ISO 19115-2 Metadata

DATASET CONTACT

***Name:** Dr. Charles Bostater

***Organization:** Florida Institute of Technology

***Position:** Professor

***Telephone Number:** 321-258-9134

Fax Number: NA

***Address:** Marine & Environmental Optics Lab & Remote Sensing Center, College of Engineering, Bldg. 407, Florida Institute of Technology, 150 West University Blvd., Melbourne Florida, 32901

***City:** Melbourne

***State/Province/Region:** Florida

***ZIP/Postal Code:** 32937

***Country:** USA

***Email Address:** cbostate@fit.edu

DATASET INFORMATION

*Title: Deepwater Horizon littoral zone monitoring and surveillance disaster and recovery airborne missions

Short Title: Florida Panhandle &Gulf of Mexico Aerial Imagery

*Date: 2011-03-12 (only single date allowed)

*Abstract:

http://www.bostater.info/sitebuildercontent/sitebuilderfiles/4dsummary.pdf
Natural oil and gases that entered the marine and littoral areas of the Gulf of Mexico ecosystem from the Deepwater Horizon oil spill site represented potential threats to the near coastal and pelagic organisms. The 4D Remote sensing project was designed to utilize data from satellite, airborne, ship borne and in-situ sensors to assess – using imagery and spatial analysis – surface and subsurface weathered oil and plumes over the Gulf of Mexico region. Satellite and airborne efforts across the littoral zone from Florida to Louisiana were conducted in order to help provide information for monitoring, forecasting, restoration, mitigation and related assessments and findings. Dr. Bostater's responsibility, acting as the FIT PI, for the 4-D remote sensing project component was: acquisition of airborne imagery in support of Deepwater Horizon oil spill recovery assessments.

*Purpose:

The airborne remote sensing imagery was collected from a low flying aircraft along the near coastal waters of the Florida Panhandle and northern Gulf of Mexico and into Barataria Bay, Louisiana, USA, during March 2011. Imagery was acquired from an aircraft that simultaneously collected traditional photogrammetric film imagery, digital video, digital still images, and digital hyperspectral imagery. The original purpose of the project was to collect airborne imagery to support assessment of weathered oil in littoral areas influenced by the Deepwater Horizon oil and gas spill that occurred during the spring and summer of 2010. The data acquired and related information demonstrated the utility of small spatial scale imagery to detect the presence of subsurface weathered oil along littoral areas in the northern Gulf of Mexico. Flight tracks and examples of imagery collected can be seen at www.bostater.info. The metadata files are presented and methods used to plan and acquire the imagery are described.

*Supplemental Information- Data Parameters and Units:

The airborne remote sensing imagery (in units of digital counts) was collected from a low flying aircraft along the near coastal waters of the Florida Panhandle and northern Gulf of Mexico and into Barataria Bay, Louisiana, USA, during March 2011. Imagery was acquired from an aircraft that simultaneously collected traditional photogrammetric film imagery, digital video, digital still images, and digital hyperspectral imagery. The original purpose of the project was to collect airborne imagery to support assessment of weathered oil in littoral areas influenced by the Deepwater Horizon oil and gas spill that occurred during the spring and summer of 2010. The data acquired and related information demonstrated the utility of small spatial scale imagery to detect the presence of subsurface weathered oil along littoral areas in the northern Gulf of Mexico. Flight tracks and examples of imagery collected can be seen at www.bostater.info. The metadata files are presented and methods used to plan and acquire the imagery are described. A suite of mobile multispectral and hyperspectral sensors were flown between ~1,000m to ~3000m altitudes in order detect subsurface features in nearby wetlands and littoral zone areas following the Deepwater Horizon oil spill. Airborne sensors and Imagery was integrated and the hyperspectral sensor was calibrated using the standard methods. The sensors include a multispectral digital frame camera system, a traditional photogrammetric camera, and a small custom hyperspectral imaging system with custom software. Ancillary sensors include multiple differential GPS and inertial motion unit (IMU) sensing systems and twin high definition video cameras for parallax related estimations. The correction of hyperspectral pushbroom imagery utilizes Kalman filtering and smoothing and is used for image related rectification and georeferencing. The ability to image subsurface features is demonstrated using the hyperspectral imaging system, and simultaneous multi-sensor systems for environmental monitoring and surveillance of shorelines, water and nearby vegetation environments in littoral zones. Airborne hyperspectral imagery (digital counts) offered unique benefits such as detection of land and water feature composition due to the information contained in the bi-directional reflectance distribution function (BRDF).

Supplemental Information- Methods:

Hyperspectral imagery was collected using a custom 64-1024 channel, 1376 pixel swath width; temperature stabilized sensing system; an integrated inertial motion unit; and differential GPS. The imaging system is calibrated using dual 18 inch calibration spheres, spectral line sources, and custom line targets. Simultaneously collected multispectral three band imagery used in the data fusion analysis is derived either a 12 inch focal length large format camera using 9 inch using high speed AGFA color negative film, a 12.3 megapixel digital camera or dual high speed full definition video cameras. Pushbroom sensor imagery is corrected using custom Kalman filtering and smoothing in order to correct images for airborne platform motions. Previously developed software developed for the hyperspectral system and the optimized data fusion process allows for post processing using atmospherically corrected and georeferenced reflectance imagery (BRDF).

Supplemental Information- Instruments:

Mapping Camera: Manufacturer: Fairchild Camera and Instrument Company
Model: K17 Aerial Camera, Dimensions: 12-in cone, Specifications: 3 bands, 2-3cm pixel width
Film: AGFA Aviphot X400 PE1 Color Negative, AGFA Aviphot Pan 400S PE1 Panchromatic
scanned at2400 dpi TIFF 3-band imagery or compressed jpegs
HD Videos: Manufacturer: JVC, Model: Everio GZ-HM550, Full Resolution HD
Digital Camera: Manufacturer: Nikon, Model: D2Xs
Hyperspectral Sensor: KB-HSI-A, Specifications: 64-1024 spectral bands and 1376 spatial pixels
Using (380-800 nm with 2 nm spectral resolution) transmission spectrograph core with "39° field
of view lens and temperature stabilized camera
GPS Sources:
Front Camera Nikon: Manufacturer: Garmin Model: 196, 1Hz
Front HD Video: Manufacturer: Hicom, Model: 406BT, 1 Hz
Back HD Video: Manufacturer: Hicom, Model: 406BT, 1Hz
Hyperspectral: Manufacturer: Garmin Model: 496, 5 Hz
IMU: Motion node USB, 100 Hz

Supplemental Information- Sampling Scales and Rates:

See above

Supplemental Information- Error Analysis:

See Above

Supplemental Information- Provenance and Historical References:

See published references in the bibliography at:

http://www.bostater.info/sitebuildercontent/sitebuilderfiles/4dsummary.pdf

KEYWORDS

*Theme Keywords: Aerial Photography

*Place Keyword:s Gulf of Mexico littoral zone, Florida Panhandle littoral zone

*Topic Category Keywords

Oceans	Health	Economy	Military Intelligence	Transportation
Biota	**x** Imagery/Base Maps/Earth Cover	**x** Environment	Planning/ Cadastre	Utilities/ Communication
Boundaries	Climatology/ Meteorology/ Atmosphere	Farming	Society	Elevation
x Geoscientific Information	Inland Waters	Location	Structure	

DATA EXTENT

See mission information and flight track lines@ http://www.bostater.info/id40.html

*Coordinate list: See flight tracks @: http://www.bostater.info/id40.html

*Time Period Description:

See images and conditions during flights @: http://www.bostater.info/id40.html

*Start Date: 2011-03-12

*End Date: 2011-03-21

DISTRIBUTION INFO:

See image request form @:

http://www.bostater.info/sitebuildercontent/sitebuilderfiles/image_request_form.docm

Data Transfer Format:

See image request form @:

http://www.bostater.info/sitebuildercontent/sitebuilderfiles/image_request_form.docm

File Decompression Technique: NA

*****Transfer Size:** Variable

*****URL:** http://www.bostater.info/id40.html

DISTRIBUTION CONTACT

Contains information about the distributor of the dataset. If the dataset is hosted at GRIIDC, the GRIIDC contact information should be used.

☐ **This data is hosted with GRIIDC**

(Check this box if your data is hosted with GRIIDC, this will fill the following fields with GRIIDC contact information.)

*__Organization:__ Marine-Environmental Optics Laboratories & Remote Sensing Center

(Name of organization responsible for distribution. If your data is hosted with GRIIDC, this should be 'Gulf of Mexico Research Initiative'.)

* **Telephone Number:** 321-258-9134

(Telephone number of an organization or individual.)

Fax Number: 321-600-9412

(Facsimile telephone number of an organization or individual.)

*__Address:__ Marine & Environmental Optics Lab & Remote Sensing Center,
College of Engineering, Bldg. 407
Florida Institute of Technology
150 West University Blvd.

*__City:__ Melbourne

*__State/Province/Region:__ FL

*__ZIP/Postal Code:__ 32901

*__Country:__ USA

*__Email Address:__ cbostate@fit.edu

*__URL:__ http://www.bostater.info/

(Organization URL. Should be formatted 'protocol://domain', e.g., http://gomri.org)

METADATA CONTACT

*****Name:** Dr. Charles Bostater

*****Organization:** Florida Institute of Technology

*****Position:** Professor

*****Telephone Number:** 321-258-9134

Fax Number: NA

*****Address:** Marine & Environmental Optics Lab & Remote Sensing Center, College of Engineering, Bldg. 407, Florida Institute of Technology, 150 West University Blvd., Melbourne Florida, 32901

*****City:** Melbourne

*****State/Province/Region:** Florida

*****ZIP/Postal Code:** 32937

*****Country:** USA

*****Email Address:** cbostate@fit.edu