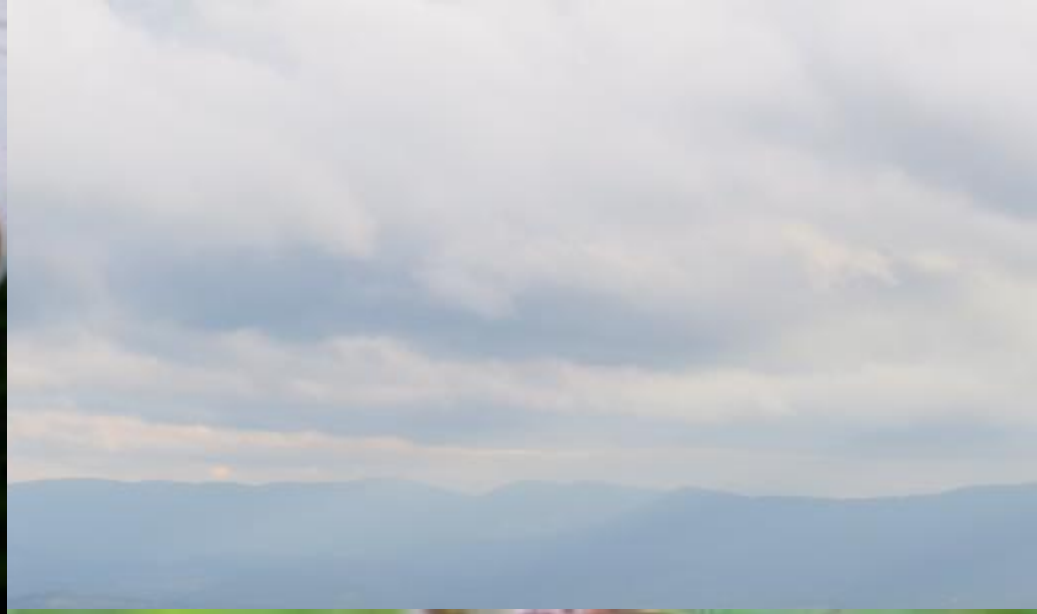
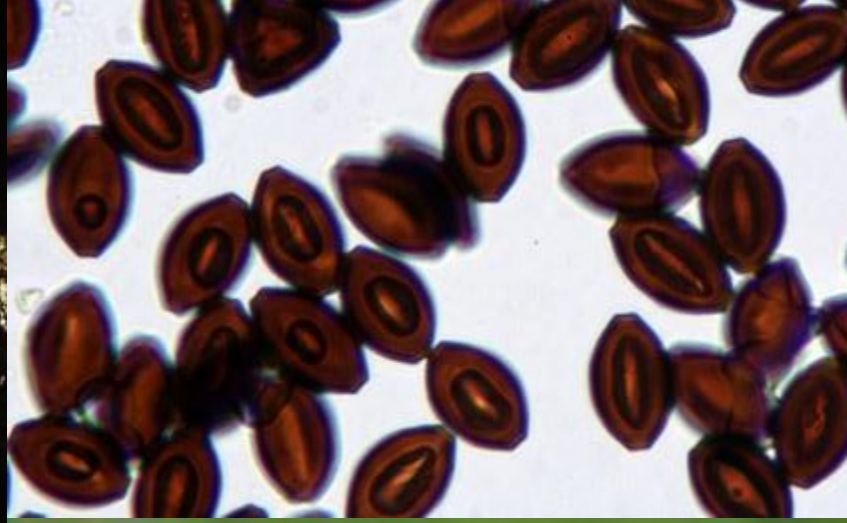
Approaching mosquito control with caution for butterflies and non-target insects

Dr. Sonia Altizer | Department Head
UGA Entomology

Background and Experience

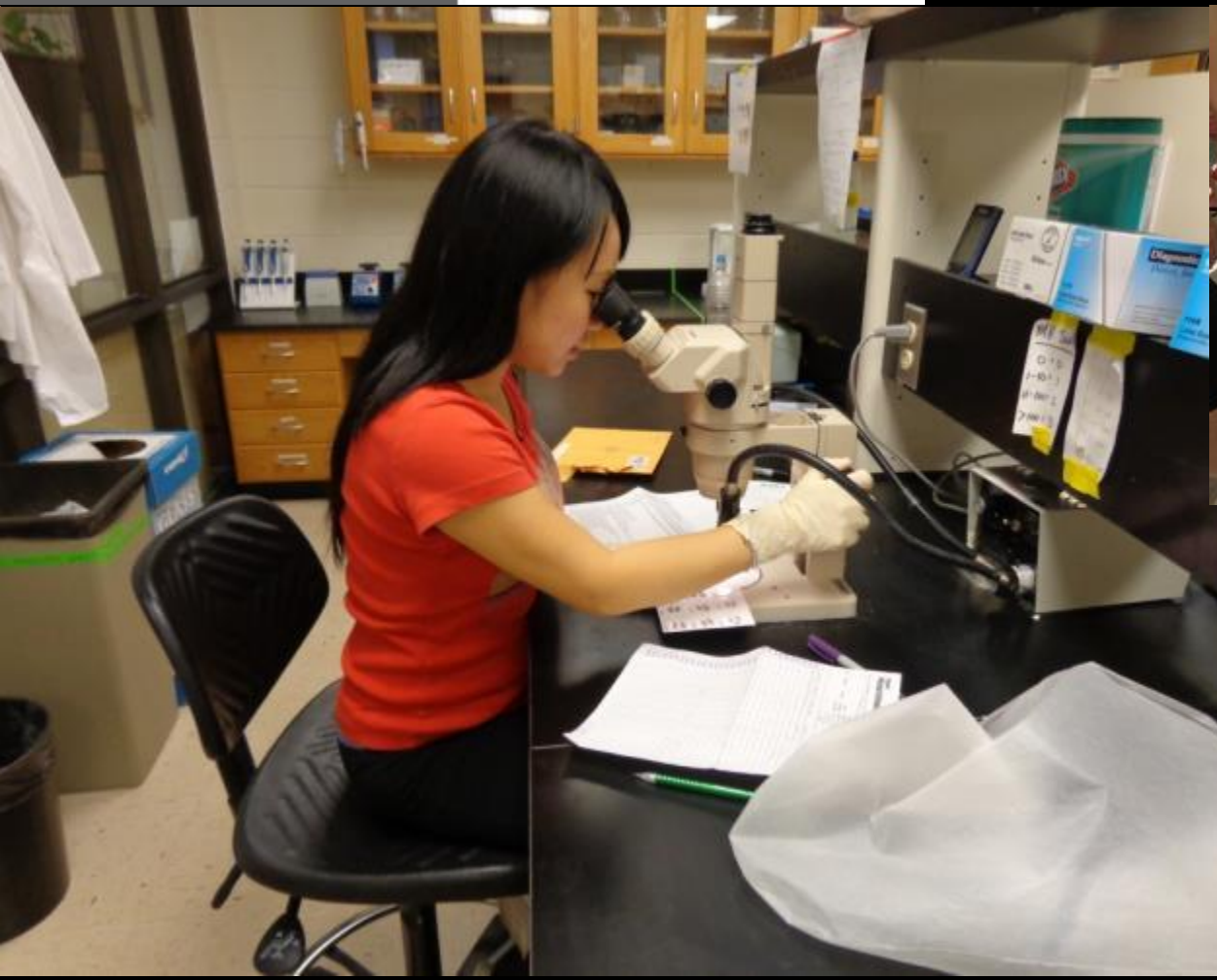


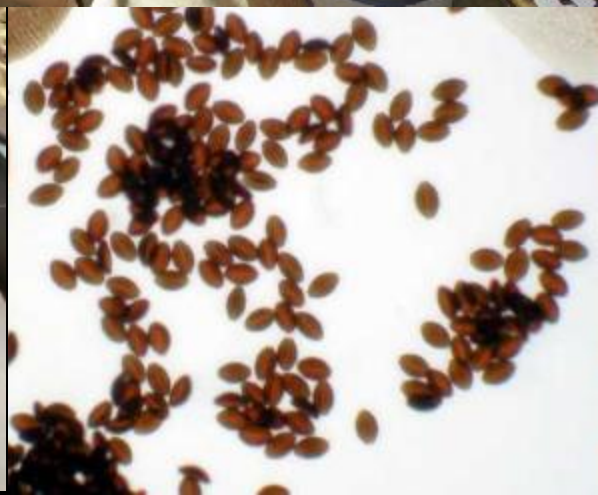


UNIVERSITY OF
GEORGIA
Odum School of Ecology

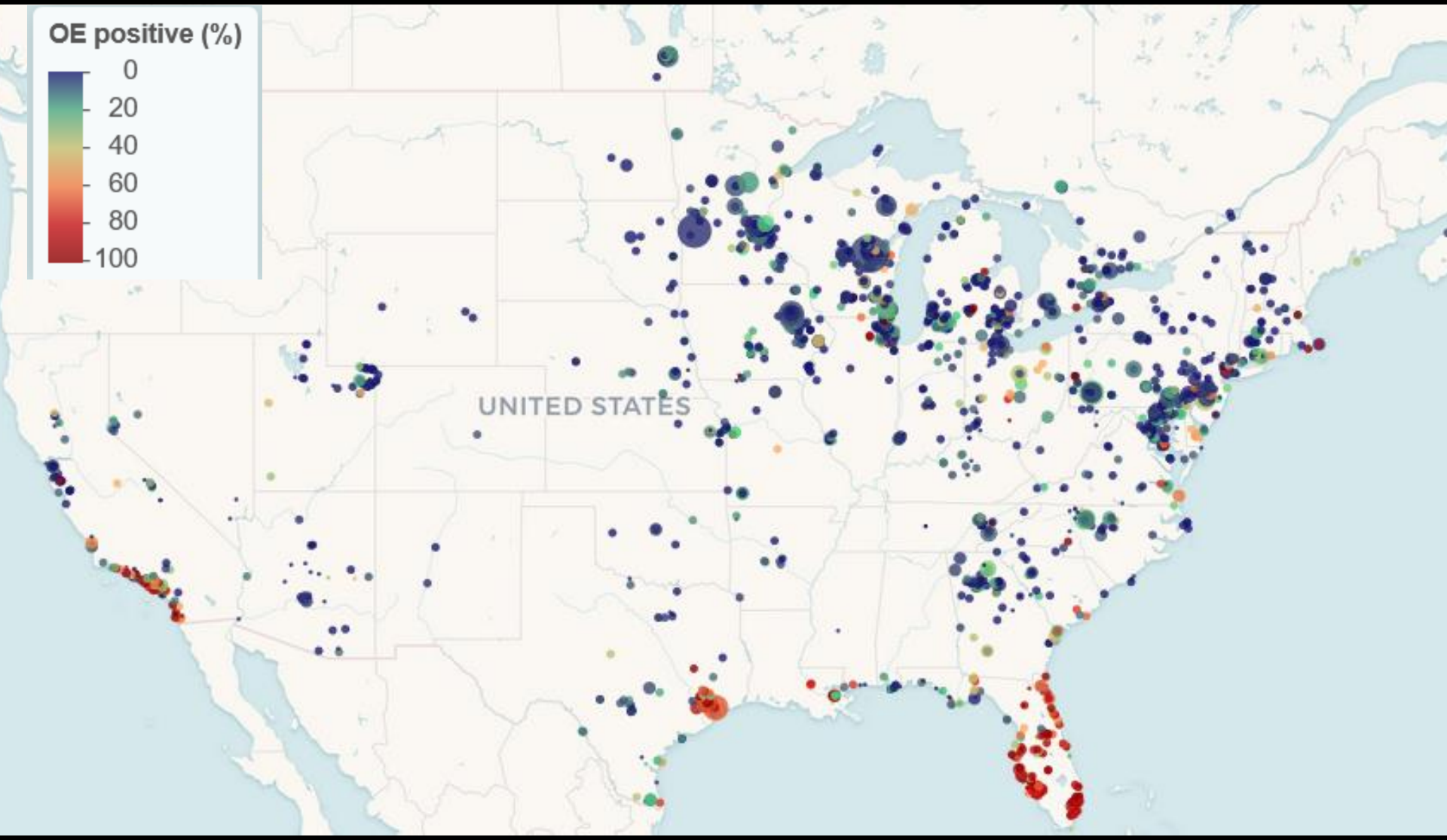
PROJECT MONARCH HEALTH

Community science project
2006-present
200+ volunteers/year
5000+ samples per year





Project monarch health summary: 2006-2022 (N = 90,000+ samples)

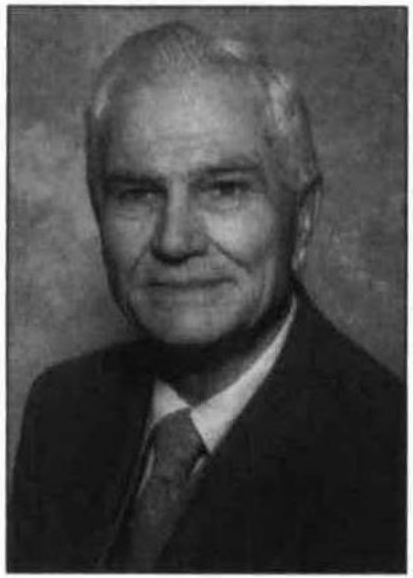


Administrative and leadership experience

- Bring together people to develop new initiatives, solve problems, shape future vision and build or strengthen partnerships

Entomology at UGA

- Insects are incredibly diverse, ecologically important, and have strong positive and negative interactions with people
- UGA entomology has innovative research and education programs
- Strong tradition of applied research and extension work
- Opportunities to build strong connections with industry and communities across GA and beyond



H.O. LUND ENTOMOLOGY CLUB

UNIVERSITY OF GEORGIA

75 years of Entomology at UGA
Founded by Dr. Horace Lund

UGA Entomology today

- 40 faculty
- 8 administrative and academic support staff
- 27 research or program-associated staff
- 18 postdocs
- 60 graduate students
- 200 undergraduate majors (ENTO and BTEC)

Expertise in medical entomology, urban insects, and vector biology

- Elmer Gray
- Mike Strand
- Kevin Vogel
- Don Champagne
- Darold Batzer
- Nancy Hinkle
- Mark Brown
- Brian Forschler
- Dan Suiter

THE FIELD OF ENTOMOLOGY IS CHANGING

- Medical entomology and vector-borne disease
- Applying new technology for data collection and analysis
- Predicting and responding to climate change, invasive species
- Genomics and evolution
- Human dimensions: economics, management and policy

Collaborate with other STEM fields (engineering, AI, computer science)

Graduate and Undergraduate Programs

Undergraduate:

BS Entomology

BS Applied Biotechnology

Graduate

PhD Entomology

MS Entomology

MPPPM

- **Large pool of alumni working** in higher education, industry and private sector, nonprofits and government agencies

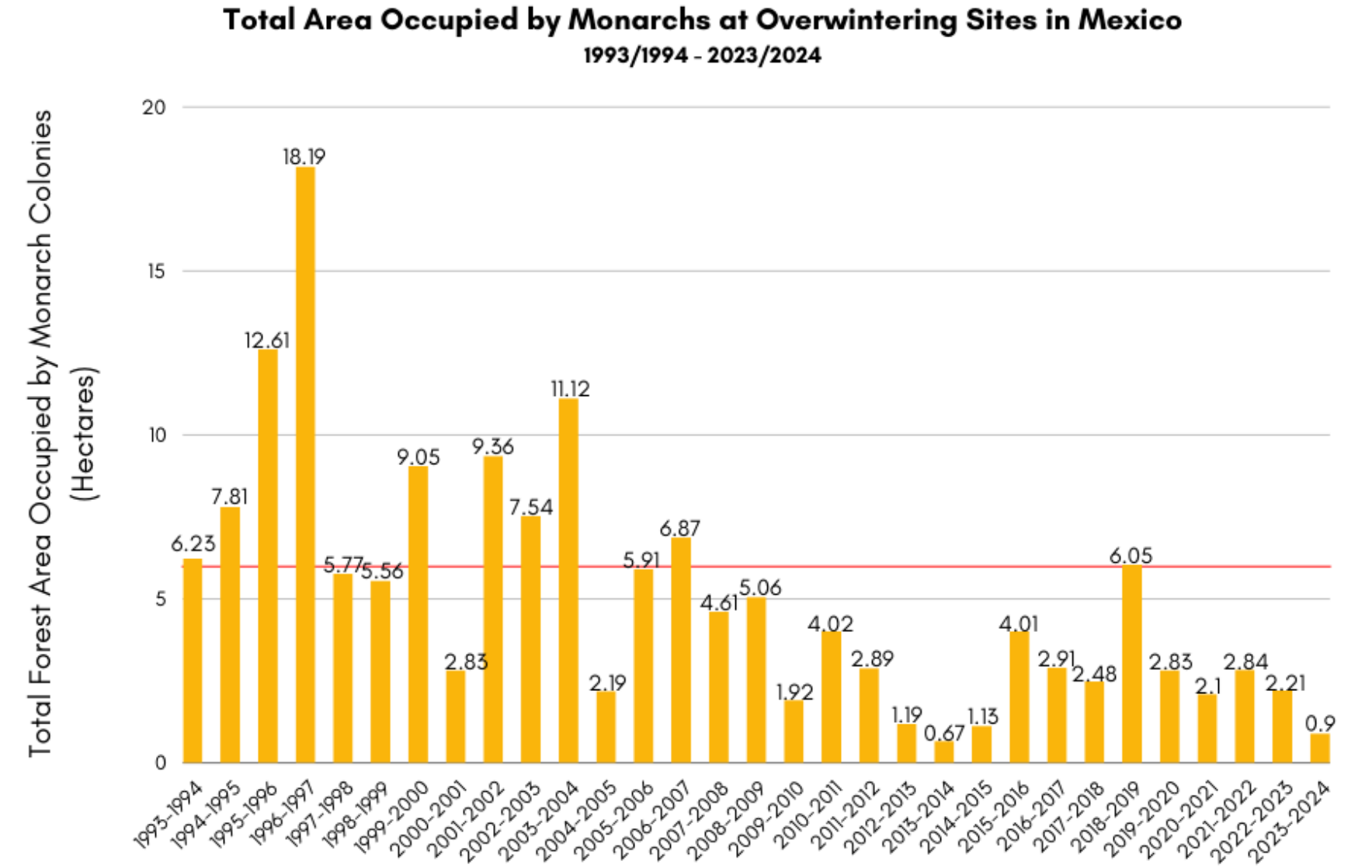
Extension and outreach

Integrated Pest Management
Urban Pest Management
Pesticide Education
Georgia Pest Management
Controlling Mosquitoes

How can we partner with GMCA to meet community needs and tackle important challenges?

Butterflies and pesticides

Monarch numbers declining at overwintering sites



RESEARCH ARTICLE | BIODIVERSITY

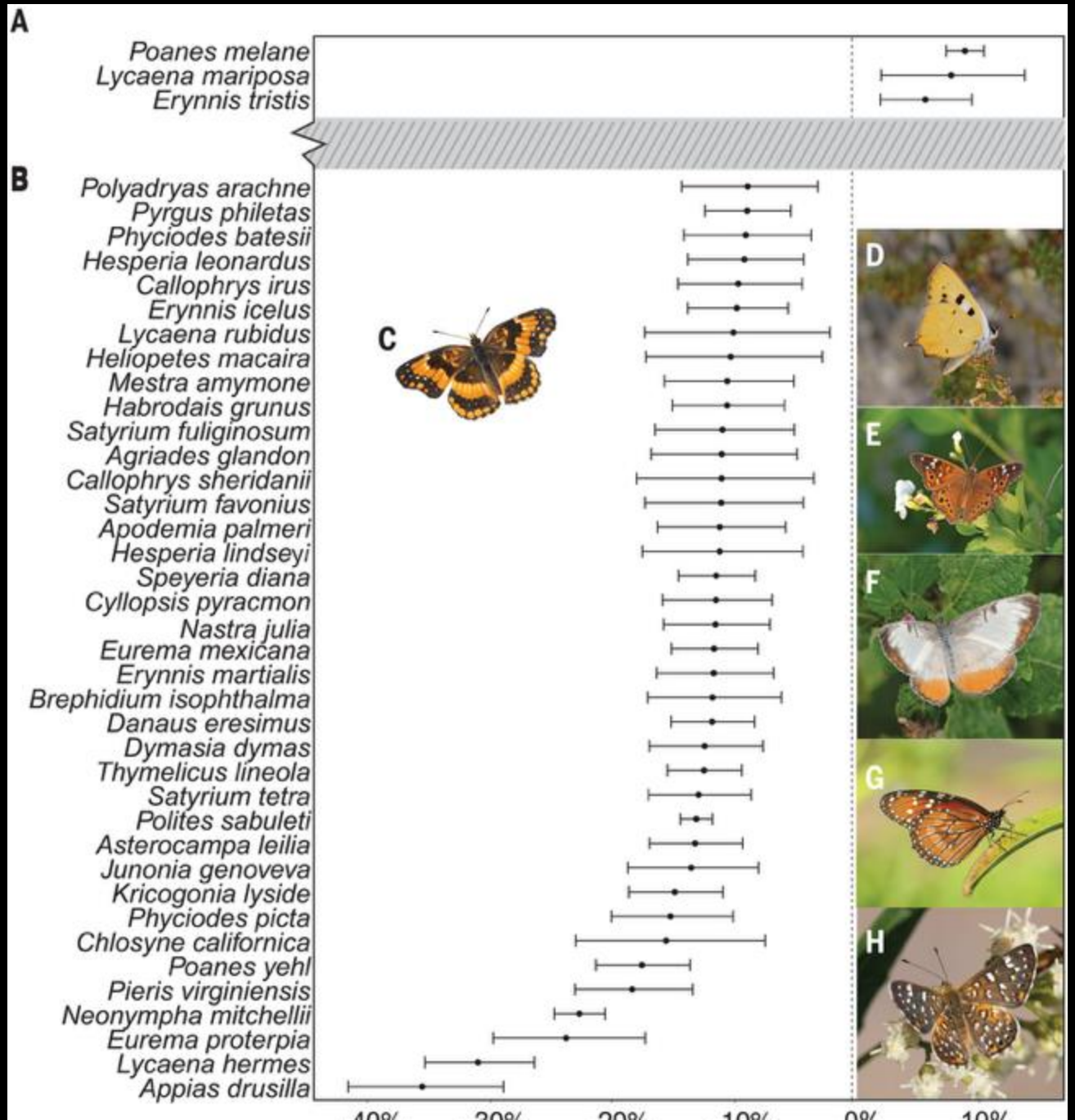
Rapid butterfly declines across the United States during the 21st century

COLLIN B. EDWARDS, ELISE F. ZIPKIN, ERICA H. HENRY, NICK M. HADDAD, MATTHEW L. FORISTER, KEVIN J. BURLS, STEVEN P. CAMPBELL, ELIZABETH E. CRONE, JAY DIFFENDORFER, [...], AND CHERYL B. SCHULTZ +23 authors Authors Info & Affiliations

SCIENCE · 6 Mar 2025 · Vol 387, Issue 6738 · pp. 1090-1094 · DOI: 10.1126/science.adp4671

Editor's summary

Reports of declining insect populations have received widespread media attention, but evidence for declines has been variable across regions and taxonomic groups. Edwards *et al*. examined trends in the most surveyed taxon: butterflies (see the Perspective by Inouye). Combining data from 35 citizen science programs across the continental US, the authors found declines in overall butterfly abundance over the past 20 years across almost all major regions. Two-thirds of studied species


A
Poanes melane
Lycaena mariposa
Erynnis tristis
B
Polyadryas arachne
Pyrgus philetas
Phyciodes batesii
Hesperia leonardus
Callophrys irus
Erynnis icelus
Lycaena rubidus
Heliopetes macaira
Mestra amymone
Habrodais grunus
Satyrium fuliginosum
Agriades glandon
Callophrys sheridanii
Satyrium favonius
Apodemia palmeri
Hesperia lindseyi
Speyeria diana
Cyllopsis pyracmon
Nastra julia
Eurema mexicana
Erynnis martialis
Brephidium isophthalma
Danaus eresimus
Dymasia dymas
Thymelicus lineola
Satyrium tetra
Polites sabuleti
Asterocampa leilia
Junonia genoveva
Kricogonia lyside
Phyciodes picta
Chlosyne californica
Poanes yehl
Pieris virginiensis
Neonympha mitchellii
Eurema proterpia
Lycaena hermes
Appias drusilla
C
D
E
F
G
H
40%
30%
20%
10%
0%
10%

JOURNAL ARTICLE

Pyrethroid insecticides implicated in mass mortality of monarch butterflies at an overwintering site in California

Staci Cibotti, Michelle L Hladik, Emily May, Emma Pelton, Timothy A Bargar, Natalie Johnston, Aimee Code

Environmental Toxicology and Chemistry, Volume 44, Issue 10, October 2025, Pages 2716–2724, https://doi.org/10.1093/etojnl/vgaf163

Published: 28 June 2025 **Article history** ▾

Abstract

Since the 1980s, monarch butterfly (*Danaus plexippus plexippus*) populations across North America have declined by 80%–95%. Although several studies have implicated pesticides as a contributing factor to their population declines, our understanding of monarch exposure levels in nature remains limited. In January 2024, a mass mortality event near an overwintering site in Pacific

Butterflies are vulnerable to a range of pesticides

- **Pyrethroids (e.g., permethrin):**

Can be acutely toxic to both adult butterflies and caterpillars

Neonicotinoids (e.g., clothianidin, imidacloprid, thiamethoxam):

Although adult monarchs may show surprising tolerance, these systemic insecticides are still a significant threat.

- **Chlorantraniliprole:**

This insecticide is particularly toxic to monarch and painted lady larvae

Organophosphates (e.g., chlorpyrifos):

These insecticides are also known to be toxic to butterflies.

- **Other broad-spectrum products:**

Many common mosquito sprays are not selective and are highly toxic to pollinators like butterflies, say Keep Massachusetts Beautiful and the National Institutes of Health.

How can we work together to minimize risks to non-target insects while protecting the health of people, animals and food systems?