δ	-----	+578	+					-383	-12.0	46+	+	-58	-6.0	-55	-2.0	+2.0
St. Vincent Island	1945-55	-----	NA	NA	NA	NA	NA	NA	7,210	59.1	188	1.6	4,219	34.6	578	4.7	12,195
	1972-75	-----	NA	NA	NA	NA	NA	NA	8,378	65.5	140	1.1	3,665	28.7	599	4.7	12,782
	Δ	-----							+1,168	+6.0	-49	-25.0	-1,054	-25.0	+21	+4.0	+5.0
Indian Peninsula	1945-55	-----	42	11.1	NA	NA	NA	NA	157	41.3	NA	NA	NA	NA	181	47.6	380
	1972-75	-----	58	14.9	NA	NA	NA	NA	139	36.0	NA	NA	NA	NA	190	49.1	387
	Δ	-----	+16	+38.0					-18	-11.0					+9	+5.0	+2.0
Cape San Blas	1945-55	-----	-0-	0.0	NA	NA	NA	4.8	3,840	66.7	-0-	0.0	291	5.1	1,344	23.4	5,754
	1972-75	-----	326	5.6	NA	NA	NA	3.2	3,860	63.5	49	0.8	251	4.3	1,298	22.6	5,766
	Δ	-----	+326	+				-97	-35.0	-180	-5.0	+49	-40	-40	-46	-3.0	+0.2
Crooked Island	1945-55	-----	NA	NA	NA	NA	NA	0.0	365	21.2	54	3.1	NA	NA	1,305	75.7	1,724
	1972-75	-----	NA	NA	NA	NA	81	4.7	327	31.2	-0-	0.0	NA	NA	1,083	64.1	1,691
	Δ	-----					+81	+	+162	+44.0	-54	-100.0			-222	-17.0	-2.0
Shell Island	1945-55	-----	NA	NA	NA	NA	NA	NA	-0-	0.0	-0-	0.0	618	41.8	862	58.2	1,480
	1972-75	-----	NA	NA	NA	NA	NA	NA	270	20.2	15	1.1	114	8.5	938	70.2	1,337
	Δ	-----							+270	+	+15	+	-504	-82.0	+76	+9.0	-10.0
St. Andrew	1945-55	-----	-0-	0.0	NA	NA	NA	NA	-0-	0.0	-0-	0.0	602	34.2	1,159	65.8	1,761
	1972-75	-----	1,621	93.6	NA	NA	NA	NA	92	5.3	20	1.1	-0-	0.0	0	0.0	1,733
	Δ	-----	+1,621	+					+92	+	+20	+	-602	-100.0	-1,159	-100.0	-2.0
Miramar	1945-55	-----	419	3.8	NA	NA	NA	NA	5,240	47.8	231	2.1	2,716	24.8	2,361	21.5	10,967
	1972-75	-----	2,472	22.2	NA	NA	NA	NA	4,851	43.8	226	2.0	1,921	17.3	1,638	14.7	11,108
	Δ	-----	+2,053	+490.0					-389	-7.0	-5	-2.0	-795	-29.0	-723	-31.0	+1.0
Santa Rosa Island	1945-55	-----	-0-	0.0	NA	NA	NA	0.0	-0-	0.0	101	0.9	1,197	11.0	9,582	88.1	10,880
	1972-75	-----	2,642	23.5	NA	NA	NA	0.5	569	5.0	41	0.3	300	2.6	7,608	68.1	11,220
	Δ	-----	+2,642	+				+	+569	+	-60	-59.0	-897	-75.0	-1,974	-21.0	+3.0
Perdido Key East	1945-55	-----	-0-	0.0	NA	NA	NA	NA	-0-	0.0	-0-	0.0	694	23.3	2,280	76.7	2,974
	1972-75	-----	520	17.7	NA	NA	NA	NA	705	24.1	6	0.2	32	1.0	1,664	57.0	2,927
	Δ	-----	+520	+					+705	+	+6		-662	-95.0	-616	-27.0	-2.0
Category totals and Change totals	1945-55	-----	32,007	6.2	3,057	0.6	593	0.1	69,505	13.5	75,722	14.7	281,186	54.6	52,835	10.3	514,905
	1972-75	-----	101,988	19.7	2,437	0.5	1,260	0.2	56,001	10.8	73,769	14.2	244,791	47.1	38,687	7.5	518,933
	Δ	-----	+69,981	+219.0	-620	-20.0	+667	+112.0	-13,504	-19.0	-1,953	-3.0	-56,940	-13.0	-14,143	-27.0	+0.2

TABLE 23.—Changes in area values of Level I land use and land cover for 5 barrier islands off the Alabama coast

Name of island	Years compared	Urban or built-up land Acres	%	Agricultural land Acres	%	Rangeland Acres	%	Forest land Acres	%	Water bodies Acres	%	Wetland Acres	%	Barren land Acres	%	Year totals
<b>Perdido Key West</b>	1945-55 1972-75 Δ	-0- 275 +275	0.0 18.6 +	NA NA NA	NA NA NA	NA NA NA	NA NA NA	-0- 922 +922	0.0 62.8 +	27 -0- -27	1.8 0.0 -100.0	1,284 115 -1,169	85.9 7.8 -91.0	183 160 -23	12.3 10.8 -13.0	1,494 1,472 -1.0
<b>Romar Beach</b>	1945-55 1972-75 Δ	-0- 1,075 +1,075	0.0 23.3 +	NA NA NA	NA NA NA	-0- 281 +281	0.0 6.1 +	-0- 653 +653	0.0 14.2 +	807 563 -244	20.3 12.2 -30.0	2,242 1,286 -956	56.6 28.0 -48.0	916 748 -168	23.1 16.2 -18.0	3,965 4,606 +16.0
<b>Mobile Point</b>	1945-55 1972-75 Δ	-0- 2,650 +2,650	0.0 15.4 +	NA NA NA	NA NA NA	-0- 1,849 +1,849	0.0 10.6 +	3,479 5,261 +1,782	19.8 30.5 +51.0	2,564 2,560 -4	14.6 14.8 -0.2	8,435 3,641 -4,794	48.0 21.1 -57.0	3,085 1,324 -1,761	17.6 7.6 -57.0	17,563 17,285 -2.0
<b>Sand Island</b>	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	42 230 +188	100.0 100.0 +448.0	42 230 +448.0
<b>Dauphin Island</b>	1945-55 1972-75 Δ	-0- 1,273 +1,273	0.0 27.5 +	NA NA NA	NA NA NA	NA NA NA	NA NA NA	822 115 -707	24.1 2.8 -86.0	NA NA NA	NA NA NA	1,327 1,645 +318	38.8 35.7 -24.0	1,268 1,587 +319	37.1 34.4 -25.0	3,417 4,620 +35.0
<b>Category totals and Change totals</b>	1945-55 1972-75 Δ	-0- 5,273 +5,273	0.0 18.7 +	NA NA NA	NA NA NA	-0- 2,130 +2,130	0.0 7.5 +	4,301 6,951 +2,650	16.2 24.8 +62.0	3,398 3,123 -275	12.8 11.0 -8.0	13,288 6,687 -6,601	50.2 28.7 -50.0	5,494 4,049 -1,445	20.8 14.3 -26.0	26,481 28,213 +1,732

TABLE 24.—Changes in area values of Level I land use and land cover for 5 barrier islands off the Mississippi coast

Name of island	Years compared	Urban or built-up land Acres	%	Agricultural land Acres	%	Rangeland Acres	%	Forest land Acres	%	Water bodies Acres	%	Wetland Acres	%	Barren land Acres	%	Year totals
<b>Petit Bois Island</b>	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	1,066 858 -208	67.1 53.2 -20.0	523 755 +232	32.9 46.8 +44.0	1,589 1,613 +1.0
<b>Horn Island</b>	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	1,986 2,470 +484	52.0 69.7 +24.0	1,837 1,075 -762	48.0 30.3 -41.0	3,823 3,545 -278
<b>Deer Island</b>	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	-0- 179 +179	0.0 45.9 +	NA NA NA	NA NA NA	479 211 -268	96.4 54.1 -55.0	18 -0- -18	3.6 0.0 -100.0	497 390 -107
<b>Ship Island</b>	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	448 678 +230	35.3 40.3 +51.0	822 1,005 +183	64.7 59.7 +22.0	1,270 1,683 +413
<b>Cat Island</b>	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	1,967 1,747 -220	78.7 70.7 -11.0	532 749 +217	21.3 30.0 +41.0	2,499 2,496 -3
<b>Category totals and Change totals</b>	1945-55 1972-75 Δ	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	-0- 179 +179	0.0 1.8 +	NA NA NA	NA NA NA	5,946 5,964 +18	61.4 61.4 +0.3	3,732 3,584 -148	38.6 36.8 -4.0	9,678 9,727 +49

## APPENDIX I: TABLES OF AREA VALUES OF LAND USE AND LAND COVER

TABLE 25.—Changes in area values of Level I land use and land cover for 18 barrier islands off the Louisiana coast

Name of island	Years compared	Urban or built-up land Acres	%	Agricultural land Acres	%	Rangeland Acres	%	Forest land Acres	%	Water bodies Acres	%	Wetland Acres	%	Barren land Acres	%	Year totals
Chandeleur Island Group	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	6,387 6,387 -0-	62.4 62.4 0.0	3,840 3,840 -0-	37.6 37.6 0.0	10,227 10,227 -0-
Grand Gosier Island	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	668 691 +23	100.0 100.0 +3.0	668 691 +3.0
Breton Island	1945-55 1972-75 Δ	10 45 +35	1.1 4.6 +350.0	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	531 365 -166	55.9 38.0 -31.0	409 550 +141	43.0 57.4 +1.0	950 960 +1.0
Sable Island	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	132 134 +2	100.0 100.0 +2.0	NA NA	NA NA	132 134 +2.0
Raccoon Point	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	774 768 -6	100.0 100.0 -1.0	NA NA	NA NA	774 768 -1.0
Coquille Point	1945-55 1972-75 Δ	162 358 +196	7.1 16.4 +121.0	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	2,129 1,817 -312	92.9 83.6 -15.0	NA NA	NA NA	2,291 2,175 -5.0
Bird Island	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	65 51 -14	100.0 100.0 -22.0	NA NA	NA NA	65 51 -22.0
Pelican Island <sup>1</sup>	1945-55 1972-75 Δ	----- 13	----- 0.5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	----- 819	----- 35.5	----- 1,472	----- 64.0	NA NA	NA NA	----- 2,304
Bastian Island <sup>1</sup>	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	----- 13	----- 0.7	----- 1,286	----- 99.3	NA NA	NA NA	----- 1,299
Bay Joe Wise	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	461 467 +6	100.0 100.0 +1.0	NA NA	NA NA	461 467 +1.0
Bay Lamer	1945-55 1972-75 Δ	-0- 2,547 +2,547	0.0 47.8 +	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	968 1,037 +69	18.1 19.4 +7.0	4,386 1,753 -2,633	81.9 32.8 -60.0	NA NA	NA NA	5,354 5,337 -0.3
Ronquille Island	1945-55 1972-75 Δ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	251 235 -15	100.0 100.0 -6.0	NA NA	NA NA	251 236 -6.0
Grande Terre Island Group	1945-55 1972-75 Δ	45 160 +115	7.8 6.5 +256.0	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	2,411 2,291 -120	98.2 93.5 -5.0	NA NA	NA NA	2,456 2,451 -0.2
Grand Isle	1945-55 1972-75 Δ	1,121 1,901 +680	29.0 48.0 +70.0	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	360 397 +37	9.3 10.0 +10.0	1,622 1,421 -201	42.0 35.9 -12.0	761 243 -518	19.7 6.1 -68.0	3,864 3,962 +3.0

<sup>1</sup> No photographic coverage for 1945-55; totals do not include data for these islands.

TABLE 25.—Changes in area values of Level I land use and land cover for 18 barrier islands off the Louisiana coast—Continued

Name of island	Years compared	Urban or built-up land		Agricultural land		Rangeland		Forest land		Water bodies		Wetland		Barren land		Year totals
		Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	
<b>Caminada</b> -----	1945-55 1972-75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	136	68.7	62	31.3	198
	Δ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	186	100.0	-0-	0.0	186
												+50	+37.0	-62	-100.0	-6.0
<b>East Timbalier Island</b> ----	1945-55 1972-75	-0-	0.0	NA	NA	NA	NA	NA	NA	NA	NA	1,113	78.0	314	22.0	1,427
	Δ	141	10.3	NA	NA	NA	NA	NA	NA	NA	NA	1,146	84.6	70	5.1	1,357
		+141	+									+33	+3.0	-244	-78.0	-5.0
<b>Timbalier Island</b> -----	1945-55 1972-75	313	10.9	NA	NA	NA	NA	NA	NA	NA	NA	1,888	65.8	670	23.3	2,871
	Δ	1,594	35.9	NA	NA	NA	NA	NA	NA	NA	NA	2,803	63.3	38	0.8	4,435
		+1,281	+409.0									+915	+48.0	-632	-94.0	55.0
<b>Isle Dernieres</b> -----	1945-55 1972-75	NA	NA	NA	NA	NA	NA	NA	NA	91	1.8	4,161	81.0	887	17.2	5,139
	Δ	NA	NA	NA	NA	NA	NA	NA	NA	70	1.3	4,205	82.9	806	15.8	5,081
										-21	-23.0	+44	+1.0	-81	-9.0	-1.0
<b>Category totals</b> ----	1945-55	1,651	4.5	NA	NA	NA	NA	NA	NA	1,419	3.8	26,447	71.2	7,611	20.5	37,128
<b>and</b> ----	1972-75	6,746	17.5	NA	NA	NA	NA	NA	NA	1,504	3.9	24,030	62.4	6,238	16.2	38,518
<b>Change totals</b> -----	Δ	+5,095	+309.0							+85	+6.0	-2,417	-9.0	-1,473	-18.0	+4.0

TABLE 26.—Changes in area values of Level I land use and land cover for 16 barrier islands off the Texas coast

Name of island	Years compared	Urban or built-up land		Agricultural land		Rangeland		Forest land		Water bodies		Wetland		Barren land		Year totals
		Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	
Bolivar Peninsula	1945-55	817	3.4	65	0.3	NA	NA	NA	NA	1,589	6.5	21,061	86.6	781	3.2	24,313
	1972-75	3,187	12.6	-0-	0.0	NA	NA	NA	NA	1,453	5.7	20,294	80.4	346	1.3	25,280
	Δ	+2,370	+290.0	-65	-100.0					-136	-9.0	-167	-4.0	-435	-56.0	+4.0
Galveston Island	1945-55	7,215	25.2	NA	NA	NA	NA	NA	NA	811	2.8	18,566	65.0	1,987	7.0	28,579
	1972-75	9,722	32.9	NA	NA	NA	NA	NA	NA	768	2.5	17,837	60.4	1,254	4.2	29,581
	Δ	+2,507	+35.0							-43	-5.0	-729	-4.0	-733	-37.0	+4.0
Rattlesnake Point	1945-55	-0-	0.0	NA	NA	NA	NA	NA	NA	NA	NA	3,977	93.9	258	6.1	4,235
	1972-75	147	3.4	NA	NA	NA	NA	NA	NA	NA	NA	3,756	88.8	332	7.8	4,235
	Δ	+147	+									-221	-6.0	+74	+29.0	0.0
Follets Island	1945-55	-0-	0.0	NA	NA	NA	NA	NA	NA	411	16.2	1,153	45.4	977	38.4	2,541
	1972-75	531	21.0	NA	NA	NA	NA	NA	NA	390	15.4	922	36.5	685	27.1	2,528
	Δ	+531	+							-21	-5.0	-231	-20.0	-292	-30.0	-1.0
Brazos	1945-55	-0-	0.0	NA	NA	NA	NA	NA	NA	162	4.9	1,648	49.4	1,524	45.7	3,334
	1972-75	147	4.4	NA	NA	NA	NA	NA	NA	141	4.2	1,754	52.9	1,274	38.5	3,316
	Δ	+147	+							-21	-13.0	+106	+6.0	-250	-16.0	-1.0
Cedar Lakes	1945-55	NA	NA	NA	NA	NA	NA	NA	NA	1,991	25.5	4,248	54.3	1,579	20.2	7,818
	1972-75	NA	NA	NA	NA	NA	NA	NA	NA	1,978	25.3	4,262	54.5	1,587	20.2	7,827
	Δ									-13	-1.0	+14	+0.3	+3	+1.0	+0.1
Brown Cedar	1945-55	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	781	53.1	689	46.9	1,470
	1972-75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	774	53.1	685	46.9	1,459
	Δ											-7	-1.0	-4	0.0	-1.0
Matagorda Peninsula East	1945-55	NA	NA	NA	NA	NA	NA	NA	NA	248	2.2	6,310	55.7	4,762	42.1	11,320
	1972-75	NA	NA	NA	NA	NA	NA	NA	NA	224	1.9	6,234	55.2	4,838	42.9	11,296
	Δ									-24	-10.0	-76	-1.0	+76	+2.0	-0.2
Matagorda Peninsula West	1945-55	365	2.1	NA	NA	5,472	32.5	NA	NA	82	0.5	6,319	37.5	4,612	27.4	16,850
	1972-75	442	2.3	NA	NA	5,324	28.6	NA	NA	192	1.0	7,597	40.8	5,107	27.3	18,662
	Δ	+77	+17.0			-148	-3.0			+90	+134.0	+1,278	+20.0	+495	+11.0	+11.0
Matagorda Island	1945-55	596	1.1	NA	NA	23,079	41.2	NA	NA	3,610	6.4	23,000	41.0	5,790	10.3	56,075
	1972-75	1,638	2.9	NA	NA	22,009	39.3	NA	NA	3,802	6.7	22,829	40.7	5,856	10.4	56,134
	Δ	+1,042	+175.0			-1,070	-5.0			+192	+5.0	-171	-1.0	+66	+1.0	+0.1
St. Joseph Island	1945-55	-0-	0.0	-0-	0.0	10,390	23.1	816	1.8	241	0.6	22,314	49.7	11,151	24.8	44,932
	1972-75	13	0.03	88	0.2	10,809	23.8	1,152	2.5	281	0.6	21,216	46.6	11,946	26.3	45,505
	Δ	+13	+	+88	+	+419	+4.0	+336	+41.0	+20	+8.0	-1,098	-5.0	+795	+7.0	+1.0
Mustang Island	1945-55	253	1.1	NA	NA	11,604	48.3	NA	NA	343	1.4	8,612	35.8	3,210	13.4	24,022
	1972-75	1,298	5.4	NA	NA	11,288	47.3	NA	NA	306	1.3	8,093	33.9	2,878	12.1	23,863
	Δ					-316	-3.0			-37	-11.0	-519	-6.0	-332	-10.0	-1.0
Padre Island North	1945-55	-0-	0.0	NA	NA	18,811	44.6	NA	NA	NA	NA	8,219	19.5	15,131	35.9	42,161
	1972-75	807	2.0	NA	NA	16,721	40.4	NA	NA	NA	NA	7,550	18.2	16,283	39.4	41,361
	Δ	+807	+			-2,090	-11.0					-669	-8.0	+1,157	+8.0	+2.0
Padre Island Central	1945-55	NA	NA	NA	NA	11,484	18.7	NA	NA	NA	NA	31,214	50.8	18,791	30.5	61,489
	1972-75	NA	NA	NA	NA	12,082	18.5	NA	NA	NA	NA	32,870	50.5	20,172	31.0	65,124
	Δ					+598	+5.0					+1,656	+5.0	+1,381	+7.0	+6.0
Padre Island South	1945-55	-0-	0.0	NA	NA	5,123	12.7	NA	NA	NA	NA	26,157	64.9	9,052	22.4	40,332
	1972-75	1,478	3.7	NA	NA	3,891	9.7	NA	NA	NA	NA	25,920	64.6	8,806	22.0	40,095
	Δ	+1,478	+			-1,232	-24.0					-237	-1.0	-246	-3.0	-1.0
Brazos Island	1945-55	NA	NA	NA	NA	3,164	41.1	NA	NA	-0-	0.0	4,276	55.6	251	3.3	7,691
	1972-75	NA	NA	NA	NA	3,181	41.4	NA	NA	96	1.2	4,250	55.3	160	2.1	7,687
	Δ					+17	+1.0			+96	+	-26	-1.0	-91	-36.0	-0.05
Category totals and Change totals	1945-55	9,246	2.5	65	0.02	89,127	23.6	816	0.2	9,508	2.5	187,855	49.8	80,545	21.4	377,162
	1972-75	19,410	5.3	88	0.02	85,305	23.5	1,152	0.3	9,431	2.7	186,158	51.2	82,209	21.0	383,953
	Δ	+10,164	+110.0	+23	+35.0	-3,822	-4.0	+336	+41.0	+123	+1.0	-1,697	-1.0	+1,664	+2.0	+2.0

TABLE 27.—*Summary of changes in area values of Level I land use and land cover for all Atlantic and Gulf Coast barrier islands in the 8 regional groups*  
 [Data do not include those islands that had no photographic coverage in 1945-55 (see tables 9, 12, and 25); acres in **boldface type**; percents in lightface.]

Name of island	Years compared	Urban or built-up land Acres	Urban or built-up land %	Agricultural land Acres	Agricultural land %	Rangeland Acres	Rangeland %	Forest land Acres	Forest land %	Water bodies Acres	Water bodies %	Wetland Acres	Wetland %	Barren land Acres	Barren land %	Totals
Category totals/ all islands -----	1945-55 1972-75	90,410 228,679	5.5 13.6	14,746 10,160	0.9 0.6	101,019 98,812	6.1 5.9	168,161 152,224	10.2 9.1	101,992 101,250	6.2 6.0	918,015 838,882	55.6 50.0	256,357 249,241	15.5 14.8	1,650,700 1,679,248
Change totals/ all islands -----	Δ	+138,269	+153.0	-4,586	-31.0	-2,207	-2.0	-15,937	-10.0	-742	-0.7	-79,133	-9.0	-7,116	-3.0	+2.0





## **APPENDIX II**

Index maps (figs. 2-7) and land use and land cover maps (figs. 8-125) of the Atlantic and Gulf Coast barrier islands, 1972-75.



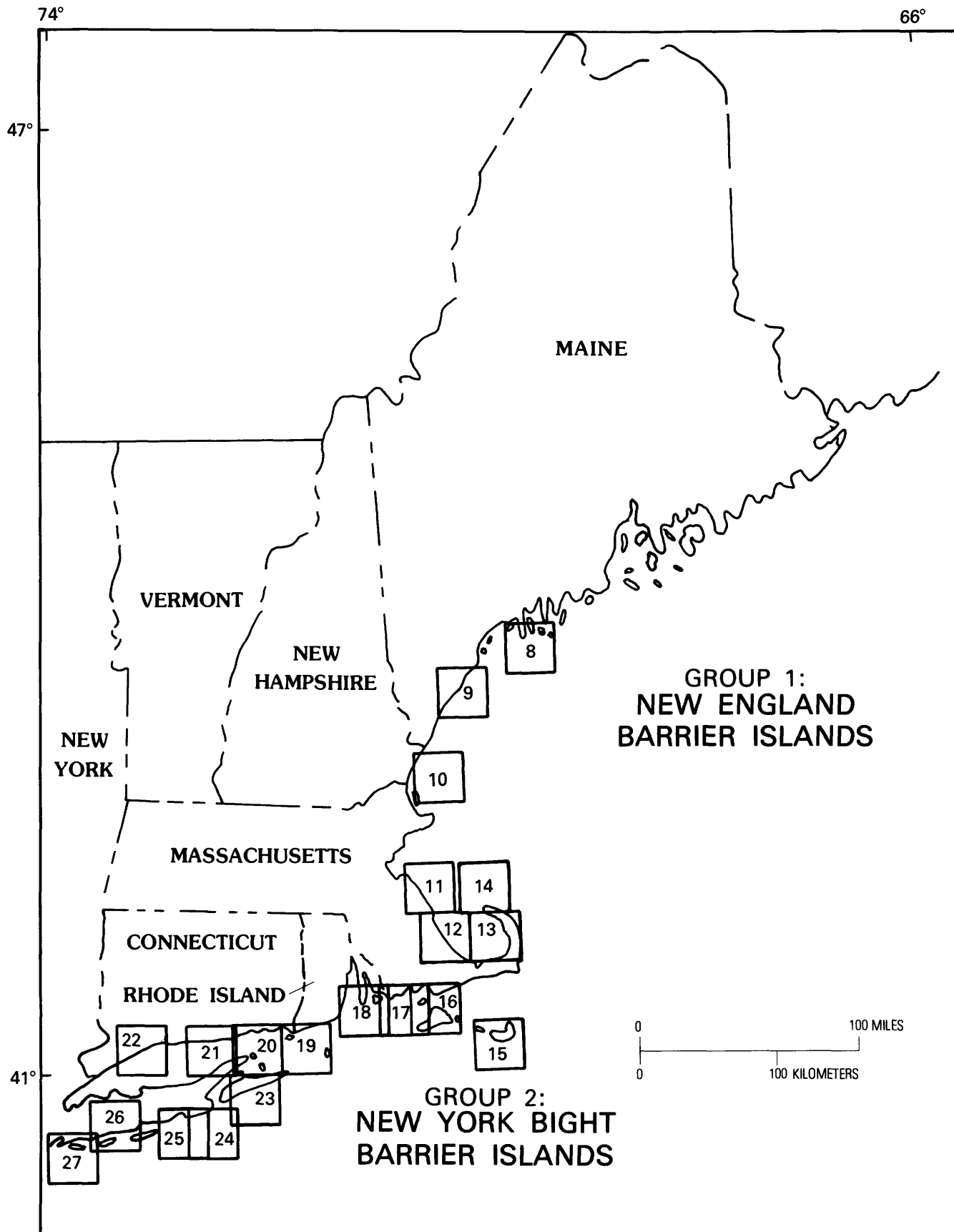


FIGURE 2.—Index to land use and land cover maps of the New England and New York Bight barrier islands.

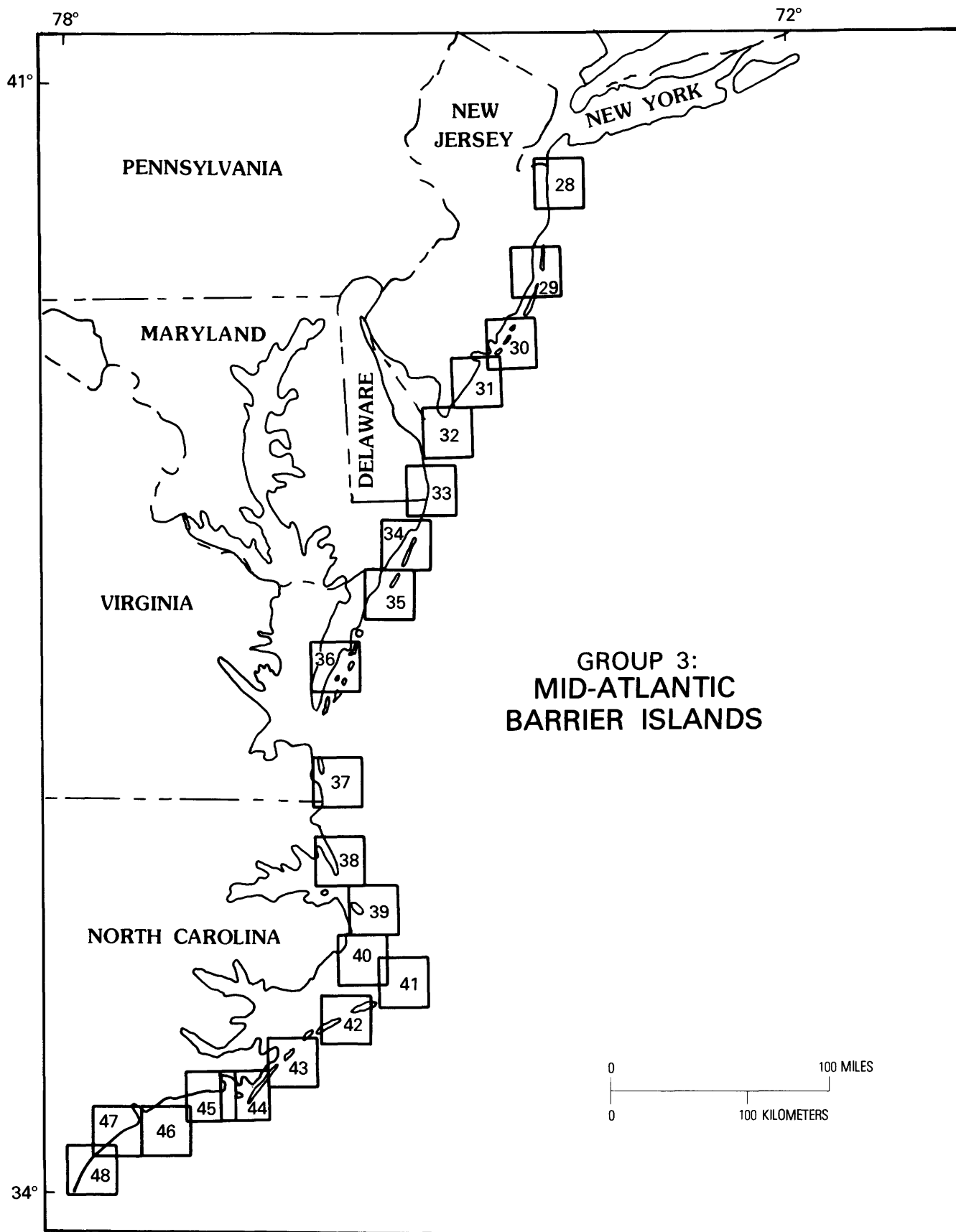


FIGURE 3.—Index to land use and land cover maps of the Mid-Atlantic barrier islands.

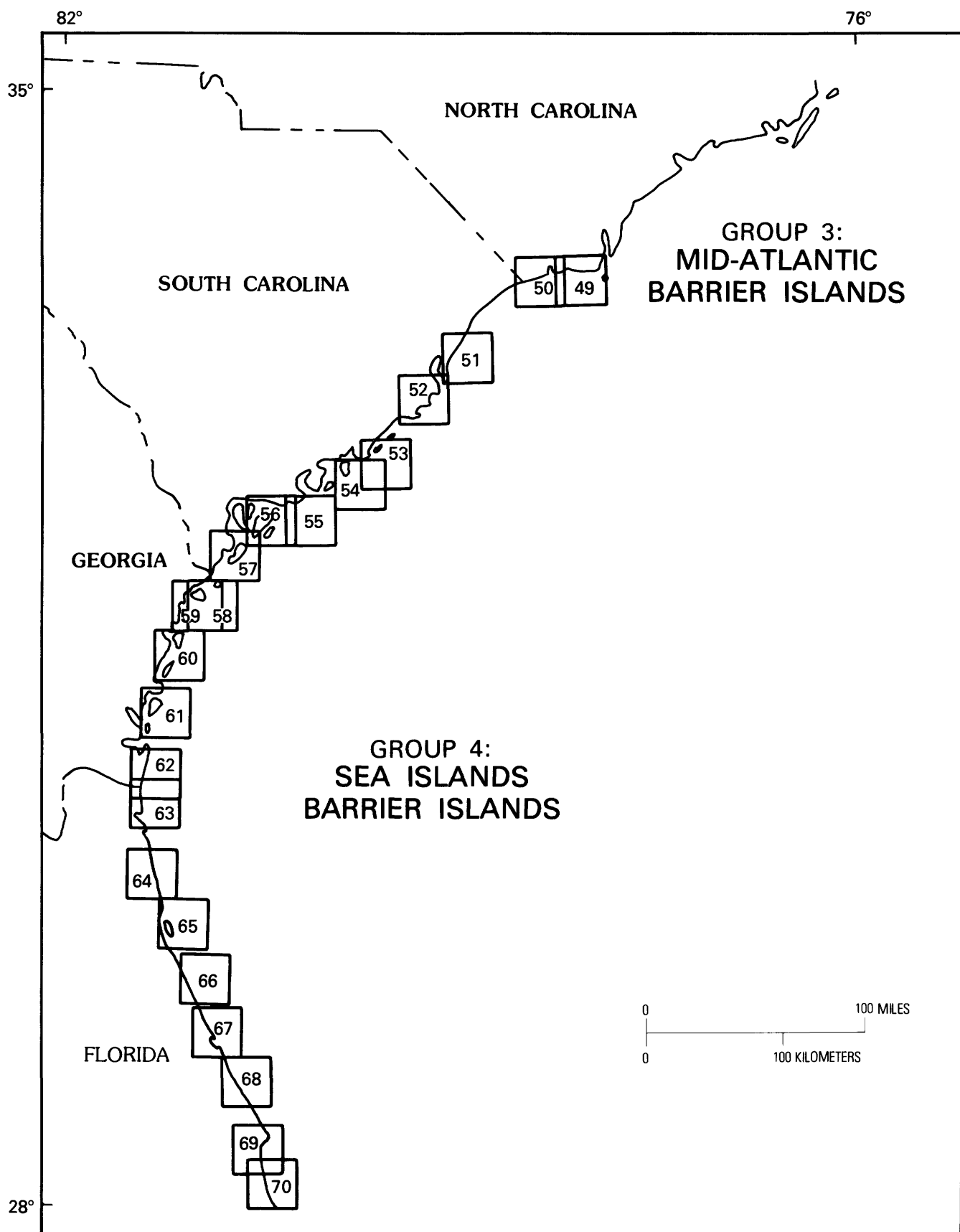


FIGURE 4.—Index to land use and land cover maps of the Mid-Atlantic, Sea Islands, and Florida Atlantic barrier islands.

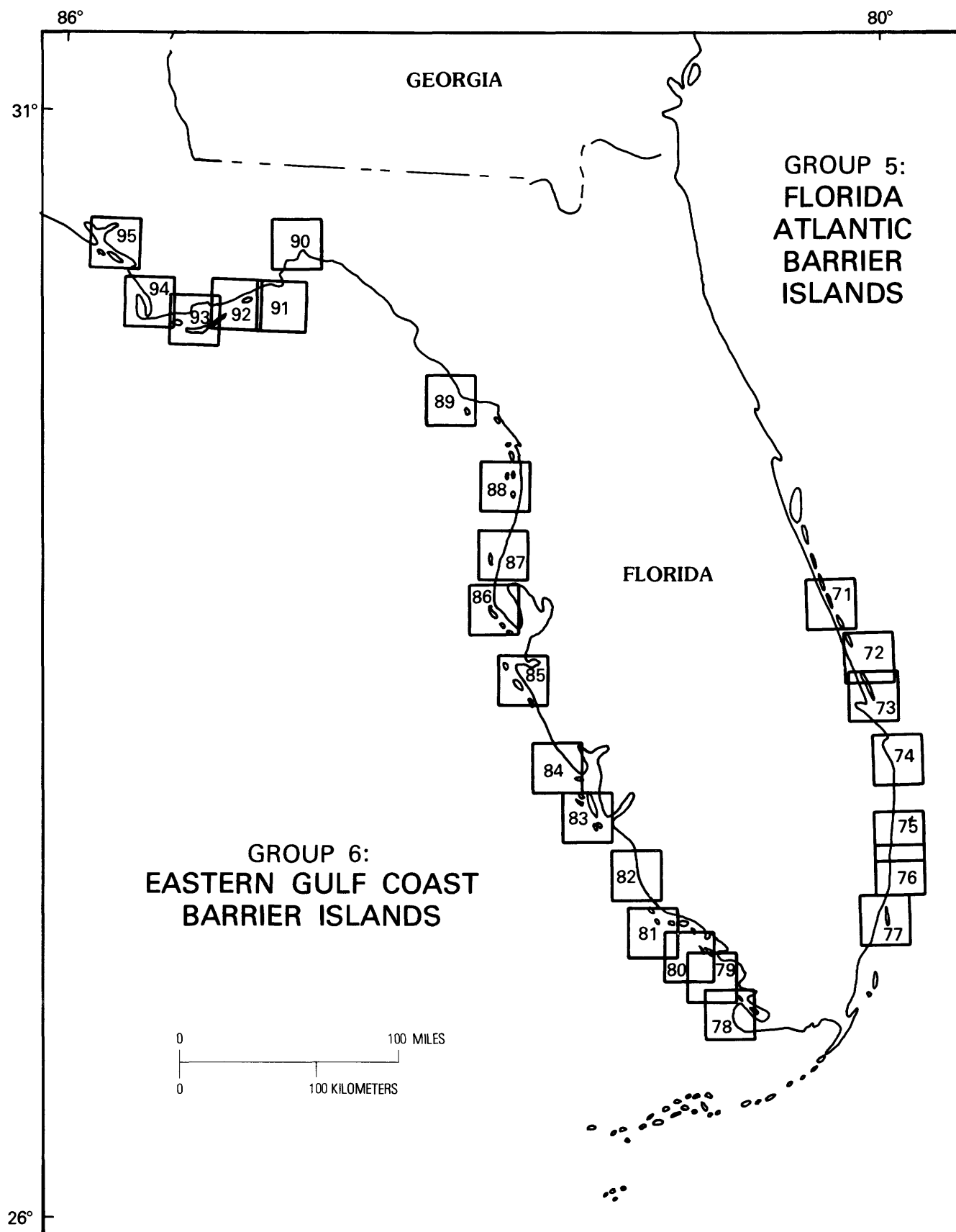


FIGURE 5.—Index to land use and land cover maps of the Florida and Eastern Gulf barrier islands.

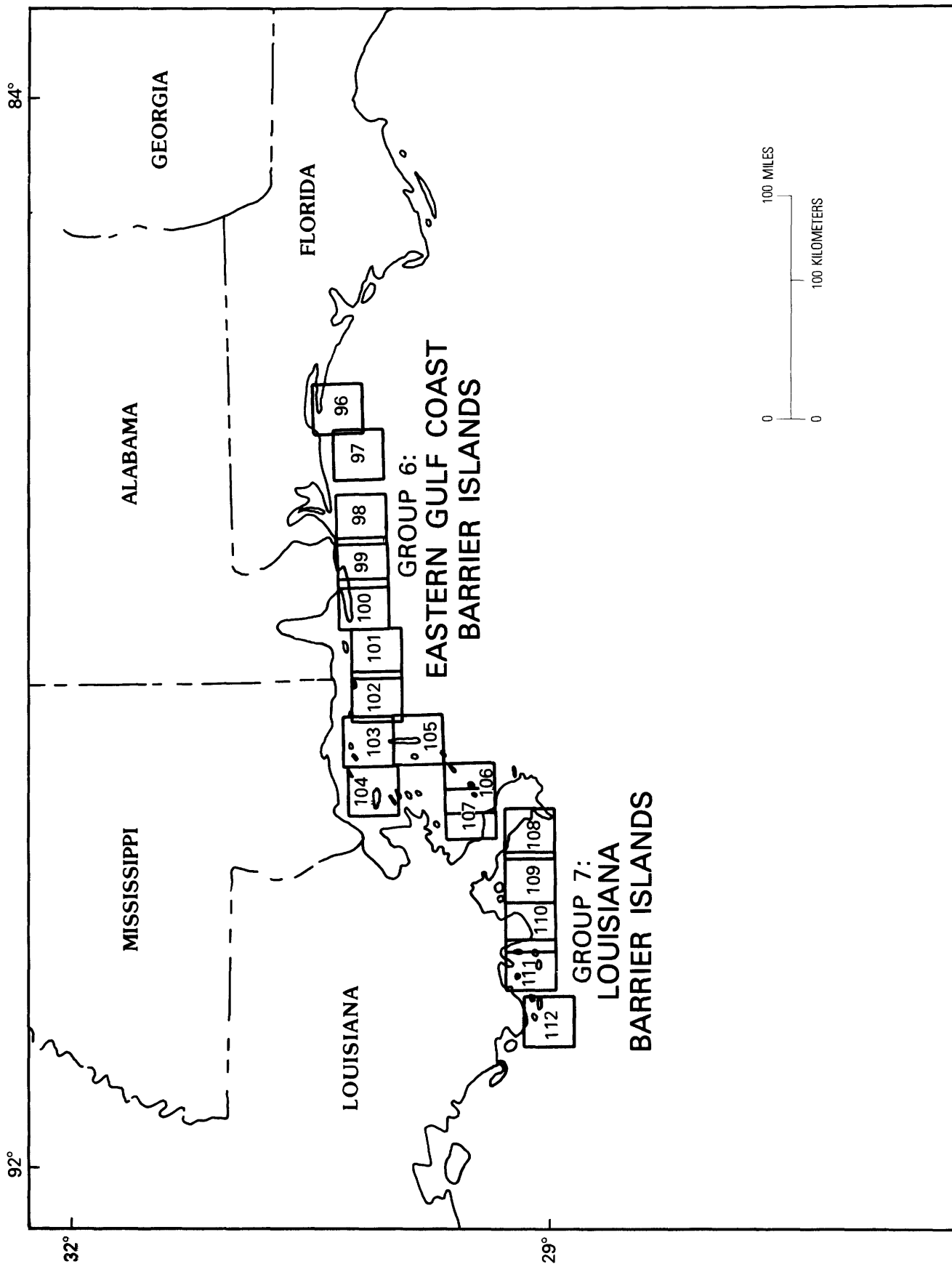


FIGURE 6. — Index to land use and land cover maps of the Eastern Gulf and Louisiana barrier islands.

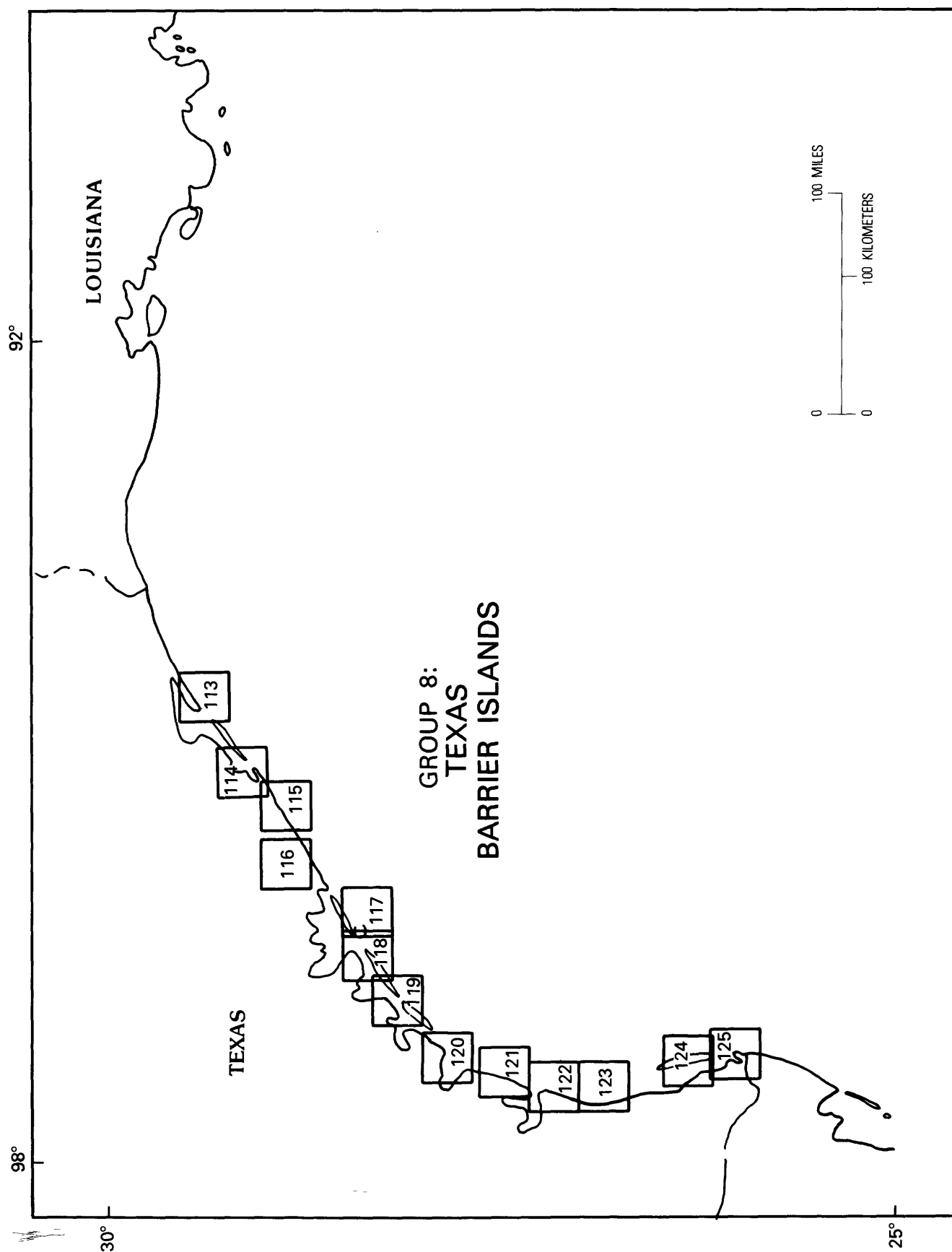


FIGURE 7.—Index to land use and land cover maps of the Texas barrier islands.



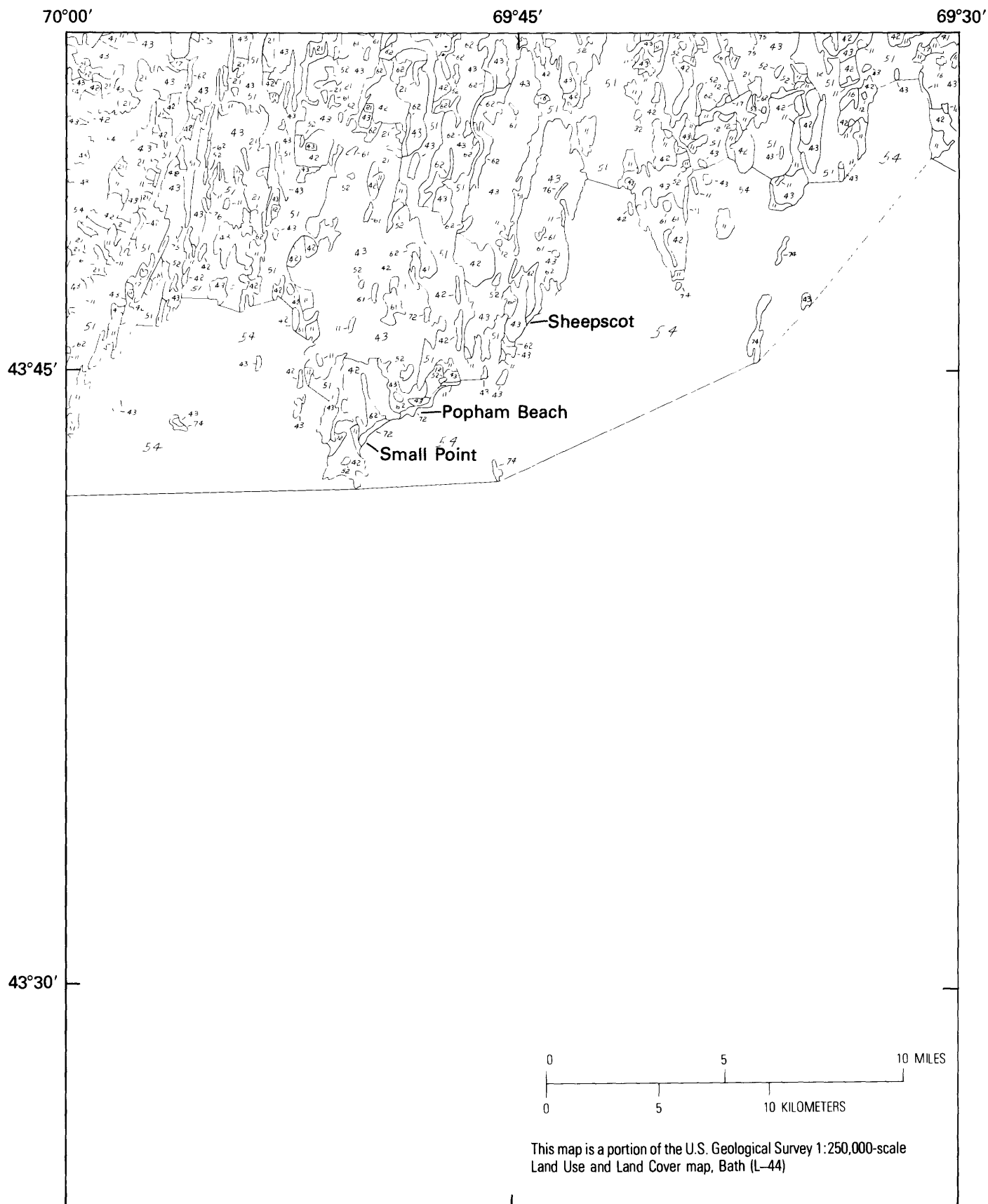


FIGURE 8.—Land use and land cover map of the coastal area near Bath, Maine, with associated barrier islands.



FIGURE 9.—Land use and land cover map of the coastal area near Portland, Maine, with associated barrier islands.

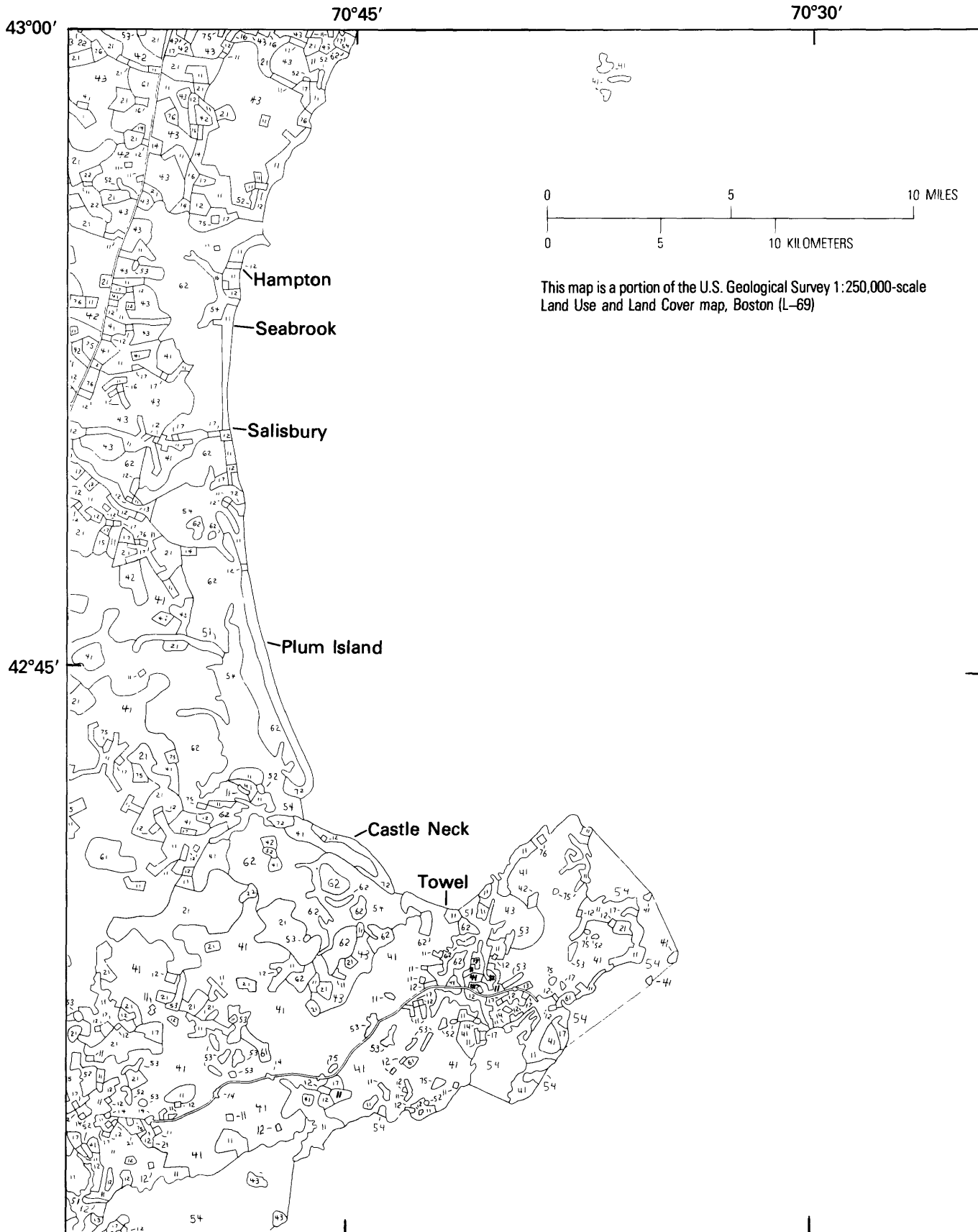


FIGURE 10.—Land use and land cover map of the coastal area near Gloucester, Mass., with associated barrier islands.

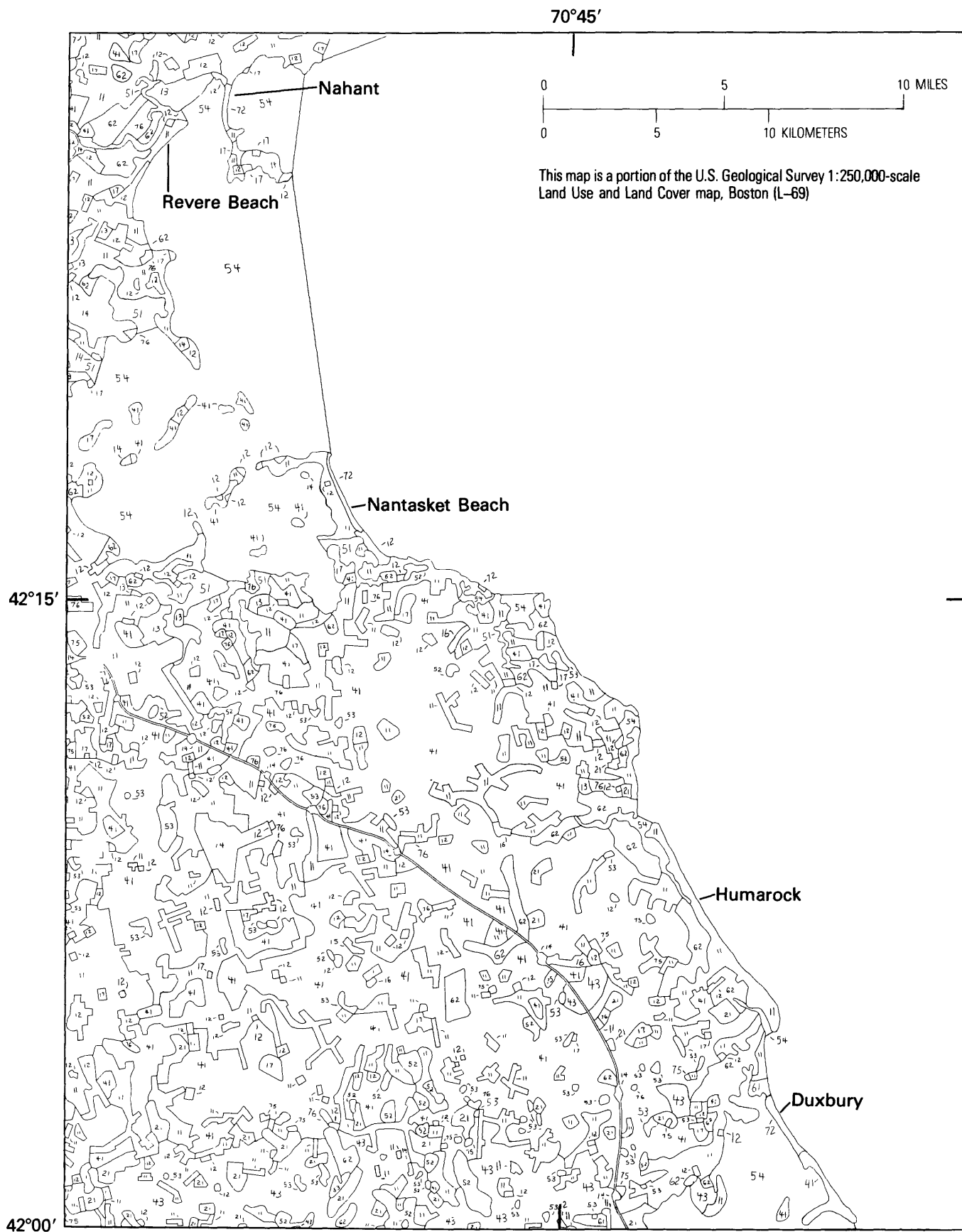


FIGURE 11. - Land use and land cover map of the coastal area near Boston, Mass., with associated barrier islands.



FIGURE 12. - Land use and land cover map of the coastal area near Plymouth, Mass., with associated barrier islands.



FIGURE 13.—Land use and land cover map of the coastal area near Cape Cod, Mass., with associated barrier islands.

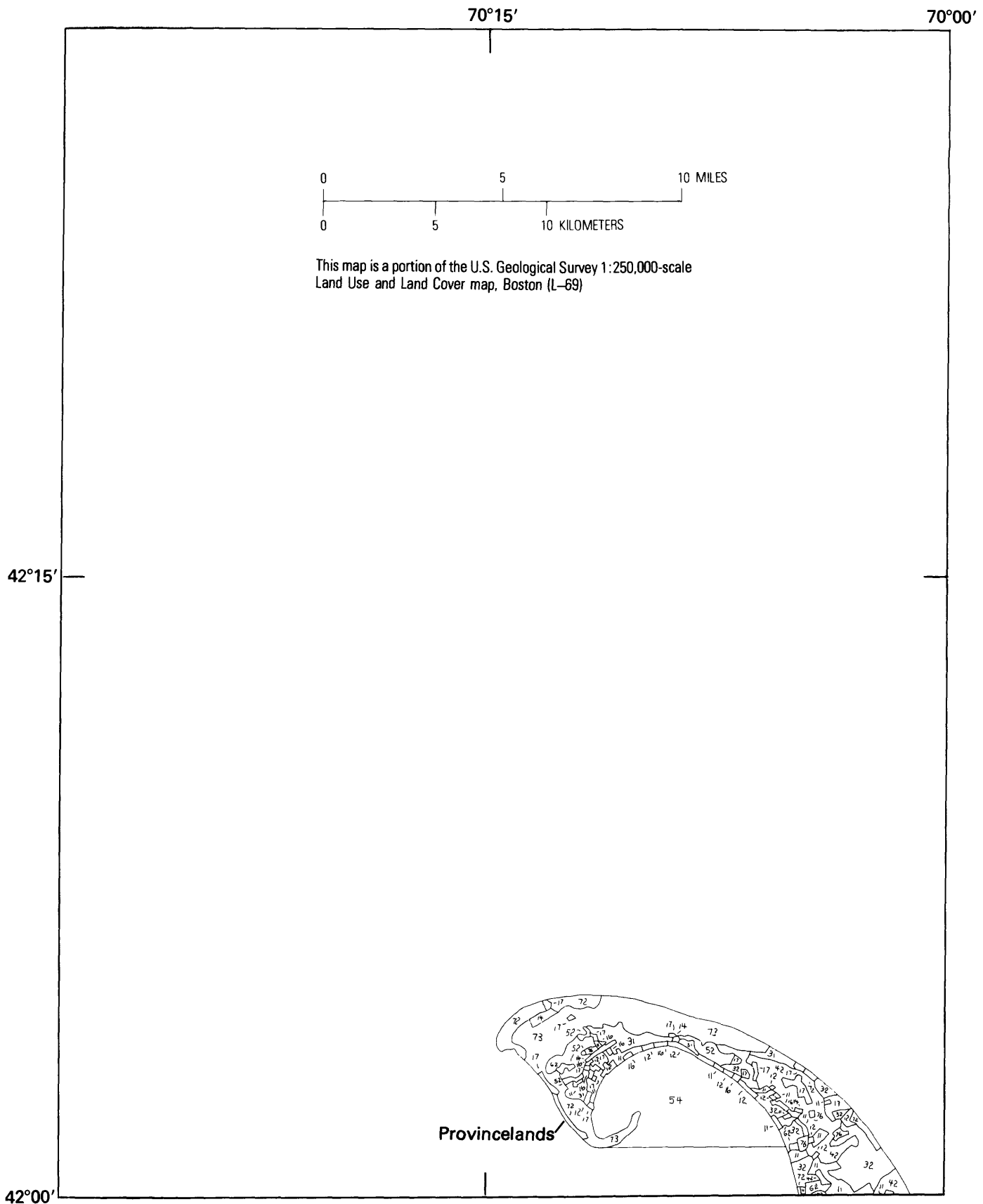
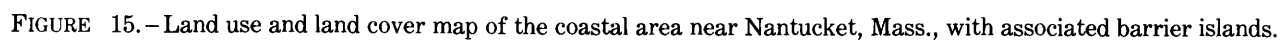


FIGURE 14.—Land use and land cover map of the coastal area near Provincetown, Mass., with associated barrier islands.





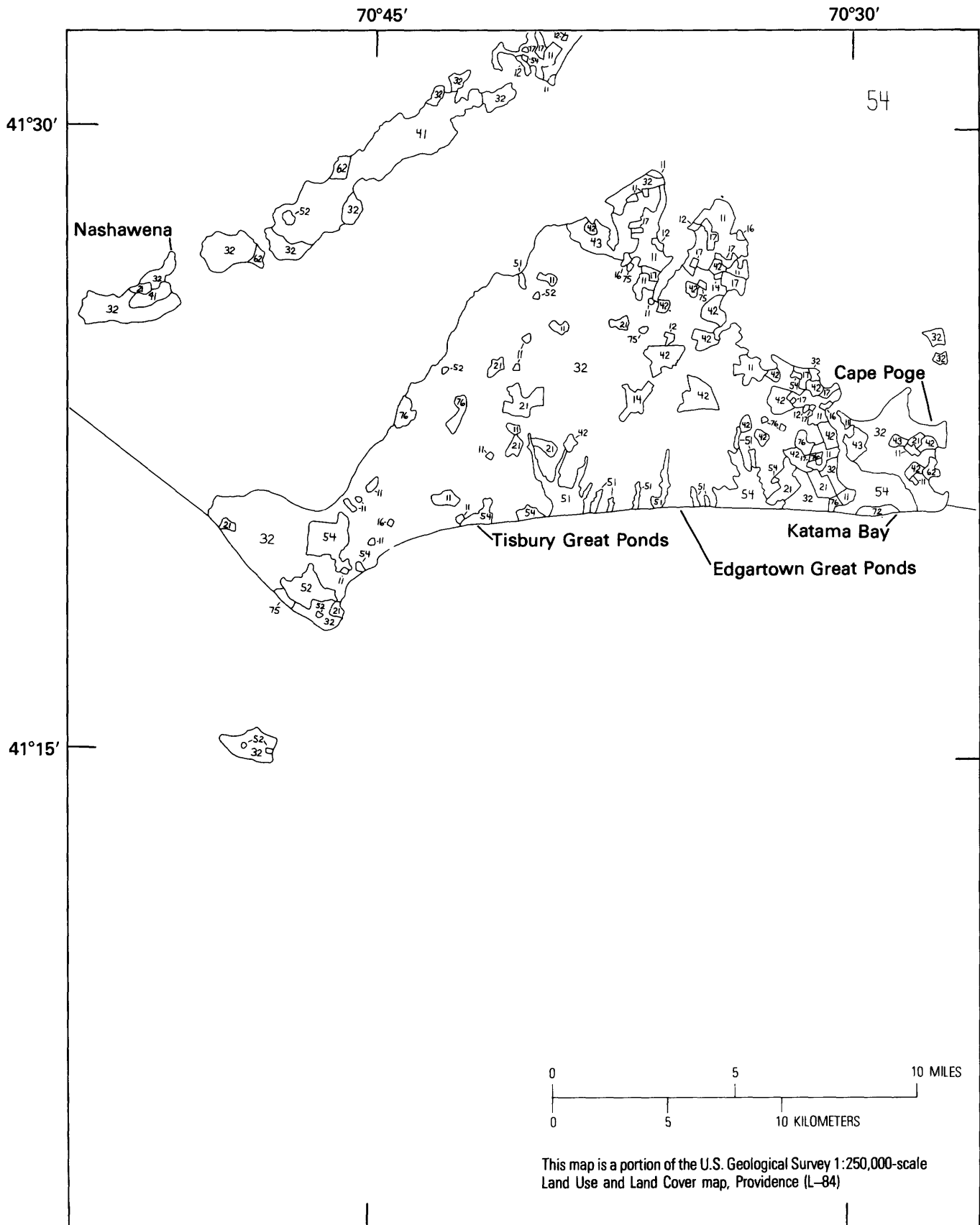


FIGURE 16. – Land use and land cover map of the coastal area near Martha's Vineyard, Mass., with associated barrier islands.

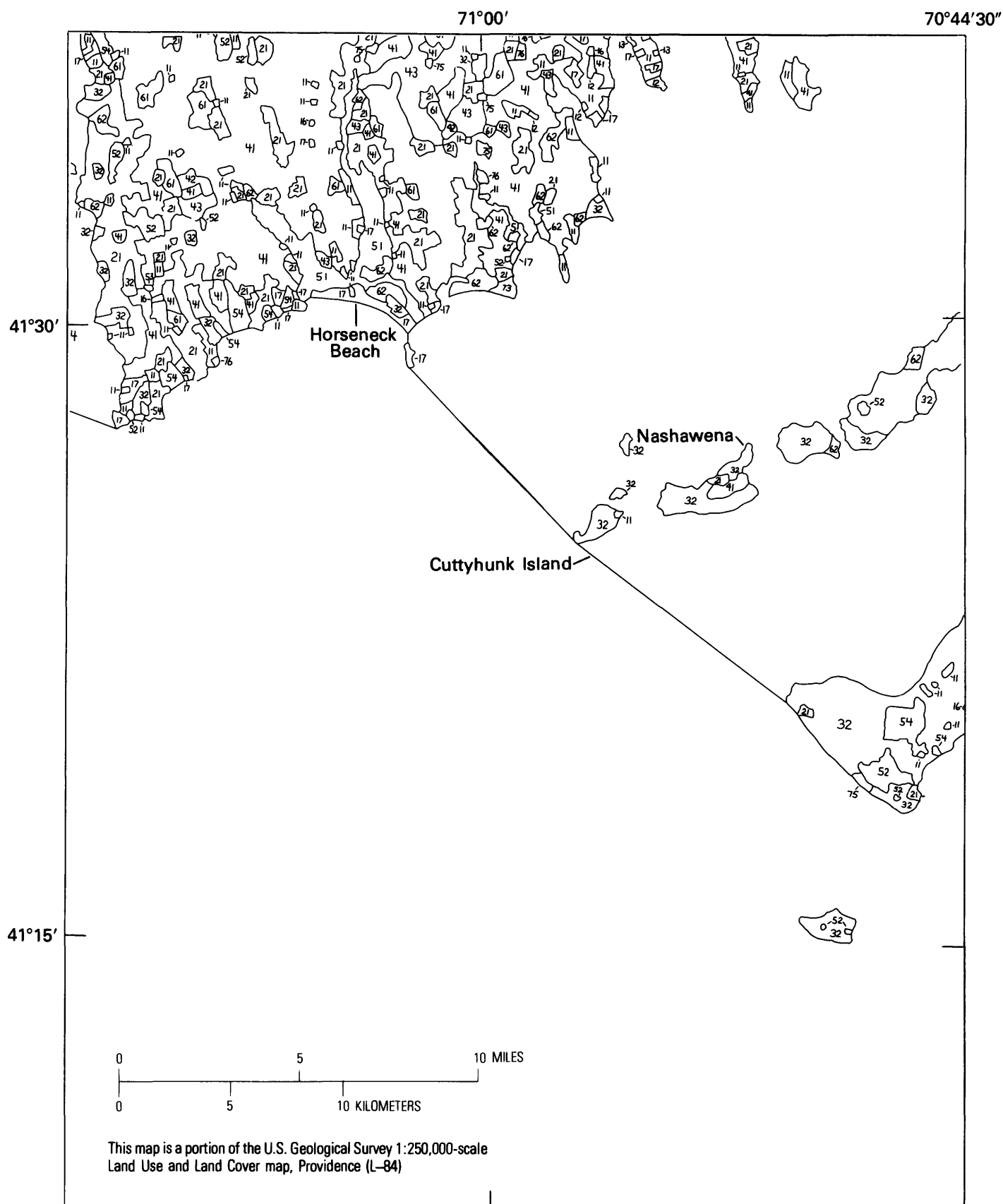


FIGURE 17. – Land use and land cover map of the coastal area near New Bedford, Mass., with associated barrier islands.

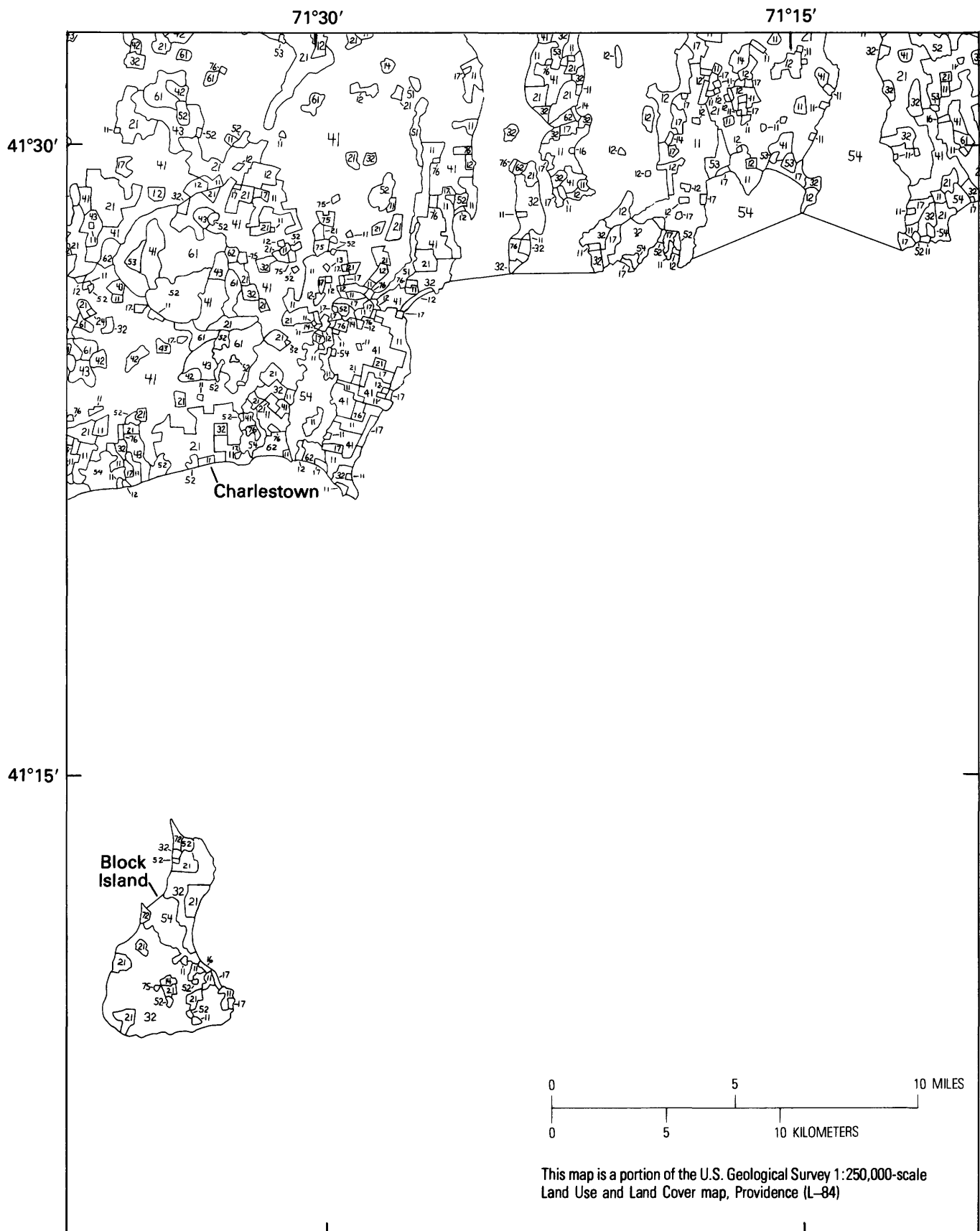


FIGURE 18.—Land use and land cover map of the coastal area near Newport, R.I., with associated barrier islands.

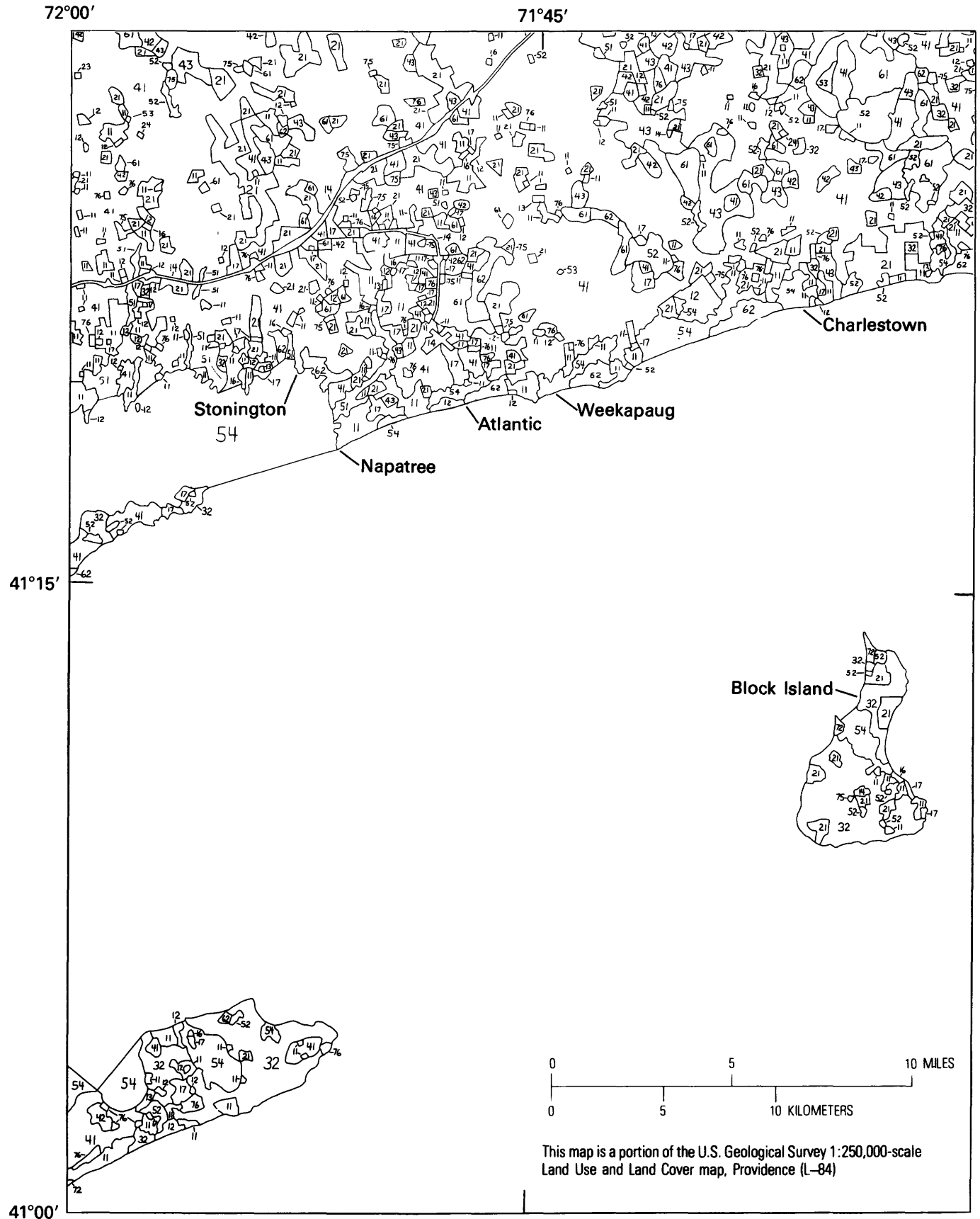


FIGURE 19.—Land use and land cover map of the coastal area near Mystic, Conn., with associated barrier islands.

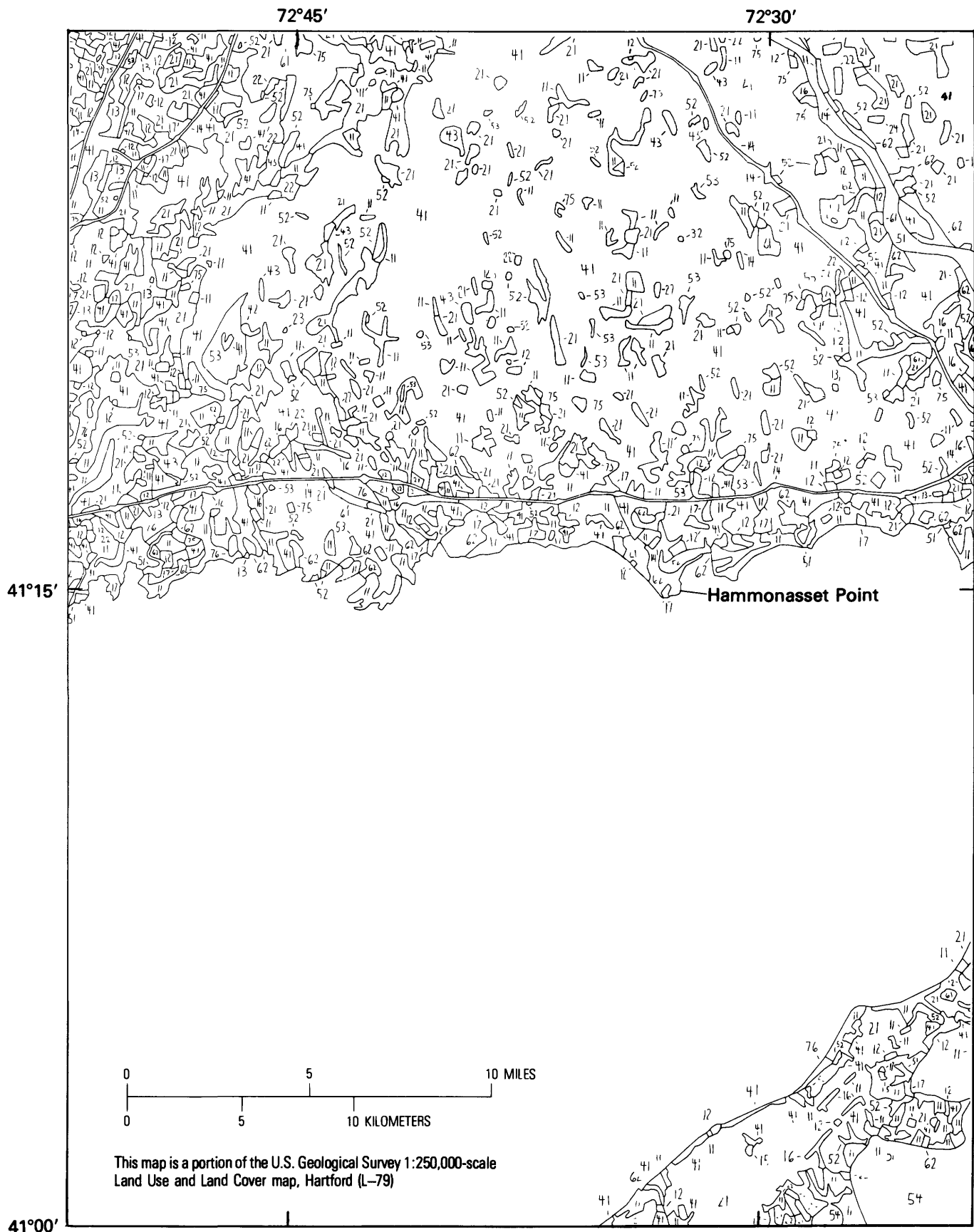


FIGURE 20.—Land use and land cover map of the coastal area near New Haven, Conn., with associated barrier islands.

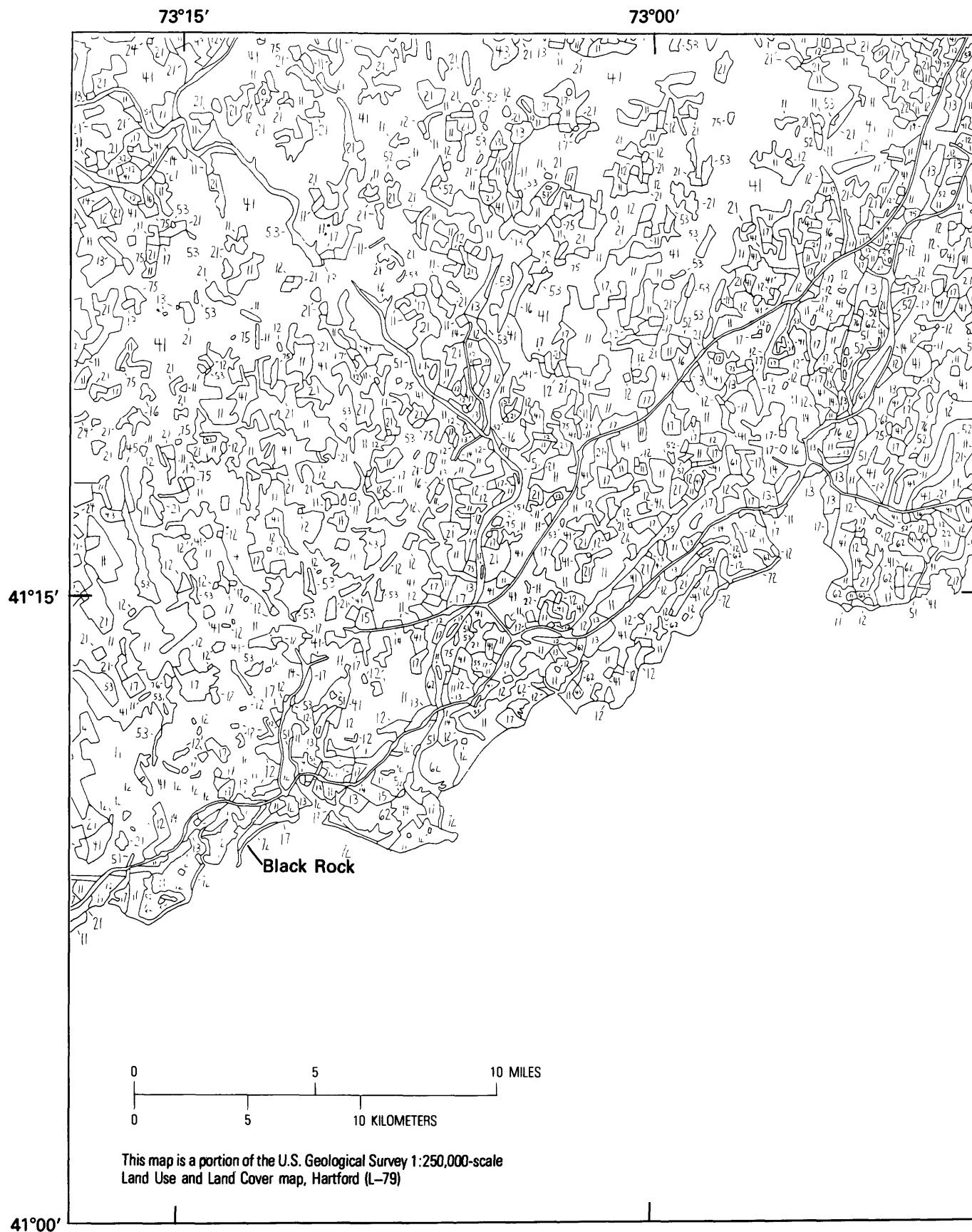


FIGURE 21. — Land use and land cover map of the coastal area near Bridgeport, Conn., with associated barrier islands.

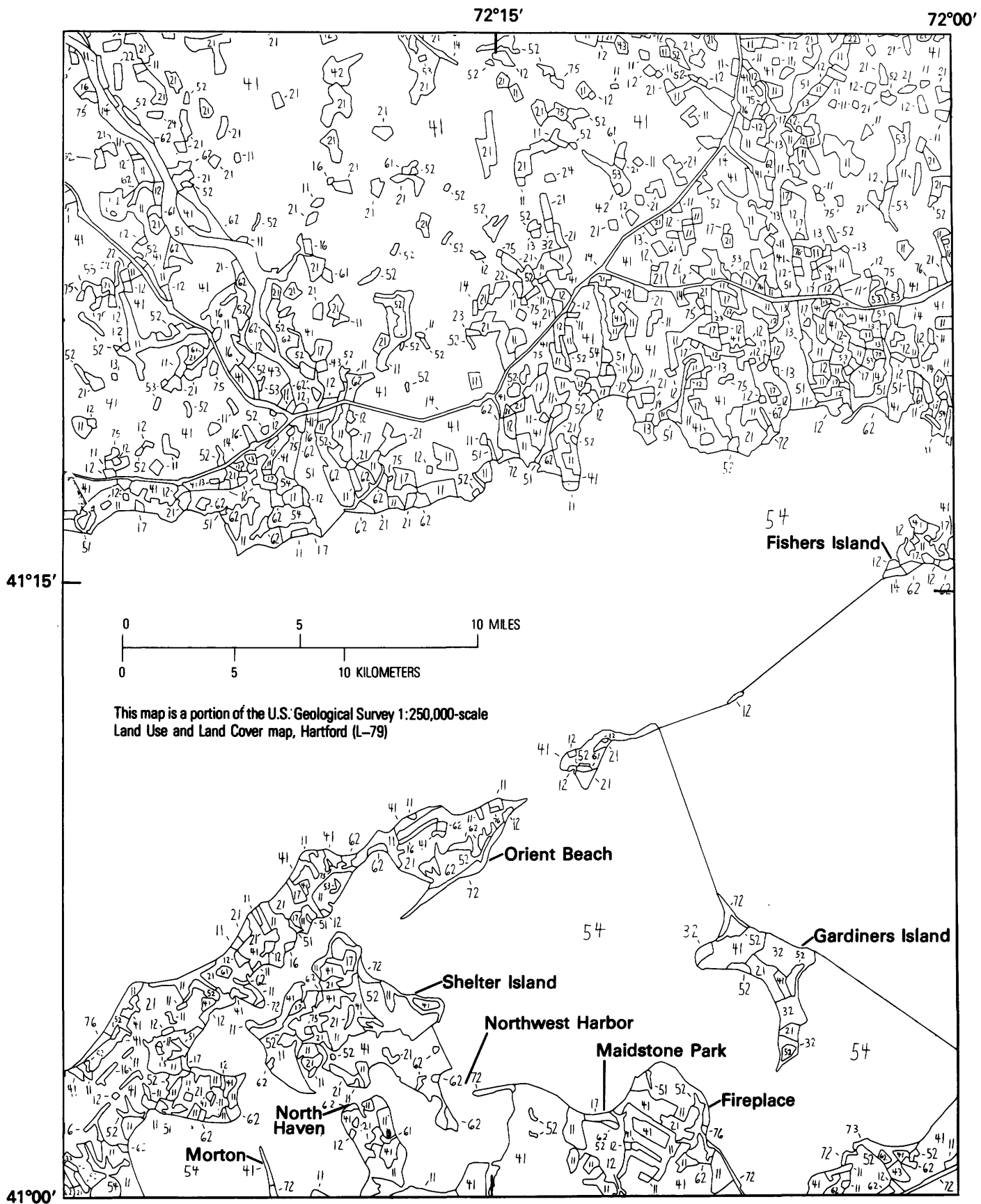


FIGURE 22. — Land use and land cover map of the coastal area near New London, Conn., with associated barrier islands.

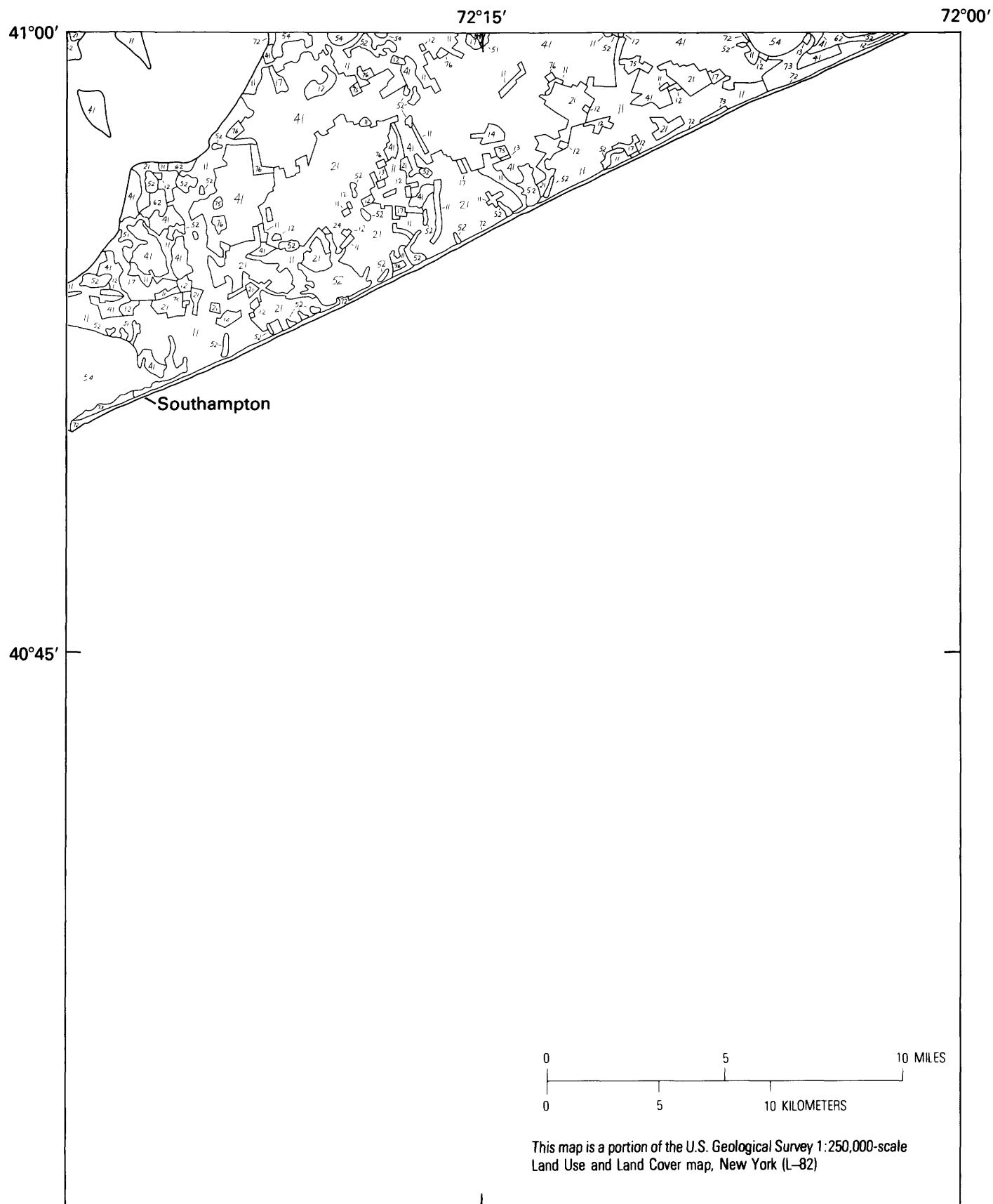


FIGURE 23. — Land use and land cover map of the coastal area near Southampton, N.Y., with associated barrier islands.





FIGURE 24. — Land use and land cover map of the coastal area near Brookhaven, N.Y., with associated barrier islands.

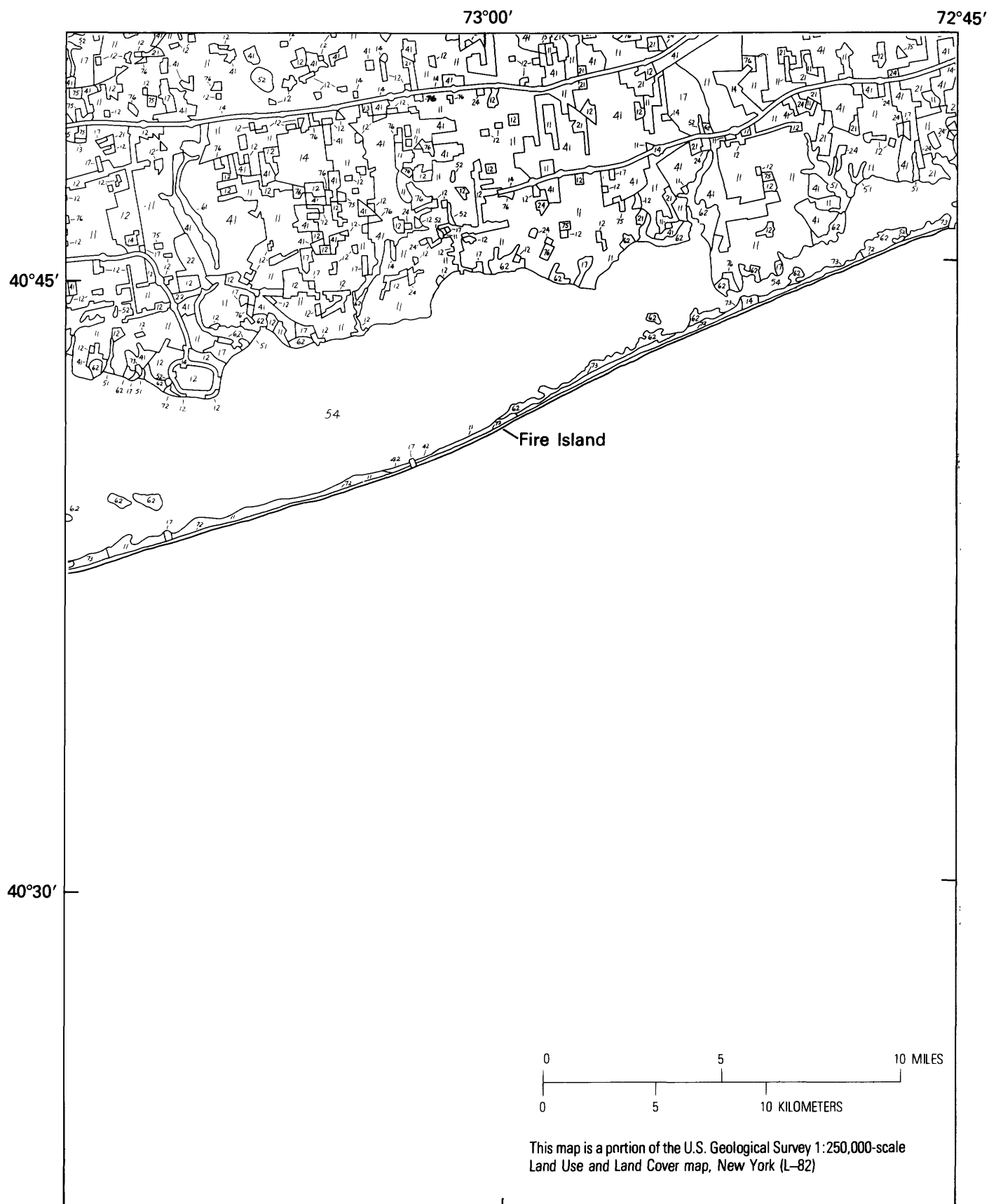


FIGURE 25.—Land use and land cover map of the coastal area near Fire Island, N.Y., with associated barrier islands.

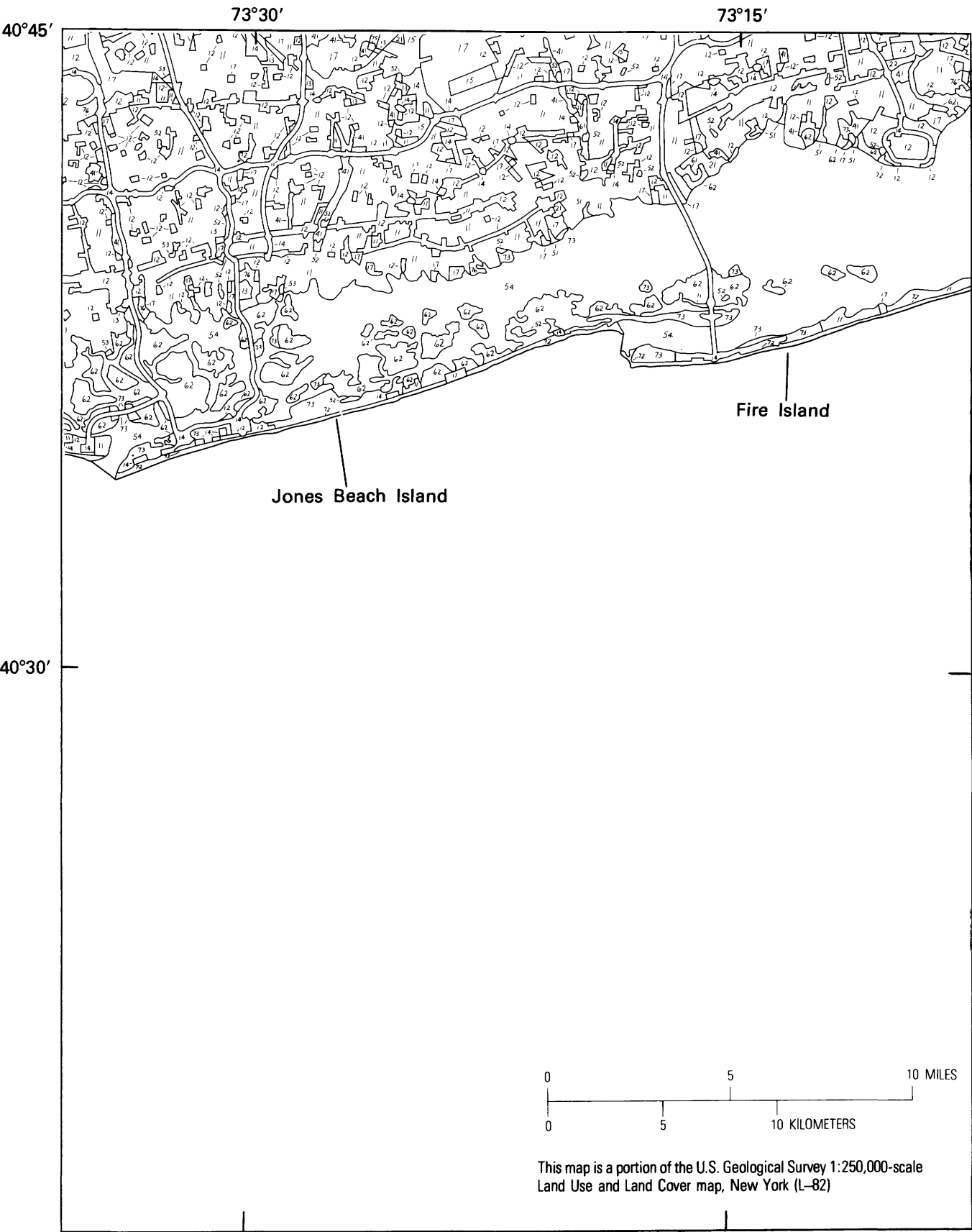


FIGURE 26. – Land use and land cover map of the coastal area near Lindenhurst, N.Y., with associated barrier islands.

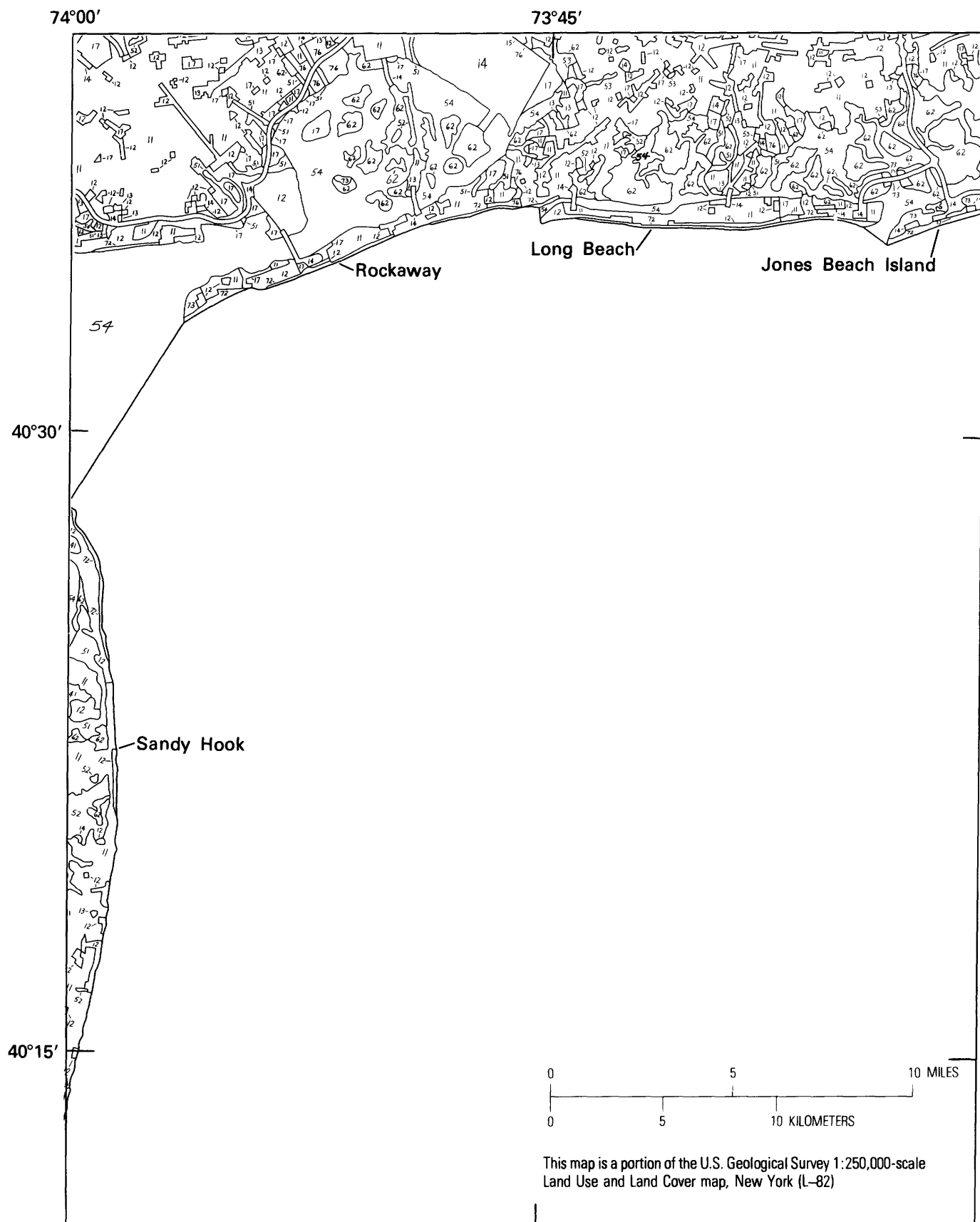


FIGURE 27.—Land use and land cover map of the coastal area near New York, N.Y., with associated barrier islands.

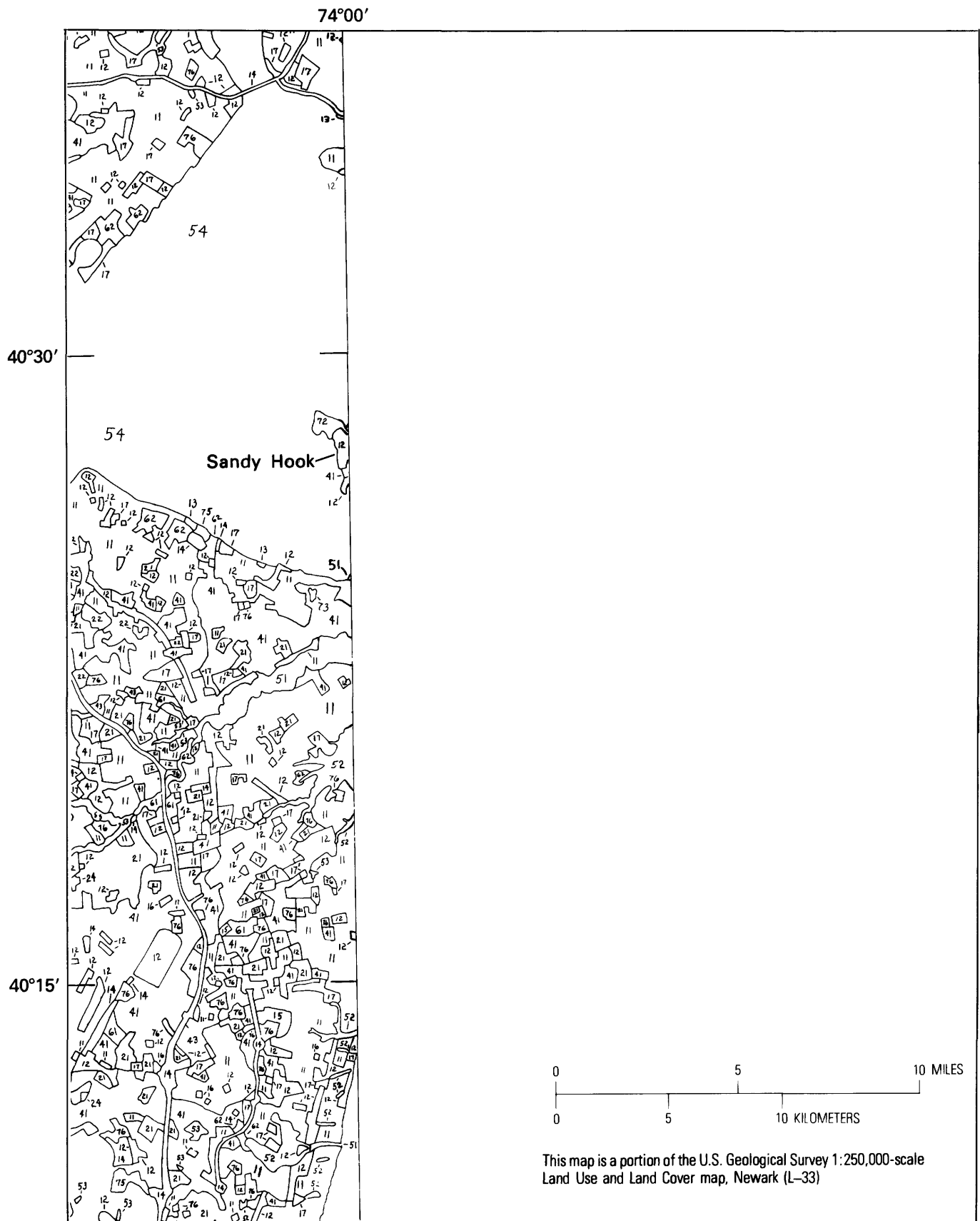
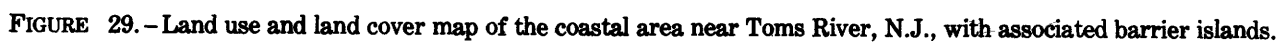
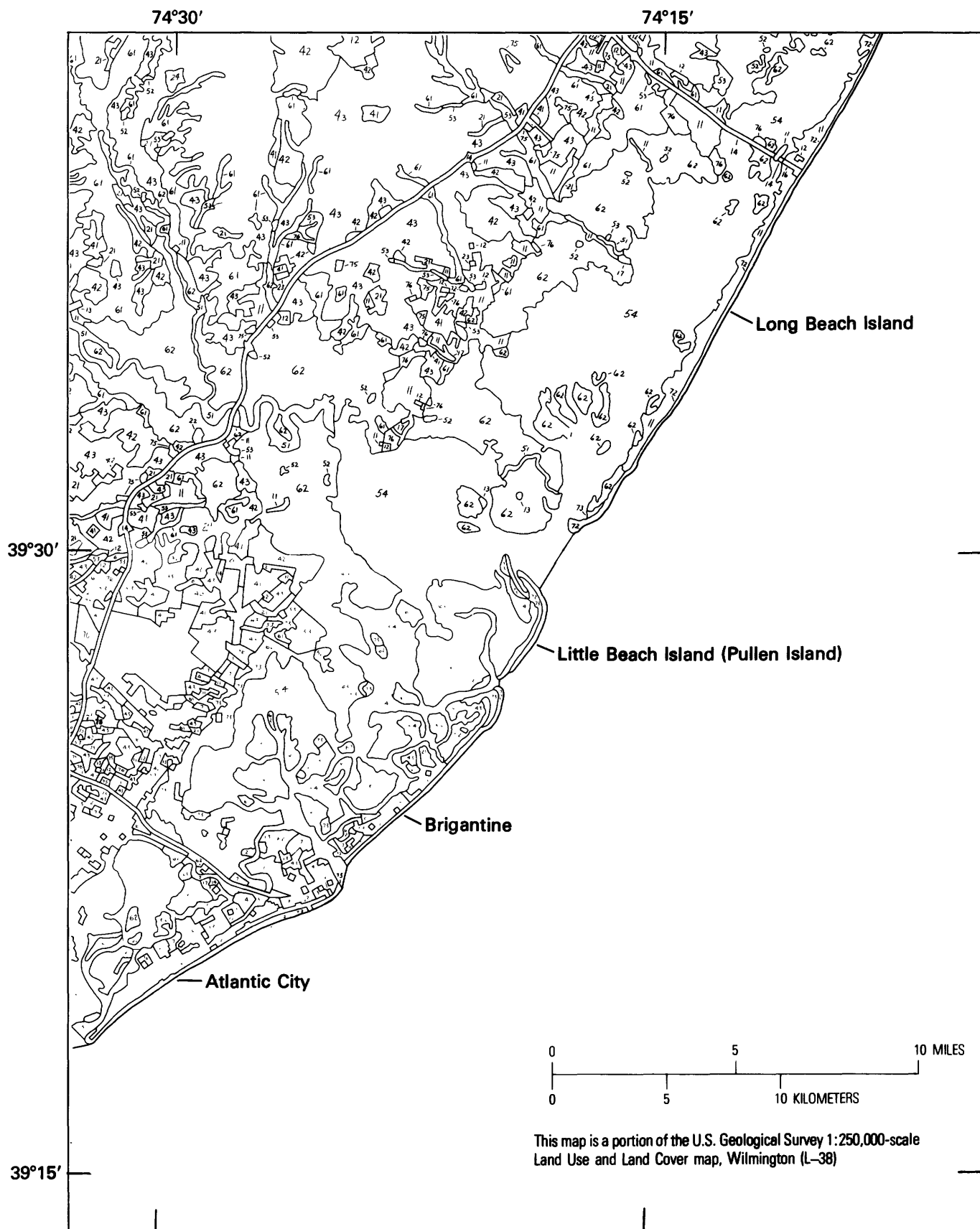


FIGURE 28. - Land use and land cover map of the coastal area near Sandy Hook, N.J., with associated barrier islands.





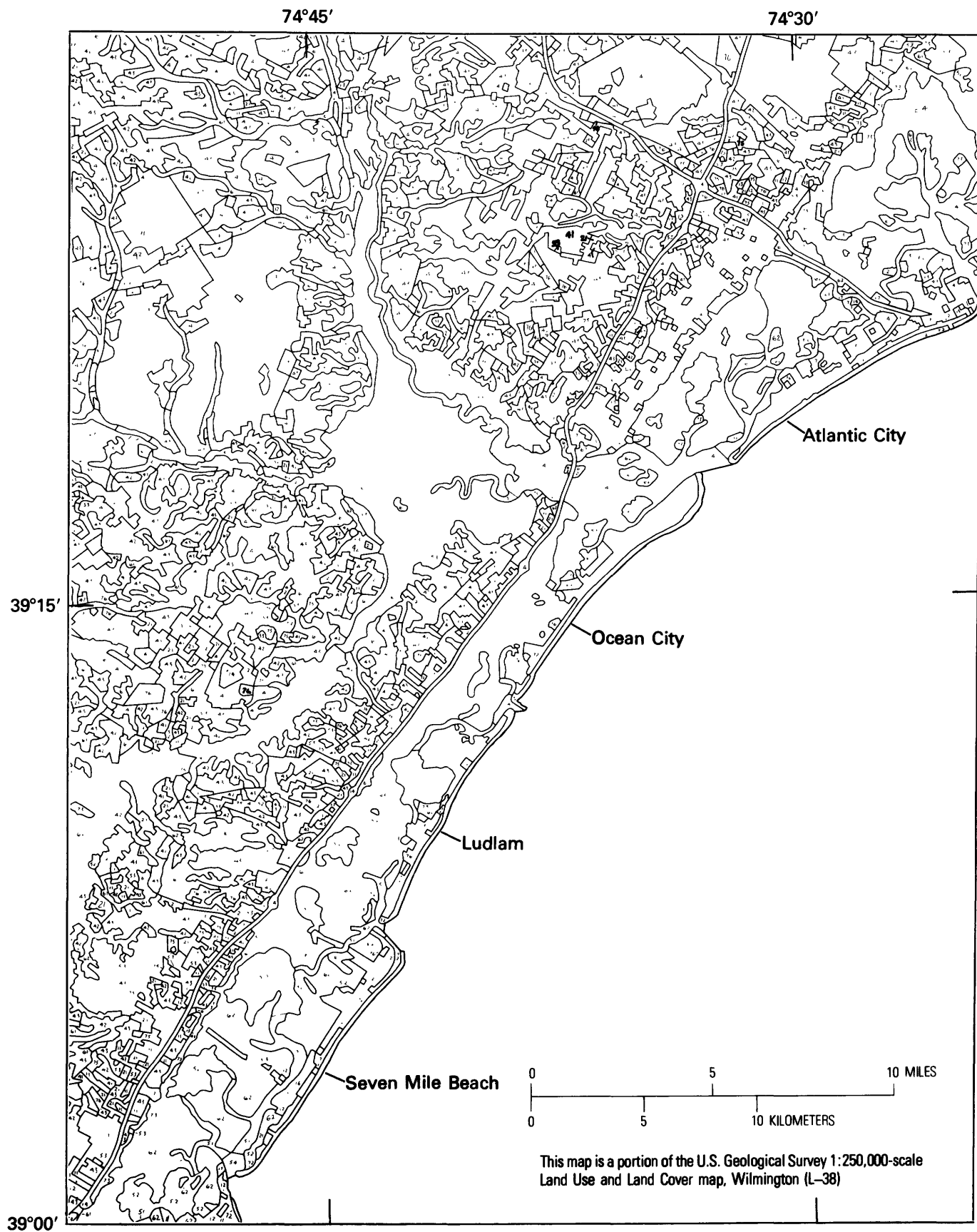


FIGURE 31. – Land use and land cover map of the coastal area near Ocean City, N.J., with associated barrier islands.





FIGURE 32.—Land use and land cover map of the coastal area near Rehoboth Beach, Del., with associated barrier islands.

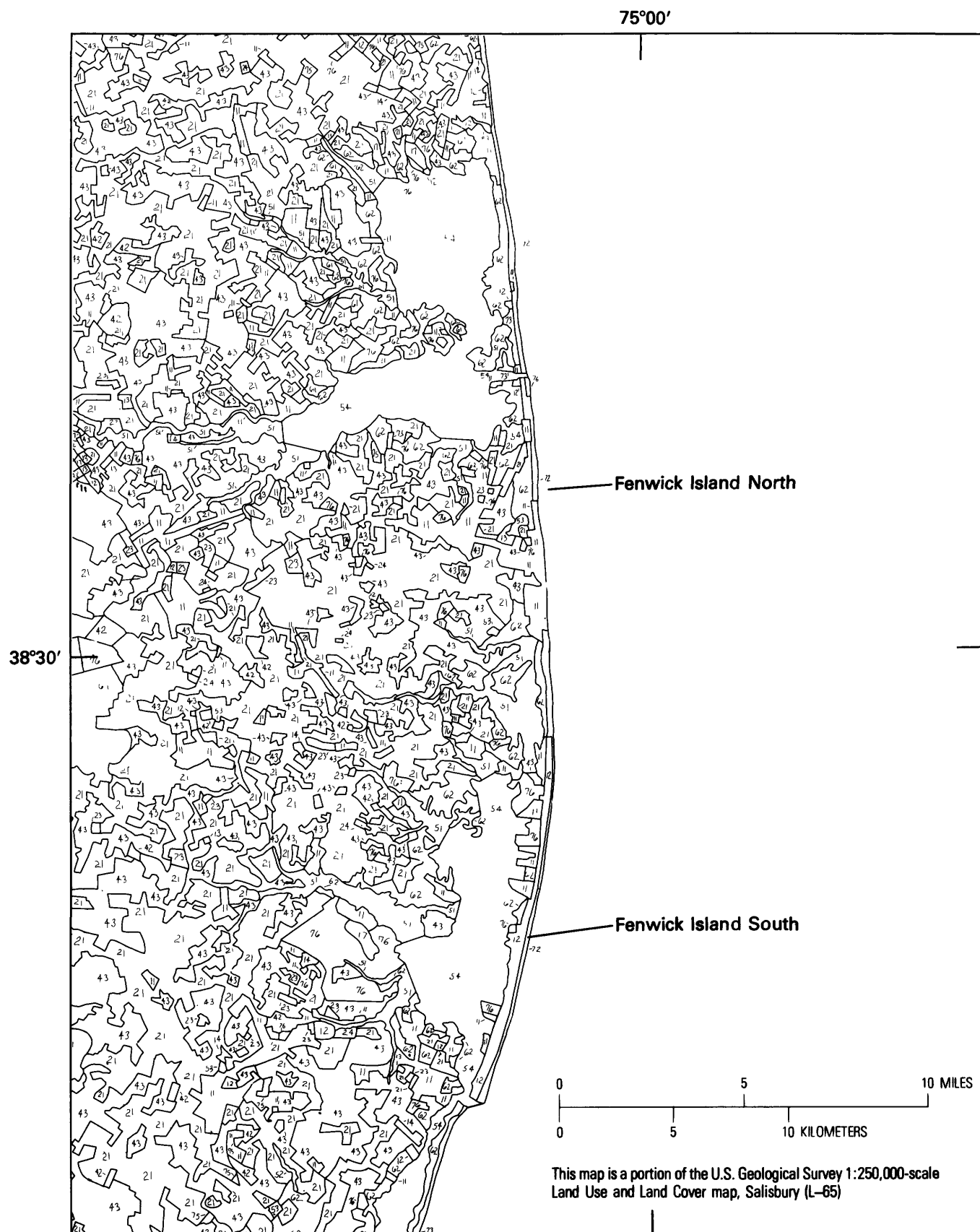


FIGURE 33.—Land use and land cover map of the coastal area near Ocean City, Md., with associated barrier islands.

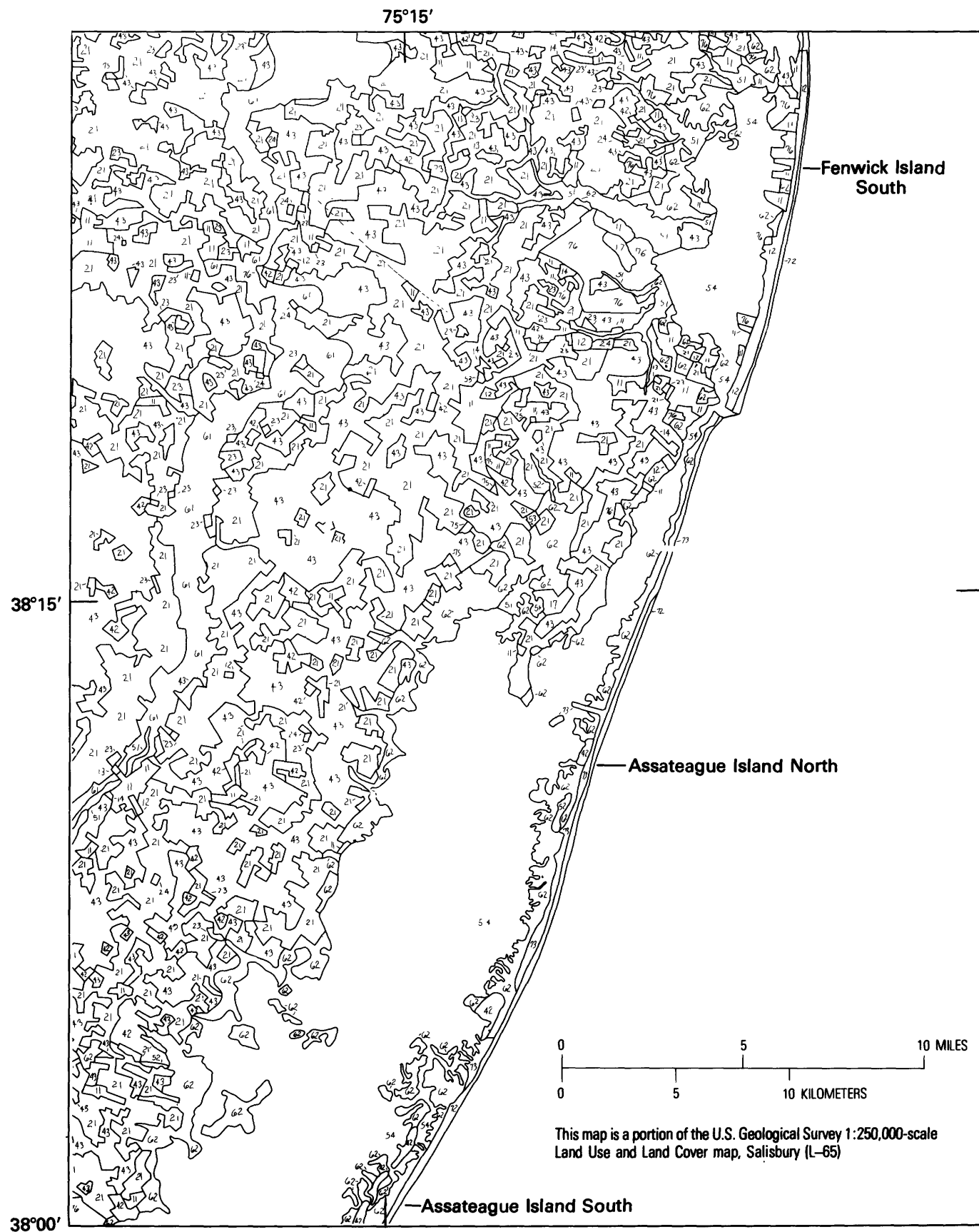


FIGURE 34.—Land use and land cover map of the coastal area near Assateague Island, Md., with associated barrier islands.

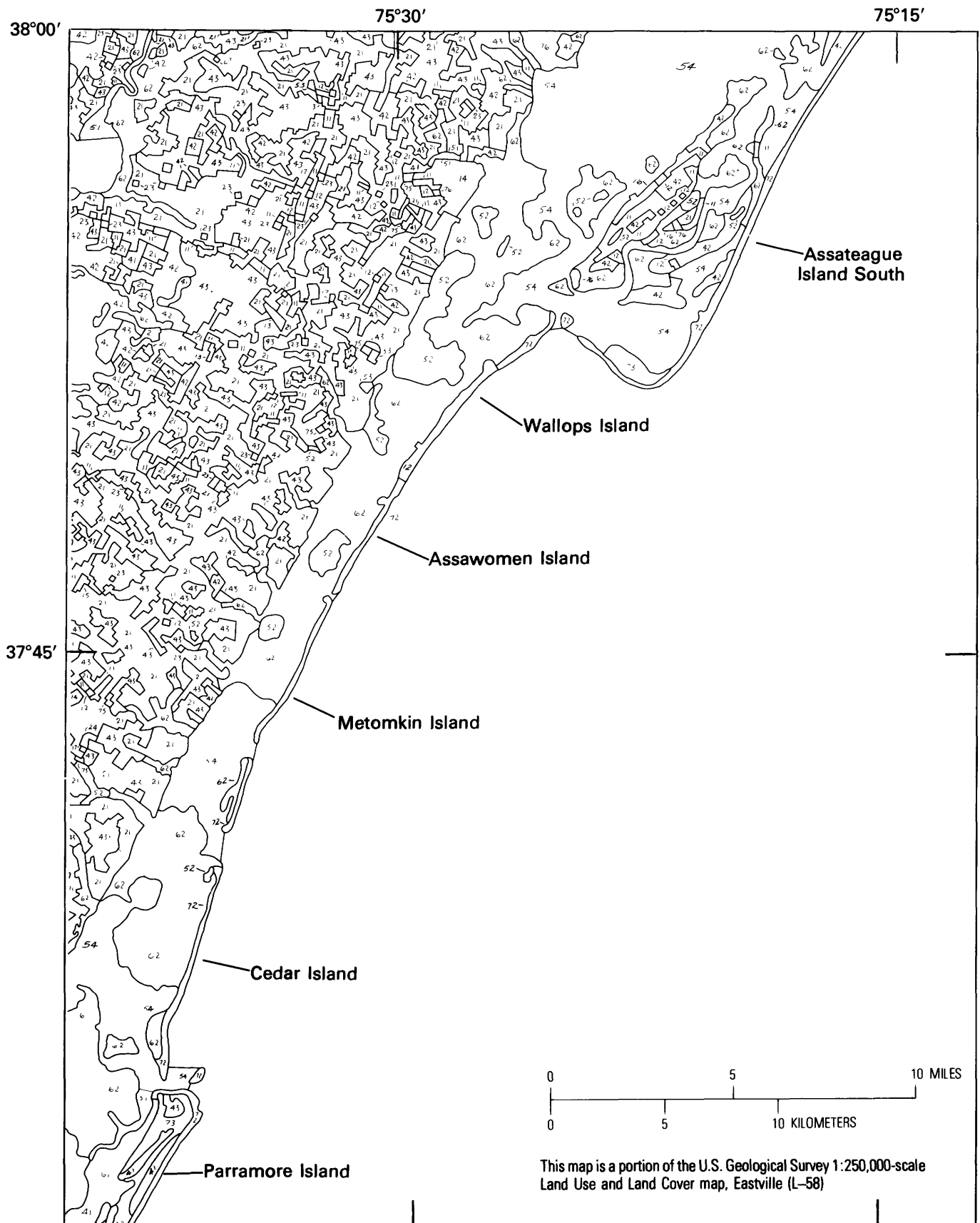


FIGURE 35. — Land use and land cover map of the coastal area near Chincoteague, Va., with associated barrier islands.

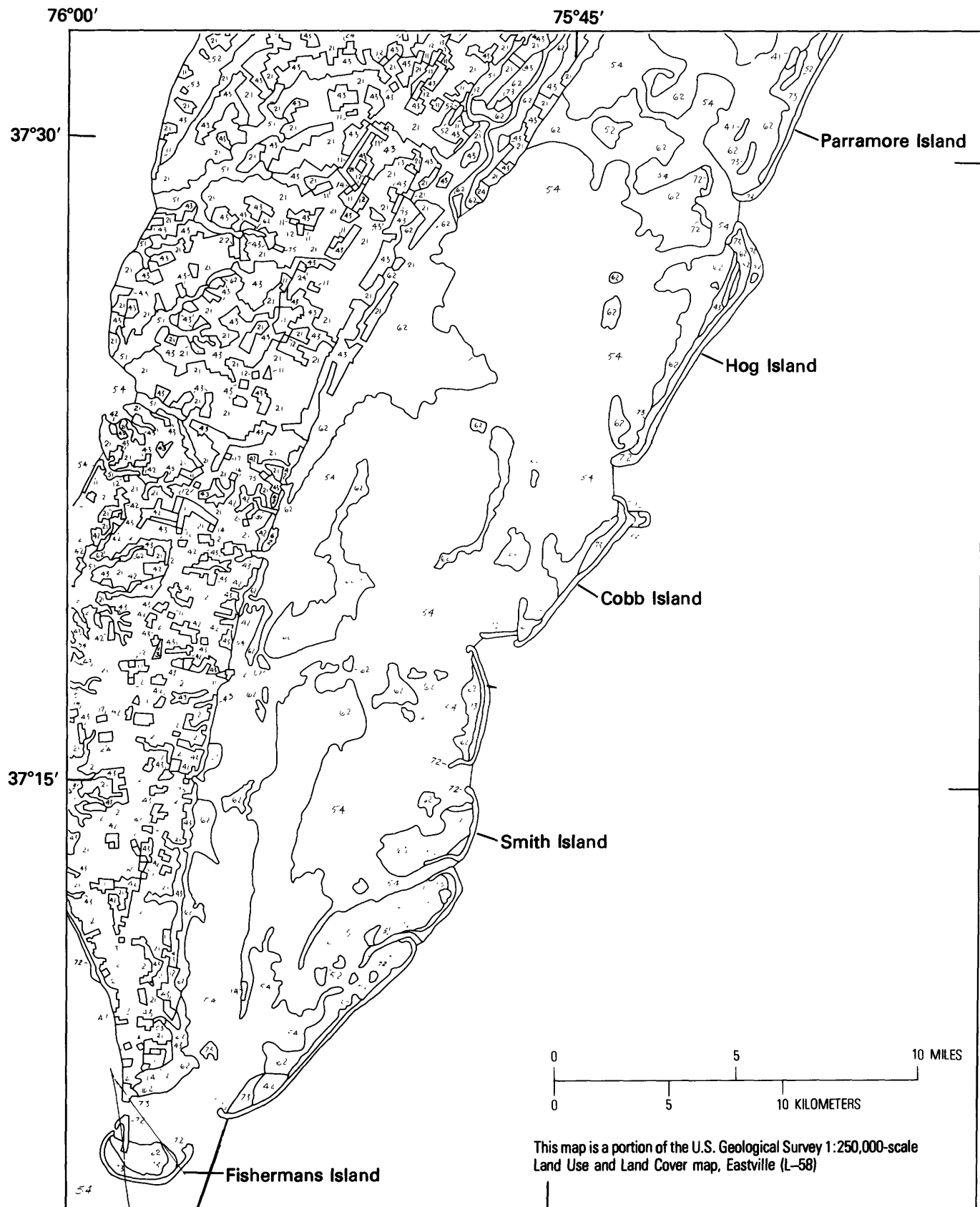


FIGURE 36. - Land use and land cover map of the coastal area near Cape Charles, Va., with associated barrier islands.

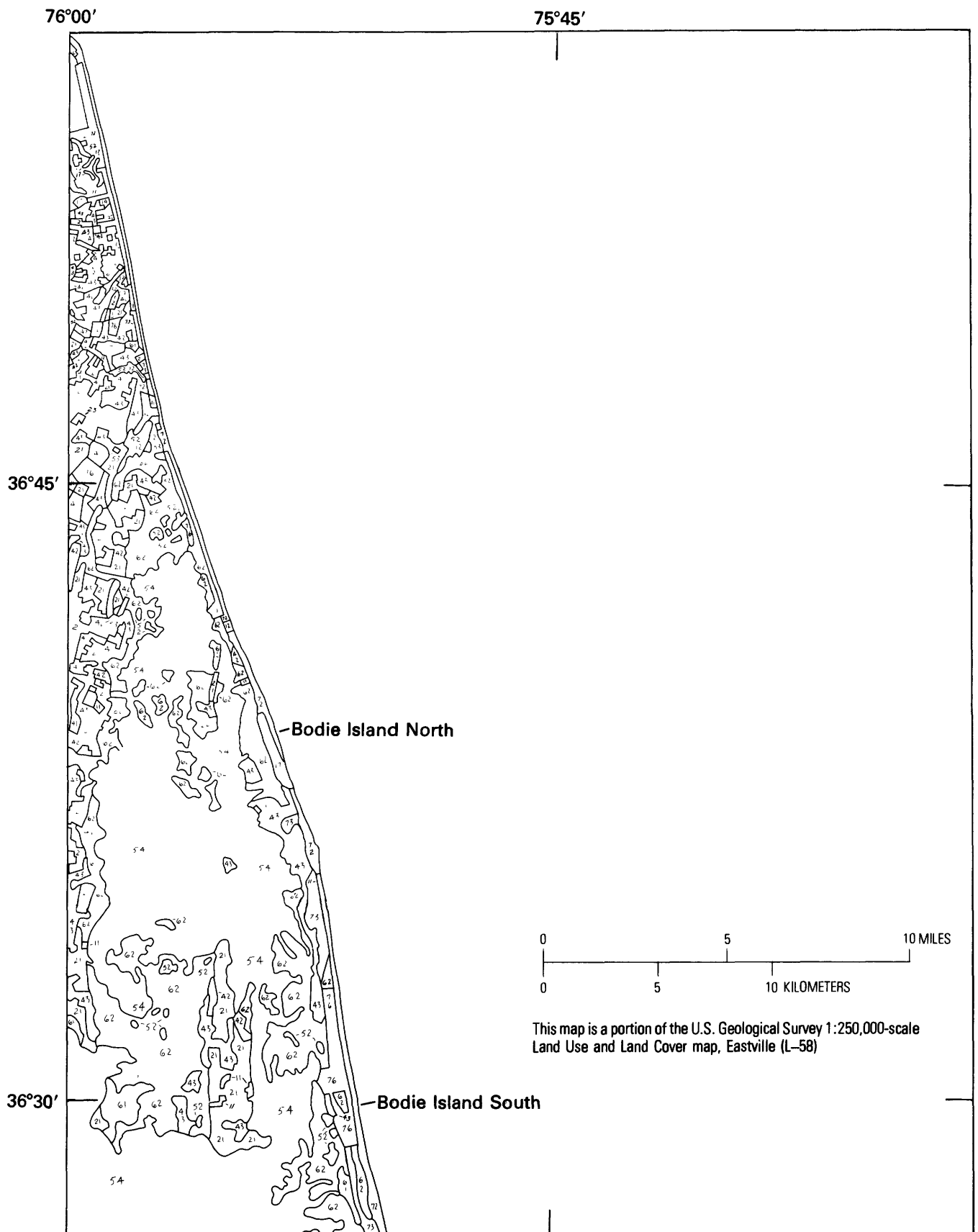


FIGURE 37.— Land use and land cover map of the coastal area near Virginia Beach, Va., with associated barrier islands.

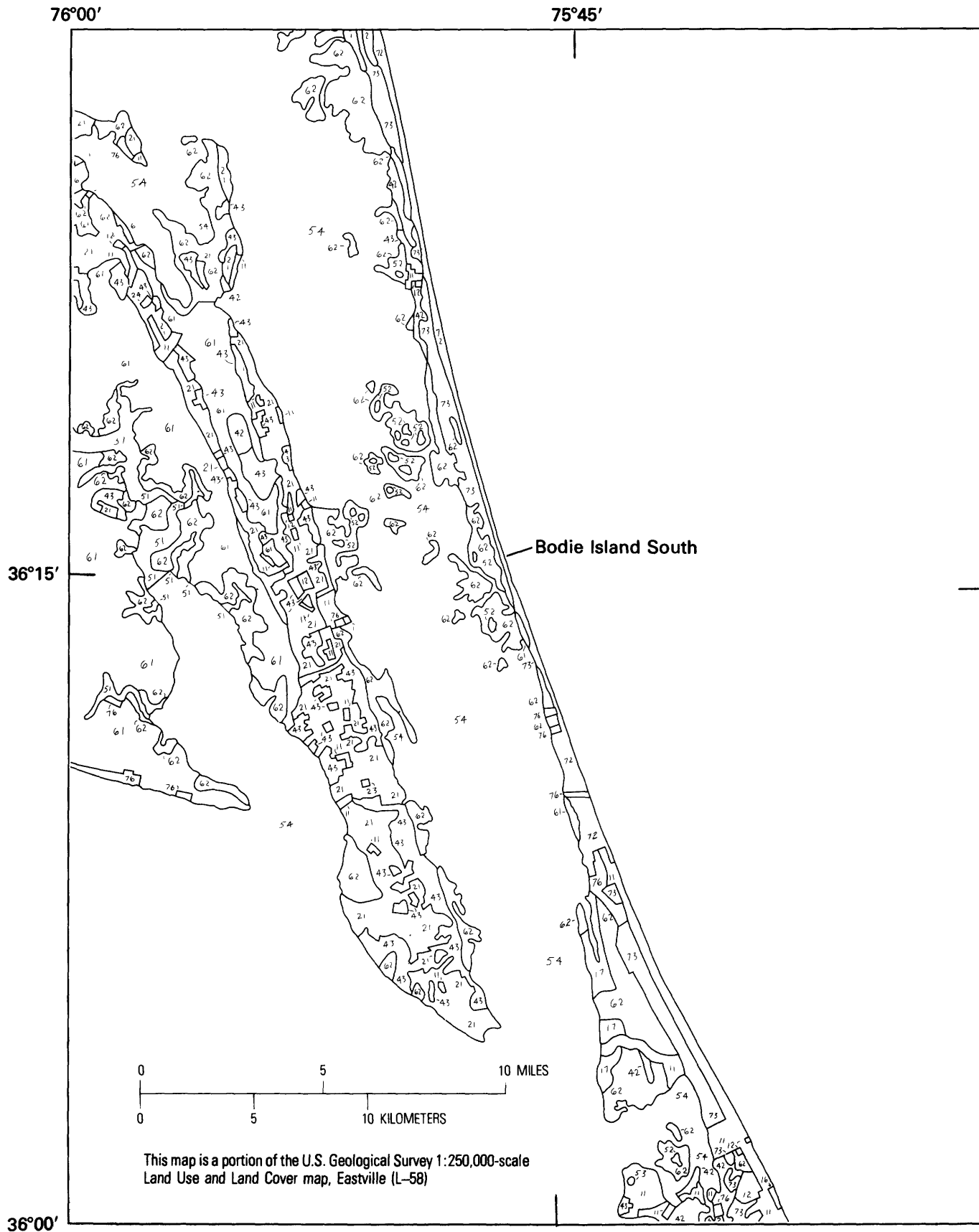


FIGURE 38. – Land use and land cover map of the coastal area near Kitty Hawk, N.C., with associated barrier islands.

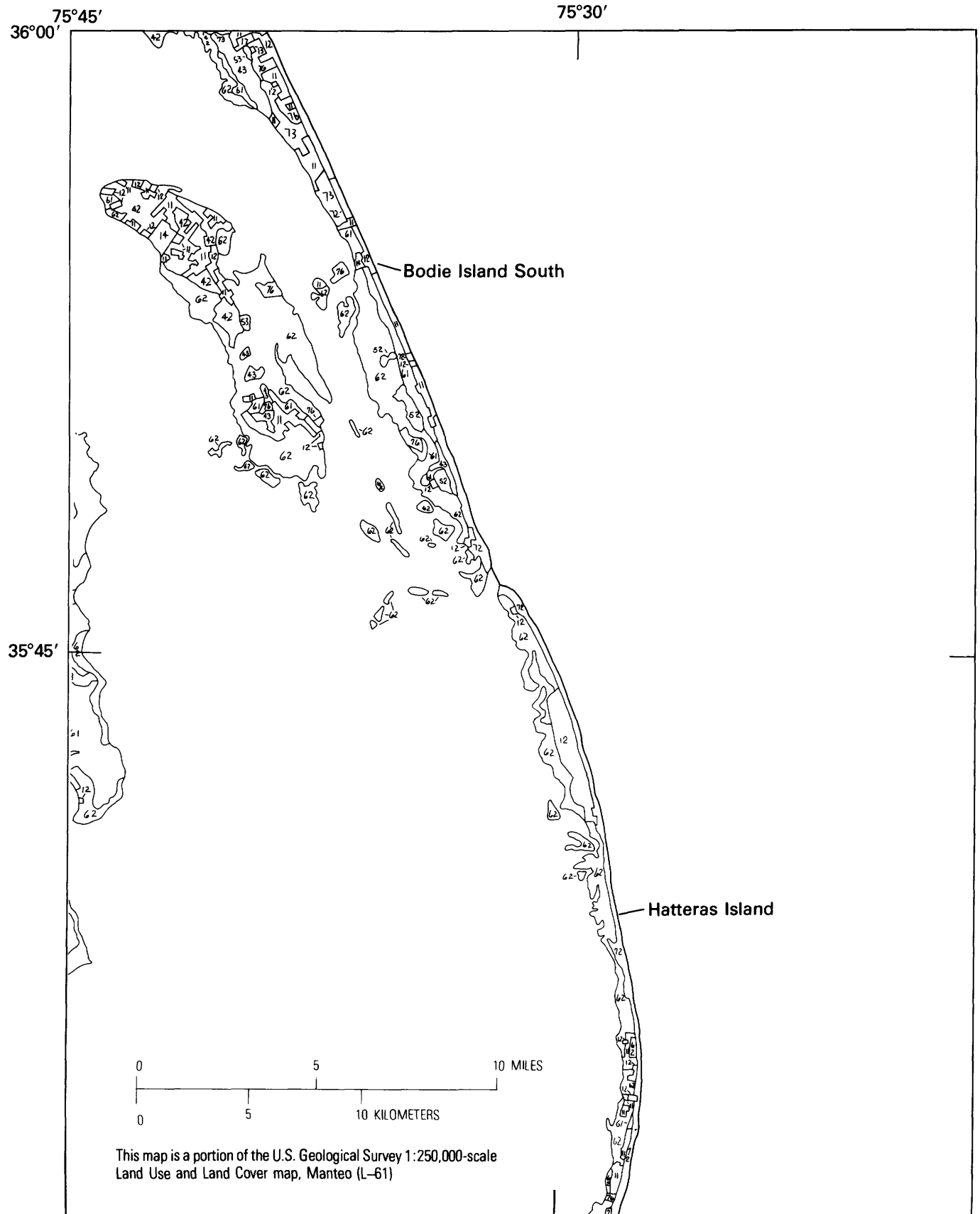


FIGURE 39. —Land use and land cover map of the coastal area near Nags Head, N.C., with associated barrier islands.



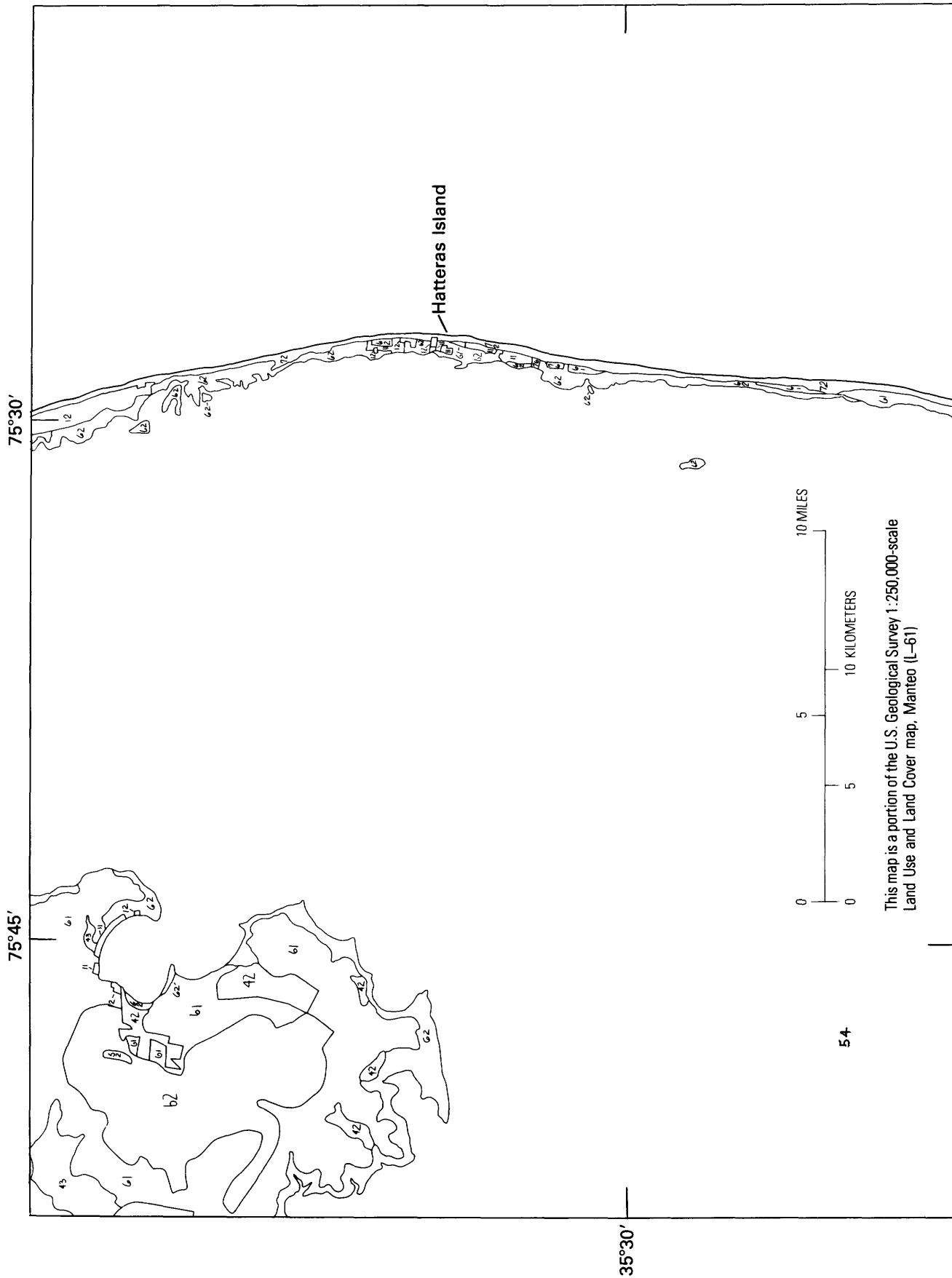


FIGURE 40.—Land use and land cover map of the coastal area near Waves, N.C., with associated barrier islands.

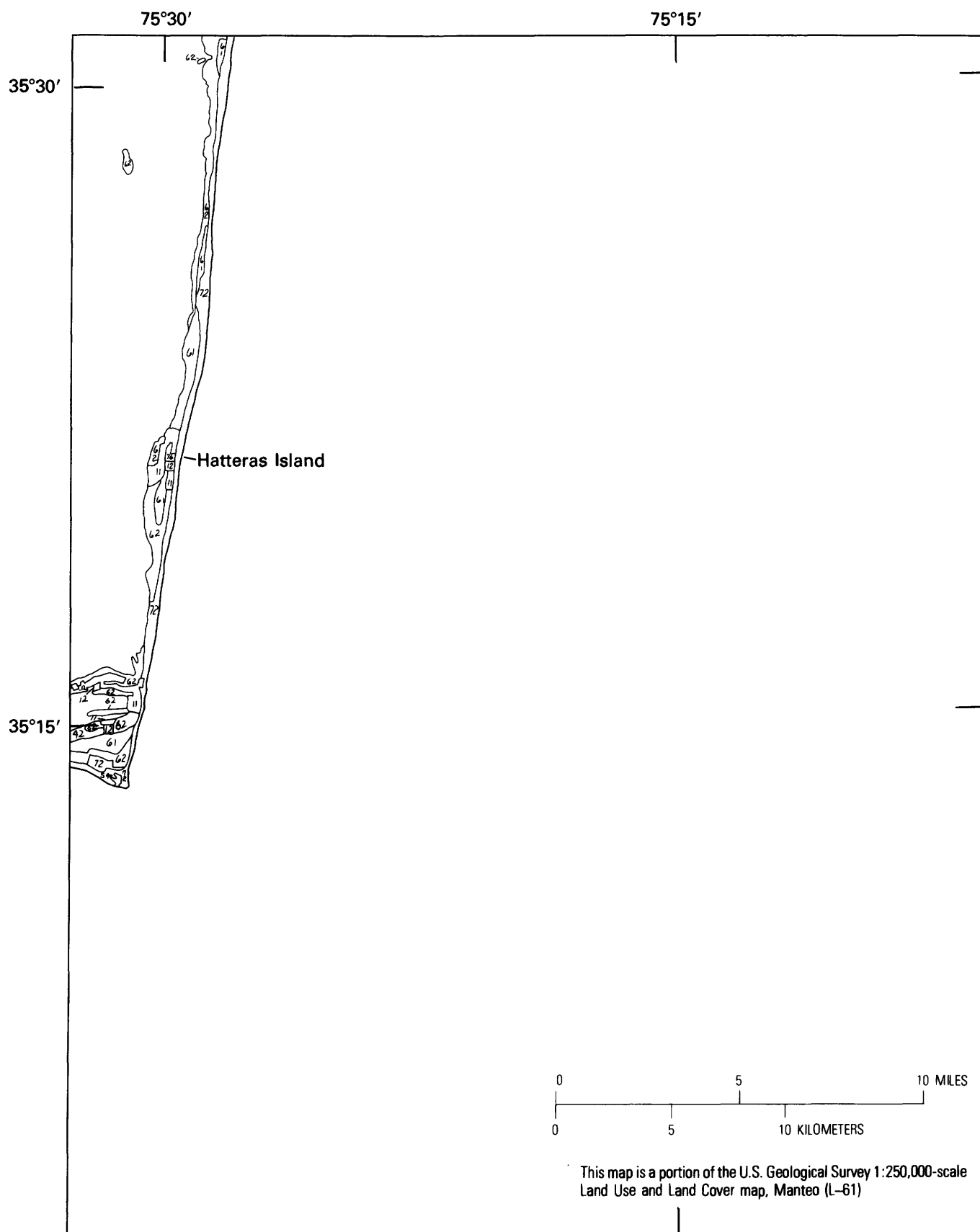


FIGURE 41.—Land use and land cover map of the coastal area near Cape Hatteras, N.C., with associated barrier islands.

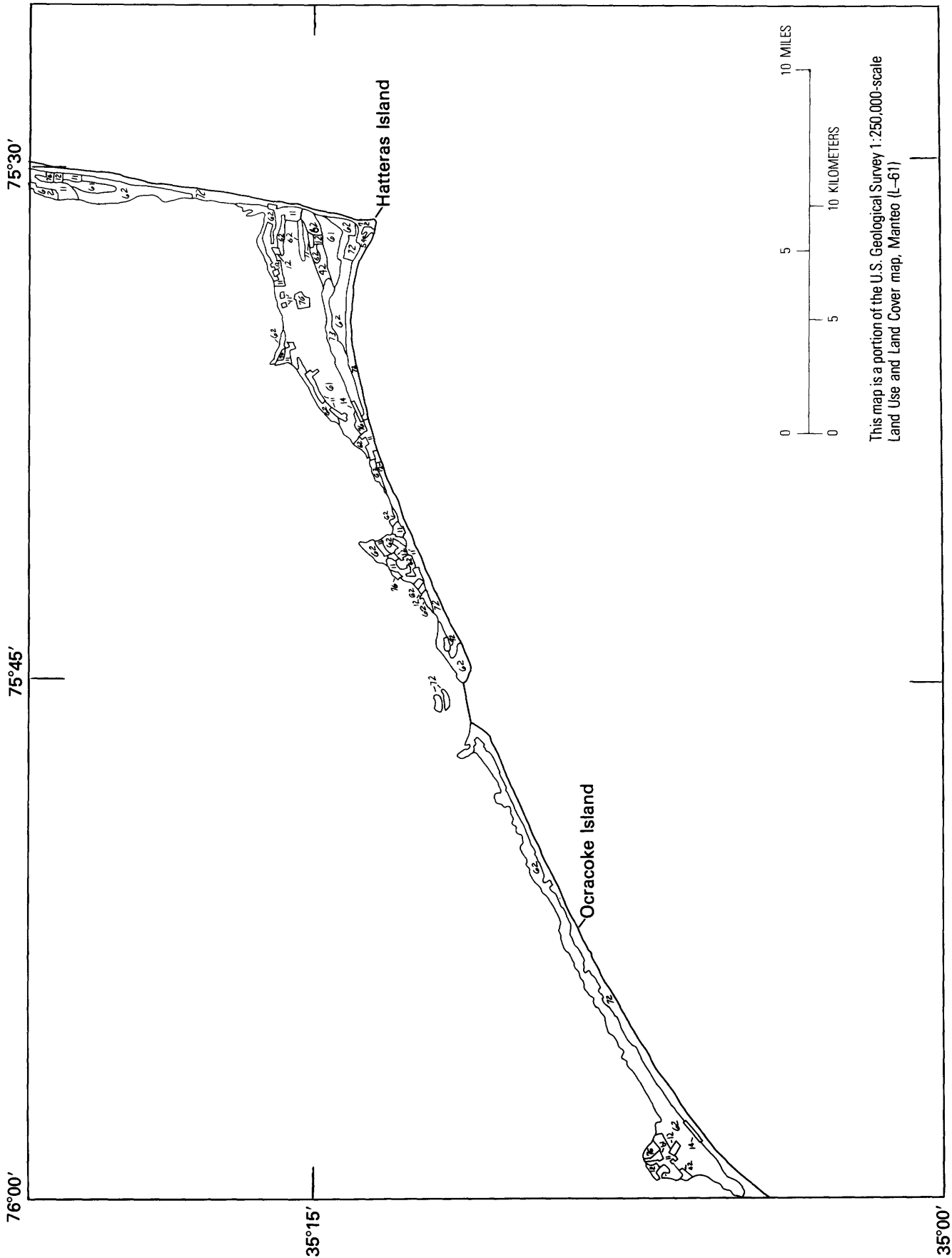


FIGURE 42. - Land use and land cover map of the coastal area near Ocracoke, N.C., with associated barrier islands.

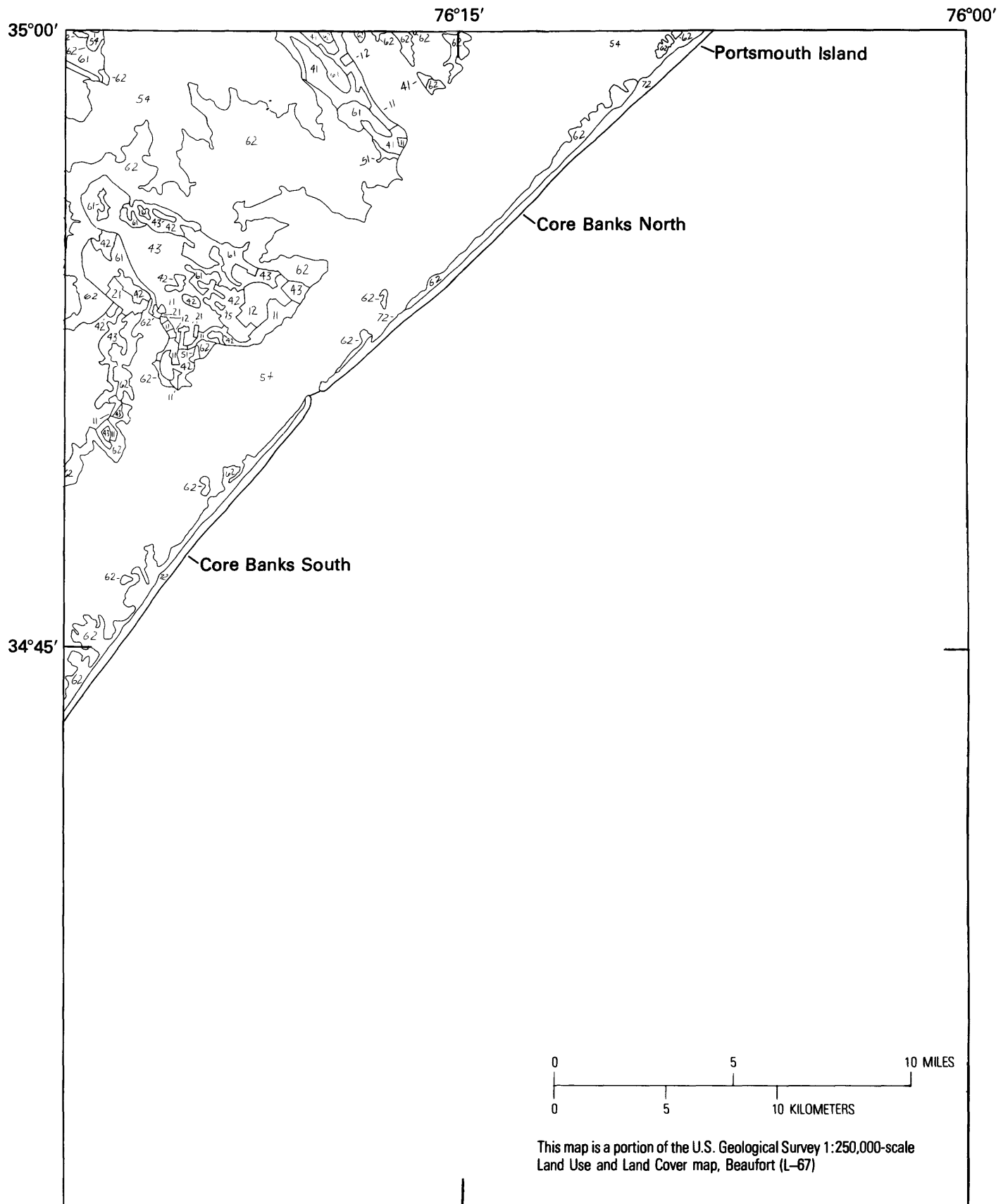


FIGURE 43.—Land use and land cover map of the coastal area near Atlantic, N.C., with associated barrier islands.



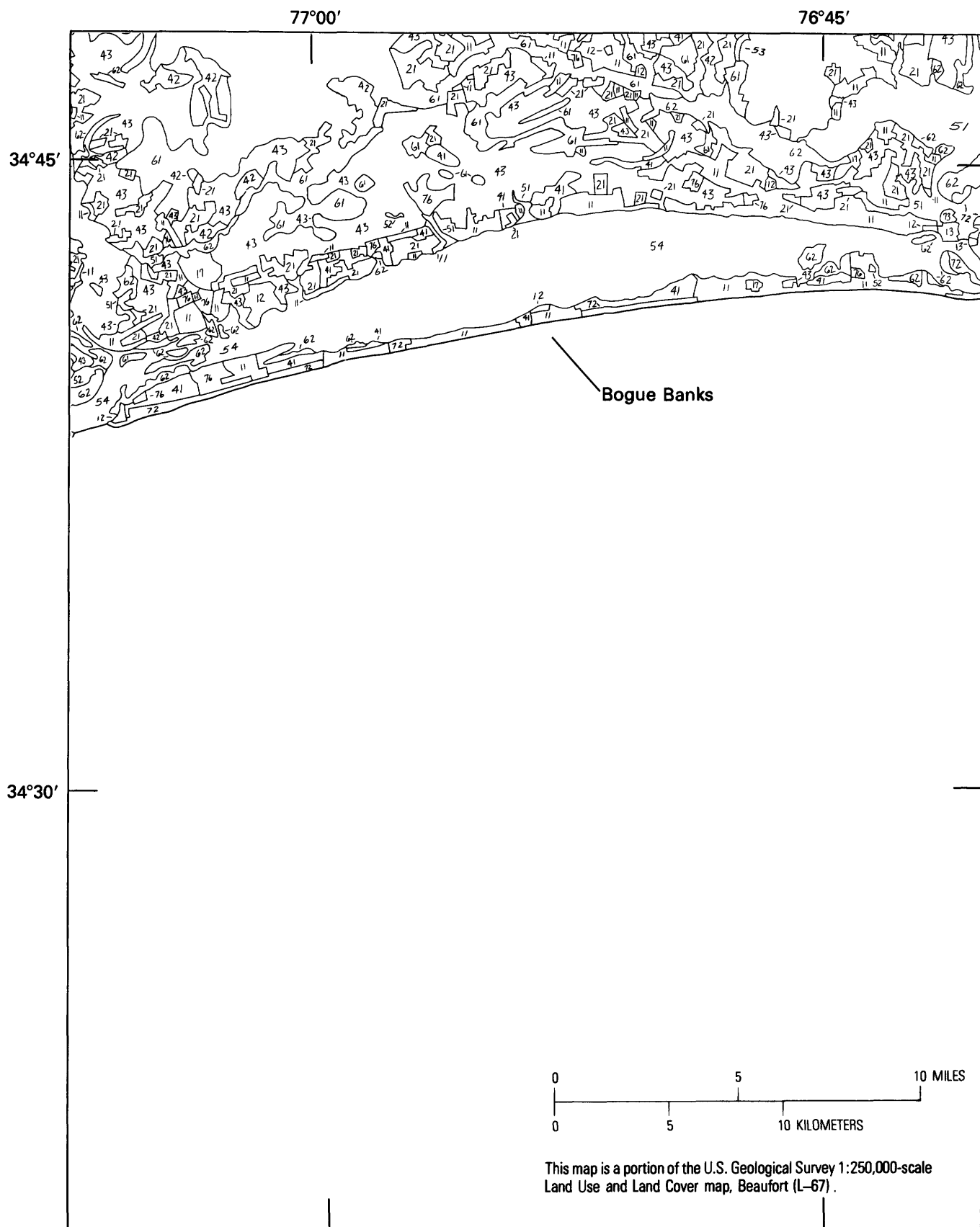


FIGURE 45.—Land use and land cover map of the coastal area near Morehead City, N.C., with associated barrier islands.

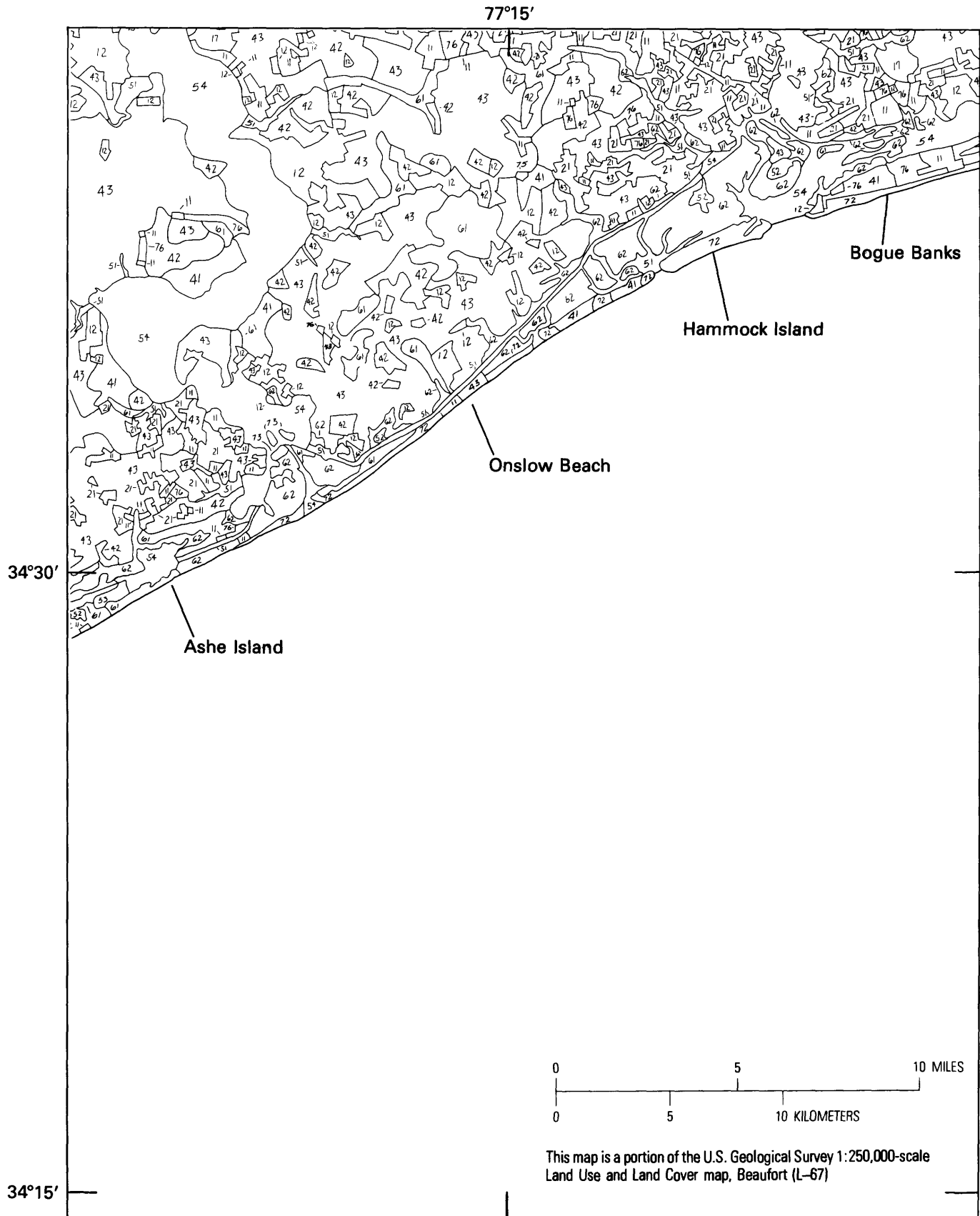


FIGURE 46. - Land use and land cover map of the coastal area near Jacksonville, N.C., with associated barrier islands.

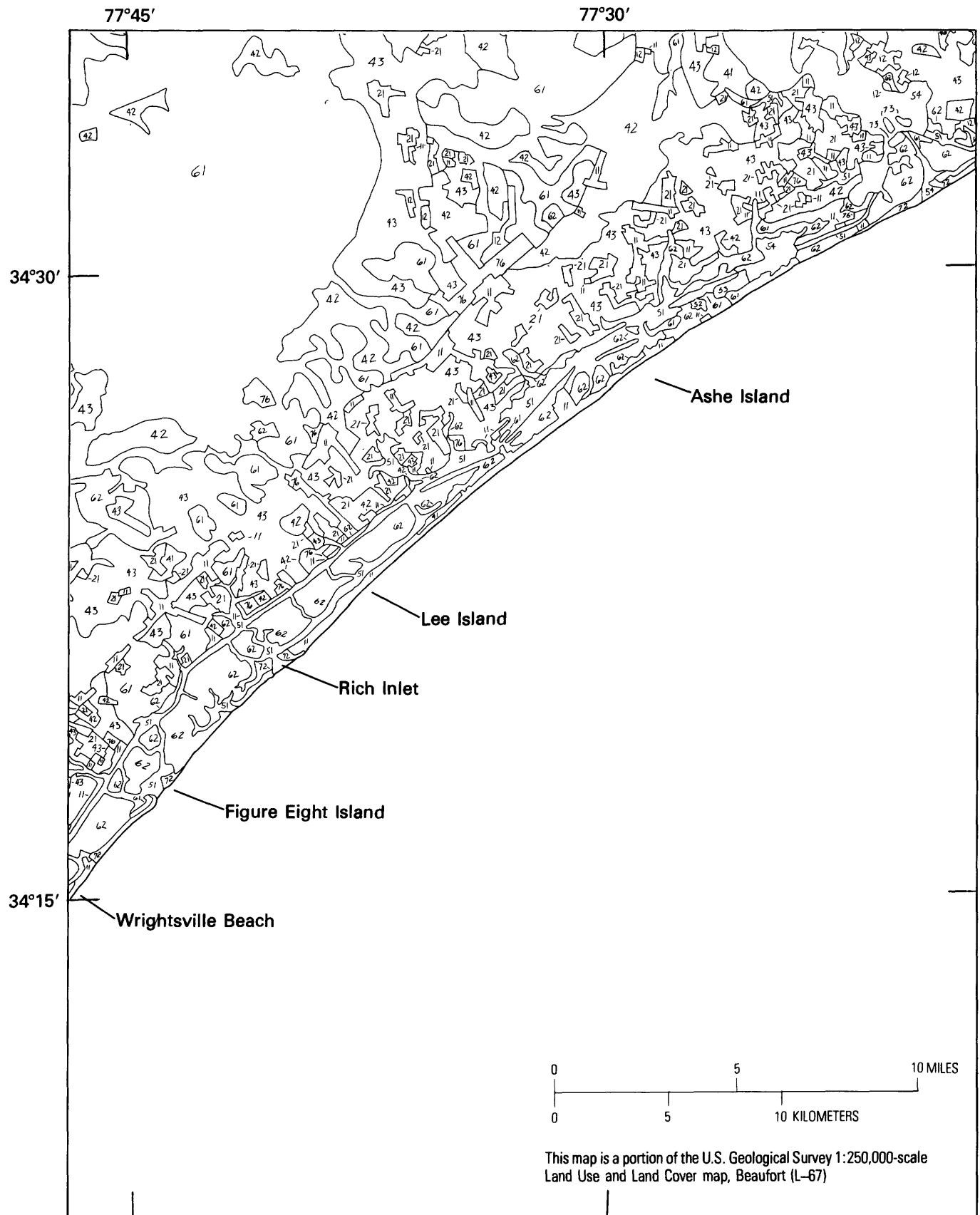


FIGURE 47. – Land use and land cover map of the coastal area near Hampstead, N.C., with associated barrier islands.





FIGURE 48. - Land use and land cover map of the coastal area near Wrightsville Beach, N.C., with associated barrier islands.

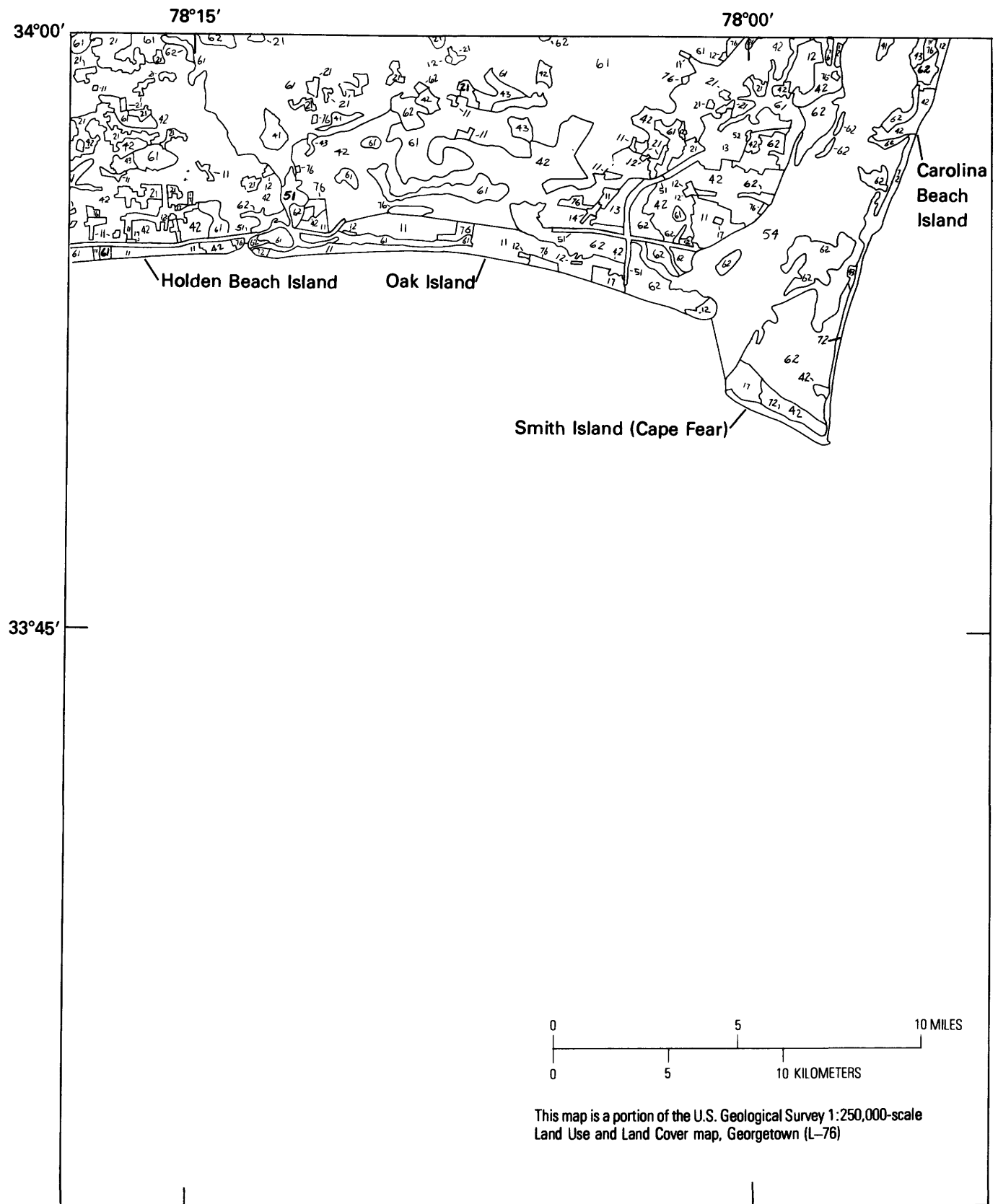


FIGURE 49.—Land use and land cover map of the coastal area near Cape Fear, N.C., with associated barrier islands.

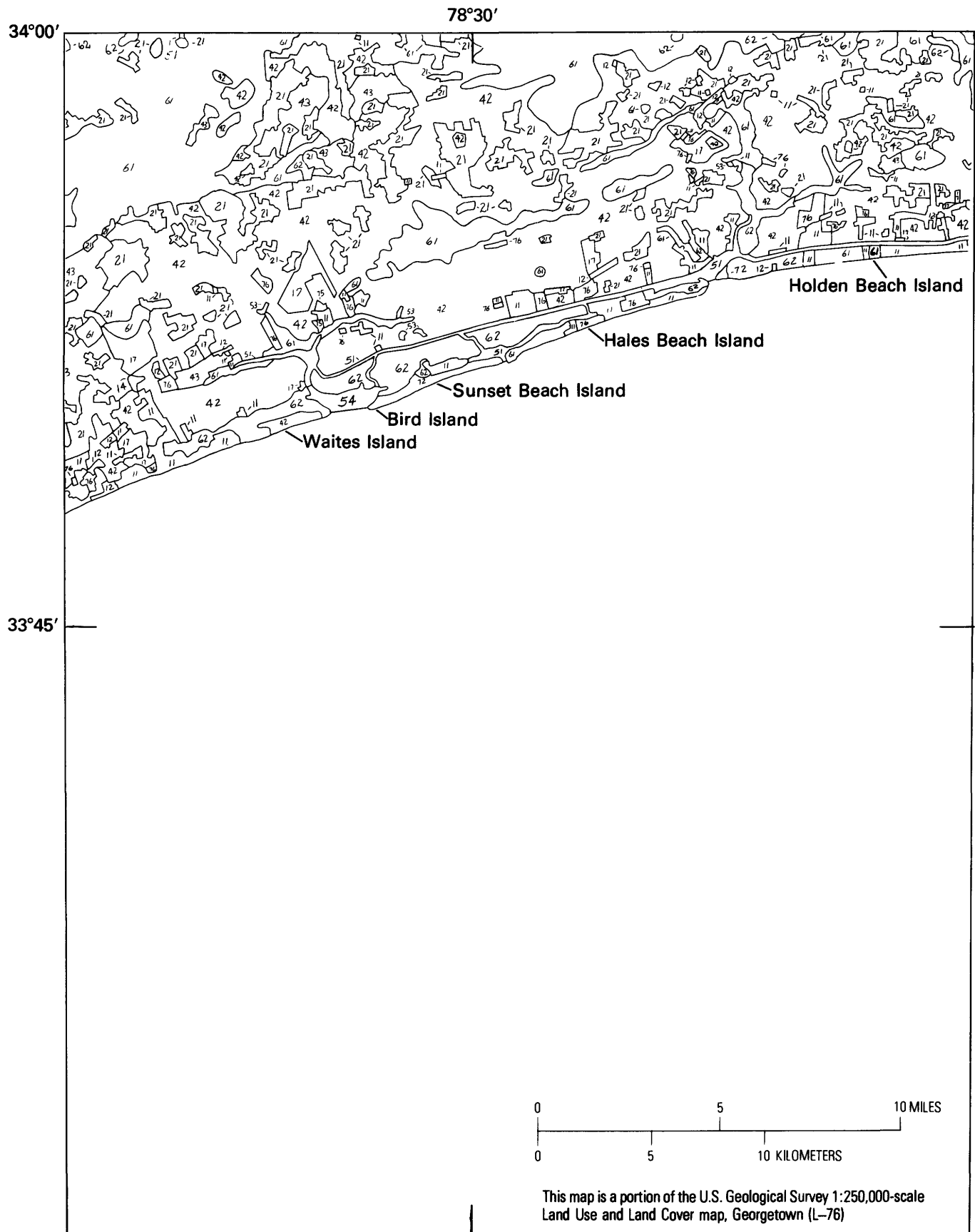


FIGURE 50.—Land use and land cover map of the coastal area near Seaside, N.C., with associated barrier islands.



FIGURE 51. — Land use and land cover map of the coastal area near Georgetown, S.C., with associated barrier islands.

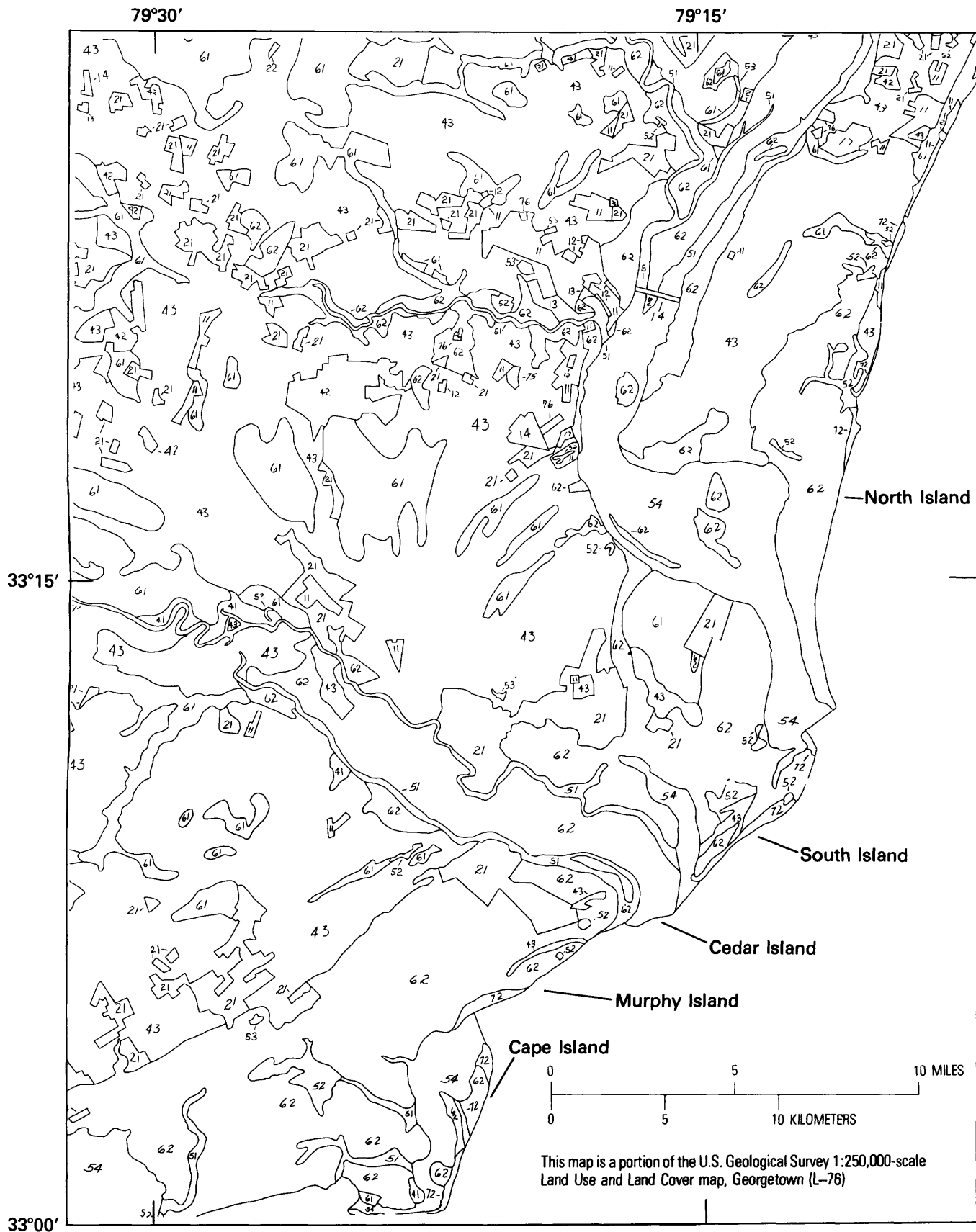


FIGURE 52. — Land use and land cover map of the coastal area near Cape Romain, S.C., with associated barrier islands.

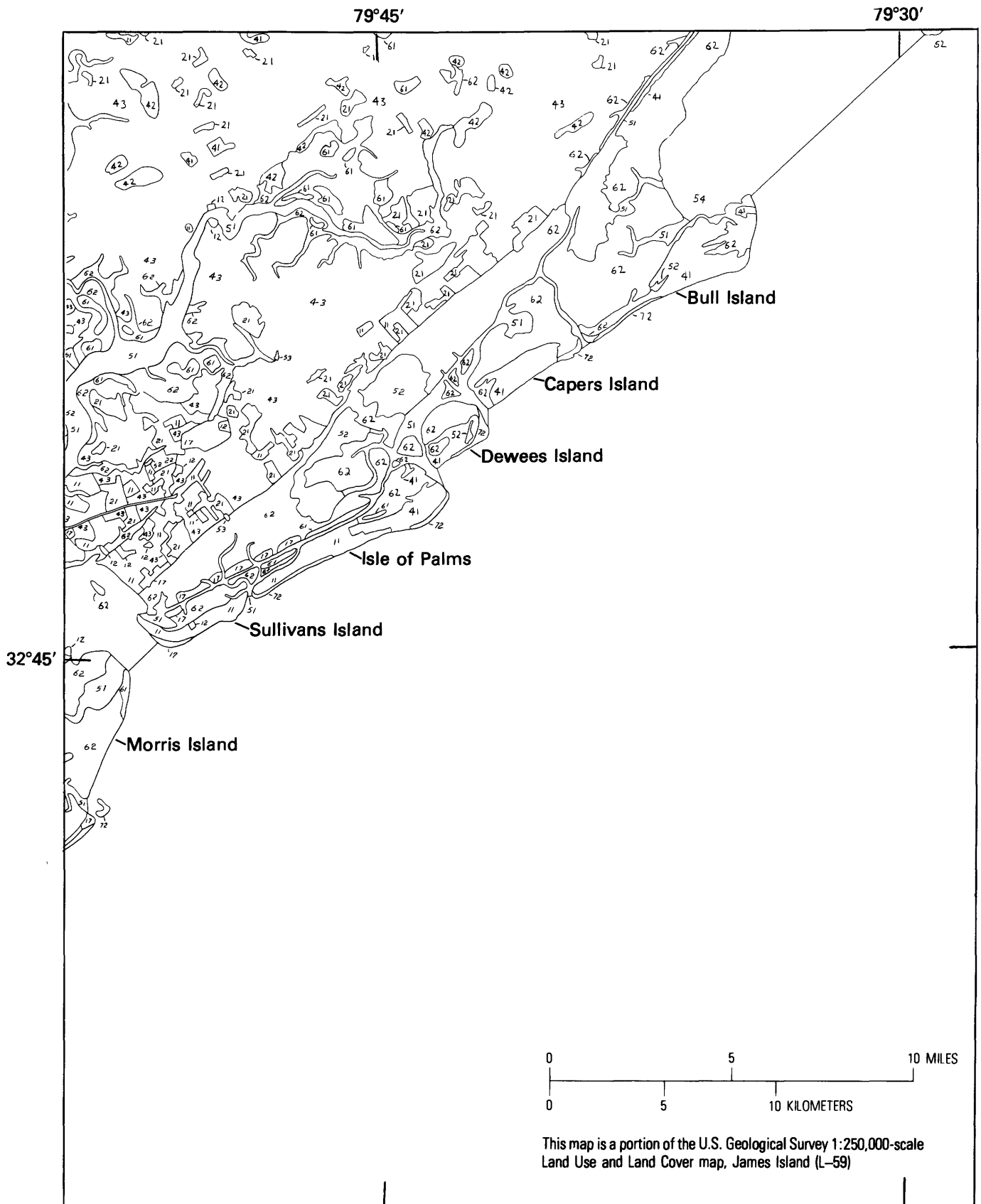


FIGURE 53.—Land use and land cover map of the coastal area near Isle of Palms, S.C., with associated barrier islands.

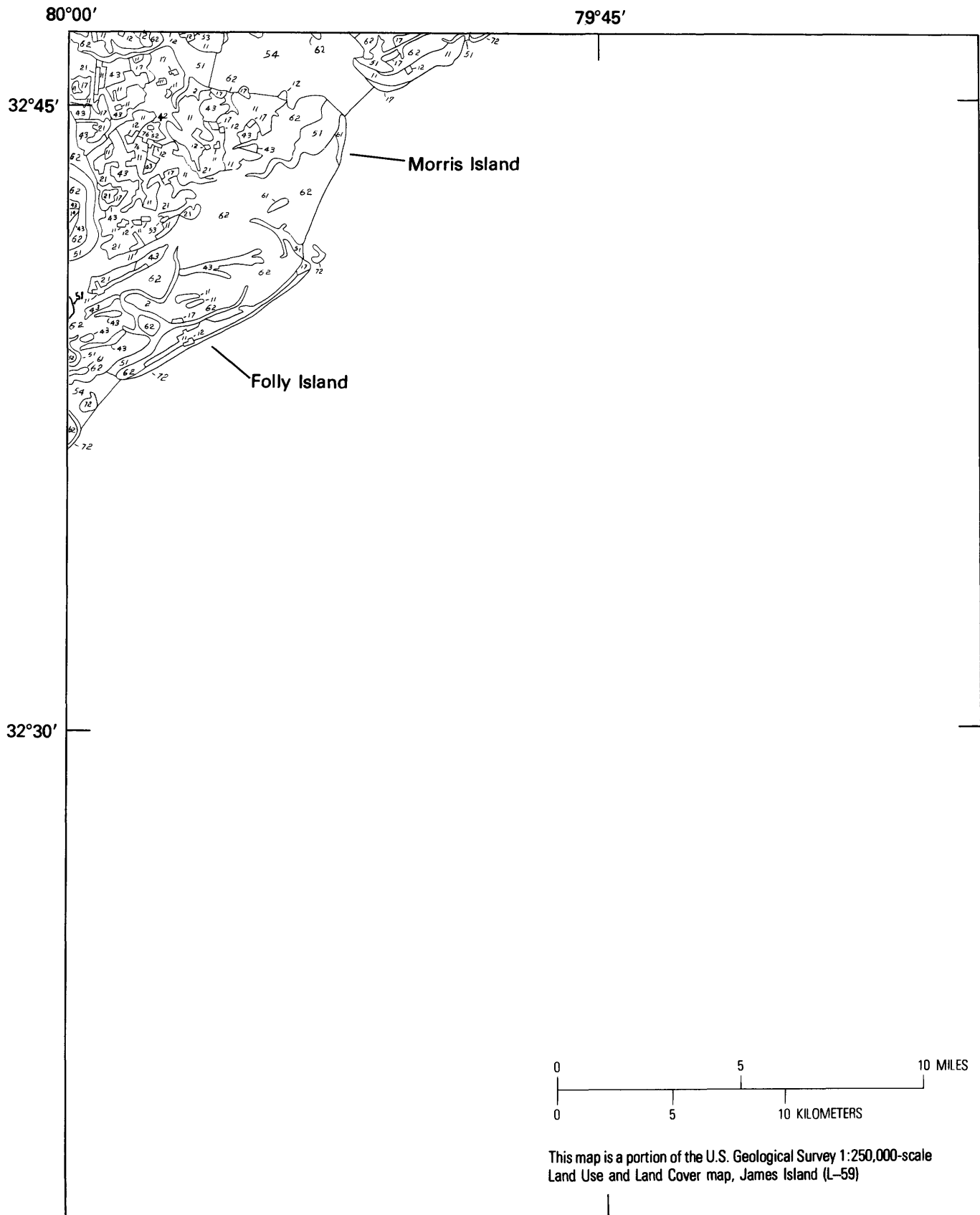


FIGURE 54. —Land use and land cover map of the coastal area near Charleston, S.C., with associated barrier islands.

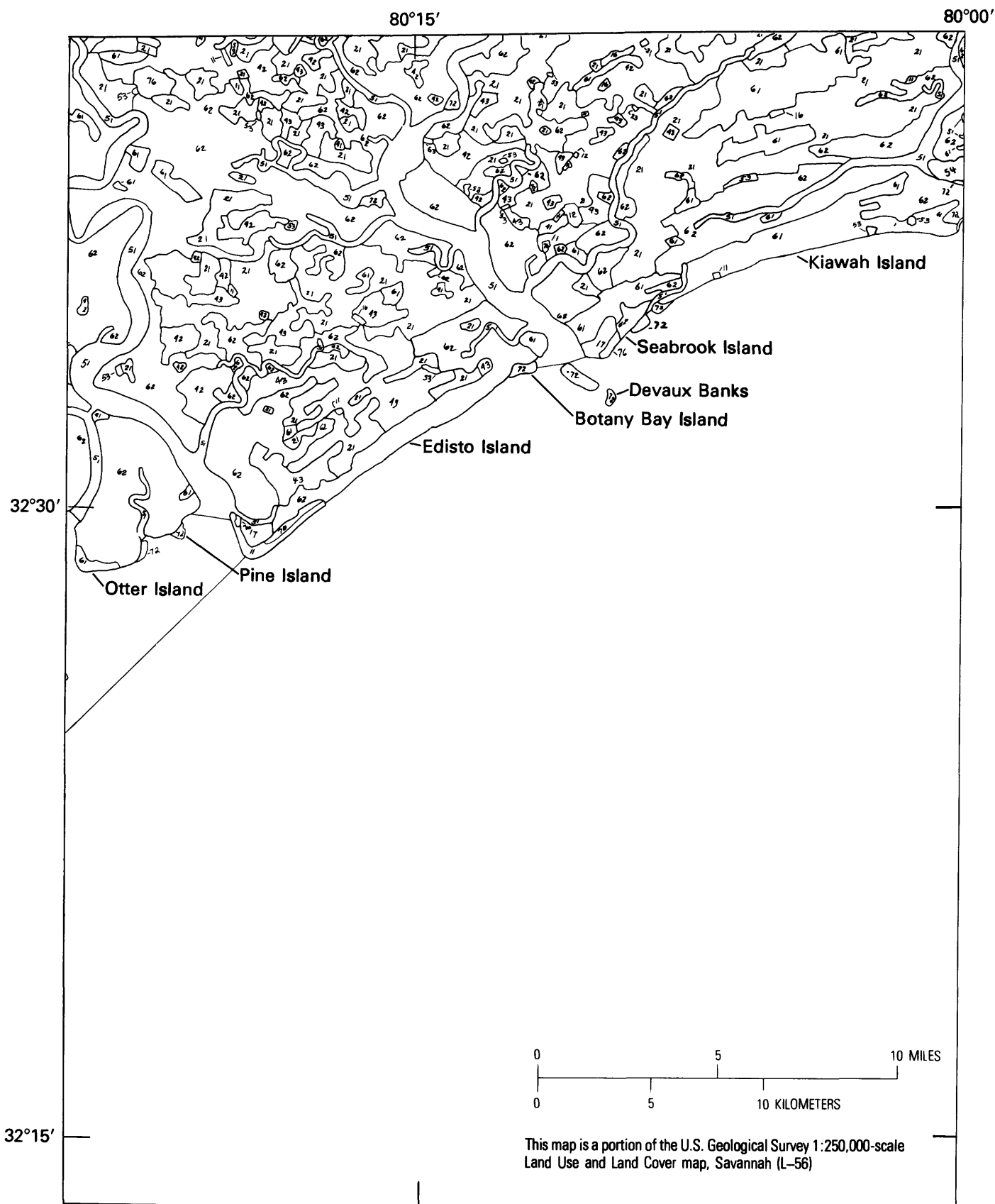


FIGURE 55. – Land use and land cover map of the coastal area near Edisto Island, S.C., with associated barrier islands.



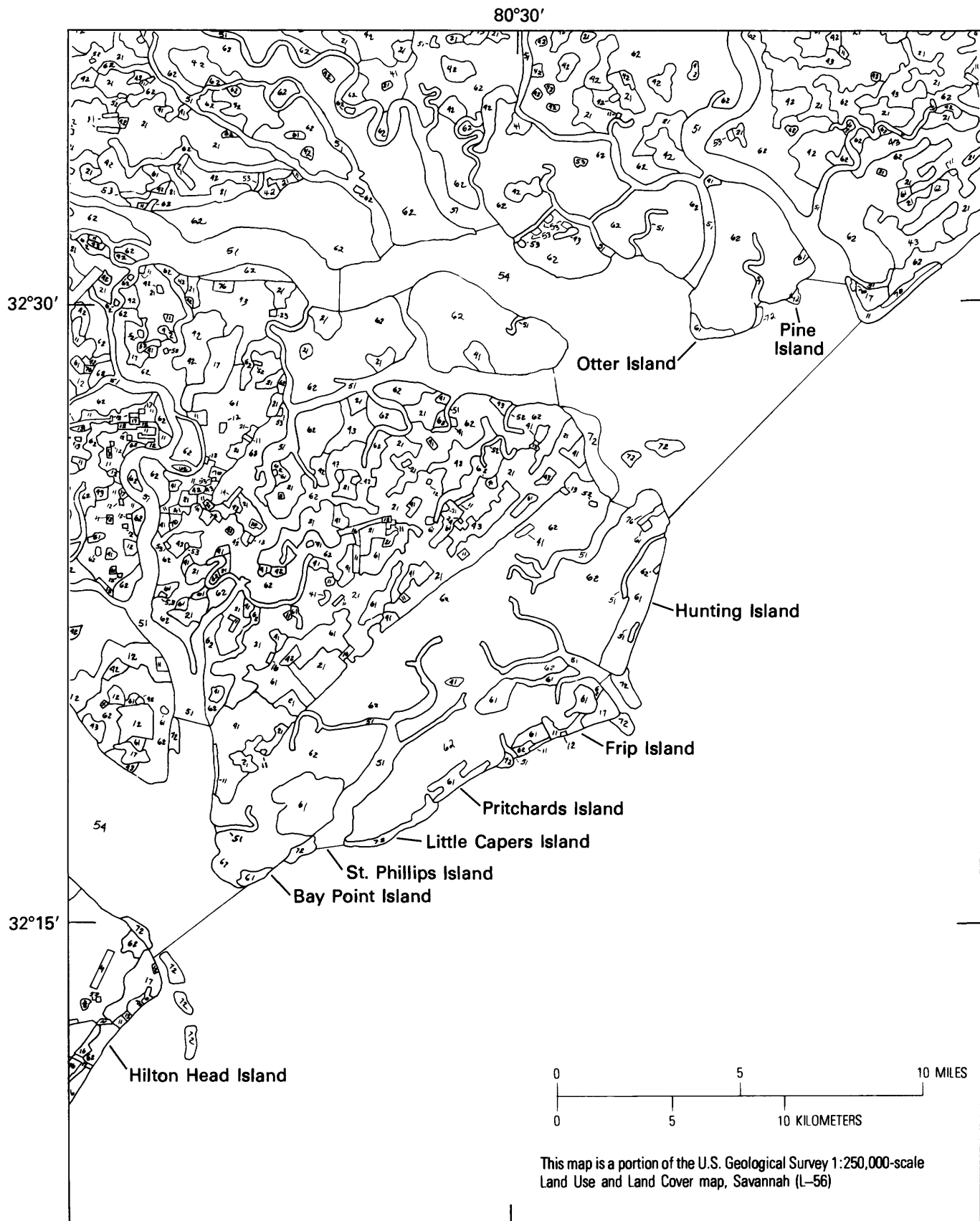


FIGURE 56.—Land use and land cover map of the coastal area near Beaufort, S.C., with associated barrier islands.

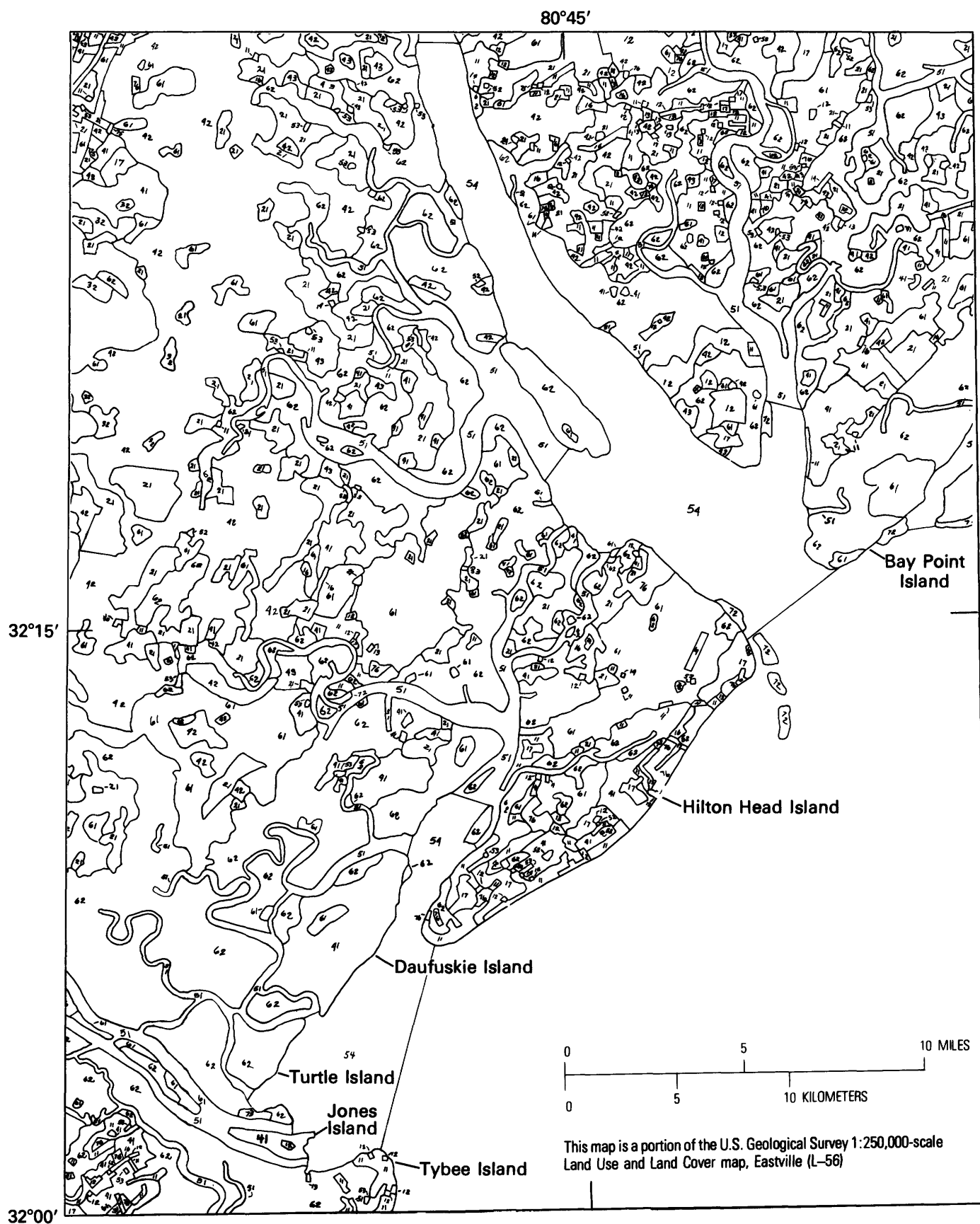


FIGURE 57. - Land use and land cover map of the coastal area near Hilton Head, S.C., with associated barrier islands.

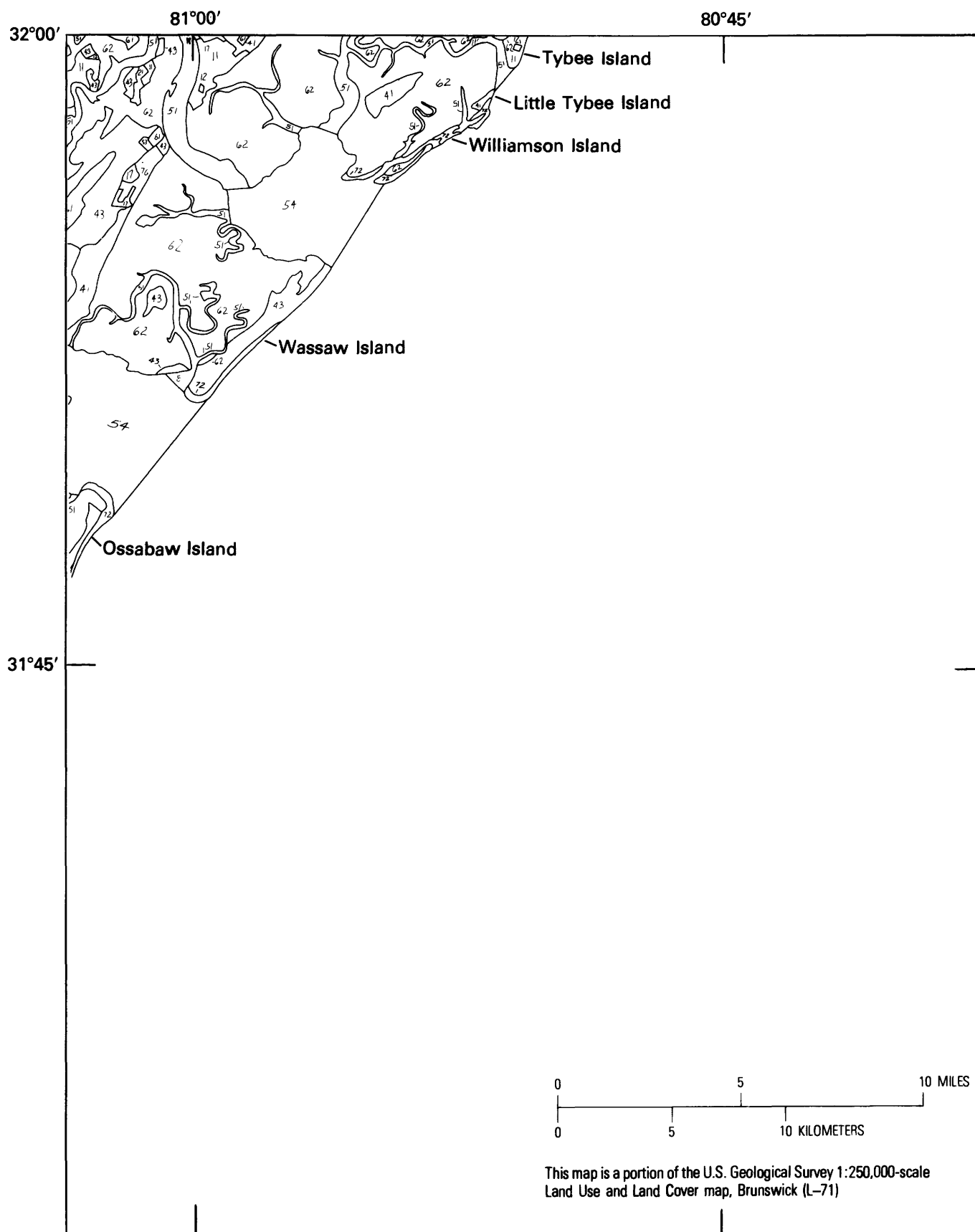


FIGURE 58.—Land use and land cover map of the coastal area near Savannah Beach, Ga., with associated barrier islands.

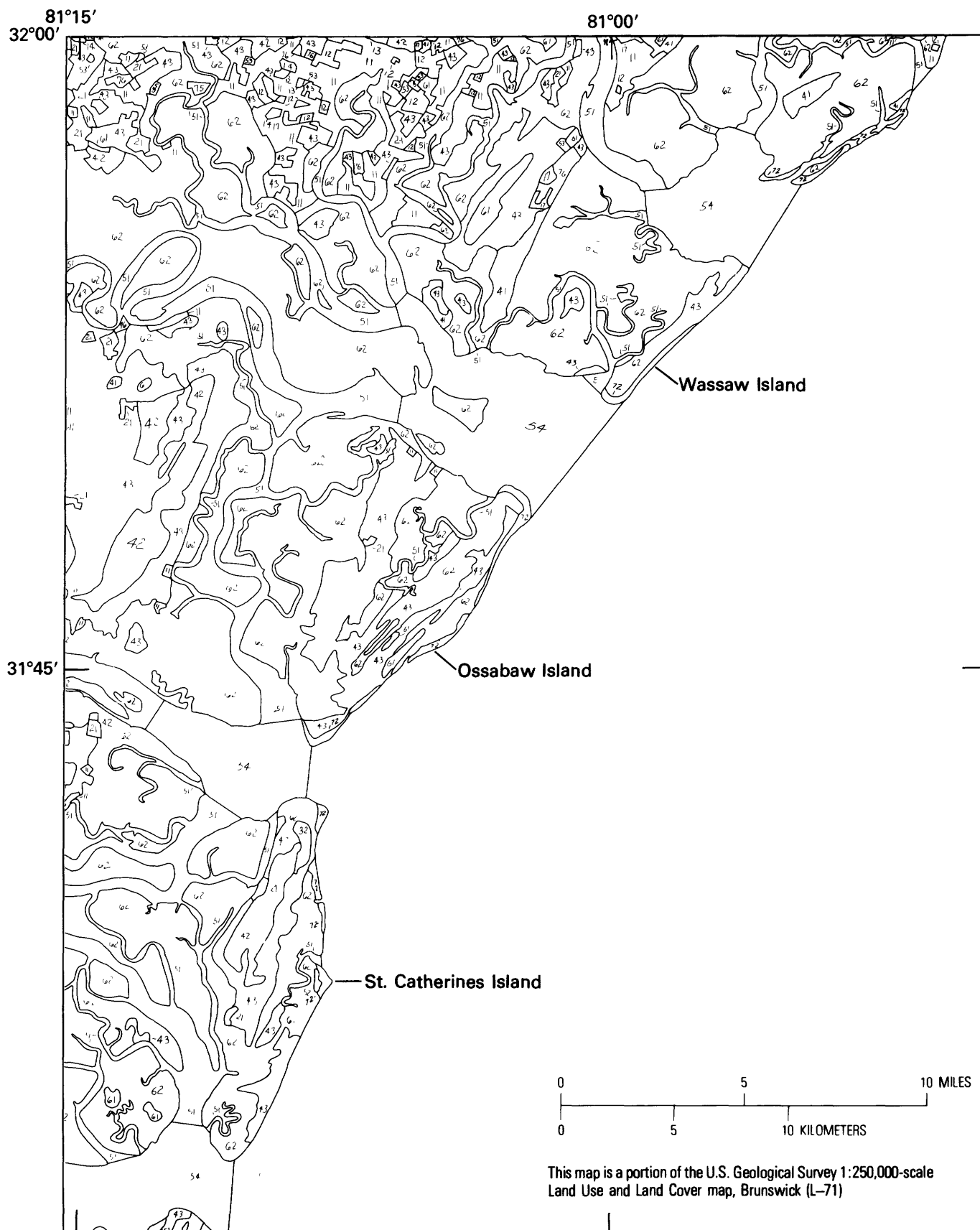


FIGURE 59.—Land use and land cover map of the coastal area near St. Catherines Island, Ga., with associated barrier islands.

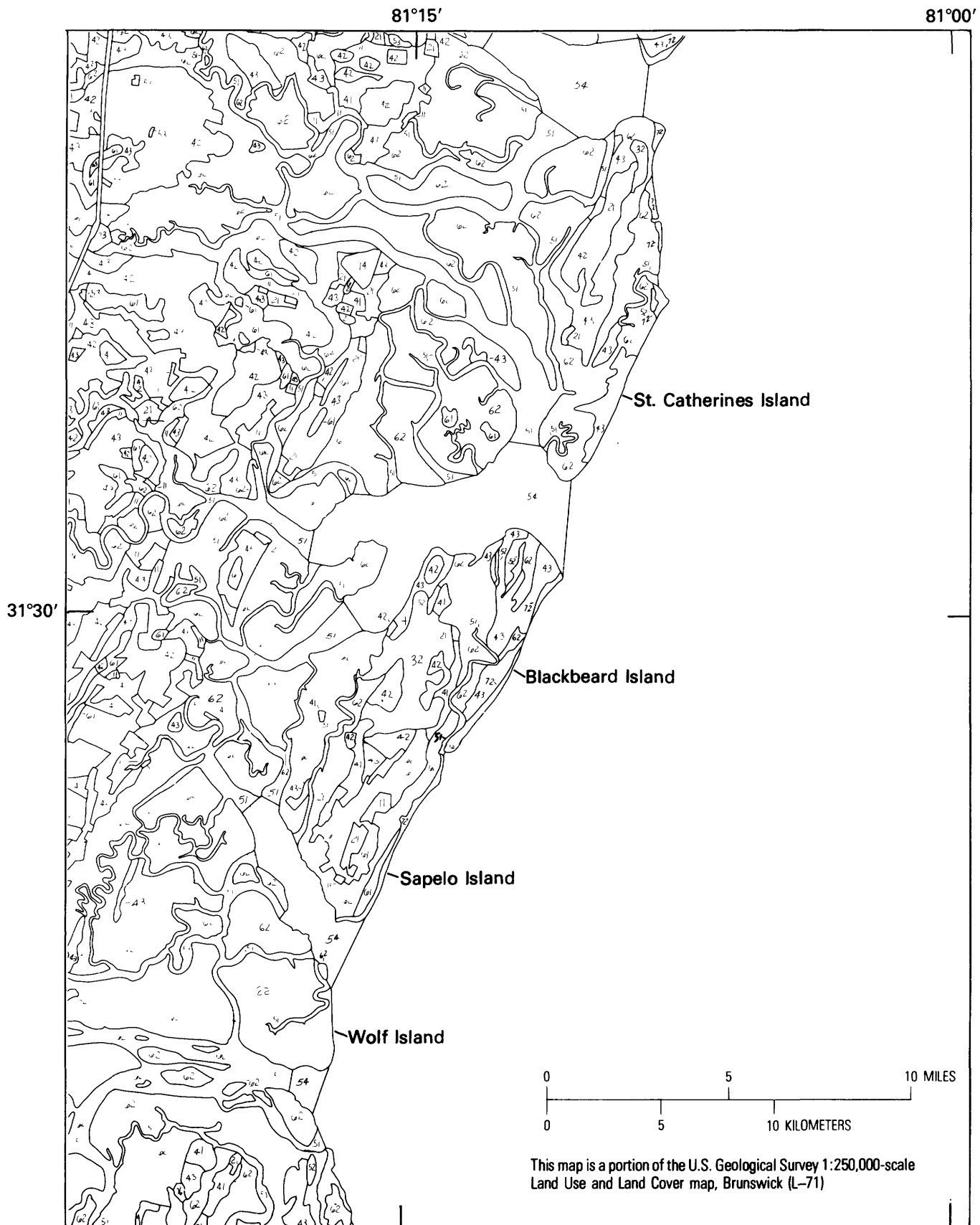


FIGURE 60. – Land use and land cover map of the coastal area near Sapelo Island, Ga., with associated barrier islands.

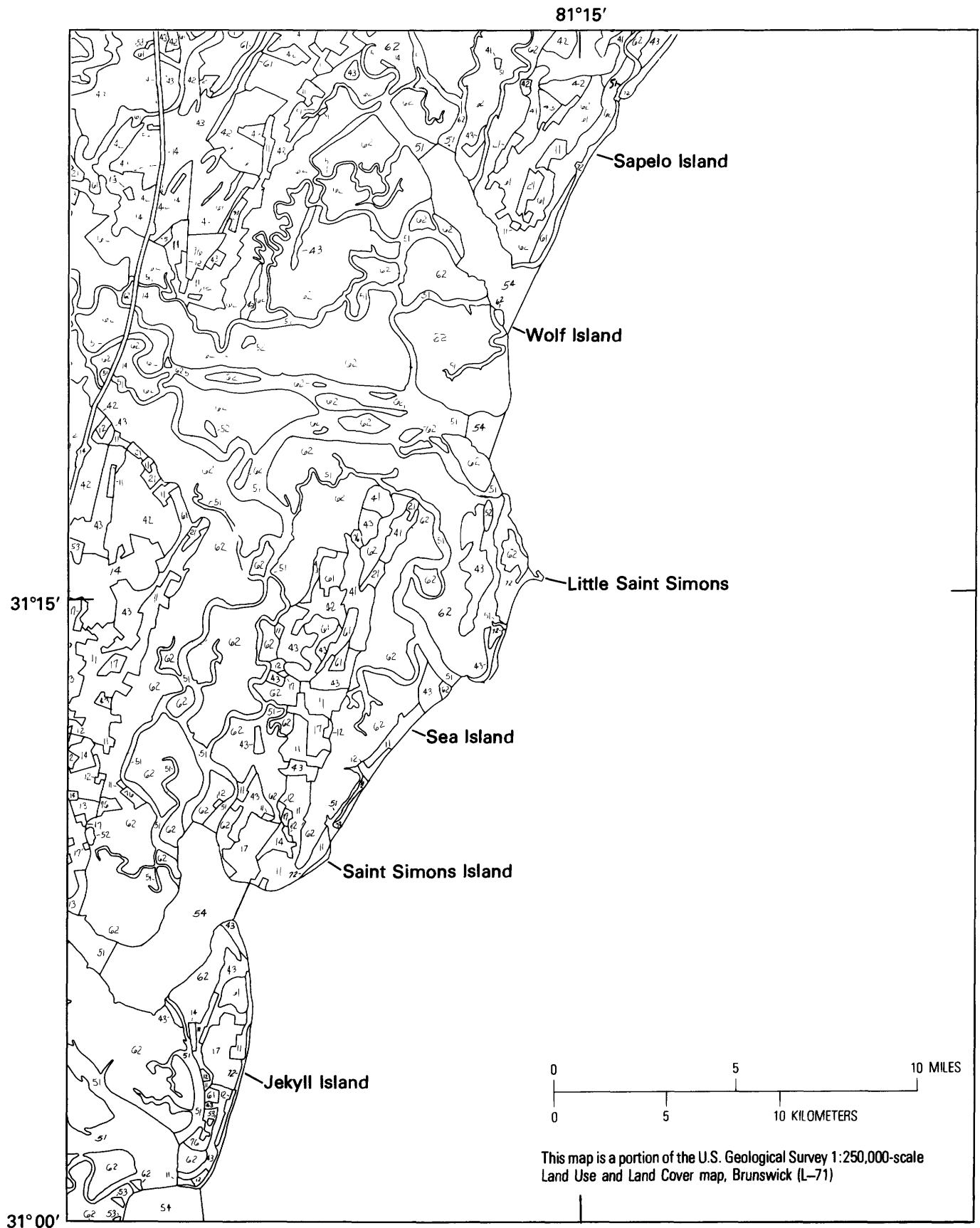


FIGURE 61. - Land use and land cover map of the coastal area near Brunswick, Ga., with associated barrier islands.

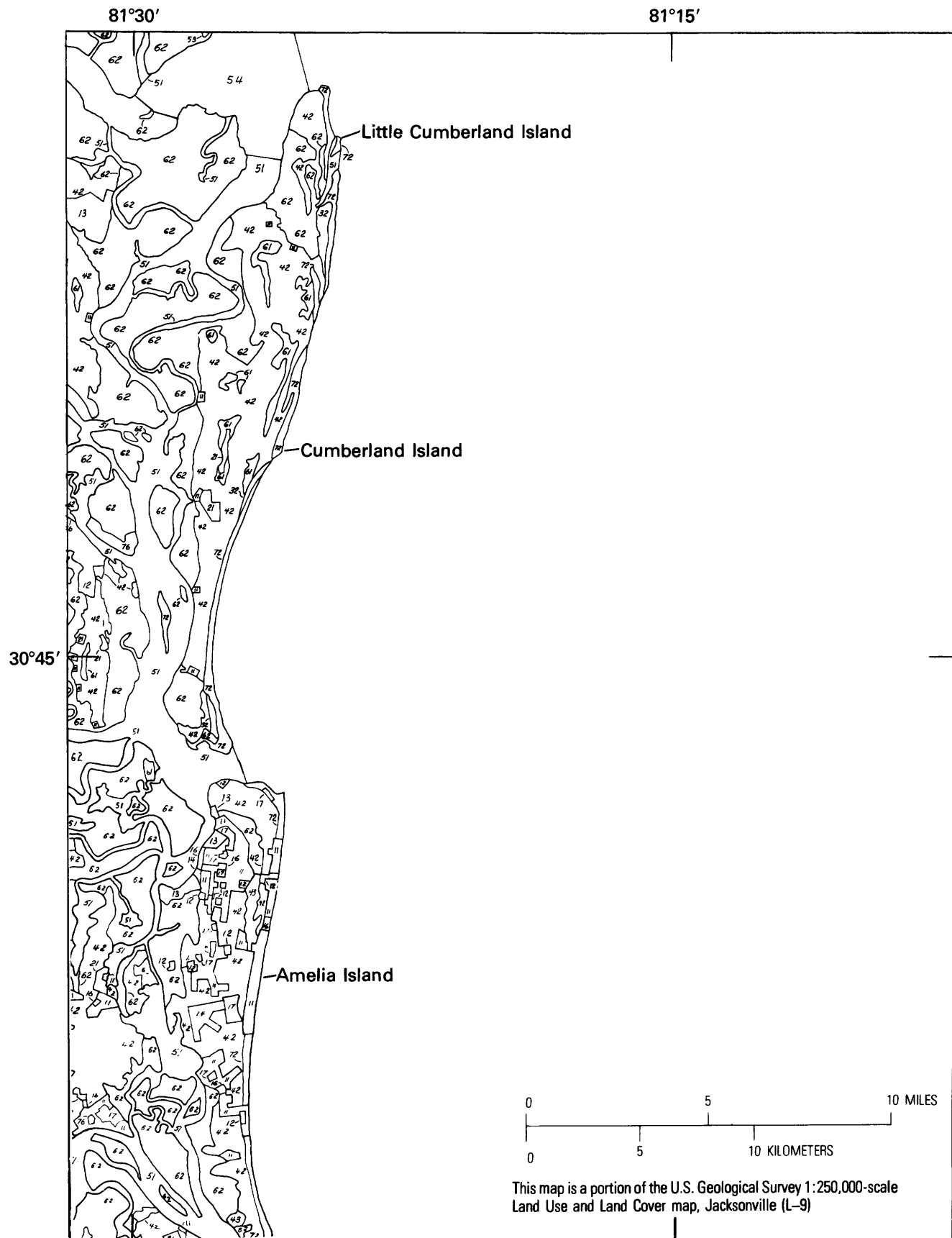


FIGURE 62.—Land use and land cover map of the coastal area near Cumberland Island, Ga., with associated barrier islands.

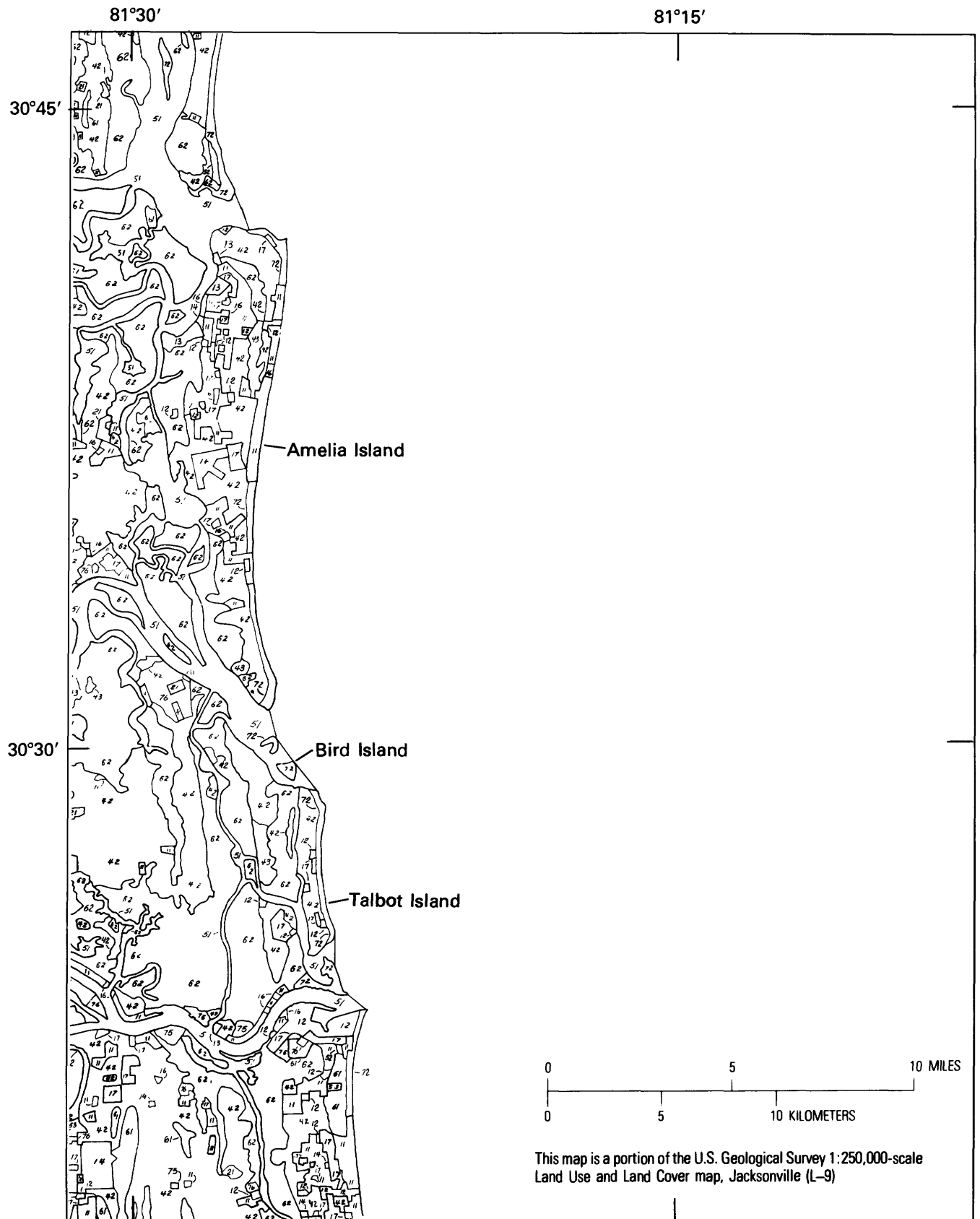


FIGURE 63.—Land use and land cover map of the coastal area near Fernandina Beach, Fla., with associated barrier islands.



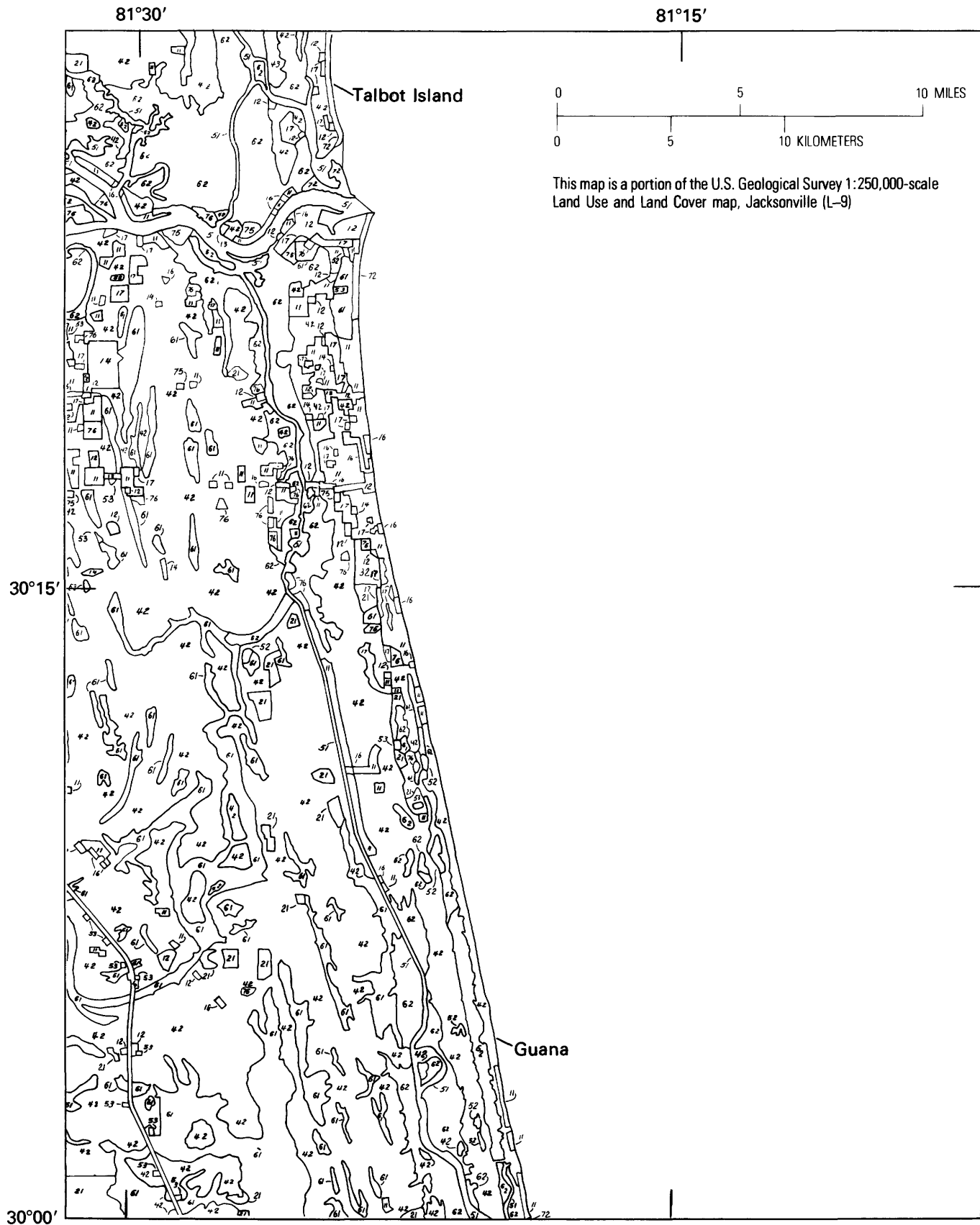


FIGURE 64. - Land use and land cover map of the coastal area near Jacksonville, Fla., with associated barrier islands.

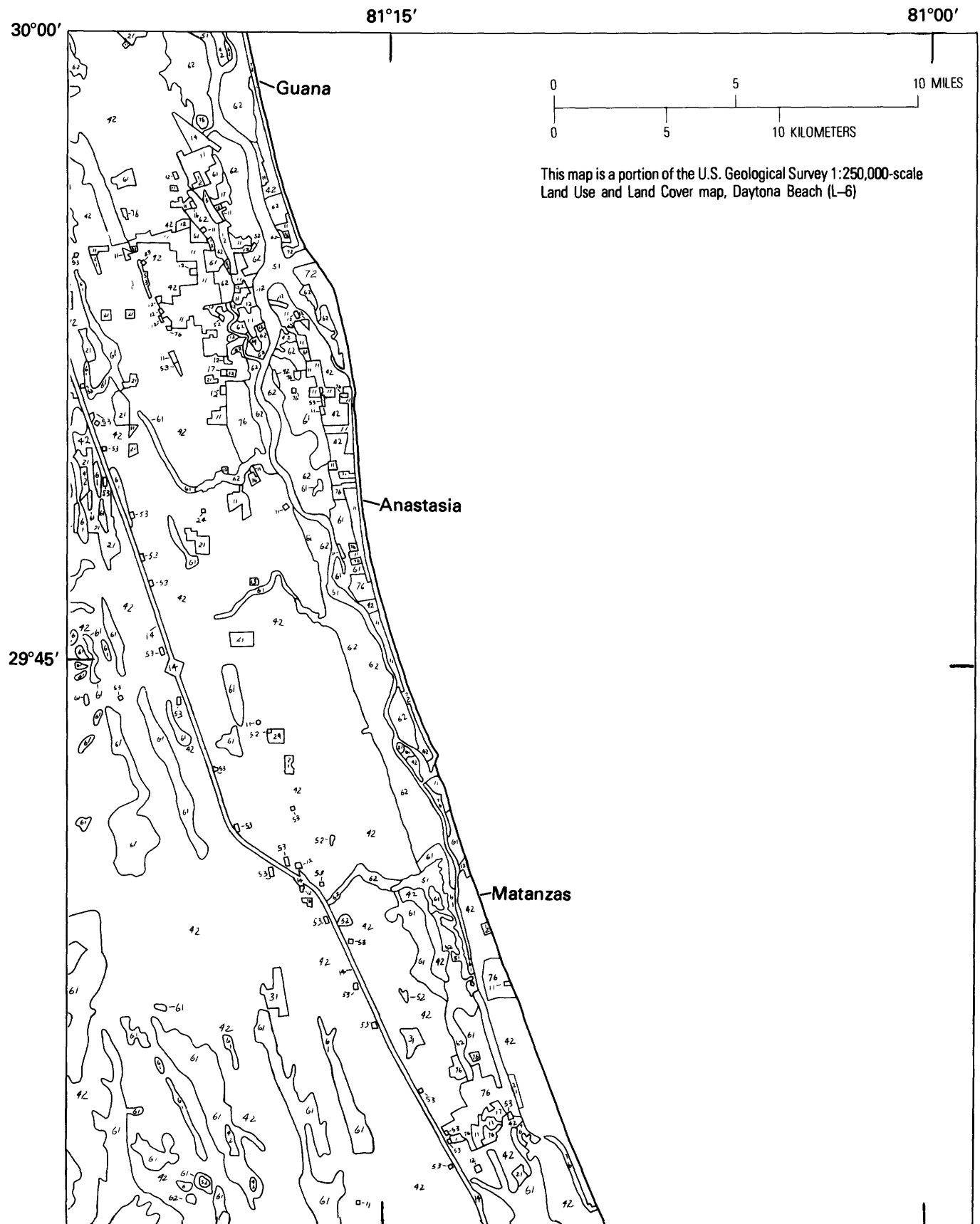


FIGURE 65. — Land use and land cover map of the coastal area near St. Augustine, Fla., with associated barrier islands.

81°00'

0 5 10 MILES  
0 5 10 KILOMETERS

This map is a portion of the U.S. Geological Survey 1:250,000-scale  
Land Use and Land Cover map, Daytona Beach (L-6)

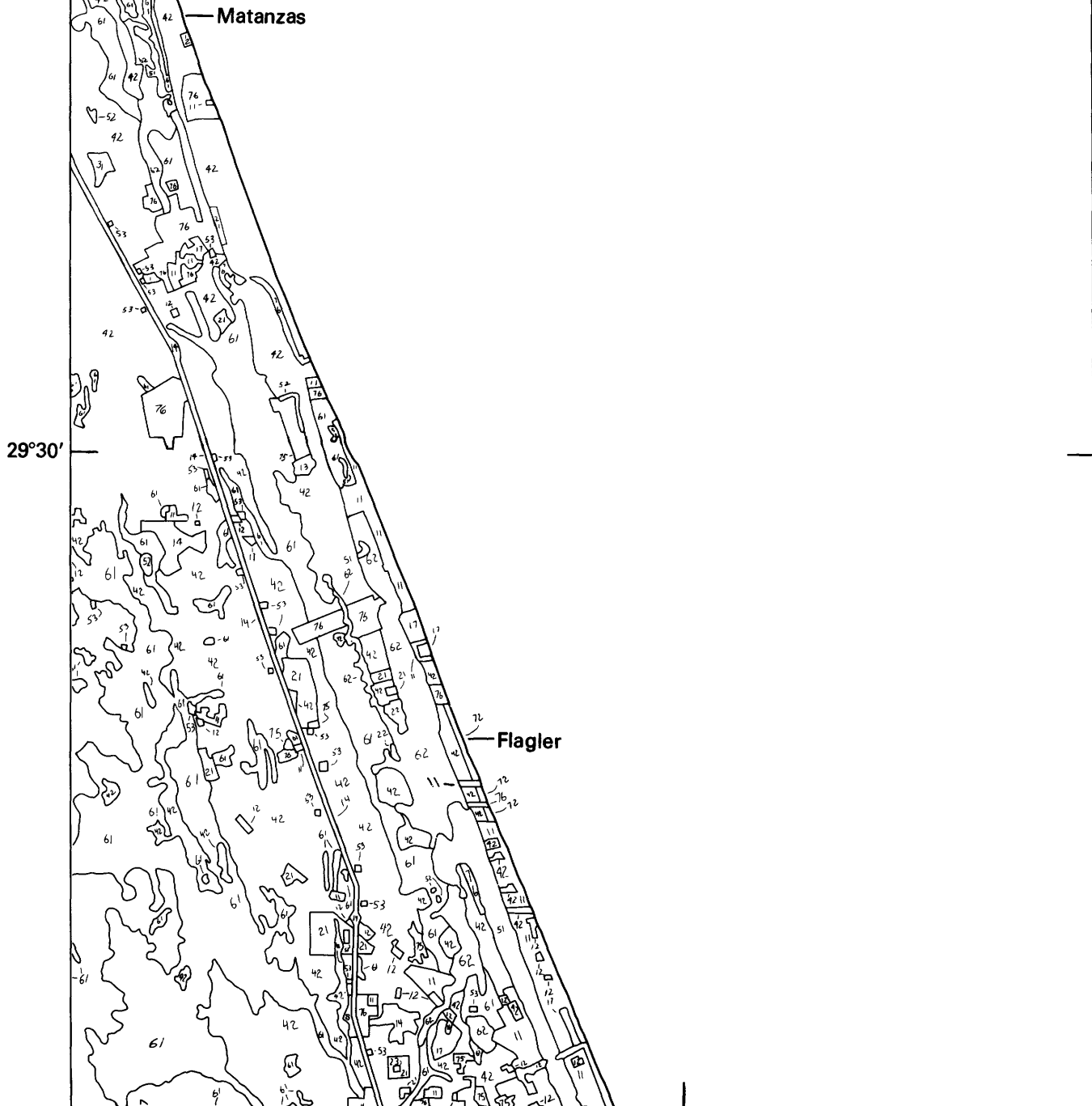


FIGURE 66. - Land use and land cover map of the coastal area near Marineland, Fla., with associated barrier islands.

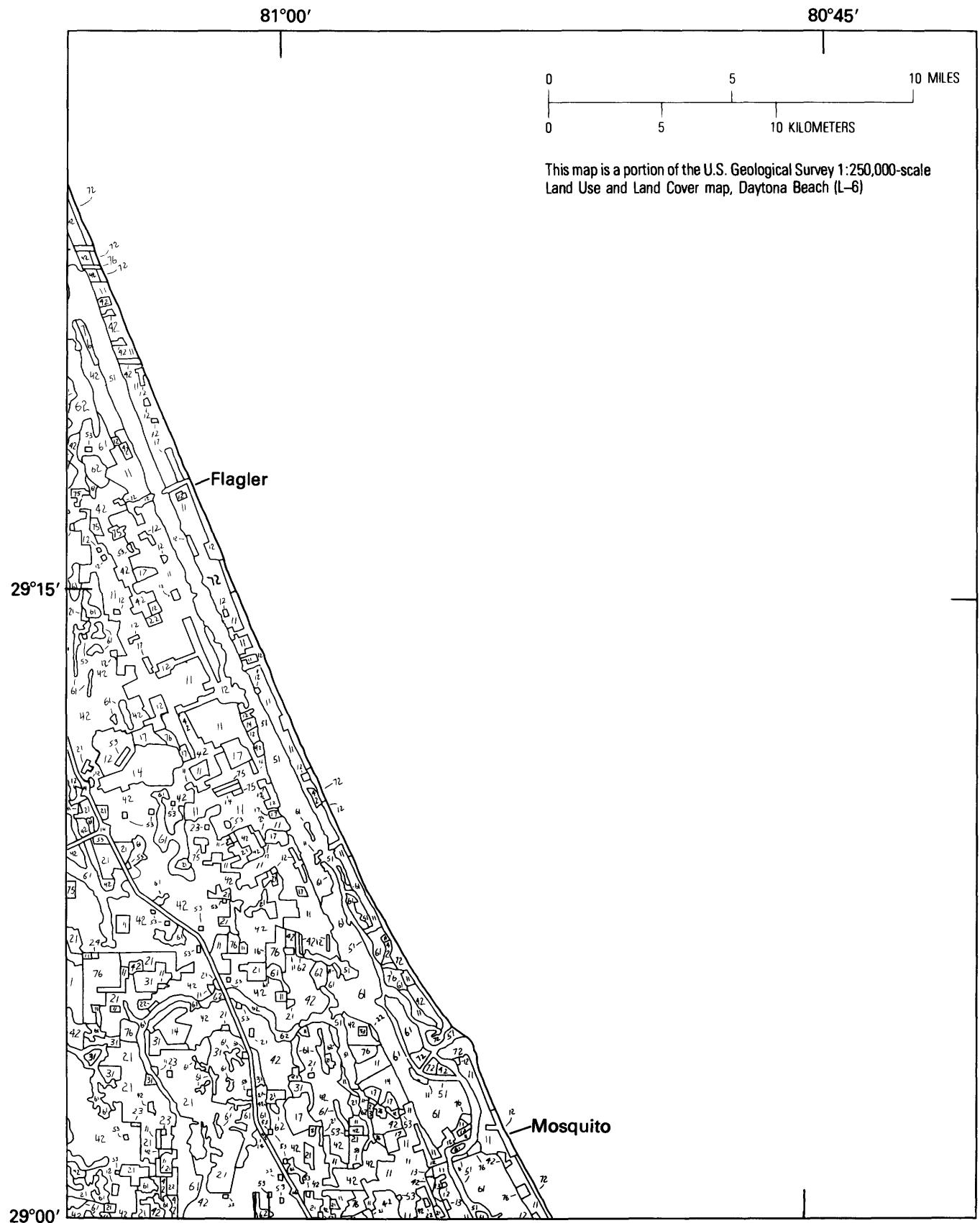


FIGURE 67. – Land use and land cover map of the coastal area near Daytona Beach, Fla., with associated barrier islands.

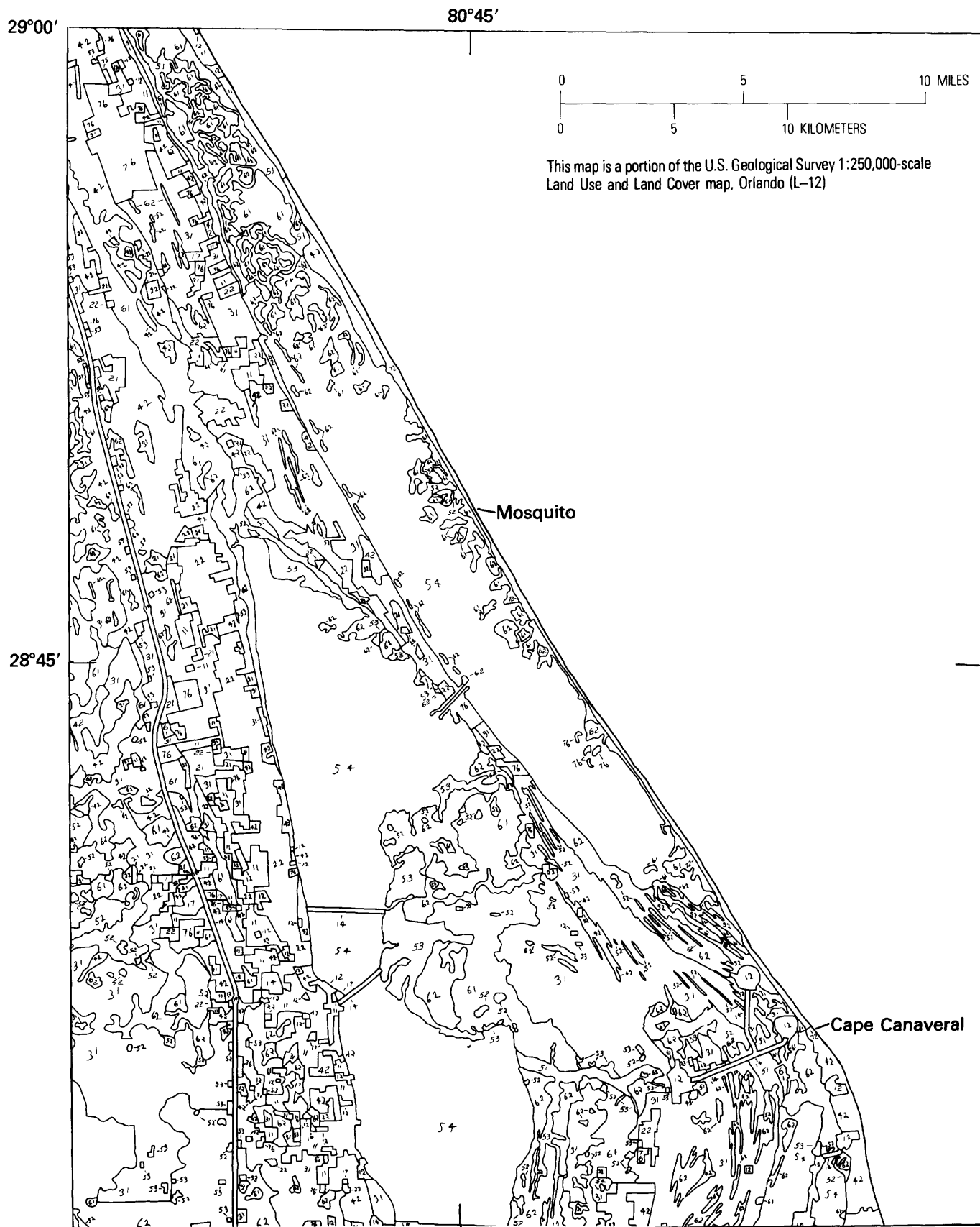


FIGURE 68.—Land use and land cover map of the coastal area near Titusville, Fla., with associated barrier islands.

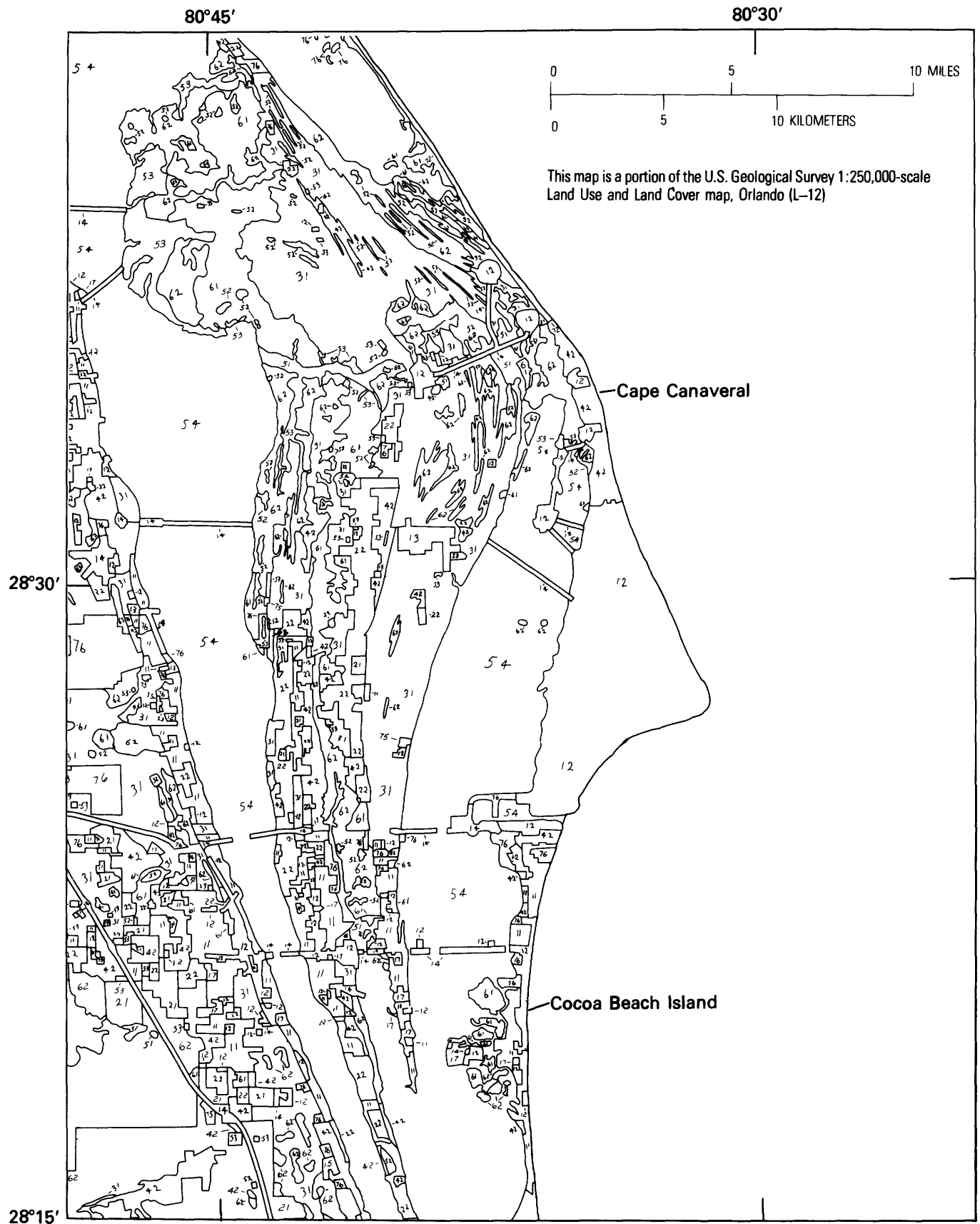


FIGURE 69. – Land use and land cover map of the coastal area near Merritt Island, Fla., with associated barrier islands.

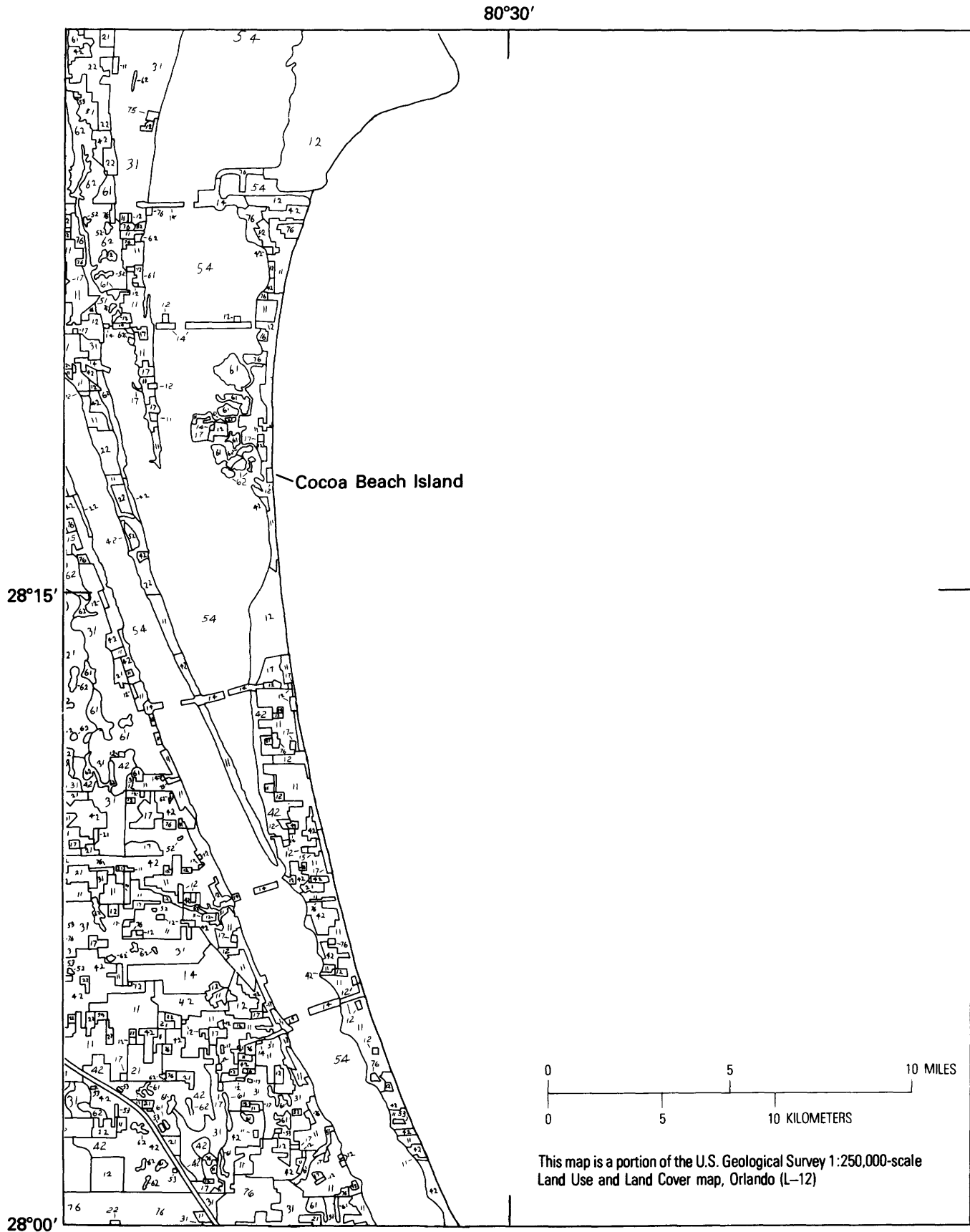


FIGURE 70. – Land use and land cover map of the coastal area near Cocoa Beach, Fla., with associated barrier islands.

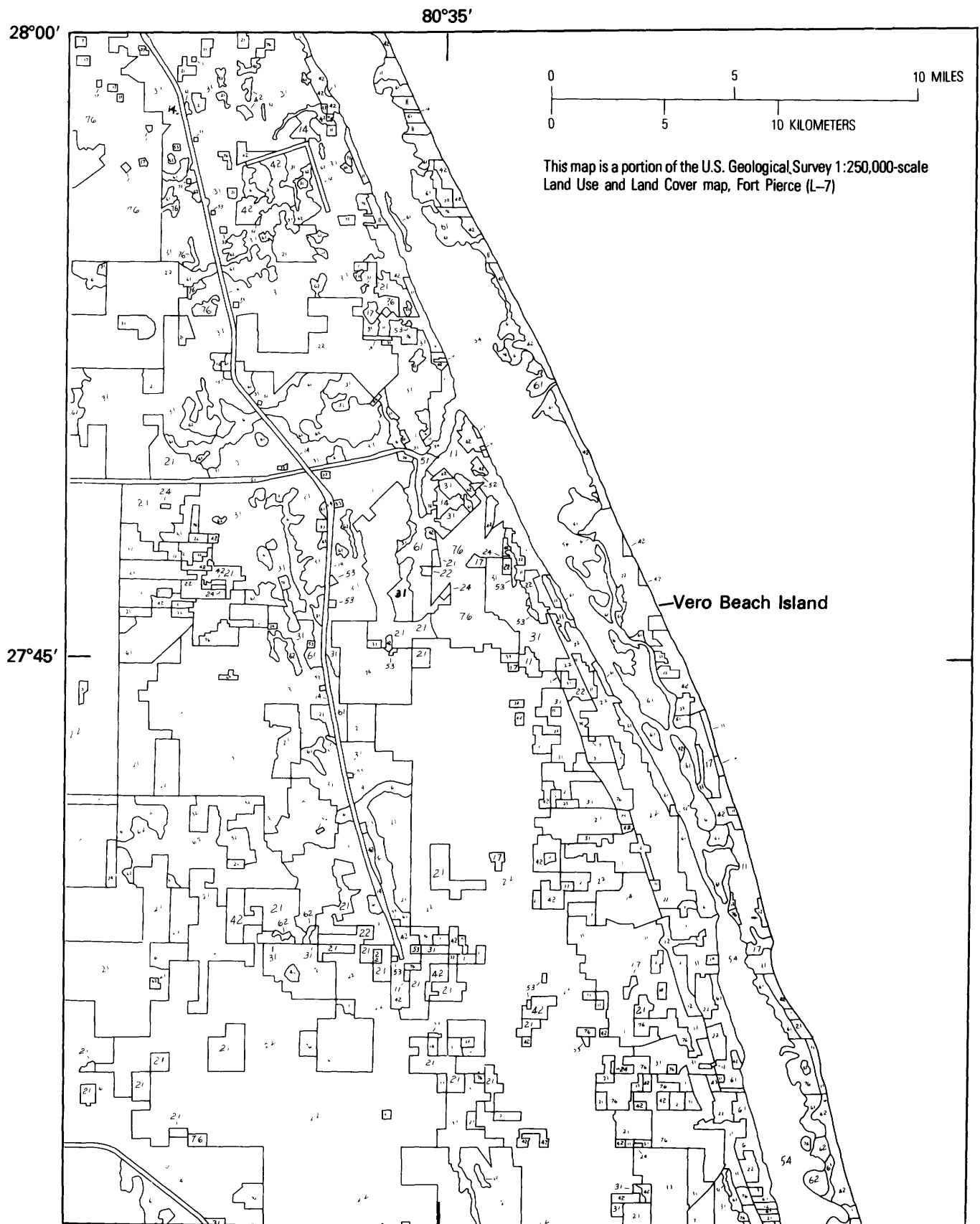


FIGURE 71. -Land use and land cover map of the coastal area near Vero Beach, Fla., with associated barrier islands.



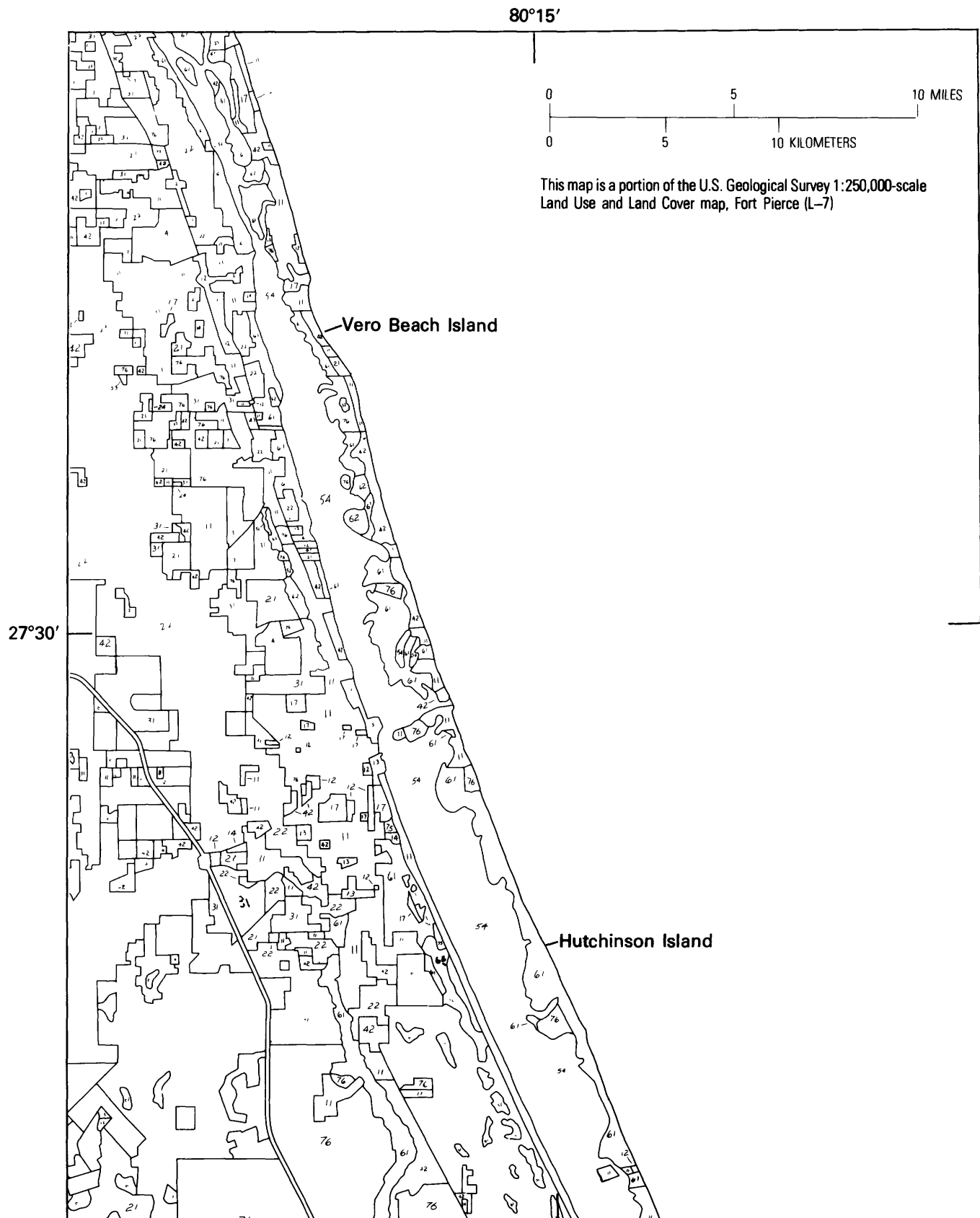


FIGURE 72. —Land use and land cover map of the coastal area near Fort Pierce, Fla., with associated barrier islands.

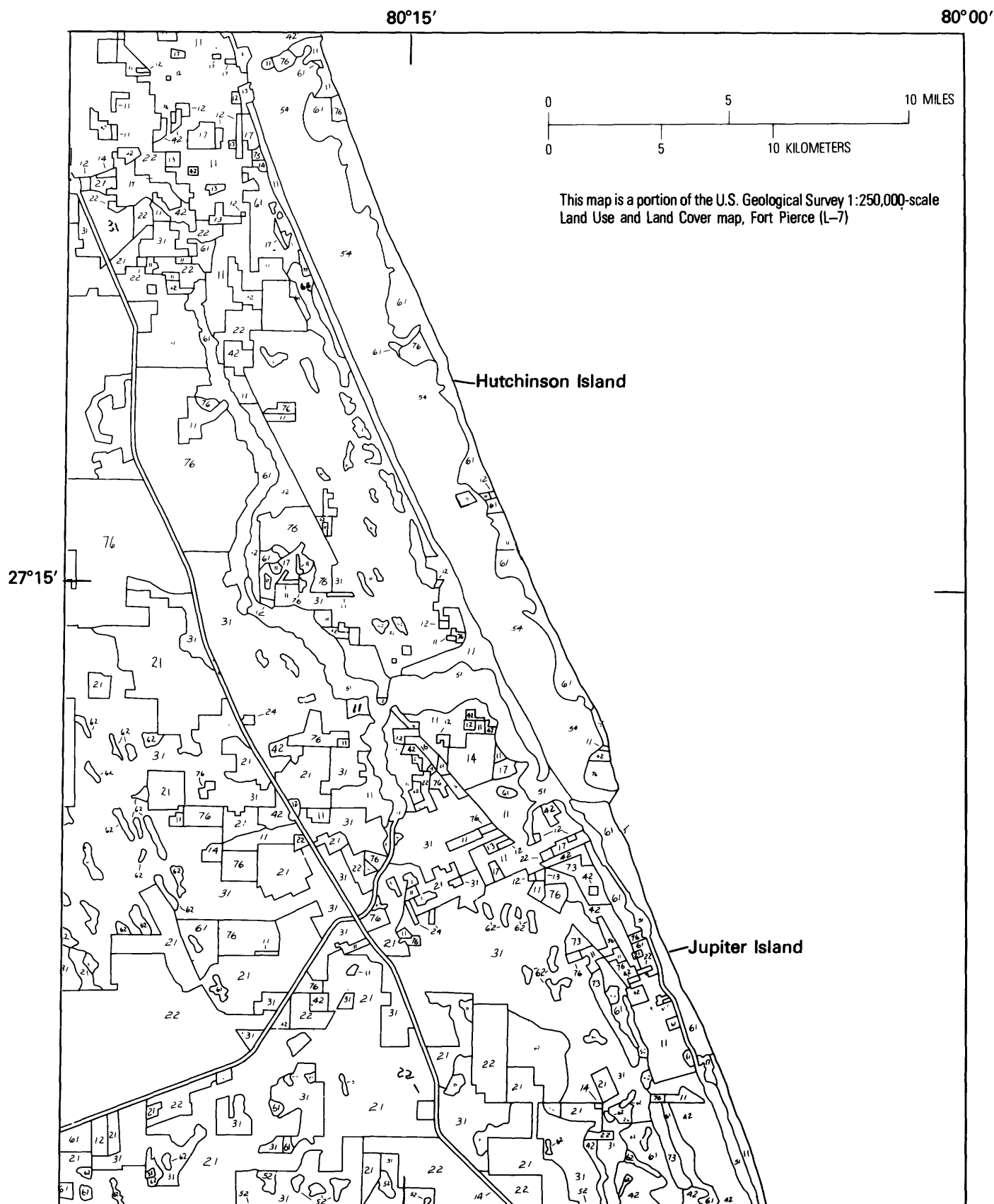


FIGURE 73. — Land use and land cover map of the coastal area near Jupiter, Fla., with associated barrier islands.



FIGURE 74.—Land use and land cover map of the coastal area near West Palm Beach, Fla., with associated barrier islands.



FIGURE 75. – Land use and land cover map of the coastal area near Boca Raton, Fla., with associated barrier islands.



FIGURE 76. - Land use and land cover map of the coastal area near Ft. Lauderdale, Fla., with associated barrier islands.

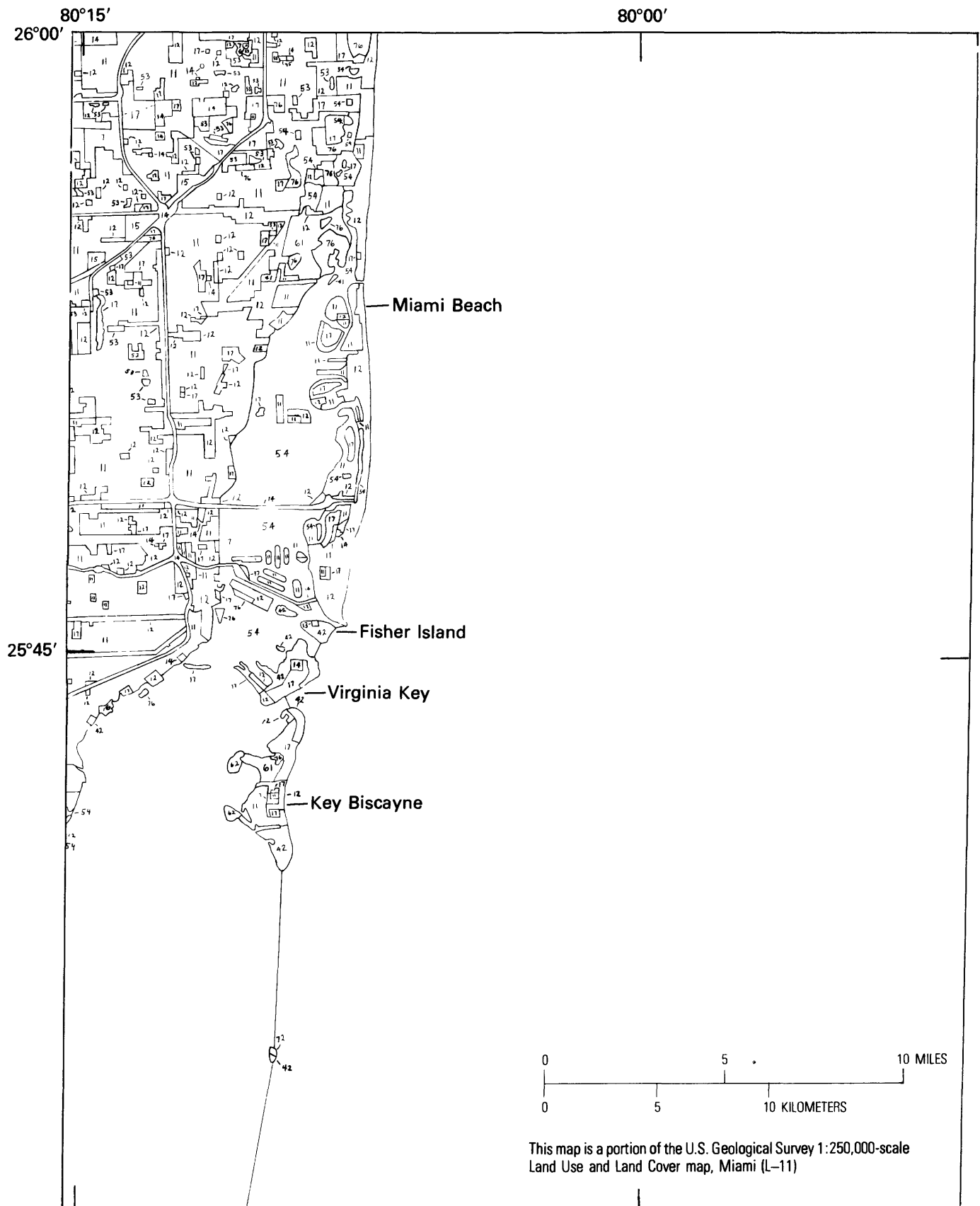


FIGURE 77.—Land use and land cover map of the coastal area near Miami, Fla., with associated barrier islands.



FIGURE 78.—Land use and land cover map of the coastal area near Cape Sable, Fla., with associated barrier islands.

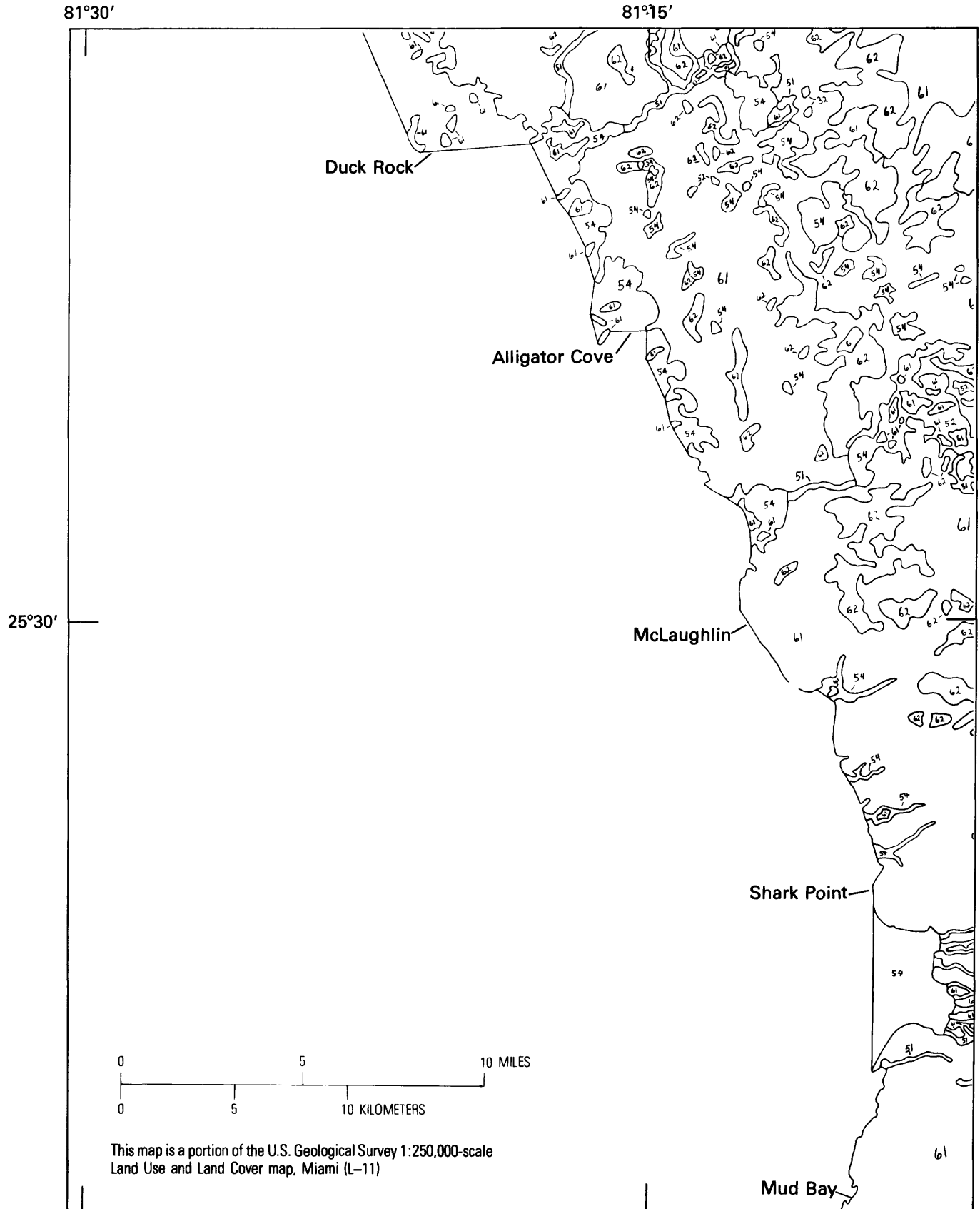


FIGURE 79. – Land use and land cover map of the coastal area near Alligator Cove, Fla., with associated barrier islands.



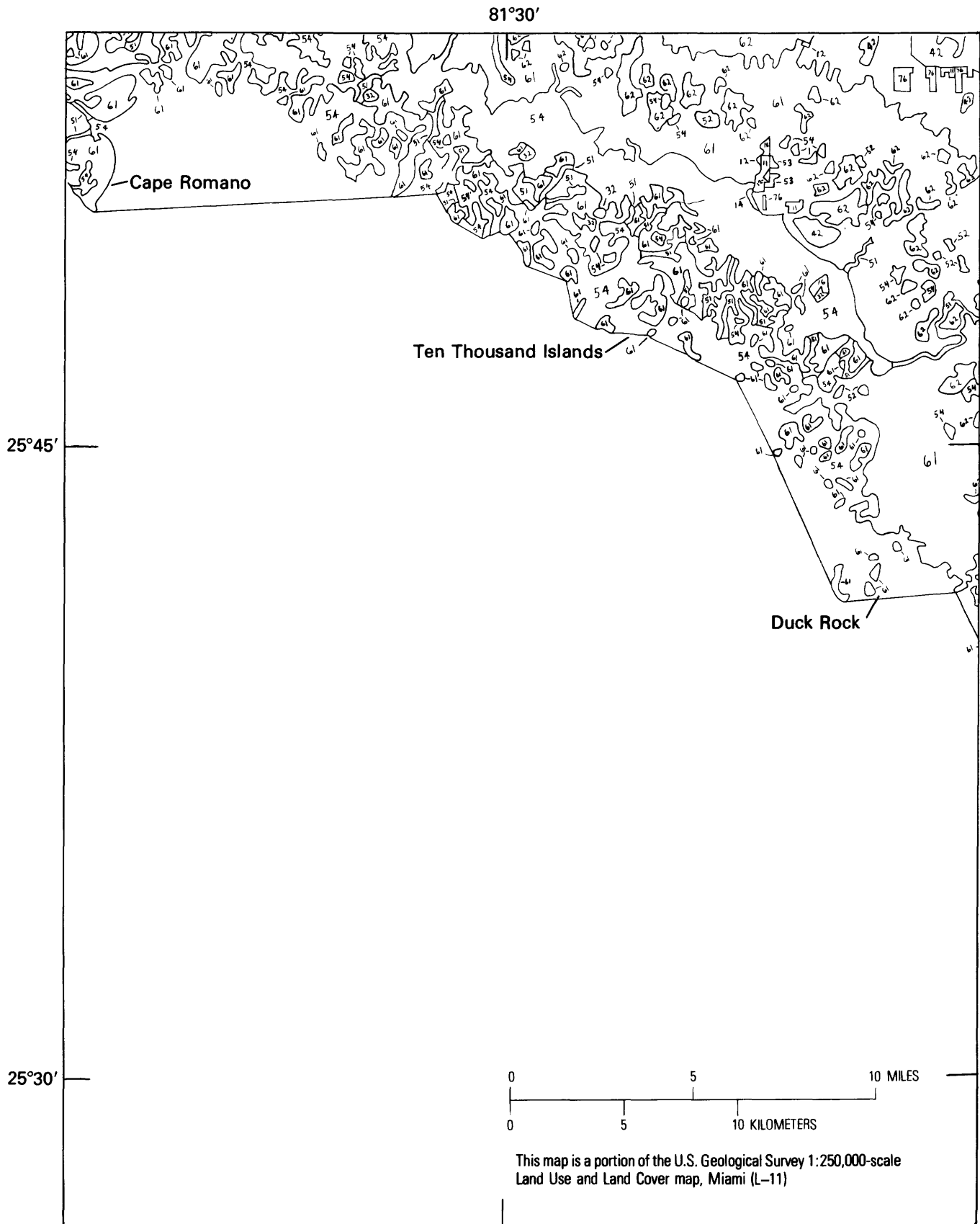


FIGURE 80. - Land use and land cover map of the coastal area near Everglades, Fla., with associated barrier islands.

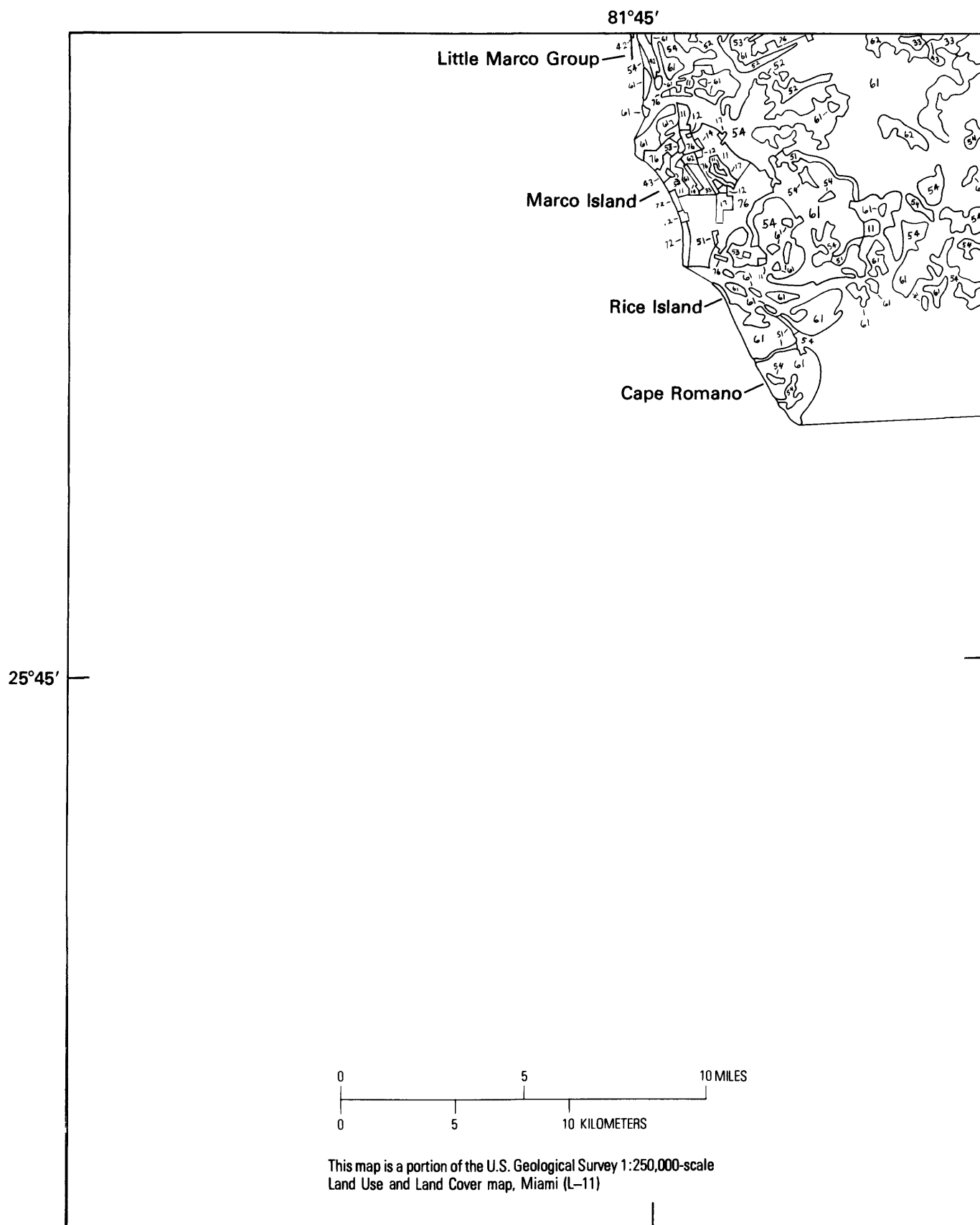


FIGURE 81.—Land use and land cover map of the coastal area near Marco, Fla., with associated barrier islands.

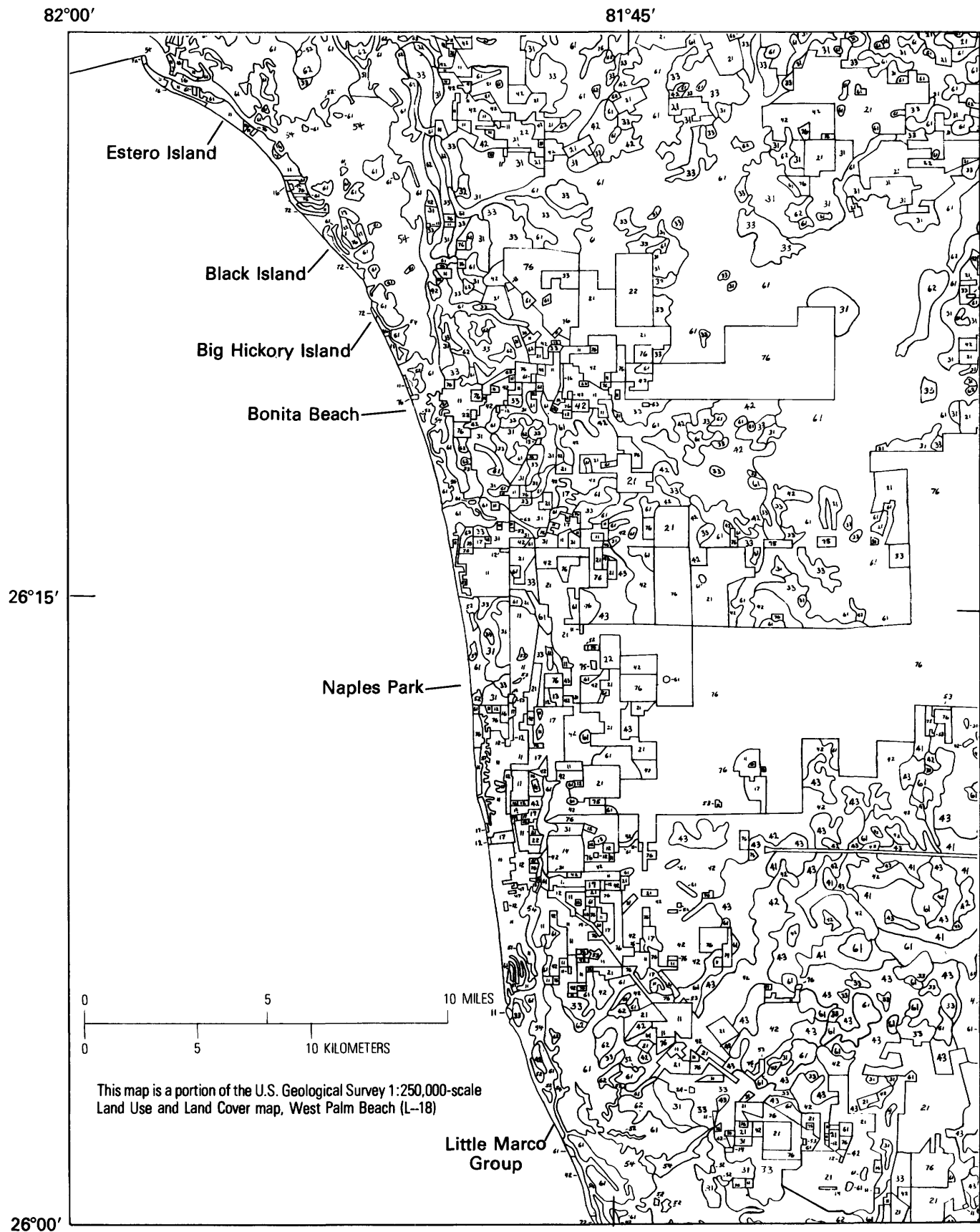


FIGURE 82. - Land use and land cover map of the coastal area near Naples, Fla., with associated barrier islands.

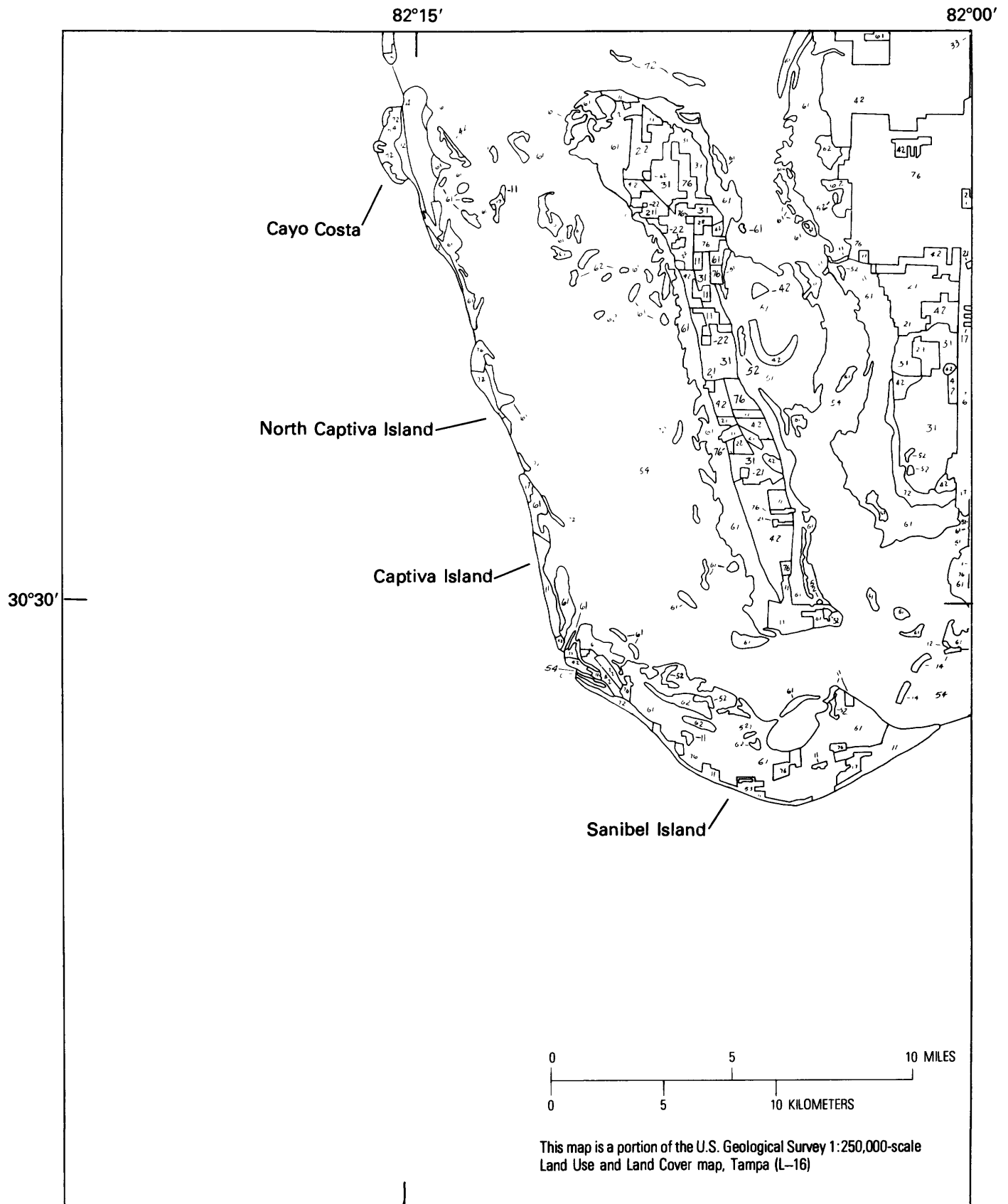


FIGURE 83.—Land use and land cover map of the coastal area near Fort Meyers, Fla., with associated barrier islands.

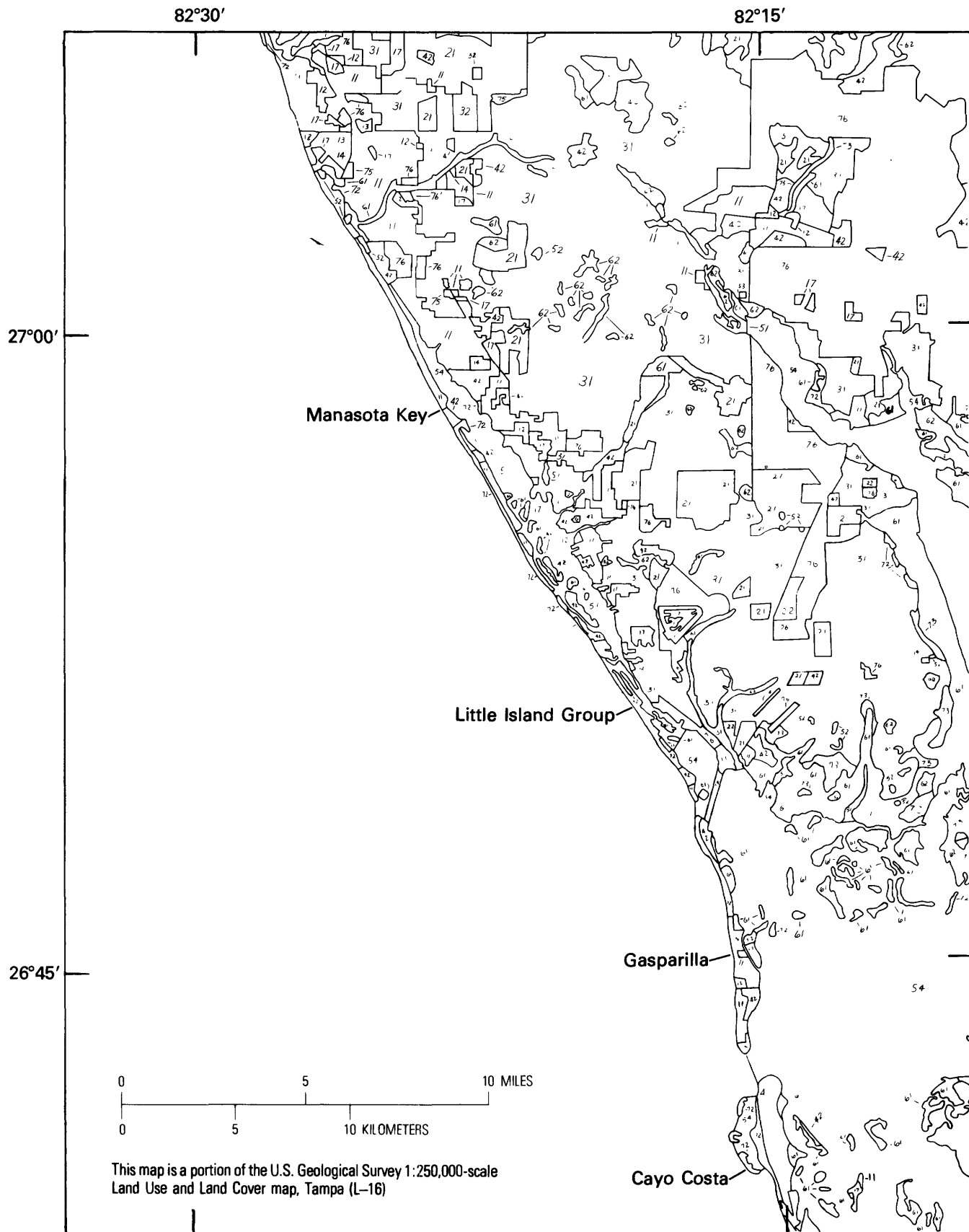


FIGURE 84. — Land use and land cover map of the coastal area near Venice, Fla., with associated barrier islands.

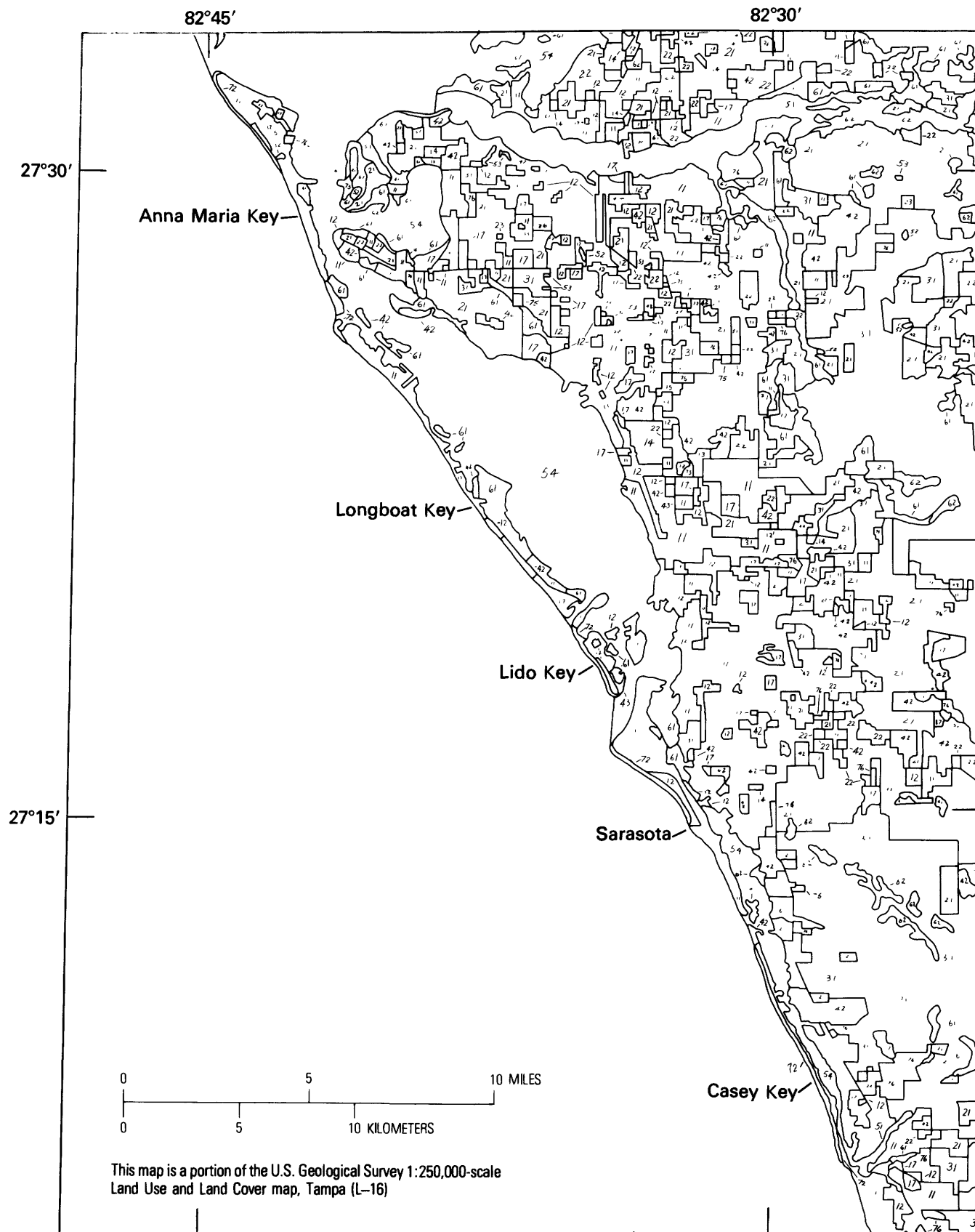


FIGURE 85.—Land use and land cover map of the coastal area near Sarasota, Fla., with associated barrier islands.

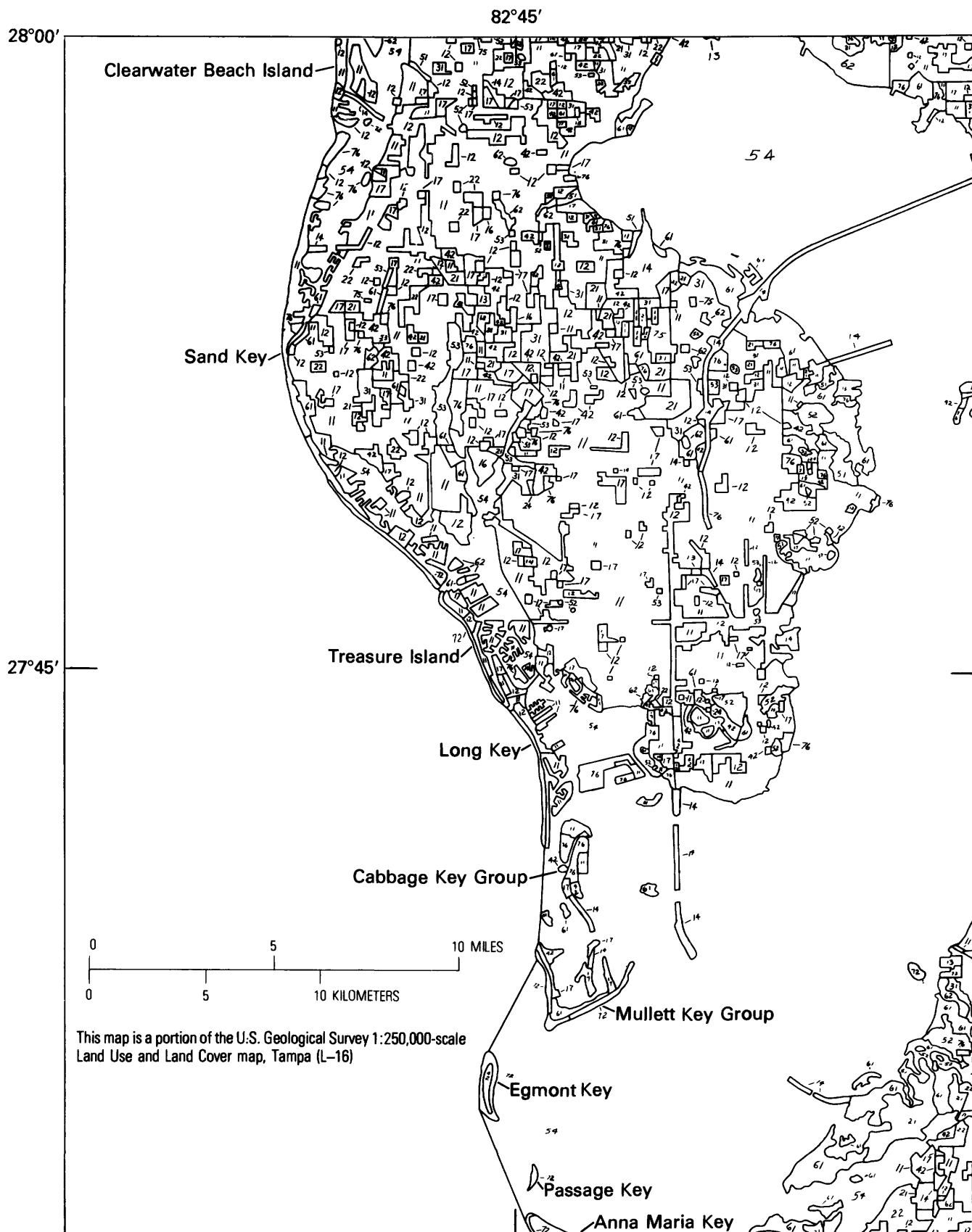


FIGURE 86. — Land use and land cover map of the coastal area near St. Petersburg, Fla., with associated barrier islands.

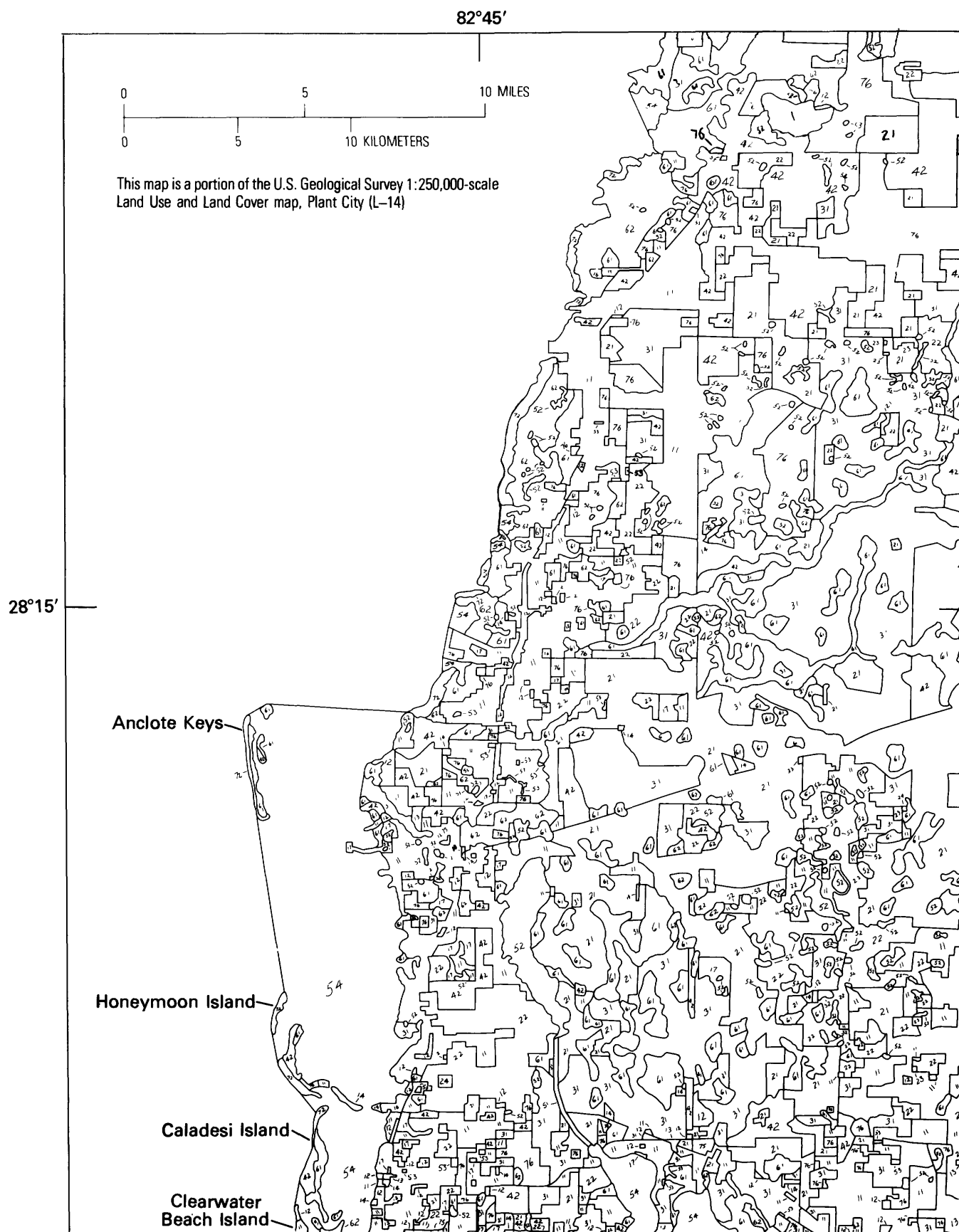
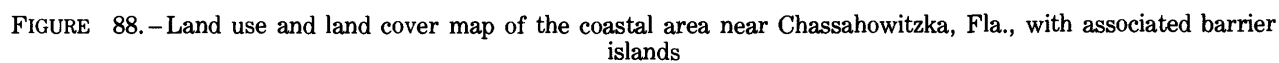


FIGURE 87.—Land use and land cover map of the coastal area near Tarpon Springs, Fla., with associated barrier islands.





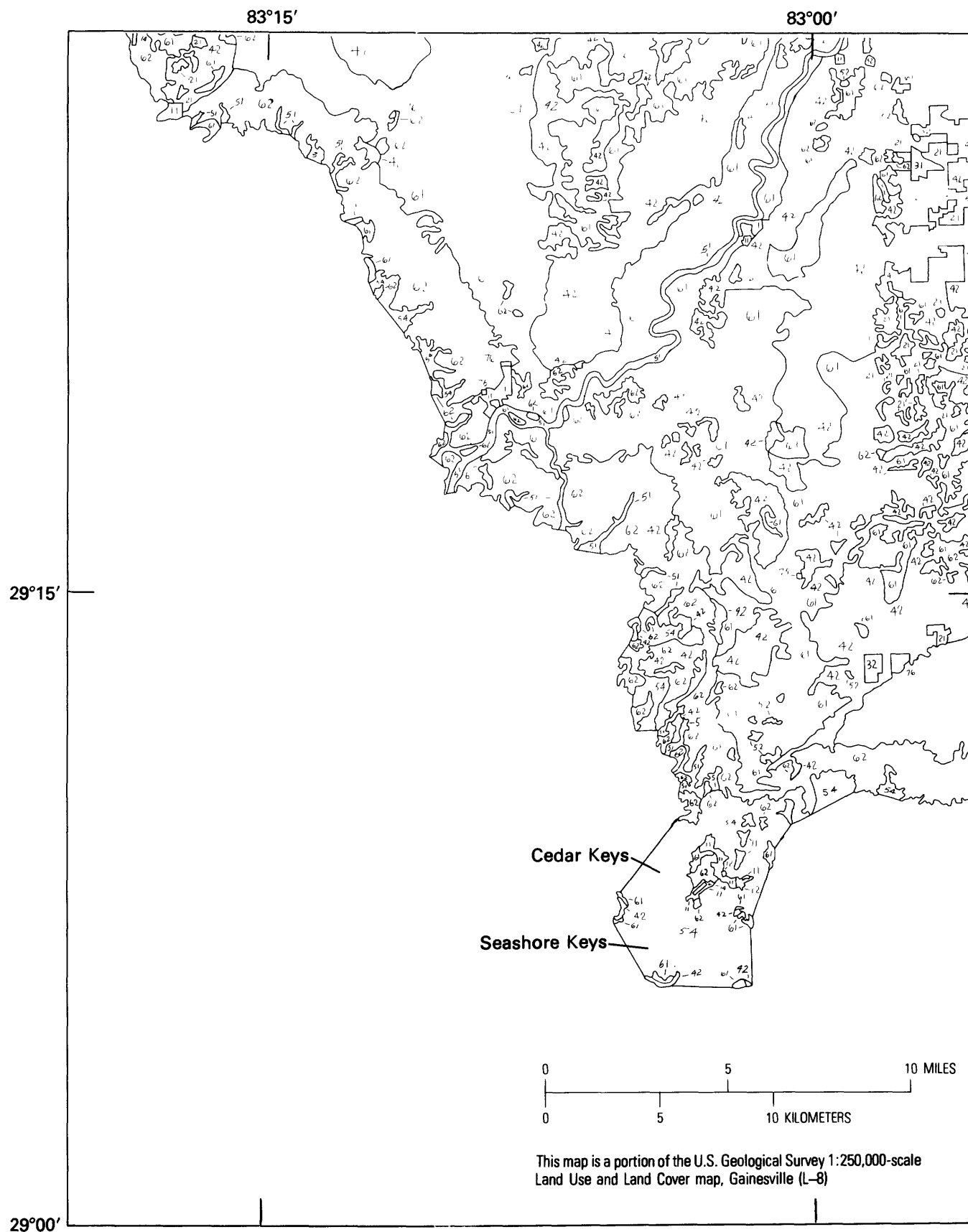


FIGURE 89.—Land use and land cover map of the coastal area near Cedar Key, Fla., with associated barrier islands.

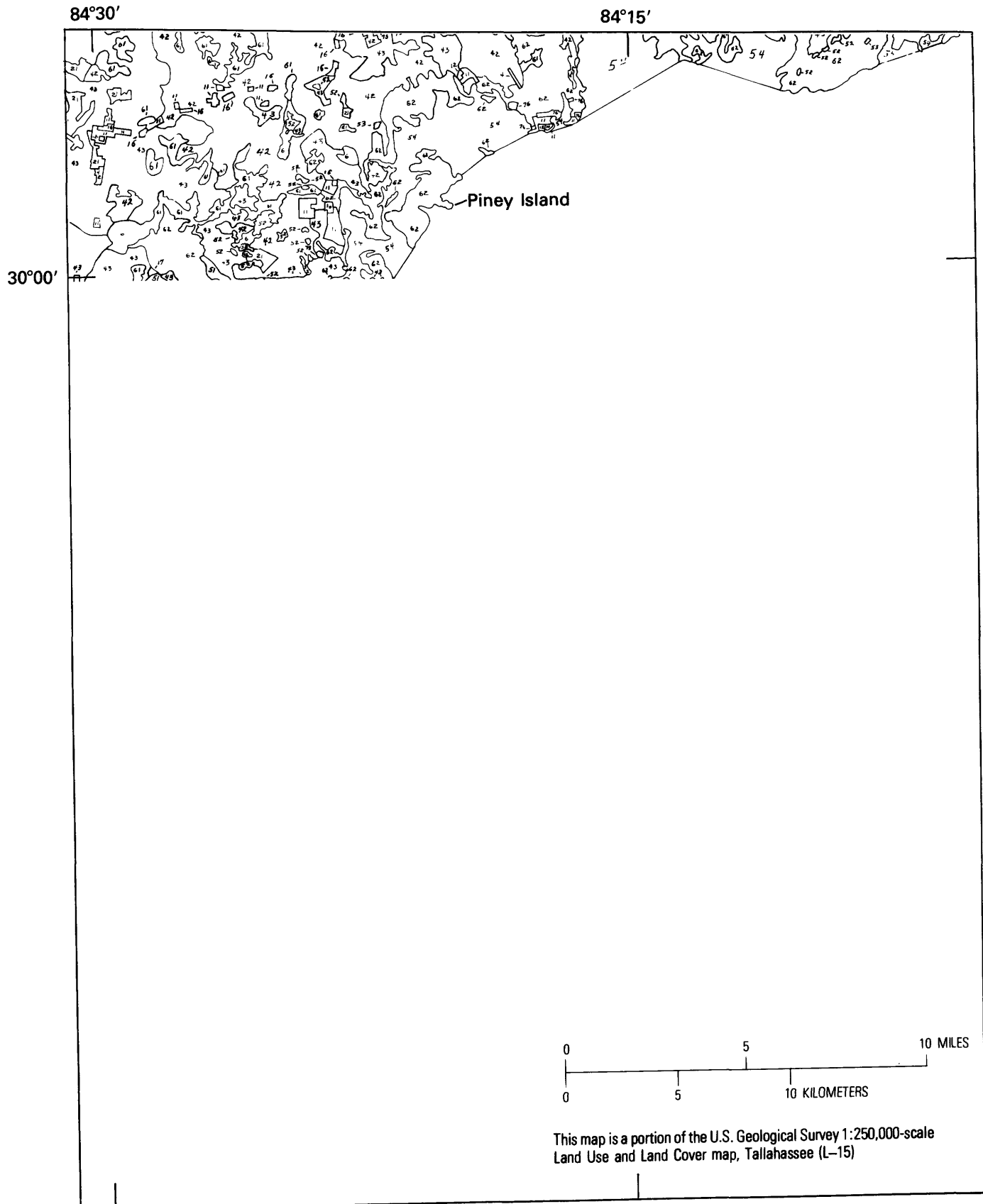


FIGURE 90. - Land use and land cover map of the coastal area near Panama, Fla., with associated barrier islands.

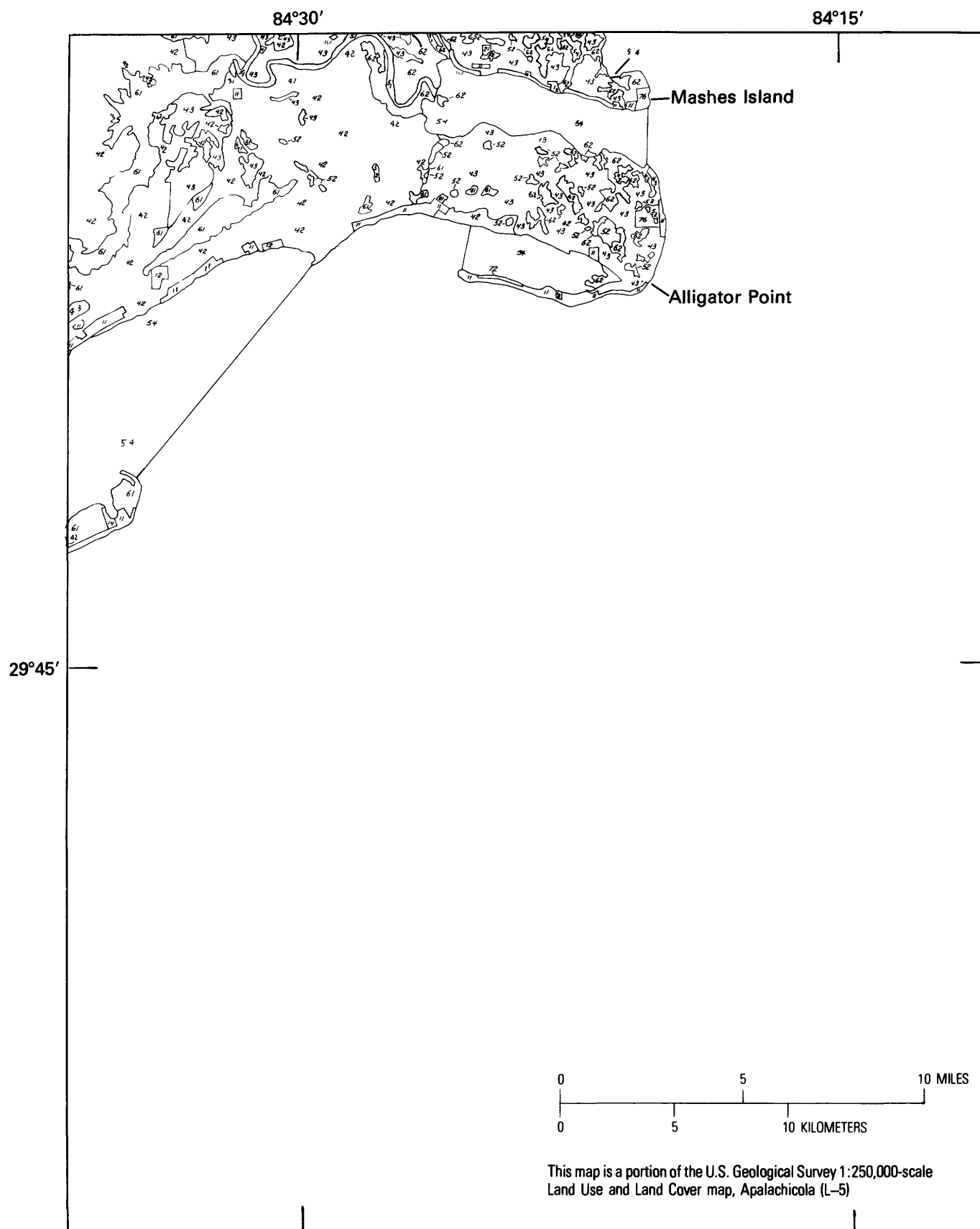


FIGURE 91. – Land use and land cover map of the coastal area near Saint Teresa, Fla., with associated barrier islands.

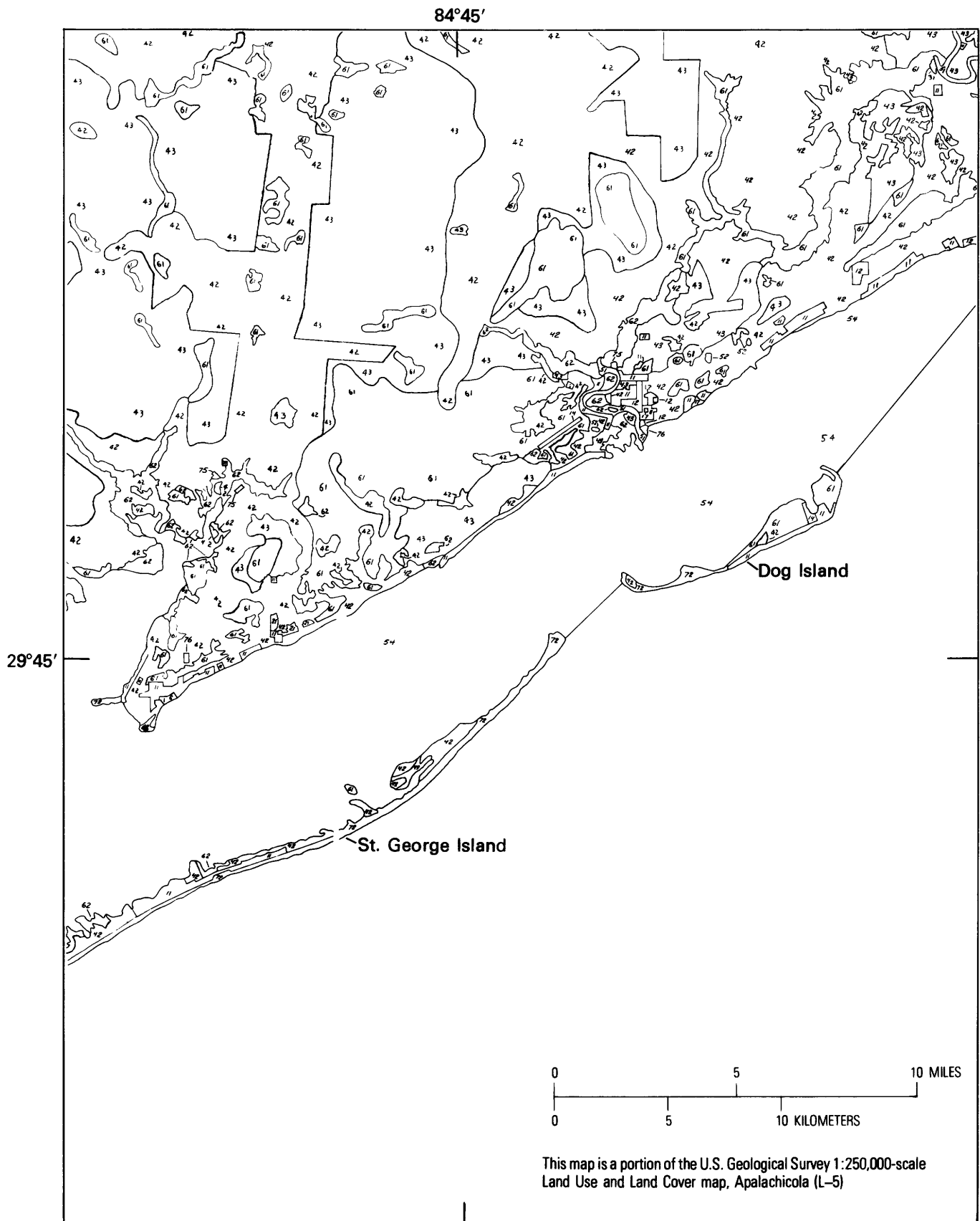


FIGURE 92. - Land use and land cover map of the coastal area near Carrabelle, Fla., with associated barrier islands.

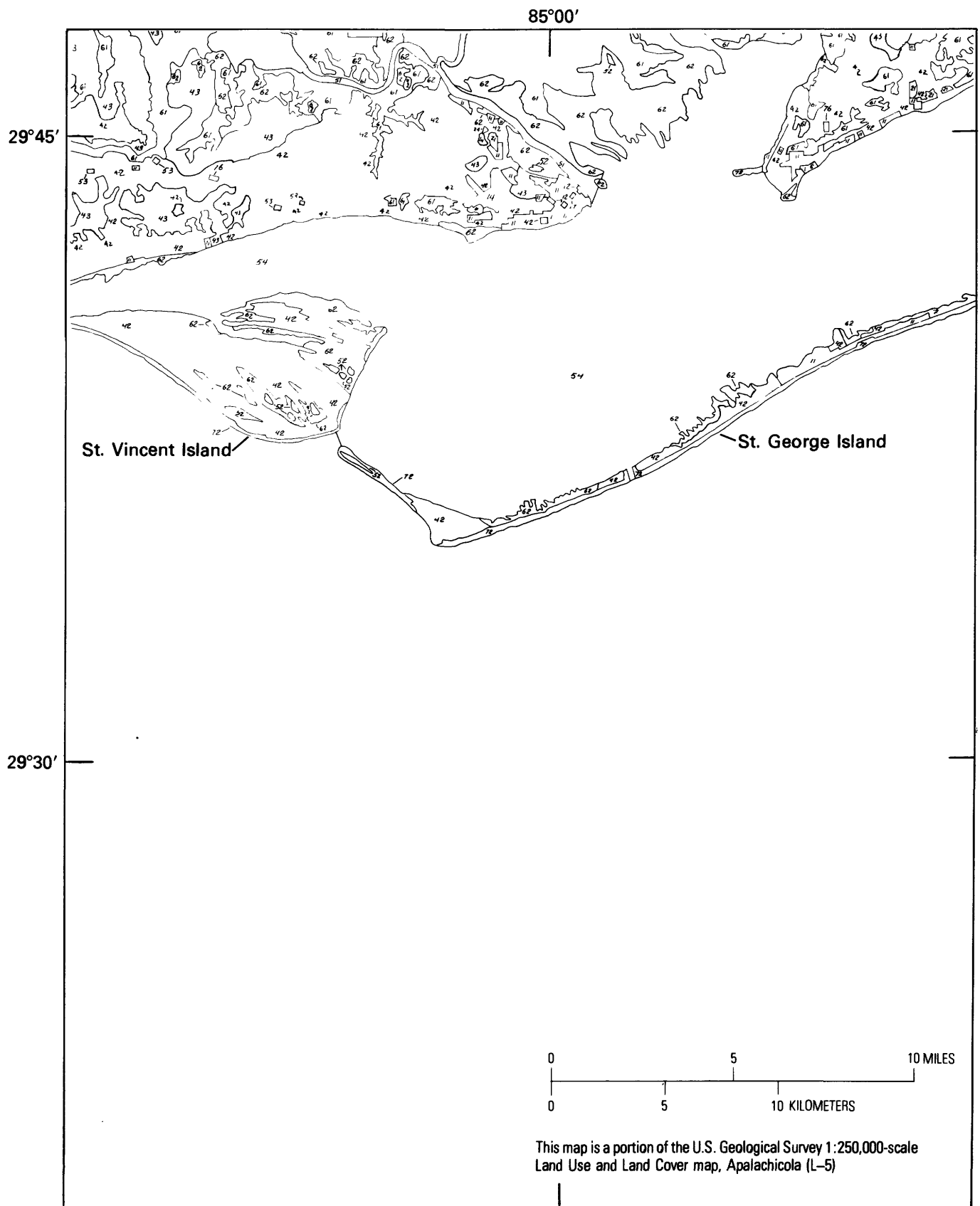


FIGURE 93. – Land use and land cover map of the coastal area near Apalachicola, Fla., with associated barrier islands.

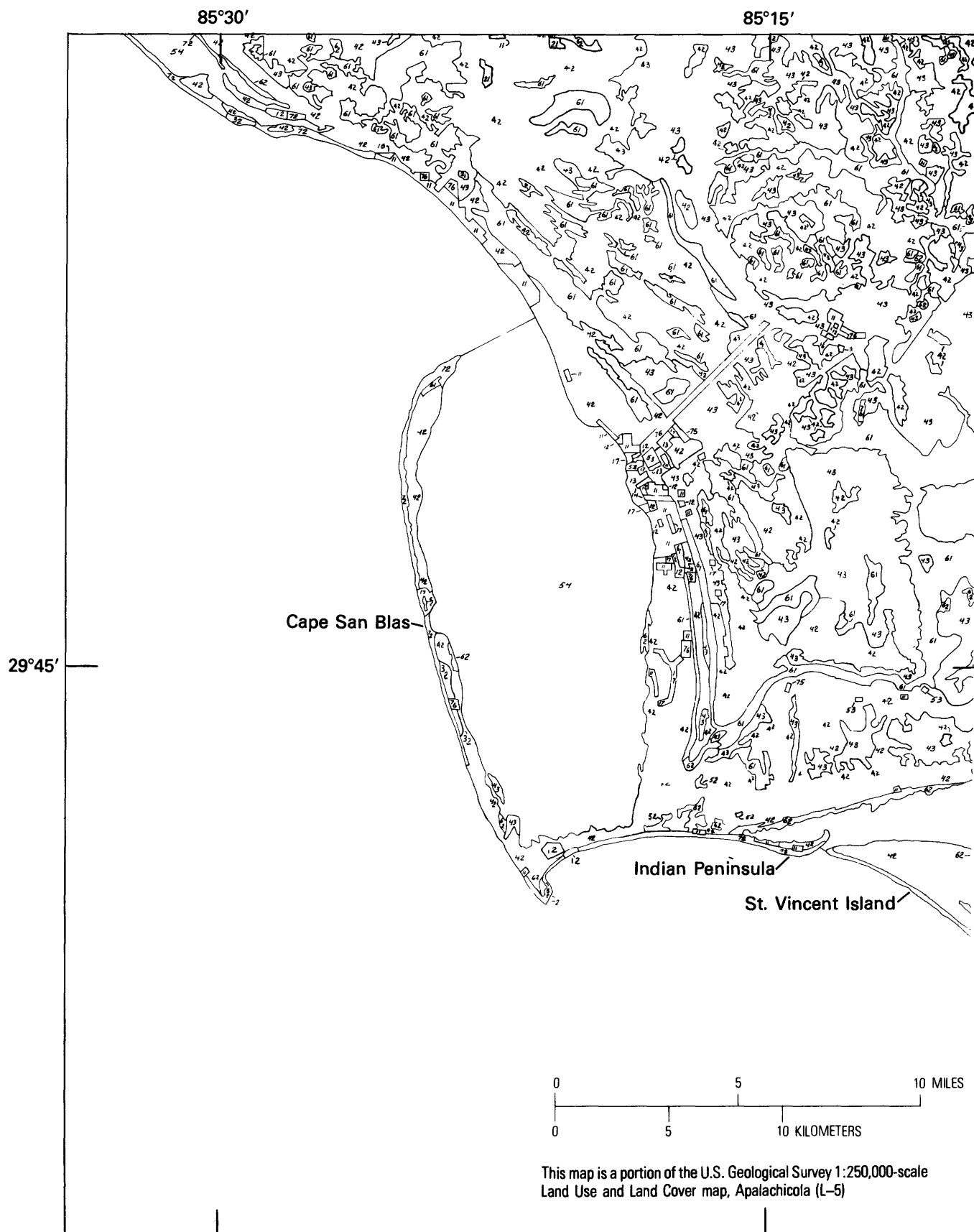


FIGURE 94.—Land use and land cover map of the coastal area near Port St. Joe, Fla., with associated barrier islands.

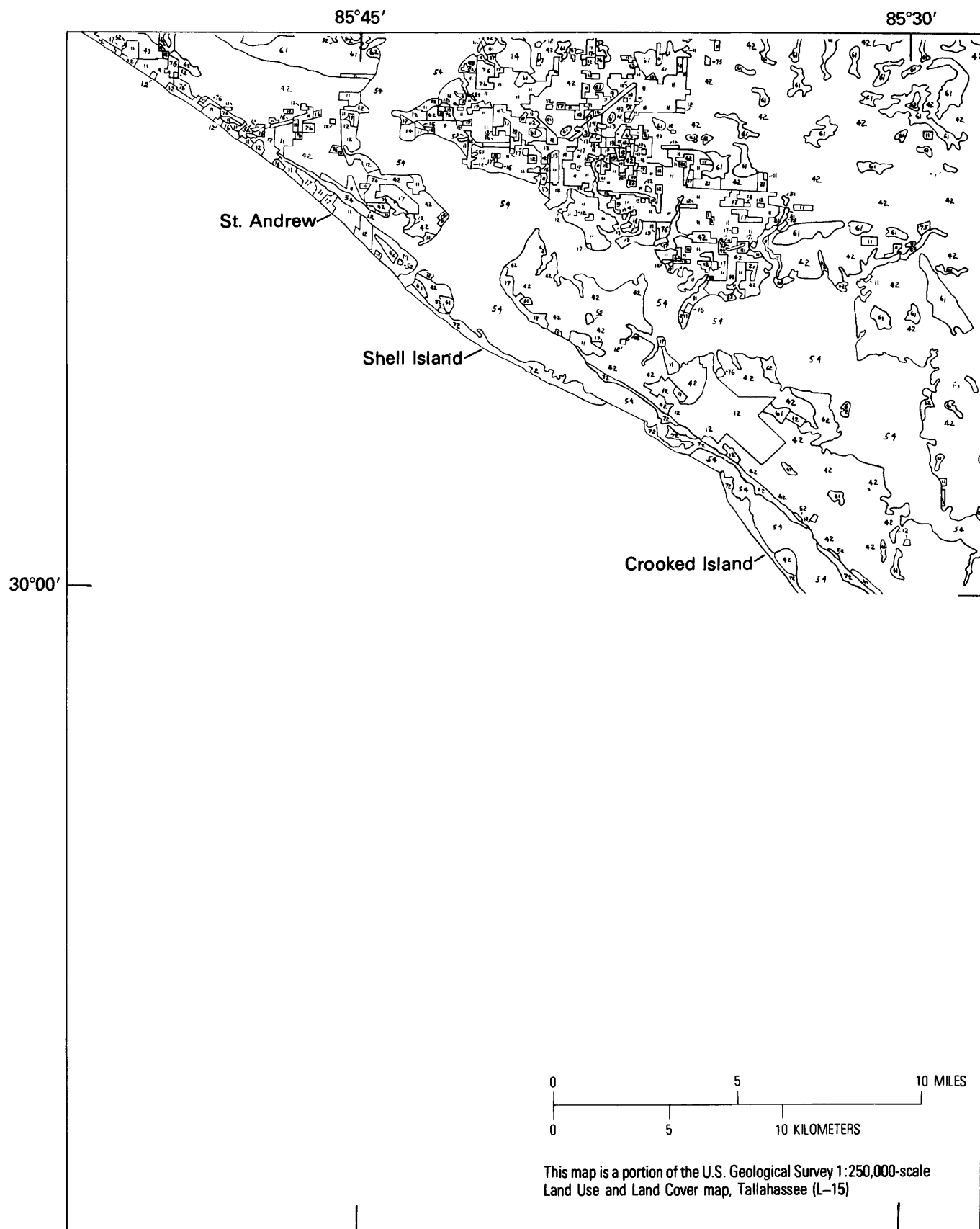


FIGURE 95. — Land use and land cover map of the coastal area near Panama City, Fla., with associated barrier islands.



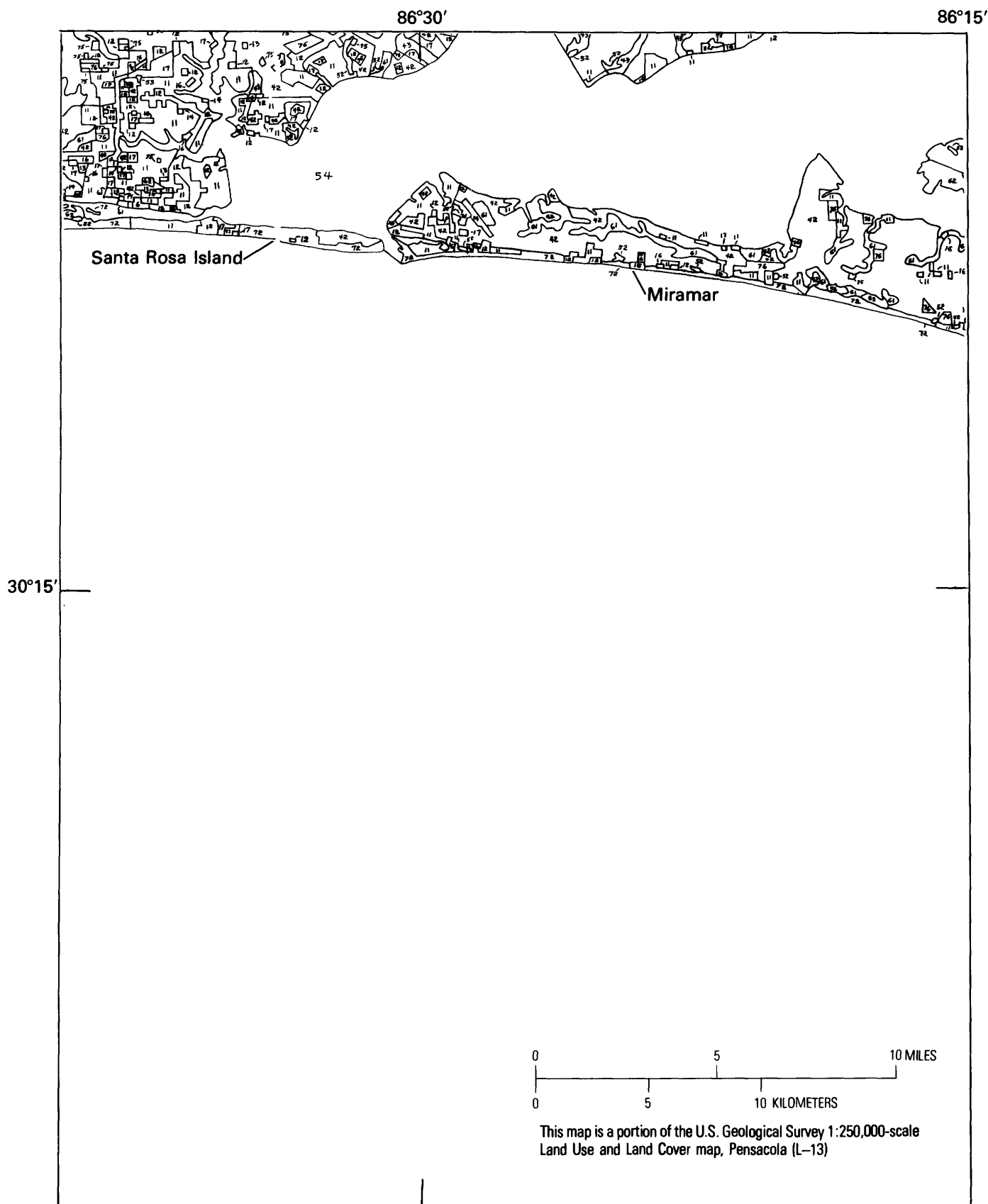


FIGURE 96. – Land use and land cover map of the coastal area near Fort Walton Beach, Fla., with associated barrier islands.

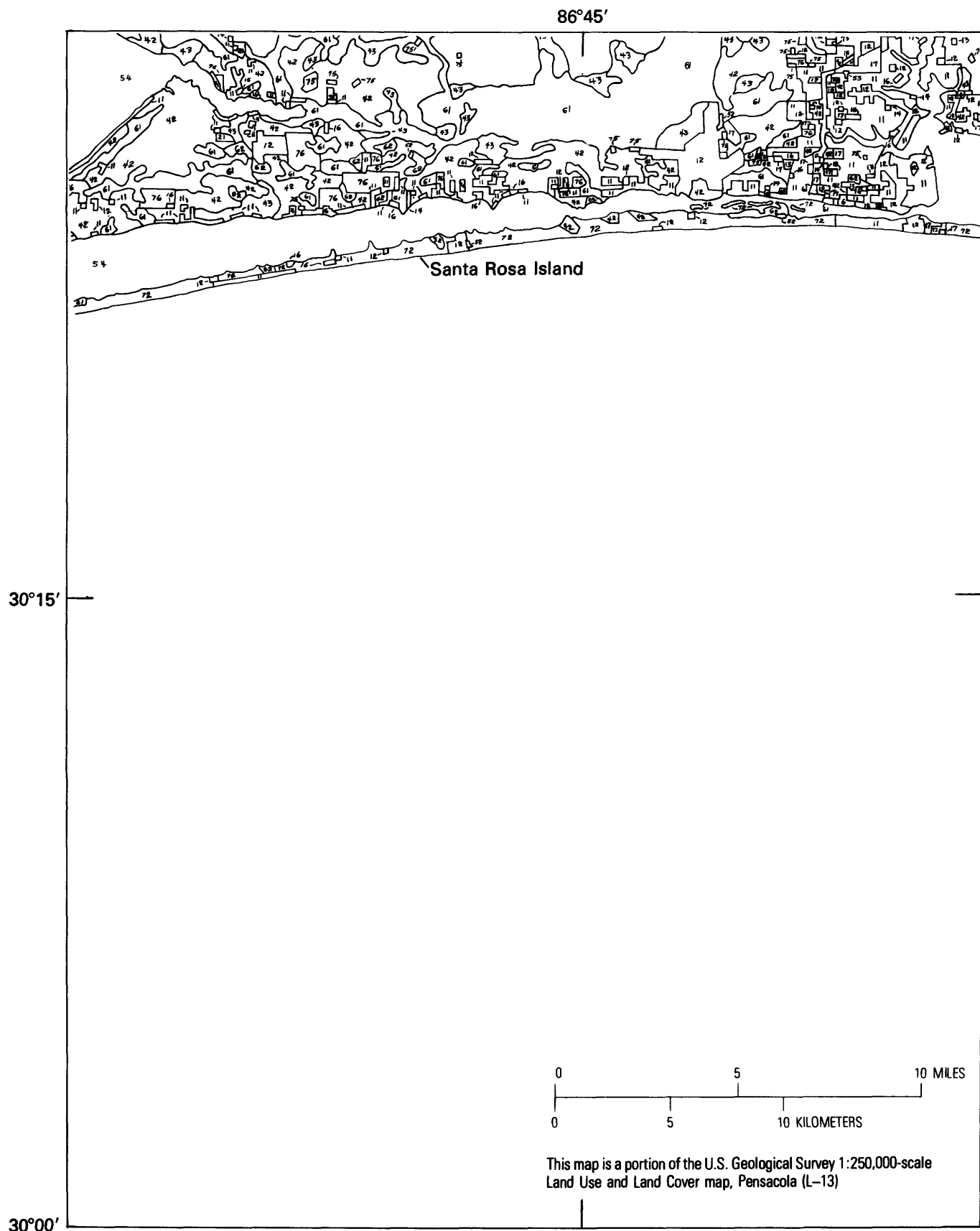


FIGURE 97. — Land use and land cover map of the coastal area near Mary Esther, Fla., with associated barrier islands.

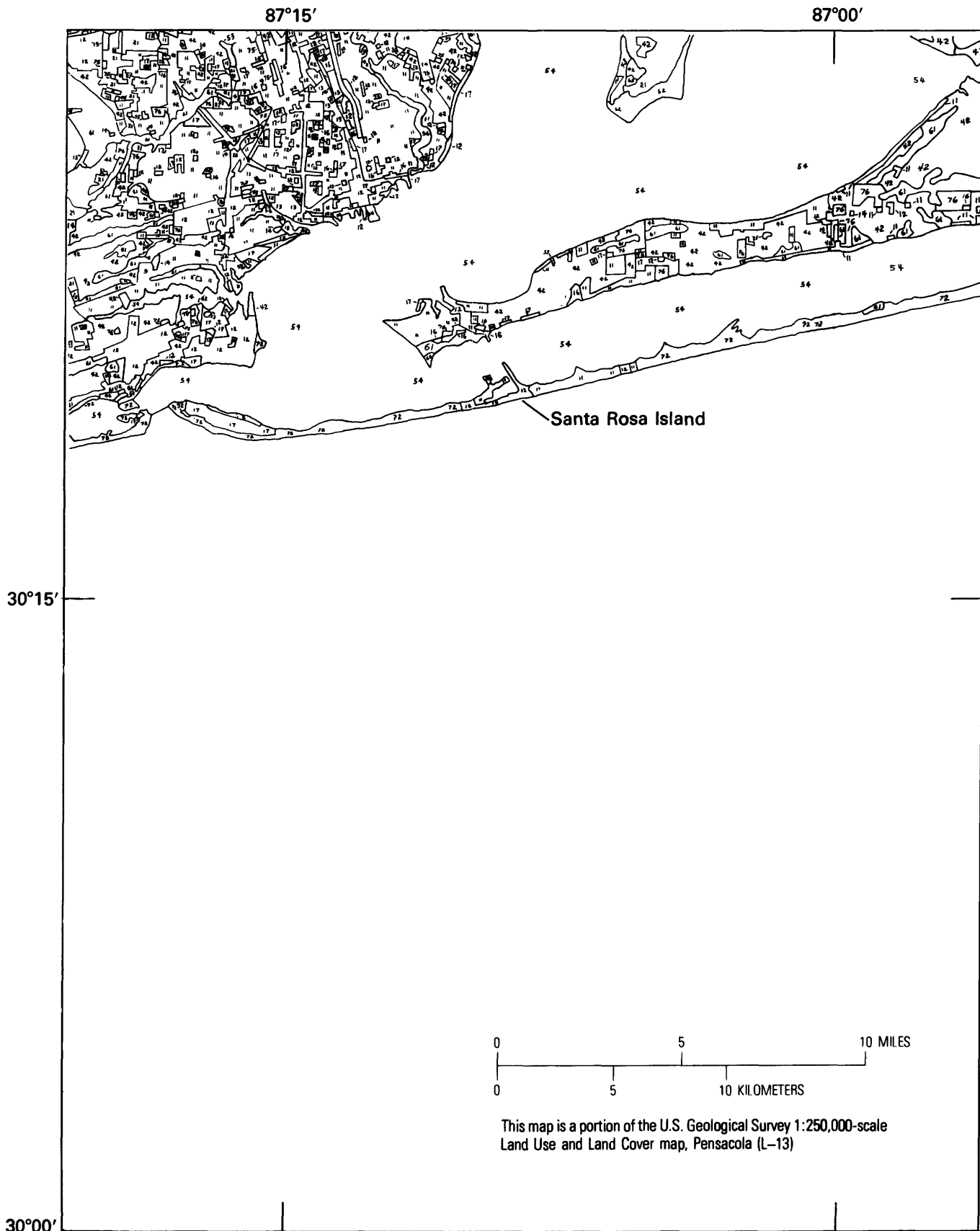


FIGURE 98. —Land use and land cover map of the coastal area near Pensacola, Fla., with associated barrier islands.

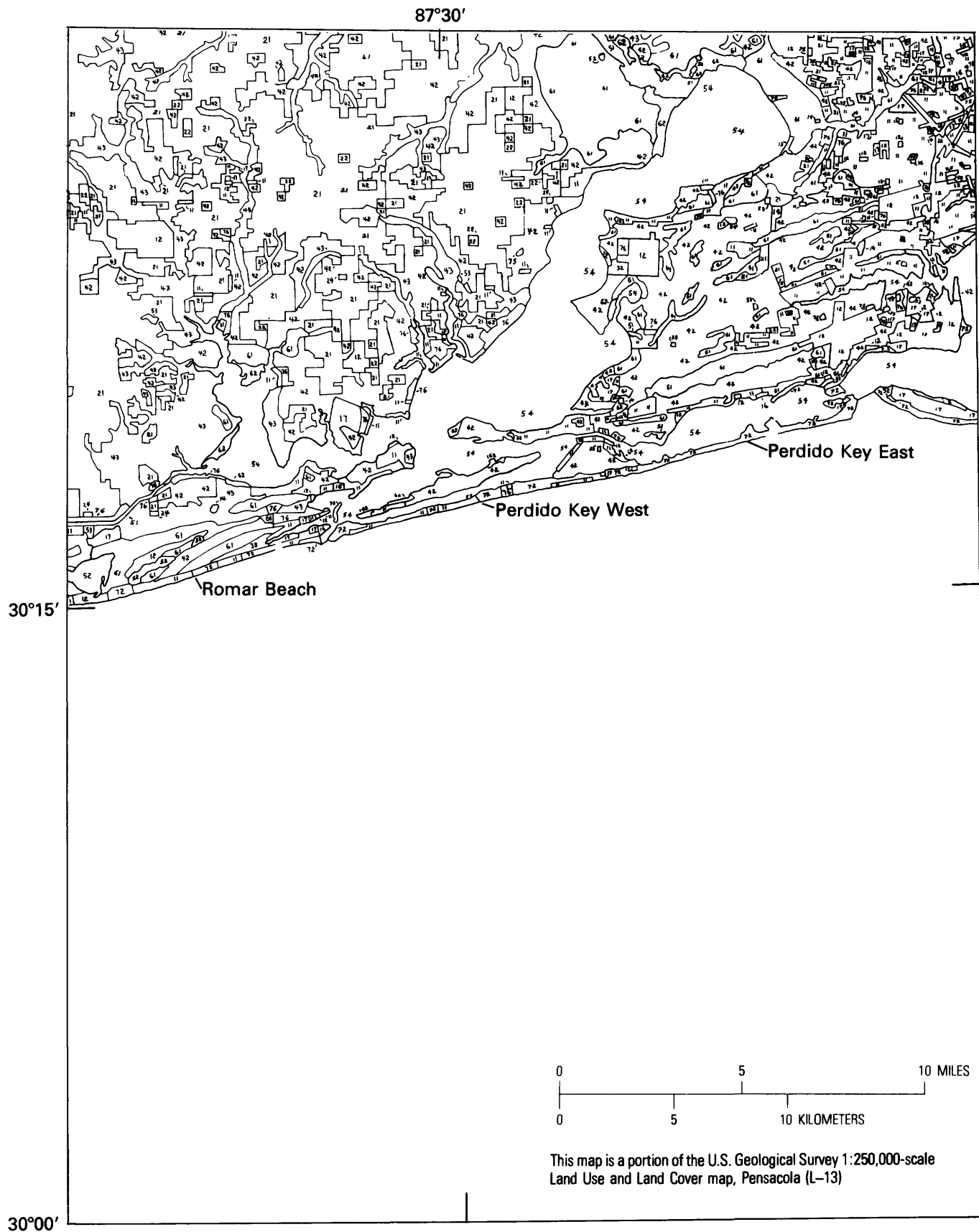


FIGURE 99. – Land use and land cover map of the coastal area near Warrington, Fla., with associated barrier islands.

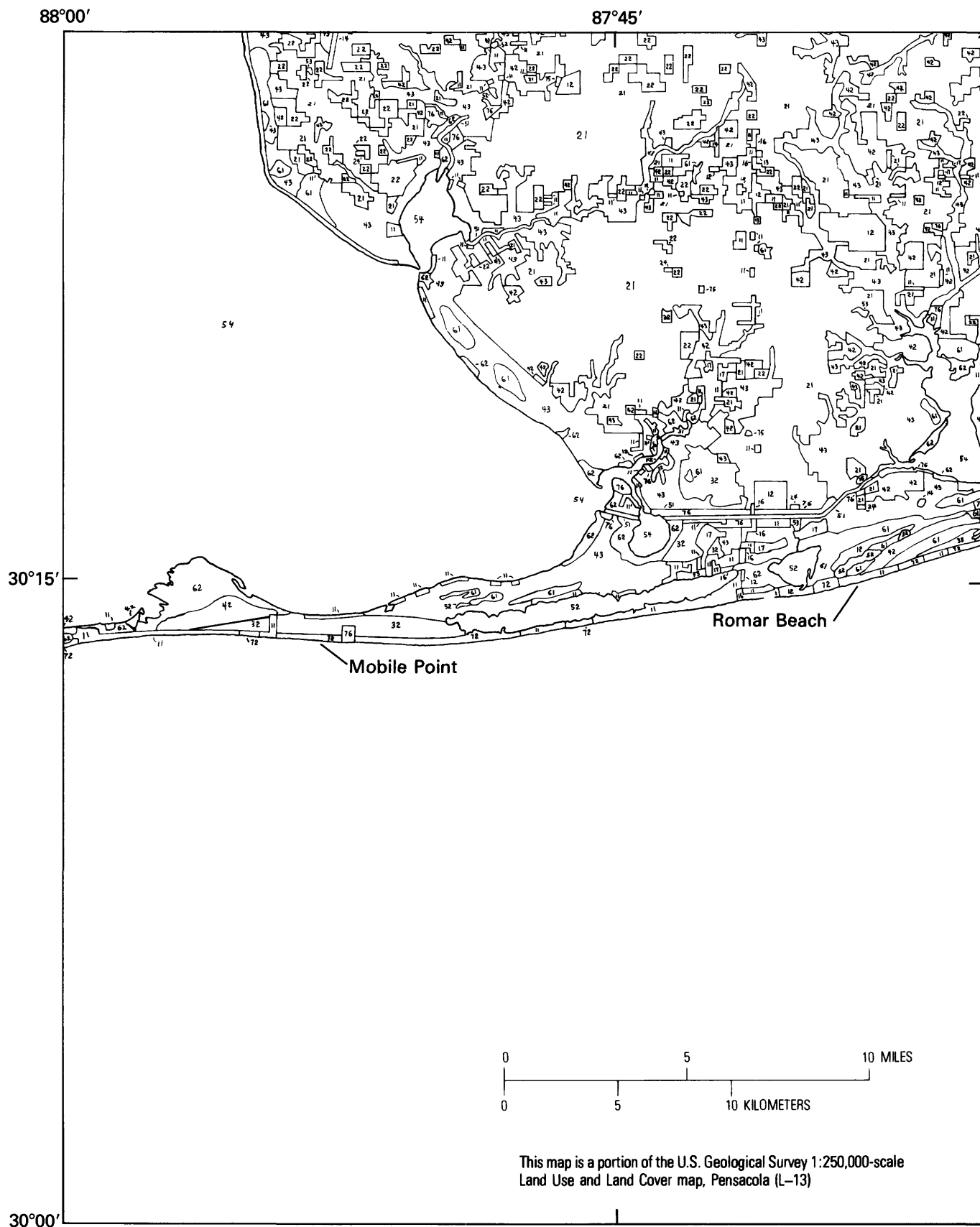


FIGURE 100. – Land use and land cover map of the coastal area near Gulf Shores, Ala., with associated barrier islands.



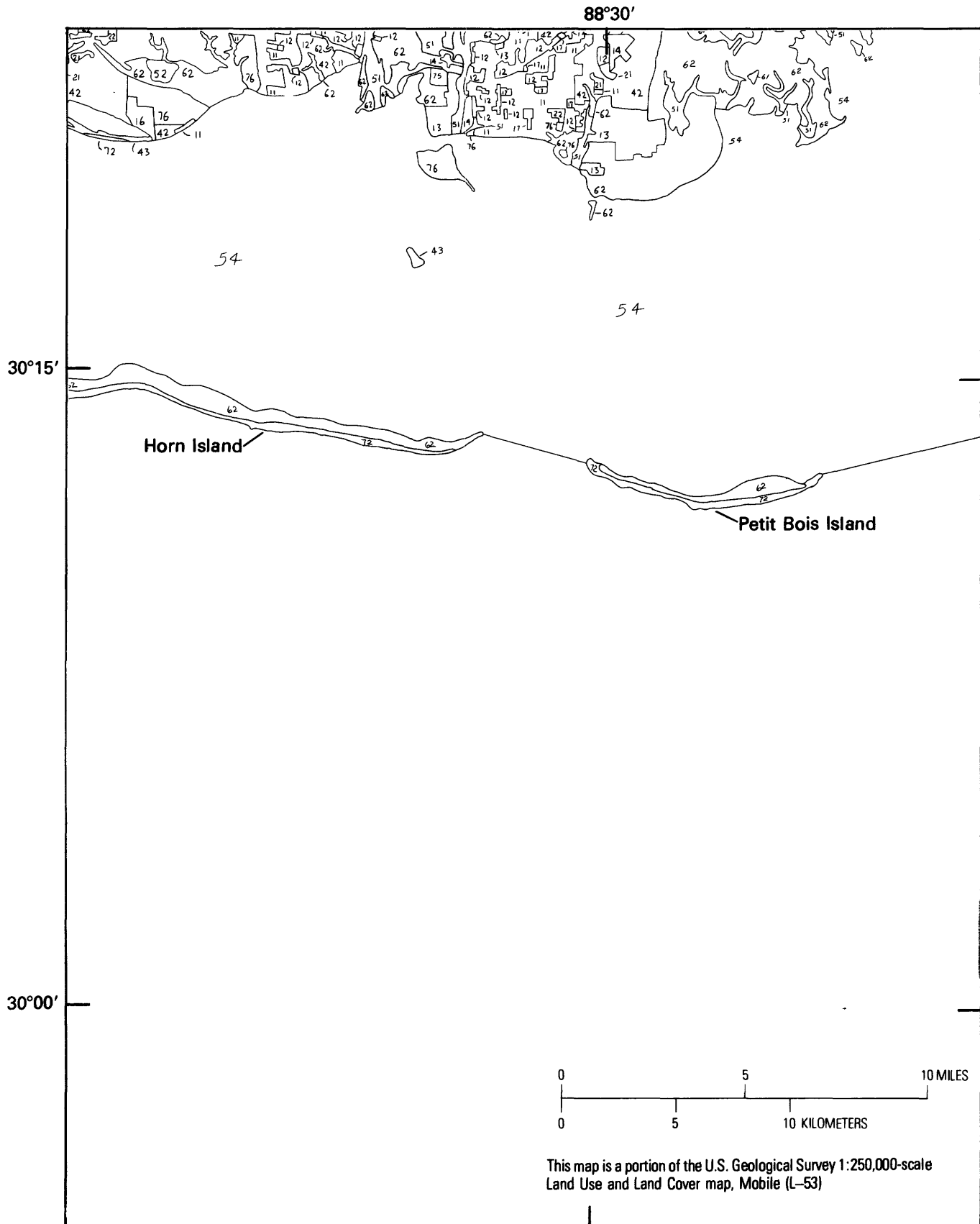


FIGURE 102. - Land use and land cover map of the coastal area near Pascagoula, Miss., with associated barrier islands.

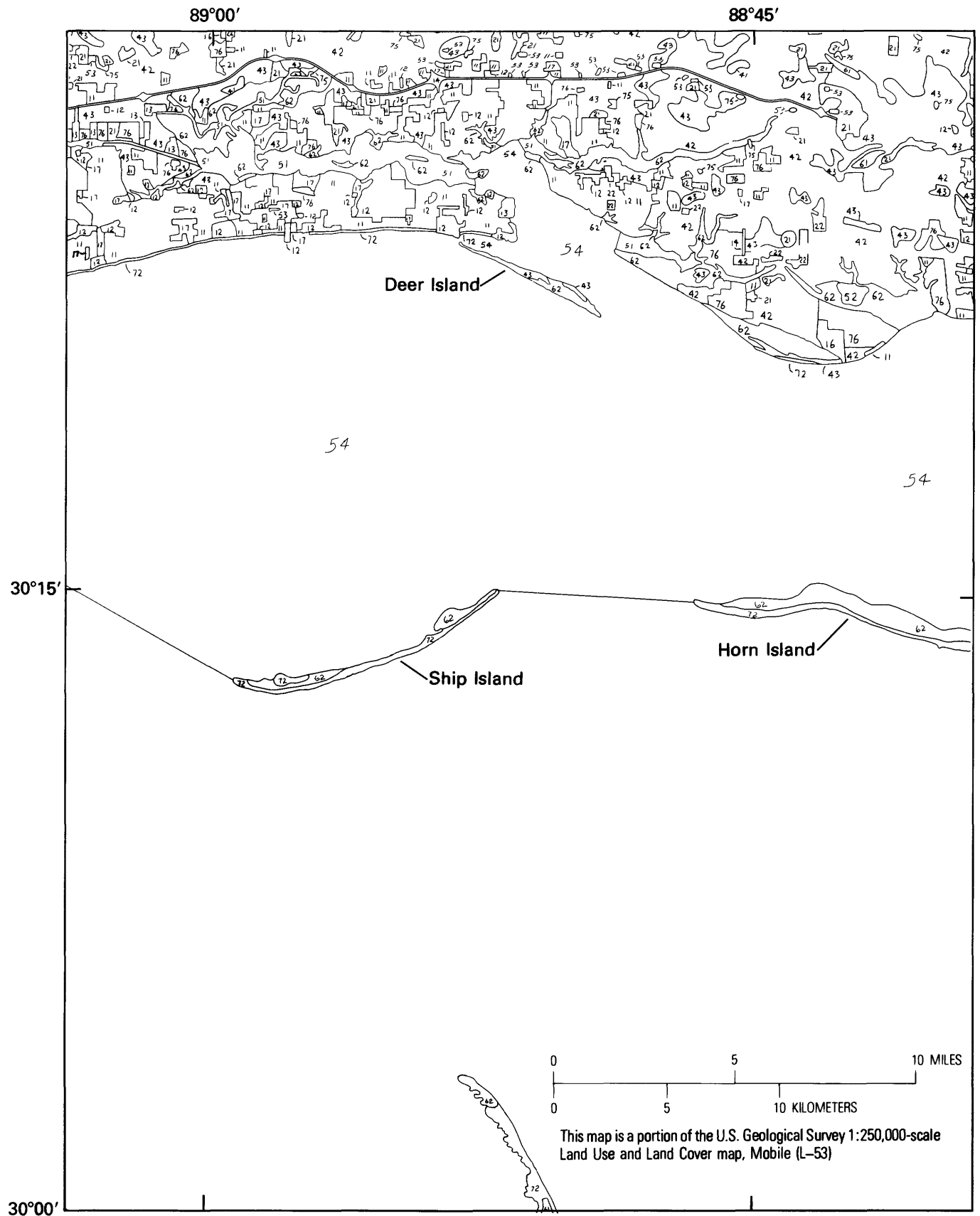


FIGURE 103.—Land use and land cover map of the coastal area near Biloxi, Miss., with associated barrier islands.



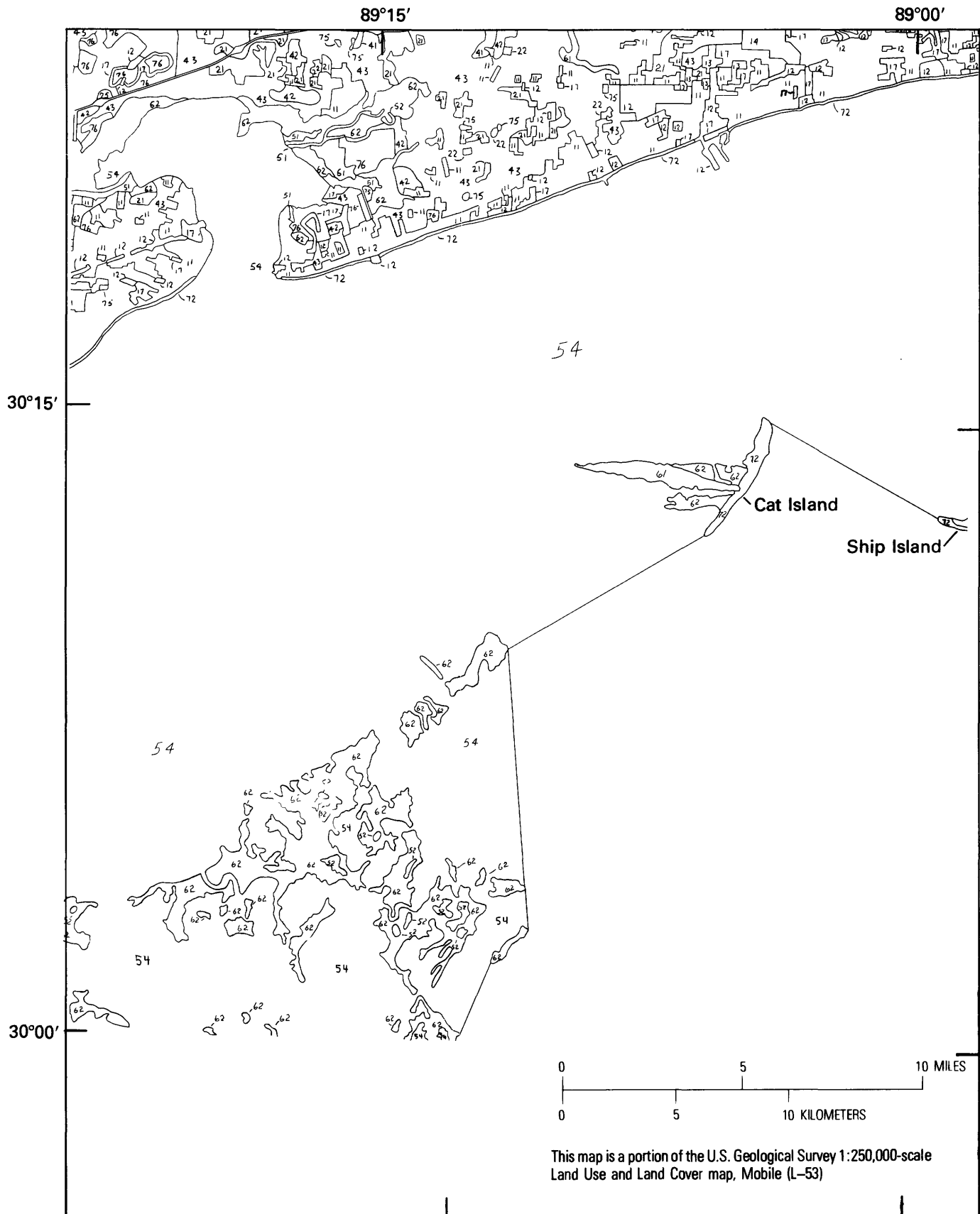


FIGURE 104. — Land use and land cover map of the coastal area near Gulfport, Miss., with associated barrier islands.

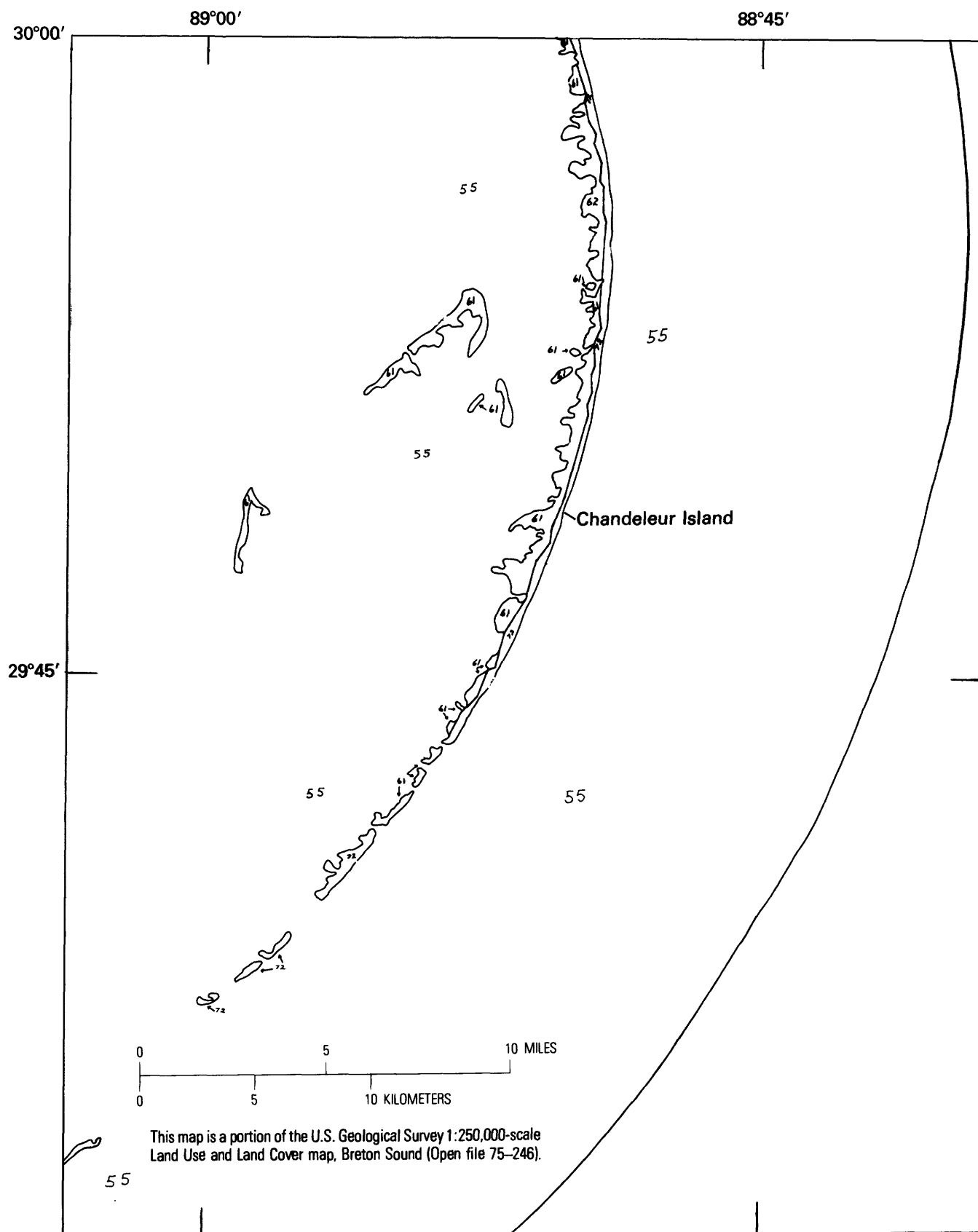


FIGURE 105.—Land use and land cover map of the coastal area near Chandeleur Islands, La., with associated barrier islands.

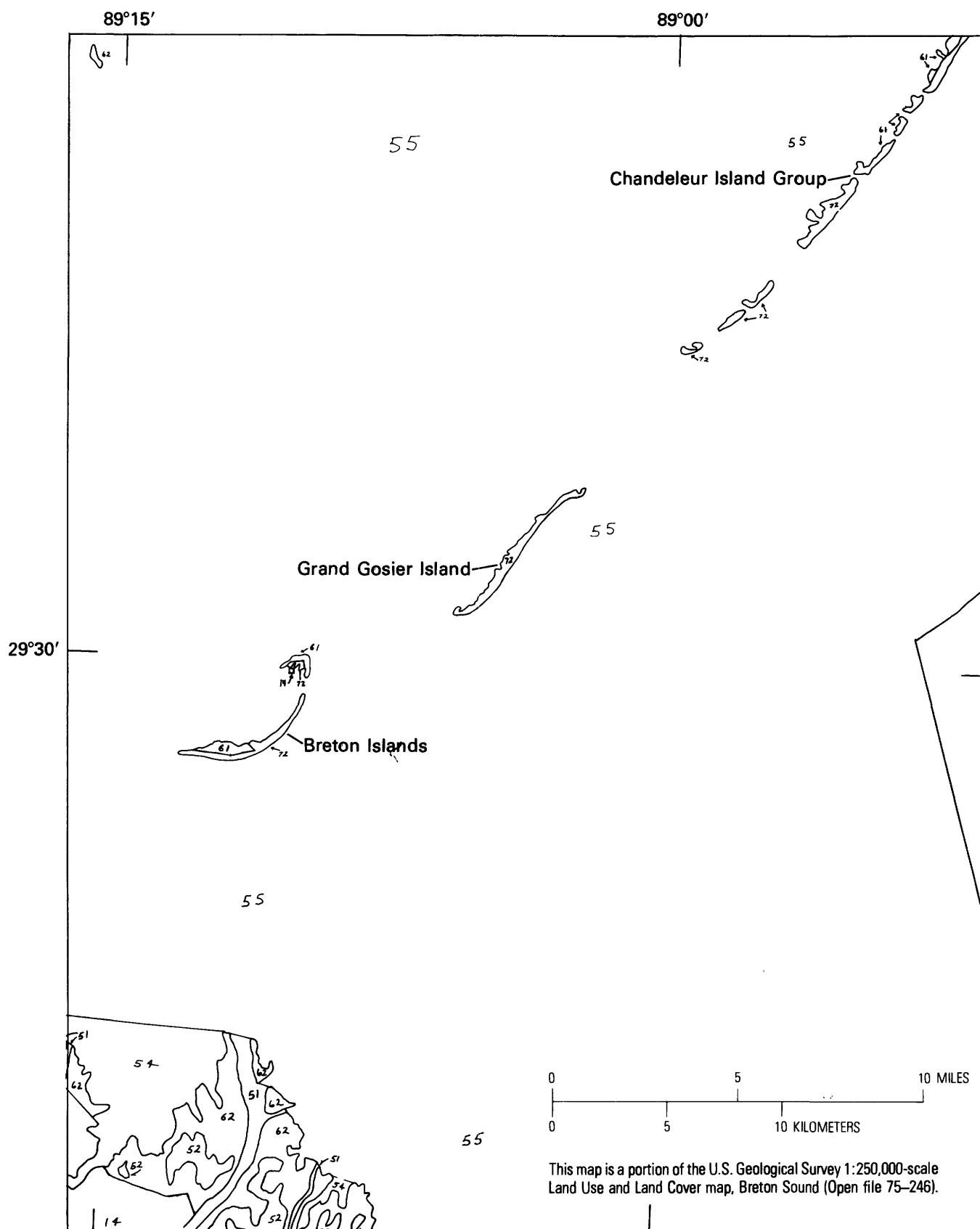


FIGURE 106. — Land use and land cover map of the coastal area near Breton Island, La., with associated barrier islands.

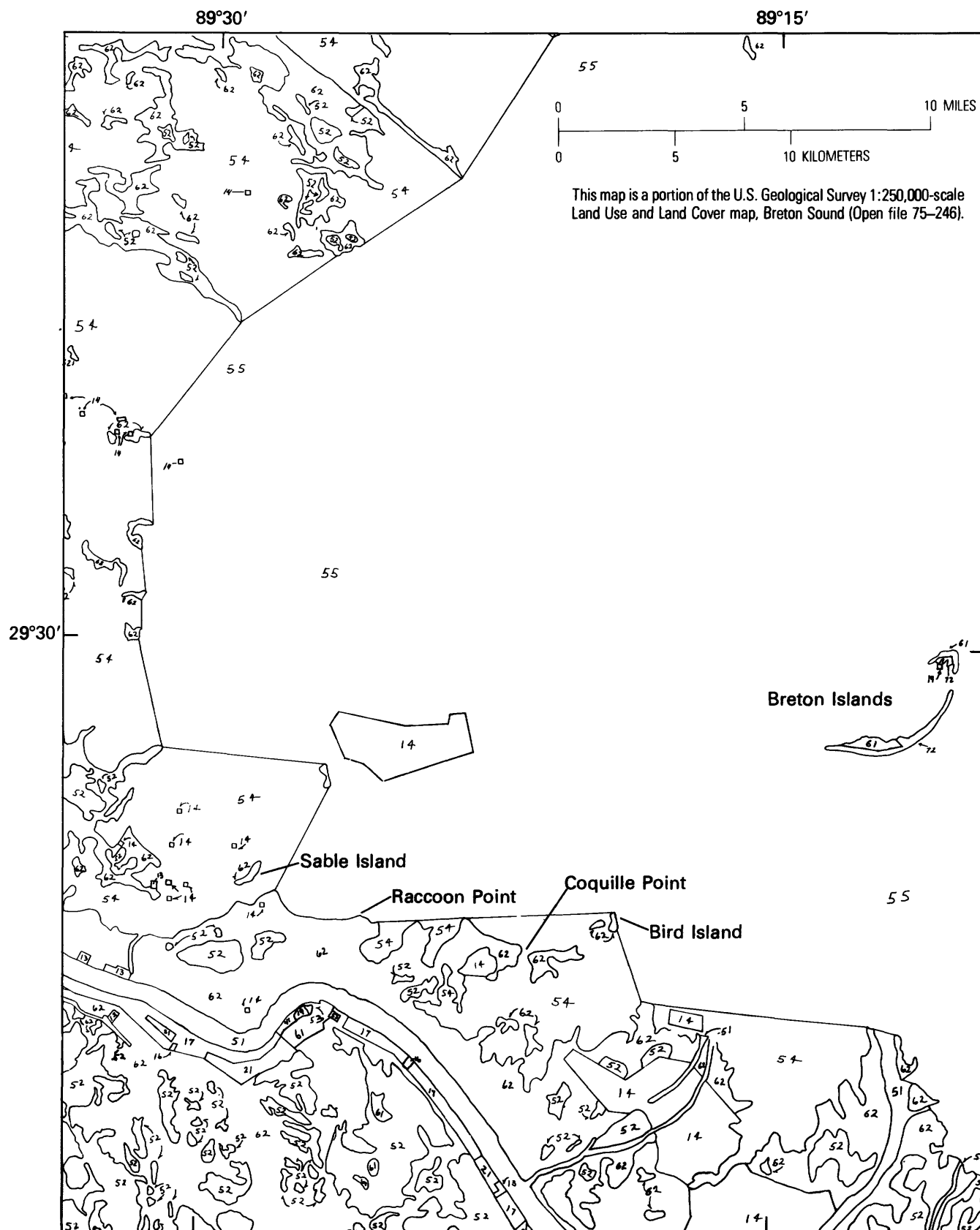


FIGURE 107.—Land use and land cover map of the coastal area near Venice, La., with associated barrier islands.

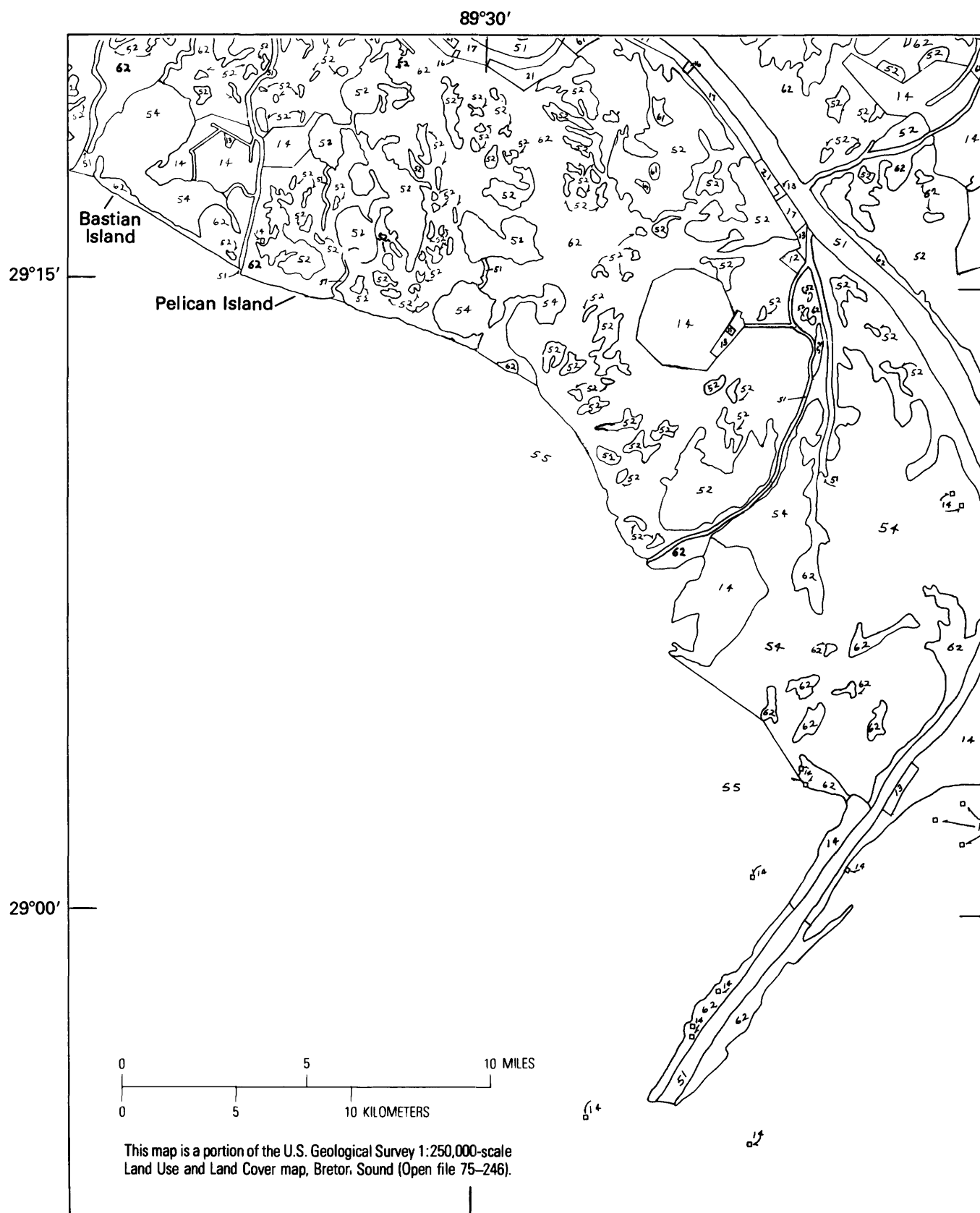


FIGURE 108.—Land use and land cover map of the coastal area near Pilottown, La., with associated barrier islands.

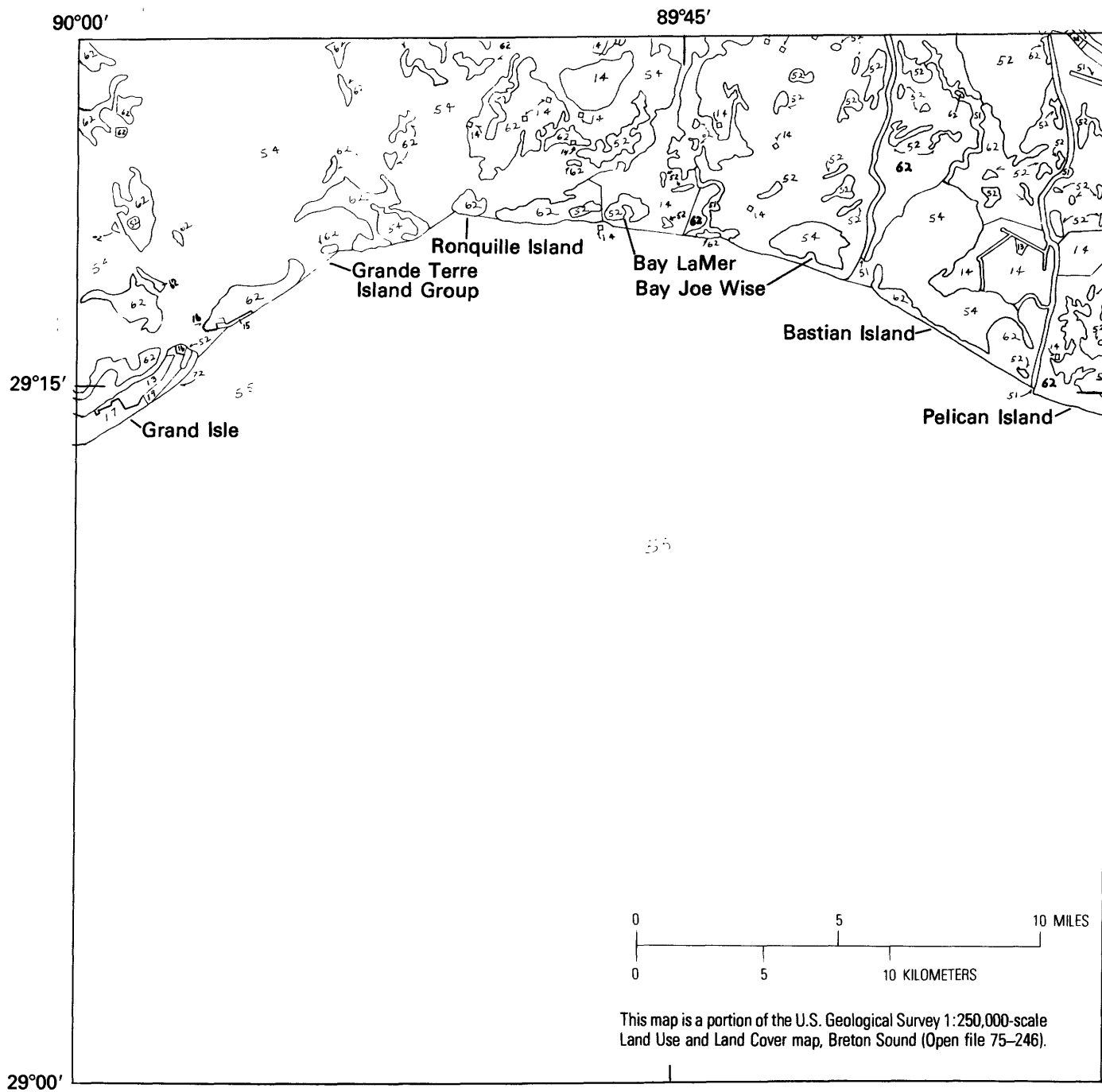


FIGURE 109.— Land use and land cover map of the coastal area near Grand Isle, La., with associated barrier islands.

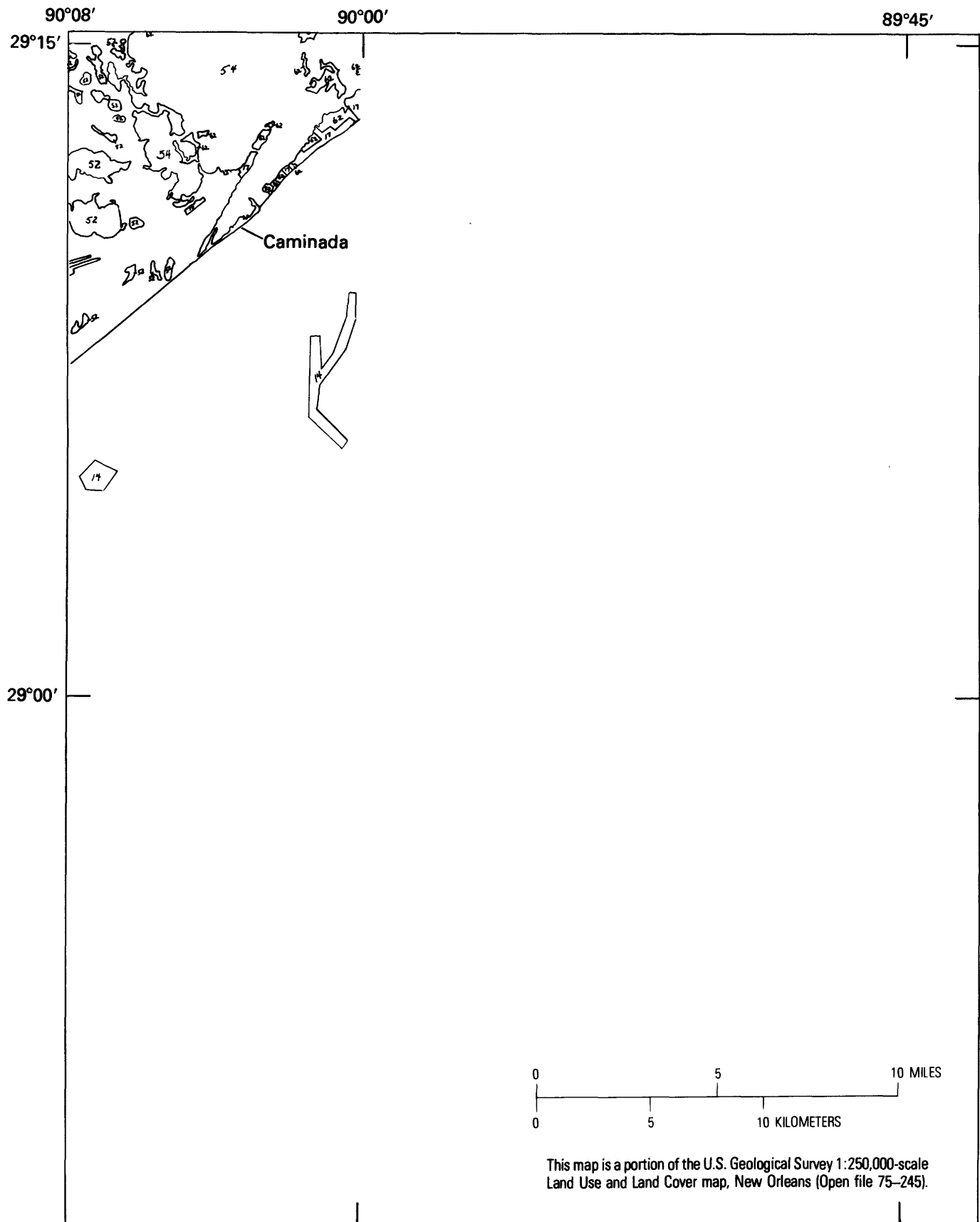


FIGURE 110. – Land use and land cover map of the coastal area near Caminada Pass, La., with associated barrier islands.

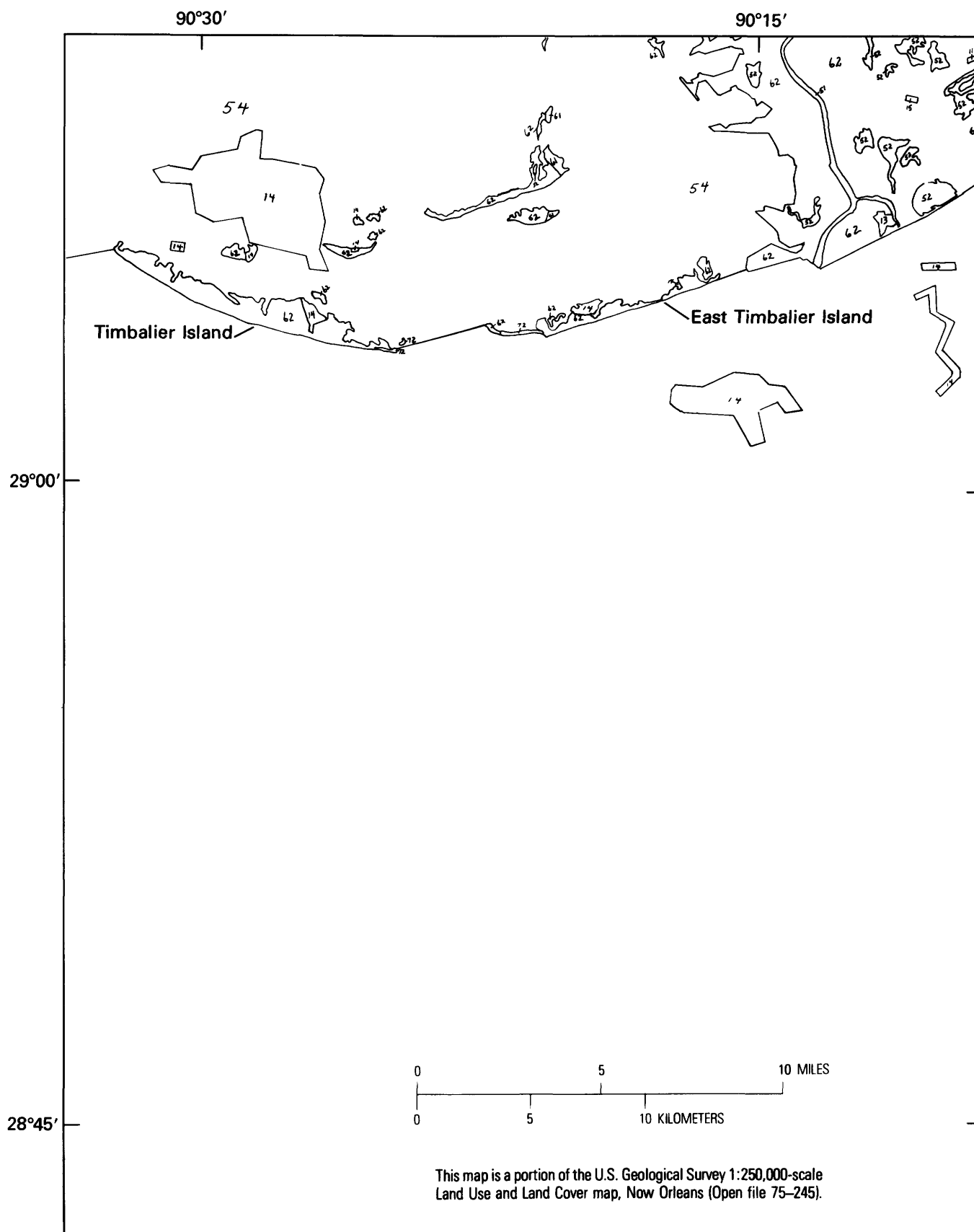


FIGURE 111. – Land use and land cover map of the coastal area near Leeville, La., with associated barrier islands.



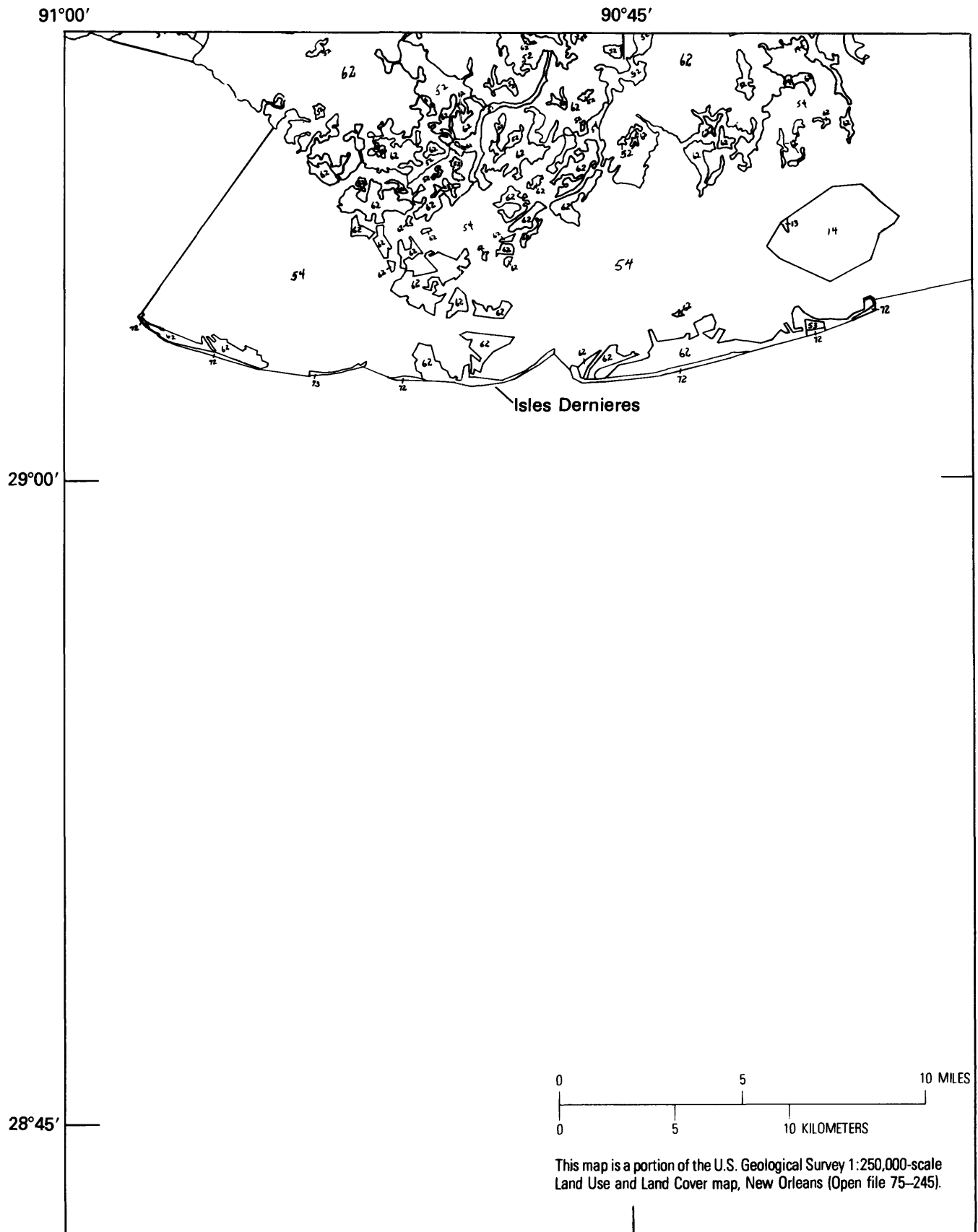


FIGURE 112. — Land use and land cover map of the coastal area near Isles Dernieres, La., with associated barrier islands.

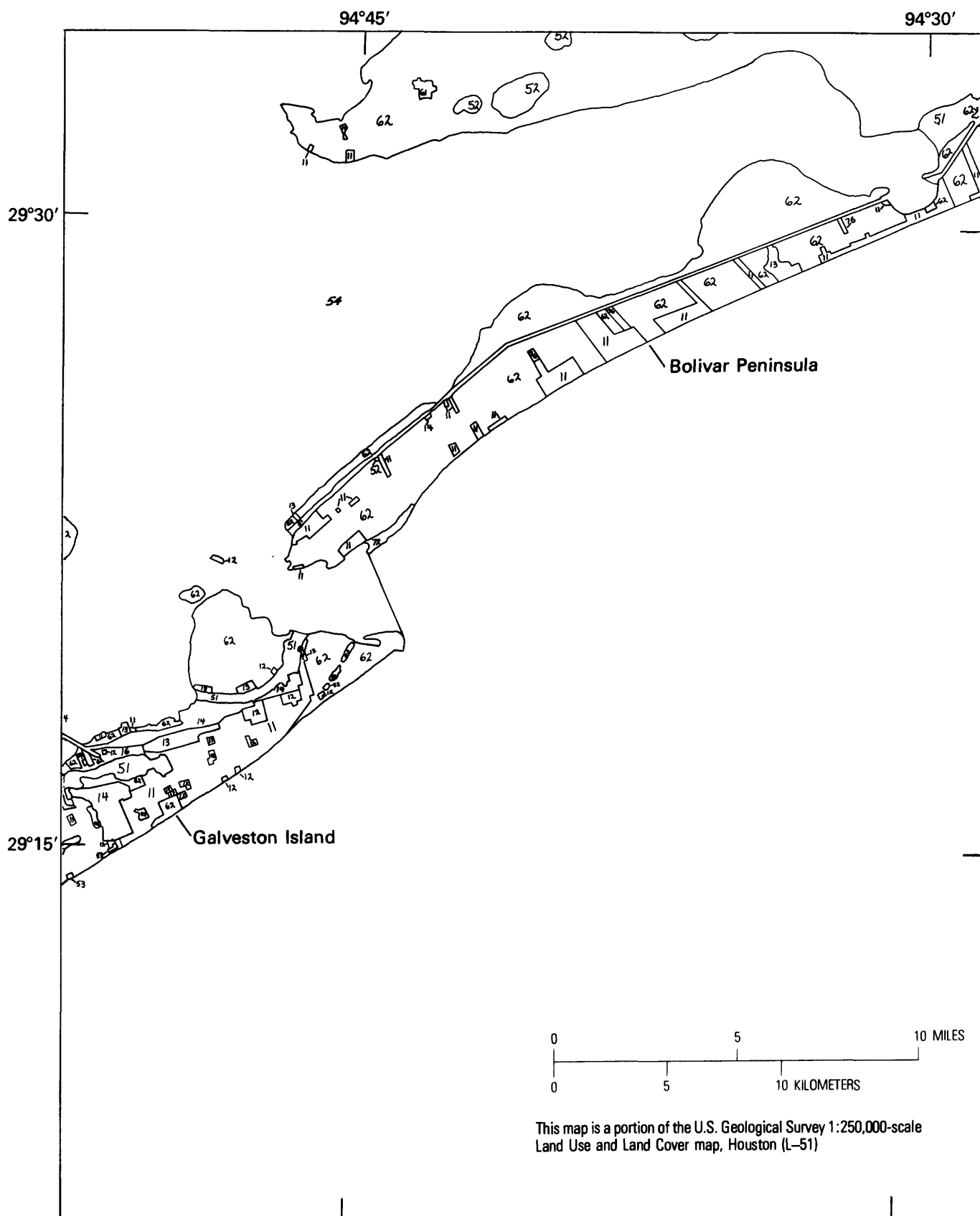


FIGURE 113.—Land use and land cover map of the coastal area near Galveston Island, Tex., with associated barrier islands.

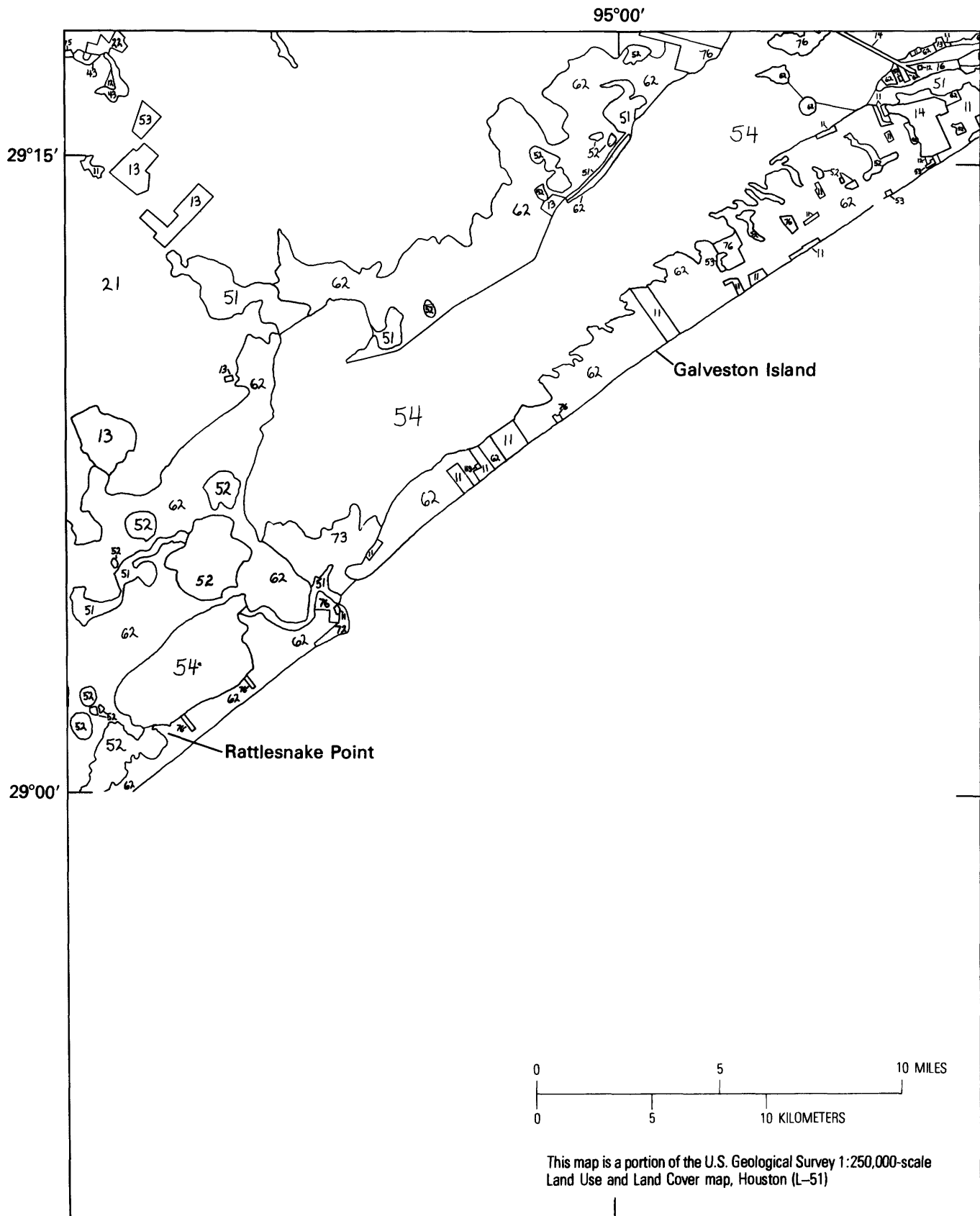


FIGURE 114.—Land use and land cover map of the coastal area near Jamaica Beach, Tex., with associated barrier islands.

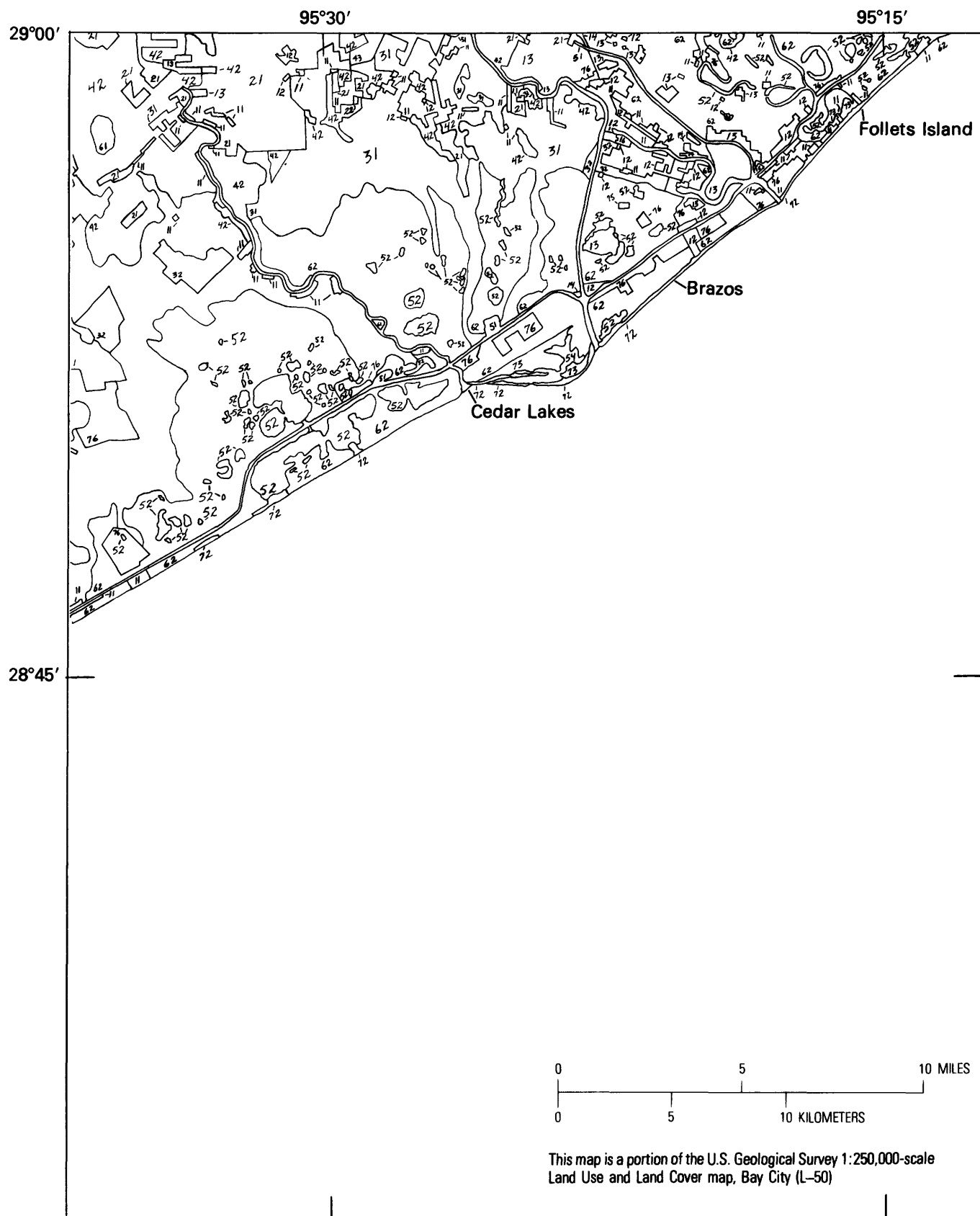


FIGURE 115. – Land use and land cover map of the coastal area near Freeport, Tex., with associated barrier islands.

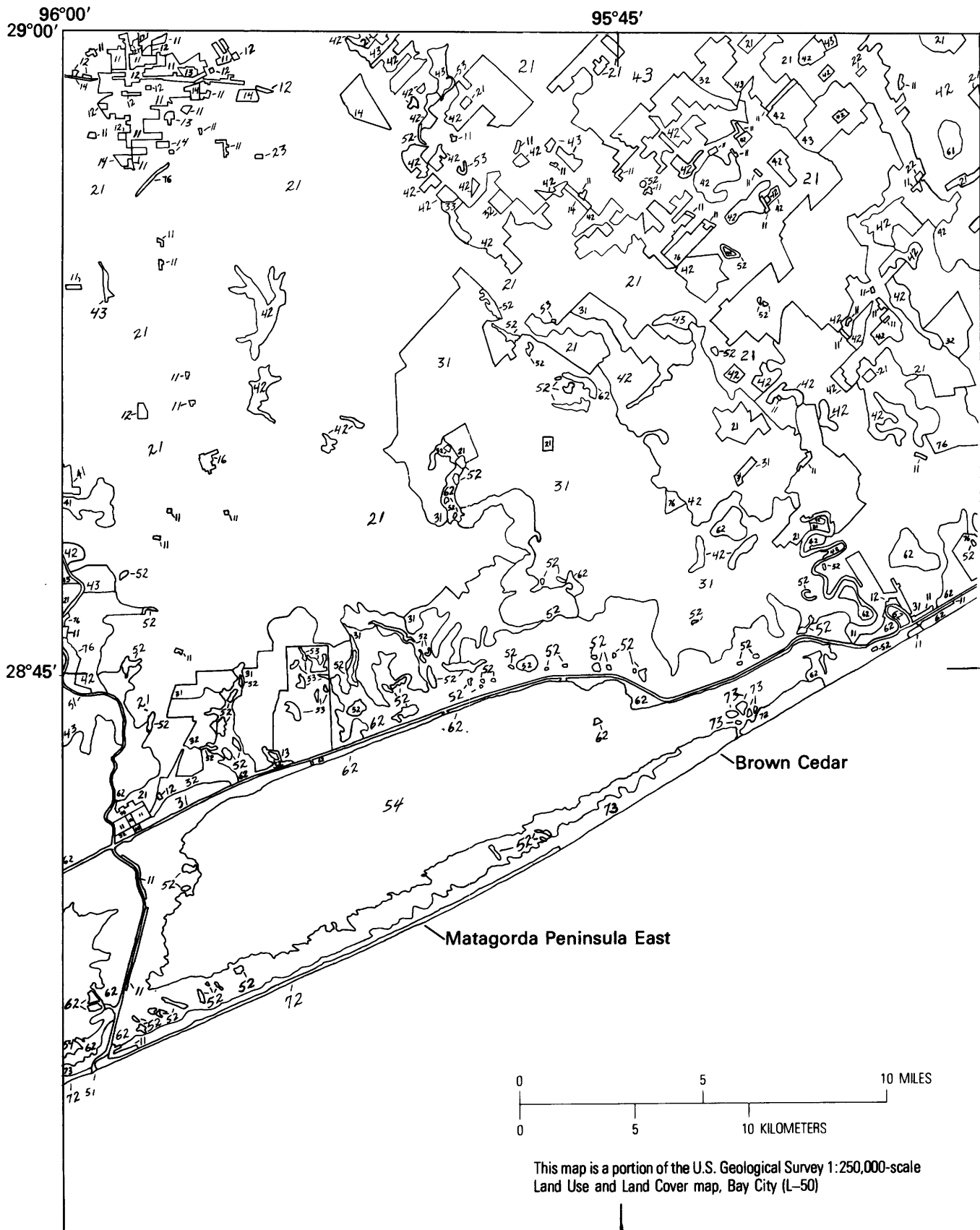


FIGURE 116. — Land use and land cover map of the coastal area near Matagorda, Tex., with associated barrier islands.

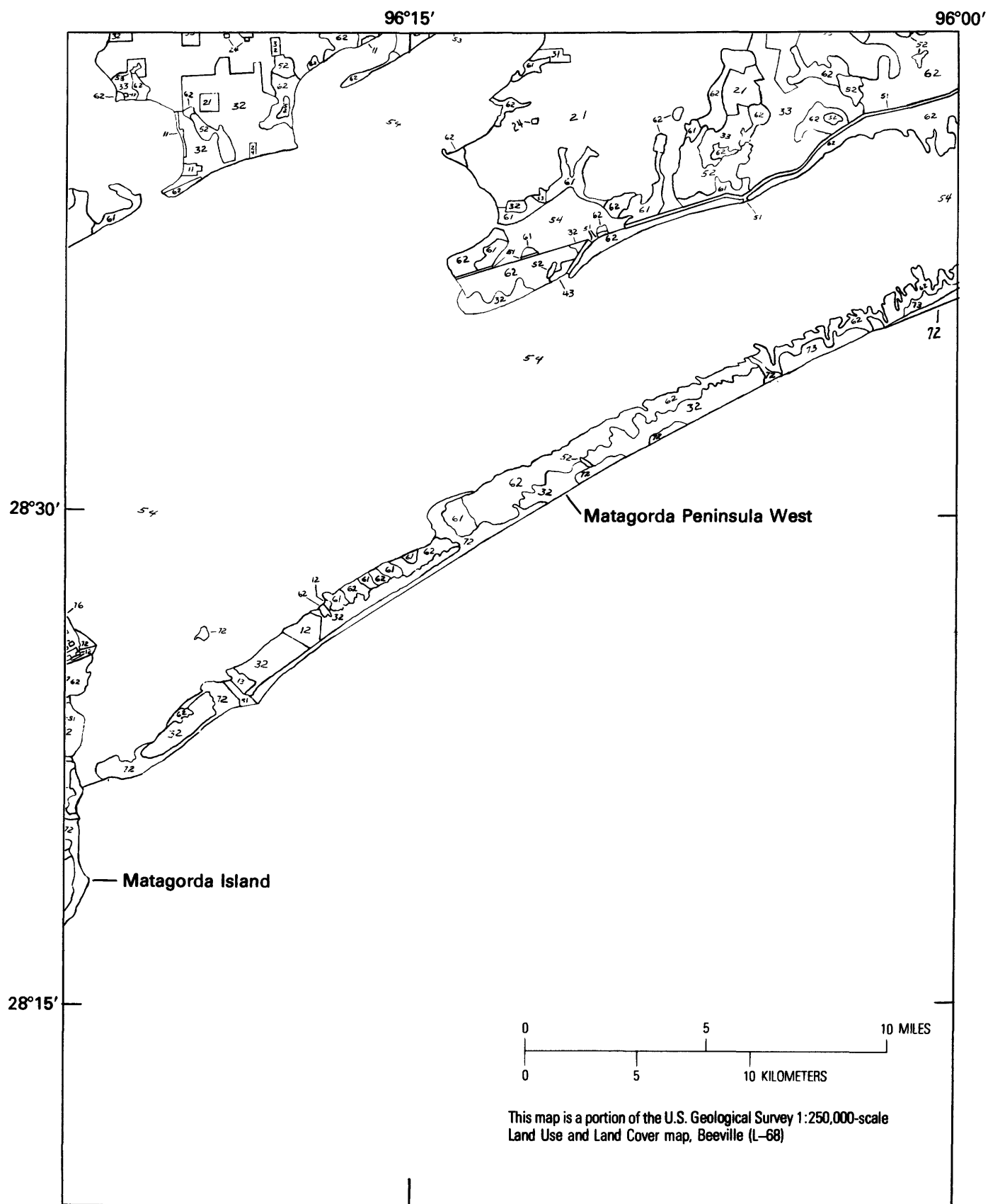


FIGURE 117. – Land use and land cover map of the coastal area near Palacios, Tex., with associated barrier islands.

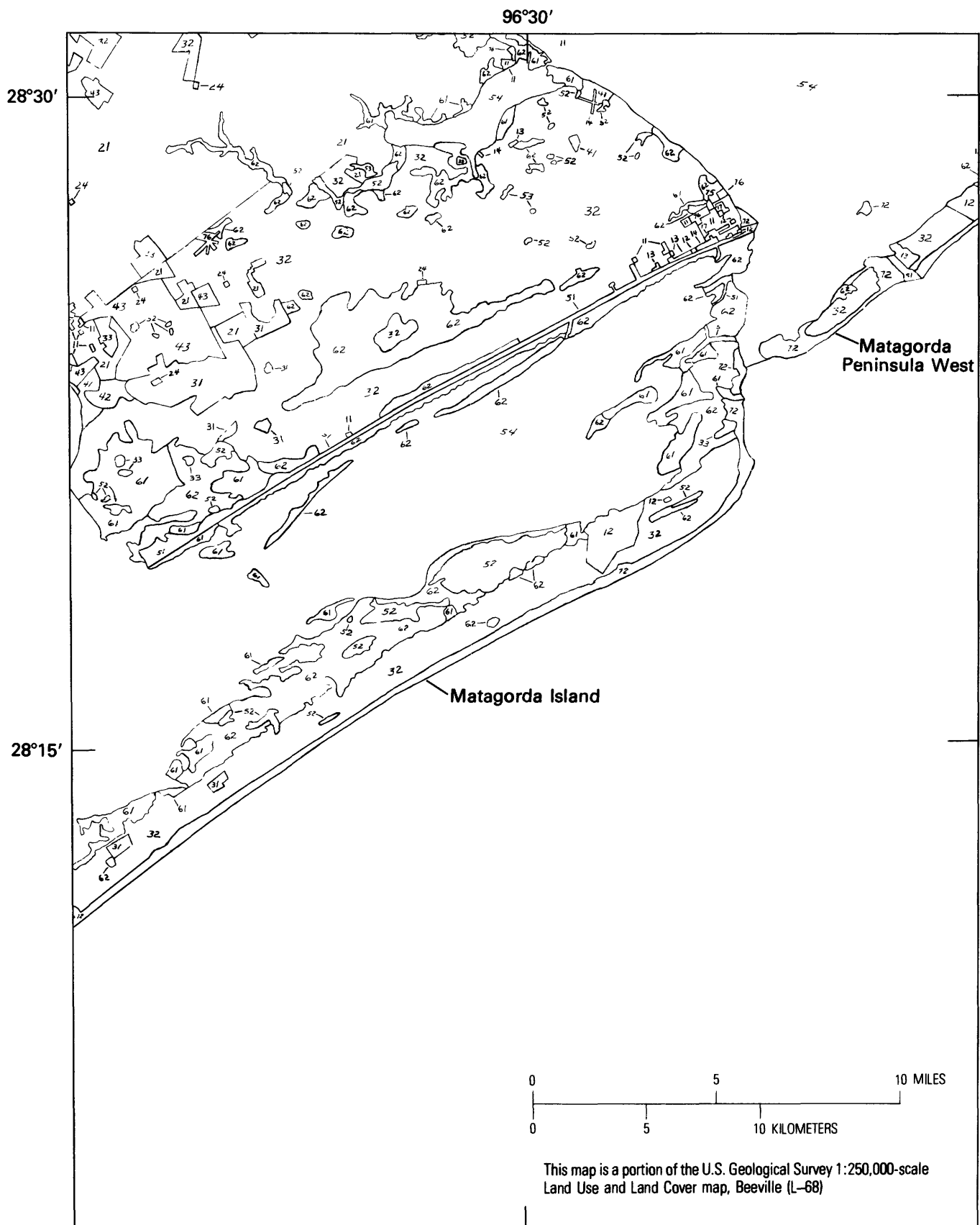


FIGURE 118. – Land use and land cover map of the coastal area near Port O'Connor, Tex., with associated barrier islands.

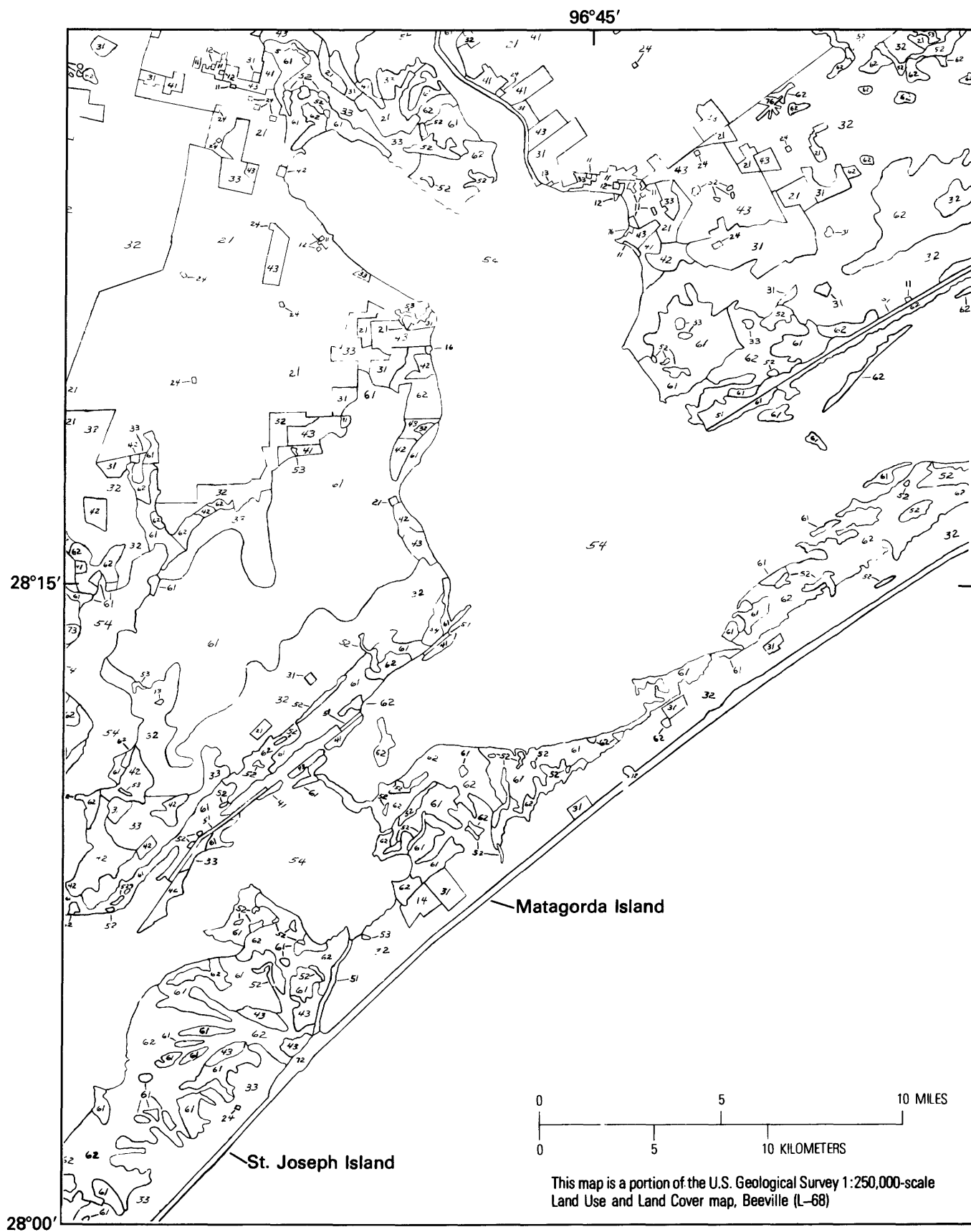


FIGURE 119.—Land use and land cover map of the coastal area near Austwell, Tex., with associated barrier islands.



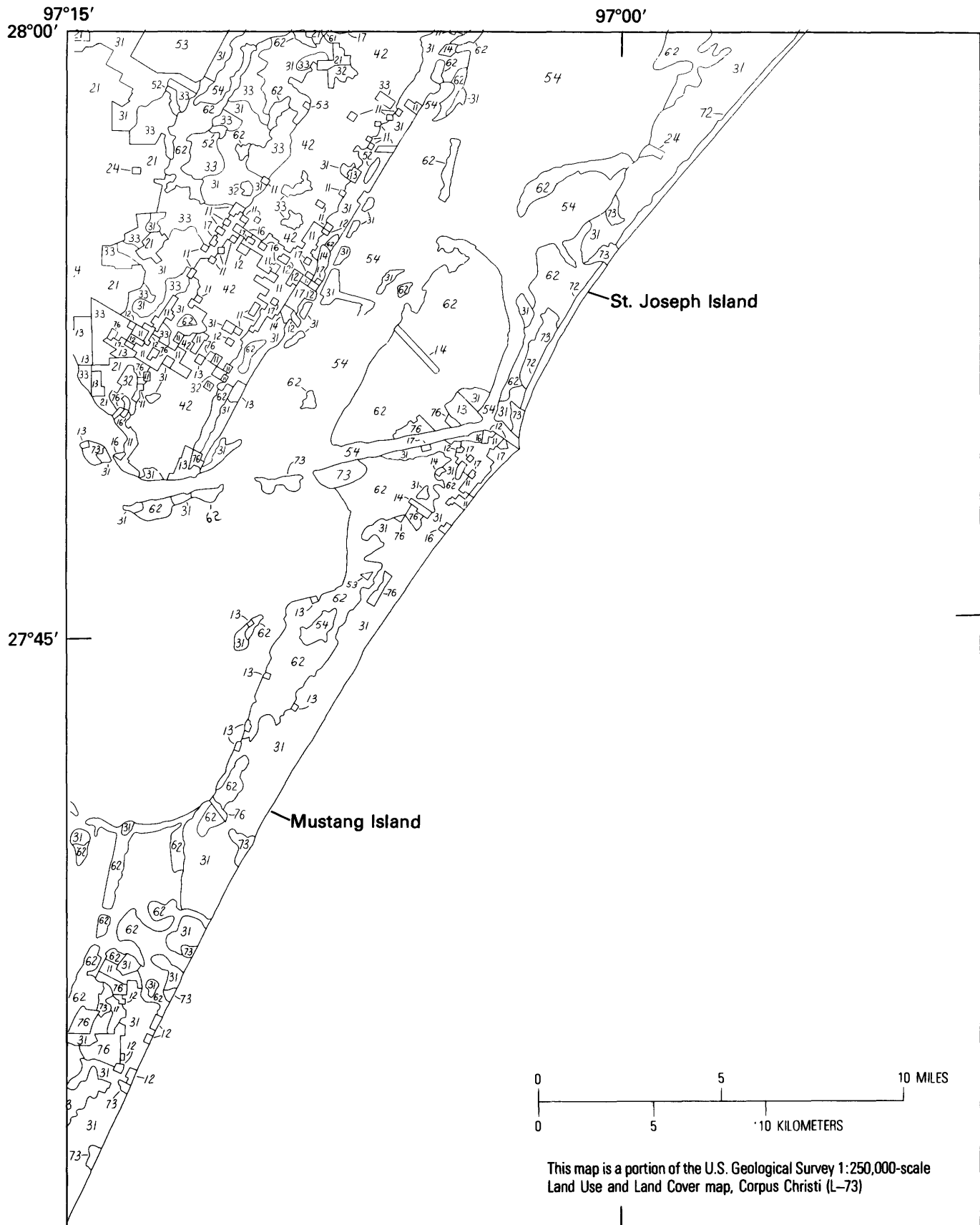


FIGURE 120. – Land use and land cover map of the coastal area near Corpus Christi, Tex., with associated barrier islands.



FIGURE 121. – Land use and land cover map of the coastal area near Laguna Vista, Tex., with associated barrier islands.

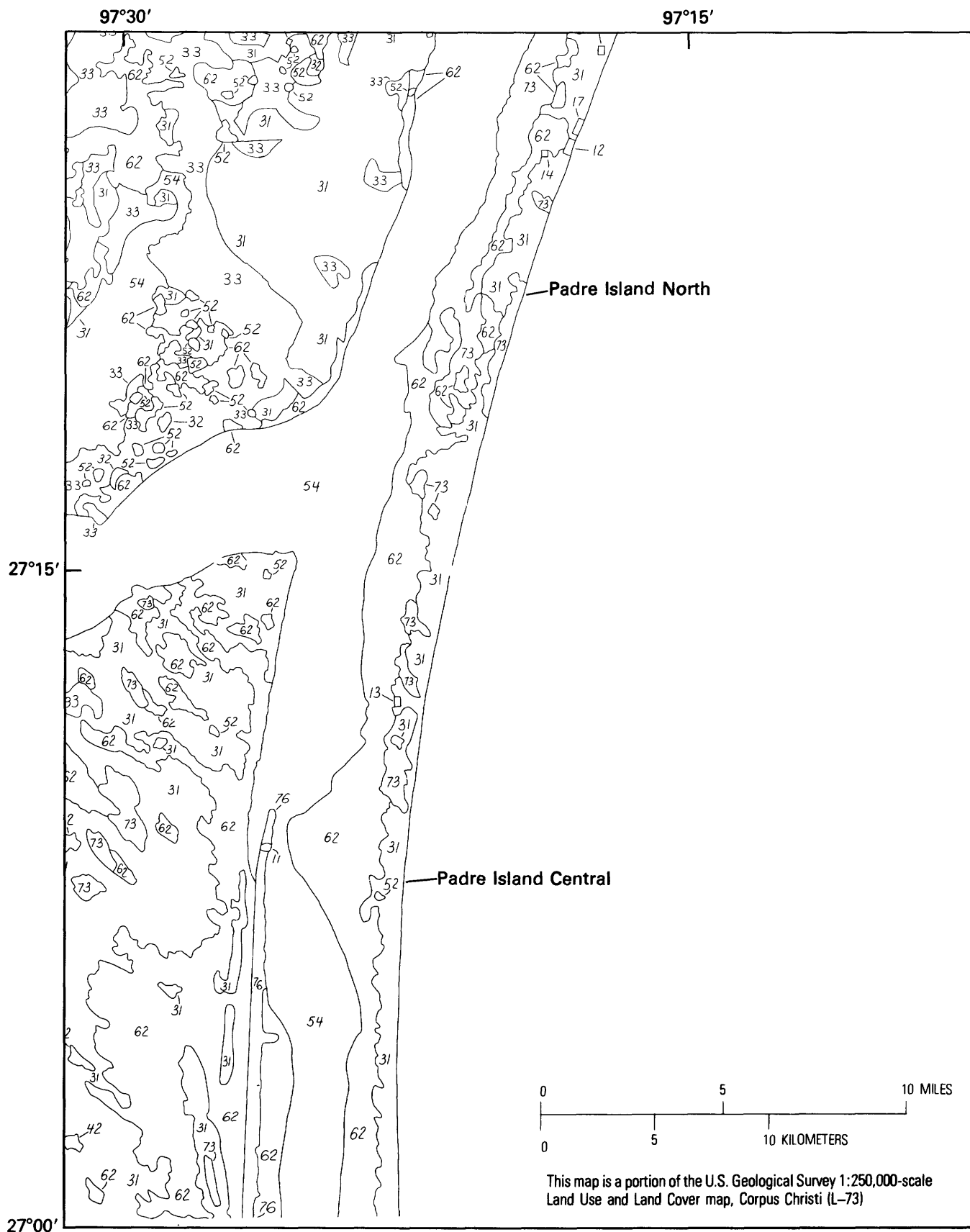


FIGURE 122. – Land use and land cover map of the coastal area near Griffins Point, Tex., with associated barrier islands.

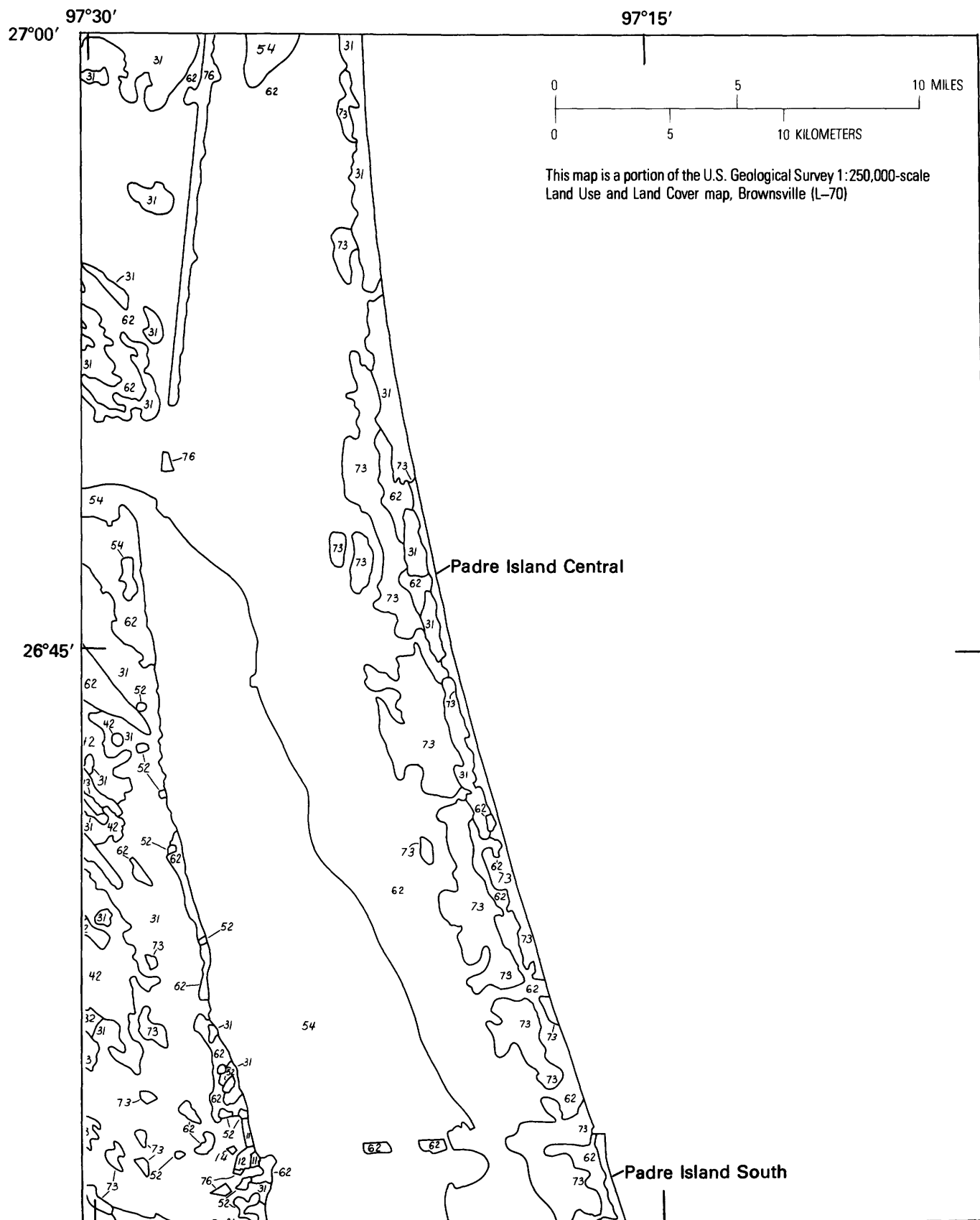


FIGURE 123. – Land use and land cover map of the coastal area near Lopena, Tex., with associated barrier islands.

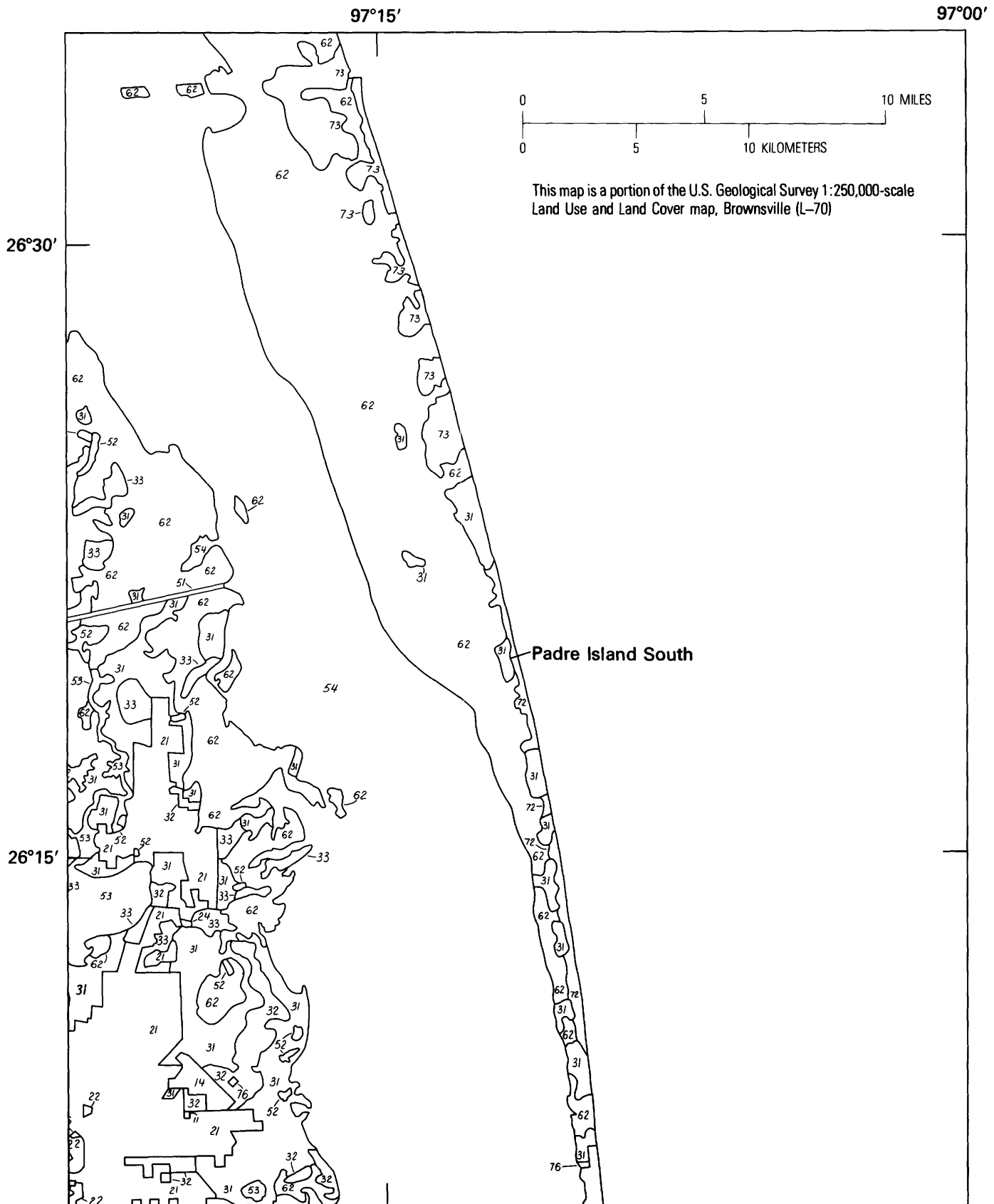


FIGURE 124.—Land use and land cover map of the coastal area near Padre Island South, Tex., with associated barrier islands.

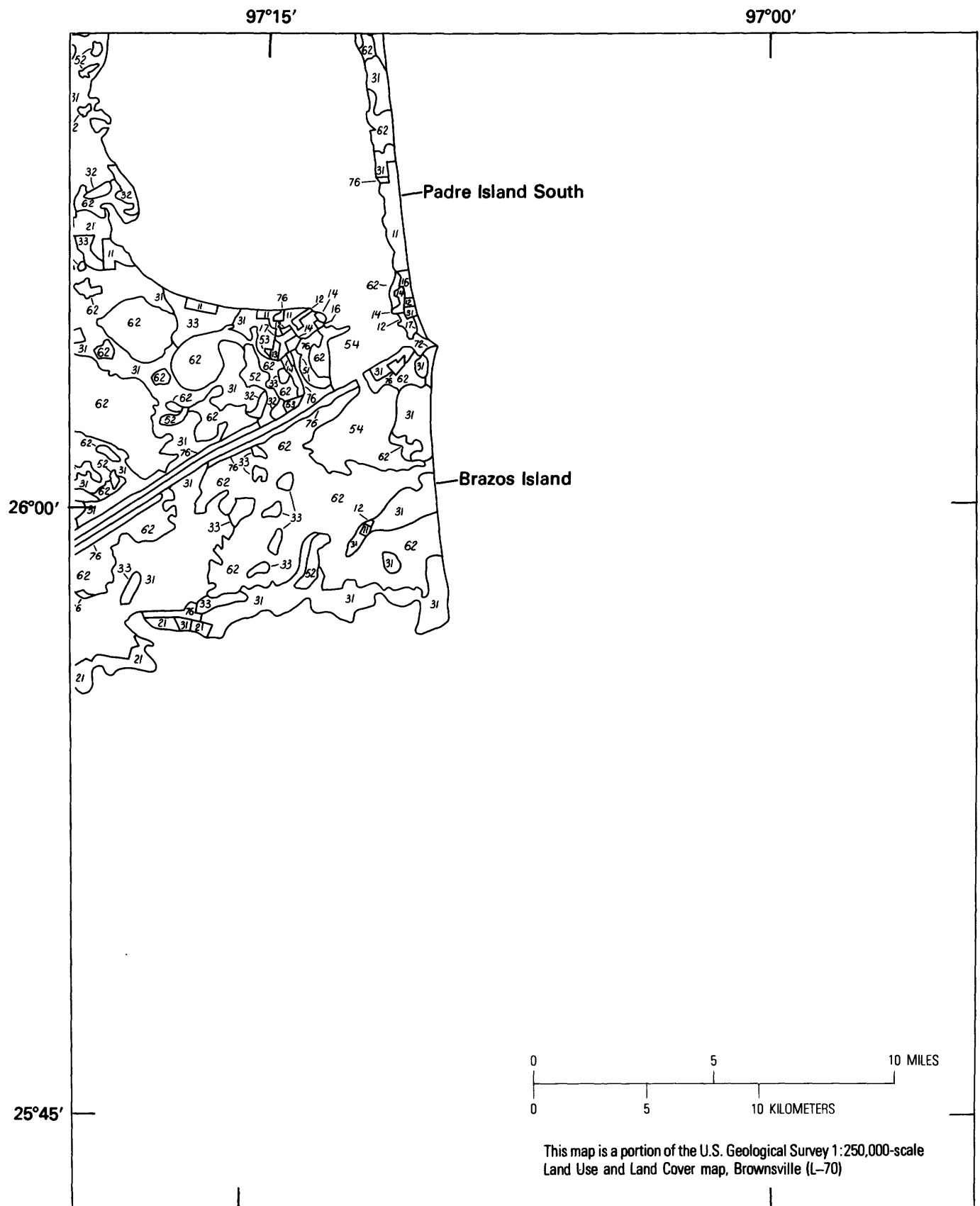


FIGURE 125.—Land use and land cover map of the coastal area near Port Isabel, Tex., with associated barrier islands.