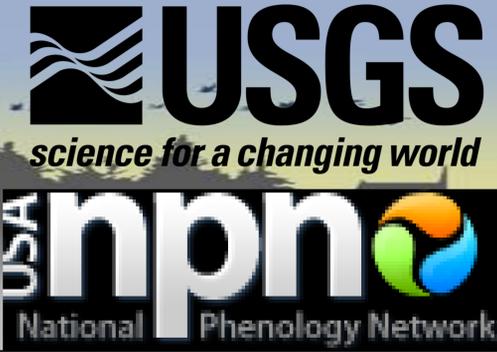


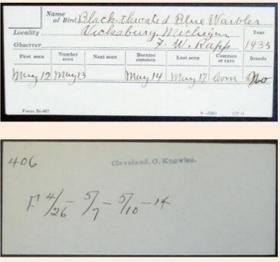


NORTH AMERICAN BIRD PHENOLOGY PROGRAM: HOW MARYLANDERS CAN HELP STUDY THE AFFECT OF CLIMATE CHANGE ON MIGRATORY BIRDS



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In the BPP File Cabinets



- Six million migration cards from 1880 to 1970
- Approximately 870 species
- Migration cards spanning all of North America and parts of South America
- Extensive literature on bird migration from 1880 to 1970
- Nest, egg and young records

* For more information, please see our handout!

WHAT IS PHENOLOGY?

Phenology is the study of periodic animal and plant life cycle events and how these are influenced by seasonal and interannual variations in climate. These events include the timing of plant leafing and flowering, insect emergence, and animal migration.

HOW CAN PHENOLOGY DATA BE USED?

Phenology can be used on both a local and global scale as a predictor for a variety of processes including climate change. By combining phenological data with short and long-term climatic forecasts, a powerful tool can be created for understanding and adapting to ongoing and future climate change.

Results published in Maryland Birdlife

The BPP records are organized by species and location, including almost all of the Maryland bird species. It is a priority of the program to get those Maryland records scanned and entered so that we can compare that data to an assessment already published in Maryland BirdLife (Droege et al. 2003). The initial evaluation concluded that the data was of high precision, showing a relatively low variation from year-to-year in arrival dates for the species selected. Sample sizes were also large and it was easy to detect differences in migration arrival dates of just a few days.

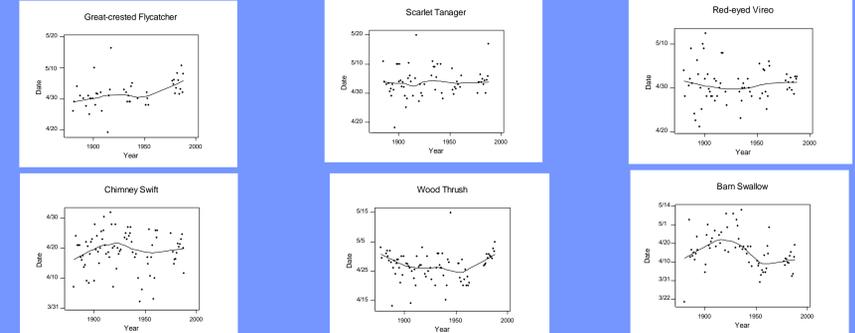
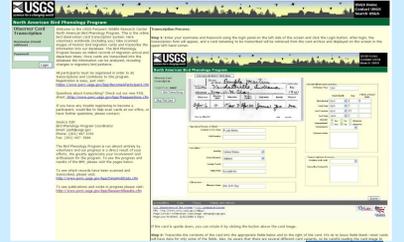


Figure 1: LOWESS smoothed plots of change over time in annual date. Data for Barn Swallows have been log transformed.

Methods



BPP office volunteers scan the migration cards onto the computer



The scanned images are made available on the BPP website



The data can now be analyzed, helping us to learn more about how bird migration is being affected by climate change

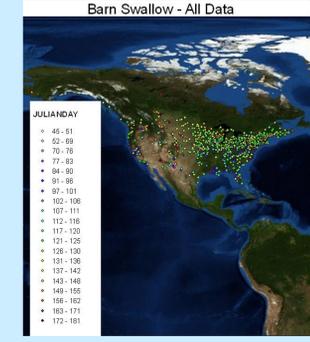
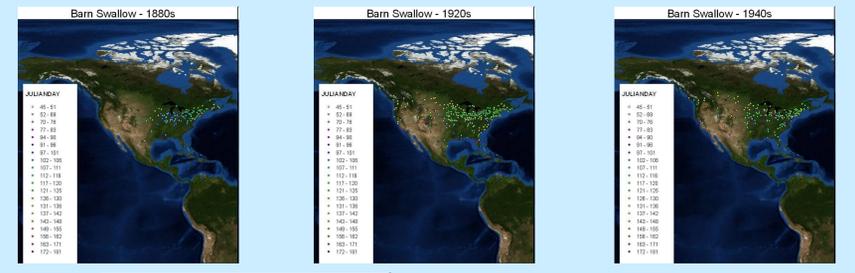


Participants register online and transcribe the data seen onto the card into the BPP database

www.pwrc.usgs.gov/bpp/



Ongoing Research on Barn Swallows



The Bird Phenology Program is currently looking at Barn Swallow data to explore it's quality and characteristics. After this is assessed, the BPP will analyze more specific information with this data set such as the cycle of arrival dates over time, the association of spring temperatures, and latitudes and longitudes throughout North America.

Program Goals

- Scan six million migration cards dating from 1880 to 1970
- Transcribe migration cards online with YOUR help!
- Analyze migration card data in conjunction with climate data
- Keep volunteers informed with the BPP E-Newsletter

Acknowledgements

I would like to thank Kinard Boone for technical and graphical assistance, John Saur and Jane Fallon for the Barn Swallow maps, and Kevin Laurent for the Mapped observations visual. I would also like to thank Sam Droege of USGS, Jake Weltzin and Abe Miller-Rushing of the National Phenology Network and former BPP coordinator Chan Robbins. And I would also like to thank the hundreds of online participants and office volunteers who are making this program a success and helping to meet it's goals.

Mapped Observations from cards transcribed online (84,742!)

Transcribed observation locations by country:

United States	77224
Canada	7393
Mexico	48
Costa Rica	29
Cuba	13
Guatemala	6
Puerto Rico	5
Trinidad and Tobago	4
Panama	3
Honduras	3
Chile	2
Bahamas, The	2
British Virgin Islands	2
Cayman Islands	1
Colombia	1
Ecuador	1
Ireland	1
Jamaica	1
Haiti	1
United Kingdom	1
Antigua and Barbuda	1



GET INVOLVED!

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