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**GEORGIA'S COASTAL ZONE—
AN INVENTORY OF PHOTOGRAPHIC
AND SATELLITE COVERAGE 1945-1977**

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PHOTOGRAPHIC AND SATELLITE COVERAGE 1945 - 1977

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Introduction

During the past 10 to 15 years, remote sensing from aircraft and spacecraft has become an efficient, economic and effective means of collecting data related to our coastal frontiers. Evaluation of aerial photography over a period of years appears to be a very practical method for the collection and synthesis of data related to numerous environmental and sociological problems of our coast. Numerous features, such as delineation of topography, wildlife habitat, public utilities, open planting zones, transportation corridors, soil characteristics, vegetation, and population distribution, can be identified from aerial photography. Although the field surveys of ground truth can not be entirely eliminated with aerial photography, the implementation of aerial photography provides a relatively inexpensive tool that can greatly reduce the time and cost for comprehensive data acquisition and assessment.



In the early days of aerial photography, exposures were made at an oblique angle with the ground. These oblique photographs provide wide angle perspectives of the terrain, but the usefulness was impaired due to unevenness of scale across the photography. A vertical photograph taken with the aerial camera pointed straight towards the earth's surface provides uniform scale throughout the photograph. With adequate end overlap or consecutive exposures, the resultant overlapping pairs permit three dimensional (stereoscopic) viewing for additional interpretation.

Imagery from spacecraft is a relatively new source of remotely sensed data providing an inexpensive means of collecting data over a very large area. Satellite imagery is available for practically every land mass in the world and on a continuous basis. Landsat imagery in particular has become a very popular resource tool in several professions. Because of limitations of scale, the imagery is generally used for statewide or regional investigations where the broad overview is necessary. Unlike conventional aerial photography, satellite data is available for both photo interpretation and automated digital interpretation.

Both photography and satellite imagery data are important to resource management. Whether you are involved in land use planning, wildlife management, energy research, economic development, or government decision making, remote sensing could be valuable.

The purpose of this publication is to summarize the numerous aerial surveys and Landsat images that are available for the six coastal counties of Georgia. The first part lists aerial photographic surveys that have been completed since 1945, while the second part deals with Landsat coverage of the region.

The surveys are categorized by county and subclassified by date. Each of the entries identifies: 1) the date, 2) percentage of coverage of the county, 3) type of film, 4) scale, 5) agency that conducted the survey, 6) project identification number, and 7) map indicating the location of the flight. Entire surveys are enumerated; individual photographs are not listed. Addresses for each of the source agencies follow the surveys, as well as addresses of several agencies that can provide the user with continuous, up-to-date data on most aerial surveys for any location in the United States. When ordering photographs, it is essential to indicate the date, scale, type of film, and project identification number. This will prevent confusion and ensure receipt of the correct photos.

date	percent of coverage	area covered by survey						scale	focal length	source	project ID number
			panchromatic	B-W infrared	natural color	color	infrared imagery				
March 1949	100%		X					1:20,000	8.25"	ASCS	DGY
March 1951	5%		X					1:28,400	6"	USGS	NV

Time and Coverage

Since the season of the year is an important factor in photo interpretation, each entry indicates the month and year for a particular survey. Although most surveys are conducted from October to April, the months of least vegetation cover and most favorable weather, several flights are taken in mid-summer. These photos could be valuable in cropland and marsh identification. The historic availability of the photography (1945 to present) also permits many comparative studies of coastal features.

By including an estimate of the coverage and a map delineating the area, we hope to simplify the search for the best photography for a particular use and a specific area. Most of the photographic missions in this region of Georgia deal with the coastline: research involving shoreline mechanics, ecology, hydrology or related subjects. Therefore, most flights are conducted without regard to political boundaries, and very few of the surveys cover 100% of a county. It is easy to see why well over half of the surveys cover only the eastern portion of most counties. Regardless, all counties have at least one survey with complete coverage.

Film Type

Once the time of year and the area of coverage have been identified, one can review the type of film used in the survey. Major films used in aerial photography include: *black and white Panchromatic, black and white infrared, natural color, and color infrared.*

The mainstay of most aerial surveys is *black and white Panchromatic* film. This film is sensitive to visible light in the range of 500 to 600 nanometers. The emulsion records about 200 different shades of gray. There are no special characteristics associated with panchromatic film. Its characteristics fall somewhere between natural color and black and white infrared films. The sunspot problem is intermediate, while its water penetration ability approaches that of natural color film. It is the most inexpensive film to use, and thus is utilized for most low altitude photography. Because of this cost factor, several Federal agencies, like the Soil Conservation Service and Agricultural Stabilization and Conservation Service, use panchromatic films exclusively. However, many more agencies and companies are using other types of film for specific purposes. Panchromatic films have approximately the same range of light sensitivity as the human eye. These films have been regarded for many years as standard film for aerial mapping, charting, and general aerial photography. The most common panchromatic film is Kodak Double-X aerographic film 2405. This film was designed to provide a wide exposure latitude, medium resolution, moderate course granularity, and good tonal contrast. It does have a slightly higher than normal sensitivity in the red portion of the spectrum and this permits relatively fast shutter speeds, especially with the use of haze cutting filters.

Black and white infrared film is sensitive to longer energy wavelengths, between 740 and 920 nanometers. The additional exposure into the near-infrared adds a new dimension into this type of remote sensing. Black and white infrared film is often used to determine the boundary between land and water. Water absorbs infrared radiation and reflects the shorter wavelengths, thereby making water appear black. Vegetation reflects infrared radiation also and creates a whitish color on the exposure. This characteristic is useful for the identification of species and plant vigor. Other advantages of black and white infrared includes increased atmospheric haze penetration and a reduced reflection of the sun from water surfaces (sunspots).

Since *panchromatic* film is not very sensitive in the green portion of the spectrum, healthy vegetation appears in gray tones on the print. Where coniferous trees are present, panchromatic film may be used for forest vegetation classification. If deciduous vegetation is intermixed with the coniferous vegetation, the utilization of Kodak infrared aerographic film 2424 provides a better separation of the types. This infrared film has a high contrast and is sensitive to the infrared radiation, as well as

the blue, green and red portions of the visible spectrum. Sometimes this film is exposed through red or dark red filters thereby only recording the red infrared wavelengths reflected from the subject. Silt laden bodies of water absorb infrared reflection to a high degree; consequently, they register light on film as opposed to clear water which registers dark on film. This has been useful for identification of water masses along the coastal zone.

The development of *natural color* aerial films was a great improvement for the photo interpretation of man-made and natural features. Natural color film can record 20,000 separate colors - a vast difference from panchromatic emulsions. This film has several advantages. Unlike black and white films, it presents the photo interpreter with a record of objects as they actually appear in nature. The human experience is to see things in color, and this film permits easy identification. In addition, there is greater penetration into shadows produced by elevated objects. Natural color has the deepest water penetration, reaching nearly 75 feet into clear water. However, it may decrease to 5-10 feet in turbid waters. Natural color film records approximately the same range of visible light as black and white Panchromatic, 420 to 680 nanometers. Because of this, it reflects nearly all visible light from water surfaces yielding a larger sunspot problem. Additionally, it is not as good a haze penetrator as infrared emulsions.

Natural color film is valuable for interpretation of healthy and diseased vegetation. The most commonly utilized film is Kodak Ektachrome MS aerographic film 2448. This film when processed produces a color positive transparency. The color photograph is superior to the black and white photos for natural vegetation studies because the human eye can detect more color variation on a color photograph than shades of gray on a black and white photograph. It has also been utilized for identifying soil types, crops, and other features. This natural color film penetrates water and is therefore useful in subsurface exploration and delineation of numerous shoreline features. It does have a drawback in that correct exposure with proper bright sunlight conditions is a necessity.

Another natural color system designed to utilize the aerial photography produces a variety of products from a single negative. Kodak aerocolor negative film 2445 produces a singular negative from which black and white or color prints, as well as black and white or color transparencies, or black and white or color diapositives can be produced. This system provides a wide variety of products which can be made from the exposure of one singular aerial negative. This is especially popular with plant ecologists, foresters, geographers, and land planners who desire a variety of products from one negative.

Finally, there is *color infrared* aerial film. This emul-

sion was developed by the military in the 1940's to differentiate between camouflage and natural foliage. Today, it is widely used in remote sensing as probably the best choice of all the emulsions. The term "false-color" is used because the exposure produces an arbitrary color shift. Most color infrared film is sensitive to radiation between 520 and 865 nanometers, more into the infrared part of the spectrum than natural color film. Near infrared radiation produces a red image; visible red radiation yields a green image, and visible green light produces a blue image on the developed film. Short wavelength, blue light is not recorded.

The false rendering of familiar colors may take some amount of familiarity, but the advantages of this type of film outweigh this handicap. There are several advantages to color infrared film over the previous types of film. One of the most prominent is its sensitivity to vegetation. Vegetation emits longer wavelength radiation than the human eye can process, resulting in a better vegetation response than non-infrared films. However, it is the addition of color that makes this film more attractive than black and white infrared. Healthy vegetation yields a bright red tone on the film, but there can also be several tones between red and blue, depending on the species. This film is also valuable in detection of diseased foliage. Another advantage of this film is the high degree of atmospheric haze penetration. In fact, color infrared provides nearly all the benefits of other emulsions, with the exception of water penetration, which is limited to about 25 feet in clear water. For these reasons, color infrared photography is becoming very popular in remote sensing.

Kodak aerochrome infrared film 2443 has been designed as a false color film with emulsion sensitive to the infrared, red, and green portions of the spectrum rather than the usual blue, green and red wavelengths. This film when processed results in a color transparency displaying false colors for most natural features. This film has become especially valuable for natural resources surveys as well as disease detection in stands of timber. Dead foliage generally registers as bright green contrasted with the healthy magenta or red vegetation on the resultant positive transparency.

Scale and Focal Length

Various scales are exhibited in the following listing, ranging from 1:5,000 to 1:130,000. Large scale photography (1:5,000) shows a small area, but yields a great amount of detail. Whereas, small scale photography (1:130,000) covers a much larger area and show little detail. However, it takes fewer photos to cover a county than large scale photography.

In addition to the scale, we have included the focal length of the camera. In order to compute the flight altitude, simply divide the focal length by the photo scale.

$$\text{flight altitude} = \frac{\text{focal length (ft.)}}{\text{photo scale (ft.)}}$$

Sources

Abbreviations under the sources column reflect the agency that should be contacted in order to purchase the photography. Generally, Federal agencies maintain their own photo labs and photos can be purchased directly from them. Local or state governments and private companies, however, either do not have large photo labs or must contract out their surveys to commercial aerial survey companies. In order to obtain photographs, written permission must be first acquired from the state or local government or company prior to contacting the aerial survey company. Addresses for the aerial companies are listed after the sources.

Aerial photographs from the Georgia Department of Transportation are not available for general public sale. However, the Ga. DOT has guidelines which enable them to work cooperatively with State, Federal, and other governmental agencies on a cost reimbursement basis. All requests and additional information pertaining to Ga. DOT photography should be submitted by letter.

Although the Army Corps of Engineers does not sell any aerials, they have many photographs "on-file" for review.

U. S. Army Corps of Engineers
Savannah District
Post Office Box 899
Savannah, Georgia 31401
(912) 233-8822

Abbreviations	Name and Address of Source	Other Instructions
ASCS	Agricultural Stabilization and Conservation Service Aerial Photography Field Office Users Services Section 2505 Parley's Way Salt Lake City, Utah 85109	(801) 524-5856
Bwk. Pulp Land	Brunswick Pulp Land Co. Woods Division P.O. Box 860 Brunswick, Georgia 31520	written permission
Camden Co.	Camden County Tax Assessor County Courthouse Woodbine, Georgia 31569	written permission; available from: Park Aerial Survey Standiford Field P.O. Box 21379 Louisville, KY 40221 (502) 366-4571
Chatham Co.	Chatham Co. - Savannah Metro Planning Commission P.O. Box 1027 Savannah, Georgia 31402	written permission; available from: Abrams Aerial Survey 124 N. Larch St. P.O. Box 508 Lansing, MI 48902 (517) 372-8100
Ga. DOT	State Highway Location Eng. Georgia Dept. of Transportation No. 2 Capitol Square, SW Atlanta, Georgia 30334	written permission ATTN: Raymond Blue
Inter'l Paper	International Paper Co. P.O. Box 355 Richmond Hill, Georgia 31324	written permission; available from: Kucera and Assoc. 7000 Reynolds Road Mentor, Ohio 44060 (216) 946-5665
ITT Rayonier	ITT Rayonier SE Timber Division P.O. Box 728 Fernandina Beach, Fla. 32034	written permission; available from: Abrams Aerial Survey 124 N. Larch St. P.O. Box 508 Lansing, MI 48902 (517) 372-8100
McIntosh Co.	McIntosh County Tax Assessor P.O. Box 801 Darien, Georgia 31305	written permission; available from: Abrams Aerial Survey 124 N. Larch St. P.O. Box 508 Lansing, MI 48902 (517) 372-8100

Abbreviations	Name and Address of Source	Other Instructions
NASA	EROS Data Center User Services Unit Sioux Falls, S. Dakota 57198	(605) 594-6511 Ext. 151
NOS	National Ocean Survey Coastal Mapping Division C 3415 Rockville, Maryland 20852	(301) 443-8601
Park Aerial	Park Aerial Surveys Standiford Field P.O. Box 21379 Louisville, Kentucky 40221	(502) 366-4571
SCS	Soil Conservation Service, USDA Cartographic Division Federal Building Hyattsville, Maryland 20782	(301) 436-8187
Schmidt Photo	Southeastern Photogramanetrics (formerly Schmidt Photo) P.O. Box 82464 Hapeville, Georgia 30354	(401) 761-0855
Thomas Lowe & Assoc.	Thomas Lowe & Assoc. 1920 Monroe Drive NE Atlanta, Georgia 30334	(404) 875-0136
Union Camp	Union Camp Corporation Woods Division P.O. Box 570 Savannah, Georgia 31402	written permission; available from: Abrams Aerial Survey 124 N. Larch St. P.O. Box 508 Lansing, MI 48902 (517) 372-8100
Univ. of Ga.	University of Georgia Marine Extension Service P.O. Box 517 Brunswick, Georgia 31520	written permission; available from: Airborne Data Inc. P.O. Box 6094 Daytona Beach, Fla. 32015 (904) 255-8952
USGS	U.S. Geological Survey Map Distribution 1200 South Eads Street Arlington, Virginia 22210	(703) 557-2751

Additional Information

Several Federal agencies have Map and Aerial Information Systems. Some systems detail information for only one agency; other systems maintain a record of all aerial surveys.

The National Cartographic Information Center maintains detailed information about all Federal, and some state, photography throughout the U. S. through the Aerial Photography Summary Record System. This system does not include information on satellite imagery or space photography. Information can be obtained both in paper catalogs or microfiche.

National Cartographic Information Center
U. S. Geological Survey
507 National Center
Reston, Virginia 22092
(703) 860-6045

The U. S. Geological Survey also maintains an informational library at the EROS Data Center, Sioux Falls, South Dakota which details all Landsat imagery, space photography, NASA aircraft and USGS Aerial Mapping photography.

The NASA Ames Research Center maintains details on all NASA high altitude projects through the Airborne Instrumentation Research Project. For information contact:

NASA Ames Research Center
AIRP Data Facility
Mail Stop 211-8
Moffet Field, California 94035
(415) 965-6252

AERIAL PHOTOGRAPHY COVERAGE

BRYAN COUNTY

date	percent of coverage	area covered by survey	panchromatic			scale	focal length	source	project ID number
			B-W	infrared	natural color				
March 1949	100%		X			1:20,000	8.25"	ASCS	DGY
March 1951	5%		X			1:28,400	6"	USGS	NV
April 1951	5%		X			1:24,000	6"	NOS	51-0
Feb. 1954	100%		X			1:10,000	8.25"	ASCS	DGY
Jan. 1956	50%		X			1:60,000	6"	USGS	55-AM-20
Jan. 1958	100%		X			1:20,000	8.25"	ASCS	DGY
Feb. 1961	20%		X			1:24,000	6"	Ga. DOT	Ga. Coastal Mosaic
Oct. 1962	10%		X			1:36,000	6"	NOS	62-W
Nov. 1963	20%		X			1:20,000	8.25"	ASCS	DGY

AERIAL PHOTOGRAPHY COVERAGE

BRYAN COUNTY

date	percent of coverage	area covered by survey	panchromatic				scale	focal length	source	project ID number
			B-W	infrared	natural color	infrared				
March 1965	5%		X				1:20,000	6"	NOS	65-L
March 1966	90%		X				1:20,000	6"	USGS	AF66-75
Jan. 1970	20%		X				1:20,000	8.25"	ASCS	DGY
April 1970	100%		X				1:50,000	6"	SCS	DGY
Nov. 1971	5%			X			1:30,000	6"	NOS	71-E(c)
Nov. 1971	10%				X		1:20,000	6"	NOS	71-F
Nov. 1971	20%		X				1:60,000	3.25"	NOS	71-M
Dec. 1971	10%		X				1:24,000	6"	USGS	VCVA
Dec. 1972	20%			X			1:24,000	6"	Univ. of Ga.	UCM1-G
Sept. 1973	5%				X		1:60,000	3.46"	NOS	73-C(c)

AERIAL PHOTOGRAPHY COVERAGE

BRYAN COUNTY

date	percent of coverage	area covered by survey	panchromatic			scale	focal length	source	project ID number
			B-W	infrared	natural color				
Sept. 1973	20%			X		1:130,000	6"	NASA	73-158
Oct. 1973	100%				X	1:130,000	6"	NASA	73-180
Feb. 1974	20%		X			1:21,000	3.46"	USGS	SWIJ
April 1974	100%				X	1:130,000	6"	NASA	74-065B
April 1974	20%				X	1:76,000	6"	USGS	VDLR
April 1974	100%					1:40,000	6"	Park Aerial	BBR
Jan. 1975	IP Land only		X			1:15,840	6"	Inter'l Paper	12595
March 1975	5%		X			1:15,840	6"	Union Camp	UCC-SAP
Oct. 1975	5%		X	X		1:65,000	12"	NASA	75-179
April 1976	5%		X	X		1:24,000	6"	Ga. DOT	Ga. Shoreline









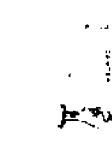
AERIAL PHOTOGRAPHY COVERAGE

CAMDEN COUNTY

date	percent of coverage	area covered by survey	panchromatic				scale	focal length	source	project ID number
			B-W	infrared	natural color	color infrared				
April 1951	50%		X				1:24,000	6"	NOS	51-0
May 1951	100%		X				1:32,800	6"	USGS	NU
Feb. 1952	Bpp Land only		X				1:15,840	6"	Bwk. Pulp Land	ASC
Oct. 1952	10%		X				1:30,000	6"	NOS	52-0
Jan. 1953	100%		X				1:20,000	6"	SCS	DSH
Nov. 1953	5%		X				1:10,000	6"	NOS	53-J
Jan. 1956	20%		X				1:60,000	6"	USGS	55-AM-20
March 1957	70%		X				1:24,000	6"	USGS	VPM
March 1959	Bpp Land only		X				1:15,840	6"	Bwk. Pulp Land	GA

AERIAL PHOTOGRAPHY COVERAGE

CAMDEN COUNTY

date	percent of coverage	area covered by survey	panchromatic				scale	focal length	source	project ID number
			B-W	infrared	natural color	color infrared				
Feb. 1961	70%		X				1:24,000	6"	Ga. DOT	Ga. Coastal Mosaic
Nov. 1962	20%		X				1:20,000	6"	NOS	62-W
Nov. 1962	10%			X			1:10,000	6"	NOS	62-W(c)
Feb. 1963	5%		X				1:36,000	6"	NOS	63-W
Sept. 1964	10%		X				1:10,000	6"	NOS	64-W
April 1965	100%		X				1:19,200	6"	Schmidt Photo.	AW
Jan. 1970	10%			X			1:21,000	3.46"	USGS	SWDG
Nov. 1971	30%				X		1:20,000	6"	NOS	71-E
Nov. 1971	5%				X		1:30,000	6"	NOS	71-E(c)

AERIAL PHOTOGRAPHY COVERAGE

CAMDEN COUNTY

date	percent of coverage	area covered by survey	panchromatic			scale	focal length	source	project ID number
			B-W	infrared	natural color				
Nov. 1971	30%		X			1:60,000	3.25"	NOS	71-M
Dec. 1972	50%			X		1:24,000	6"	Univ. of Ga.	UGMT-6
March 1973	20%		X			1:76,000	6"	USGS	VDPQ
Oct. 1973	20%				X	1:60,000	3.46"	NOS	73-C
Oct. 1973	100%				X	1:130,000	6"	NASA	73-180
Feb. 1974	70%			X		1:21,000	3.46"	USGS	SWIJ
April 1974	70%				X	1:76,000	6"	USGS	VDLR
April 1974	20%				X	1:60,000	3.46"	NOS	74-C
April 1974	100%				X	1:130,000	6"	NASA	74-065B

AERIAL PHOTOGRAPHY COVERAGE

CAMDEN COUNTY

date	percent of coverage	area covered by survey	panchromatic	B-W infrared	natural color	color infrared	infrared imagery	scale	focal length	source	project ID number
Dec. 1974	ITT Land only		X					1:15,840	6"	ITT Rayonier	RAY
Feb. 1975	20%					X		1:15,000	6"	USGS	VDPR-1
March 1975	BPP Land only				X			1:15,840	6"	Bwk, Pulp Land	ERT
Oct. 1975	20%		X	X				1:65,000	12"	NASA	75-179
April 1976	20%				X			1:24,000	6"	Ga. DOT	Ga. Shoreline
Jan. 1977	100%		X					1:20,000	6"	Camden Co.	BLB
Feb. 1977	100%		X					1:48,000	6"	SCS	13039

AERIAL PHOTOGRAPHY COVERAGE

CHATHAM COUNTY

date	percent of coverage	area covered by survey	panchromatic				scale	focal length	source	project ID number
			B-W	infrared	natural color	color				
Feb. 1945	5%		X				1:20,000	3.46"	NOS	45-C
March 1951	80%		X				1:28,400	6"	USGS	NV
April 1951	10%		X				1:24,000	6"	NOS	51-0
Jan. 1952	100%		X				1:20,000	6"	SCS	DQG
Nov. 1953	10%		X				1:10,000	6"	NOS	53-J
Nov. 1955	5%		X	X			1:15,000	6"	NOS	55-L & 55-0
Jan. 1956	40%		X				1:60,000	6"	USGS	55-AM-20
Nov. 1956	10%		X				1:30,000	6"	NOS	56-W
Feb. 1961	80%		X				1:24,000	6"	Ga. DOT	Ga. Coastal Mosaic

CHATHAM COUNTY

**AERIAL PHOTOGRAPHY
COVERAGE**

date	percent of coverage	area covered by survey	panchromatic				scale	focal length	source	project ID number
			B-W	infrared	natural color	color infrared				
April 1962	60%		X				1:40,000	6"	NOS	62-S
Oct. 1962	50%		X				1:36,000	6"	NOS	62-W
Nov. 1962	10%		X				1:20,000	6"	NOS	62-W
Oct. 1964	10%		X				1:70,000	3.25"	NOS	64-M
Nov. 1964	30%		X				1:30,000	6"	NOS	64-S
March 1965	20%		X				1:40,000 1:20,000	6"	NOS	65-L
Nov. 1965	100%		X				1:19,200	6"	Schindt Photo.	AX
March 1966	20%		X				1:20,000	6"	USGS	AF 66-75
March 1967	20%		X				1:30,000	6"	NOS	67-S

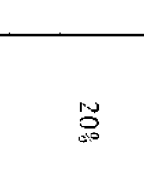
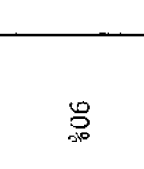
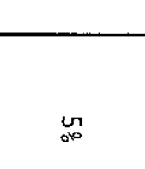
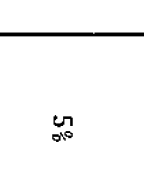
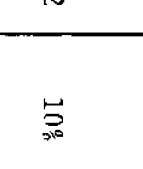
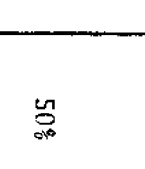
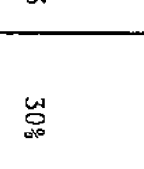
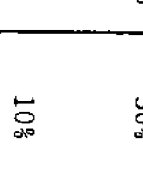
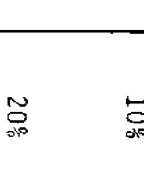
AERIAL PHOTOGRAPHY

CHATHAM COUNTY

date	percent of coverage	area covered by survey	panchromatic				scale	focal length	source	project ID number
			B-W	infrared	natural color	color infrared				
April 1970	100%		X				1:50,000	6"	SCS	DQG
June 1970	100%		X				1:24,000	6"	Chatham Co.	CKJ
Nov. 1970	60%			X			1:40,000	6"	NOS	70-L(c)
Nov. 1970	10%			X			1:20,000	6"	NOS	70-L(c)
March 1971	1%			X			1:20,000	6"	NOS	71-E(c)
March 1971	5%			X			1:30,000	6"	NOS	71-E
Nov. 1971	80%		X				1:60,000	3.25"	NOS	71-M
Nov. 1971	20%			X			1:30,000	6"	NOS	71-E(c)
Nov. 1971	10%		X				1:30,000	6"	NOS	71-S









AERIAL PHOTOGRAPHY COVERAGE

CHATHAM COUNTY

date	percent of coverage	area covered by survey	panchromatic			scale	focal length	source	project ID number
			B-W	infrared	natural color				
Nov. 1971	20%				X	1:20,000	6"	NOS	71-E
Dec. 1971	90%		X			1:24,000	6"	USGS	VCVA
July 1972	5%				X	1:130,000	6"	NASA	72-116
Aug. 1972	5%				X	1:130,000	6"	NASA	72-144
Sept. 1972	10%				X	1:130,000	6"	NASA	72-167
Dec. 1972	50%			X		1:24,000	6"	Univ. of Ga.	UCMI-G
Sept. 1973	30%			X		1:130,000	6"	NASA	73-158
Oct. 1973	10%			X		1:40,000	6"	NOS	73-E
Oct. 1973	20%				X	1:60,000	3.46"	NOS	73-C



AERIAL PHOTOGRAPHY COVERAGE

CHATHAM COUNTY

date	percent of coverage	area covered by survey	panchromatic			scale	focal length	source	project ID number
			B-W	infrared	natural color				
Oct. 1973	100%				X	1:130,000	6"	NASA	73-180
Feb. 1974	80%		X			1:21,000	3.46"	USGS	SMIJ
April 1974	80%				X	1:76,000	6"	USGS	VDLR
April 1974	30%				X	1:60,000	3.46"	NOS	74-C
April 1974	100%				X	1:130,000	6"	NASA	74-065B
Nov. 1974	10%		X			1:30,000	6"	NOS	74-S
Jan. 1975	100%		X			1:24,000	6"	Chatham Co.	ERS
Oct. 1975	10%			X		1:20,000	6"	NOS	75-B(c)










CHATHAM COUNTY

**AERIAL PHOTOGRAPHY
COVERAGE**










date	percent of coverage	area covered by survey	panchromatic	B-W	infrared	natural color	color	infrared	infrared imagery	scale	focal length	source	project ID number
April 1976	30%			✓						1:24,000	6"	Ga. DOT	Ga. Shoreline
April 1976	5%			✓						1:12,000	6"	Ga. DOT	Ga. Shoreline
Feb. 1977	100%			✓						1:24,000	6"	Chatham Co.	FKS

AERIAL PHOTOGRAPHY COVERAGE

GLYNN COUNTY

date	percent of coverage	area covered by survey	panchromatic				scale	focal length	source	project ID number
			B-W	infrared	natural color	infrared color				
Feb. 1945	10%		X				1:20,000	3.46"	NOS	45-C
Feb. 1945	5%		X				1:5,000 1:10,000	3.46"	NOS	45-C
April 1951	90%		X				1:24,000	6"	NOS	51-0
May 1951	100%		X				1:32,800	6"	USGS	NU
Feb. 1952	BPP land only		X				1:15,840	6"	Bulk. Pulp Land	ASC
Feb. 1952	10%		X				1:24,000	6"	NOS	52-0
Oct. 1952	5%		X				1:30,000	6"	NOS	52-0
Jan. 1953	100%		X				1:20,000	6"	SCS	DSF
Nov. 1953	10%		X				1:10,000	6"	NOS	53-J

**AERIAL PHOTOGRAPHY
COVERAGE**

date	percent of coverage	area covered by survey	panchromatic			scale	focal length	source	project ID number
			B-W	infrared	natural color				
				infrared	infrared				
Jan. 1956	20%		X			1:60,000	6"	USGS	55-AM-20
March 1957	10%		X			1:24,000	6"	USGS	VPM
March 1959	BPP Land only		X			1:15,840	6"	Bwk. Pulp Land	Ga.
Feb. 1961	70%		X			1:24,000	6"	Ga. DOT	Ga. Coastal Mosaic
April 1962	100%		X			1:20,000	6"	Schmidt Photo.	AL
Nov. 1962	10%			X		1:10,000	6"	NOS	62-W(c)
Nov. 1962	20%		X			1:20,000	6"	NOS	62-W
Feb. 1963	20%		X			1:36,000	6"	NOS	63-W
Sept. 1964	10%		X			1:10,000	6"	NOS	64-W










AERIAL PHOTOGRAPHY COVERAGE

GLYNN COUNTY

date	percent of coverage	area covered by survey	panchromatic			scale	focal length	source	project ID number
			B-W	infrared	natural color				
Sept. 1964	5%			X		1:5,000	6"	NOS	64-N(c)
March 1965	20%		X			1:20,000 1:40,000	6"	NOS	65-L
Oct. 1967	5%			X		1:30,000	6"	NOS	67-S(c)
April 1971	10%		X			1:30,000	6"	NOS	71-E
Nov. 1971	30%				X	1:20,000	6"	NOS	71-E
Nov. 1971	20%			X		1:30,000	6"	NOS	71-E(c)
Nov. 1971	40%		X			1:60,000	3.25"	NOS	71-M
Dec. 1972	30%			X		1:24,000	6"	Univ. of Ga.	UGM-G
Feb. 1973	100%		X			1:24,000	6"	Schmidt Photo.	BZ





AERIAL PHOTOGRAPHY COVERAGE

GLYNN COUNTY

date	percent of coverage	area covered by survey	panchromatic				scale	focal length	source	project ID number
			B-W	infrared	natural color	infrared				
March 1973	20%		X				1:76,000	6"	USGS	VDFQ
Oct. 1973	20%				X		1:60,000	3.46"	NOS	73-C
Oct. 1973	100%				X		1:130,000	6"	NASA	73-180
Feb. 1974	80%		X				1:21,000	3.46"	USGS	SWTJ
April 1974	100%				X		1:130,000	6"	NASA	74-065B
April 1974	80%				X		1:76,000	6"	USGS	VDLR
April 1974	20%				X		1:60,000	3.46"	NOS	74-C
Nov. 1974	20%		X				1:30,000	6"	NOS	74-S
Feb. 1975	20%				X		1:15,000	6"	USGS	VDFR-1

AERIAL PHOTOGRAPHY COVERAGE

GLYNN COUNTY

date	percent of coverage	area covered by survey	panchromatic			scale	focal length	source	project ID number
			B-W	infrared	natural color				
March 1975	BPP land only			X		1:15,840	6"	Bwk. Pulp Land	ERT
Oct. 1975	40%		X	X		1:65,000	12"	NASA	75-179
April 1976	30%			X		1:24,000	6"	Ga. DOT	Ga. Shoreline
Feb. 1977	100%		X			1:48,000	6"	SCS	13127

LIBERTY COUNTY

AERIAL PHOTOGRAPHY COVERAGE

date	percent of coverage	area covered by survey	panchromatic				scale	focal length	source	project ID number
			B-W	infrared	natural color	color infrared				
Feb. 1945	1%		X				1:20,000	3.46"	NOS	45-C
May 1951	20%		X				1:32,800	6"	USGS	NU
April 1951	30%		X				1:24,000	6"	NOS	51-0
Feb. 1952	Bpp Land only		X				1:15,840	6"	Bwk. Pulp Land	ASC
Oct. 1952	10%		X				1:30,000	6"	NOS	52-0
Jan. 1953	100%		X				1:20,000	6"	SCS	DSD
Jan. 1956	90%		X				1:60,000	6"	USGS	55-AM-20
March 1959	Bpp Land only		X				1:15,840	6"	Bwk. Pulp Land	GA
Feb. 1961	50%		X				1:24,000	6"	Ga. DOT	Ga. Coastal Mosaic

AERIAL PHOTOGRAPHY COVERAGE

LIBERTY COUNTY

date	percent of coverage	area covered by survey	panchromatic	B-W	infrared	natural color	color	infrared	infrared imagery	scale	focal length	source	project ID number
Nov. 1962	10%		X							1:20,000	6"	NOS	62-W
March 1963	30%		X							1:20,000	8.25"	ASCS	DSD
Oct. 1963	20%			X						1:40,000	6"	NOS	63-W(c)
Sept. 1964	5%		X							1:10,000	6"	NOS	64-W
March 1965	20%		X							1:40,000	6"	NOS	65-L
March 1965	20%		X							1:20,000	6"	NOS	65-L
March 1966	70%		X							1:20,000	6"	USCS	AF 66-75
Nov. 1971	20%			X						1:60,000	3.25"	NOS	71-M
Nov. 1971	20%				X					1:30,000	6"	NOS	71-E(c)

AERIAL PHOTOGRAPHY

COVERAGE

LIBERTY COUNTY

date	percent of coverage	area covered by survey	panchromatic				scale	focal length	source	project ID number
			B-W	infrared	natural color	color				
Nov. 1971	10%				X	1:20,000	6"	NOS	71-E	
Dec. 1972	30%			X		1:24,000	6"	Univ. of Ga.	UGMI-G	
Jan. 1973	70%		X			1:20,000	6"	Park Aerial	AVO	
Oct. 1973	10%			X		1:60,000	3.46"	NOS	73-C	
Oct. 1973	100%			X		1:130,000	6"	NASA	73-180	
Feb. 1974	30%		X			1:21,000	3.46"	USGS	SWTJ	
April 1974	30%			X		1:76,000	6"	USGS	VDLR	
April 1974	10%			X		1:60,000	3.46"	NOS	74-C	
April 1974	100%			X		1:130,000	6"	NASA	74-065B	

AERIAL PHOTOGRAPHY COVERAGE

LIBERTY COUNTY

date	percent of coverage	area covered by survey	panchromatic	B-W	infrared	natural color	color	infrared	infrared imagery	scale	focal length	source	project ID number
Dec. 1974	ITT Land only		X							1:15,840	6"	ITT Rayonier	RAY
Jan. 1975	100%		X							1:48,000	3.46"	SCS	DSD
March 1975	Bpp Land only					X				1:15,840	6"	Bwk. Pulp Land	FRT
March 1975	50%		X							1:15,840	6"	Union Camp	UCC-SAP
Oct. 1975	20%		X	X						1:65,000	12"	NASA	75-179
April 1976	10%			X						1:24,000	6"	Ga. DOT	Ga. Shoreline

AERIAL PHOTOGRAPHY COVERAGE

McINTOSH COUNTY

date	percent of coverage	area covered by survey	panchromatic					scale	focal length	source	project ID number
			B-W	infrared	natural color	color	infrared				
Feb. 1945	5%		X					1:20,000	3.46"	NOS	45-C
April 1951	100%		X					1:24,000	6"	NOS	51-0
May 1951	100%		X					1:32,800	6"	USGS	NU
Oct. 1952	5%		X					1:30,000	6"	NOS	52-0
Jan. 1953	100%		X					1:20,000	6"	SCS	DSE
Nov. 1953	5%		X					1:10,000	6"	NOS	53-J
Jan. 1956	50%		X					1:60,000	6"	USGS	55-AM-20
Feb. 1961	70%		X					1:24,000	6"	Ga. DOT	Ga. Coastal Mosaic
Nov. 1962	20%		X					1:20,000	6"	NOS	62-W

AERIAL PHOTOGRAPHY COVERAGE

MCINTOSH COUNTY

date	percent of coverage	area covered by survey	infrared imagery				scale	focal length	source	project ID number
			panchromatic	B-W	natural color	color				
Oct. 1963	30%			X			1:40,000	6"	NOS	63-W(c)
Sept. 1964	5%		X				1:10,000	6"	NOS	64-W
March 1965	20%		X				1:20,000	6"	NOS	65-L
March 1965	20%		X				1:40,000	6"	NOS	65-L
Jan. 1967	100%		X				1:28,800	6"	Thomas Lowe Assoc.	171
Nov. 1971	10%		X				1:20,000	6"	NOS	71-S
Nov. 1971	40%			X			1:30,000	6"	NOS	71-E(c)
Nov. 1971	10%				X		1:20,000	6"	NOS	71-E
Nov. 1971	60%		X				1:60,000	3.25"	NOS	71-M

AERIAL PHOTOGRAPHY COVERAGE

MCINTOSH COUNTY

date	percent of coverage	area covered by survey	panchromatic	B-W	infrared	natural color	infrared color	infrared imagery	scale	focal length	source	project ID number
Dec. 1972	70%				X				1:24,000	6"	Univ. of Ga.	UCMT-G
March 1973	30%		X						1:76,000	6"	USGS	VDFQ
Oct. 1973	20%				X				1:60,000	3.46"	NOS	73-C
Oct. 1973	100%				X				1:130,000	6"	NASA	73-180
Feb. 1974	70%		X						1:21,000	3.46"	USGS	SWIJ
Feb. 1974	30%				X				1:15,000	6"	USGS	VDFR-1
April 1974	100%				X				1:130,000	6"	NASA	74-065B
April 1974	70%				X				1:76,000	6"	USGS	VDFR
April 1974	20%				X				1:60,000	3.46"	NOS	74-C

AERIAL PHOTOGRAPHY COVERAGE

MCINTOSH COUNTY

date	percent of coverage	area covered by survey	panchromatic			scale	focal length	source	project ID number
			B-W	infrared	natural color				
Dec. 1974	ITT Land only		X			1:15,840	6"	ITT Rayonier	RAY
Jan. 1975	IP Land only		X			1:15,840	6"	Inter'l Paper	12595
Feb. 1975	30%				X	1:15,000	6"	USGS	VDPR-1
April 1975	90%		X			1:15,840	6"	Union Camp	UCC-SAP 53
Oct. 1975	60%		X	X		1:65,000	12"	NASA	75-179
Jan. 1976	10%				X	1:15,000	6"	USGS	VDPR-1
April 1976	30%			X		1:24,000	6"	Ga. DOT	Ga. Shoreline
March 1977	100%		X			1:24,000	6"	McIntosh Co.	FKG

Landsat Imagery

Imagery is a relatively new type of graphic medium available to scientists, planners and resource managers in comparison to aerial photography. Space imagery began in the early 1960's with weather satellites scanning the earth to provide remotely sensed data for better weather forecasting. The success of these projects opened the way in the early 1970's for the Earth Resources Technology Satellite Program. Today the Landsat satellite provides earth resource data for a wide variety of investigations in many different disciplines around the world.

Imagery has proved to be a valuable tool in many areas of study. In agriculture, satellite imagery can be used to make soil surveys, assess crop management practices and range conditions, and predict yields. Foresters can monitor reclamation or assess fire and insect damage. Geologists use imagery in mineral and petroleum exploration, volcano and earthquake prediction. Landsat data can also be used in snow surveys, drainage and flooding patterns, and water pollution studies. Imagery has uses in a variety of geographic studies from transportation and urban land use to topography and population density. Imagery can provide data for better seafood production, regulation of air pollution or monitor iceberg movements.

The first Earth Resource Technology Satellite, ERTS-1 (now renamed Landsat-1), was launched on July 23, 1972. A second Landsat-2 satellite was launched January 22, 1975. Together they provide nearly continuous coverage of the earth's surface. Landsat passes over any point on the earth every 9 days at a flight altitude of 570 miles. The sunsynchronous polar orbit was selected to reduce the sun angle. On each north to south pass, Landsat crosses the equator at about 9:30 a.m. (10:00 to 10:30 a.m. on the Georgia coast).

Each Landsat satellite presently carries three data acquisition systems: (1) a multispectral scanner (MSS) with four spectral bands, (2) a return beam vidicon (RBV) and (3) a data collection system that relays data to ground-based stations. The multispectral scanner is the primary sensor which supplies images for dissemination. The images are 115 miles (185 km) per side in four spectral bands in the visible and near-infrared portions of the spectrum. These four bands are:

Band 4, the green band, 500 to 600 nanometers, emphasizes movement of sediment-laden water and delineates areas of shallow water, such as shoals, reefs, etc.

Band 5, the red band, 600 to 700 nanometers, emphasizes cultural features.

Band 6, the near-infrared band, 700 to 800 nanometers emphasizes vegetation, the boundary between land and water, and landforms.

Band 7, the second near-infrared band, 800 to 1100 nanometers provides the best haze penetration and emphasizes vegetation, the boundary between land and water, and landforms.

An analysis of the four individual black and white images or the false-color infrared composite images often enables inventory and identification of different earth resources, and the repetitive (9 or 18 days) and seasonal coverage provided by Landsat is an important tool for the interpretation of dynamic systems. A set of black and white images for all four bands reveals the same area in green, red and near-infrared wavelengths.

The sensors onboard the spacecraft transmit the images to the ground receiving stations at Goddard Space Flight Center in Greenbelt, Maryland. The data is then converted from electronic signals to photographic images and computer compatible tapes. Master reproducible copies are sent to the EROS Data Center in Sioux Falls, S. Dakota, where the data is available to the public.

The following listing identifies all of the Landsat images for Georgia's coast that are of good quality for interpretation. Images were judged as good if (1) there was 10% or less cloud cover over the entire scene and (2) there was an overall quality rating of 8 or higher, on a scale of 1 to 10. Coverage includes those areas in orbiting Paths 17 and 18 and Rows 37,38, and 39 that covers the coastal area. Each entry identifies:

DATE OF IMAGE - month/day/year

SCENE IDENTIFICATION NUMBER - 81DDDHHMMS50000

8: Landsat image
1 and 5: Landsat-1 or 2: Landsat-2
DDD: days since launch
HHMM: hours/minutes since launch
S: tens of seconds since launch
5: multispectral scanner (MSS)
0000: unused

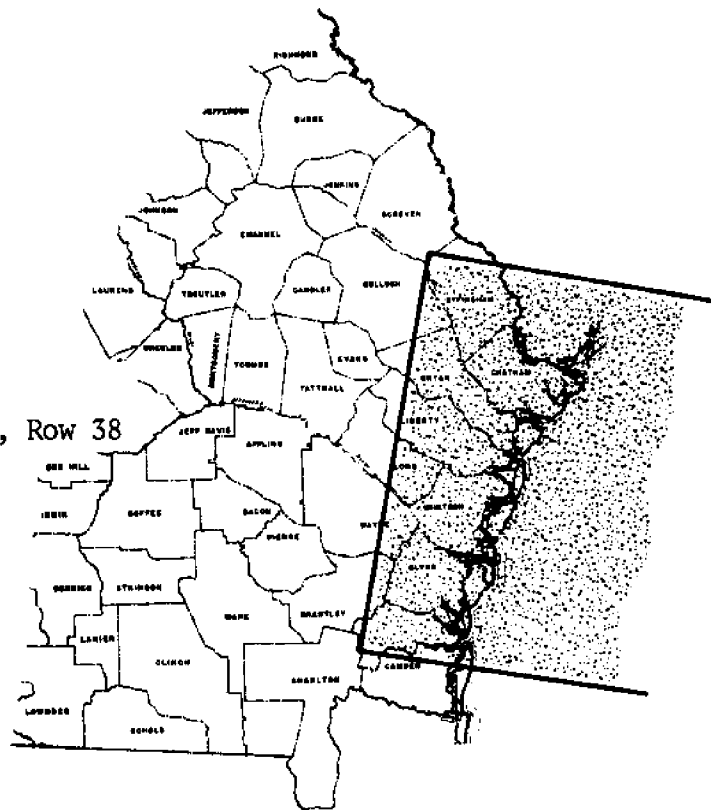
PERCENT OF CLOUD COVER - 10% or 0% of cloud coverage over the entire scene

QUALITY OF MSS IMAGE BAND - rating for each of the MSS bands (4,5,6,7) on a scale of 1 to 10 (10 is the best)

LANDSAT COVERAGE

date	scene identification number	percent of cloud cover	quality of MSS image band			
8/19/72	81027152655N000	10%	8	8	8	8
4/10/73	81261152805N000	0%	8	8	8	8
6/3/73	81315152745N000	0%	8	2	2	8
8/14/73	81387152645N000	10%	2	8	8	2
11/12/73	81477152505N000	0%	8	8	8	2
11/30/73	81495152455N000	0%	2	8	8	8
2/10/74	81567152305N000	10%	2	8	8	8
3/18/74	81603152225N000	0%	8	8	8	2
4/18/75	81999150825N000	0%	5	8	8	8
9/27/75	851611459050000	0%	5	5	5	8
1/22/76	823651513150000	0%	5	8	5	5
1/31/76	852871451150000	10%	5	8	5	8
2/9/76	823831513050000	10%	5	8	8	8
4/3/76	824371511250000	0%	5	5	5	8
7/11/76	854491439550000	10%	5	8	8	8
8/16/76	854851436550000	10%	5	8	8	8
11/23/76	826711504250000	10%	8	8	8	8
12/29/76	827071502550000	10%	8	8	8	8
2/21/77	827611500550000	10%	8	8	5	5

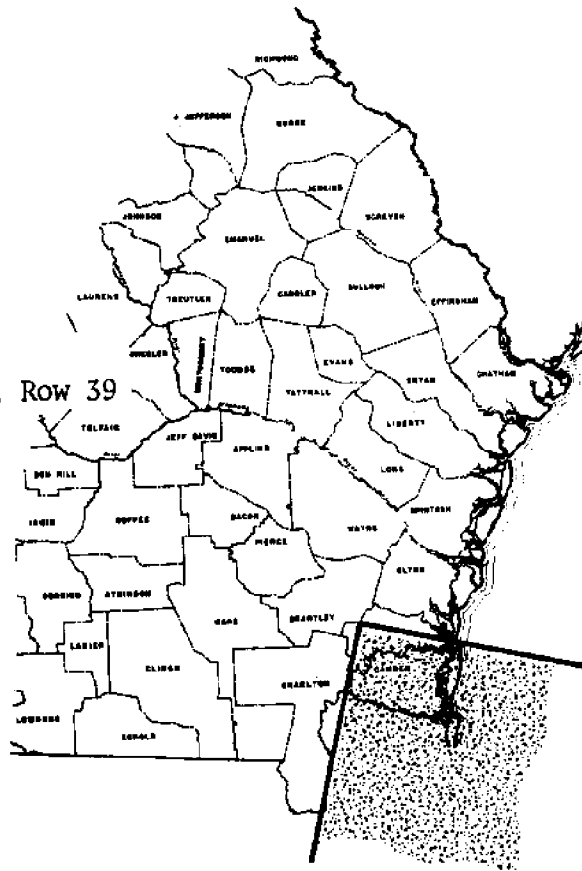
Landsat Worldwide Reference System: Path 17, Row 38



LANDSAT COVERAGE

date	scene identification number	percent of cloud cover	quality of MSS image band			
4/10/73	81261152835N000	0%	8	8	8	8
6/3/73	81315152805N000	10%	8	8	2	8
9/19/73	81423152635N000	10%	8	8	8	8
5/11/74	81657152135N000	10%	8	8	8	8
1/31/76	852871451350000	10%	8	8	5	8
4/12/76	853591446550000	10%	8	8	8	8
7/11/76	854491440250000	10%	8	8	8	8
8/16/76	854851437250000	10%	8	8	8	8
12/29/76	827071503150000	10%	8	8	8	8
2/21/77	827611501150000	0%	8	8	5	8

Landsat Worldwide Reference System: Path 17, Row 39



LANDSAT COVERAGE

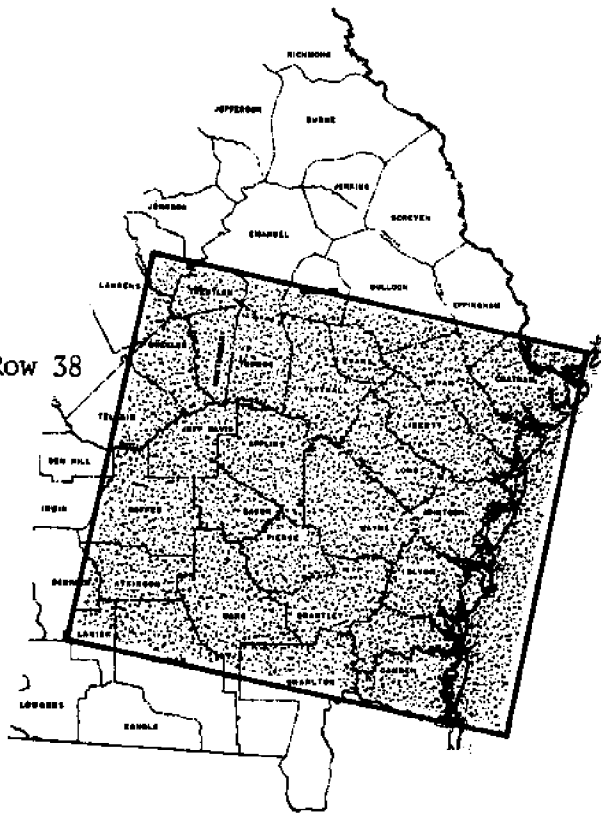
date	scene identification number	percent of cloud cover	quality of MSS image band			
10/31/72	81100153315N000					
2/16/73	81208153335N000	10%	8	8	8	8
3/24/73	81244153355N000	0%	8	8	8	8
4/11/73	81262153355N000	10%	8	8	8	8
5/17/73	81298153335N000	0%	8	8	8	8
		0%	8	8	2	8
10/26/73	81460153055N000					
11/13/73	81478153045N000	0%	2	8	8	8
12/1/73	81496153045N000	10%	8	8	8	2
2/11/74	81568152845N000	0%	8	8	2	8
3/19/74	81604152815N000	0%	2	8	8	8
		10%	2	8	2	2
4/24/74	81640152725N000					
6/17/74	81694152545N000	0%	2	8	2	2
10/3/74	81802152155N000	10%	8	8	8	8
10/21/74	81820152145N000	10%	8	8	8	8
11/26/74	81856152025N000	10%	8	8	5	8
		0%	8	8	8	8
4/28/75	82096152135N000					
5/25/75	85036151215N000	10%	5	8	8	8
12/18/75	823301519250000	10%	5	8	8	8
1/23/76	823661519050000	10%	5	8	8	8
2/10/76	823841518450000	0%	8	8	8	8
		0%	5	8	8	8
2/28/76	824021518150000					
3/17/76	824201517350000	0%	5	8	8	8
4/4/76	824381517050000	0%	8	8	8	8
4/13/76	853601452050000	10%	8	8	8	8
5/19/76	853961449350000	10%	8	8	8	8
		0%	8	8	8	8

Continued following page

LANDSAT COVERAGE

date	scene identification number	percent of cloud cover	quality of MSS image band			
6/6/76	854141448250000	10%	8	8	8	8
7/12/76	854501445350000	0%	8	8	8	5
7/21/76	825461514150000	10%	8	8	8	8
9/22/76	855221439450000	10%	8	8	8	8
10/1/76	826181512050000	10%	8	8	8	8
11/6/76	826541510450000	10%	8	8	8	8
12/30/76	827081508350000	10%	8	8	8	8
2/10/77	856631427150000	0%	5	8	8	8
2/22/77	827621506350000	0%	8	8	8	8

Landsat Worldwide
Reference System: Path 18, Row 38



LANDSAT COVERAGE

date	scene identification number	percent of cloud cover	quality of MSS image band			
10/13/72	81082153325N000	10%	8	8	8	8
10/31/72	81100153345N000	10%	8	8	8	8
12/24/72	81154153355N000	10%	8	8	8	8
2/16/73	81208153405N000	0%	8	8	2	8
4/11/73	81262153415N000	0%	8	8	8	8
4/29/73	81280153415N000	0%	2	8	8	2
5/17/73	81298153405N000	0%	8	8	2	8
10/26/73	81460153115N000	0%	2	8	8	8
11/13/73	81478153105N000	10%	8	8	8	8
12/1/73	81496153105N000	0%	8	8	2	8
2/11/74	81568152905N000	0%	8	8	8	8
3/1/74	81586152855N000	0%	8	8	8	8
4/24/74	81640152745N000	0%	2	8	2	2
10/21/74	81820152215N000	10%	8	8	8	8
11/26/74	81856152045N000	10%	8	8	5	8
12/14/74	81874152005N000	10%	8	8	8	8
1/1/75	81892151925N000	0%	8	8	8	8
12/18/75	823301519450000	10%	5	5	8	5
3/17/75	824201518050000	0%	8	8	8	8
4/4/76	824381517250000	10%	8	8	8	8
7/21/76	825461514350000	10%	8	8	8	8
9/22/76	855221440050000	10%	8	8	8	8
10/1/76	826181512350000	10%	0	8	8	8
2/22/77	827621506550000	0%	8	8	8	8

Landsat Worldwide
Reference System: Path 18, Row 39

