



**Northeast Coastal and Barrier Network
Inventory and Monitoring Program**

Standard Operating Procedure (SOP)

**Archiving Aerial Photography Associated with the
USGS-NPS Vegetation Mapping Program**

Version 1.0 (September, 2009)

DRAFT

The following table lists all changes that have been made to this Standard Operating Procedure since the original publication date. Any recommended or required changes added to the log must be complete and concise and promptly brought to the attention of the Data Manager. The Data Manager will review and incorporate all changes, officially complete the revision history log, and change the date and version number on the title page.

Revision History Log:

New Version #	Previous Version #	Revision Date	Author (full name, title, affiliation)	Location in Document and Description of Change	Reason for Change

Developed by:
Dennis Skidds, National Park Service, Northeast Coastal and Barrier Network.

Recommended Citation

NPS, 2009. Northeast Coastal and Barrier Network - USGS Vegetation Characterization Program Aerial Photography Archiving Procedures, U.S. National Park Service, Kingston, RI.

Table of Contents

I. Introduction.....	3
II. Scope.....	3
III. Archiving Aerial Photography Products with EROS.....	3
IV. EROS Film Archive Specifications.....	5
V. Accessing the EROS Aerial Photography Archives.....	7
VI. References.....	9

Draft

I. Introduction

The National Park Service Inventory & Monitoring (NPS I&M) Vegetation Mapping Program, in cooperation with the U.S. Geological Survey (USGS) Center for Biological Informatics, has undertaken an effort to classify, describe, and map vegetation communities in all 270+ national park units within the NPS I&M program. Datasets produced by the program meet stringent national standards and include:

- Park-wide aerial photography
- Vegetation classifications, descriptions, and dichotomous field keys
- Ground photographs of vegetation classes
- Spatial databases and hardcopy maps of vegetation communities
- Metadata for all spatial datasets
- Complete accuracy assessment of spatial data

While most data products are archived and served to the public via the USGS Vegetation Characterization Program (<http://biology.usgs.gov/npsveg/>), hardcopy aerial photographs and original digital scans are housed at the USGS Earth Resources Observation and Science (EROS) Center in Sioux Falls, SD.

The following sections of this document provides further information for Network Data Managers and other end users for archiving data with and retrieving data from the EROS Center.

II. Scope

The procedures and general information presented here apply to the Northeast Coastal and Barrier Network and other NPS I&M networks in the Northeast Region. Implementation of these procedures by NCBN staff is mandatory.

III. Archiving Aerial Photography Products with EROS

During the initial phase of the vegetation mapping process, hardcopy aerial photographic prints or films are scanned and used to create park-wide orthophoto mosaics. In general, these scans take the form of image files in .TIF format at a resolution of 400-1200dpi. The following items should be sent to the EROS Center for archiving:

1. All hardcopy prints and / or negatives. (Roll form is preferred, but cut and sleeved products will also be accepted.)
2. All digital scans of the photographs at the highest resolution available. Image files may be included on one or more CD/DVD, but larger numbers of files should be sent via an external hard drive with the following specifications:

- USB 2.0 / USB 1.1 compatible
 - PC and XP compatible
 - Capacity range of 120 GB to 1.5 Terabytes
 - Cache Buffer—8 megabytes or higher
 - Spin Rate—7200 RPM
 - **Note:** Western Digital ‘My Book Premium’ hard drives are not supported.
3. Any available ancillary data that would prove useful to EROS staff for the production of metadata. Appropriate information would include such items as:
- GIS datasets of photograph center points
 - GIS datasets of flight lines
 - Airborne global positioning system (GPS) data
 - Inertial measurement unit (IMU) data
 - Flight reports
 - Camera specifications
 - Camera calibration data
 - Photography scanning equipment specifications
 - Data regarding scanning resolution or other pertinent settings
4. A transmittal letter clearly describing all hardcopy and digital products included in the shipment.

Products should be shipped to the following address:

Timothy Smith, Long Term Archive Data Management Lead
USGS Earth Resources Observation and Science (EROS) Center
47914 252nd Street
Sioux Falls, SD 57198

Questions may be directed to Timothy Smith (phone: 605 594-6091, email: tsmith@usgs.gov) or Mike Mulligan (phone: 303-202-4242, email: mmulligan@usgs.gov).

IV. EROS Film Archive Specifications

The USGS EROS Center provides secure storage of hardcopy (as well as digital) photographic archives and ensures access to those archives to NPS and other government staff, scientific cooperators, and the public. The center’s collection of over 100,000 film rolls (over 8.5 million frames) is housed on its Sioux Falls, SD campus in a secure, climate controlled facility:

- Size = 28,725 square feet
- Temperature held at a constant 67°F (± 2°)
- Relative Humidity range between 35 – 40% (± 5%)
- Key-card access by approved staff only
- On-site backup power generator

V. Accessing the EROS Aerial Photography Archives

In addition to secure storage, a primary advantage of archiving vegetation mapping aerial photography with the EROS Center is ease of data delivery. Datasets may be obtained using any of three methods:

- Free download of medium-resolution scans via the USGS EarthExplorer system
- Ordering of high-resolution scans delivered on DVD (fee required)
- Interagency loan of hardcopy photographic prints / films

A. Free download of medium-resolution scans. EROS digitizes all hardcopy aerial photographs and resamples digital files at a resolution of 400 dpi, and appropriate metadata is generated for each frame. These medium resolution scans are made available for free download via the public-facing USGS EarthExplorer website (<http://earthexplorer.usgs.gov>). To access imagery associated with NCBN vegetation mapping projects:

The screenshot displays the EarthExplorer search interface. At the top, it says "Query and order satellite images, aerial photographs, and cartographic products through the U.S. Geological Survey." Below this are three main steps: "1. Select your dataset(s)", "2. Enter your search criteria", and "3. Search >>>".

Step 1: Select your dataset(s) shows a list of categories on the left. Under "Aerial Photography", "Aerial Photo Single Frames" is selected. Other categories include AVHRR, Commercial, Declassified Data, Digital Elevation, Digital Line Graphs, Digital Maps, EO-1, Forest Carbon Sites, Global Land Survey, and Landcat Archive.

Step 2: Enter your search criteria includes a search bar with "US/World Feature Search" entered. Below it, the date range is set from "01/01/1920" to "12/31/2020". There are also buttons for "Address/Place name", "Search", and "Reset".

A map of the United States is shown with a red bounding box over the Northeast region. The map includes a scale bar (10 mi, 20 km) and a legend for "Lat/Long Grid" with options for "Dec" and "DMS".

At the bottom, there are fields for "Area Selected" in "Degree/Minute/Second" or "Decimal" format, and a "Number of Results" section set to "500" records.

1. Navigate to: <http://earthexplorer.usgs.gov>.
2. In the first frame, 1. *Select your data set(s)*, click on *Aerial Photography*.
3. Select the *Aerial Photo Single Frames* sub category.
4. A *Selected Datasets* option will appear at the bottom of the data set list. Click on the *(Additional Search Criteria)* link to the right of the selected dataset.
5. In the window that appears, scroll down to the *Project* field, type in the four-letter unit code of the park for which you need data (e.g., GATE).

The screenshot shows a web browser window titled "EarthExplorer: Dataset-Specific Search Criteria - Mozilla Firefox". The address bar contains the URL "http://edcns17.cr.usgs.gov/cgi-bin/EarthExplorer/phtml/search/criteria_specific.phtml?cseq=3073". The main content area is a form with several sections:

- Roll Image Type:** A dropdown menu with "All" selected. Below it are "Infrared (B&W)" and "Infrared (Color)".
- Scale (example: 8800 to 15000):** Two empty input fields separated by "to".
- Roll Number:** An empty input field.
- Project:** An input field containing the text "GATE".

At the bottom of the form are "OK" and "Cancel" buttons. The status bar at the bottom of the browser window shows "Done" and "FoxSaver".

6. Click *OK*. You will be returned to the original search page.
7. At the bottom of the second frame, 2. *Enter your search criteria*, set the *Number of Results* to 500 (from 10).
8. Click 3. *SEARCH*.
9. On the Results Summary page, click on the dataset "Aerial Photo Single Frames."

The screenshot shows the USGS EarthExplorer interface. At the top left is the USGS logo with the tagline "science for a changing world". To the right is a satellite image. Further right are links for "USGS Home", "Contact USGS", and "Search USGS". Below this is the "EarthExplorer" header with navigation links for "Home" and "EarthExplorer Tutorial". On the right side of the header are links for "Login", "Register", "Shopping Basket", and "Help".

The main content area is titled "Results Summary" and contains a table with the following data:

Select	Data Set	Matches	Status	Comments
<input checked="" type="checkbox"/>	Aerial Photo Single Frames	206 of 206	Complete	

Below the table are two buttons: "Results" and "Redefine Criteria".

At the bottom of the page, there is a footer with links for "Accessibility", "FOIA", "Privacy", and "Policies and Notices". It also includes contact information for the U.S. Department of the Interior and U.S. Geological Survey, the URL "http://earthexplorer.usgs.gov/", and the page contact information "custserv@usgs.gov". Logos for "USA.gov" and "TAKE PRIDE IN AMERICA" are also present.

10. To download a frame, click the link in the *Downloaded* column.
11. You will be prompted to register before the download begins. Registration is free.

USGS
science for a changing world

EarthExplorer

Home EarthExplorer Tutorial

Results

[Show Map](#) [Pop-out](#)

The up to date Google map is not for purchase or for download; it is to be used as a guide for re

Aerial Photo Single Frames

206 of 206 metadata records retrieved. Showing 1-10

	Preview Image	Show Footprint	Show All Fields	Exclude	Download	View all frames from roll	Product Availability	Entity ID	Acquisition Date	Quality
1		Show	Show	<input type="checkbox"/>	Download	View	Medium	ARLGATE00017711	2002/12/17	8
2		Show	Show	<input type="checkbox"/>	Download	View	Medium	ARLGATE00017712	2002/12/17	8
3		Show	Show	<input type="checkbox"/>	Download	View	Medium	ARLGATE00017713	2002/12/17	8
4		Show	Show	<input type="checkbox"/>	Download	View	Medium	ARLGATE00017715	2002/12/17	8
5		Show	Show	<input type="checkbox"/>	Download	View	Medium	ARLGATE00017716	2002/12/17	8
6		Show	Show	<input type="checkbox"/>	Download	View	Medium	ARLGATE00017717	2002/12/17	8

B. Ordering high-resolution scans. If required, the NCBN can request EROS to make available for download high-resolution scans of the imagery at 7, 14, or 21-microns (3600, 1800 or 1200 dpi). When such products are available, additional fields are added to the

EarthExplorer results screen. To order high-resolution scans:

1. Select the appropriate checkbox in the *Order* field and indicate the quantity desired.
2. Click *Add Selected Items to Shopping Basket*. The page will refresh.
3. Select the desired resolution and media type (e.g., DVD).
4. If you have not registered, you will now be required to register to purchase your data.

The screenshot shows the USGS EarthExplorer interface. At the top, there is a navigation bar with 'Home', 'Prices', 'Help', 'Login', 'Register', 'Why Register?', and 'Shopping Basket'. Below this is a 'Results' section with a yellow banner stating: 'Your search results are now available in [KML](#). Click on the KML button below the search results list to download the KML file.' A blue banner below that says: 'The up to date Google map is not for purchase or for download; it is to be used as a guide for reference and search purposes only.'

The main content area is titled 'NHAP' and shows '10 of 7 metadata records retrieved. Showing 1-10'. Below this is a table with the following columns: Preview Image, Show Footprint, Show All Fields, Exclude, Order Qty, Price, Medium Resolution Download, Product Availability, Project, Roll Nbr, Frame Nbr, Acquisition Date, Film Type, State, County, Center Coordinates, NW Corner, and NE Corner.

Preview Image	Show Footprint	Show All Fields	Exclude	Order Qty	Price	Medium Resolution Download	Product Availability	Project	Roll Nbr	Frame Nbr	Acquisition Date	Film Type	State	County	Center Coordinates	NW Corner	NE Corner
	Show	Show	<input type="checkbox"/>	<input type="checkbox"/>	\$30.00	NH1NHAP800058002	High/Medium	NHAP80	58	2	1980/05/21	BW	AZ	MOHAVE	34° 56'15.00"N 114° 03'45.00"W	35° 01'20.10"N 114° 09'34.60"W	35° 01'02.60"N 113° 57'33.91"W
	Show	Show	<input type="checkbox"/>	<input type="checkbox"/>	\$30.00	NH1NHAP800058003	High/Medium	NHAP80	58	3	1980/05/21	BW	AZ	MOHAVE	34° 52'30.00"N 114° 03'45.00"W	34° 57'35.06"N 114° 09'34.34"W	34° 57'17.64"N 113° 57'34.20"W
	Show	Show	<input type="checkbox"/>	<input type="checkbox"/>	\$30.00	NH1NHAP800058004	High/Medium	NHAP80	58	4	1980/05/21	BW	AZ	MOHAVE	34° 48'45.00"N 114° 03'45.00"W	34° 53'50.06"N 114° 09'34.09"W	34° 53'32.64"N 113° 57'34.49"W

The screenshot shows the USGS Shopping Basket interface. At the top, there is a USGS logo and navigation links for Home, Contact, and Search. The main heading is "USGS Shopping Basket" and it indicates "Step 1 of 5 Shopping Basket". A progress bar shows the current step: "1. Shopping Basket", followed by "2. Order Summary", "3. Address", "4. Payment/Submit", and "5. Receipt".

Below the progress bar, there are links for "No charge for shipping within the US", "\$5.00 Handling Fee", "Return Policy", "Delivery Times", "Payment Options", "Product Descriptions", and "Contact Us".

The shopping basket itself is empty, showing a table with one item:

Item	Remove	Item Description	Product Description	Options	Media	Product Price	Add Custom Features
1.	Remove	Entity ID: AR1ARZ000290153, Acquisition Date: 1965/06/11, Scale: 12000, Image Type: B/W	High Resolution Scanned 9 X 9 in. B/W	21 Micron	DVD	\$30.00	None

At the bottom right of the basket, there is a summary box: "Estimated Total: \$30.00" and "\$5.00 Handling Fee".

Below the item list, there is a "For all items:" section with dropdown menus for setting all product types, options, media types, and custom features to the values shown in the item list. An "Update Shopping Basket" button is located below these settings.

The footer contains links for "Accessibility", "FOIA", "Privacy", and "Policies and Notices". It also includes contact information for the U.S. Department of the Interior and U.S. Geological Survey, including a URL and page contact email. Logos for "USA.gov" and "Take Pride in America" are also present.

- C. Interagency loan of hardcopy products. The USGS' agency-to-agency film loan program can be used for temporary assignments of hardcopy products of 30 days or less. To request a film loan, contact:

Timothy Smith
 Long Term Archive Data Management Lead
 USGS Earth Resources Observation and Science (EROS) Center
 47914 252nd Street
 Sioux Falls, SD 57198
 Phone: 605 594-6091
 email: tsmith@usgs.gov

VI. References

- USGS. 2008. How to Use EarthExplorer. U. S. Geological Survey Center for Earth Resources Observation and Science (EROS). <http://edcsns17.cr.usgs.gov/helpdocs/tutorial/tutorial.html>.