

**Forest Service Manual
National Headquarters - Washington Office
Washington, DC**

**Forest Service Manual 7100 – Engineering Operations
Chapter 7140 - Geometronics**

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Digest: Following is an explanation of the changes throughout the directive by section.

7140: Revises the following sections with no additional changes to the chapter.

7142.04b: Changes caption from “Director of Public Affairs Office, Washington Office” to “Director of the Office of Communication, Washington Office” to reflect current Organization structure, and updated direction to Director of the Office of Communication.

7149: Changes caption from “Map Sales and Geospatial Information Dissemination Programs” to “Map and Geospatial Product Sales.” Revises section direction in its entirety, adds authorities, sets forth new direction, updates current direction, and removes obsolete direction.

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Geometronics is the organization, presentation, communication, distribution, and utilization of geographic information in graphic or digital form. Geometronics incorporates the art and science of cartography in conjunction with photogrammetry, geodesy, geography, remote sensing, imagery analysis, and computer mapping technology to graphically display the spatial relationship of geographical data through maps and other information products.

7140.1 - Authority

Basic authority for this activity is vested in the Secretary of Agriculture (Title 5, United States Code (U.S.C.), section 301 (5 U.S.C. 301)). Responsibility for coordination of all Department of Agriculture mapping work is delegated to the Chief of the Forest Service by the Under Secretary for Natural Resources and Environment through Title 7, Code of Federal Regulations, section 2.60(a)(26) (7 CFR 2.60(a)(26)). The authority to sell maps and reimburse the appropriation(s) charged for the cost of furnishing maps is set forth in 7 U.S.C. 1387. The statute authorizes the Secretary to sell maps to persons at not less than the estimated cost.

7140.11 - Cooperative Efforts

1. The Granger-Thye Act of March 3, 1925, as amended (16 U.S.C. 572). This act authorizes the Forest Service to perform geometronics activities, by written agreement whereby the Forest Service may perform work for others, at the expense of the interested party, on or adjacent to National Forest System lands (FSM 1580).
2. The Economy Act of June 30, 1932, as amended (31, U.S.C. 1535-1536). This act authorizes cooperative efforts with other Federal agencies through the sale or purchase of stores, materials, or services.
3. The Federal Land Exchange Facilitation Act of 1988 (43, U.S.C. 1716). This act requires the Forest Service to consult with other Federal agencies concerning the needs, costs, and benefits associated with improvements in existing methods used for land surveying and mapping, including collecting, storing, retrieving, disseminating, and using information about Federal and other lands.
4. Title 7, Code of Federal Regulations, section 2.42(a)(3), delegates coordination of aerial photographic projects for the Department of Agriculture to the Farm Service Agency by the Under Secretary for Farm and Foreign Agricultural Services.
5. OMB Circular A-16. This circular, as revised, establishes the following:
 - a. Procedures for programming and coordinating Federal topographic mapping activities.
 - b. Procedures for the maintenance of the National Atlas of the United States.

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- c. Procedures for the programming and coordination of geodetic control surveys. On July 16, 1968, an Interdepartmental Agreement was signed to coordinate geodetic surveying activities under the Federal Geodetic Control Committee.
- d. Coordination procedures for depicting international boundaries and claims of sovereignty.
- e. A Federal Geographic Data Committee to coordinate the Federal Government's development of the National Spatial Data Infrastructure.

7140.12 - Map Preparation and Sale

1. The Agricultural Adjustment Act of 1938, section 387 (7 U.S.C. 1387)). This act provides the basic authority for sale of photographic reproductions and maps.
2. Title 36, Code of Federal Regulations, section 295.4, requires the preparation of maps to provide for public awareness on the use of off-road vehicles on National Forest System lands.
3. Title 36, Code of Federal Regulations, section 219.12(d) establishes planning criteria that require the collection, assembly, and use of data, maps, graphic material, and explanatory aids, of a kind, character, and quality, and to the detail appropriate, for management decisions to be made.
4. Title 36, Code of Federal Regulations, Part 212, provides for the administration of the Forest Development Transportation System, which, as part of the construction or reconstruction of a forest development transportation facility, requires locating, surveying, and mapping, including the establishment of temporary and permanent geodetic markers, in accordance with required specifications.
5. Title 36, Code of Federal Regulations, section 212.20(a), provides for the National Forest Development Trail System Operation and requires that forest development trails be identified on maps made available to the public at Forest Service offices.
6. OMB Circular A-25. This circular provides guidelines for charging for products and services. The guidelines support the established price criteria for map sales and other geospatial products.
7. OMB Circular A-76. This circular provides guidelines for the performance of commercial activities, including activities conducted at photographic laboratories. Use for project planning to determine the cost benefit ratio of competitive bids.
8. OMB Circular A-130. This circular provides uniform government-wide information resource management policies and the authority to recover the cost of disseminating resource information.

7140.13 - Resource Management Support

1. The National Forest Management Act of 1974 (16 U.S.C. part 1604) recognizes that forest plans should include maps and other descriptive documents.
2. Title 16, United States Code, section 521b, requires the Secretary of Agriculture to submit a detailed report of proposed purchase or transfer of land relating to the National Forest System in excess of \$150,000. This regulation establishes report criteria, including the location and size of the land, and requires Geometronics support to produce maps and other graphics that depict the location of lands designated for proposed purchase or exchange.
3. Title 36, Code of Federal Regulations, section 228.102(c)(1), provides for the identification of oil and gas resources and requires the Forest Service to identify on maps the areas that are subject to leasing analyses and decisions.
4. Title 36, Code of Federal Regulations, section 293.4, requires the Forest Service to establish uniform procedures and standards for the maintenance, and availability to the public, of records pertaining to National Forest System Wilderness areas, including maps and other related documents.
5. Title 36, Code of Federal Regulations, section 219.6, requires that the Forest Service provide maps and other related information as part of the public participation aspect of the land management planning process.

7140.14 - U.S. Board on Geographic Names

Title 43, United States Code, section 364 (43 U.S.C. 364), vests authority to approve geographic names in the U.S. Board on Geographic Names established under the Secretary of the Interior.

7140.2 - Objective

To provide accurate and timely geographic information in graphic or digital form for use by forest resource managers, planners, and the general public.

7140.3 - Policy

1. Agency managers shall make optimum use of graphic and digital geographic information to support the management of national forest system lands and resources.
2. Managers should use the most cost effective approach to produce maps and related spatial information products in support of the Forest Service mission. Options to consider in determining cost effectiveness are use of Forest Service facilities, use of interagency cooperative agreements, and use of private sector contracts.

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3. Geometronics personnel must maintain technical currency and proficiency. Appropriate means of maintaining technical skill include classroom training, attendance at seminars/conferences, and membership in professional societies.

7140.4 - Responsibility

7140.41 - Director of Engineering, Washington Office

It is the responsibility of the Washington Office Director of Engineering to:

1. Coordinate mapping activities for the Department of Agriculture (7 CFR 2.60(a)(26)).
2. Produce Base Series layers, orthophotoquads, and other materials to support National and Regional mapping programs through the Geometronics Service Center (GSC).
3. Ensure that reviews of geometronics-related activities are conducted according to direction in FSM 1400.
4. Oversee the Service-wide remote sensing program as part of the Technical Applications and Support function of Engineering.
5. Provide Service-wide technical liaison and training in remote sensing techniques through the Remote Sensing Applications Center (RSAC).
6. Provide for the development and maintenance of employees' technical proficiencies in geometronics.
7. Provide for the investigation, development, and distribution of information on new and improved geometronics systems and techniques.
8. Provide for the development of and support to the field for standards and processes for spatial (locational) aspects of input data and output information for Geographic Information Systems, including:
 - a. The technology that is used to acquire and enter data (such as remote sensing technology, photogrammetry, and automated cartographic processes).
 - b. The cartographic aspects of data and information (such as map scales, map projection, resolution, accuracy, legends, formats, and applications).
 - c. Coordination with others involved in collection and maintenance of digital data.
9. Represent the Secretary of Agriculture on the U.S. Board on Geographic Names.

7140.42 - Regional Foresters

It is the responsibility of the Regional Forester to:

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1. Provide for the technical inspections of ongoing geometronics-related activities.
2. Ensure that an inspection report and appropriate follow-up reports are prepared (FSM 1413).
3. Ensure that geometronics activities comply with Forest Service standards and specifications.

7140.5 - Definitions

(FSH 7109.13a, sec. 05; FSM 7140.8).

7140.6 - Abbreviations and Acronyms

(FSH 7109.13a, sec. 05).

7140.8 - References

(FSH 7109.13a, sec. 06).

The Forest Service has adopted the publication entitled, "Definitions of Surveying and Associated Terms," which was prepared by a joint committee of the American Congress on Surveying and Mapping and the American Society of Civil Engineers, as the standard Forest Service reference for geometronics-related terms. This publication can be obtained from the American Congress on Surveying and Mapping, 5410 Grosvenor Lane, Suite 100, Bethesda, MD 20814, (301) 493-0200, 1-800-548-2723, Manual Practice No. 34. As necessary, the publication may be supplemented by the Defense Mapping Agency (Department of Defense) "Glossary of Mapping, Charting, and Geodetic Terms," which can be obtained from U.S. Geological Survey, Branch of Distribution, Box 25286, Denver, CO 80225, (303) 236-7477. Additional information entitled "Glossary of the Mapping Sciences" may be obtained from the American Society of Photogrammetry and Remote Sensing, P.O. Box 1504, Cranberry Township, PA 16066-0504, (412) 772-0099.

7141 - Geometronics Administration

7141.02 - Objective

To maintain accurate, complete records and to provide geophysical data to agency management officials for use in the analysis of resource management and in the preparation of reports.

7141.03 - Policy

Geometronics specialists shall be available when needed to assist in the planning process and other resource-related activities.

7141.1 - Geometronics Planning

Include Geometronics programs in the Regional Annual Program and Financial Plan (FSM 1310 and FSM 6520). Prepare detailed plans necessary to accomplish all cyclic geometronics-related programs and individual projects anticipated for the coming year, regardless of the source of financing.

7141.2 - Records

Normally, maintain product records in 7.5-minute quadrangle format or in graphics form on the Department of the Interior, U.S. Geological Survey, tag base format accompanied by tabular supplements and summaries (FSH 7109.13a, sec. 07, and FSH 6209.11, Records Management Handbook, ch. 40).

7141.3 - Financing

7141.31 - Base Series Mapping-Geometronics

The Forest Service base series system is financed by line item in the annual Chief's planning, budgeting, and management information letter. Funds for this line item are appropriated for general land management. Orthophotoquads and National Aerial Photography Program (NAPP) are support activities included in the base series system. Distribution of funding is based on the relative needs of each Region and the Geometronics Service Center (GSC).

7141.32 - Cartographic Products

Finance other cartographic products from Regional multi-functional or contributed funds.

7141.33 - Project Work

The benefiting activity must finance site or strip maps, plats, and other project materials. Forest Service units may request project work from other in-service units, including the Geometronics Service Center (GSC), on a reimbursable basis.

7142 - Base Series Maps

This map system must be the principal source of mapping information to meet Forest Service needs.

7142.02 - Objective

7142.03 - Policy

Regional Offices and the Geometronics Service Center (GSC) shall produce standard Base Series maps jointly. Maps are to be updated on a cyclic basis consistent with Regional needs and available funds to provide current information for management of Forest Service programs.

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Maps are to be prepared in accordance with standard specifications in FSH 7109.13a, chapter 10, and in "Cartographic Specifications and Symbols," EM-7140-24. (FSH 7109.13a, sec. 06.3).

7142.04 - Responsibility

7142.04a - Director of Engineering, Washington Office

The Washington Office Director of Engineering has the responsibility to:

1. Provide for the development of policy, objectives, procedures, standards, and specifications for the Base Series map program.
2. Provide for the development of guidelines and procedures for the production of the Base Series maps through the Geometronics Service Center and their timely delivery to the Regions.
3. Review requests for deviations from geometronics specifications and consider permanent incorporation into cartographic symbols and specifications, when revised (FSH 7109.13a, sec. 10.61).

7142.04b - Director of the Office of Communication, Washington Office

The Director of the Office of Communication, Washington Office, has the responsibility to ensure the updating of text and pictures and to provide for storage, distribution, and reprinting the brochure "A Guide to Your National Forests" on a cost-reimbursable basis from the Regions and Washington Office Staffs.

7142.04c - Regional Foresters

Regional Foresters have the responsibility to:

1. Provide for the development of guidelines and procedures for ensuring that the Geometronics Service Center (GSC) receives materials in a timely manner to meet annual program schedules.
2. Work jointly with the Manager, Geometronics Service Center (GSC), to develop and agree on an annual program of work, and submit it to the Director of Engineering, Washington Office, for review and approval.
3. Ensure the Regional geometronics organizations construct new data when Base Series materials of suitable scale and accuracy are not available.
4. Ensure the Regional geometronics organizations develop revision cycles tailored to expected levels of development and coordinate correction guide preparation with all affected Forests.

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5. Work with GSC to develop symbols and type specifications for Regional geometronics needs.

7142.04d - Manager, Geometronics Service Center

The Manager, Geometronics Service Center (GSC), has the responsibility to:

1. Ensure that GSC works jointly with each Regional Forester's designated representative to develop and agree on an annual program of work and submit it to the Director of Engineering, Washington Office, for review and approval.
2. Provide means to obtain all original components from the Department of Interior, Geological Survey, for standard quadrangles.
3. Provide for the production and updating of the map portion of the brochure "A Guide to Your National Forests."
4. Provide for the construction and maintenance of the base map for the Regional and State Guide for each Region on a cost reimbursable basis. This includes 1:2,000,000-scale digital data for Regions 1 through 9 or the 1:2,000,000-scale maps for Alaska. Provide this map at variable scales based on Regional needs.
5. Provide for the development of National standards, as needed, for special purpose maps, such as those required to support the forest planning process.
6. Ensure that GSC personnel verify the accuracy of digital elevation models and digital orthophoto quadrangles.

7142.1 - Primary Base Series/Single Edition Quadrangle

The Primary Base Series (PBS)/Single Edition Quadrangle (SEQ) shall consist of master 1:24,000-scale, 7.5-minute quadrangle bases (Regions 1-9); 1:63,360-scale, 15-minute quadrangle bases (Region 10); or 1:25,000-scale metric quadrangles.

7142.11 - Interim Editions

Interim editions that do not meet map accuracy standards may be used until standard accuracy quadrangles are available (FSH 7109.13a, sec. 11.6).

7142.12 - Base Map Quadrangle Indexing System

See FSH 7109.13a, section 11.7, for instructions on use of the indexing system.

7142.2 - Secondary Base Series

The Secondary Base Series (SBS) is a derivative of the PBS/SEQ and is prepared at a scale of 1:126,720, or an alternative scale of 1:100,000 metric edition in Region 10. The format of this series includes all or part of a National Forest in each map (FSH 7109.13a, sec. 12).

7142.3 - Road Classification System

The Road Classification System describes surface type ("Cartographic Specifications and Symbols," EM-7140-24), jurisdiction (FSM 7703), maintenance level (FSH 7709.58), and route marker type ("Standards for Forest Service Signs and Posters," EM-7100-15).

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7142.31 - Road Classification Symbolology

Prepare maps to display the appropriate road classification symbol(s) in accordance with exhibit 01. Display roads that are in a long-term maintenance level 1 designation with the appropriate road closure symbol ("Cartographic Specifications and Symbols," EM-7140-24).

7142.31 - Exhibit 01

Road Classification Matrix

ROAD CLASSIFICATION	SURFACE TYPE	JURISDICTION	MAINTENANCE LEVEL *	ROUTE MARKER TYPE *
1 Primary Highway	Paved	Federal-State	NA	Interstate-US-State
2 Secondary Highway	Paved	State-County	NA	US-State-County
3 Light Duty Road	Unspecified (Unknown - outside NF/ NG boundary)	Other	NA	US-State-County
3A Light Duty Road	Paved	FS and Other	3-5	Distinctive or Horizontal
3B Light Duty Road	Gravel	FS and Other	3-5	Distinctive or Horizontal
3C Light Duty Road	Dirt	FS and Other	3-5	Horizontal
4 Unimproved Road	Not Specified	FS and Other	2	Vertical
5 Four Wheel Drive Road	Not Specified	FS and Other	2	Vertical
* Does not apply to a private road.				

7142.32 - Closed and Obliterated Roads

1. Depict on Single Edition Quadrangle maps temporarily closed roads, roads closed for less than 5 years, or roads designated for long-term level 1 maintenance. Include associated gates, berms, and barrier symbols.
2. Do not depict on Single Edition Quadrangle maps roads closed continuously for 5 or more years that have not received any maintenance during that period of time and that are scheduled for obliteration when resources allow. Also do not depict on the map associated gates, berms, and barrier symbols.
3. Do not depict on the Single Edition Quadrangle maps obliterated roads or any symbology that refers to an obliterated road.

7143 - Cartographic Products

The Base Series layered map system is sufficiently flexible to allow production of various cartographic products with a minimum of redrafting or digital manipulation.

7143.02 - Objectives

In preparing and providing cartographic products, the Forest Service seeks to achieve the following:

1. To maintain Regional uniformity in cartographic information provided to users from Regional geometronics organizations.
2. To achieve uniform quality of Forest Service cartographic products.

7143.03 - Policy

1. The Forest Service shall meet user needs for cartographic products by providing a wide range of user-oriented map products from the possible combinations of Base Series plates and layers, either manually or electronically. Regional geometronics organizations must edit and approve products prior to their reproduction for public distribution.
2. Cartographic products for specific needs must be developed from the Base Series source materials.

7143.04 - Responsibility

7143.04a - Regional Foresters

It is the responsibility of the Regional Forester to ensure:

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1. The production of cartographic products in accordance with FSH 7109.13a, chapter 10, and "Cartographic Specifications and Symbols," EM-7140-24 (FSH 7109.13a, sec. 06.3).
2. The availability of cartographic products to individuals who request information about the National Forests and Grasslands.
3. Joint funding is available for initial construction, printing, periodic updates, storage, and distribution of the Regional and/or State Guide from the budgets of Regional staffs who directly benefit from the production and maintenance of this free map product.
4. The Regional geometronics staffs participate in developing standards for National Special Purpose Maps and support these mapping efforts.

7143.1 - Family of Maps - Visitor Information Series

The agency has devised a "Family of Maps" to provide visitors with consistent, accurate information on National Forest System lands (FSM 2360). Standards for current products within the Visitor Information Series are set out in sections 7143.11 - 7143.15.

7143.11 - A Guide to Your National Forests - FS-418

This map portrays the entire United States and shows the locations of National Forests and Grasslands. The U.S. Geological Survey National Atlas Layers must be the source of base materials for the map.

Make this map available to individuals requesting information about the National Forest System lands. For many individuals, this map serves as an introduction to the National Forests and Grasslands and a source for further information (such as addresses of Forest Supervisors' Offices).

When stocked at Forest Service locations, provide single copies of this map free of charge to the public (FSM 7149.1). The public may order single maps from the Consumer Information Catalog, Pueblo, Colorado, at a nominal charge. A 25 percent discount will be granted for orders of 100 or more maps.

7143.12 - Regional or State Guide

The Regional or State Guide is a derivative of Department of the Interior U.S. Geological Survey bases at scales ranging from 1:2,000,000 to 1:500,000 and usually portrays an entire Region or State. This map is optional.

1. Design the map for potential visitors who need a more detailed, larger scale map for planning a visit to a specific Region or State.

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2. Provide an overview of the Region and/or State, major points of interest, recreation opportunities, and where visitors can obtain more information.
3. Display an entire Region or a portion of one or more Regions.
4. Show the location of land areas administered by the Forest Service as well as other Federal agencies that may be of interest to the visitor.
5. Produce these guides in accordance with FSH 7109.13a, section 13.2, and "Cartographic Specifications and Symbols," EM-7140-24, chapter 4 (FSH 7109.13a, sec. 06).
6. For base information for Regions 1 through 9, use digital files, created by the U.S. Geological Survey from their 1:2,000,000-scale maps series as the source material. Source material for Region 10 is 1:2,000,000-scale maps. Produce this map product at various scales based on the needs of the Region.
7. Provide this map free of charge to the public.
8. Obtain base plates for Regions 1 through 9 from the GSC (FSM 7142.04d) and obtain recreational information, text, and photographs from the Regional Recreation and Public Affairs staffs.

Regions provide funding for the initial development and for periodic updates of the map(s). When feasible cooperate with other Federal or State governmental agencies and associations to assist with these maps through a cooperative agreement or memorandum of understanding.

7143.13 - Pocket Visitor Guide

This optional guide is for visitors to a specific National Forest or Grassland. It provides a small scale, generalized map of individual National Forests or Grasslands for those seeking information about the unit. Regional Geometronics Staff determine source material for the Pocket Visitor Guide which should include the Secondary Base Series or digital data when appropriate. Produce the guides in accordance with FSH 7109.13a, section 13.3, and "Cartographic Specifications and Symbols," EM-7140-24, Chapter 5 (FSH 7109.13a, sec. 06.3). Artwork and text are provided by Regional, Forest, and District staffs.

7143.14 - Forest Visitor Map

The Forest Visitor Map provides detailed information about a National Forest and/or National Grassland. It is to be used by the Forest visitor and those interested in specific activities such as driving, camping, hunting, or other recreational activities. The map should be readable, easy-to-use, and provide the information Forest visitors request. Display on the map the variety of recreational opportunities available on National Forests. The Forest Visitor Map must depict an entire National Forest, National Grassland, or a subdivision of a National Forest and shall contain long-term (3-4 years) travel information. Compile the travel information from the Forest Plan and reflect the travel management philosophy described in the plan. Region 10 Forest

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Visitor Maps are exempt from the requirement to show travel information; use special publications for this purpose. Use the narrative section to provide information about travel restrictions and opportunities when it cannot be graphically depicted. Use the Secondary Base Series as the base map for the Forest Visitor Maps and produce in accordance with FSH 7109.13a, section 13.4, and "Cartographic Specifications and Symbols," EM-7140-24, chapter 2 (FSH 7109.13a, sec. 06.3). Artwork, photos, and text are provided by the appropriate Forest staffs. Sell these maps to the public at a price determined by the Inter-disciplinary National Map Sales Steering Committee (FSM 7149.2).

7143.15 - Wilderness and Special Area Maps

Other maps besides the Family of Maps products described previously may be produced by the Regions, using existing Regional specifications, but the use of the Family of Maps cover panel design is encouraged. Depict on these maps, derived from the Base Series, detailed information on Wilderness Areas and other special interest areas or features. Include additional National Forest information (FSH 7109.13a, ch. 10) as appropriate. Sell maps to the public for a price that reimburses the cost of furnishing the maps to the public as specified in FSM 7149 (FSH 7109.13a, sec. 13.5).

7143.2 - National Special Purpose Maps

Use Base Series maps in preparing special purpose maps to support national planning efforts. Special purpose maps are required to support the forest planning process.

7144 - Project Support

Base Series materials are often unsuitable to support the unique graphic requirements for special projects, so additional project support may be needed from Regional geometronics staffs.

7144.03 - Policy

Support a wide variety of special projects by providing special purpose maps or other graphics that satisfy the accuracy requirements of the intended use.

7144.1 - Products

Regional geometronics organizations shall collect new map data when Base Series materials are not suitable, accurate, or available. Examples of such data include reconnaissance and design strip maps for roads, recreation, and administrative sites; site plans for engineering developments; digital data; and right-of-way plats.

7144.2 - Regional Products and Services Guide

Develop and maintain a Regional geometronics products and services document describing typical National Forest projects requiring earth measurement and display. Include a description of services, samples of geometronics products, instructions on how to order such products, and typical costs.

7145 - Remote Sensing

Remote sensing is the detection and recording of reflected, scattered, and emitted energy of the electromagnetic spectrum. (See FSH 7109.13a, sec. 05, for a detailed definition of remote sensing). The most common form of remote sensing is aerial photography. An increasing number of diverse modern sensors are being used to collect data concerning the earth's surface, substrata, and resources. Included in the category of remote sensing are aerial photography, non-standard high-altitude photography, satellite data (film and magnetic tape), and other aircraft sensor systems including thermal infrared and video.

7145.02 - Objectives

1. To satisfy diverse mapping and resource requirements.
2. To provide the most efficient and cost effective remotely-sensed data.

7145.03 - Policy

The acquisition of all remotely-sensed data will be evaluated based on project needs. Evaluation criteria include resolution, film type, and emulsion.

7145.04 - Responsibility

7145.04a - Deputy Chief, National Forest System

The Deputy Chief for the National Forest System, is responsible for overseeing the development, coordination, and technology transfer of remote sensing activities.

7145.04b - Deputy Chief, Research

The Deputy Chief for Research is responsible for basic research in all fields of remote sensing in the Forest Service.

7145.04c - Regional Foresters

It is the responsibility of the Regional Forester to ensure that the Regional geometronics staff prepares, publishes, and implements a Regional resource and high-altitude photography plan.

7145.04d - Forest Supervisors and District Rangers

It is the responsibility of the appropriate line officer to:

1. Ensure that flight requests are not in violation of the OMB Circular A-76 (FSM 7140.1) process.
2. Approve funding for satellite remote sensing system project procurement.

3. Approve funding for all other aircraft sensor system projects.

7145.05 - Definitions

(FSH 7109.13a, sec. 05).

7145.06 - Abbreviations and Acronyms

(FSH 7109.13a, sec. 05).

7145.07 - References

See FSH 7109.13a, sec. 06, for references and specifications for remote sensing.

7145.1 - Aerial Photography Variations

(See Remote Sensing definition in FSH 7109.13a, section 05.)

7145.11 - Recurrent Aerial Photography Plan

The Regional geometronics staff shall prepare, publish, and implement a Regional resource and high-altitude photography plan that specifies recurrent aerial photography requirements. Include this plan as part of the Regional Annual Program and Financial Plan (FSM 7141.1 and FSM 7145.17).

7145.12 - Selections and Approvals

Use the "Forest Service Utility Guide for Aerial Photography" (FSH 7109.13a, sec. 06.2) for selection of scales and emulsions to satisfy identified requirements. Documentation of the decision for determining scale and emulsions must be maintained with the originating unit. All aerial photography must have the prior approval of the Regional Staff Director for engineering activities or the Station or Area Director.

Obtain approval from the Farm Service Agency Aerial Photography Field Office (FSA-APFO) Director for the acquisition of any block of standard 9-inch format photography including large format (9-inch X 18-inch) aerial photography exceeding a 100 square mile area (excluding the National Aerial Photography Program (NAPP)) before funds are expended. Send informational copies and background information of all aerial photography applications to the Director of Engineering, Washington Office. See FSH 7109.13a, chapter 20, for application submittal instructions.

Acquisition of other than 9-inch format photography (such as 35 mm, 70 mm, optical bar, video, and so forth) need not be approved. Report to the FSA/APFO Director the photographic completion of areas of over 100 square miles, defining type, format, geographical area, inclusive dates of flying, and deposition (location) of film.

7145.13 - Financing

Finance the acquisition of resource and project photography from Regional or Forest multi-functional or contributed funds.

7145.14 - Acquisition of Aerial Photography

Acquire high-altitude aerial photography through the NAPP, which is a cooperatively funded program administered by the Department of the Interior, U.S. Geological Survey, or through independent means, such as contractors, when the flight schedule for NAPP coverage does not meet Forest Service program needs.

Acquisition of all aerial photography for areas greater than 100 square miles must be made through the Farm Service Agency/Aerial Photography Field Office (FSA-APFO) (7 CFR 2.42(a)(3)). The FSA-APFO performs flight line planning, contracting, and inspection. Regional Foresters and Station, Area, and Institute Directors may request contracting authority from FSA-APFO. Obtain aerial photography for areas less than 100 square miles by the most expedient and cost-effective means.

7145.15 - Loan of Negatives

Standard aerial photographic film must be loaned outside the Forest Service only in the following situations:

1. During emergency and defense operations (FSM 1590).
2. When used by Federal agencies who exchange negatives within and outside the Department of Agriculture.
3. When other government agencies have contributed to the original cost of the aerial photography (FSH 7109.13a, ch. 20).

7145.16 - Purchase of Aerial Photography

1. Forest Service Photography. Original film of Forest Service resource photography not older than 40 years--including black and white, color, and color infrared (CIR)--is stored at and can be purchased through the FSA-APFO.

National 1:58,000-scale CIR photography, obtained through the National High Altitude Photography Program, and 1:40,000-scale black and white or CIR photography, obtained through NAPP, are also stored at and can be purchased from FSA-APFO. See FSH 7109.13a, section 22.1, for ordering instructions.

The Earth Resources Observation Systems (EROS) Data Center, Sioux Falls, South Dakota, stores and sells 1:80,000-scale black and white National High Altitude Photography coverage. See FSH 7109.13a, section 22.3, for ordering instructions.

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Original film of all Forest Service resource photography that is more than 40 years old is stored at the National Archives and Records Administration, Washington, D.C., where reproductions may be purchased. See FSH 7109.13a, section 22.5, for ordering instructions.

2. Non-Forest Service Photography. Send requests for reproductions from film stored in laboratories of other Federal or non-Federal agencies directly to the laboratory holding the film. See FSH 7109.13a, section 22.3-22.5, for ordering instructions.

7145.17 - Aerial Photography, Farm Service Agency Requirements

By October 1 of each year, Regional geometronics staff shall submit to the FSA-APFO aerial photography acquisition requirements and an estimate of all aerial photo prints they plan to purchase from FSA-APFO during the following fiscal year. Provide a copy of this submittal to the Washington Office Engineering Staff. See exhibits 01 and 02 in FSH 7109.13a, section 21.7, for examples of submittal forms (FSH 1309.14).

7145.2 - Non-standard High-Altitude Aerial Photography

Non-standard high-altitude aerial photography refers to reconnaissance-type photography obtained from aircraft platforms 65,000 feet or more above mean sea level. Multiple camera formats are available, such as optical bar-type panoramic format (5-inches by 38-inches, or 5-inches by 60-inches) with long focal length (24-inches and 30-inches); and large-format (9-inches by 18-inches) with 24-inch focal length used individually or in a pallet with three cameras. Metric cameras of 152-mm and 305-mm focal lengths are occasionally flown in high-altitude pallets along with reconnaissance camera systems. These systems are flown for the Forest Service on a cost-reimbursable basis by the National Aeronautics and Space Administration (NASA) operating from the Ames Research Center, Moffett Field, California, or as otherwise deployed.

7145.21 - Approvals

Commission of all non-standard aerial photography services for the Forest Service must have the approval of the Regional Staff Director for engineering activities or the Station or Area Director.

7145.22 - Financing

Finance the purchase of non-standard high-altitude aerial photography using Regional or Forest multi-functional or contributed funds.

7145.23 - Acquisition of Non-Standard Aerial Photography

The Remote Sensing Applications Center (RSAC) is the official point of contact for negotiation and coordination of Forest Service participation in the National Aeronautics and Space Administration (NASA) Annual Airborne Instrumentation Research (AIR) Program. For scheduling and flight planning, contact the RSAC Manager. The annual call for Forest Service

participation in the NASA AIR Program is issued to Regional Foresters and Directors during June with replies for anticipated participation required by September 1 for RSAC consolidation.

High priority projects that were not anticipated, nor provided for, in the unit budget planning process, such as flights to monitor the impact of an episodic event (floods, fire, insects), may be submitted to the RSAC Manager at any time. The NASA cannot accept the transfer of funds for flight support during the last 30 days of the fiscal year unless the RSAC Manager certifies the flight is required as an emergency response. Soliciting units are responsible for ensuring that the flight requests are not in violation of the OMB Circular A-76 process.

7145.24 - Archive Storage

The FSA/APFO holds all original film from Forest Service participation in the NASA AIR Program in its archives. For exceptions, see FSM 7145.16.

7145.25 - Purchase of Non-Standard High-Altitude Photography

Purchase photography taken in flights flown by NASA and funded by the Forest Service through the RSAC Manager. Acquire photography flown by NASA for other than Forest Service requestors through the Earth Resources Observations Systems (EROS) Data Center, Sioux Falls, South Dakota.

7145.3 - Satellite-Related Imagery

Satellite remote sensing systems are those onboard, orbiting, or stationary space satellites such as LANDSAT and SPOT satellite imagery.

7145.31 - Approvals

Satellite remote sensing system project procurements require the approval of the line officer of the funding unit (FSM 7145.04c).

7145.32 - Financing

Finance the procurement of satellite-related imagery using Regional or Forest multi-functional or contributed funds.

7145.4 - Other Aircraft Sensor Systems

Other aircraft systems include, but are not limited to, Airborne Multi-spectral Scanners, Thermal Infrared (Scanners and Forward Looking Infrared), Active and Passive Microwaves Systems, and Airborne Multi-spectral Photographic Systems (FSM 7145.04d).

Combinations of these sensor systems are available on Forest Service, National Aeronautics and Space Administration, and other aircraft.

7145.41 - Approvals

The procurement of all other aircraft sensor systems for Forest Service projects requires the approval of the line officer of the funding unit.

7145.42 - Financing

Finance the procurement of other remote sensing system projects using Regional or Forest multi-functional or contributed funds.

7145.43 - Acquisition of Remote Sensing Imagery

(FSM 7145.23).

7145.5 - Training

Training and training materials for standard aerial photography and non-standard high-altitude photography are available from the Remote Sensing Applications Center. For information concerning training opportunities, consult the Regional, Station, Area, or Institute remote sensing contact.

7146 - Automated Cartography - Digital Data Services and Production

7146.02 - Objective

To develop a digital data base covering all areas of Forest Service interest to support base map production and resource spatial analysis (Geographic Information Systems) and provide current digital information for the management of Forest Service resource programs, according to the standards and specifications in FSH 7109.13a, chapter 40, and in "Cartographic Specifications and Symbols," EM-7140-24, chapter 6 (FSH 7109.13a, sec. 06.3).

7146.03 - Policy

1. A seamless digital data base must be established using a 7.5-minute Primary Base Series/Single Edition Quadrangle. The data base must be updated regularly to be consistent with Regional information needs and available funding.
2. Management of national cartographic data base should be accomplished in cooperation with other agencies.

7146.04 - Responsibility

7146.04a - Director of Engineering, Washington Office

The Director of Engineering, Washington Office, is responsible for the development of policy, objectives, procedures, standards, and specifications for the Forest Service digital map program through the Washington Office Engineering Staff, Geometronics Branch.

7146.04b - Manager, Geometronics Service Center

The Manager of the Geometronics Service Center (GSC) is responsible for carrying out the processes of collecting, updating, storing, and delivering digital base map data.

7146.04c - Regional Foresters

The Regional Forester is responsible for the development of guidelines and procedures for ensuring that GSC correction guide data from the Region is submitted in a timely manner to maintain current information to support Regional resource program objectives.

7146.05 - Definitions

Cartographic Feature Files. Cartographic Feature Files (CFF's) are a digitized version of the Primary Base Series/Single Edition Quadrangle (PBS/SEQ) 1:24,000, 7.5-minute quad, excluding contours. The planimetric layers collected are the transportation, hydrography, boundary, land ownership, Public Land Survey System (PLSS), and cultural layers. Applications for the data include requests for products such as PBS/SEQ, Secondary Base Series, and the Family of Maps, and the use of a base layer template for registration of Geographic Information System (GIS) information. See "Cartographic Feature Files: A Synopsis for the User," EM 7140-21, for detailed information concerning CFF's (FSH 7109.13a, sec. 06.3).

Digital Elevation Model. Digital Elevation Models (DEM's) are an array of digital records of elevations recorded in X,Y, Z coordinates in the Universal Transverse Mercator coordinate system. Digits are collected from 7.5-minute quadrangle map layers or photogrammetrically. Applications for this type of data include the production of orthophotos, contouring, slope-zone maps, aspect-zone maps, perspective views, cross sections, and analytical uses such as Geographic Information Systems (GIS).

Global Positioning System. Global Positioning System (GPS) technology allows for electronic data collection utilizing a three-dimensional measurement system based on observations of the radio signals of the NAVSTAR Global Positioning System. The GPS observations are processed to determine station positions in Cartesian coordinates (X,Y, Z), which can be converted to geodetic coordinates (latitude, longitude, and height above reference ellipsoid). With adequate connections to the vertical control network and determination of the height of the geoid, orthometric heights or elevations can be computed for the points with unknown elevations. See FSH 7109.13a, chapter 40, for requirements on application and use of this technology.

7147 - Geographic Names

Follow the direction and standards for geographic names set forth in FSH 7109.14 and in "Principles, Policies and Procedures: Domestic Geographic Names," published by the Domestic Names Committee for the U.S. Board on Geographic Names. Obtain this publication from the U.S. Geological Survey, Executive Secretary for Domestic Names, 523 National Center, Reston,

Virginia 22092. Standards for naming administrative units and associated sites and areas are found in FSM 1200.

7148 - Miscellaneous Geometronics Services

Geometronics specialists shall perform drafting, digital data collection and manipulation, photogrammetry, and other special skills and services required to meet the management needs of the Forest Service.

7148.04 - Responsibility

7148.04a - Director of Engineering, Washington Office

It is the responsibility of the Director of Engineering, Washington Office, to:

1. Maintain a small supply of the latest edition of each National Forest, National Grassland, or Purchase Unit map.
2. Maintain a limited quantity of other reference and special purpose maps as needed.
3. Maintain a supply of Forest Service maps for distribution to the Chief, Washington Office Staffs, the Office of the Secretary, and other agencies.

7148.04b - Regional Foresters

It is the responsibility of the Regional Forester to ensure that copies of Regional lithographic maps are provided to the Director of Engineering, Washington Office.

7148.04c - Directors of Engineering Activities, Regional Staff

It is the responsibility of the Regional Staff Director for engineering activities to:

1. Maintain an adequate supply of cartographic products to respond to public requests for information.
2. Ensure that activities related to conducting control or geodetic surveys follow the standard professional practices for this work (FSM 7150).

7148.04d - Regional Geometronics Leaders

It is the responsibility of the Regional Geometronics Leader to:

1. Administer the Regional geometronics program by ensuring that photogrammetric services are provided as needed, cartographic materials are distributed for administrative and public use, and map sale products are furnished to the public upon request.

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2. Provide, through geometronics development, systems to collect, store, process, distribute, and display graphic information. After field review, submit the system proposal to the Director of Engineering, Washington Office, for Service-wide use consideration.

7148.04e - Manager, Geometronics Service Center

It is the responsibility of the Manager, Geometronics Service Center (GSC), to:

1. Provide the Director of Engineering, Washington Office, with copies of maps generated at GSC.
2. Provide for the management and maintenance of DATUM.

7148.1 - Secondary Base Series Derivative Lithographic Reproductions

A small supply of the latest edition of each National Forest, National Grassland, or Purchase Unit map is available from the Washington Office Engineering Staff for administrative use by the Forest Service, other Federal Agencies, and Members of Congress (FSM 7148.04a).

7148.2 - Cartographic Products

A limited quantity of other reference and special purpose maps must be maintained by the Washington Office Engineering Staff to meet estimated official needs. This includes Regional information maps and similar visitor-oriented publications (FSM 7148.04a and FSM 7148.04b).

7148.3 - Control Surveys

Follow Regional Office and field instruction in FSM 7150 for all activities related to the execution of the control surveys or geodetic surveys. See FSM 7155 for direction on geodetic and control surveys.

7148.4 - Photogrammetry

Employ current technology and procedures to produce maps, orthophotographs, mosaics, digital information, and design data (FSM 7148.04b).

7148.5 - Geometronics Development

Employ systems to collect, store, process, distribute, and display graphic information. Proposals for development may be submitted by any Forest Service employee (FSH 7109.13a, ch. 30). The employee shall submit the proposal to the Regional Geometronics Group Leader or equivalent in Stations and Area. After field review, the proposal must be submitted to the Director of Engineering, Washington Office, for evaluation if it has potential for Service-wide application (FSM 7148.04b).

7148.6 - Distribution Services

(FSM 7148.04b).

7148.61 - Maps Furnished to Washington Office

Provide the following lithographic products to the Washington Office Director of Engineering (FSM 7148.04b) as specified:

1. Primary Base Series/Single Edition Quadrangle (PBS/SEQ). Provide the Washington Office individual maps as requested.
2. Secondary Base Series Derivative or Forest Visitor Maps. Send six folded copies of each revised edition. Also provide three flat copies and six folded copies to both the Geometronics Service Center and the Remote Sensing Applications Center.
3. Regional or State Guide. Supply six folded copies of each edition published.

7148.62 - Maps Furnished to Others

1. Provide six folded copies of each revised map (except Primary Base Series/Single Edition Quadrangles (PBS/SEQ)) to Regional geometronics units (FSM 7148.04b).
2. Provide one current copy of the PBS/SEQ to the U.S. Geological Survey (USGS), Domestic Names Branch, 523 National Center, Reston, VA 22092, for use in updating the Geographic Names Information System. The names information may be provided to the USGS via the maintenance software supplied to each Regional Geographic Names Coordinator.
3. Provide one copy of all published maps to the National Archives and Records Administration (NARA) for permanent retention (FSM 7148.65). Send maps to NARA, Cartographic and Architectural Branch, 8601 Adelphi Rd., College Park, MD 20740-6001.

7148.63 - Distribution of Maps by Washington Office Engineering Staff

The Washington Office Engineering Staff shall maintain a distribution list of cooperators, including other Federal agencies, technical libraries, educational institutions, and certain other map recipients as designated by the Chief. The Washington Office Geometronics Staff furnishes map products produced by the Regions, when requested, for official information and reference.

7148.64 - Other Agency Maps

Other Federal map making agencies furnish the Washington Office with copies of new map publications for official use. Distribute Federal agency maps received under routine procedures as follows:

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1. U.S. Department of the Interior, Geological Survey topographic quadrangles.
 - a. One copy to the Regional Office responsible for managing the mapped area.
 - b. One copy to Station or Area nearest to the mapped area.
2. Other Maps. Distribute other maps and map publications received by Washington Office Engineering to field units as necessary.

7148.65 - Distribution of Maps to National Archives and Records Administration

Regional Office Geometronics Leaders shall send one copy of all published maps to the National Archives and Records Administration (NARA) for permanent retention. Forward maps to NARA, Cartographic and Architectural Branch, 8601 Adelphi Rd., College Park, MD 20740-6001 (FSM 7148.04d).

7148.7 - Sale of Map Products

When a request for a map is received from the public, the Forest Service shall furnish the requested map, either free or at the designated charge (sec. 7149.3), depending on the map requested. This does not prohibit giving a Forest Visitor Map to a Forest Service cooperator. See FSM 7149.1, Map Pricing Procedures, for direction on furnishing maps to cooperators. Stamp any map provided to a cooperator "For Official Use Only - Not for Sale" (FSM 7148.04b).

7148.71 - Primary Base Series/Single Edition Quadrangle

Field units are authorized to sell administrative maps under the Map Sales Program. Sell a map at the cost of reproducing, indexing, and handling, but not for less than the current price of a Department of the Interior Geological Survey 7.5-minute quadrangle map. See FSM 7149.2 for map pricing procedures.

7148.72 - Secondary Base Series

When no other map meets the requestor's needs, furnish Secondary Base Series lithographic reproduction materials under guidelines provided in FSM 7149.22 (1)(c).

7148.73 - Other Forest Service Maps

(FSM 7143).

7148.74 - Negatives and Duplicate Negatives

The Forest Service has the authority to sell duplicates of map negatives (FSM 6512.12a). Do not release these materials when it is known they are to be used in advertising or in any way that would indicate that the Department, either directly or by implication, endorses any commercial product unless the following disclaimer is included in the final product:

This map is reproduced from drawings produced by the Forest Service, USDA, and is distributed as a public service at no cost to the United States Government. Such distribution in no way constitutes an endorsement of any product or service produced by the distributor.

Do not furnish material classified for security purposes unless the Office of Security having jurisdiction over the area has given approval.

Because maps are not copyrighted, there are no additional legal restrictions on map reproduction from negatives by local printing businesses. In providing negatives for use by commercial printers, replace the standard credit line with the following:

This map is reproduced from maps prepared by the U.S. Department of Agriculture, Forest Service.

7148.8 - Information Center Service

7148.81 - DATUM

The DATUM Information Center Service offers a nationally accessible, electronic source of Forest Service information materials about the variety of map products, services, and geospatial data available from the Geometronics Service Center.

DATUM includes information about such materials as Cartographic Feature Files (CFF's), Digital Elevation Models (DEM's), LT Plus Backup Files (LTP's), and other geospatial data. It contains information on how to order reports on data availability, upcoming conferences and training opportunities, past editions of DATUM newsletter, and GIS tools for using the data. Users nationwide can review a list of documents available electronically from DATUM and request a document by sending a message to the DATUM mailer's profile, stating the document desired on the subject line. The DATUM document requested is mailed automatically to the requester's inbox, where it can be viewed or printed as a CEO document. Some documents may also be printed in Office/PUBLISHER and TeX desktop publishing formats. Further instructions can be found in the "Help drawer" within the Information Center Service.

7149 - Map and Geospatial Product Sales

7149.01 - Authority

1. Executive Order 12906, April 13, 1994: Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure. This order requires agencies of the Federal Government to establish a proactive program for disseminating geospatial information products.
2. Executive Order 13642, May 9, 2013: Making Open and Machine Readable the New Default for Government Information. This order requires agencies of the Federal

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Government to ensure that information assets, including geospatial data, are released in ways that make the data easy to find, accessible, and usable.

3. OMB Circular A-25; User Fees. This circular establishes Federal policy regarding fees assessed for Government services and for sale or use of Government goods or resources including maps and geospatial products. It directs agencies to establish prices for products and services that reflect current market pricing in order that the private sector may compete without disadvantage. The circular also directs agencies to establish simple, auditable accounting procedures.

4. The Agricultural Adjustment Act of 1938, section 1387, as amended (7 U.S.C. § 1387). This statute is the primary authority for map and geospatial data sales. This act provides the basic authority for sale of reproductions of information such as geo-referenced data from all sources, aerial or other photographs, mosaics, and maps as have been obtained in connection with the authorized work of the Department.

7149.02 - Objectives

1. To provide saleable maps and geospatial products, which may include data, that assist visitors to National Forest System Lands and which help communicate the Forest Service mission.
2. To recover the costs of disseminating maps and geospatial data and products so that the program is self-sustaining.
3. To sell Forest Service maps at current market prices. To recover costs associated with repackaging, reformatting and shipping data as necessary.

7149.03 - Policy

The Map Sales Program is established to furnish maps and geospatial products that assist visitors to our National Forests and Grasslands and which promote awareness and understanding of the Forest Service mission. The program must be self-sustaining in order to continue the delivery of these products into the future. Map prices will align with similar products found in the market place.

7149.04 - Responsibility

7149.04a - Director of Engineering, Technology and Geospatial Services, Washington Office

It is the responsibility of the Director of Engineering, Technology and Geospatial Services, Washington Office to direct the Geospatial Information Officer to:

1. Establish and maintain a national map sales price list for maps for all products in the Map Sales Program, along with official volume discounts available to purchasers. This

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list is published at the Geospatial Management Office website (<http://fsweb.gmo.fs.fed.us/>).

2. Analyze map cost component data for nationally priced maps at least once every 3 years. Adjust nationally established prices when necessary based on an analysis of historical costs and current market prices for similar map products. The sale price will be rounded up to the nearest dollar.
3. Direct Regions to perform similar analyses for Regional specialty map prices that are set by the Regional Forester.
4. Review savings realized from volume sales procedures at least once every 3 years and adjust volume discount structure as necessary based on map cost analysis and current market conditions.
5. Establish a national map sales steering team, chaired by the Geospatial Information Officer, with representatives from the Geospatial Management Office, Recreation, Heritage and Volunteer Resources; Office of Communications; Financial Policy and Analysis; and the National Partnership Office to review and affirm new map prices when adjustments are determined to be necessary.
6. Publish new map prices and communicate price changes as necessary at the [Geospatial Management Office website](http://fsweb.gmo.fs.fed.us/) (<http://fsweb.gmo.fs.fed.us/>). Communicate map price changes and implementation processes.

7149.04b - Director of Financial Policy and Analysis, Washington Office

It is the responsibility of the Director of Fiscal Policy and Analysis, Washington Office, to provide accounting procedures for managing map sales receipts. These policies and procedures are documented in FSM 6530, Billing and Collections and associated handbooks.

7149.04c - Regional Foresters

It is the responsibility of each Regional Forester to:

1. Designate a responsible official at the Regional level, usually the Regional Geospatial Services Manager (or equivalent), to manage the Region's Map Sales Program and Map Sales Funds; and to oversee the required fiscal and physical inventory for saleable map products.
2. Delegate the management of the Region's map sales fund to a responsible official at the Regional level, usually the Regional Geospatial Services Manager (or equivalent), (FSM 7149.22: Cost Analysis Procedures; FSM 6530: Billings and Collections).

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3. Ensure the assessment of map sales fund solvency on an annual basis. Map sales funds should be maintained at a sustainable level. Avoid allowing balances that significantly exceed the program's average yearly budget obligation request.
4. Ensure that an annual physical inventory of saleable map products is performed each year, as set forth in FSM 7149.11d- Map Inventory and Control Records, and any other Region-specific direction.
5. Provide the annual map cost component analysis to the Washington Office Director of Engineering, Technology and Geospatial Programs by February 28 of each year.
6. Set prices for regional map products and authorize the sale of new maps in the Map Sales Program.

7149.04d - Regional Geospatial Services Managers (or equivalents)

It is the responsibility of Regional Geospatial Services Managers (or other staff as designated by the Regional Forester) to:

1. Manage the Region's Map Sales Program and Map Sales Fund.
2. Annually collect and consolidate map cost component information including physical inventory data and map sales accounting data from all units in their Region involved in map sales. See FSM 7149, 11d, ex 01.
3. Perform a map cost component analysis for their Region following the guidelines provided in FSM 7149.2 - Cost Recovery.
4. Provide regionally consolidated cost component analysis, including the Region's cost component worksheet to the Washington Office Director of Engineering, Technology and Geospatial Services each fiscal year. This information is to be submitted by February 28 of the following year. See 7149. 21: Cost Analysis Procedures for information requirements and template worksheets.
5. Collect and assemble regional map inventory data (FSM 7149.11d, ex. 02) in order to plan appropriate map production and printing quantities.
6. Establish and publish the selling price for Region and Forest Special Purpose Maps such as special area maps and river guides. Assess prices of each regional or special purpose map at least once every three years based on cost data and market analysis of similar products. Submit product list and prices to the Geospatial Information Officer.

7149.04e - Line Officers

It is the responsibility of each Line Officer responsible for map and geospatial data sales to:

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1. Designate a responsible official(s) at each map sales location to manage the map inventory, perform annual physical inventory, review map sales, reconcile any discrepancies, and respond to the annual map cost component data call. Provide sales information needed by the Regional Office for preparation of the annual cost component analysis. See FSM 7149.2.
2. Complete an Annual Map Inventory Record, in accordance with FSM 6551.6: Accounting Procedures for Inventory and Operating Materials and Supplies, as of the last day of the fiscal year and provide it to the Regional map sales point of contact by November 30 of each fiscal year. Use form AD-107 to record transfer of maps between units. No cost adjustments are necessary when maps are transferred within a Region. Document maps removed from inventory by destruction using form AD-112 See FSM 7149.14 - Disposition of Old or Obsolete Maps. When one Region sells another region's maps, the maps will be transferred to the other Region using form AD-107.
3. Follow sales and accounting procedures for maps and geospatial products sold at the unit level (see FSH 6509.11k Service-Wide Finance and Accounting Handbook).
4. Assure that for-sale maps are accounted for as controlled property and are not distributed for administrative use without payment from benefitting staff or units.
5. Annually, compare actual inventory to sales data and handle discrepancies found in the map inventory in accordance with FSM 6551.6: Accounting Procedures for Inventory and Operating Materials and Supplies.

7149.05 - Definitions

Administrative Maps. Forest Service maps which are created and published for intended use by the visiting public. They may also serve multiple internal business purposes, such as for fire, timber sale activities, Forest/District planning activities, contract and agreement administration, land use administration, and recreation management. These maps are referred to as “administrative maps,” or “administrative-use maps”. When maps are removed from the sales inventory for use as administrative products, the staff using the maps will reimburse the map sales fund. See FSM7149.11e,-Administrative Use.

Cost Component Data. Fiscal and accounting information compiled to assess expenses incurred to deliver the Map Sales Program. See 7149.11d, exhibit. 01 for a sample cost component worksheet.

Forest Service Geospatial Data. Data that has explicit geographic positioning information included within it. Geospatial data may include attribute data that describes the features found in the dataset. Geospatial data may be in vector or raster format. Geospatial data that is part of the Forest Service system of record, and is stored in a Forest Service database, is considered to be Forest Service geospatial data.

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Forest or Grassland Visitor Maps. A map which provides detailed information about a particular national forest or national grassland. It is developed and published by the Forest Service for use by visitors and those interested in specific activities such as camping, hunting, fishing or other recreational activities. The map displays the various recreational opportunities available, safety information, and interpretive content about the national forest. The map may depict an entire national forest, national grassland, or a subdivision of a national forest or national grassland. (See 7143.14 – Forest Visitor Map)

Interpretive Associations. Non-profit organizations that work in partnership agreements with the Forest Service. (FSM 2390 Interpretive Services).

Obsolete Maps. Maps superseded by a new version or a similar map of the same area. At other times, even when a newer version has not been published, a map may be considered to be obsolete for one or more of the following reasons:

- a. The area represented by the map has undergone significant changes and the existing map no longer accurately depicts critical features such as roads, trails, administrative unit boundaries, and/or facilities.
- b. The map contains significant erroneous information that could mislead or misinform the user.
- c. The map no longer accomplishes its intended purpose, or there is no longer need for the map.
- d. The map paper/plastic has become degraded and is unreadable or otherwise unusable.

Special Purpose and Special Area Maps. Maps of special areas managed by the Forest Service with intended purposes that vary from the standard map products (See FSM 7144.03, Policy). They depict detailed information on Wilderness Areas and other special interest areas such as Wild and Scenic River areas, National Recreation areas and National Monuments. These maps may contain similar content and symbology to the standard Forest/Grassland Visitor Map, however they may vary from those standards as needed to accomplish the intended purpose of the map.

7149.1 - Map Sales Program

7149.11 - Map Sales Program Guidelines

7149.11a - Types of Maps for Sale

Digital and hardcopy saleable map products include but are not limited to:

1. Large scale topographic quadrangle maps or equivalent products.
2. Forest, Grassland, and District Visitor Maps.

3. Wilderness Maps.
4. Special Purpose/Area Maps, such as trail maps; wild and scenic river maps and guides; and atlases, and other specialized maps.
5. Maps produced jointly with another government agency.
6. Maps from other Federal agencies, if stocked and in the sales program. These maps are to be sold at the price designated by the producing agency.

7149.11b - Types of Free Maps

Free digital and hardcopy map products include, but are not limited to:

1. *A Guide to Your National Forests and Grasslands* (FS-418), as well as Regional and/or State Guides, shall be provided free of charge to the public.
2. Pocket Visitor Guides should be provided free of charge. Under special circumstances, a waiver allowing a fee, to be established in accordance with FSM 7149.12, may be granted by the Washington Office, Director of Engineering, Technology and Geospatial Programs.
3. Special Purpose/Area Maps may be provided free of charge to the public.
4. Motor Vehicle Use Maps must be furnished free of charge in accordance with the Forest Service Travel Management Policy.

The cost of furnishing free maps shall be borne by the benefiting unit's appropriated funds, not map sales funds.

7149.11c - Sales Price

When a map is sold, the total costs associated with furnishing the updated map, guide, or atlas must be recovered. Forest Service map prices must be set to ensure cost recovery, but also priced so that maps allow the private sector to compete without disadvantage, in accordance with OMB Circular A-25- Market Prices. A market analysis will be performed at least once every three years to determine if map prices require adjustment.

7149.11d - Map Inventory Record and Controls

Map inventories must be treated as controlled property and stored in a secured area (see FSM 6414 Property Management – Controls). An annual inventory of maps is required and is due to the Regional Office by November of each year (see (FSH 6509.14 para 04.2 Number 5 – Collection Officers). Use a map inventory form (see an example at FSM 7149.11d, ex. 02) to collect inventory data for the cost component analysis as well to monitor map supply levels. Units should retain a 6-month supply that will allow adequate time to request and receive a new supply of reprinted maps. Inventories at the National Forest Map Store, The U.S. Geological

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Service (USGS) Map Store and any other map distributors must be monitored and maintained. Units will supply maps to these distributors when indicated on low stock reports.

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7149.11d - Exhibit 01

Regional Cost Component Analysis Worksheet (See [GMO website](#) for actual Excel worksheet)

REGION: _____

Fiscal Year XX

1	Salary (USFS)	
2	Contract Cost	
3	Program Management	
4	Misc. Costs (software, hardware, travel, training, supplies, etc.)	
6	Total Number of Maps Printed	
8	Print Cost	
9	Number of Maps Printed	
11	Front Desk - Number of Maps Sold	
13	NF Store - Number of Maps Sold	
14	NF Store - Total Reimbursement	
15	NF Store - Other charges	
17	USGS - Number of Maps Sold	
18	USGS - Total Reimbursement	
24	¹ Front desk distribution cost is 5 minutes at GS-6 GSA General Schedule salary	
25	² Full prices per current price direction	

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7149.11d - Exhibit 02

SAMPLE ANNUAL MAP INVENTORY RECORD

Forest/Grassland/Unit Map Inventory	Quantity/Record
3. New printing received	
4. Transferred In (Form AD-107)	
Total additions	
Subtractions - Maps Out	
5. Sold	
6. Transferred Out (Form AD-107)	
7. Recycled or destroyed (Form AD-112)	
Total Subtractions	
8. Calculated FY Inventory (from sales)	
9. Actual FY Inventory (physical count)	
10. Difference between Previous and Actual Inventory	
11a. Explanation	
12. Unit Name	
13. Prepared By	
14. Date	

7149.11e - Administrative Use

Do not use Map Sales funds to bear the cost of furnishing maps for administrative use. Purchase administrative use maps at full cost with a government purchase card and charge such maps to the appropriate management code of the benefiting unit. Bulk discounts will be applied to these purchases if purchased through the National Forest Map Store. Benefiting unit activities include, but are not limited to: fire, timber sale activities, Forest/District planning activities, contract and agreement administration, land use administration, and recreation. Benefiting units may be allowed to pre-pay for maps at the time of printing at a reduced price. The reduced price must recover the national average costs of production and printing. Maps used internally for administrative purposes are to be stamped “For Administrative Use Only.”

7149.11f - Map Standards

New editions of Forest Visitor maps provided to external customers must meet established Forest Service map standards, see FSH 7109.13a and Engineering Management Series publication "Cartographic Specifications and Symbols," EM-7140-24 (FSH 7109.13a, sec. 06.3). Special Purpose/Area maps published by the regions are not required to meet the EM-7140-24 standards. All published maps must meet requirements specified in the [USDA Visual Standard Guide](https://www.usda.gov/sites/default/files/documents/visual-standards-guide-january-2013.pdf), (<https://www.usda.gov/sites/default/files/documents/visual-standards-guide-january-2013.pdf>). DVDs and CDs that contain packaged geospatial data must also follow the USDA Visual Standard. Geospatial data furnished to the public must contain FGDC compliant metadata. All map publications must include the USDA nondiscrimination statement as stated at the [USDA website](https://www.usda.gov/non-discrimination-statement) (<https://www.usda.gov/non-discrimination-statement>). The shortened version, “USDA is an Equal Opportunity Provider, Employer and Lender” is acceptable for smaller maps and where space is limited. See USDA Departmental Regulation 4300-3 (DR-4300-3), Equal Opportunity Public Notification Policy for more information.

7149.11g - Financing Map Production

Charge production and printing costs of new maps to appropriated funds. Map sales funds must only be used to revise, reprint or otherwise replace existing maps produced for sale, including the costs of revision, reconstruction, printing and distribution.

7149.12 - Geospatial Data Dissemination

The following outlines direction for geospatial dissemination:

In compliance with Executive Order 120906, Coordinating Geographic Data Acquisition and Access; and the President’s Open Data Policy (see 7149.01.4) Forest Service geospatial data approved for publication should be made readily available at no cost to the public. When it is necessary to repackage data, appropriate fees may be collected to recover costs incurred. Monies shall be deposited to the map sales fund.

7149.13 - Disclaimers

Include information on products and data disseminated to the public that explains the product's intended usage and any other necessary disclaimer information. Disclaimers will vary on products depending on their intended usage and audience. The following data disclaimer is required on all corporate data disseminated outside the agency or posted to public facing data clearinghouses or websites. The map disclaimer is an example that covers most map disclaimer requirements. Questions about appropriate disclaimers should be referred to the Geospatial Information Officer.

1. Data Disclaimer. The USDA Forest Service makes no warranty, expressed or implied, including the warranties of merchantability and fitness for a particular purpose, nor assumes any legal liability or responsibility for the accuracy, reliability, completeness or utility of these geospatial data, or for the improper or incorrect use of these geospatial data. These geospatial data and related maps or graphics are not legal documents and are not intended to be used as such. The data and maps may not be used to determine title, ownership, legal descriptions or boundaries, legal jurisdiction, or restrictions that may be in place on either public or private land. Natural hazards may or may not be depicted on the data and maps, and land users should exercise due caution. The data are dynamic and may change over time. The user is responsible to verify the limitations of the geospatial data and to use the data accordingly.

2. Map Disclaimer. This map is intended to depict physical features as they generally appear on the ground and may not be used to determine title, ownership, legal boundaries, legal jurisdiction, including jurisdiction over roads or trails, or access restrictions that may be in place on either public or private land. Obtain permission before entering private lands, and check with appropriate government offices for restrictions that may apply to public lands. Lands, roads and trails within the boundaries of the National Forest may be subject to restrictions on motor vehicle use. Obtain a Motor Vehicle Use Map, or inquire at the local Forest Service Office for motor vehicle access information. Natural hazards may or may not be depicted on the map, and land users should exercise due caution. This map may not be suitable for navigation.

7149.14 - Disposition of Old or Obsolete Maps

When maps are revised, remove previous editions from circulation according to Federal Property Management Regulations using AD-112, Report of Unserviceable, Lost, Stolen, Damaged, or Destroyed Property. Refer to FSM 6413 Property Management – Disposal for additional guidance. Limited quantities (20 copies or less) of old maps, stamped "OUT-OF-DATE/NOT FOR SALE" may be donated to educational institutions for educational purposes for uses where map content and accuracy are not critical. Use SF-120, Report of Excess Personal Property and SF-122, Transfer Order Excess Personal Property, to document transfer of obsolete maps to educational institutions. Recycle or destroy remaining maps, documenting the destruction with two witnesses and attaching the destruction order to the completed AD-112. List the total number of maps recycled destroyed or exchanged on an Annual Map Inventory Record such as

in the example provided at FSM 7149.11d, exhibit 02. Include those maps donated for educational purposes in this category.

Regions may require a specific inventory record format that differs from the example provided at FSM 7149.11d, exhibit 02. Units should complete inventory forms as directed by the Regional Geospatial Services Program Manager or equivalent.

7149.2 - Cost Recovery

7149.21 - Cost Analysis Procedures

An annual map cost analysis must be performed to ensure that the costs associated with construction, printing and distributing maps to the public are being recovered as required by OMB Circular A-25 and 7 U.S.C. section 1387. The initial construction and printing of any new map must be borne by appropriated funds. Subsequent costs associated with furnishing the map after the initial production and printing shall be borne by the Map Sales Fund. Prepare a cost component worksheet to determine preparation and program management, printing and distribution costs. Establish a price based on market analysis for similar maps. A sample cost component worksheet and market analysis are available at the Geospatial Management Office website. (<http://fsweb.gmo.fs.fed.us/>).

7149.22 - Map Discount Pricing Procedures

1. Volume Discount Pricing. Volume discounts will be made available only through the National Forest Map Store and the U.S. Geological Survey. These discounts are based upon savings to the government through bulk sales. Volume discount rates are available and published at the [Geospatial Management Office website](#). No other discount will be made available.
2. Map Exchange Policy. Interpretive Associations (IA) may exchange previous versions of maps when a new or revised version is printed to ensure that the latest maps available are being sold to the public. The terms of the exchange must become part of the required Annual Operating Plans for each IA agreement. Encourage the IAs to monitor their map inventory to prevent overstocking and minimize the need to exchange maps. Exchanges will be handled by the National Forest Map store. The total number of maps exchanged must be recorded in the required annual map inventory. IAs are expected to stock the most current version of any given map. Maps received from IAs through this exchange process are obsolete and must be destroyed in accordance with FSM 7149.21 paragraph 5. This is the only case in which old maps may be exchanged for new maps. Only IAs are eligible for this map exchange.
3. Standard Map Pricing Policy. All maps sold at official Forest Service facilities such as Regional Offices, Forest Supervisor's Offices, District Offices, Visitor Centers, or other facilities, shall be sold at the official price established nationally by the Forest Service and published on the official Map Price List at the [Geospatial Management Office website](#) (<http://fsweb.gmo.fs.fed.us/>) or Regional Office website for Regional

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products. Interpretive Associations selling maps at Forest Service facilities are required to collect sales tax to the price of the map, and this will be added to the price of the map.

4. Phone and Email Requests. Local units, responding to phone requests for maps should refer customers to the National Forest Map Store. The National Forest Map Store is set up to process these orders. Shipping and handling costs for map orders are not included in the price of maps. Interpretive Associations filling phone and email orders may charge shipping and handling.

7149.3 - Map Price List

The latest prices for saleable map products are published at the [Geospatial Management Office website](#).