

# Mississippi Orthoimagery Implementation Plan

## Table of Contents

### Mississippi Orthoimagery Implementation Plan

<b>Overview</b>	<b>1</b>
Business Drivers and Stakeholders .....	1
Benefits .....	1
Current Status .....	1
Standards/Guidelines .....	3
Resources Requirements .....	4
Success Factors .....	4
<b>Implementation Options.....</b>	<b>5</b>
State Program .....	5
Orthoimagery Option 1: Develop contract specifications and inventory available orthoimagery and orthoimagery activities of local government.....	5
Implementation Strategy .....	5
Coordination requirements.....	6
Resource Needs.....	7
Dependencies.....	7
Orthoimagery Option 2: State Orthoimagery Consortium .....	8
Implementation Strategy .....	8
Coordination Requirements .....	8
Resource Needs.....	8
Dependencies.....	8
Orthoimagery Option 3: State Orthoimagery Program .....	9
Implementation Strategy .....	9
Coordination Requirements .....	9
Resource Needs.....	9
Dependencies.....	9
<b>Appendix A: Current Status of Orthoimagery in Mississippi.....</b>	<b>10</b>
<b>Appendix B: Department of Revenue Rules – Minimum Requirements for Aerial     Photography .....</b>	<b>13</b>
<b>Appendix C: Department of Revenue Flight Schedule.....</b>	<b>15</b>
<b>Appendix D. Wisconsin Regional Orthophotography Consortium 2010 .....</b>	<b>17</b>
<b>Appendix E: North Carolina Technical Specifications for Digital Orthophoto Base Mapping     .....</b>	<b>19</b>

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## Overview

### Business Drivers and Stakeholders

- *Base Mapping:* All base mapping relies on imagery. Having current high quality imagery has become a necessity for nearly all GIS applications.
- *Parcel mapping:* The Department of Revenue requires regular updates of orthoimagery to support local government property assessment updates.
- *Forestry and Agriculture Management:* These business drivers are highlighted because they require leaf on or mid summer photography, which makes them, a little unique compared to most applications, which use leaf off imagery.

### Benefits

Orthoimagery is one of the more valuable information sets for the GIS community. It can provide a clear picture of ground conditions and is commonly used backdrop for many themes. When current imagery is combined with parcel maps or address information can reduce the need for site accomplishing in minutes what would otherwise take. Property appraisers will use the orthoimagery to verify the number of buildings on a property, which reduces the number of site, visits that that they need to make.

### Current Status

The following is a summary of the status of recent orthoimagery acquisitions in Mississippi. A more detailed description is found in Appendix A.

#### *Large-scale orthoimagery (2 foot resolution or better):*

Mississippi was able to collect statewide orthoimagery in 2006 at 2 foot resolution and acquire 1 foot and 6 inch imagery for six coastal counties in 2007 (George, Hancock, Harrison, Jackson, Pearl River and Stone}. The digital imagery was composed of 24 bit natural color digital ground orthos in the leaf-off season.

Counties and local governments also collect large scale imagery as do state agencies, generally on a project-by-project basis. The Tax Assessor's Office is required to collect aerial photography, not orthoimagery, on either a twelve, ten or eight year cycle depending upon the number or parcels in the county. The Department of Revenue (formerly the Tax Commission) rules are included in Appendix B along with the schedule for county imagery as of the summer 2010. Most notable are the requirements for at least one-foot imagery in the urban and 2 foot imagery in the rural areas. There are important considerations for local governments in the design of state digital orthoimagery program.

The following table shows the Department of Revenue schedule for county aerial photography. The time interval for flying aerial photography is determined on a parcel count basis as follows:

- 10,000 parcels and less Within 12 years
- 10,001 to 20,000 parcels Within 10 years
- 20,001 parcels and above Within 8 years

Table 1 shows that half of the counties are required to fly aerial photography<sup>1</sup> in the urban areas in the next five years and in the rural areas in the next six years.

**Table 1 Schedule of county aerial photography, the values in the cells represent the number of counties.**

Year	Urban Next Flight	Urban Next Flight Cumulative	Rural Next Flight	Rural Next Flight Cumulative
2009	1	0	0	0
2010	6	7	2	2
2011	10	17	15	17
2012	8	25	2	19
2013	6	31	5	24
2014	4	35	6	30
2015	9	44	10	40
2016	2	46	7	47
2017	9	55	6	53
2018	5	60	17	70
2019	8	68	4	74
2020	6	74	3	77
2021	3	77	4	81
2022	3	80	0	81
2023	1	81	0	81
2024	0	81	0	81
2025	1	82	1	82
2026	0	82	0	82
Average	2015		2016	

It should be noted that when the counties acquire “aerial photography” they are required to conduct a soils analysis within two years.

*Small-scale orthoimagery (3 ft or greater):*

The Department of Agriculture through its National Agricultural Imagery Program (NAIP) acquires peak growing season “leaf on” imagery on a regular basis, and delivers this imagery to USDA County Service Centers to maintain the common land unit (CLU) boundaries and assist with farm program management. The goal of NAIP is to collect 1-meter imagery for the entire conterminous United States. The imagery is acquired in natural color, with a "four band" product available through a contract "buy up". Image products are available in the year of acquisition. NAIP imagery for

<sup>1</sup> Aerial photography and not necessarily digital orthoimagery.

Mississippi was collected in 2004, 2005, 2006, 2007, 2009 and 2010. Although valuable for many programs the one-meter scale is not adequate for many GIS applications including the Tax Assessor needs. This imagery was purchased and processed (reprojected and clipped) and published by MARIS to support local government E911 offices.

### **Standards/Guidelines**

Mississippi has adopted national standards for orthoimagery. The state should expand upon this standard to facilitate uniform acquisition by developing standards and/or guidelines that are written with the specific objective of incorporating the language into contracts for data acquisition. Even if a program is not in place “contract standards” can do much to coordinate existing activities if the stakeholder community is a part of the development and review process.

*A case for developing uniform specifications from North Carolina (see Appendix D):*

The following section provides specific examples of some of the benefits accrued from the development of uniform specifications for the acquisition of orthoimagery described from the experiences in North Carolina (NC). The State GIS in NC has considerable experience contracting for orthoimagery acquisition across a number of entities. The purpose of their contract is to make sure they get comparable product specifications on the pricing. The state also provides a quality control to ensure that the state and counties are getting product that meets the specifications. The data specifications are supported by USGS in the sense that the USGS supports cost sharing for contracts following the NC specifications. The counties and contractors have all endorsed these specifications creating a level playing field for bidding (see North Carolina State Specification Appendix E). Some of the examples of benefits from the uniform specifications are described below.

*Image Clarity:* One of the issues NC has seen in the past are contractors bidding digital orthoimagery at a higher flight and then re-sampling the data. The products are less expensive but are of significantly less quality. With the standardized specifications that include collection in digital format with multiple bands NC has seen the clarity is double and even triple what they have gotten in the past. For example they can see ground features in the shadows because of the digital collection of the aeriels. This is not possible with digital aerial imagery created from scanned film base.

*Preparing for Follow on projects:* When data is pulled off the airplane it is in a raw proprietary format. The NC standard requires that raw digital data be transferred to a non-proprietary format. The file size is significantly large, 120 terabytes, because of the use of multiple spectrum scanners, but the savings of having these files cuts the subsequent processing cost in half. For example the raw digital files can be reprocessed for infrared or terrain modeling. The files are provided to the state and

maintained in “cold storage” (as opposed to live storage) until they are needed.

*Leveling the playing field:* A sample request for proposal (RFP) for the counties is provided in the appendix of the specification and which has been extremely valuable for the counties. They have also found the need to include film specifications in an appendix as an informative annex to help firms using film to be competitive (some smaller firms use film and then scan the film providing a disclaimer about the shadow detail). The vendors have been supportive of the standard RFP because they know everyone is bidding to the same specification.

### *Resources Requirements*

The resources for standard development depend upon specification like the ones developed by North Carolina’s. Mississippi could continue with the specifications they have at no additional cost. A detailed specification will take about one year to finalize if it is developed as a consensus standard that goes through a statewide review process. A State GIS Coordinator or the Technical Advisory Team of the GIS Council should lead the development of the standard.

### **Success Factors**

1. *Inventory:* Knowledge of existing and future digital orthoimagery. This will be essential for coordinating orthoimagery acquisition. An outreach effort through the regional planning council’s will be an effective method for monitoring local government activities.
2. *Standards:* Develop uniform orthoimagery standards and specifications that optimize the value to all levels of government. The entire stakeholder community needs to be involved in the development of the specifications, state, local federal government and the vendor community to acquire buy in. The objective of the specifications is to define the product for the users and to level the field for the vendors.
3. *Update cycle:* The update cycle needs to be on a regular schedule. Ideally a minimum of three years for urban areas and five years for rural areas.
4. *Upgrades:* Allow for “buy up” for agencies/local governments to acquire an improved product.
5. *Outreach and Planning:* Advance notice and procedures should be in place to allow the stakeholders to submit budgets to participate in the program (2 year lead).
6. *Soils Survey:* The tax assessor is required by DOR to update their soils survey each time they acquire orthoimagery. The cost of a soils update for counties without out digital parcels where it is done manually can be significant. This cost of the soils survey will need to be accounted for in the acquisition of orthoimagery.

## Implementation Options

There is a need for a state orthoimagery program that collects imagery on a regular cycle with advanced notice that allows for the coordination, leveraging and pooling of existing resources from state and local governments. The following three options provide a progression of activities for accomplishing those ends.

### State Program

The goal of a state program is to acquire statewide orthoimagery that can be used by all levels of government. There are three approaches to establishing an orthoimagery program that are cumulative in content and increasing in resource requirements:

- Standards in the form of uniform technical specifications are established
- Acquire funding for statewide digital orthoimagery.
- Acquire funding for soils assessment per DOR requirements.
- Allow for local governments to buy up to a higher resolution.
- Establish a regular schedule for orthoimagery acquisition, ideally on a 3 to 5 year update cycle.

### **Orthoimagery Option 1: Develop contract specifications and inventory available orthoimagery and orthoimagery activities of local government.**

Mississippi has adopted national standards for orthoimagery but detailed product specifications need to be developed that can be used in contracts to create uniform product that has utility for all level of governments. A centralized inventory of state, federal, regional and local government orthoimagery activity needs to be maintained to facilitate coordination.

#### *Implementation Strategy*

##### *Develop orthoimagery specifications*

- Establish a workgroup to develop detailed specifications for orthoimagery.
- Review product specifications from different states, the North Carolina standards provides an interesting model to consider (see Appendix E)
- Develop digital orthoimagery specifications that can be incorporated into state and local government contracts.
- Engaging the stakeholder community in the development of the standard is essential for adoption of those standards. The stakeholders view “contract specifications” that have been developed by experts as a benefit to them.

##### *Compile Inventory of available and scheduled orthoimagery*

- Maintain a centralized inventory of large-scale and small-scale orthoimagery, historical and planned
- Identify scheduled/potential orthoimagery acquisition projects so that they can be included in an outreach effort.
- Utilize the regional planning council’s to monitor orthoimagery activity.

*Coordination requirements*

- This effort will require a coordinator who is knowledgeable of the subject matter. Acquiring acceptance for the use of the specifications will require the involvement of the entire stakeholder community, including vendors, in the development of orthoimagery specifications.



*Resource Needs*

<b>Resource</b>	<b>Initial Year</b>	<b>Maintenance</b>
Coordinator	15%	NA
Time requirements	1 Year	NA

*Dependencies*

- Coordinator
- Participation in the development of the specifications by the user community, Department of Revenue, Tax Assessors and the vendors.

## Orthoimagery Option 2: State Orthoimagery Consortium

Establish a “consortium of the willing” among state and local governments to pool their resource for the acquisition of orthoimagery on a regularly scheduled basis. The state provides the coordination and contract management. The benefits would be in the reduced costs to the counties through economies of scale and a standardized product that allows apple to apple comparisons between proposals.

### Implementation Strategy

- *Acquisition plan:* Develop a strategy and marketing plan to build the consorting. Utilize the specifications developed in option 1. Look to other states as for models (see Wisconsin Regional Orthophotography Consortium in Appendix D).
- *Funding mechanism:* Establish a funding mechanism to accept contributions and contracts that can be managed over more than one fiscal year.
- *Out reach and coordination:* Utilize the regional planning council’s to market the acquisition as well as the inventory of anticipated orthoimagery acquisition to directly contact potential participants.
- *Seed money:* The state should provide some level of funding to bring the stakeholders to the table.

### Coordination Requirements

The coordination requirements for this effort can be significant. The coordinator will need to develop a plan and market it proposal to state agencies and local governments. It is important that they have sufficient time to submit their budget proposal.

### Resource Needs

Resource	Initial Year	Maintenance
Coordinator	15% - 20%	NA
Time requirements	1 to 2 Year	NA

### Dependencies

- *Digital orthoimagery specifications*
- *Meet Department of Revenue requirements*
- *Project Coordinator*
- *Base funding of at least 30%*
- *Lead time that is adequate to allow the stakeholders to include funding requests in their budgets.*

### Orthoimagery Option 3: State Orthoimagery Program

The objective of option 3 is to acquire statewide orthoimagery on a regular basis and allow local governments to “buy up” to a better resolution if they wish.

#### *Implementation Strategy*

- Acquire a funding source
- Budget for tax assessor requirement for soils assessment
- Develop implementation strategy including schedule and contract management.
- Initiate contract process

#### *Coordination Requirements*

Most of the coordination work has been done during option 1 although acquiring the funding will require working with the legislature and state agencies. There will still need to be an outreach effort but this can be much of it can be done through the DOR training program and the regional planning councils. The contractual component is primarily project management.

#### *Resource Needs*

<b>Resolution</b>	<b>Statewide Coverage 46,907 sq miles</b>	<b>\$/sq mile</b>
<b>2 ft</b>	<b>1,828,000</b>	<b>\$38.97/sq mile*</b>
<b>1 ft</b>	<b>4,690,700</b>	<b>~\$100/sq mile**</b>

#### *Dependencies*

- *Digital orthoimagery uniform specifications*
- *Meet Department of Revenue minimal requirements for orthoimagery and soils assessments.*
- *Project Coordinator*
- *Base funding for statewide orthoimagery and soils assessment.*
- *Lead time that is adequate to allow the stakeholders to include funding requests in their budgets and “buy ups”.*

## Appendix A: Current Status of Orthoimagery in Mississippi

- **Statewide 2 ft Orthoimagery 2006**  
Imagery was collected statewide for 2ft orthoimagery in 2006.
- **Coastal 1 ft and .5 ft Imagery 2007:** Additional imagery was collected for six coastal counties in 2007 (George, Hancock, Harrison, Jackson, Pearl River and Stone) at 1 foot and .5 foot resolution. The half-foot resolution imagery was collected for those areas more susceptible to storm surge and flooding.
- **NAIP 1 meter agriculture areas:**  
The National Agricultural Imagery Program (NAIP) mission is to acquire peak growing season “leaf on” imagery, and deliver this imagery to USDA County Service Centers, in order to maintain the common land unit (CLU) boundaries and assist with farm programs.

The goal of NAIP is to collect 1-meter imagery for the entire conterminous United States. The imagery is acquired in natural color, with a "four band" product available through a contract "buy up". Image products are available in the year of acquisition.

While the focus of NAIP is on agricultural areas, cost share partnerships between federal agencies are leveraged to acquire full state coverage.

- **Standard NAIP Coverage unless noted:** Full Coverage/Three Band (Natural Color) Geotiff Quarter Quads, Three Band MrSid County Mosaics
  - 2004 1m Film available
  - 2005 2m
  - 2006 2m Film available
  - 2007 1m
  - 2009 1m
  - 2010 1m Four Band (Natural Color/Color Infrared) Geotiff Quarter Quads)

**Content Title:** Coast Aerial Photography 1ft (2007)**Content Type:** Downloadable Data**Publisher:** GIS Help, Mississippi Coordinating Council for Remote Sensing and GIS**Publication Date:** 2007-05-14**Content Description**

**Content Summary:** This metadata record describes the acquisition and production of ground ortho natural color digital orthoimagery consisting of 2797 sheets (5000' x 5000') for the 6 coastal George, Hancock, Harrison, Jackson, Pearl River and Stone. The digital imagery was composed of 24 bit natural color digital ground orthos at a scale of 1 to 200 with a 30cm ground sample distance (GSD) for the project area. This project was tasked by Mississippi Geographic Information, LLC (MGI) with Work Orders ED-9& ED-9A. EarthData International, Inc. was authorized to undertake this project in accordance with the terms and conditions of the professional service agreement between MGI and EarthData International, Inc., dated February 14, 2007.

**Content Purpose:** The imagery may be used for base map, cadastral and/or infrastructure mapping purposes. All imagery was acquired in spring 2007 and processed during the spring, summer and fall of 2007.

**Content Themes:** Imagery and Base Maps, Transportation Networks

**Time Period of Content****Beginning Date:** 2007-01-25**Ending Date:** 2007-02-06**Content Citation****Content Title:** Aerial Photography 1 M (2004)**Content Type:** Other Document**Publisher:** Aerial Photography Field Office (APFO)**Publication Date:** 2005-05-27**Content Description**

**Content Summary:** This data set contains imagery from the National Agricultural Imagery Program (NAIP). NAIP acquires digital orthoimagery during the agricultural growing seasons in the continental U.S. A primary goal of the NAIP program is to enable availability of orthoimagery within a year of acquisition. NAIP provides two main products: 1 meter ground sample distance (GSD) orthoimagery rectified to a horizontal accuracy of within +/- 3 meters of reference digital ortho quarter quads (DOQQS) from the National Digital Ortho Program (NDOP); and, 2 meter GSD

orthoimagery rectified to within +/- 20 meters of reference DOQQs. The tiling format of NAIP imagery is based on a 3.75'x 3.75' quarter quadrangle with a 360 meter buffer on all four sides. NAIP quarter quads are rectified to the UTM coordinate system NAD83. NAIP imagery can obtain as much as 10% cloud cover per tile.

**Content Purpose:** The 1 meter GSD NAIP is intended as a source for current digital orthoimagery in USDA Field Service Center GIS and for other uses that require orthoimagery acquired during the agricultural growing season.

**Content Themes:** Agriculture and Farming, Biology and Ecology, Environment and Conservation

### **Content Status**

**Update Frequency:** Irregular

## Appendix B: Department of Revenue Rules – Minimum Requirements for Aerial Photography

The State Department of Revenue uses the following standards of for determining the acceptability of the real and personal property rolls in each county.

### Mississippi Tax Laws, Rules and Regulations

#### Title 35, Mississippi Administrative Code

##### *35.VI.2.06 Chapter 06. Standards of Acceptance*

#### 1. Minimum Requirements for Aerial Photography

a. Aerial Photography covering the entire county will be flown periodically and accepted by the county using specifications established by the State Tax Commission. The time interval for flying aerial photography will be determined on a parcel count basis as follows:

Parcels of real property Time period

- 10,000 parcels and less Within 15 years
- 10,001 to 20,000 parcels Within 12 years
- 20,001 parcels and above Within 10 years

b. The county may appeal to the MSTC for an extension of the time period based on the lack of growth in assessed value, the lack of increased parcels, or the lack of change in use value coverages. Requests for such extensions must be made two (2) years prior to the set time period intervals as described above and the MSTC shall accept or reject in writing the request within ninety (90) calendar days.

c. Within two (2) years after acceptance of aerial photography, the county will re-classify or verify all agricultural property according to its current use (cultivable or uncultivable). Counties flying multiple times within the designated time frame may request that additional verification of cultivatable or uncultivable lands may not be required.

d. Prior to flying new aerial photography the county will contact the MSTC in writing. Minimum photography accuracy will be to the standards of the original ownership base if the original accuracy has been approved by the MSTC. MSTC approval of the original accuracy must be submitted to the county within ninety (90) calendar days after the county notifies the MSTC of its intent to fly new aerial photography.

e. USGS Digital Orthophoto Quadrangles (DOQ'S) will be considered acceptable photography for rural areas only.

## 2. Minimum Requirements for Mapping

a. Counties shall acquire and maintain a proper ownership mapping system performed over an appropriate aerial photography base. Ownership maps and aerial photos will be maintained as separate products but will be required to overlay and correlate. Once aerial photography is flown and accepted, the county must submit a plan acceptable to the MSTC to complete ownership map revisions.

b. Originals or copies of current ownership maps and aerial photography must be housed in the Assessor's office.

c. Upon flying new photography, the accepted map scales for ownership mapping are as follows:

Minimum scales required

Scale Application

-----  
1"=100' Urban Centers/Incorporated Areas

1"=400' Sparse/Moderate Rural Areas

Alternate scales accepted

-----  
1"=50' Downtown Business Districts

1"=200' Populated Rural Areas

### **Scale requirements must be coordinated with the MSTC prior to flying aerial photography.**

d. Mapping and related documents and materials will be updated annually to reflect changes such as roads, waterways, transmission lines, pipe lines, and reservoir projects. This update should also include any changes pertaining to ownership, acreage, lots, parcel numbers, and exempt properties.

e. In counties that have digital mapping systems, Assessors shall have the capability to produce (or reproduce on demand) all documents, maps, photographs, copies, and materials described in these minimum requirements at the prescribed sizes, scales, and formats, and on the prescribed mediums (paper, Mylar, etc.).

f. All counties will have maps to be used in the field for appraisal purposes. Upon demand, the county shall have the capability to produce and reproduce maps with aerial photo or imagery composites.



## Appendix C: Department of Revenue Flight Schedule

Counties	Population	Urban Next	Rural Next
ADAMS	30,722	2019	2019
ALCORN	35,822	2011	2011
AMITE	13,038	2019	2018
ATTALA	19,755	2019	2020
BENTON	7,981	2020	2021
BOLIVAR	36,766	2015	2016
CALHOUN	14,422	2010	2011
CARROLL	10,278	2013	2014
CHICKASAW	18,683	2013	2014
CHOCTAW	9,023	2013	2014
CLAIBORNE	10,755	2023	2021
CLARKE	17,207	2020	2019
CLAY	20,722	2010	2011
COAHOMA	26,936	2012	2012
COPIAH	29,094	2019	2016
COVINGTON	20,544	2015	2015
DESOTO	158,719	2017	2018
FORREST	81,078	2018	2018
FRANKLIN	8,324	2021	2021
GEORGE	22,681	2012	2012
GREENE	14,352	2019	2019
GRENADA	23,046	2015	2015
HANCOCK	40,962	2017	2017
HARRISON	181,191	2017	2017
HINDS	247,631	2014	2016
HOLMES	20,290	2020	2020
HUMPHREYS	9,809	2013	2014
ISSAQUENA	1,612	2015	2015
ITAWAMBA	23,000	2010	2011
JACKSON	132,922	2015	2015
JASPER	17,940	2011	2011
JEFFERSON	8,928	2025	2025
JEFFERSON DAVIS	12,543	2020	2020
JONES	67,776	2020	2017
KEMPER	9,833	2011	2011
LAFAYETTE	43,975	2013	2014
LAMAR*	49,980	2015	2015
LAUDERDALE	79,099	2015	2015
LAWRENCE	13,308	2019	2018
LEAKE	23,132	2022	2018
LEE	81,913	2012	2013
LEFLORE	34,563	2019	2018
LINCOLN	34,830	2016	2016

LOWNDES	59,658	2017	2017
MADISON	93,097	2015	2015
MARION	25,732	2011	2011
MARSHALL	36,900	2009	2010
MONROE	36,905	2018	2016
MONTGOMERY	11,129	2011	2011
NESHOBA	30,302	2017	2017
NEWTON	22,568	2011	2011
NOXUBEE	11,631	2021	2021
OKTIBBEHA	44,544	2012	2013
PANOLA	35,245	2018	2018
PEARL RIVER	57,860	2017	2017
PERRY	12,035	2012	2018
PIKE	39,834	2015	2015
PONTOTOC	29,248	2017	2018
PRENTISS	25,709	2011	2011
QUITMAN	8,391	2014	2015
RANKIN	143,124	2016	2016
SCOTT	29,341	2011	2011
SHARKEY	5,420	2014	2014
SIMPSON	27,920	2020	2018
SMITH	15,826	2022	2018
STONE	16,619	2019	2019
SUNFLOWER	29,610	2018	2018
TALLAHATCHIE	12,638	2011	2011
TATE	27,337	2010	2011
TIPPAH	21,661	2017	2018
TISHOMINGO	19,034	2017	2018
TUNICA	10,436	2012	2013
UNION	27,263	2011	2011
WALTHALL	15,291	2010	2010
WARREN	48,175	2012	2016
WASHINGTON	54,616	2012	2013
WAYNE	20,654	2022	2018
WEBSTER	9,852	2014	2015
WILKINSON	10,143	2013	2013
WINSTON	19,309	2018	2018
YALOBUSHA	13,773	2010	2011
YAZOO	27,981	2021	2018

## Appendix D. Wisconsin Regional Orthophotography Consortium 2010

The following information was taken directly from the Wisconsin Regional Orthophotography Consortium's web site <http://www.ncwrpc.org/WROC/>. This document lays out the framework of a program that Mississippi could use as a model for developing a similar program in Mississippi. This could serve as a model for Option 2,

### Purpose and Benefits

The Wisconsin Regional Orthophotography Consortium (WROC) is a multi-entity group led by seven regional planning commissions (RPCs). The goal of the consortium is to build and sustain a multi-participant program to acquire digital orthoimagery and elevation data throughout Wisconsin. WROC is planning for imagery projects in 2010. The WROC approach brings a number of potential benefits to its members, including cost savings, specifications and standards support, data sharing between members and partners, and procurement support.

To facilitate a cooperative approach for orthoimagery data acquisition, WROC is working with the Wisconsin land information community to strengthen relationships between local, regional, state, and federal entities. The benefits of a consortium approach, however, should not come at the expense of meeting each member's specific needs. To that end, WROC is designed to allow all participants to receive products and services tailored to their individual geospatial needs.

### WROC State/Regional/Federal Partnership Funding Targets

The Wisconsin Regional Orthophotography Consortium (WROC) is a multi-entity group led by seven regional planning commissions. WROC is planning for high-resolution aerial imagery projects with more than 45 counties in 2010. Through a U.S. Homeland Security grant the State of Wisconsin recently allocated \$700,000 to assist in the acquisition of statewide aerial imagery. As more partner funding becomes available, higher resolution data and other local datasets may become available to partners.

The table below summarizes the funding levels needed to achieve statewide imagery products in Wisconsin. As additional state/regional/federal partnership funding increases, the following additional and/or improved products will become available to state/regional/federal partners. Additionally this funding will help reduce the cost of local products and eliminate duplication of effort statewide.

The table below was designed to provide general information regarding resolutions and accuracies and to establish appropriate funding targets. Final resolutions, accuracies, and funding targets will be determined as local project participation and partnership funding totals are finalized.

LEVEL	SPATIAL RESOLUTION	HORIZONTAL ACCURACY	PARTNER COST	LOCAL COST REDUCTION	LEVEL DESCRIPTION
1	24 inch	+/- 40 to 60 Feet	\$800,000	10%	Partners may have access to higher resolution WROC imagery
2*	18 inch	+/- 30 to 40 Feet	\$1,100,000	20%	Partners likely have access to higher resolution WROC imagery
3	18 inch	+/- 10 Feet	\$1,900,000	100% (18") 45% (12")	Partners likely have access to higher resolution WROC imagery and may have access to other local datasets
4	12 inch	+/- 5 Feet	\$4,000,000	100%	Partners likely have access to higher resolution WROC imagery and likely have access to other local datasets

**\*Level 2 digital orthophotography will meet USGS National Mapping Program specifications for 1:12,000 scale digital orthophotography.**

All imagery will be color digital orthophotography. General accuracies are listed above but will be dependent upon existing digital elevation models (DEMs).

**Appendix E: North Carolina Technical Specifications for Digital  
Orthophoto Base Mapping**

**North Carolina Technical Specifications for Digital  
Orthophoto Base Mapping**

Land Records Management Division  
North Carolina Department of  
The Secretary of State

Edited by Thomas W. Morgan

Adopted October 1, 2009

Link for document

[http://www.nconemap.com/Portals/3/documents/Tech\\_Specs\\_Digital\\_Orthophoto\\_Base\\_Map\\_100109.pdf](http://www.nconemap.com/Portals/3/documents/Tech_Specs_Digital_Orthophoto_Base_Map_100109.pdf)