

# Biogeography. Lecture 7

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January 29, 2016



# Outline

## Basics of ecology

- Ways of life

- Ecological factors

- Biotic ecological factors: ecological interactions

- Human-related ecological factors



# Basics of ecology

## Ways of life



# Ways of life

## ▶ How to obtain energy?

1. From sun light: **phototrophy**
2. From chemical reactions with inorganic matter (“rocks”):  
**lithotrophy**
3. From breaking organic molecules into inorganic (typically, carbon dioxide and water): **organotrophy**

## ▶ How to obtain building blocks?

1. From assimilation of carbon dioxide: **autotrophy**
2. From other living beings: **heterotrophy**



# Six life styles

	<b>Phototrophs</b>	<b>Lithotrophs</b>	<b>Organotrophs</b>
<b>Autotrophs</b>	Plants	Bacteria	Bacteria
<b>Heterotrophs</b>	Bacteria	Bacteria	Animals



# Basics of ecology

## Ecological factors



# Ecological factors

- ▶ Everything what is surrounding organism
- ▶ Types of ecological factors:
  - ▶ Abiotic
  - ▶ Biotic
  - ▶ Anthropogenic



# Abiotic: classification A

- ▶ Resources
- ▶ Conditions



# Abiotic: classification B

- ▶ General (seasonal)
  - ▶ Temperature
  - ▶ Solar radiation
  - ▶ Content of environment (humidity etc.)
- ▶ Particular
  - ▶ Environment pressure (atmosphere pressure, gravitation etc.)
  - ▶ Environment movement (wind, currents)
  - ▶ Relief



# Basics of ecology

## Biotic ecological factors: ecological interactions



# Two-species model

- ▶ Species I and species II may influence each other differently
- ▶ For example, species I may facilitate the increase the number of species II individuals (+ interaction)
- ▶ At the same time, species II could be neutral to species I (0 interaction)



# Six basic ecological interactions

	+	0	-
+	mutualism	commensalism <sup>1</sup>	exploitation <sup>2</sup>
0	...	neutralism	amensalism
-	...	...	interference <sup>3</sup>

<sup>1</sup> Includes phoresy (transportation), inquilinism (housing) and metabiosis (“sponging” like in sucker fishes)

<sup>2</sup> Includes predation, parasitism and phytophagy

<sup>3</sup> Includes competition, allelopathy and aggression



# Basics of ecology

## Human-related ecological factors



# Anthropogenic factors

## ▶ Direct

- ▶ Collecting
- ▶ Hunting
- ▶ Plowing
- ▶ Tree cutting

## ▶ Indirect

- ▶ Grazing
- ▶ Polluting
- ▶ Melioration
- ▶ Recreation



# Summary

- ▶ Ecology studies relation between organisms and environment



# For Further Reading



A. Shipunov.

*Biogeography* [Electronic resource].

2014—onwards.

Mode of access:

[http://ashipunov.info/shipunov/school/biol\\_330](http://ashipunov.info/shipunov/school/biol_330)



Ecology.

<http://en.wikipedia.org/wiki/Ecology>

