

Orthoimagery, Black Hawk County Iowa, March 1999

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Identification Information:

Citation:

Citation Information:

Publication Date: Unpublished Material

Title: Orthoimagery, Black Hawk County Iowa, March 1999

Publication Information:

Publication Place: Black Hawk County Iowa

Publisher: Black Hawk County

Online Linkage: <http://www.co.black-hawk.ia.us/depts/bhentry.htm>

Description:

Abstract:

Aerial photography of Black Hawk County taken in March, 1999 was used to update BHC orthophotos. Orthophotos combine the image characteristics of a photograph with the geometric qualities of a map. Orthophotography was only developed for selected areas of BHC. The selected areas include 1) areas that had undergone significant change or building development since 1994, and 2) areas where digital terrain models have been or are being produced in conjunction with flood studies. The 1999 digital orthophoto have a 0.5249333 ft. ground resolution. The 1999 digital orthophotos were subdivided, or tiled, into 500-meter by 500-meter TIF image files. The image tiles are referenced to the Iowa State Plane Coordinate System NAD 1983 North Zone in feet. The images were radiometrically balanced and mosaicked prior to the tile creation. Images were supplied in TIF format with TIF World (tfw) Files. The tfw files are available in feet and meters, for use with either 1994 or 1999 orthophotos. The orthoimages for areas that underwent significant change since 1994 were

incorporated into Black Hawk County's cadastral GIS project web application. The product for the cadastral mapping project involved resampling the 1994 images to a 0.5249333 ft. pixel size (which does not improve the resolution of the 1994 imagery), combining 402 tiles of 1999 images with 1994 images and converting the images to MrSid format (18:1 compression ratio) with header files.

Purpose:

The orthophotos were developed to provide spatially accurate, high resolution images that serve as a foundation for drawing vector graphics, including the GIS cadastral maps. The 1999 imagery also serves as a basis for development of digital terrain models for many flood prone areas of BHC.

Supplemental Information:

Aerial photos, orthophotos in TIFF format, and digital terrain models were developed by Aerial Services Inc., Cedar Falls Iowa as a contracted service. Conversion from TIFF format to MrSid format was done as a contracted service by the Sidwell Company, 675 Sidwell Court, St. Charles, IL.

Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 19990301

Ending_Date: 19990401

Currentness_Reference: ground condition

Status:

Progress: Complete

Maintenance_and_Update_Frequency: Irregular

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -92.556

East_Bounding_Coordinate: -92.062

North_Bounding_Coordinate: 42.644

South_Bounding_Coordinate: 42.294

Keywords:

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Category

Theme_Keyword: imageryBaseMapsEarthCover

Place:

Place_Keyword: Black Hawk County

Place_Keyword: Iowa

Temporal:

Temporal_Keyword: March, 1999

Access_Constraints:

This data set is in the public domain, and the recipient may not assert any proprietary rights thereto nor represent it to anyone as other than Black Hawk County, Aerial Services Inc., or FEMA.

Use_Constraints:

This data set is provided "as-is" without warranty of any kind, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The user assumes all responsibility for the accuracy and suitability of this data set for a specific application. In no event will the creators or Black Hawk County be liable for any damages, including lost profits, lost savings, or other incidental or consequential damages arising from the use of or inability to use this data set. 1999 orthoimages for Black Hawk County should not be used at scales greater than 1:1200.

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Black Hawk County Information Technology
Department

Contact_Person: Kim Veeder

Contact_Position: Director

Contact_Address:

Address_Type: mailing and physical address

Address: 316 E. 5th Street

City: Waterloo

State_or_Province: Iowa

Postal_Code: 50703

Country: USA

Contact_Voice_Telephone: 319 833-3154

Contact_Facsimile_Telephone: 319 833-3165

Contact_Electronic_Mail_Address: kveeder@co.black-hawk.ia.us

Data_Set_Credit:

Aerial Services, Inc., 2120 Center Street, Cedar Falls Iowa contracted service provider

Native_Data_Set_Environment: tiff with tfw file, cot (with georeferenced header), MrSid

Data_Quality_Information:

Attribute_Accuracy:

Attribute_Accuracy_Report:

Aerial mapping camera has state of the art electronics and is calibrated by the USGS every three years. Kodak Double-X Aerographic Film 2405 Black and White was

used. Flight Height : 4800' agl . Negative scale =1:9,600 (1"= 800'). Camera Type: LMK modified 1000 with FMC, Gyromoment and GPS, with calibrated focal length: 152.48. First-order IMA and Zeiss P series analytical stereo plotters were used to collect the mapping data. Autometric softcopy stations were utilized for digital orthophoto production. During digital image production, photographic reproduction of the source image was completed on an analog dodging printer to improve image quality and radiometric uniformity. One set of film diapositives was produced for the analytical aero-triangulation and a second set was produced for scanning purposes. The scanned images were orthorectified using Autometric softplotter software. The orthorectified images were balanced and mosaicked using OrthoVista and Autometric software. Large image blocks were mosaicked at one time to lessen the effects of variance due to sun angle and illumination. Even though images were acquired on different days and at different times, this process eliminated major image differences. Good radiometry and image content was maintained for the entire project with only minor variances between blocks.

Logical_Consistency_Report:

Logical relationships between tfw files and corresponding orthophotos tested. Logical relationships between MrSid files and header tested.

Completeness_Report:

Contact Lynn Kloberdanz, BHC Engineer's Office, for reference map showing location of orthophotos developed from 1999 aerial photography.

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

The positional accuracy is dependent, in part, upon the individual accuracies of each process used to produce the final data. The individual processes or data sources used are the ground control, aerotriangulation process, source camera calibration, DTM process, and the mosaic process. The digital orthophotos were developed based on 179 measured ground control points. These measured points fall within +/- 0.05 meters in horizontal position, using a 95% confidence factor. The horizontal ground control was completed to First Order (1:100,000) or better survey standards. The vertical control was completed to third order standards. The testing of the control yielded accuracies well beyond those needed to meet National Map Accuracy Standards (NMAS). The aerotriangulation process was tested by using strip, block and bundle tests, along with targeted control that was withheld for validation purposes. The aerotriangulation was found to exceed 1:10,000 of the flight height of the photography used. The aerial cameras used have current calibrations from USGS that exceed the needed standards. These calibrations were utilized in all photogrammetry processes. The scanner is calibrated or checked in three ways. At the time of scanning, the data is checked against a calibrated reseau grid. The scans are checked a second time at the point of import of the aerotriangulation solutions and a test against the camera fiducials and their calibrated positions. The final test of scans occurs when stereo models are created on the softcopy photogrammetric systems and control point comparisons are completed. The DTM production is done on softcopy and hardcopy stereoplotter equipment using standard compilation techniques. Breaklines and mass points were compiled to ensure positional accuracies needed for the project. The mosaic

process was part of the final quality control check. During this process, overlapping images were mosaicked together using a tolerance of 2 pixels. Estimated positional accuracy is + 2 pixels. Users should be aware that even though the scale of digital data may be increased to overlay large scale digital maps, the accuracy of the digital source is not improved by scale enlargement. For a complete report regarding the establishment of geodetic control points for Black Hawk County, please contact either Geoff Tinker or Lynn Kloberdanz, Black Hawk County Engineer's Office.

Vertical_Positional_Accuracy:

Vertical_Positional_Accuracy_Report:

All measured points fall within +/- 0.1 ft. vertically for bench mark use utilizing a 95% confidence factor. For a complete report regarding the establishment of geodetic control points for Black Hawk County, please contact either Geoff Tinker or Lynn Kloberdanz, Black Hawk County Engineer's Office.

Lineage:

Process_Step:

Process_Description:

The following production procedures, equipment and software were utilized on all or a portion of the project: 1. Source images were scanned at 25 microns. 2. Ground control points were acquired from GPS ground surveys with First Order accuracy for horizontal and third order accuracy for vertical. 3. The aerotriangulation results yielded ground positions with horizontal and vertical residuals of 0.35 meters. 4. The scanned images were processed by Aerial Services Inc. The aerotriangulation results were applied to each image and stereo models were created for softcopy viewing and DTM production. Hard copy diapositives were set up using the aerotriangulation results for DTM production in analytical stereoplotters. Breakline and mass point data was compiled for each stereo model for DTMs. The DTM was compiled to yield image overlap for mosaic purposes. 5. The DTM was utilized along with the controlled images to orthorectify stereo models for orthophotos of the areas requested by Black Hawk County and FEMA. 6. The images were mosaicked by Aerial Services, Inc. into seamless coverages for the areas requested. These image areas are at 0.16-meter resolution with the areas cut into TIF image tiles 500 meters by 500 meters in size. 8. All image tiles were visually inspected by Aerial Services, Inc. for positional anomalies and radiometric variances prior to delivery to Black Hawk County. 9. The TIF image tiles were delivered on CD, along with a tfw files. The coordinate system utilized was NAD 1983 in feet. Production of world files (tfw) was done in both meters and feet for use in geo-referencing the image tiles.

Process_Date: 1999-2000

Process_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Black Hawk County Engineers Office
Contact_Person: Lynn Kloberdanz

Contact_Position: Engineering Technician
Contact_Address:

Address_Type: mailing and physical address
Address: 316 E. 5th Street
City: Waterloo
State_or_Province: Iowa
Postal_Code: 50703

Contact_Voice_Telephone: 319 833-3008
Contact_Electronic_Mail_Address: lkloberdanz@co.black-hawk.ia.us

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:

Raster_Object_Type: Pixel

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: Lambert Conformal Conic
Lambert_Conformal_Conic:

Standard_Parallel: 42.067
Standard_Parallel: 43.267
Longitude_of_Central_Meridian: 93.5
Latitude_of_Projection_Origin: 41.5
False_Easting: 1500000
False_Northing: 1000000

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: row and column
Planar_Distance_Units: survey feet

Geodetic_Model:

Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137

Denominator_of_Flattening_Ratio: 298.257

Vertical_Coordinate_System_Definition:

Altitude_System_Definition:

Altitude_Datum_Name: National Geodetic Vertical Datum of 1929

Altitude_Resolution:

1:1200 resolution is at 0.5249333' (0.16m), flight altitude=4800 ft elevation agl

Altitude_Distance_Units: feet

Altitude_Encoding_Method:

Explicit elevation coordinate included with horizontal coordinates

Entity_and_Attribute_Information:

Overview_Description:

Entity_and_Attribute_Overview:

8-bit gray-scale value between 0-255. A value of 0 represents black while a value of 255 represents white. Values between 0 and 255 are represented as a shade of gray.

Distribution_Information:

Distributor:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Black Hawk County Information Technology
Department

Contact_Person: Kim Veeder

Contact_Position: Director

Contact_Address:

Address_Type: mailing and physical address

Address: 316 E. 5th Street

City: Waterloo

State_or_Province: Iowa

Postal_Code: 50703

Contact_Voice_Telephone: 319 833-3154

Contact_Electronic_Mail_Address: kveeder@co.black-hawk.ia.us

Resource_Description: Offline Data

Standard_Order_Process:

Digital_Form:

Digital_Transfer_Information:

Format_Name: TIFF or MrSID

Digital_Transfer_Option:

Offline_Option:

Offline_Media: CD-ROM

Fees: Contact Black Hawk County Information Technology Department for established fee schedule

Ordering_Instructions: Contact distributor

Turnaround: One week or less

Available_Time_Period:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 20000301

Ending_Date: present

Metadata_Reference_Information:

Metadata_Date: 20060817

Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Kim Veeder

Contact_Organization: Black Hawk County Information Technology Department

Contact_Position: Director

Contact_Address:

Address_Type: mailing and physical address

Address: 316 E. 5th Street

City: Waterloo

State_or_Province: Iowa

Postal_Code: 50703

Contact_Voice_Telephone: 319 833-3154

Contact_Electronic_Mail_Address: kveeder@co.black-hawk.ia.us

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

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