

[USGS Community for Data Integration Session 2](#) [1]

Submitted by erinmr on Fri, 2014-06-06 17:12 Tuesday, July 8, 2014 - 11:00 to 12:30

Event: [Summer Meeting 2014](#) [2]

Session Type: [Workshop](#) [3]

Collaboration Area: [Information Technology and Interoperability](#) [4]

Abstract/Agenda:

Presenter #4: Tara Chesley-Preston, USGS Northern Rocky Mountain Science Center & Montana State University (406.994.7158; tchesley-preston@usgs.gov [5]), Robert Diehl, USGS Northern Rocky Mountain Science Center, and Todd Preston, Parallel, Inc.

Title: Summarization of National NEXRAD Data for use in Biological Applications

Abstract:

The US network of weather radars known as NEXRAD (NEXT generation RADar) is one of the largest and most comprehensive terrestrial sensor networks in the world with the ability to detect the movements and densities of hundreds of species of birds, bats, and insects. These radars have been shown to provide biologically useful data related to the ecology, behavior, conservation, and management of flying animals. Such data often includes but is not limited to altitude-specific measures of speed, direction, orientation, and the intensity of the movement. Currently, however, considerable post processing is required to enable the biological potential of these data, and this has limited their accessibility to the wider biological community. This project proposes a proof-of-concept to advance methods of processing, summarizing, and distributing biological radar data of flying animals in a form more accessible and meaningful to the larger biological science community. Processed and summarized data will be integrated into ScienceBase, an interdisciplinary data server and repository, where it will support current and future biological research applications. We are currently working with collaborators to develop algorithms to automate the collection and processing of NEXRAD datasets, which will initially be done manually using CDI funds. Manual summaries, in addition to providing biologically relevant NEXRAD data for the two fall migratory seasons covered, will provide a valuable resource to QA/QC algorithm performance prior to complete automation.

Presenter #5: Laura Ellison, Ecologist, USGS Fort Collins Science Center (970.226.9494; ellisonl@usgs.gov [6]); Lance Everette, Information Technology Specialist USGS Fort Collins Science Center (970.226.9225; everettel@usgs.gov [7]); Anne Ballmann, Wildlife Disease Specialist, USGS-National Wildlife Health Center, (608.270.2445; aballmann@usgs.gov [8]); Suzanne Peurach, Collection Manager, USGS Patuxent Wildlife Research Center, Smithsonian Institution (202.633.1277; peurachs@si.edu [9]); Jeremy Coleman, National White-Nose Syndrome Coordinator, U.S. Fish and Wildlife Service (413.253.8223; jeremy_coleman@fws.gov [10])

Title: North American Bat Data Integration

Abstract:

Bats are essential to the health of our natural world. They help control pests and are vital pollinators and seed-dispersers for countless plants. Bat populations are in trouble, however. Since 2006, more than 5 million bats have died due to a fungal disease called White-nose Syndrome (WNS). At the same time, several migratory tree-dwelling species are being killed in unprecedented numbers by wind turbines. This project will integrate two important datasets into an online web application called the USGS Bat Population Data (BPD) Project so that they are available to bat researchers and can inform conservation efforts for bats. The first dataset is WNS diagnostic data, which are used to better understand the distribution and spread of WNS, as well as the fungus that causes the disease. The second dataset is the Bat Banding Program files. For 40 years, the U.S. Government administered a bat banding program and the files have never been consolidated and entered into a searchable database. There is much interest in the bat conservation community for easy access to

these historical records of banding at sites now infected with WNS or potentially threatened by wind energy development and climate change. This project will also develop the application programming interfaces (APIs), data services, and data management workflows to share the public government bat data and metadata with BISON (Biodiversity Information Serving Our Nation) and Sciencebase.

Presenter #6: Ryan Longhenry, USGS EROS Data Center (605.594.6179;

rlonghenry@usgs.gov [11])

Title: Adopt a Pixel - Data Infrastructure

Abstract:

Adopt a Pixel is a ground-reference data acquisition system engaging citizen scientists to serve operational and research needs of the Landsat science community. CDI funding will support the establishment of the data infrastructure within the Operational Science group of the USGS Earth Resources Observation and Science (EROS) Center. Currently, the Adopt a Pixel initiative resides in a pilot state. CDI funding will be utilized to create a user upload capability, a data ingest process and a data management system for storage of imagery and metadata; and to enable incorporation into the USGS Earth Explorer web-based user interface for the query and download by the end user. Once the system is developed, tested, and released, users will be able to efficiently search and download numerous USGS-supported remote sensing datasets with the addition of linked ground reference photos provided by the user community.

Notes:

1) Tara Chelsey-Preston, USGS & Montana State University and Robert Diehl, USGS: Summarization of NEXRAD Data for use in Biological Applications

Introduction to what radar is, what NEXRAD means and where NEXRAD sites are located

NEXRAD Data Products:

- Reflectivity: Power reflected off of object back to radar
- Radial Velocity: speed of particles
- Spectrum Width: Variation of Speed
- 3 new polarimetric radar products (not discussed in this talk)

NEXRAD is designed for operational meteorology use but can be repurposed for biological analysis

20 years of data archived in Asheville, NC. Free to access

Showed examples of radar reflectivity images of songbird migration, bat roosts; streams of migrating hawks; ducks, geese and cranes; and mayflies along the Mississippi river

Showed example of radar reflectivity (GIF image loop) of continental songbird migration

Example of using radar data to investigate restoration efforts of wetland and vegetation. Mean standard reflectivity of biological scatters was used to assess restoration efforts.

Example of using radar data to assess habitat associations when combined with land use data

Additional Examples:

- Environmental Safety (Twin Towers smoke plume)
- Investigation: Shuttle Columbia disaster

Discussion of challenges: Why do biologists not use NEXRAD data? Lack of accessibility and difficulty of use.

Partnering with USGS to extract and generate images of NEXRAD biological data and to develop training datasets

Can use radar to get a vertical distribution of biological scatters using reflectivity and velocity data

Major problems w/integrating data?

- Identifying biological signatures on radar and separating out meteorological targets and noise
- Suggestion: Crowdsourcing for image analysis

2)Laura Ellison, USGS; Lance Everette, USGS; Anne Ballmann, USGS; Suzanne Peurach, USGS; Jeremy Coleman, USFWS: North American Bat Data Integration

Importance of Bats

- 1/4 of all mammals on the planet
- insect eaters (crop and forest pests)
- Pollination
- Bioindicators

History of Centralized Bat Data

- Bat Population Database (BPD, 1995)
- Provide centralized database to assess bat population and trends on national scale
- BPD quiescent until...

Bat Armageddon

- White-nose syndrome
- 90-100% mortality
- New York State west to Missouri
- Wind turbines
- estimated >750K bat deaths from wind turbines in 2012
- Climate change
- Don't know exactly how that will affect bat species just yet
- Sequestration (funding)

Current BPD Status

- Bibliographic searches by species, states and authors
- Updating data
- Fields for capture and acoustic data

CDI Project: Bat Data Integration

- WNS diagnostic data
- Integrate WNS disease tracking system into BPD
- Develop data agreement with NWHC
- Bat banding files
- Ship banding files from Smithsonian to FORT
- Scan 3x5" cards and QA/QC records
- Provide export services

Developing a North American Bat Population Monitoring Program (NABat)

3)Ryan Longhenry, USGS: Adopt a Pixel - Data Infrastructure

Adopt a Pixel: What is it?

- Ground reference image system

History:

- Flickr pilot site. Active Spring and Summer 2013, Utilized to test feasibility of application and targeted specific test groups across the US
- Over 1,100 complete sets of volunteered data

Collaborators acknowledged

USGS Community for Data Integration Session 2

Published on Commons (<https://commons.esipfed.org>)

Data upload portal:

- Allows for upload of AaP data by viewing direction
- Includes initial check of data quality & scan for viruses
- Initial release will be simple interface restricted to a controlled group of users

Web-based User Interface

- Uses existing EarthExplorer Interface
- Collocated reference imagery w/ >300 other remote sensing datasets

Data Ingest & Archiving Software

- Extract metadata from imagery
- Ingests record into database
- Moves data into the archive directory structure

Discussion of current project status

- All pieces scheduled for release at end of FY14

Closing Comments

Session Leads:

Name: [Jennifer Carlino](#) [12]
Organization(s): [USGS](#) [13]

Presenters:

Name: [Tara Chelsey-Preston](#) [14]
Organization(s): [USGS](#) [13]

Name: [Laura Ellison](#) [15]
Organization(s): [USGS](#) [13]

Name: [Lance Everette](#) [16]
Organization(s): [USGS](#) [13]

Name: [Anne Ballmann](#) [17]
Organization(s): [USGS](#) [13]

Name: [Suzanne Peurach](#) [18]
Organization(s): [USGS](#) [13]

Name: [Jeremy Coleman](#) [19]
Organization(s): [USFWS](#) [20]

Name: [Ryan Longhenry](#) [21]
Organization(s): [USGS](#) [13]

Notes takers:

Name: [Kyle Nelson](#) [22]
Organization(s): [University of Wisconsin Madison](#) [23]
Email: wxkylenelson@gmail.com [24]

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Teaser: Showcasing the USGS Community for Data Integration (CDI) projects.

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- [5] <mailto:tchesley-preston@usgs.gov>
- [6] <mailto:ellisonl@usgs.gov>
- [7] <mailto:everettel@usgs.gov>
- [8] <mailto:aballmann@usgs.gov>
- [9] <mailto:peurachs@si.edu>
- [10] mailto:jeremy_coleman@fws.gov
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- [24] <mailto:wxkylenelson@gmail.com>