

NORTH AMERICAN BIRD PHENOLOGY PROGRAM: The World's Largest and Longest Dataset on Bird Migration

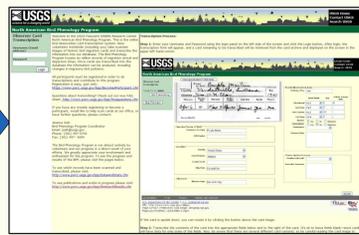


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Methods



BPP office volunteers scan each migration card into the computer



The scanned images are made available on the BPP website.



Participants register online and transcribe the card on the screen into the fields available. Each card is entered twice by different participants and sent to the BPP database

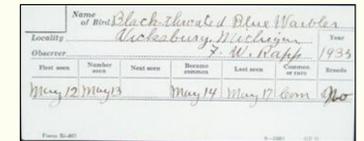
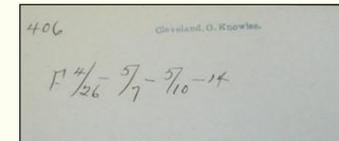


The data can now be analyzed, helping us to learn more about how bird migration is being affected by climate change. Data will also be made publicly accessible on NPN website.

In the BPP File Cabinets

- 6,000,000 migration cards from 1880 to 1970
- Approximately 850 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 nestling records

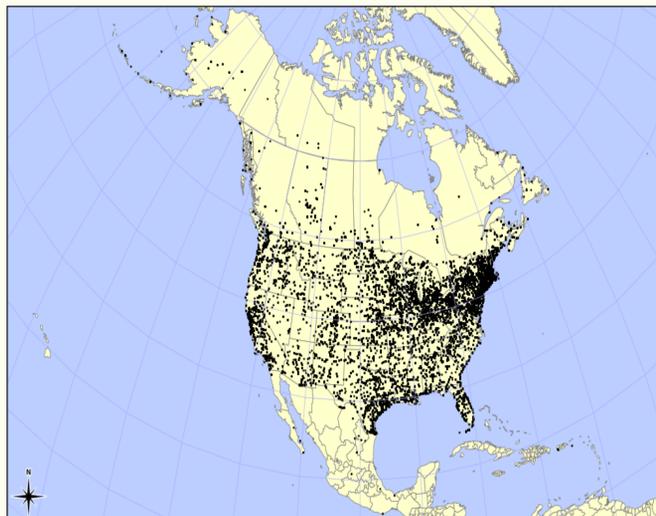
* For more information, please see our handout!



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

Transcribed observation by geographic locations:

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



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

www.pwrc.usgs.gov/bpp/

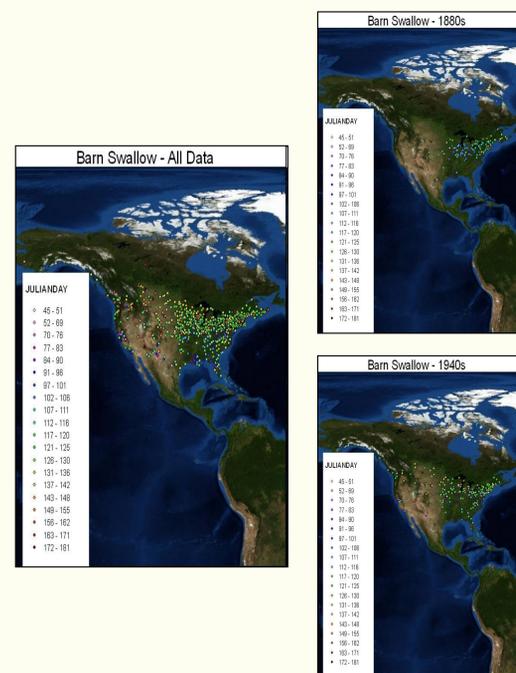
Current Progress

- Number of Cards Scanned in the BPP Office: 350,500
- Number of Office Volunteers: 15
- Number of Cards Transcribed Online: 133,000
- Number of Online Participants: 1,500

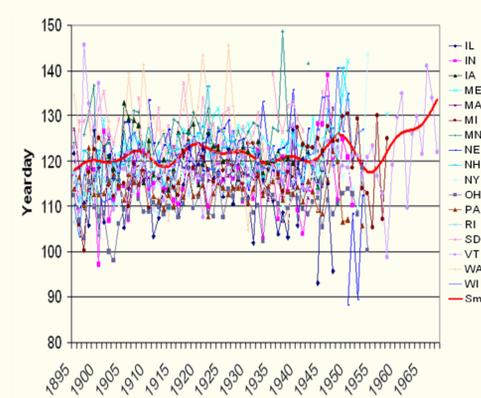


Ongoing Research on Barn Swallows

The Bird Phenology Program has looked at Barn Swallow data to explore its quality and characteristics. The BPP is now analyzing more specific information with this data set such as the cycle of arrival dates over time, the association of spring temperatures, and the NAOI and SOI indexes. All data on Barn Swallows used for analysis were documented from 1895 to 1968.



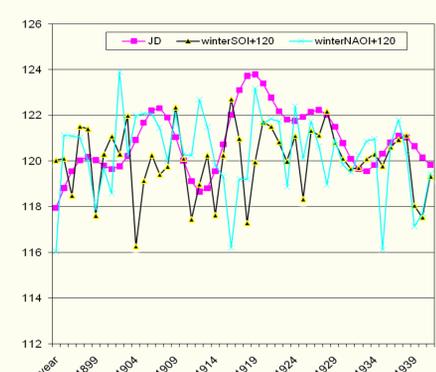
Arrival Dates by Year for States, with Composite (LOESS) Summary



Statistical Analysis

- For States, we analyzed data using log-linear hierarchical model similar to Breeding Bird Survey analysis
- Control for sites
 - Estimate year effects
- Loess smooth of state data used to provide composite summary
- Semiparametric (control for state)
 - Composite hierarchical model in development

Plot of Barn Swallow Arrival Dates with NAOI or SOI Indexes



We Correlated Change in Barn Swallow Arrival Dates with Changes in NAOI and SOI

- North Atlantic Oscillation (NAOI) and Southern Oscillation (SO) indices are large-scale climatic indices
- To evaluate year to year changes in arrival dates relative to these indexes, we correlated first-differences
- No significant correlations
 - $r^2 = 0.004$ (SOI)
 - $r^2 = 0.002$ (NAOI)

Results published in Maryland Birdlife

BPP records for 6 species found in Maryland and an additional set of arrival dates from the 1980's (N=1502 total observations) we used for an initial evaluation of the sampling characteristics of the data set. Arrival data were found to have low inter-annual variation with Coefficient's of Variation ranging from 4.8-7.9%. The 95% C.I. for 4 physiographic regions in Maryland 10.2, 7.1, 2.2., and 5.1 days. For most species arrival dates differed significantly among physiographic regions (later in the mountains, earlier on the Eastern Shore). Three species showed no change across the time period, 2 shifted later, and 1 shifted earlier (Droege et al. 2003).

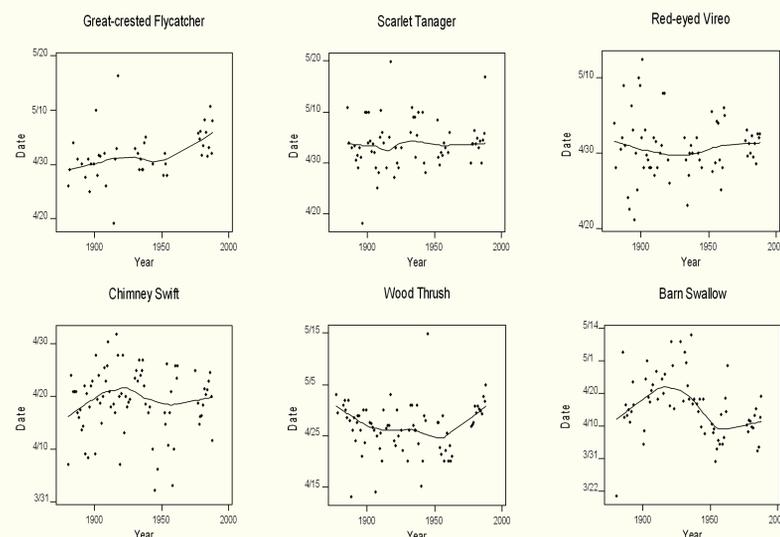


Figure 1: LOESS smoothed plots of change over time in annual date. Data for Barn Swallows have been log transformed.

GET INVOLVED!

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