

# Why is phenology important?

## The scientific perspective



Abe Miller-Rushing  
National Park Service, Acadia National Park

# Outline

- Introduction
- History
- Ecology
- Climate, carbon, and water
- People

# Phenology is linked to climate



# Phenology is a part of daily life



Phenology...is perhaps the simplest process in which to track changes in the ecology of species in response to climate change. IPCC 2007



# Outline

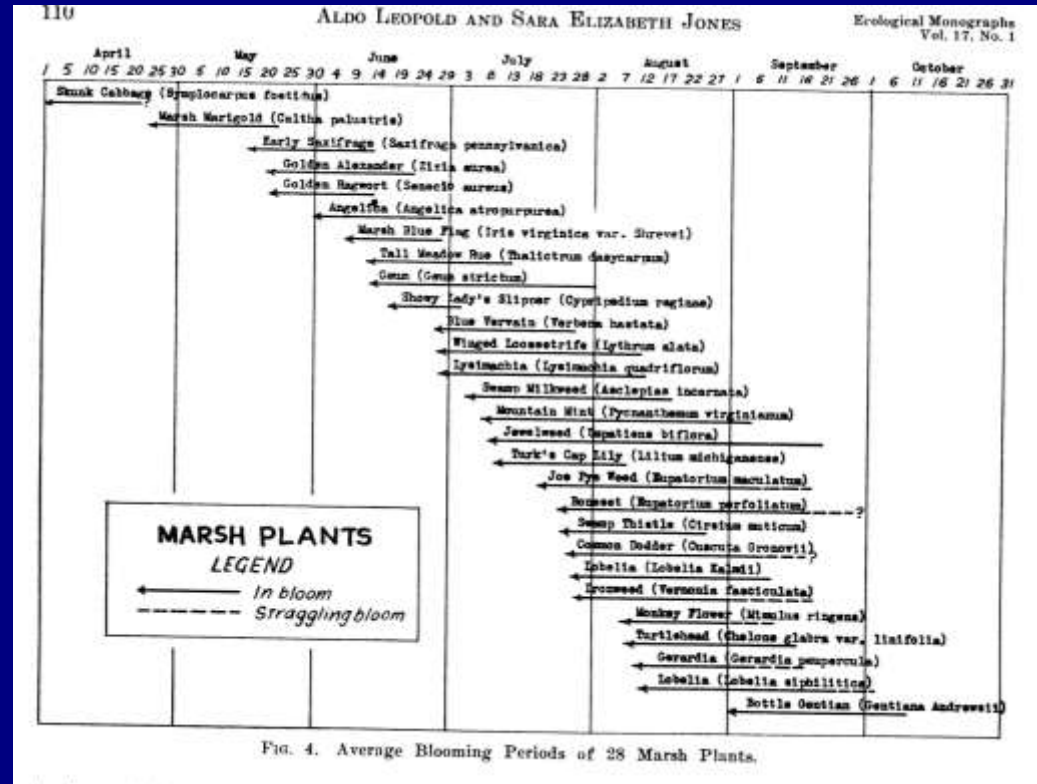
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As old as agriculture



# Low priority in ecology

- Phenology not thought to change over time
- Species thought to shift in unison



# Phenology is changing

- Different species changing at different rates
- Changes our understanding and approach to ecology
- Changes our day-to-day lives



# Outline

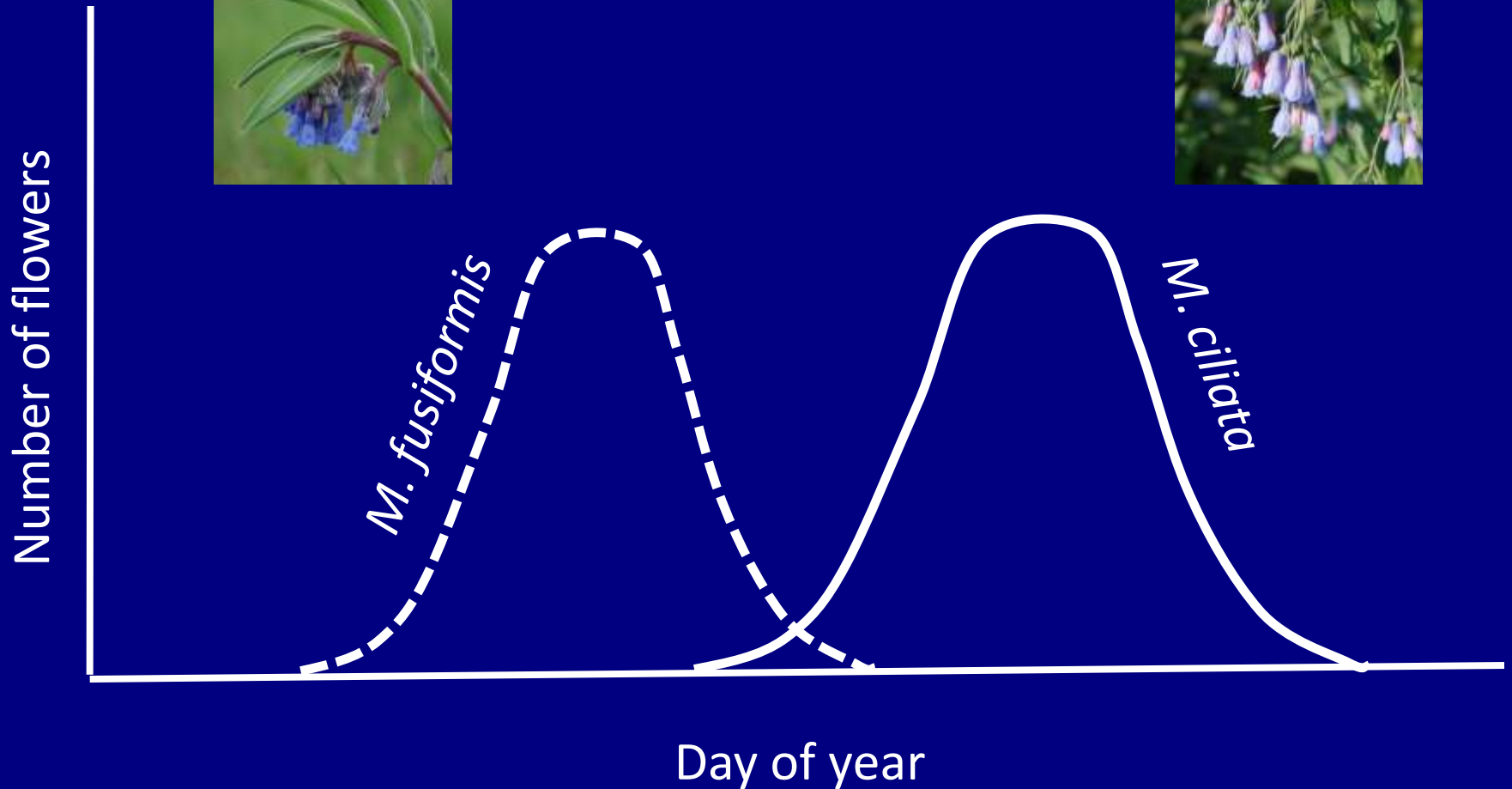
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# Relationships will change

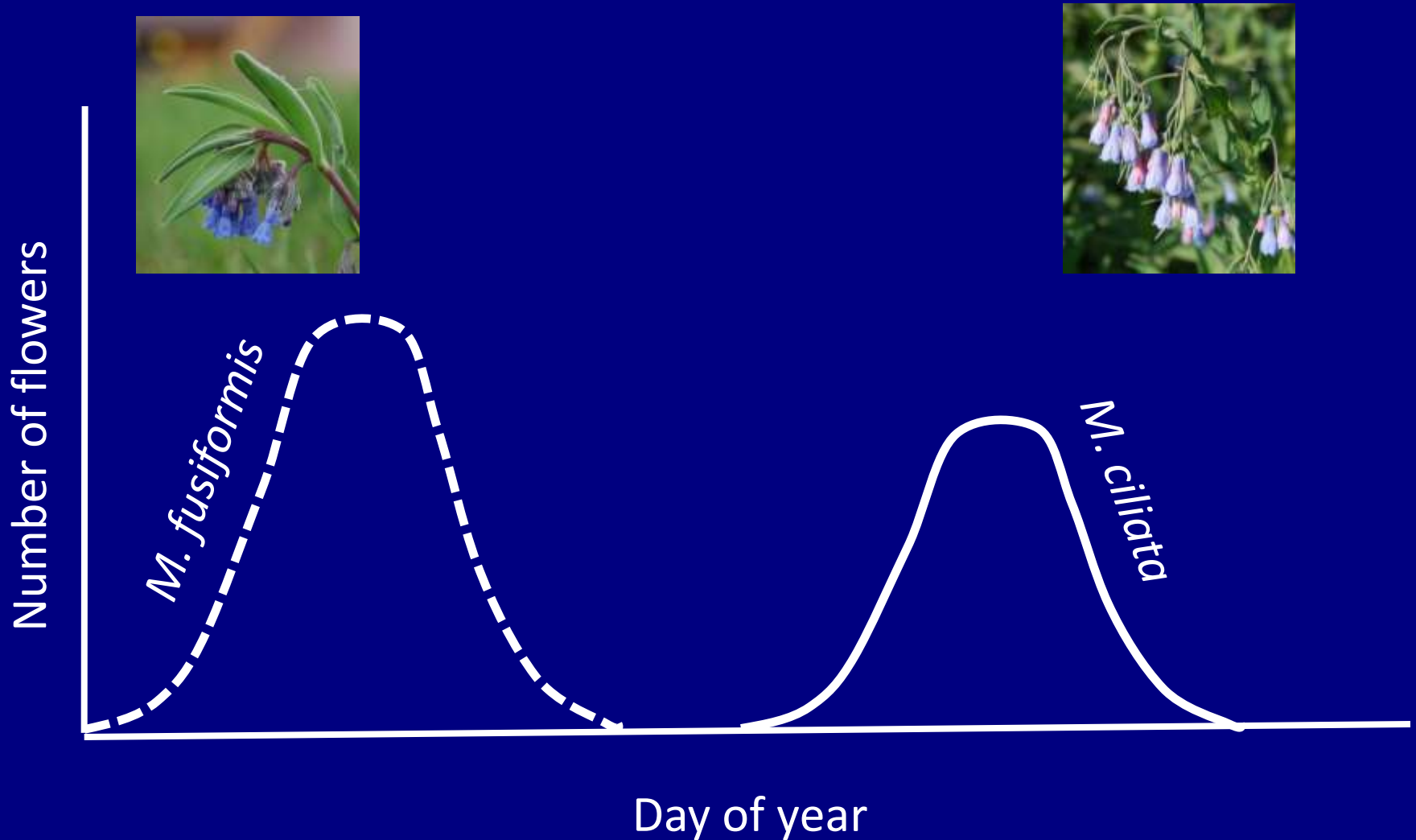
- Pest outbreaks
- Mismatches
- Species ranges
- Demography



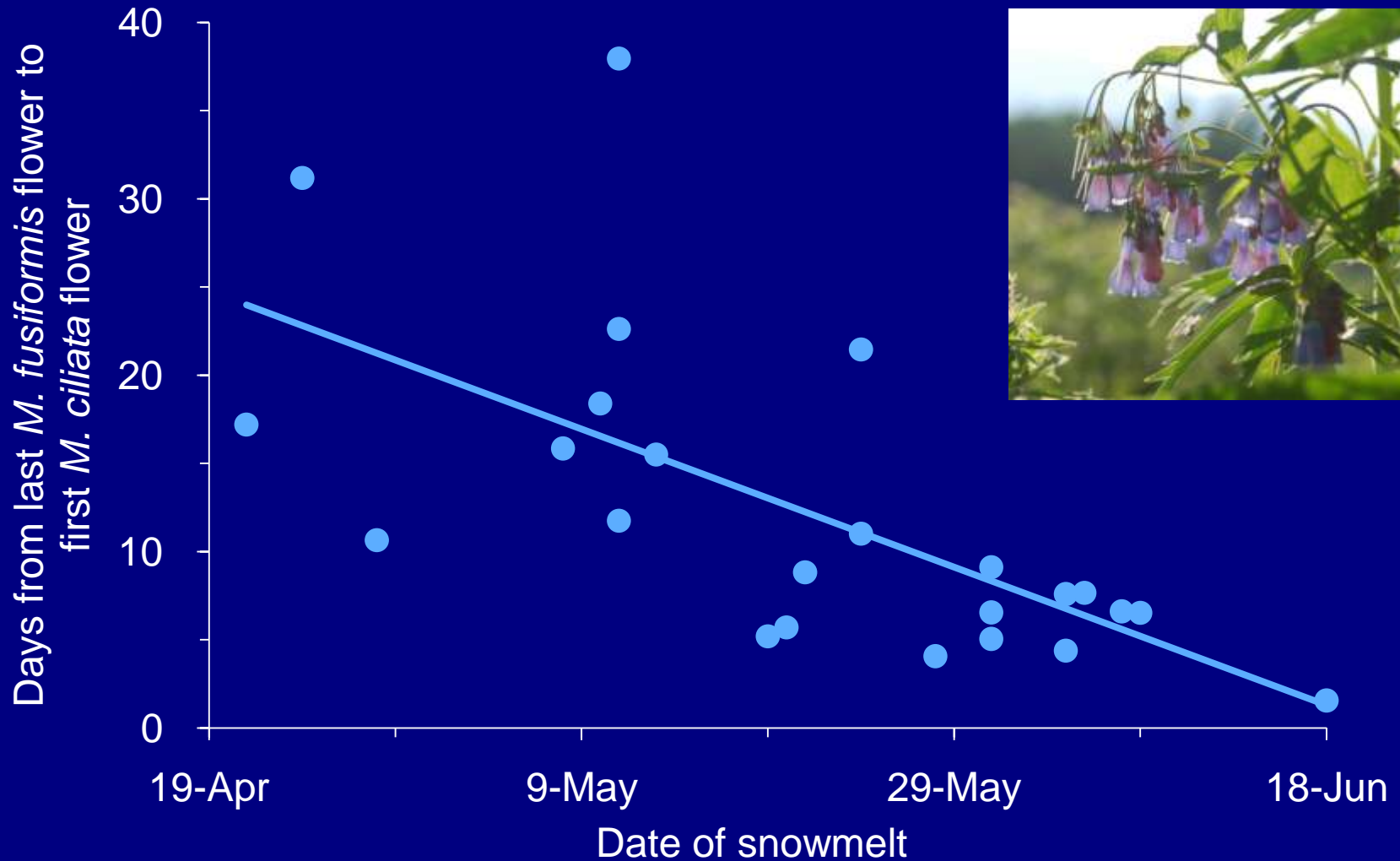
# Resource gaps for pollinators



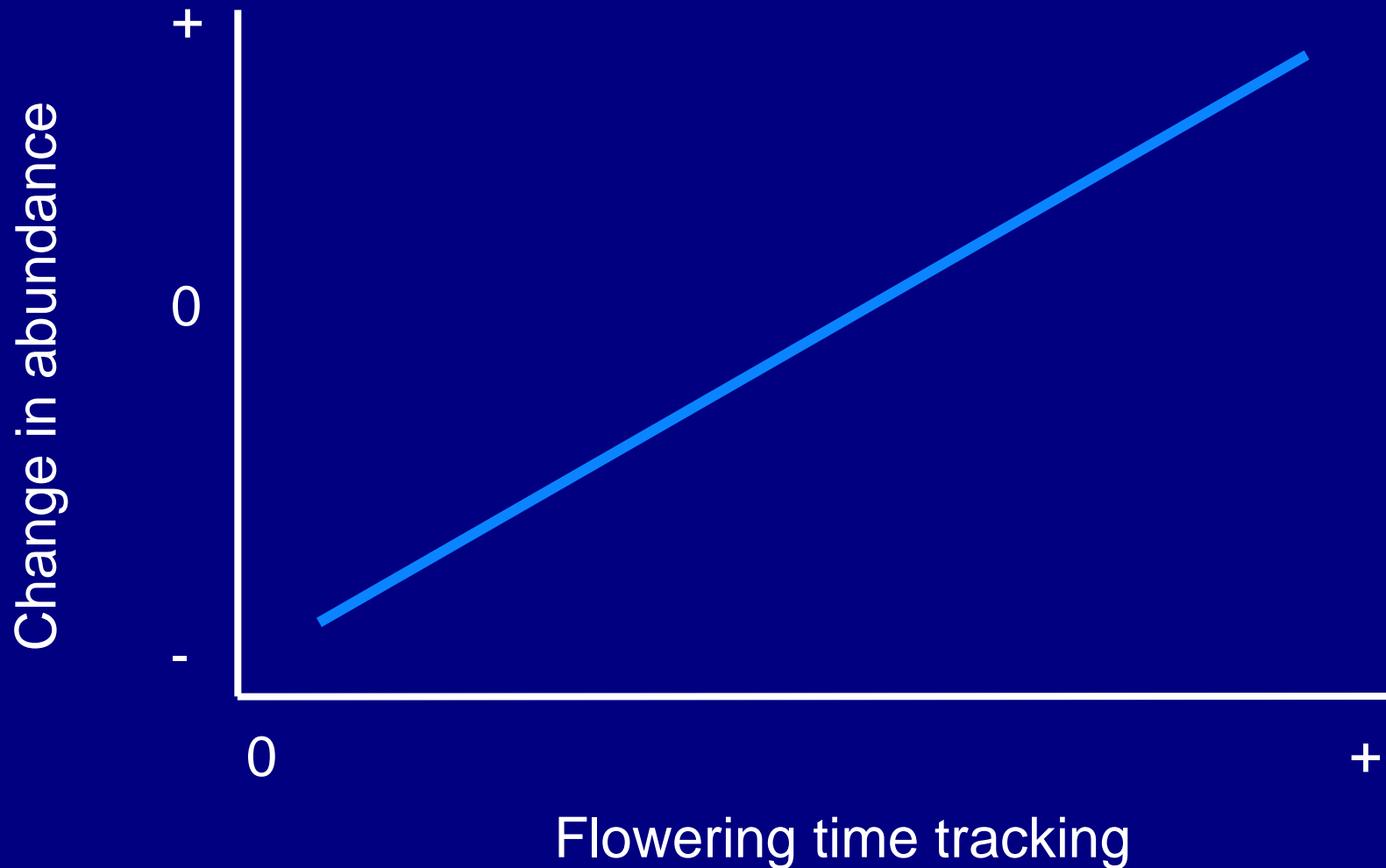
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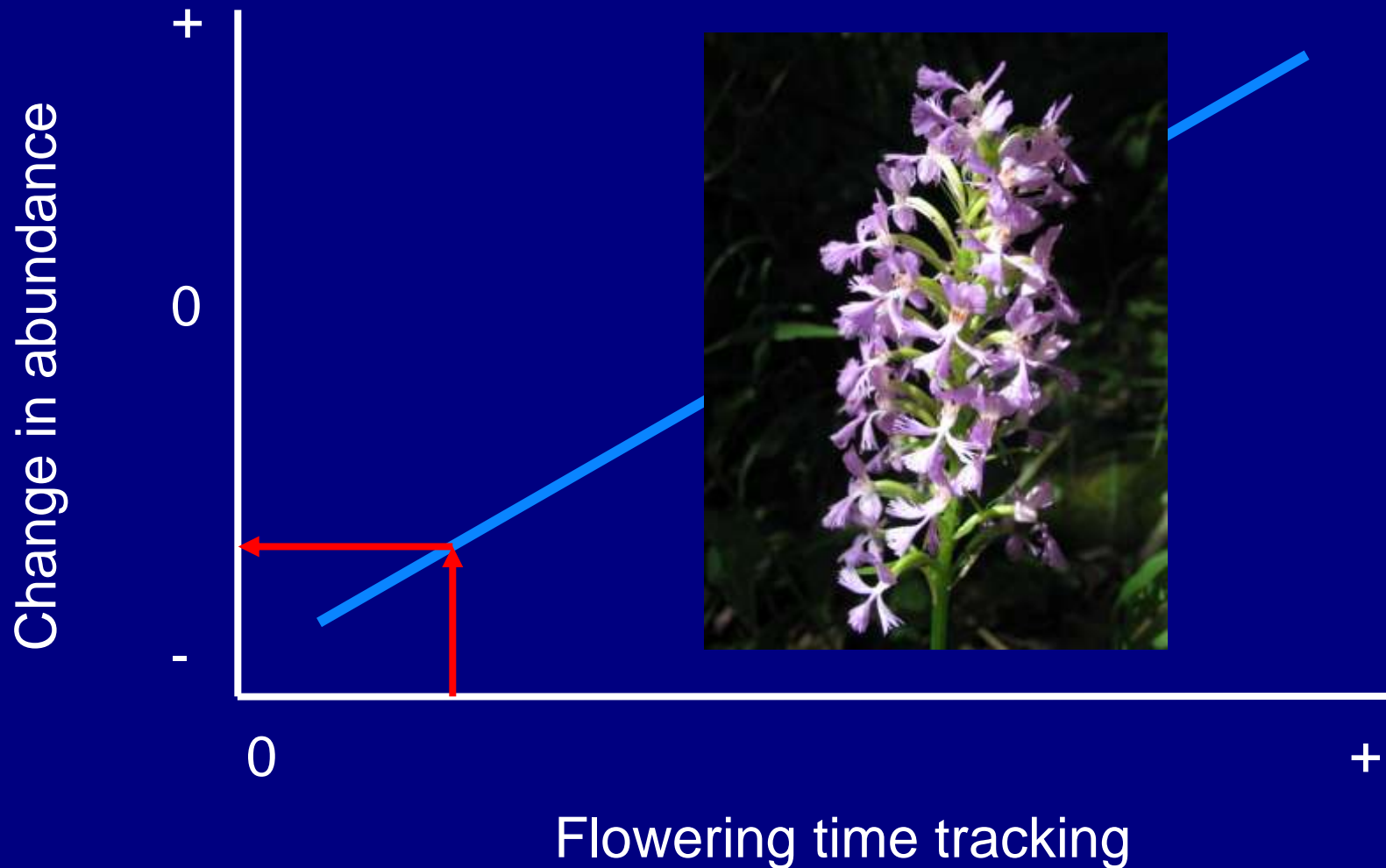
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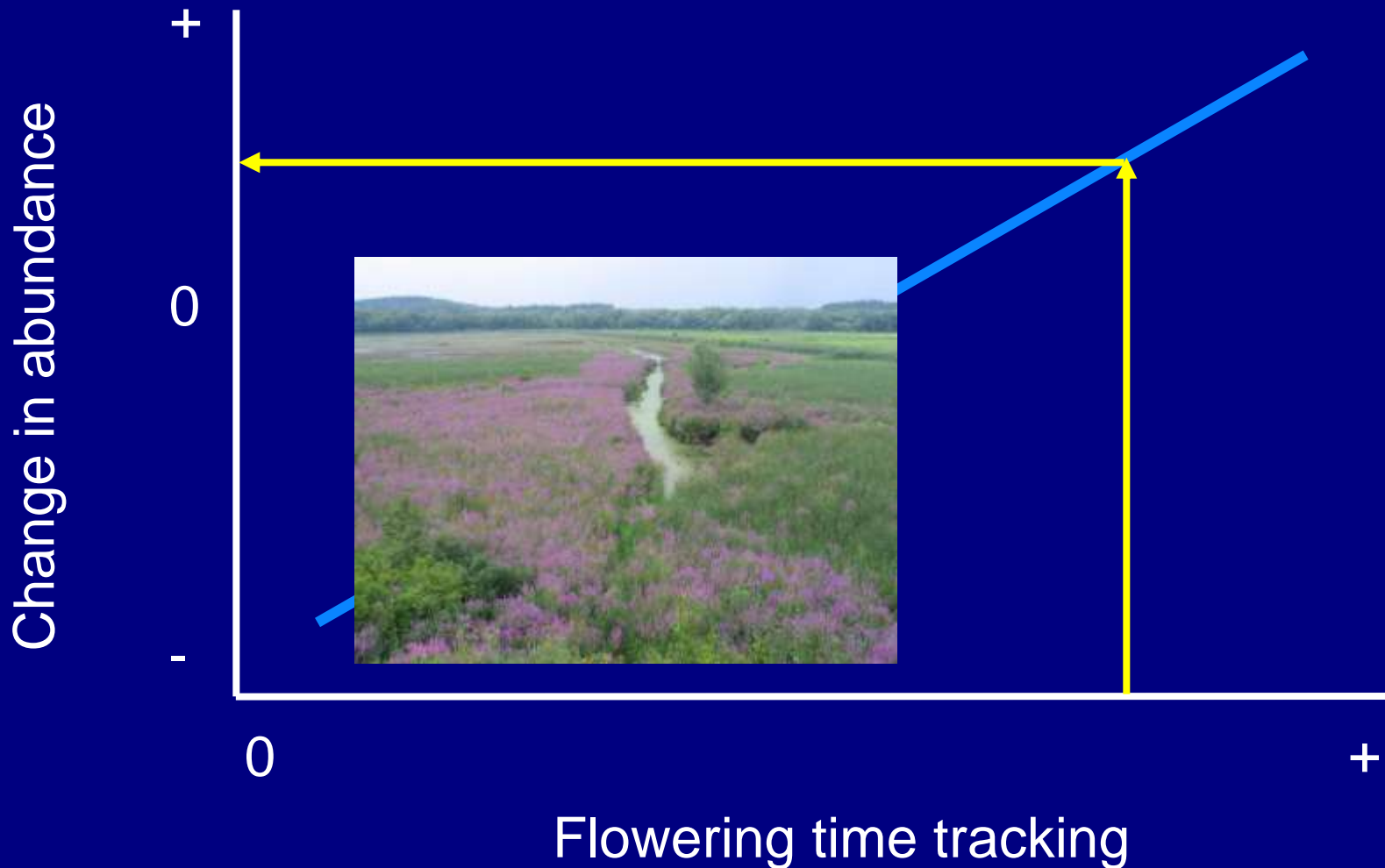
# Phenology indicates vulnerability



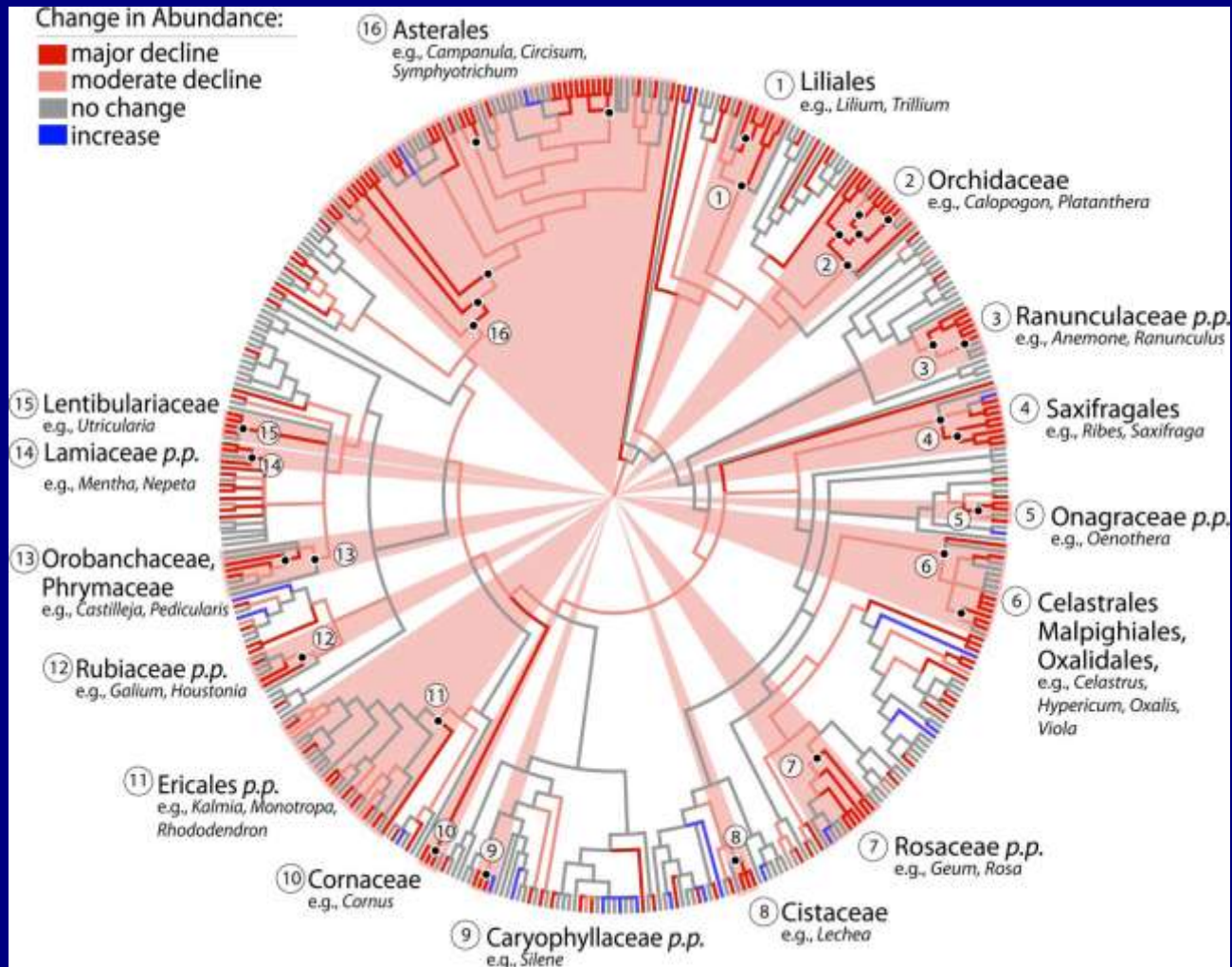
# Phenology indicates vulnerability



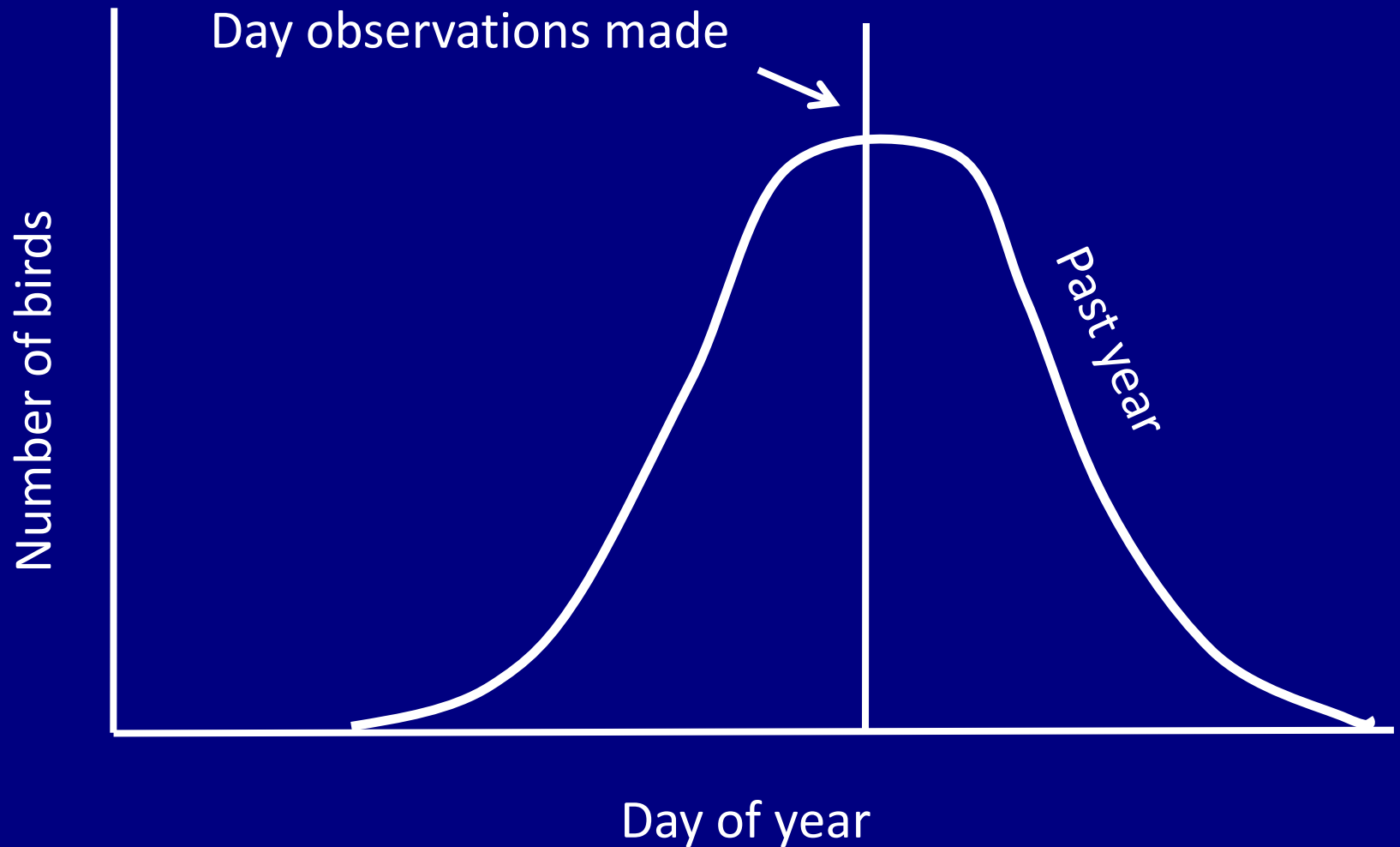
# Phenology indicates vulnerability



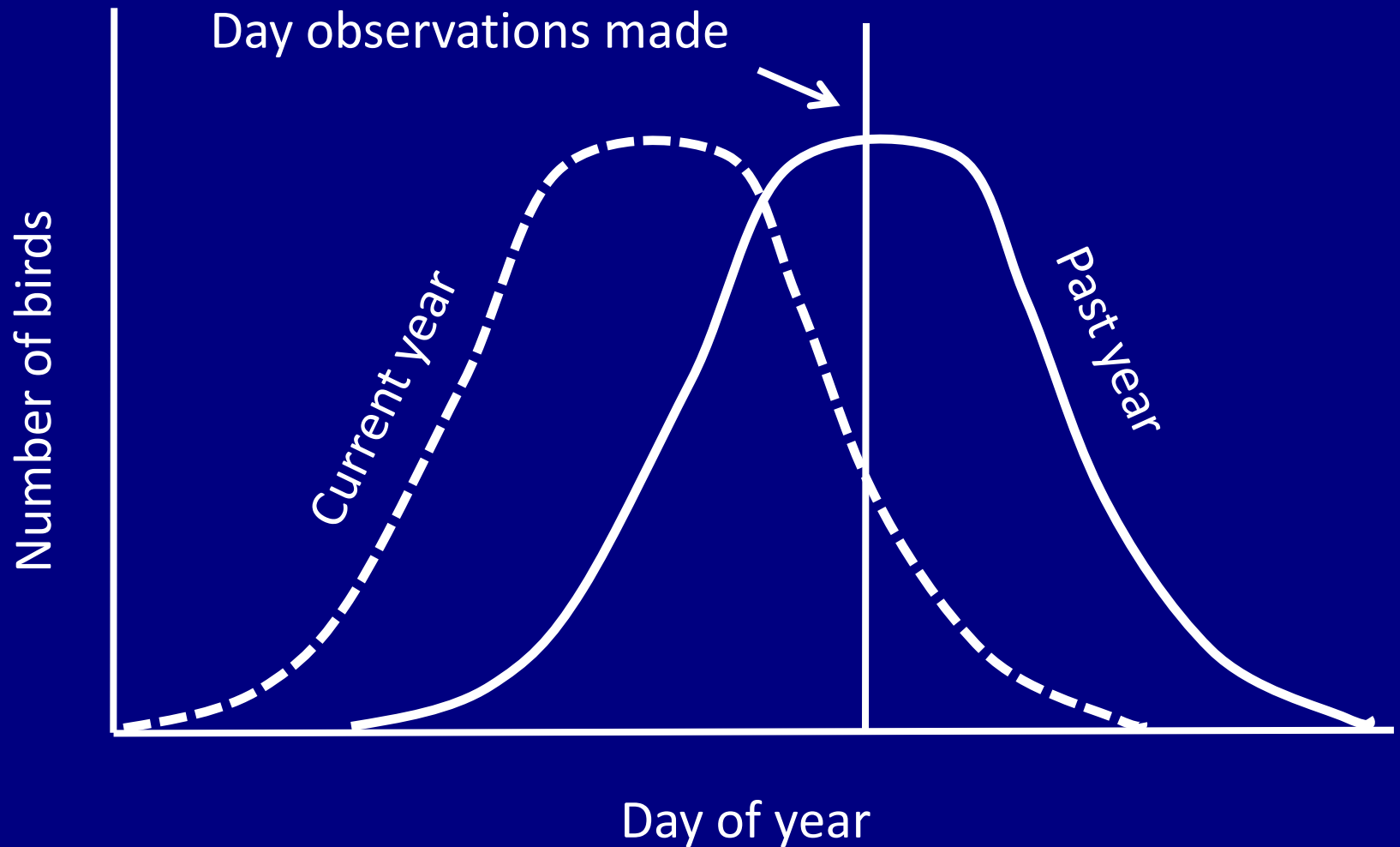
# Non-random loss of biodiversity



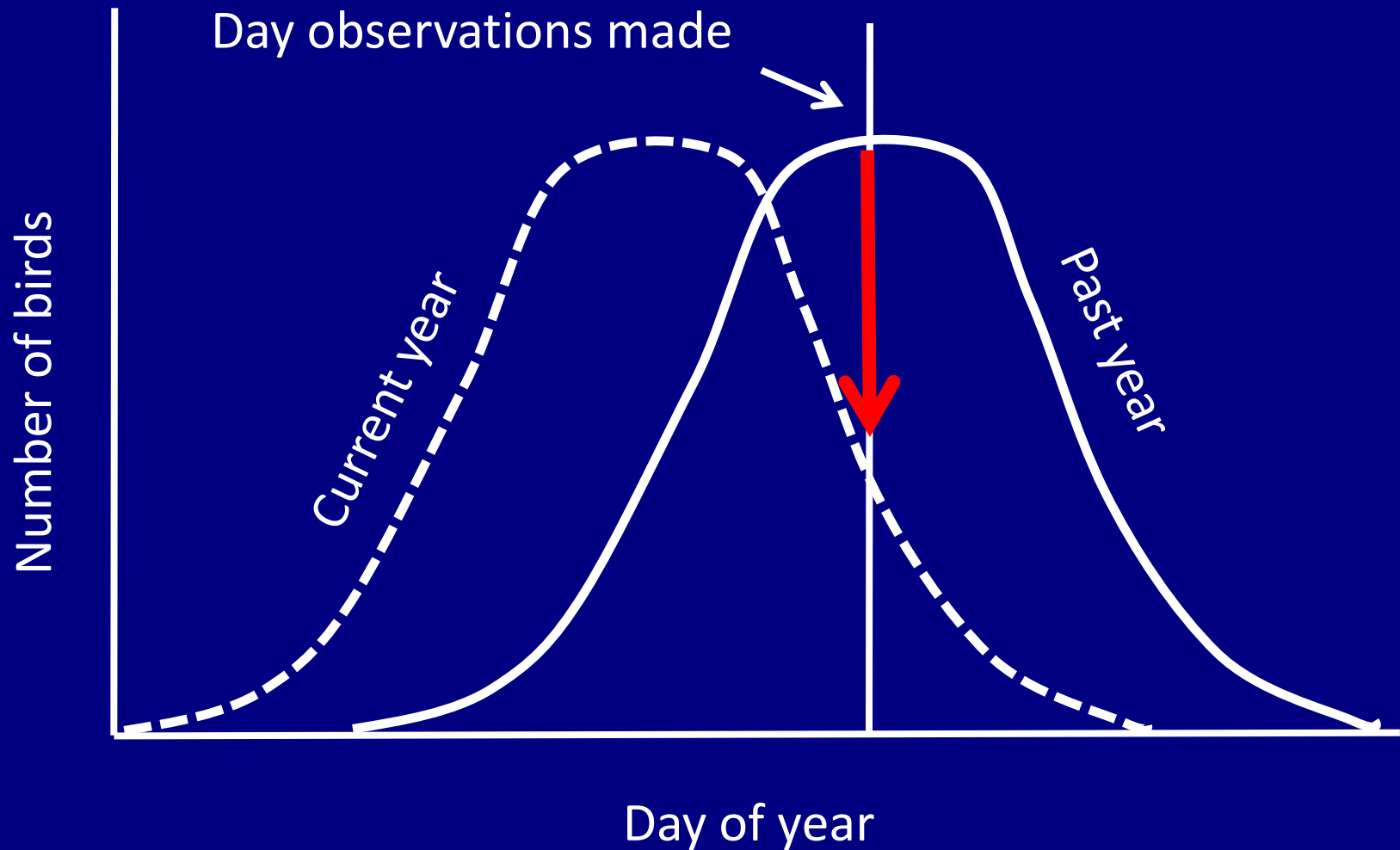
# Informing existing monitoring



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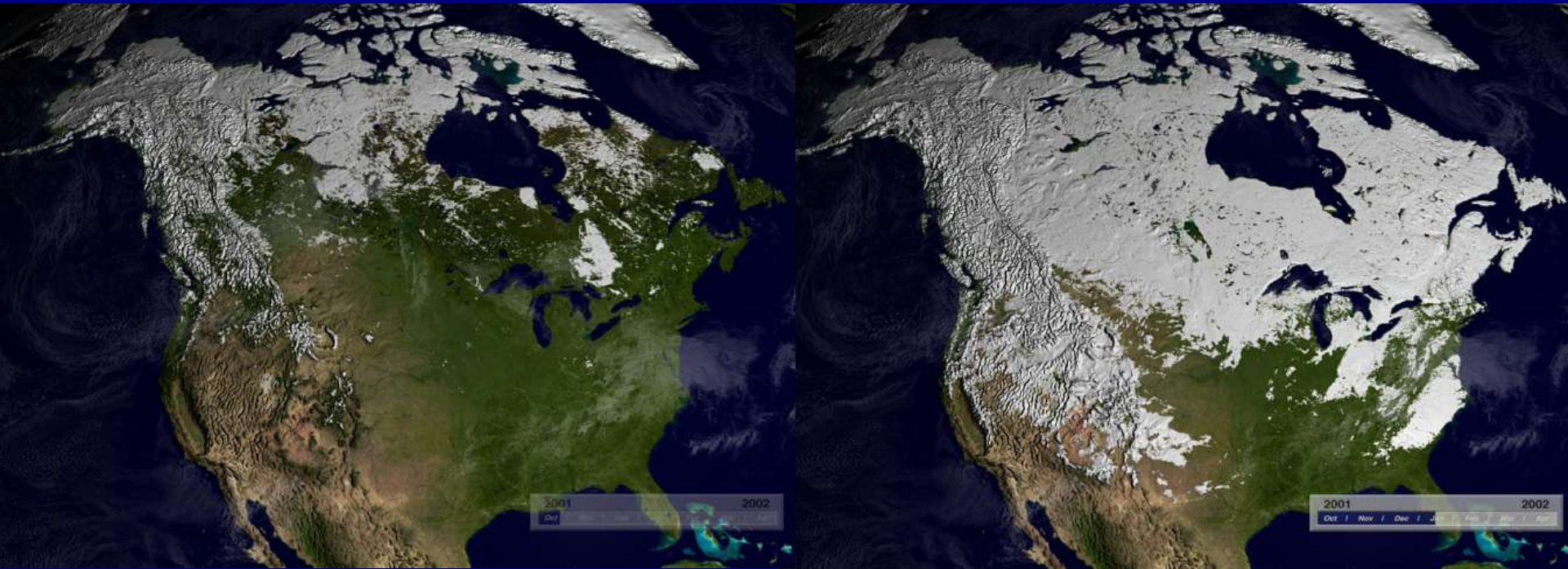
We must improve our understanding to forecast and manage the changes taking place



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# Longer growing season



# Carbon sequestration



# Water



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# Hunting and fishing



# Health



# Cultural events



# Economic behaviors



# Bottom line

- Phenology is a critical aspect of human and natural systems.
- Changes in phenology have huge implications for people and ecosystems.
- Much more work is needed.



[abe\\_miller-rushing@nps.gov](mailto:abe_miller-rushing@nps.gov)