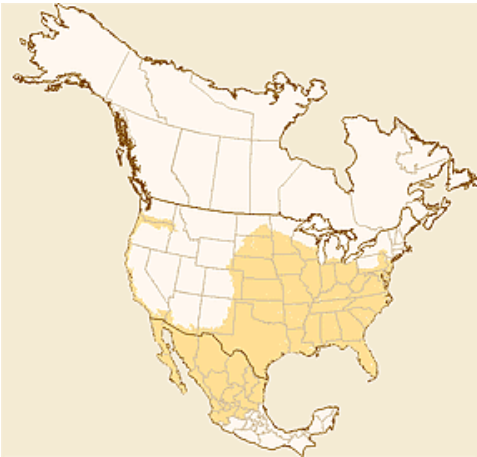
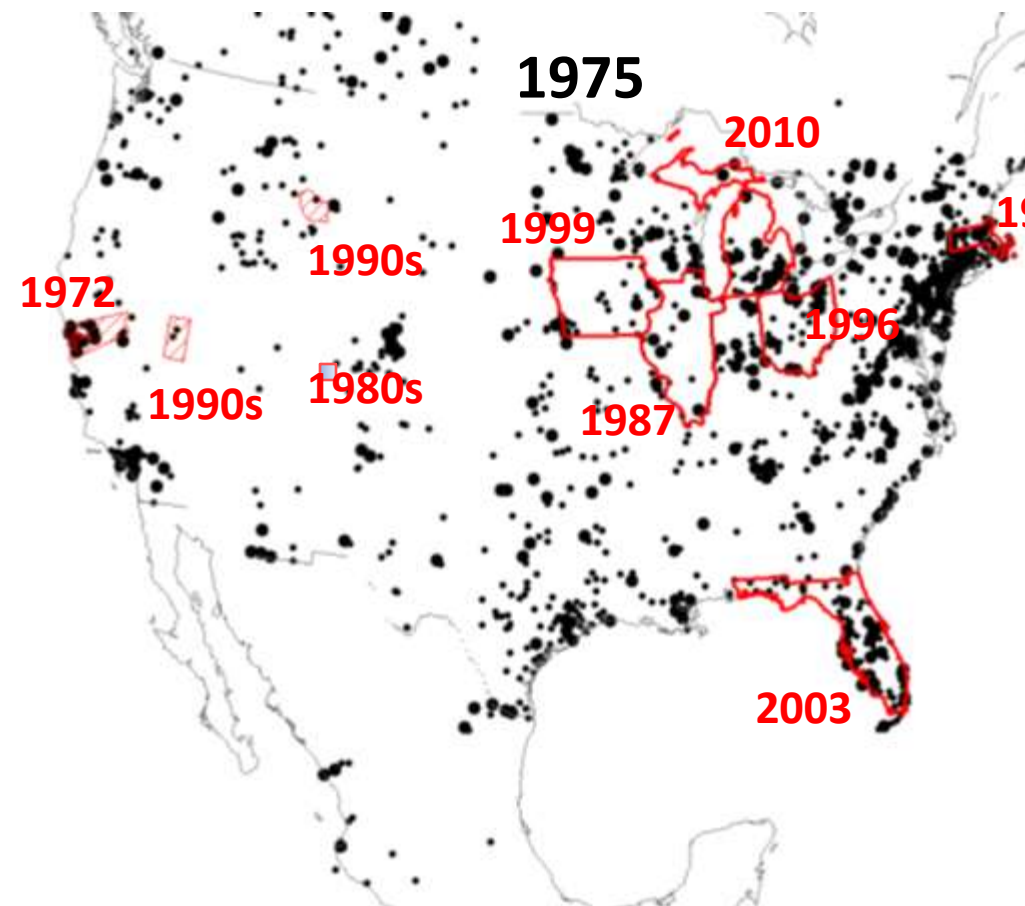


Butterfly monitoring in North America

Leslie Ries, UMD, Biology and Socio-environmental Synthesis Center



North American butterfly monitoring efforts are little known both at home and abroad



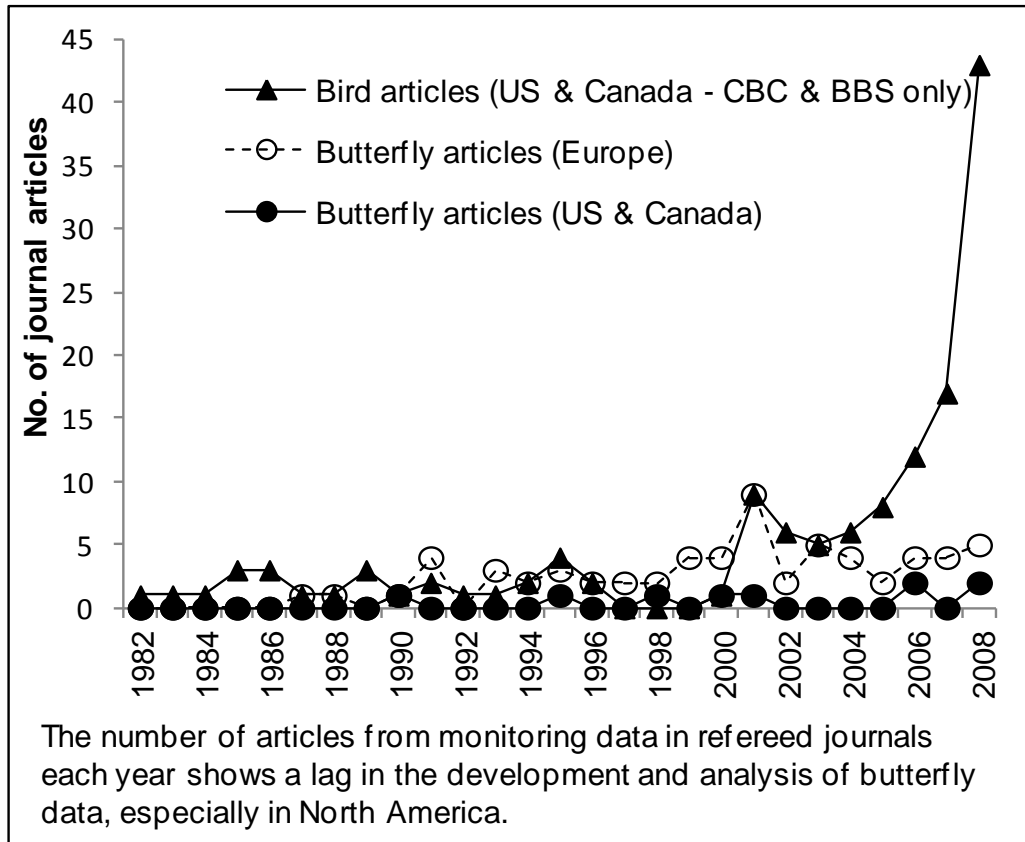
Volunteer (citizen-scientist) driven:

- North American Butterfly Association's Count Program
 - “Checklist” program
 - Groups of people “cover” a count circle (25km radius) and count all the butterflies they see in a single day
 - 1-3 times per year
- State-based programs
 - “Pollard” transects based on European model
 - Transects completed by a single observer every week or two

Academic programs

- Smaller scale but more rigorous protocols

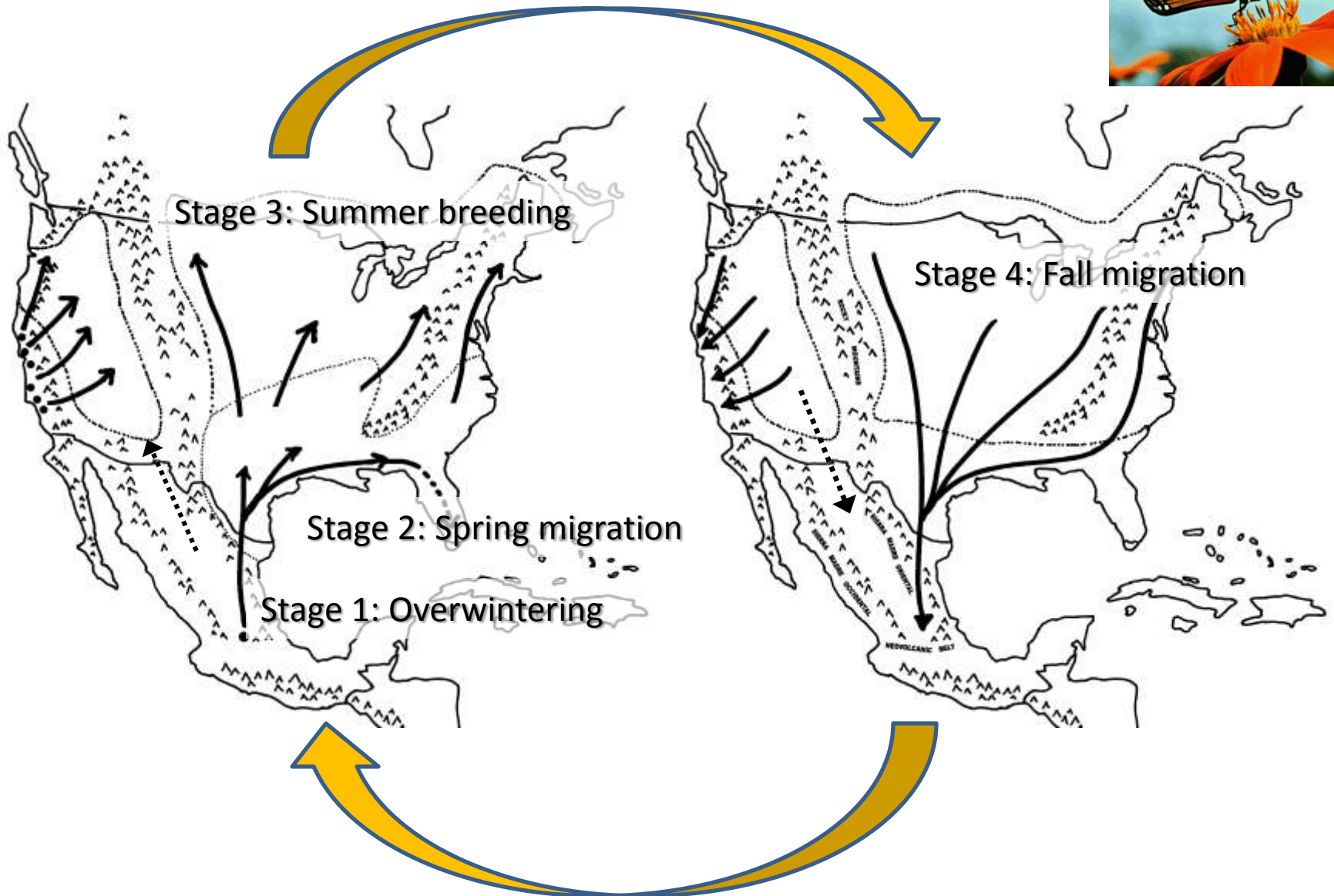
But North American monitoring data are little known and rarely used by scientists



- Very little has been explored relative to butterfly range and phenology shifts
- Exceptions come from long-term academic data sets.

Lack of access is also a problem

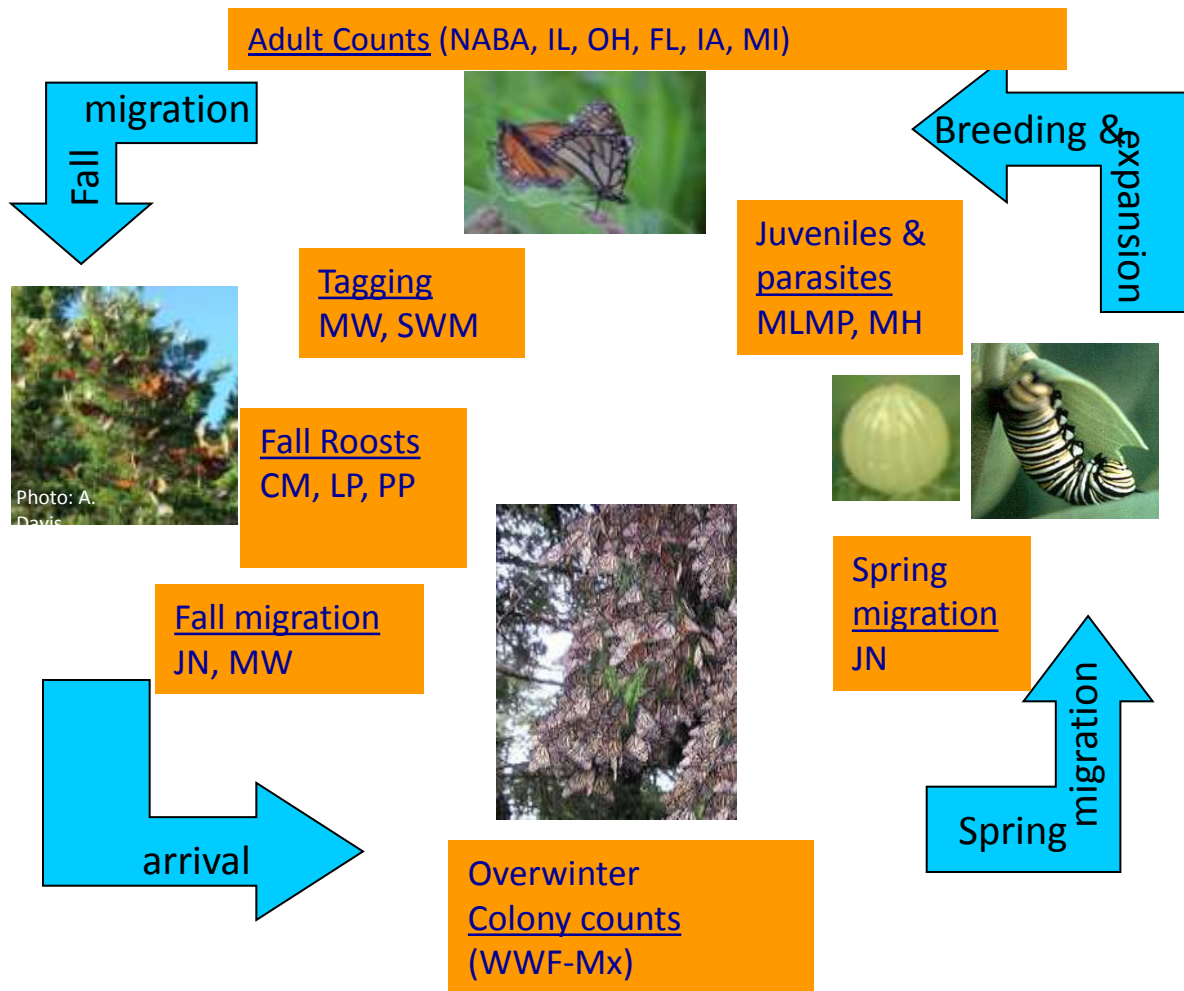
One exception is the monarch butterfly:
intensively monitored with many publications



Overwintering biology is unique



Monarchs are intensively monitored at every stage



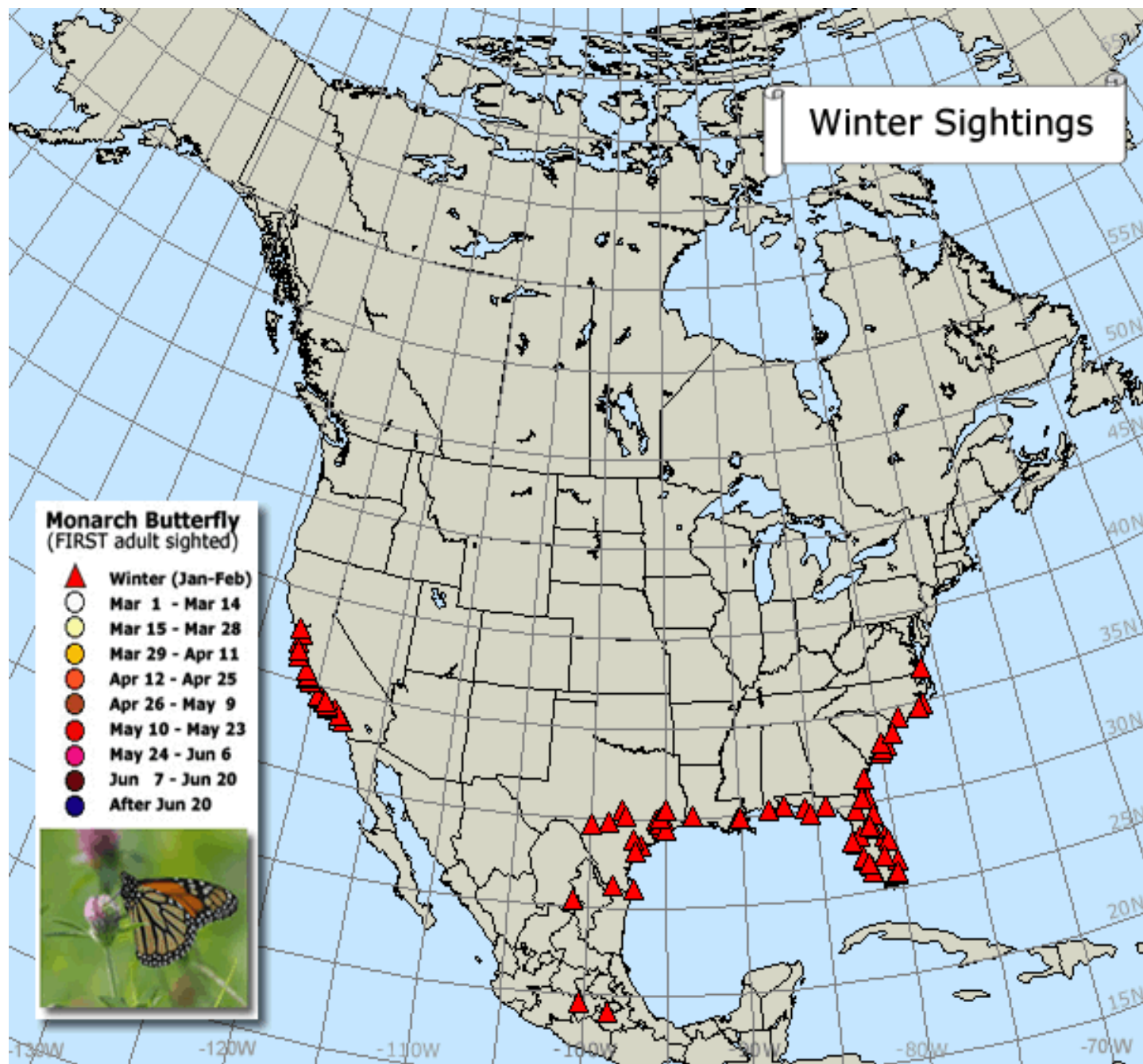
MONITORING PROGRAMS

- NABA: North American Butterfly Association count program
- IL: Illinois monitoring network
- OH: Ohio monitoring network
- FL: Florida monitoring network
- IA: Iowa monitoring network
- MI: Michigan monitoring network
- MLMP: Monarch Larvae Monitoring Project
- MH: Monarch Health
- JN: Journey North
- WWF-Mx: World Wildlife Fund in Mexico
- TMC: Thanksgiving Monarch Counts
- MW: MonarchWatch
- SWM: Southwest Monarchs
- CM: Cape May roost monitoring
- LP: Long Point roost monitoring
- PP: Peninsula Point roost monitoring

Winter Sightings

Monarch Butterfly (FIRST adult sighted)

- ▲ Winter (Jan-Feb)
- Mar 1 - Mar 14
- Mar 15 - Mar 28
- Mar 29 - Apr 11
- Apr 12 - Apr 25
- Apr 26 - May 9
- May 10 - May 23
- May 24 - Jun 6
- Jun 7 - Jun 20
- After Jun 20





August 30

Monarch Butterfly Overnight Roosts

Fall 2002-2008

- Before Aug. 30
- Aug. 30 - Sep. 5
- Sep. 6 - Sep. 12
- Sep. 13- Sep. 19
- Sep. 20 - Sep. 26
- Sep. 27 - Oct. 3
- Oct. 4 - Oct. 10
- Oct. 11- Oct. 17
- Oct. 18 - Oct. 24
- After Oct. 24

★ Mexican overwintering sites



-130W

-120W

-110W

-100W

-90W

-80W

-70W

15N

20N

25N

30N

35N

40N

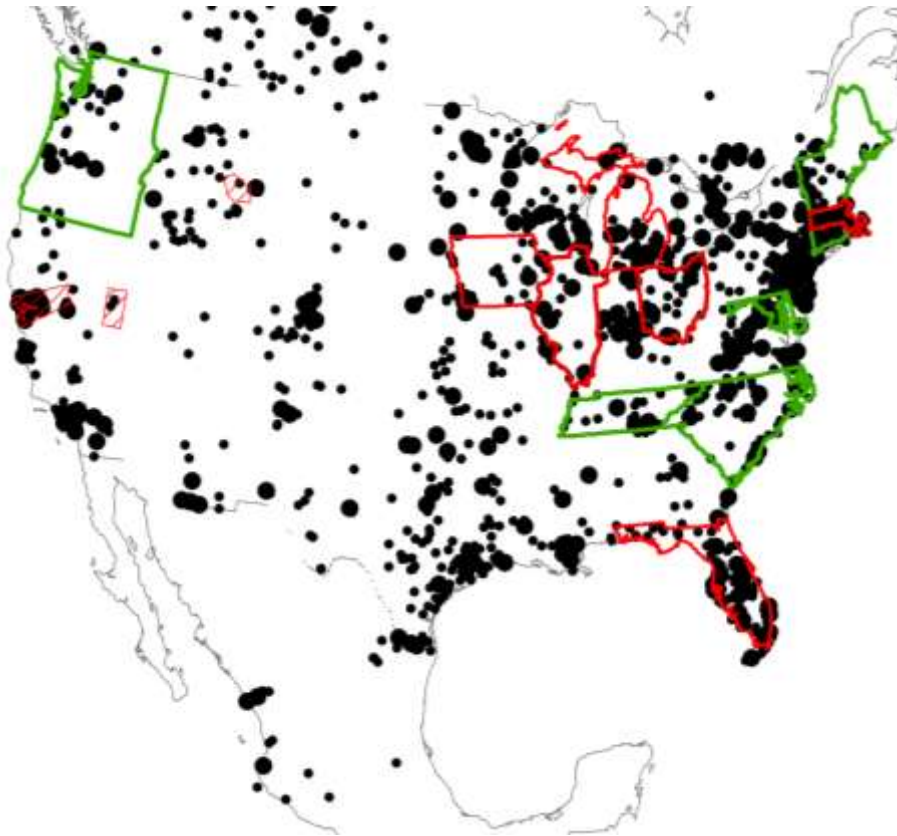
45N

50N

55N

The North American Butterfly Knowledge Network

- A new NSF-funded initiative to develop butterfly data resources collected by citizen-scientists



GOALS:

1. Public access to monitoring data
2. Visualization tools for data exploration
 - Maps and trends
3. Knowledgebase for North American butterflies (US, Can, Mexico)
 - Life history
 - Photos
4. Analytical approaches for monitoring data

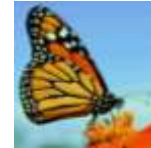
FOCUS WILL BE ON USE OF WEB 2.0 TECHNOLOGY

Public access and visualization

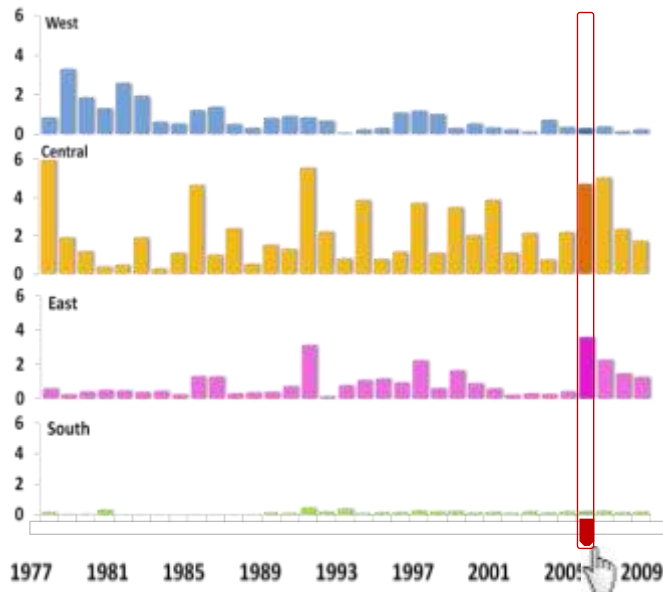
- Access and visualization tools for NABA and hopefully regional programs as well
 - Maps and trend graphs
 - Local lists of species (sorted by abundance)

[Monarch \(*Danaus plexippus*\)](#)

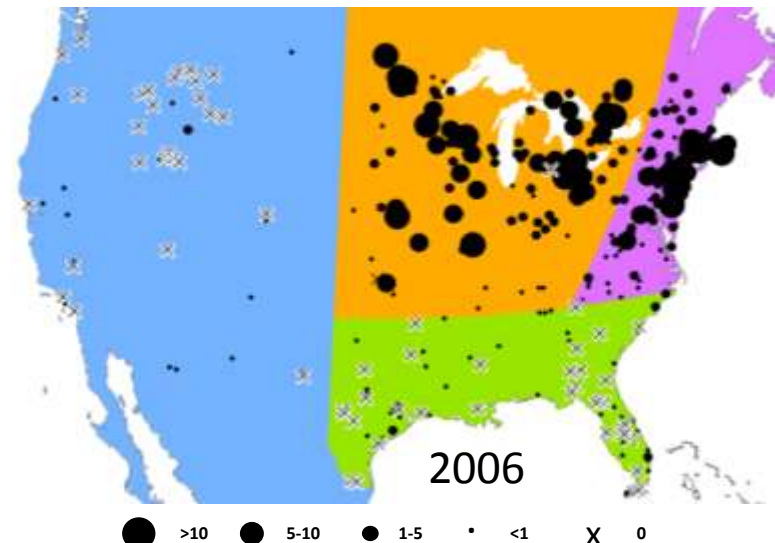
This butterfly has a unique migratory habit. The eastern population migrates to Mexico to overwinter each year. The western population overwinters along the California coast. For both of these populations, successive generations of butterflies expand their range during a summer breeding season, and then return to overwintering sites each fall. A non-migratory population lives in southern Florida. [More details.](#)



Observations per party-hour



Extent: ☒ Ecoregions ☐ Political boundaries
Season: ☐ spring ☒ summer ☐ fall



Public-access knowledgebase will be distributed by Encyclopedia of Life

Encyclopedia of Life - Animals - Plants - Pictures & Information - Mozilla Firefox

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David Fickhoff marked an association between

zotero

Species information and photos are currently developed for general use

hespérie à taches argentées (*Epargyreus clarus*) - Encyclopedia of Life - Mozilla Firefox

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← eol.org/pages/184797/overview

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Leslie
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 Mary Keim [see all media](#)







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[Epargyreus clarus](#) Cramer 1775
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Species recognized by [National Center for Biotechnology Information](#):
[Epargyreus](#)
[Epargyreus clarus](#)
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Reviewed by 2 curators [learn how to curate](#)

 **Andrew Brower**

zotero

But we want to distribute a structured-language version amenable for analyses

Analytical challenges in analyzing butterfly monitoring data

- Grappling with the biology of invertebrates
 - Detectability based on weather and species
 - Asynchronous nature of emergence and death
 - Phenology is generally more plastic than for vertebrates
- How much can we learn from checklists?
 - Yearly abundance indices for trends analysis
 - Taking phenology into account
- Working with new “opportunistic” data sources
 - Butterflies and Moths of North America
 - Butterflies I’ve seen
 - General sites for logging observations (observado.org)

My research focus:

Mechanistic Species Distribution Models

- Mechanistic models translate environmental conditions (often GDD models) into biologically relevant metrics (survivorship or fecundity) and can be used to predict distributions on large scales.
- BENEFITS:
 - Specific mechanisms are identified a priori
 - Allows independent distribution data to test predictions and identify specific weaknesses and strengths of the models
- DRAWBACKS:
 - Lack of model development for most organisms
 - Short history of model development
 - Lack of model transferability between species
- CURRENT FOCUS:
 - Sachem (*Atalopedes campestris*)
 - Monarch (*Danaus plexippus*)

