

Technical Report Series
Number 73-4

EXISTING AERIAL PHOTOGRAPHIC
RESOURCES OF COASTAL GEORGIA
AND A
BRIEF LISTING OF INTERPRETATIVE AIDS

by
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Skidaway Island, Georgia

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The Technical Report Series of the Georgia Marine Science Center is issued by the Georgia Sea Grant Program and the Marine Extension Service of the University of Georgia on Skidaway Island (P. O. Box 13687, Savannah, Georgia 31406). It was established to provide dissemination of technical information and progress reports resulting from marine studies and investigations mainly by staff and faculty of the University System of Georgia. In addition, it is intended for the presentation of techniques and methods, reduced data and general information of interest to industry, local, regional, and state governments and the public. Information contained in these reports is in the public domain. If this prepublication copy is cited, it should be cited as an unpublished manuscript.

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INTRODUCTION

In an effort to quantify various coastal resources of Georgia, aerial photography has become the most expedient and least expensive means of acquiring an adequate overview. Recent interest and examination of remote sensing has demonstrated that it is undoubtedly pertinent in assessing the primary productivity of salt marsh areas, assisting in the location of the least detrimental prospective highway sites across the wetlands, and recommending dredge spoil disposal sites along coastal waterways. The coastal Georgia wetlands are receiving increased attention through aerial photographic studies. Therefore, an assemblage of quality photographs is being compiled by multiple agencies which can then be utilized for the multifarious interests of numerous individuals and organizations.

Aerial photography is presently employed not only for a detailed examination of the Georgia marshlands but it is being utilized in forestry, geology, geography, hydrography, and general ecological studies of coastal environments. An extensive assortment of varied applications can be derived through the interpretative methodologies created, expanded, and perfected by these disciplines. Consequently, much of the required aerial photography is already available.

This technical report summarizes the available reservoir of photographic information of the Georgia coast including acquisition, interpretation, and utilization of aerial photography. It has been conceived to expose these resources for individuals interested in the procurement of aerial photographic materials. The preparation of this report and the acquisition of complete coastal Georgia photography during December of 1972 was funded in part by the United States Department of Commerce Office of Sea Grant, and we respectfully acknowledge their support.

ACQUISITION OF AERIAL PHOTOGRAPHY

There are numerous sources from which one can obtain black and white as well as color aerial photographs of the Georgia Coastal Regions taken at various times over a period of several years.

One such source of aerial photographs is the past Apollo and Gemini flights. Catalogs of photographs taken on various missions are available along with price quotations from:

Technology Application Center
The University of New Mexico
Albuquerque, New Mexico 87106

Examples of two available photographs that may be purchased from the above source are:

1. Georgia Coast (Savannah-Brunswick)
Photo Frame: No. AS9-3416
Latitude: 33⁰46'N
Longitude: 81⁰00'W
Altitude: 104 Miles
Cloud Cover: 45% (Oblique View)
2. Georgia Coast (Savannah-Brunswick)
Photo Frame: No. AS9-3417
Latitude: 33⁰41'N
Longitude: 81⁰00'W
Altitude: 104 Miles
Cloud Cover: 44% (Oblique View)

The pricing information is included in Appendix I.

ERTS (Earth Resources Technology Satellite) Imagery is also available for the entire coastal region. This imagery can be obtained by writing:

EROS DATA CENTER
Sioux Falls, South Dakota 47198
Commercial Ph: 605/339-2270
FTS Ph: 605/336-2381

ERTS Inquiry/Order Form is listed in Appendix II. (See also U.S. Geological Survey.)

The United States Department of Agriculture Agricultural Stabilization and Conservation Service (USDA-ASCS), the United States Department of Agriculture Soil Conservation Service (USDA-SCS), and private agencies have offered the following information related to aerial photographic coverage of coastal Georgia.

<u>Year of Flight</u>	<u>Scale</u>	<u>Coverage</u>	<u>Available From</u>
BRYAN COUNTY			
1954	1"=1320'	Complete	USDA-SCS P.O. Box 86 Pembroke, Georgia 31321 Ph: 912/653-4681
1958	1"=1320'	Complete	USDA-SCS P.O. Box 86 Pembroke, Georgia 31321 Ph: 912/653-4681
1964	1":330'	Partial	USDA-ASCS P.O. Box 368 Pembroke, Georgia 31321 Ph: 912/653-2581
1970	1":330'	Partial	USDA-ASCS P.O. Box 368 Pembroke, Georgia 31321 Ph: 912/653-2581
1970		Complete	USDA-SCS P.O. Box 86 Pembroke, Georgia 31321 Ph: 912/653-4681
CAMDEN COUNTY			
1953	1"=1320'	Complete	USDA-ASCS Nahunta, Georgia 31553 Ph: 912/462-5637
1965	1":1600'	Complete	Schmidt Photogrammetrics P.O. Box 82464 Atlanta, Georgia 30354 Ph: 404/761-0855

<u>Year of Flight</u>	<u>Scale</u>	<u>Coverage</u>	<u>Available From</u>
CHATHAM COUNTY			
1952	1" : 330'	Complete	USDA-ASCS P.O. Box 9543 Savannah, Georgia 31402 Ph: 912/232-4321, Ext. 202
1968	1" = 1320'	Complete	USDA-SCS P.O. Box 9381 Savannah, Georgia 31402 Ph: 912/236-0761
1970	1" : 50,000"	Complete	USDA-SCS P.O. Box 9381 Savannah, Georgia 31402 Ph: 912/236-0761
1970	1" : 400' and 1" : 1000'	Complete	Metropolitan Planning Commission 2 Bay Street West Savannah, Georgia 31402 Ph: 912/236-0761
1972	1" : 500'	Complete	Jack W. Berry Associates, Inc. P.O. Box 23 Morrow, Georgia 30260 Ph: 404/361-6956 Ph: 404/361-4764
GLYNN COUNTY			
1953	1" = 660'	Complete	USDA-ASCS Jesup, Georgia 31545 Ph: 912/427-2502
1962	1" = 1660'	Complete	Schmidt Photogrammetrics P.O. Box 82464 Atlanta, Georgia 30354 Ph: 404/761-0855
1973	1" = 2000'	Complete	Schmidt Photogrammetrics P.O. Box 82464 Atlanta, Georgia 30354 Ph: 404/761-0855

<u>Year of Flight</u>	<u>Scale</u>	<u>Coverage</u>	<u>Available From</u>
LIBERTY COUNTY			
1953	1":660'	Partial	USDA-ASCS P.O. Box 617 Hinesville, Georgia 31313 Ph: 912/876-3390
1963	1":660'	Partial	USDA-ASCS P.O. Box 617 Hinesville, Georgia 31313 Ph: 912/876-3390
1973	1": 1700'	Partial	Park Aerial Surveys P.O. Box 21379 Louisville, Kentucky 40221 Ph: 502/366-4571

With permission from:
H. L. Yoh Company
1764 Watson Blvd.
Warner Robin, Georgia 31093
Ph: 912/923-4525

And: County Commissioners Office
Hinesville, Georgia 31313
Ph: 912/876-2164

LONG COUNTY			
1953	1":330'	Complete	USDA-ASCS P.O. Box 147 Ludowici, Georgia 31316 Ph: 912/545-2061
1968	1":660'	Partial	USDA-ASCS P.O. Box 147 Ludowici, Georgia 31316 Ph: 912/545-2061

<u>Year of Flight</u>	<u>Scale</u>	<u>Coverage</u>	<u>Available From</u>
MCINTOSH COUNTY			
1953	1"=330'	Complete	USDA-ASCS P.O. Box 147 Ludowici, Georgia 31316 Ph: 912/545-2061
1967	1"=2000'	Complete	Thomas M. Lowe, Jr. and Associates, Inc. Consulting Engineers Atlanta, Georgia Ph: 404/875-0136

Appendix III is complete with U.S. Department of Agriculture Agricultural Stabilization and Conservation Service aerial photo order form, instructions, and price list.

Aerial photographic reproductions are obtainable through the United States Geological Survey who maintains records of aerial photographic coverage of the United States based on reports from Federal and State agencies and commercial companies. These photographs are utilized primarily for topographic and geological mapping. Appendix IV contains a price list for available prints. The U.S. Geological Survey has recently opened "browse files" in seventeen locations across the United States where 16mm microfilm copies of imagery taken by the first experimental Earth Resources Technology Satellite (ERTS-I) can be viewed. Forms, procedures for ordering, and price lists are posted at all viewing locations. The file presenting Georgia with the easiest accessibility is the Tallahassee, Florida file located in the Florida Department of Transportation. Further information

can be acquired by writing:

The Map Information Office
U.S. Geological Survey
Washington, D. C. 20242

Still another agency which provides aerial photographs of the Georgia coast as well as the entire eastern coastal area is the National Oceanic and Atmospheric Administration's (NOAA) National Ocean Survey (NOS). Appendix V includes both purchasing and price information. It may be noted that the sale of aerial photographic reproductions is secondary to the NOS's responsibility for charting; therefore, orders could be delayed. Inquiries should be directed to:

Director
National Ocean Survey
National Oceanic and Atmospheric Administration
Rockville, Maryland 20852

Continental Aerial Surveys has available black and white aerial photography of all coastal cities with a population of over three thousand. This photography was taken in 1970 and has a scale of 1":2000'. For price information and availability of the photography contact:

Mr. K. H. Howard, Jr.
Continental Aerial Surveys
P. O. Box 335
Alcoa, Tennessee 37701
Ph: 615/577-8911

Finally, the most recent and complete photographic coverage of coastal Georgia was initiated in early December of 1972. On 2 December 1972 within two hours of low tide during midday, aerial photographs generally including all land from the eastern edge of the sea islands westward approximately to a north-south line designated by U.S. Highway No. 17 were taken. These photographs since exposed on Kodak Aerocolor Negative film can be purchased

as black and white prints, black and white positive transparencies, color prints or color transparencies. Fold-out indices of these imageries will be found inside the back cover. Single frames and/or complete sets are available to scale or enlarged. Appendix VI contains price information. All inquiries should be directed to:

MAPCOtec, Inc.
P. O. Box 310
Daytona Beach, Florida 32015

PHOTOINTERPRETATION OF AERIAL PHOTOGRAPHS

The potential for acquisition of precision aerial photographs is matched by the necessity for accurate interpretation of the photographs. The following is a listing of several sources of interpretative methodology:

The Eastman Kodak Company has three publications available for interpretative usage: "Photointerpretation and Its Uses: A non-technical review of some of the aspects of interpreting the information contained in an aerial photograph" (Kodak Pamphlet No. M-42, August 1968), "Photointerpretation for Land Managers" (Kodak Publication No. M-76, September 1970), and "Photointerpretation for Planners" (Kodak Pamphlet No. M-81, 1972). Each of these publications is available from:

Professional, Commercial, and Industrial Markets Division
Department 454
Eastman Kodak Company
Rochester, New York 14650

The following five publications are suggested for interpretative analysis of aerial photography:

American Society of Photogrammetry. 1968. Manual of Color Aerial Photography. First Ed. Available from: American Society of Photogrammetry, 105 N. Virginia Ave., Falls Church, Virginia 22046.

American Society of Photogrammetry. 1971. Proceedings of the Third Biennial Workshop on Color Aerial Photography in the Plant Sciences and Related Fields. Available from: American Society of Photogrammetry, 105 N. Virginia Ave., Falls Church, Virginia 22046.

American Society of Photogrammetry. 1972. Proceedings of a Symposium on Coastal Mapping, Washington, D. C., First Ed. Available from: American Society of Photogrammetry, Potomac Region, Photogrammetric Surveys Division, 105 N. Virginia Ave., Falls Church, Virginia 22046.

Johnson, Philip L. (Editor). 1969. Remote Sensing in Ecology. University of Georgia Press, Athens, Georgia 30602.

NASA. 1968. Exploring Space with a Camera. Scientific and Technical Information Division, Office of Technology Utilization, National Aeronautics and Space Administration, Washington, D. C. 20418.

NASA. 1971. Monitoring Earth Resources from Aircraft and Spacecraft. Scientific and Technical Information Division, Office of Technology Utilization, National Aeronautics and Space Administration, Washington, D. C. 20418.

National Academy of Sciences. 1970. Remote Sensing; with Special Reference to Agriculture and Forestry. Printing and Publishing Office of National Academy of Sciences, 2101 Constitution Ave., Washington, D. C. 20418.

The following publications, being more specific than those previously mentioned, may be of interest for a more complete analysis and a basic knowledge of photointerpretation of aerial photography.

Anson, A. 1966. Color photo comparisons. Photogrammetric Engineering. 32:286-297.

- Anson, A. 1968. Color Aerial Photos in the Reconnaissance of Soils and Rocks. Reprint F3-659 Eastman Kodak Co.
- Avery, T. E. 1968. Interpretation of Aerial Photographs. Minneapolis: Burgess Publishing Company.
- Brock, G. C. 1952. Physical Aspects of Air Photography. London: Longmans. Green and Company.
- Colwell, R. N. 1967. Remote sensing as a means of determining ecological conditions. BioScience. 17:444-451.
- Colwell, R. N. 1968. Remote sensing of natural resources. Scientific American. 218:59-69.
- Duddek, M. 1967. Practical Experiences with Aerial Color Photography. Photogrammetric Engineering. 33(10):1117-1125.
- Egan, W. C. and M. E. Hair. 1971. Automated delineation of wetlands in photographic remote sensing. In Willow Run Laboratories. Summaries Seventh International Symposium of Remote Sensing of Environment. University of Michigan, Ann Arbor, Michigan. p. 199-200.
- Eyre, L. A. 1971. High-altitude color photos. Photogrammetric Engineering. 37:1149-1153.
- Gallagher, J. L., R. J. Reimold, and D. E. Thompson. 1972. Remote Sensing and Salt Marsh Productivity: Proceedings of the 38th Annual Meeting of the American Society of Photogrammetry in Washington, D. C.

- Gallagher, J. L., R. J. Reimold, and D. E. Thompson. 1973. A Comparison of Four Remote Sensing Media for Assessing Salt Marsh Primary Productivity: Proceedings of the VIII International Symposium on Remote Sensing of Environment. University of Michigan, Ann Arbor, Michigan. (In press)
- Grimes, B. H. and J. C. E. Hubbard. 1971. A comparison of film type and the importance of season for interpretation of coastal marshland vegetation. *Photogrammetric Record*. 7:213-222.
- Heller, R. C. 1971. Imaging with photographic sensors. In National Research Council. Remote Sensing with Special Reference to Agriculture and Forestry. National Academy of Sciences. Washington, D. C. p. 35-72.
- Howard, John A. 1970. *Aerial Photo-ecology*. New York: American Elsevier.
- Mott, P. 1966. Some Aspects of Colour Aerial Photography in Practice and Its Application. *The Photogrammetric Record*. 5(28):221-237.
- Murtha, P. A. 1969. Aerial photographic interpretation of forest damage: An annotated bibliography. Department of Fisheries and Forestry. Ottawa, Canada. p. 76.
- Murtha, P. A. 1972. A Guide to Air Photo Interpretation of Forest Damage in Canada. Forest Management Institute, Canadian Forestry Service Publication No. 1292, Ottawa.
- Olson, D. P. 1964. The Use of Aerial Photographs in Studies of Marsh Vegetation. *Maine Agr. Expt. Sta. Bull.* 13. p. 62.

- Pestrong, R. 1969. Multiband photos for a tidal marsh. *Photogrammetric Engineering*. 35:453-470.
- Reimold, Robert J. 1971. Remote Sensing of Salt Marsh Productivity: Proceedings of the Third Biennial Workshop on Color Aerial Photography in the Plant Sciences--American Society of Photogrammetry and The University of Florida in Gainesville, Florida.
- Reimold, R. J., J. L. Gallagher, and D. E. Thompson. 1972. Coastal Mapping with Remote Sensors: Proceedings of the Coastal Mapping Symposium--American Society of Photogrammetry in Washington, D. C. p. 99-112.
- Reimold, R. J., J. L. Gallagher, and D. E. Thompson. 1973. Remote Sensing of Tidal Marsh Primary Production. *Photogrammetric Engineering*. (In press)
- Schöbler, H. 1969. Analysis of Image Definition. *Photogrammetric Engineering*. 35(12):1228-1238.
- Sorem, A. L. 1967. Principles of Aerial Color Photography. *Photogrammetric Engineering*. 33(9):1008-1018.
- Strandberg, Carl H. 1967. *Aerial Discovery Manual*. New York: John Wiley and Sons, Inc.
- Strandberg, Carl H. 1968. *Color Aerial Photography*. Reprint F3-658 Eastman Kodak Co.

Stroud, Linda M. and A. W. Cooper. 1969. Color-infrared Aerial Photographic Interpretation and Net Productivity of a Regularly Flooded North Carolina Salt Marsh. Water Resources Research Institute of the University of North Carolina. Report No. 14. p. 86.

Wobber, Frank J. 1968. Aerial and Orbital Images in Urban Environment Studies. Reprint F3-94 Eastman Kodak Co.

Woodrow, H. C. 1967. The Use of Colour Photography for Large-Scale Mapping. The Photogrammetric Record. 5(30):433-460.

PHOTOGRAMMETRIC EQUIPMENT

Remote sensing is enhanced by interpretative methodology which ultimately initiates useful interpretations to be taken from available photographs with some relative degree of accuracy. This accuracy of interpretation is further magnified by the acquisition and utilization of proper interpretative equipment. A minimal listing of valuable aids, to follow, will augment the interpretation of aerial photographs.

1.) A quality photograph is naturally an essential portion of photo-interpretation. These photographs must be adequately protected from easily acquired emulsion scratches which at a later observation session may be annoying if not, in an interpretative context, deceiving. Therefore, it has been discovered that single frame photographs can be non-expensively and adequately protected by placing them within $9\frac{1}{2}$ inch by 12 inch acetate sheet protectors which can then be placed in a loose leaf binder for easy reference. Also available are binders with 10 acetate sheet protectors, size 14" x 11", already included. Both the acetate sheet protectors and the sets are available from:

The Darien News
P. O. Box 496
Darien, Georgia 31305

12" x $9\frac{1}{2}$ " Acetate sheet protectors: 50/box (3 oval holes): Catalog No. L2-15: \$15.00

14" x 11" Set (Binder with 10 acetate sheet protectors): Catalog No. 4117: \$12.00 (Extra sheet protectors \$0.50 each)

2.) For interpretative usage it is helpful to examine color or black and white transparencies on a significantly smaller scale than the original

diapositive. This allows extreme magnification of the minute detail contained within the context of the photograph to become apparent even to the unaided eye. One piece of equipment which produces such magnification is a Bessler Portascribe Overhead Projector (12.5" E.F. Series) with a 1000 watt BRH lamp and a three element lens. This particular projector is available from:

Charles Bessler Company
East Orange, New Nersey

Catalog No. 17626-EE: Approximately \$250.00

3.) Keuffel and Esser Company makes a portable film viewer with a film transport mechanism. This lighted viewing table allows entire spools of transparencies to be examined in a relatively brief period of time as well as allowing lengthy inspection of both single frame and spools of diapositives according to the actual scale of the positive image. This viewer along with photogrammetric equipment is available through:

Keuffel and Esser Company
Photogrammetric Systems Division
20 Whippany Road
Morristown, New Jersey 07960

Viewer: Catalog No. 72-0210: \$175.00

4.) Another useful tool for interpretative purposes is an Aerial Exposure Computer computing the ground distance covered during exposure, the total image motion on film, the size of the lens opening, and the image velocity. These factors are often essential for accurate photo-interpretation of both positive images and prints. The new "Kodal Aerial Exposure Computer" (Kodak Publication No. R-10) is available by sending

a prepaid order (\$2.50 including applicable state and local taxes) to:

Eastman Kodak Company
Department No. 454
343 State Street
Rochester, New York 14650

Also available through the above listed address is Kodak Publication No. M-77 entitled "Notes on the Kodak Aerial Exposure Computer".

5.) Aero Service Corporation has a pocket computer for interpretative use (slide rule type), which provides statistics for fifteen flight heights ranging from 1,200 feet to 31,680 feet. Single pocket computers are available free of charge by writing requests to:

Aero Service
Division of Litton Industries
4219 Van Kirk Street
Philadelphia, Pennsylvania 19135

PHOTOGRAPHIC SYSTEMS

To further one's knowledge of aerial photography, a consideration of photographic systems is essential. Photographic systems incorporate such factors as film structure, film dimension, splices, photographic properties, speed, strength properties, surface properties, brittleness, etc. into systems applicable to a specified use. The Eastman Kodak Company offers publications which may be of assistance in a discussion of aerial photographic systems:

1. Properties of Kodak Materials for Aerial Photographic Systems.
Volume I: Kodak Aerial Films and Photographic Plates. Publication No. M-61, \$4.95, Standard Book No. 0-87895-037-X.
2. Properties of Kodak Materials for Aerial Photographic Systems.
Volume II. Physical Properties of Kodak Aerial Films. Publication No. M-62, \$2.95, Standard Book No. 0-87985-038-8.
3. Kodak Data for Aerial Photography. Publication No. M-29, \$2.75, Catalog No. 1513381.
4. Kodak Aero-Neg Color System. Publication No. M-40. This system has been found to be one of the most versatile systems available.
5. Specifications and Characteristics of Kodak Aerial Films. Publication No. M-57L, \$0.10, Catalog No. 1080571.

These publications are available from:

Eastman Kodak Company
Department 454
Rochester, New York 14650

Also available from Kodak is a publication entitled Index to Kodak Technical Information (Publication No. L-5) which gives a list of all Kodak technical pamphlets and data books along with prices and ordering information. For a complimentary copy of this publication write to:

Department 412-L
Eastman Kodak Company
Rochester, New York 14650

In addition to the references acknowledged within the above publications, the following may be of interest:

Fritz, N. L. 1967. Optimum Methods for Using Infrared Sensitive Color Films. *Photogrammetric Engineering*. 33(10):1128-1138.

Glaflkides, P. 1960. *Photographic Chemistry*. London: Fountain Press.

Hunt, R. W. G. 1965. Luminance Levels in Colour Transparencies and Reflexion Prints. *The Journal of Photographic Science*. 13(2):108-116.

Mullins, L. 1966. Some Important Characteristics of Photographic Materials for Air Photographs. *The Photogrammetric Record*. 5(28):240-270.

Welch, R. 1968. Film Transparencies vs Paper Prints. *Photogrammetric Engineering*. 34(89):490-501.

AERONAUTICAL SECTIONAL CHARTS AND TOPOGRAPHIC MAPS

Aeronautical sectional charts and topographic maps can be interpretative aids as another viewpoint of the area covered by the aerial photograph in question. The following two organizations provide such charts and maps.

The National Ocean Survey publishes aeronautical charts of the United States. These may be obtained by designating the name and series of the chart; for example, Savannah local - section X. Procedural information and charts can be acquired through:

The Distribution Division (C-44)
National Oceanic and Atmospheric Administration
National Ocean Survey
Riverdale, Maryland 20840
Ph: 301/344-2613

Sectional charts: \$1.00 each

Local charts: \$.80 each

The United States Department of the Interior, Geological Survey is a major source of topographic maps of Georgia through the following dealers as well as the Geological Survey itself. It should be noted that dealers' prices may be higher than the Survey's price. Some of the dealers are as follows:

Aerial Surveys
107 Church Street, N.W.
Marietta, Georgia 30060

John J. Harte Associates Inc.
Architects & Engineers
198 Luckie Street
Atlanta, Georgia 30303

MAPCOTec, Inc.
2215 Perimeter Park, N.E.
Atlanta, Georgia 30341

Savannah Blue Print Company
11 East York Street
Savannah, Georgia 31401

Thomas M. Lowe, Jr. & Associates, Inc.
Consulting Engineers
1920 Monroe Drive, N.E.
Atlanta, Georgia 30324

White's Book Store
Cross Country Plaze
Columbus, Georgia 31906

And finally the initial source of these topographic maps is:

Distribution Section
U. S. Geological Survey
1200 South Eads Street
Arlington, Virginia 22202

TIDAL DATA

The following tidal information may be of assistance in photographic interpretation and tidal-photographic correlations.

Tidal Current Tables (Atlantic Coast of North America) and Tide Tables (East Coast of North and South America) may be obtained by writing:

National Oceanic and Atmospheric Administration
National Ocean Survey
Rockville, Maryland 20852

Tidal Current Tables: \$2.00

Tide Tables: \$2.00

More specific data (for example, monthly tidal data sheets containing the high and low tidal heights and time for Mayport, Florida and Fort Pulaski, Georgia along the southeastern Atlantic coast) are also available.

Contact:

Mr. Saul C. Berkman
Chief, Processing Section
Tides Branch
Oceanographic Division
National Ocean Survey
National Oceanic and Atmospheric Administration
6001 Executive Boulevard
Rockville, Maryland 20852

The price of this service is \$10.00 per year.

Also tidal data for the Duplin River Estuary from June of 1972 until . . . may be requested from:

Dr. Robert J. Reimold
The University of Georgia
Marine Institute
Sapelo Island, Georgia 31327

The data requested should be specifically related to a relatively short period of time rather than complete tidal tables of the estuary system. The Institute is not equipped for the reproduction of large quantities of data.

COASTAL PROTECTION AGENCIES

This technical report is concerned with coastal Georgia which includes marshland, waterways, and mainland areas. Moreover, much of the available photography listed is likely to contain these aforementioned areas. Therefore, it is necessary to acknowledge coastal protection agencies which may be of assistance in answering various questions which may naturally arise during the course of an interpretation session.

The first organization, presently an eight county commission, is the Coastal Area Planning and Development Commission (CAPDC). It was established primarily to create, promote, and foster development of industrial, civic, commercial, educational, and natural resources. The commission is specifically interested in forest and natural water areas: consisting of fresh water streams and rivers, salt marshes, estuaries, deep water harbors, and finally, the Atlantic Ocean. Coastal development information may be easily obtained by contacting:

Mr. Vernon Martin (Planning Director)
The Coastal Area Planning and Development Commission
P. O. Box 1316
Brunswick, Georgia 31520

The Army Corps of Engineers is responsible for permits to perform work or place structures in or across navigable waters of the United States. These decisions are based on an evaluation of the impact of the proposed work on the public interest. "Factors affecting the public interest include, but are not limited to, navigation, fish and wildlife, water quality, economics, conservation, aesthetics, recreation, water supply, flood damage prevention, ecosystems, and, in general, the needs and welfare of the people." Therefore, any waterway construction appearing on aerial photographs which

may be of interest to the viewer may be verified by the Army Corps of Engineers. Any queries related to permit procedures may be directed to:

District Engineer
Corps of Engineers
Department of the Army
Savannah District, Corps of Engineers
P. O. Box 889
Savannah, Georgia 31402

For information concerning granted permits (present or past construction), queries should be directed to Chief, Permits and Statistics Branch, at the above address.

Another source of waterway information can be provided by the United States Coast Guard. Their jurisdiction pertains to vessel documentation, air and marine emergency, and reparation of buoys and other coastal structures. They may be reached at the following addresses:

U.S. Coast Guard
Vessel Documentation
Federal Building
Brunswick, Georgia 31520 Ph: 912/264-1747
Savannah, Georgia 31402 Ph: 912/232-4321

U.S. Coast Guard (Air and Marine Emergency)
1 East Beach
St. Simons Island, Georgia 31322 Ph: 912/638-8210

U.S. Coast Guard Cutter Smilax
Foot of F Street
Brunswick, Georgia 31520 Ph: 912/265-5645

The Georgia Coastal Marshland Protection Act of 1970 is enforced by the Georgia Department of Natural Resources, Game and Fish Division. This agency can give the aerial photo interpreter insight into the marshland areas present within the coastal area. For further information contact:

Dr. F. C. Marland
Department of Natural Resources
Game and Fish Division
Sapelo Island, Georgia 31327
Ph: 912/485-2486

Mr. David Gould
Georgia Game and Fish Division
Howard Coffin Park
Brunswick, Georgia 31520
Ph: 912/265-1550

Georgia Department of Natural Resources
Game and Fish Division
Demeries Creek Office
Richmond Hill, Georgia 31324
Ph: 912/233-2383

APPENDIX I

GEMINI/APOLLO PHOTOGRAPHY

PRICE LIST

All Gemini & Apollo 6, 7, 8 & 9 Earth-Oriented Imagery

35mm Superslides, Color Transparencies, cardboard mounts (2" x 2")	\$	0.90	each
70mm Slides, Color Transparencies, cardboard mounts (2¼" x 2¼")	\$	1.35	each
8" x 8" Color Prints			
First print of any frame	\$	10.00	
Each duplicate of same frame	\$	5.00	
8" x 8" Black & White Prints			
First print of any frame	\$	5.00	
Each duplicate of same frame	\$	2.50	

Special Edited Sets

36 Superslides (35mm) chosen as outstanding examples of Gemini synoptic photography and for general interest - with brief descriptive catalog.	\$	27.00
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The following sets were fashioned to illustrate various features and aspects of the indicated disciplines:

Discipline Sets Selected from Gemini Synoptic Photography

Geology, 61 slides	\$	45.75
Hydrology, 23 slides	\$	17.25
Oceanography, 46 slides	\$	34.50
Geography, 58 slides	\$	43.50
Meteorology, 54 slides	\$	40.50
Land Use, Urban Studies, 16 slides	\$	12.00
Peru, Saturation Coverage, 16 slides	\$	12.00
SW U.S. and Northern Mexico, 39 slides	\$	29.25

APPENDIX II

ERTS INQUIRY/ORDER FORM
(please print or type)

Data to be furnished by:

EROS DATA CENTER
Sioux Falls, SD 57198
Commercial: 605-339-2270
FTS : 605-336-2381

Date _____
Total \$ _____

NAME : _____
ADDRESS: _____

PHONE: _____
Commercial _____
FTS _____

AREA(S) OF INTEREST

If you have a map available with geographic or UTM coordinates, please provide the geographic location by one of the following:

- _____ Latitude and longitude of a point (if you are interested in a small area)*
- _____ Latitude and longitude of the center and radius in miles (if you are interested in a larger, generally circular area)
- _____ Latitude and longitude of up to eight corners of a polygon (if you are interested in an irregular area)

*You may describe a specific area by geographic name if the coordinates are unknown. i.e., I am interested in a 10 mile radius circle centered on the city of Atlanta, Georgia. Explain on the reverse of this form.

DATA DESIRED (System Corrected Images-Bulk) Black and White Bands
Circle the desired band(s) on each sensor -- Return Beam Vidicon 1 2 3
Multispectral Scanner 1 2 3 4
Circle the percentage of maximum cloud cover acceptable 10 20 30 40 50 60 70 80 90

WHEN YOU PLACE THE ORDER, WE WILL FURNISH THE LATEST PHOTOGRAPH(S) OBTAINED OVER YOUR AREA OF INTEREST UNLESS YOU SPECIFY OTHERWISE.

SIZE	SCALE	PRINTS	UNITS	PRICE	TRANSPARENCIES	UNITS	PRICE
		UNIT PRICE**			UNIT PRICE**		
Contact (76mm)	1:3,369,000	\$1.25			\$2.50		
Enlargement (8 x 9)	1:1,000,000	1.75			3.00		
Enlargement (18 x 14)	1:500,000	3.50			---		
Enlargement (40 x 40)	1:250,000	9.00			---		
Microfilm (16mm) 100 ft. roll	---	---			15.00		
Totals	---	(enter in line A below)			(enter in line B below)		

** For more than 25 photographs of one frame in an order there is a reduction in unit price. This reduced price may be obtained from the Data Center.

- I wish to order a color composite, if available (DO NOT SEND MONEY UNTIL NOTIFIED OF AVAILABILITY BY THE DATA CENTER)
- I wish to order Scene Corrected Images (Precision) (DO NOT SEND MONEY UNTIL NOTIFIED OF AVAILABILITY BY THE DATA CENTER)
- I wish to place a standing order for repetitive cover (You will be contacted by the Data Center to arrange details. (DO NOT SEND MONEY FOR A STANDING ORDER)

PRINTING INSTRUCTIONS

Check whether product should be:

1. Undodged (Reproductions will normally be dodged electronically or manually to achieve a uniform density over the image area. Check this item if you plan to use the image for radiometric analysis, in which case the density distribution in the original material will be preserved.)
2. Print to:
 - Accentuate highlighted areas
 - Normal
 - Accentuate shadowed areas
3. Special requirements:

PRICE CALCULATION

- A. Total from A (above) \$ _____
 - B. Total from B (above) + \$ _____
 - C. Total cost of reproductions (A + B) \$ _____
 - Plus Cost of Shipping
 - D. Regular Mail \$ 0.00
 - E. Air Mail (\$2 + 1X of line C) \$ _____
 - F. Total price of order (C + D + E) \$ _____
- Payment Made By:
- Purchase Order No. _____
 - Check No. _____
 - Government Account No. _____

APPENDIX III

U. S. DEPARTMENT OF AGRICULTURE
Agricultural Stabilization and Conservation Service



POSTAGE & FEES PAID
United States Department of Agriculture

OFFICIAL BUSINESS
Penalty for Private Use, \$300

PURCHASER'S CHECK LIST

1. Read instructions on back of form.
2. Be sure correct entries are made in columns 1 through 5. Do not make entries in columns 6 through 10.
3. Read notice at bottom of front of form.
4. Be sure to enclose remittance.

(1) _____
PRINT OR TYPE - (NAME OF PURCHASER)

(2) _____
(STREET ADDRESS)

(3) _____
(CITY, STATE AND ZIP CODE)

TOTAL REPRODUCTIONS	PURCHASER'S ORDER NO.	AMOUNT REMITTED \$	ORDER NO.	PAGE OF
IDENTIFICATION OF PHOTOGRAPHY			AMOUNT OF ORDER \$	DATE
STATE	COUNTY		REFUND \$	SCHEDULE NO.

IMPORTANT: List roll and exposure numbers consecutively.

1	PAPER SIZE 2	QUANTITY EACH 3	SYMBOL 4	ROLL NO. 5	EXPOSURE NO. 6	PROJECTION SETTING 7	IMAGE DIMENSION 8	E - W OR SWING 9	N - S OR TILT 10	LAB. CHECK 11
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

NOTICE: Normally orders will be made and shipped within 30 days after receipt. Charges for Air Shipments must be prepaid and added to the cost of the order.

IMPORTANT - On LABEL on face of order print or type items 1 thru 3 only.

IDENTIFICATION OF PHOTOGRAPHY

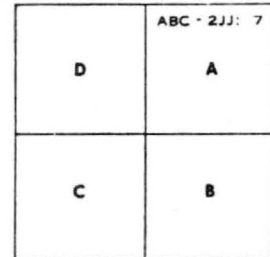
PAPER SIZE	QUANTITY	SYMBOL	ROLL NO.	EXPOSURE NO.
1	2	3	4	5
24" x 24"	1	D J D	3 A	96

Column 1. Enter paper size 9½" x 9½", 24" x 24" etc., When ordering indexes enter "Photo Index" and list sheet numbers and year of photography.

Column 2. Enter number of prints wanted from each exposure number.

Column 3, 4 and 5. Enter the symbol, roll number, and the exposure number of the negative, Exposure numbers may be listed in inclusive sequences. This information is in the upper right corner of each photograph and may be obtained from photo-index sheets or from the Agricultural Stabilization and Conservation Office in the county where the farm or area photographed is located.

* QUADRANT NUMBERING SYSTEM



(Area Covered by Negative)

Example: Your area of interest lies wholly within lower left quadrant, you should order ABC-2JJ: 7C. When more than one quadrant from the same negative is ordered, image overlap will be furnished.

If you do not know your area of interest as related to the negative, we suggest a visit to the ASCS office for assistance.

PRICES (Quoted prices are based on paper size)

Remittance is required before prints will be made, and must be by check, money order, or draft payable to ASCS. Stamps will not be accepted.

TYPE OF REPRODUCTION	SIZE	APPROX. SCALE FROM 1:20,000 PHOTOGRAPHY	APPROX. SCALE FROM 1:40,000 PHOTOGRAPHY	COST (per print)	
				1 - 25	2/ EXCESS OVER 25 3/
Contact Print ^{1/}	9½" x 9½"	1" = 1667'	1" = 3334'	\$1.25	\$0.90
Enlargement	13" x 13"	1" = 1320'	1" = 2640'	2.50	2.00
Enlargement	17" x 17"	1" = 1000'	1" = 2000'	3.00	2.50
Enlargement	24" x 24"	1" = 660'	1" = 1320'	4.00	3.25
Enlargement	24" x 24"	1" = 330' * (Quadrant)	1" = 660' * (Quadrant)	4.00	3.25
Enlargement	38" x 38"	1" = 400'	1" = 800'	8.00	7.00
Photo Index (No. of sheets per county depends on size of county)	20" x 24"			2.50	2.50

All enlargements are made at diameters to fit paper size unless scale accuracy is requested. For "scale accuracy" add \$0.50 per print.

- 1/ For polyester base paper (9½" x 9½" only) add \$0.50 per contact print.
- 2/ Applies to first 25 prints ordered regardless of size of order.
- 3/ Applies to each print in excess of 25. Quantity prices apply only when order is shipped to one address.

ADDRESS ORDERS FOR PHOTOGRAPHS OF THESE STATES TO:

Western Aerial Photography Laboratory
Compliance & Appeals Division
ASCS-USDA
2505 Parley's Way, Salt Lake City, Utah 84109
Tel. Area Code 801, 524-5856

- Arizona
- Arkansas
- California
- Colorado
- Hawaii
- Idaho
- Kansas
- Louisiana
- Montana
- Nebraska
- Nevada
- New Mexico
- North Dakota
- Oklahoma
- Oregon
- Texas
- Utah
- Washington
- Wyoming

ADDRESS ORDERS FOR PHOTOGRAPHS OF THESE STATES TO:

Eastern Aerial Photography Laboratory
Compliance & Appeals Division
ASCS-USDA
45 South French Broad Avenue, Asheville, N.C. 28801
Tel. Area Code 704, 254-0961 Extension 610

- Alabama
- Connecticut
- Delaware
- Florida
- Georgia
- Illinois
- Indiana
- Iowa
- Kentucky
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Missouri
- New Hampshire
- New Jersey
- New York
- North Carolina
- Ohio
- Pennsylvania
- Rhode Island
- South Carolina
- South Dakota
- Tennessee
- Virginia
- West Virginia
- Wisconsin

Orders for photography not held by Agricultural Stabilization and Conservation Service should be forwarded to the holding agency; if address is not known forward to the Coordinator of Aerial Photographic Work of the Department, ASCS, U. S. Department of Agriculture, Washington, D. C. 20250.

APPENDIX IV

UNITED STATES GEOLOGICAL SURVEY

Prices

Contact prints, enlargements, and transformed prints are unmounted and untrimmed. The reproduction will be printed on standard paper stock unless the order specifies other materials such as waterproof (low shrink) paper or stable base film.

In most cases similar prices are charged by other Federal agencies. Prices are subject to revision at any time.

	<u>1 to 25</u> <u>each</u>	<u>Over 25*</u> <u>each</u>
Contact prints (9 x 9 in.)	\$1.75	\$1.25
Enlargement Magnification:		
1.5X (14 x 14 in.)	\$3.00	\$2.50
2X (18 x 18 in.)	3.50	3.00
3X (27 x 27 in.)	4.50	3.50
4X (36 x 36 in.)	9.00	8.00
For an intermediate-size enlargement, use the price listed for the next larger size. For example, one 24- x 24-inch enlargement costs \$4.50.		
Transformed prints from either convergent or transverse low-oblique photographs	\$3.50	\$3.00
Film positives contact printed from aerial negatives	\$3.00	\$3.00
Copy Negatives (one step)	\$3.00	\$3.00
Kelsh plates		
Contact prints on glass. Specify thickness (0.25 or 0.06 inch) and method of printing (emulsion to emulsion or through film base)	\$6.50	\$6.00
ER-55 plates		
Reductions on glass (11 x 11 cm.)	\$5.00	\$4.50
Photoindexes		
7½- & 15-minute quadrangle units (10- x 12-in. sheet)	\$2.50	
High-altitude photography (20- x 24-in. sheet)	\$3.00	

*Quantity prices apply only to those prints ordered in excess of 25 of the same size. For example, 26 contact prints cost \$45.00 (25 at \$1.75 = \$43.75 + 1 at \$1.25).

APPENDIX V

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL OCEAN SURVEY

Information for Purchasing

1. The sale of aerial photographic reproductions is secondary to the National Ocean Survey's responsibility for charting. Normally, outside orders will be filled in less than 30 days but our official charting requirements will be given priority. Forward inquiries to: Director, National Ocean Survey, NOAA, Rockville, Maryland 20852. The requester should describe the specific area of interest by geographic coordinates, a detailed description or a sketch.
2. Payment by check, money order, or draft, payable to National Ocean Survey, Commerce Department, shall accompany orders.
3. Prints are not stocked. They are custom processed for each order and cannot be returned for credit or refund. This includes mis-ordered prints.
4. Shipment by parcel post is prepaid. Shipment by express, airmail or involving any special handling must be paid by the purchaser.
5. The scales of aerial photographs are only approximate due to shrinkage or expansion of paper caused by atmospheric conditions, uncertainty in reported flight altitude, tip and tilt of the aircraft and the effect of ground relief.
6. Authorization to purchase photographs of classified areas must be obtained by the purchaser from appropriate military authorities. This office will inform the requester when such clearance is required and how to submit the application.
7. National Ocean Survey aerial photography is of the single lens type, some panchromatic, some color and a smaller portion of infrared.

Pertinent information on each type follows:

Panchromatic Aerial Photographs (Black & White)

Single-lens aerial photographs are usually taken at 1:10,000, 1:20,000, 1:24,000, 1:30,000 or 1:40,000 scale. Photographs are printed on double-weight glossy paper unless double-weight matte is specified.

Contact prints are 9"x9" and the ground area varies with the scale as follows:

<u>Scale</u>	<u>Area</u>	<u>1 Side</u>
1:10,000 (1 in. = 833 ft.)	2.0 sq. mi.	1.42 mi.
1:12,000 (1 in. = 1000 ft.)	2.9 sq. mi.	1.70 mi.
1:20,000 (1 in. = 1667 ft.)	8.1 sq. mi.	2.84 mi.
1:24,000 (1 in. = 2000 ft.)	11.6 sq. mi.	3.41 mi.

NOAA, continued

Infrared Aerial Photographs (Black & White)

The National Ocean Survey occasionally uses infrared photography for waterline surveys. Water photographs black and the photography shows a sharp cutoff line between land and water areas; this feature is most useful for our nautical charting program.

Prices of contact prints and enlargements are the same for infrared and panchromatic photography.

Price of Contact Prints:

\$2.00 each, for 1 through 25 - \$1.25 each, after first 25

Price of Enlargements:

2x ratio (18"x18") \$4.00 each, for 1 through 25
\$3.00 each, after first 25

3x ratio (27"x27") \$5.00 each, for 1 through 25
\$3.50 each, after first 25

4x ratio (36"x36") \$10.00 each, for 1 through 25
\$8.00 each, after first 25

Ratio prints are unmounted and untrimmed enlargements of single-lens photographs. Prints are normally processed only from whole negatives, but upon special request, selected parts of negatives will be enlarged. Selected parts of negative, any size up to 36"x36":

\$10.00 each, for 1 through 25
\$8.00 each, after first 25

For an intermediate size enlargement, use price list for the next larger size. Example: Price for one 24"x24" enlargement is \$5.00.

Price of Film Positives:

Individually contact printed from aerial negatives - \$3.00 each.

Price of Copy Negatives:

Individually printed on film - \$6.00 each.

Price of Contact Diapositives:

On glass, for 1st and 2nd order plotting instruments - \$6.50 each.

NOAA, continued

Color Aerial Photographs

The use of color photography has increased manyfold in recent years. With faster film speeds and newer emulsions, its superior definition makes color photography invaluable for many phases of photogrammetry. Printon contact prints are available at \$7.00 each, and duplicate transparencies at \$6.00 each. No discount for quantity purchases. Enlargements are not available. Black and white enlargements from color film are available at the same price as panchromatic enlargements plus the additional cost of \$3.00 each for processing the black-and-white negative.

Photo Index Sheets

The National Ocean Survey's aerial photography is special purpose photography. Usually it consists of a single strip or a few parallel strips of photographs. It is impracticable to index this photography by the shingle mosaic method commonly used by other government agencies.

The photographs are usually indexed on 1:250,000 scale base maps that cover an area of 1 degree of latitude by 1 degree of longitude with each individual exposure indicated by a dot. Occasionally larger scale bases are used for indexes. Separate series of photo indexes are maintained for the different categories of photography as follows:

Single-lens panchromatic; single-lens infrared and single-lens color.

Ozalid prints of indexes are available at \$0.50 each upon request.

APPENDIX VI

MAPCOTec, INC.

MAPCOTec FILM OWNERSHIP

Color Photography Paper Prints and Enlargements

Item	Quantity				
	<u>1</u>	<u>2-5</u>	<u>6-25</u>	<u>26-50</u>	<u>Over 50</u>
Contract Prints 9"x9"	\$15.00	\$13.50	\$ 9.50	\$ 6.50	\$ 5.00
2 - Diameter Enlargements 18"x18"	32.50	30.00	28.00	26.00	24.00
3 - Diameter Enlargements 27"x27"	40.00	36.50	32.00	29.00	26.00
4 - Diameter Enlargements 36"x26"	47.50	42.50	37.50	32.00	28.00
5 - Diameter Enlargements 40"x40"	60.00	50.00	42.00	35.00	30.00

A. The following applies above 5 - Diameter			<u>Any Quantity</u>
6 - Diameter	40"x40"	(6.5"x6.5" from negative)	\$85.00
7 - Diameter	40"x40"	(5.5"x5.5" from negative)	85.00
8 - Diameter	40"x40"	(5"x5" from negative)	85.00
9 - Diameter	40"x40"	(4.5"x4.5" from negative)	85.00
10 - Diameter	40"x40"	(4"x4" from negative)	85.00

B. Color printing is done every Thursday for Friday shipment. Special printing may be obtained for a \$75.00 additional set-up charge.

C. All prices subject to change without prior notice.

D. 4% Florida Sales Tax must be added if applicable.

MAPCOTec, INC.

CLIENT FILM OWNERSHIP

Color Photography Paper Prints and Enlargements

Item	Quantity				
	<u>1</u>	<u>2-5</u>	<u>6-25</u>	<u>26-50</u>	<u>Over 50</u>
Contract Prints 9"x9"	\$10.00	\$ 9.50	\$ 6.50	\$ 4.50	\$ 3.00
2 - Diameter Enlargements 18"x18"	22.50	20.00	18.00	16.00	14.00
3 - Diameter Enlargements 27"x27"	30.00	26.50	22.00	19.00	16.00
4 - Diameter Enlargements 36"x36"	37.50	32.50	27.50	22.00	18.00
5 - Diameter Enlargements 40"x40"	50.00	40.00	32.00	25.00	20.00

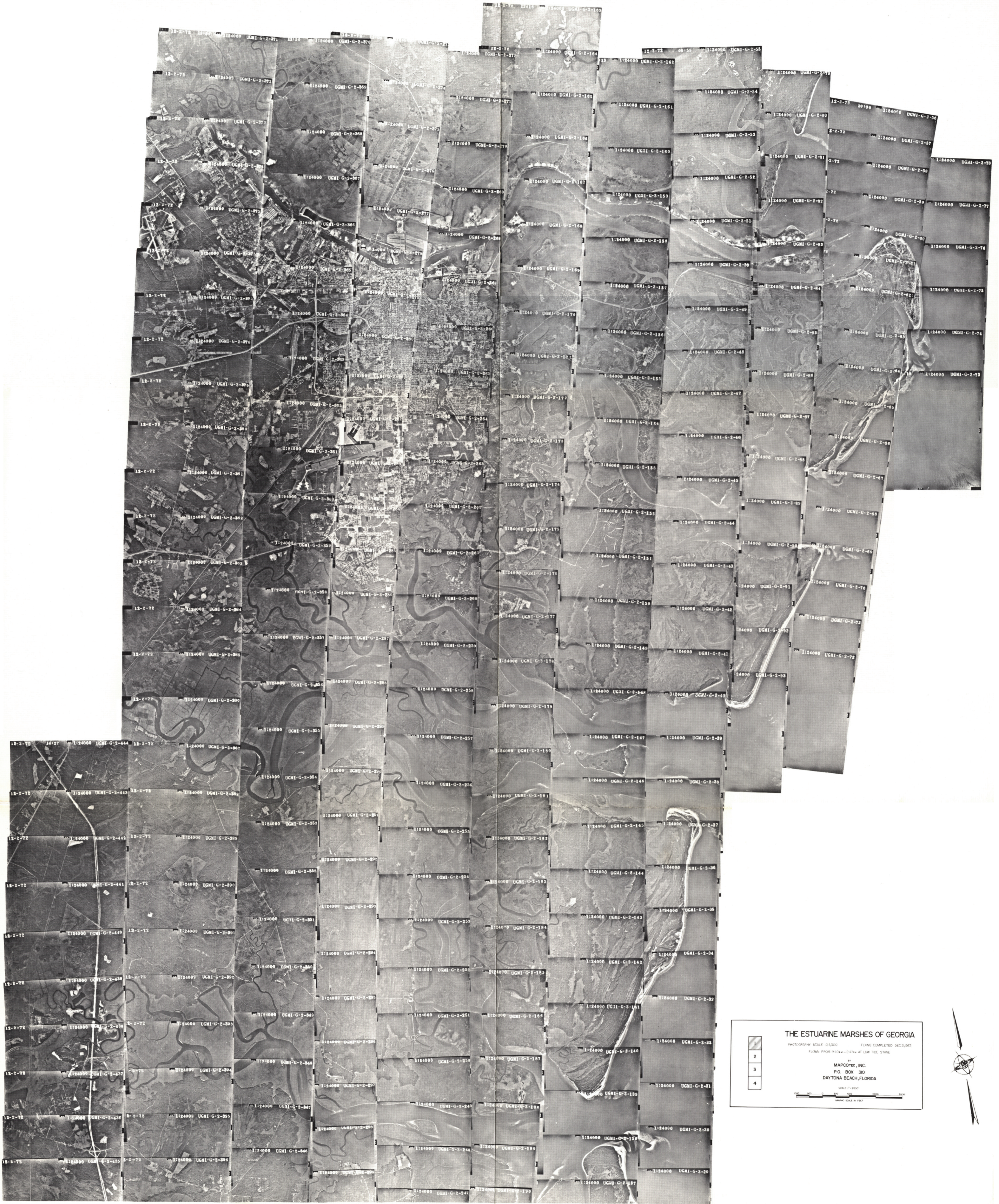
A. The following applies above 5

			<u>Any Quantity</u>
6 - Diameter	40"x40"	(6.5"x6.5" from negative)	\$75.00
7 - Diameter	40"x40"	(5.5"x5.5" from negative)	75.00
8 - Diameter	40"x40"	(5"x5" from negative)	75.00
9 - Diameter	40"x40"	(4.5"x4.5" from negative)	75.00
10 - Diameter	40"x40"	(4"x4" from negative)	75.00

B. Color printing is done every Thursday for Friday shipment. Special printing may be obtained for a \$75.00 additional set-up charge.

C. All prices subject to change without prior notice.

D. 4% Florida Sales Tax must be added if applicable.



THE ESTUARINE MARSHES OF GEORGIA
AERIAL PHOTOGRAPHY SCALE 1:24,000 FLYING COMPLETED DEC. 2, 1972
FLYING FROM 9400' - 2400' AT LOW TIDE STAGE
MAPCOTE, INC.
P.O. BOX 310
DAYTONA BEACH, FLORIDA
SCALE 1" = 2000'
GRAPHIC SCALE IN FEET





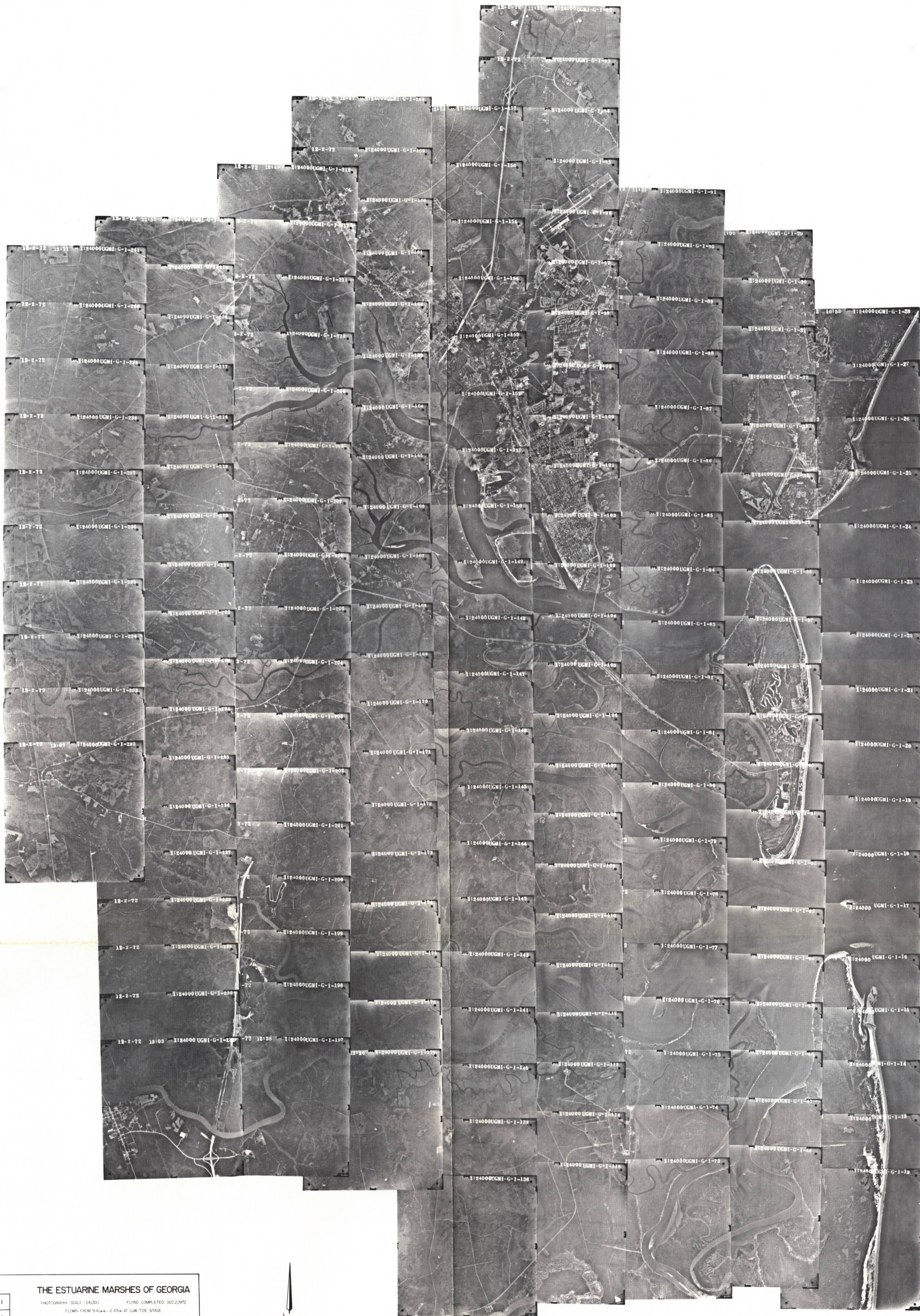
THE ESTUARINE MARSHES OF GEORGIA

PHOTOGRAPHY SCALE 1:24000 FLIGHTS COMPLETED DEC 2/1972
 FLOWN FROM SH-40W - 247m AT LOW TIDE STAGE

BY
 MAPCOTEK, INC.
 P.O. BOX 300
 DAYTONA BEACH, FLORIDA

SCALE 1:25000
 GRAPHIC SCALE IN FEET





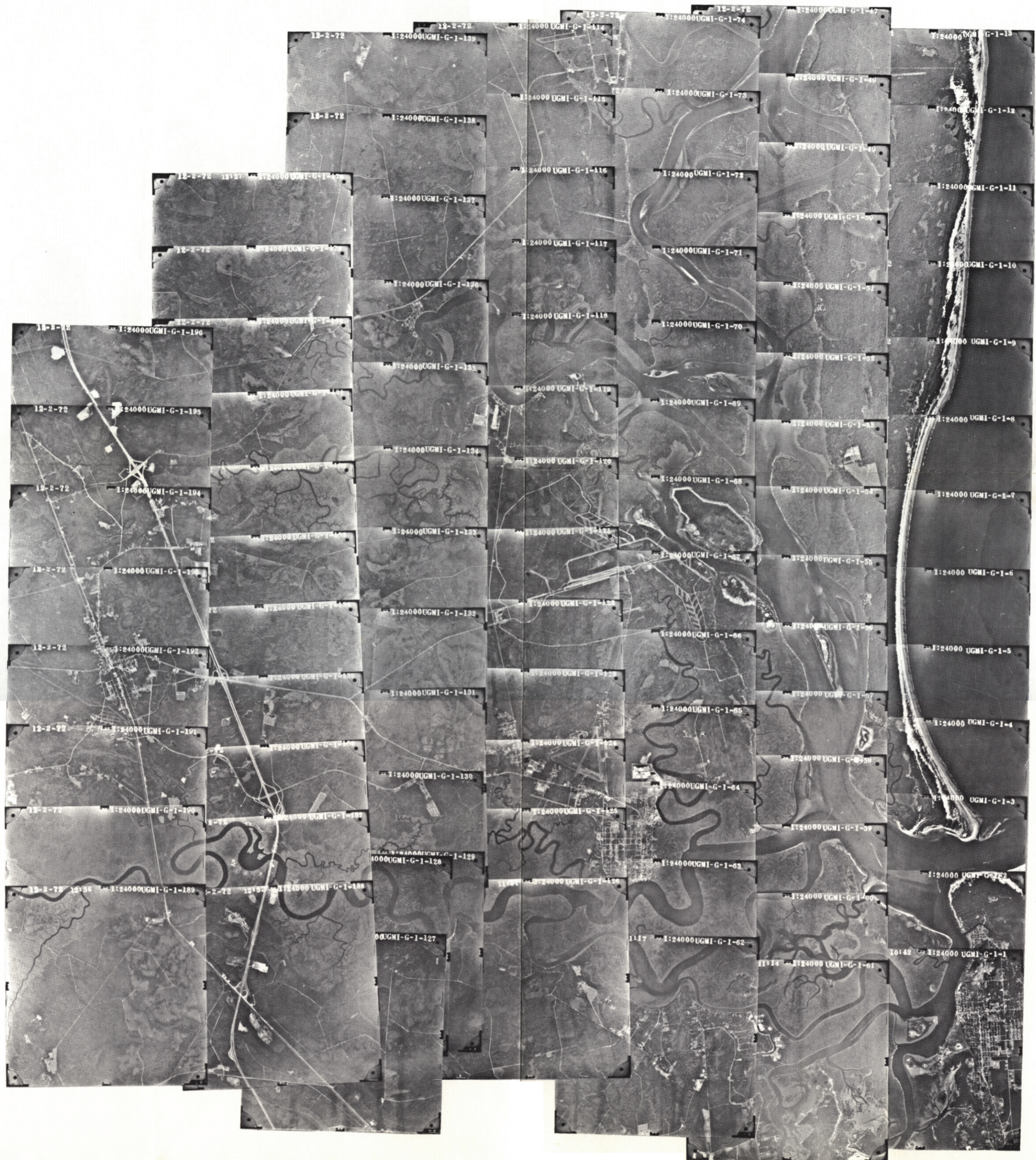
THE ESTUARINE MARSHES OF GEORGIA
PHOTOGRAPHY SCALE: 1:24,000 FLYING COMPLETED: DEC 2, 1972
FLOW: FROM 9:50 AM - 2:47 PM AT LOW TIDE STAGE

BY
MARCOTTE, INC.
P.O. BOX 30
DAYTONA BEACH, FLORIDA

SCALE 1" = 200'

GRAPHIC SCALE: 0 1000 2000 3000 FEET





THE ESTUARINE MARSHES OF GEORGIA

PHOTOGRAPHY SCALE 1:24000 FLYING COMPLETED DEC 2, 1972
 FLOWN FROM 940' A.M. - 2.47 H. AT LOW TIDE STAGE

BY
MAPCOTEC, INC.
 P.O. BOX 310
 DAYTONA BEACH, FLORIDA

SCALE 1" = 2000'
 GRAPHIC SCALE IN FEET

