

# Plant Ecology: Introduction

## What is (Plant) Ecology?

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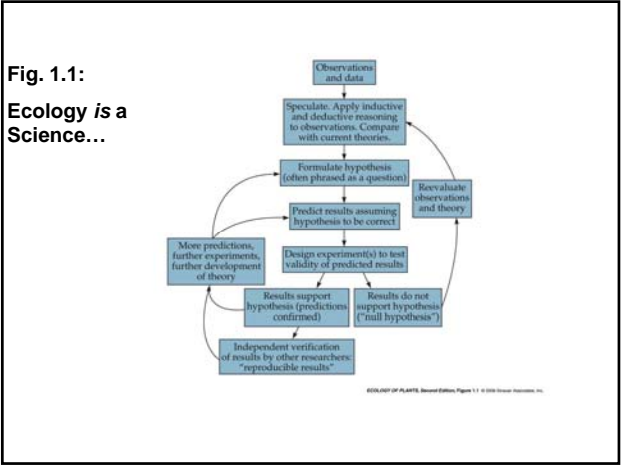
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**...and is based in the development and testing of theory**

TABLE 1.1 The components of a scientific theory	
Component	Description
Domain	The scope in space, time, and phenomena addressed by the theory
Assumptions	Conditions or structures needed to build the theory
Concepts	Labeled regularities in phenomena
Definitions	Conventions and prescriptions necessary for the theory to work with clarity
Facts	Confirmable records of phenomena
Confirmed generalizations	Condensations and abstractions from a body of facts that have been tested
Laws	Conditional statements of relationship or causation, or statements of process that hold within a universe of discourse
Models	Conceptual constructs that represent or simplify the natural world
Translation modes	Procedures and concepts needed to move from the abstractions of a theory to the specifics of application or test
Hypotheses	Testable statements derived from or representing various components of the theory
Framework	Nested causal or logical structure of the theory

Source: Pickett et al. 1994.

ECOLOGY OF PLANTS, Second Edition, Table 1.1 © 2008 Sinauer Associates, Inc.

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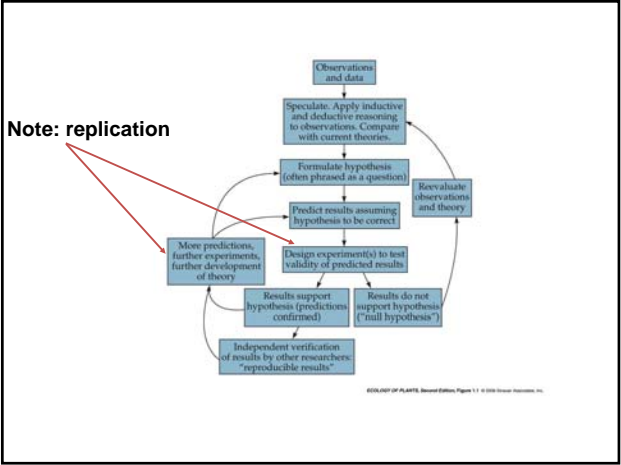
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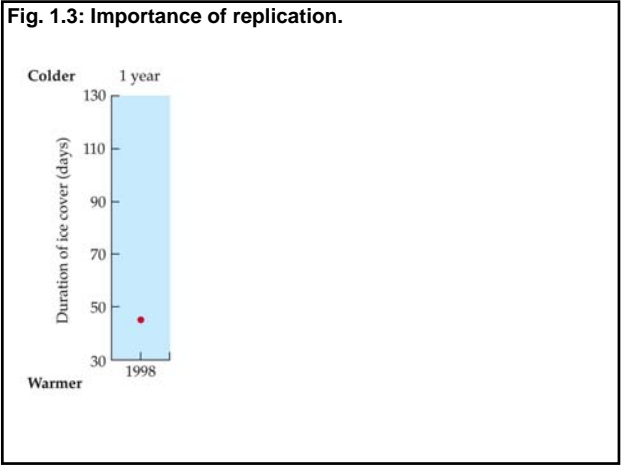
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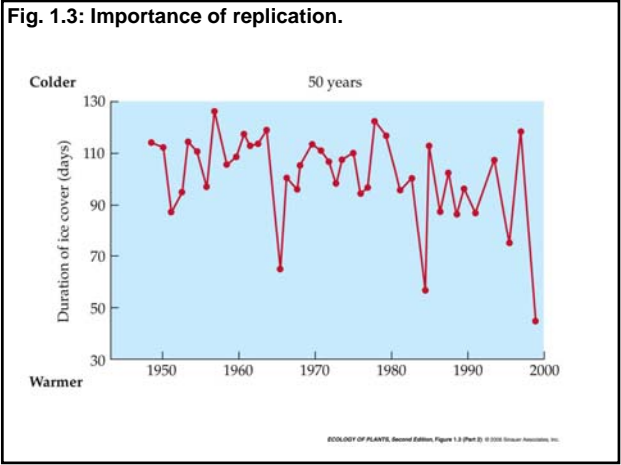
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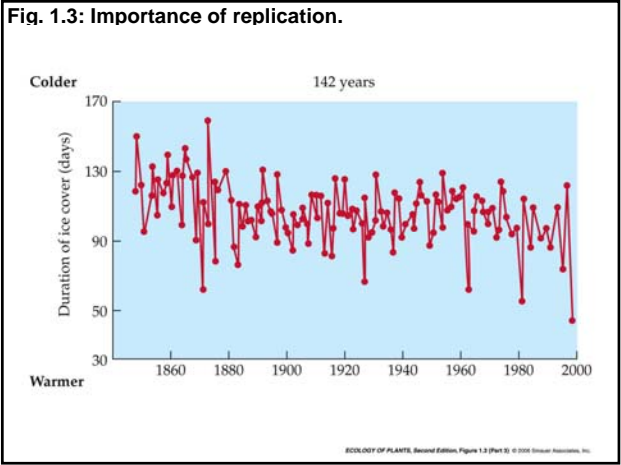
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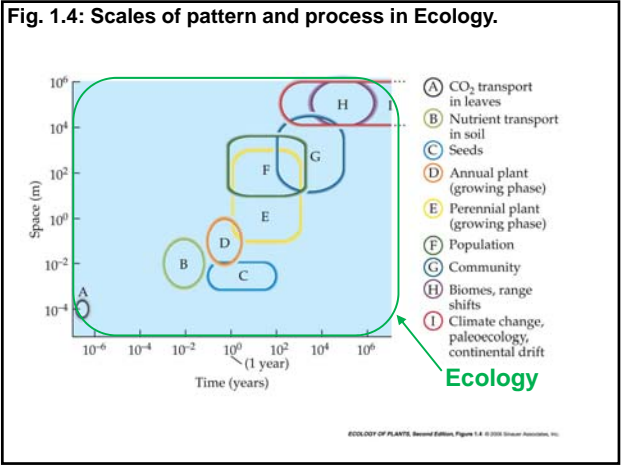
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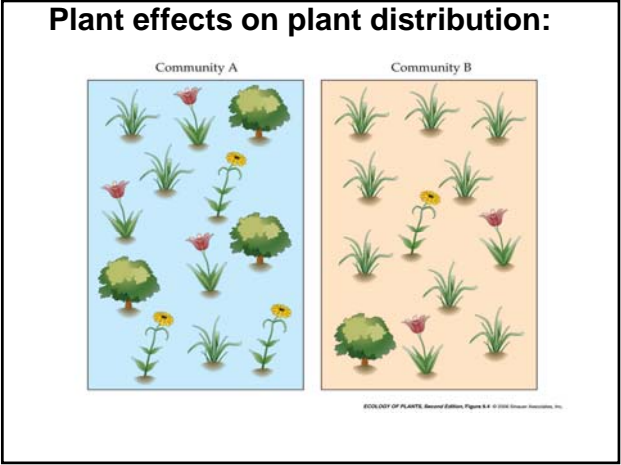
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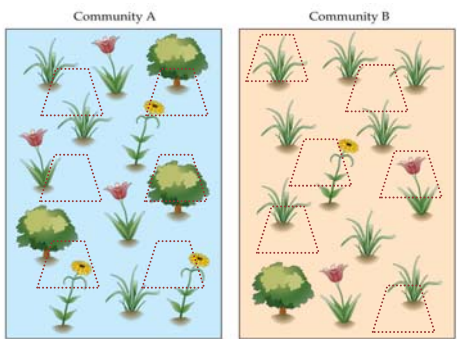
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**Replication again:**



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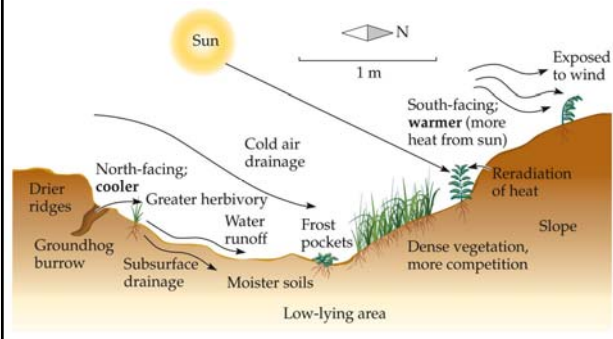
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**Environmental effects on plant distribution:**



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**Fig. 1.2:**  
**Konza Prairie: Long-Term Ecological Research Site**



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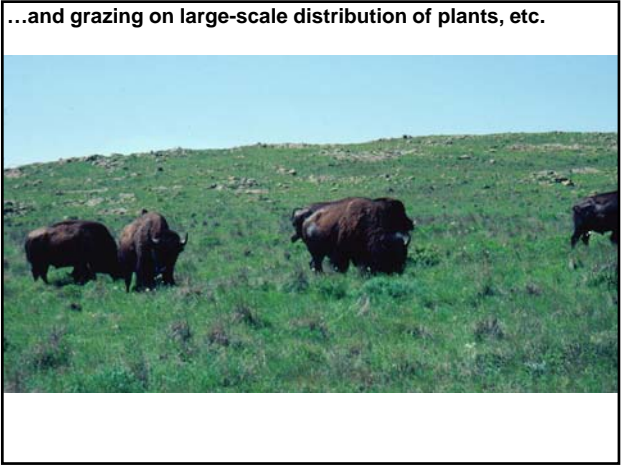
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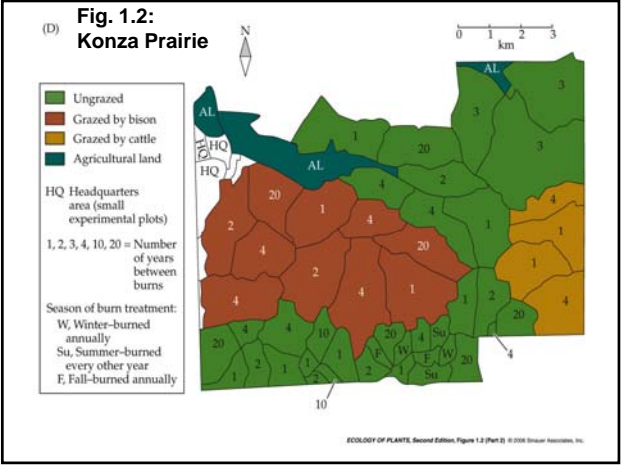
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**From Plant Geography to modern Plant Ecology**

Plant Geography (late 1700s - early 1800s)  
- vegetation type is related to climate, thus to geography

Integrative studies of multiple factors  
- "In the great chain of causes and effects, no thing and no activity should be regarded in isolation."  
- Humboldt, early 1800s

Plant Ecology emerges (mid to late 1800s)  
- integration of plant biology, physiology, competition, succession, disturbance

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**Fig. 1.6: Charles Darwin and the voyage of HMS Beagle (1831)**



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**From Plant Geography to modern Plant Ecology**

Functional Ecology,  
Physiological Ecology, and  
Plant Population Biology (mid 1900s)

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**A few selected titles from a recent issue (Dec 2008) of the journal *Plant Ecology*:**

- > *Utricularia* : a vegetarian carnivorous plant?
- > Consequences of nectar robbing for the fitness of a threatened plant species
- > Gender modification in a monoecious species  
*Sagittaria potamogetifolia* (Alismataceae)
- > Structural characteristics and canopy dynamics of *Tsuga canadensis* in forests of the southern Appalachian Mountains, USA
- > Rainforest fragmentation and the demography of the economically important palm *Oenocarpus bacaba* in central Amazonia

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**Why do we care?**

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**Why do we care?**

Conservation Preservation and Restoration of Biodiversity and ecosystem functions

Food supply (agroecology)

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