

Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed

1.1. Name of the Data, data collection Project, or data-producing Program:

2010 Connecticut Multispectral Coastal Digital Orthophotography

1.2. Summary description of the data:

The 2010 Connecticut Multispectral Coastal Digital Orthophotography is 1:12,000-scale, 4-band (red, green, blue, and near infrared) tide controlled orthorectified imagery. These data were compiled from a set of 821 individual vertical aerial images taken over 3 distinct days during a June 15 to September 15, 2010 flight window. The orthophotos can be configured to show either true color or color infrared versions of the coastal landscape. The geographic extent (~320 sq mi) of the photography includes: * all land areas within one-thousand (1000) feet of Mean High Water (MHW) and within one-thousand (1000) feet of state-regulated tidal wetlands; * an area of at least two-thousand (2000) feet waterward of the immediate shoreline of Long Island Sound in order to clearly depict the interface between the shorelands and coastal waters; * all offshore islands within the territorial borders of the State of Connecticut including Goose Island and Falkner Island (offshore of Branford); Calf Islands and Great Captain Island (offshore of Greenwich); Norwalk Islands (offshore of Norwalk); Thimble Islands (offshore of Branford); Sandy Point (offshore of Stonington); and all islands in the Connecticut part of Fishers Island Sound; and * the main stem of the Connecticut River up to the Massachusetts State line. To maximize the quality of the images and their contents, photography also conformed to the following flight specifications: * photos were only taken during times of no/minimal cloud cover when lighting and weather conditions optimized the data collection; * solar altitude was no more than 65 degrees and no less than 30 degrees; * the ground detail was not obscured by flooding; * the foliage (salt marsh vegetation in particular) was fully developed; * seasonal conditions (summer) favored maximum human use/recreation activities (e.g., boats and temporary docks/structures in water, etc.) * photo times were planned within 1 hour window before or after a predicted low tide based on National Oceanic and Atmospheric Administration (NOAA) predicted tide tables. * Forward overlap is 60% and side image overlap is 30% * Crab and Tilt do not exceed 5 degrees. The individual aerial photos were orthorectified and mosaicked into grid-based system provided by the State of Connecticut Department of Environmental Protection. Adjacent tiles are edgematched

with no gaps. Temporal and seasonal differences between source images were minimized to avoid incongruence across join lines. When a mosaic of source images was made, the image judged by visual inspection to have the best contrast was used as the reference image. The brightness values of the other images were adjusted to match that of the reference image. The join lines between the overlapping images were hosen to minimize tonal variations. Localized adjustment of the brightness values were performed to minimize tonal differences between join areas. The ground resolution of the imagery is approximately 1 ft per pixel. Data is compiled at 1:12,000 scale. This data is not updated.

Original contact information:

Contact Name: Kevin O'Brien

Contact Org: State of Connecticut Department of Environmental Protection

Phone: 860-424-3034

Email: dep.gisdata@po.state.ct.us

1.3. Is this a one-time data collection, or an ongoing series of measurements?

One-time data collection

1.4. Actual or planned temporal coverage of the data:

2010-06-15, 2010-06-18, 2010-06-19

1.5. Actual or planned geographic coverage of the data:

W: -72.802172, E: -72.616273, N: 41.928232, S: 41.718586

1.6. Type(s) of data:

(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)

Map (digital)

1.7. Data collection method(s):

(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)

1.8. If data are from a NOAA Observing System of Record, indicate name of system:

1.8.1. If data are from another observing system, please specify:

2. Point of Contact for this Data Management Plan (author or maintainer)

2.1. Name:

NOAA Office for Coastal Management (NOAA/OCM)

2.2. Title:

Metadata Contact

2.3. Affiliation or facility:

NOAA Office for Coastal Management (NOAA/OCM)

2.4. E-mail address:

coastal.info@noaa.gov

2.5. Phone number:

(843) 740-1202

3. Responsible Party for Data Management

Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.

3.1. Name:

3.2. Title:

Data Steward

4. Resources

Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):

5. Data Lineage and Quality

NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible

(describe or provide URL of description):

Process Steps:

- 2010-09-15 00:00:00 - Imagery Acquisition: A set of 821 individual aerial photos were taken over 3 distinct days during a June 15 to September 15, 2010 flight window. The geographic extent (~320 sq mi) of the photography includes: * all land areas within one-thousand (1000) feet of Mean High Water (MHW) and within one-thousand (1000) feet of state-regulated tidal wetlands; * an area of at least two-thousand (2000) feet waterward of the immediate shoreline of Long Island Sound in order to clearly depict the interface between the shorelands and coastal waters; * all offshore islands within the territorial borders of the State of Connecticut including Goose Island and Falkner Island (offshore of Branford); Calf Islands and

Great Captain Island (offshore of Greenwich); Norwalk Islands (offshore of Norwalk); Thimble Islands (offshore of Branford); Sandy Point (offshore of Stonington); and all islands in the Connecticut part of Fishers Island Sound; and * the main stem of the Connecticut River up to the Massachusetts State line. To maximize the quality of the images and their contents, photography also conformed to the following flight specifications: * photos were only taken during times of no/minimal cloud cover when lighting and weather conditions optimized the data collection; * solar altitude was no more than 65 degrees and no less than 30 degrees; * the ground detail was not obscured by flooding; * the foliage (salt marsh vegetation in particular) was fully developed; * seasonal conditions (summer) favored maximum human use/recreation activities (e.g., boats and temporary docks/structures in water, etc.) * photo times were planned within 1 hour window before or after a predicted low tide based on National Oceanic and Atmospheric Administration (NOAA) predicted tide tables. * Forward overlap will be 60% and side image overlap will be 30% * Crab and Tilt will not exceed 5 degrees. All flight plans were approved by CTDEP prior to flight operations. Flight Info: Flight # 1 on 6/15/2010 * Date: 06/15/2010 * Time: 8:10AM - 11:47 (EST) * Aircraft #: N62923 * Camera Type: DMC * Camera Serial #: 131 * Focal Length (mm): 120 * # Flight Lines: 10 lines were flown (see flight logs) * AbGPS and IMU were used to obtain the omega, phi and kappa values Flight #1 on 6/18/2010 * Date: 06/18/2010 * Time: 8:38 - 11:20 (EST) * Aircraft #: N62923 * Camera Type: DMC * Camera Serial #: 131 * Focal Length (mm): 120 * # Flight Lines: 14 lines were flown (see flight logs) * AbGPS and IMU were used to obtain the omega, phi and kappa values Flight #2 on 6/18/2010 * Date: 06/18/2010 * Time: 2:00 - 3:29 (EST) * Aircraft #: N62923 * Camera Type: DMC * Camera Serial #: 131 * Focal Length (mm): 120 * # Flight Lines: 4 lines were flown (see flight logs) * AbGPS and IMU were used to obtain the omega, phi and kappa values Flight # 1 on 6/19/2010 * Date: 06/19/2010 * Time: 10:43 - 11:25 (EST) * Aircraft #: N62923 * Camera Type: DMC * Camera Serial #: 131 * Focal Length (mm): 120 * # Flight Lines: 3 lines were flown (see flight logs) * AbGPS and IMU were used to obtain the omega, phi and kappa values All flight data was QA/QC inspected by PhotoScience Inc. and the NOAA Office for Coastal Management prior to shipment to the State of Connecticut, Department of Environmental Protection for final QA/QC. No areas were required to be reflown. | Source Produced: RAWs (Citation: Flight Plan) - 2010-01-01 00:00:00 - Ground Surveying: Ground Control points were collected from July 10, 2010 to July 14, 2010 by P. Hrabak of Photo Science, Inc.. A total of 41 Photo Identifiable (PID's) features were collected for this project. Static GPS observation sessions were of 30 minutes apiece, using a Trimble 5700 receiver and a Zephyr Geodetic antenna on a 2.0 meter fixed height tripod. PDOP prediction was accommodated, only collecting data when values were predicted to be less than 4.0 and with 6 or more satellites, using an elevation mask of 15 degrees. A data log sheet was filled out on each occupation. Four photographs were taken of each point from four different directions. High-contrast corners of pavement, especially concrete adjoining dark asphalt or grass, were favored, and were selected in evenly-spaced, open, well-exposed areas where the planned aerial imagery footprints had

maximum overlap. See the full Survey Report for more details. | Source Produced: Ground Control Points (Citation: Flight Plan)

- 2010-01-01 00:00:00 - Aerotriangulation: Softcopy aerotriangulation was performed by Photo Science to supplement and extend ground control and ABGPS / IMU control data. Aerotriangulation constructs a detailed model of the position of each pass point and provides residuals (and blunders) at all photo control locations. The end result is not only the referenced image, but also a coordinate listing of all of the points and corresponding residuals. This process enabled photogrammetric production of the orthophotography requirements. According to the scope of work, accuracy is stated: Positional Accuracy should be at least as good as the National Map Accuracy Standards for the nominal scale of the output. The AT computations were based on a projection of the Connecticut State Plane Coordinate System and a datum of NAD83. Vertical computations were based NAVD88. All final coordinate and elevation values were expressed in US Survey Feet. A digital image of the aerial photography was utilized to compare and measure the coordinates of selected pass points, (min. 9 per image) with the exception of end images, which have a minimum of 6 per image. Pass points were either dark spots on the ground, corner intersections of sidewalks, rocks, or road lines to name a few. These pass points and any ground based photo control points were measured using the calibration statistics to adjust measurements for the specific camera characteristics. Computer routines (relative and absolute) provide analysis of all pass points, tie points, ABGPS and photo control points. Once all strips were checked for completeness, the strips were assembled into a block where a second degree block adjustment was run along with the full least squares bundle adjustment. Once the last set of blunders and adjustments are complete, a final block bundle adjustment is run to produce the final solution using a rigorous simultaneous least squares bundle adjustment. The bundle adjustment was then run with minimal ground control to test the photogrammetric measurements for consistency. Next, the full ground control data set, including the ABGPS data, was added to the adjustment. The horizontal control was then tightened and the effect on the vertical control and the photogrammetric residuals were inspected. Results of the Aerotriangulation Phase can be found in Photo Science's AT reports. | Source Produced: Aerotriangulation Report

- 2010-01-01 00:00:00 - Digital Orthophoto Processing: The ortho rectification process required as input a digital elevation model (DEM), imagery (RAW), camera calibration and aerotriangulation exterior orientation file (AT Report). The orthorectified imagery was produced using Intergraph OrthoPro software. It uses ImageStation Photogrammetric Manager (ISPM) for photogrammetry project setup, file management, and importing triangulation data from a user defined ASCII file (EO). The ortho project recorded all the operations, including all the parameters that are defined through the OrthoPro workflow, such as the project area coordinates, pixel size, rotation angle, ISPM project and its unorthorectified source images, product areas (index) orthorectification settings, seamlines and so on. The results were single frame images ready for mosaicking into manageable tiled orthos. The single frame orthos were checked for accuracy against the surveyed ground control

before further image editing. Orthorectified imagery was mosaicked, locally color-balanced and cut to the tile definition boundaries using Intergraph OrthoPro software. Tiled orthophotos undergo a rigorous manual QC process to evaluate for remaining hotspots (sun reflectance over water), tone quality, color balance and the feathering area along seamlines. Any imperfections at this point were manually edited. Radiometry is verified by visual inspection of the digital orthophoto. Slight systematic radiometric differences may exist between adjacent orthoimage files; these are due primarily to differences in source image capture dates and sun angles along flight lines. These differences can be observed in an image's general lightness or darkness when it is compared to adjacent orthoimage file coverages. Tonal balancing may be performed over a group of images during the mosaicking process which may serve to lighten or darken adjacent images for better color tone matching. The final 1' GSD, tiled, 4 band (R,G,B), 16 bit, ortho images were then converted to the required GeoTIFF file format.

- 2010-10-05 00:00:00 - Dataset copied.

5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:

5.2. Quality control procedures employed (describe or provide URL of description):

6. Data Documentation

The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?

No

6.1.1. If metadata are non-existent or non-compliant, please explain:

Missing/invalid information:

- 1.7. Data collection method(s)
- 3.1. Responsible Party for Data Management
- 4.1. Have resources for management of these data been identified?
- 4.2. Approximate percentage of the budget for these data devoted to data management
- 5.2. Quality control procedures employed
- 7.1. Do these data comply with the Data Access directive?
- 7.1.1. If data are not available or has limitations, has a Waiver been filed?
- 7.1.2. If there are limitations to data access, describe how data are protected
- 7.4. Approximate delay between data collection and dissemination
- 8.1. Actual or planned long-term data archive location
- 8.3. Approximate delay between data collection and submission to an archive

facility

- 8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

6.2. Name of organization or facility providing metadata hosting:

NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:

<https://www.fisheries.noaa.gov/inport/item/49485>

6.4. Process for producing and maintaining metadata

(describe or provide URL of description):

Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf

7. Data Access

NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?

7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

7.2. Name of organization of facility providing data access:

NOAA Office for Coastal Management (NOAA/OCM)

7.2.1. If data hosting service is needed, please indicate:

7.2.2. URL of data access service, if known:

<https://coast.noaa.gov/dataviewer/#/imagery/search/where:ID=429>

https://coastalimagery.blob.core.windows.net/digitalcoast/CoastalCT_2010_429/index.html

7.3. Data access methods or services offered:

The data distributor does not provide custom GIS analysis or mapping services. Data is available in a standard format and may be converted to other formats, projections, coordinate systems, or selected for specific geographic regions by the party receiving the data.;

7.4. Approximate delay between data collection and dissemination:

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:

8. Data Preservation and Protection

The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:

(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)

8.1.1. If World Data Center or Other, specify:

8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:

8.2. Data storage facility prior to being sent to an archive facility (if any):

Office for Coastal Management - Charleston, SC

8.3. Approximate delay between data collection and submission to an archive facility:

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection

9. Additional Line Office or Staff Office Questions

Line and Staff Offices may extend this template by inserting additional questions in this section.