

Biogeography. Lecture 5

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Outline

Basics of physical geography
Basics of climatology

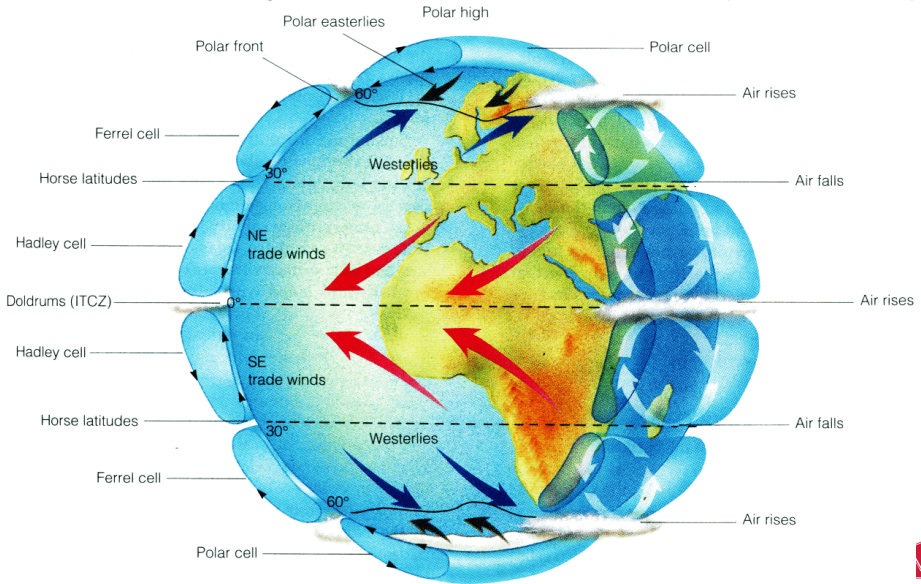


Basics of physical geography

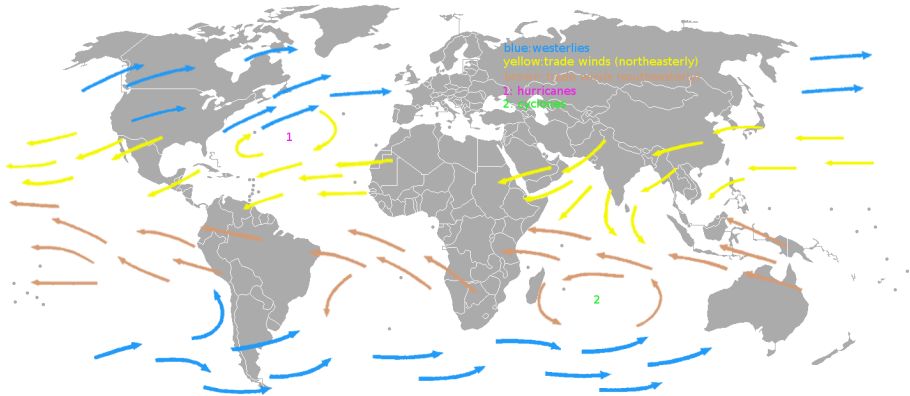
Basics of climatology



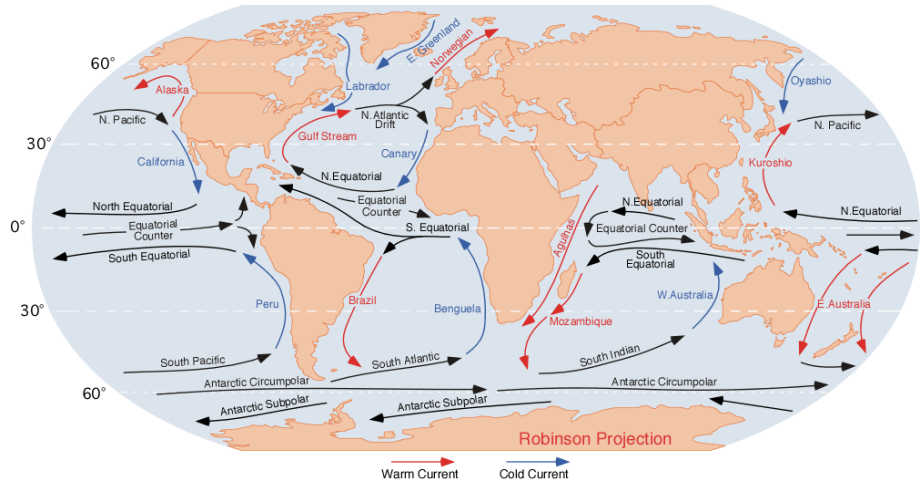
Idealized atmospheric circulation on Earth (with labels)



Prevailing winds



Ocean currents



El Niño: climatic oscillation

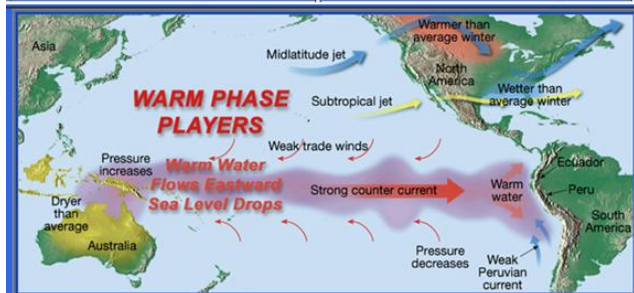
- ▶ Sometimes, western warm currents change atmospheric circulation in East Pacific
- ▶ They will bring wet and warm weather, mostly damaging to the living organisms from western North and South America (adapted to low precipitation)



La Niña *versus* El Niño



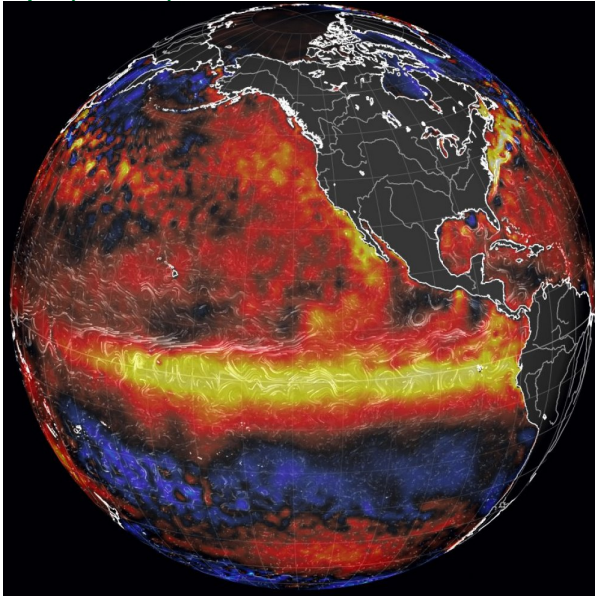
Normal
Situation



El Niño
Situation



Last El Ninjo (2016)



Seasons

- ▶ Temperature seasons: axial, not orbital effects
- ▶ Tropical wet seasons (monsoons) are related with temperature seasons and circulation

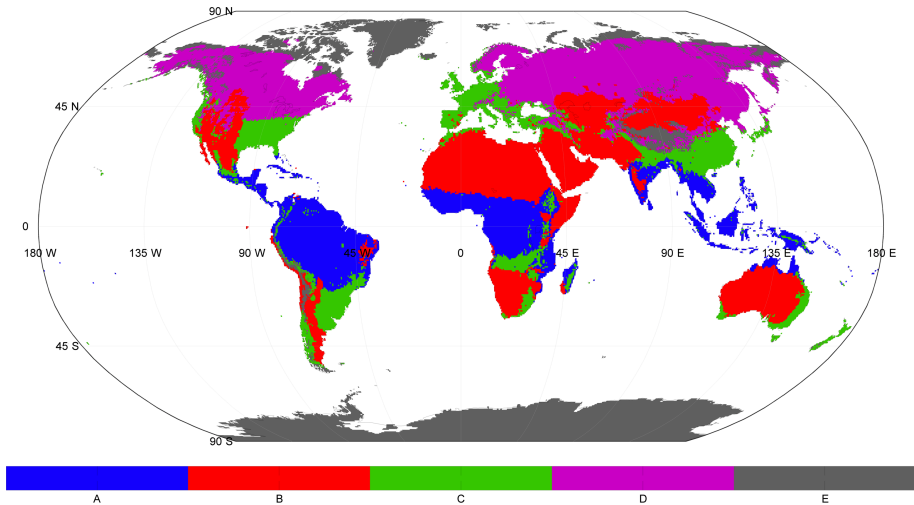


Climates

- ▶ Geographical zones: arctic, temperate and tropical
- ▶ Koeppen climates: A, tropical; B, dry; C, mild mid-latitude; D, cold mid-latitude; and E, polar



Koeppen climates

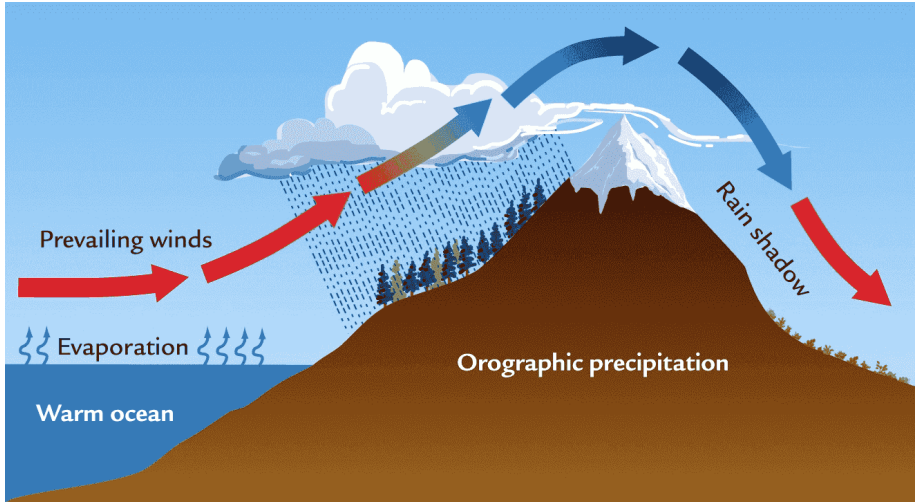


Climate and altitude

- ▶ Sea warming and rain shadow
- ▶ Altitudinal zones: lowland, montane, subalpine, alpine and snow



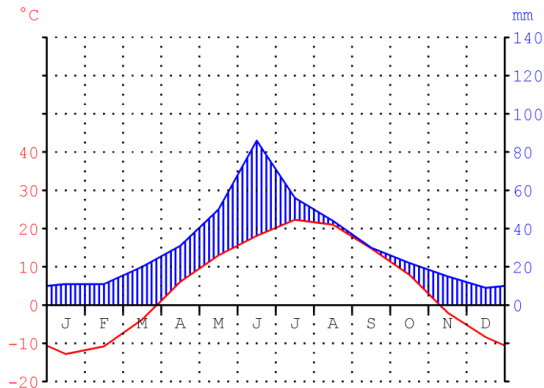
Sea warming and rain shadow



Climate diagram I

Erstellt mit Geoklima 2.1

Bismarck/USA
 46°46'N/100°45'W
 511m



Monat	Temp. (°C)	Nied. (mm)
JAN	-12,8	11
FEB	-10,8	11
MRZ	-3,8	20
APR	6,1	31
MAI	13,0	50
JUN	18,1	86
JUL	22,3	56
AUG	21,0	44
SEP	14,8	30
OKT	7,9	22
NOV	-2,0	15
DEZ	-8,4	9

Temp.-Jahresmittel
 5,4 °C

Niederschlagssumme
 385 mm



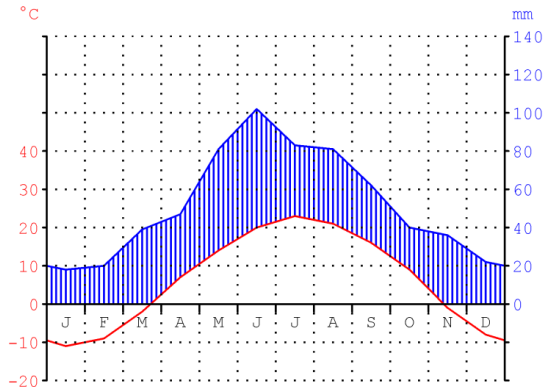
Climate diagram II

Erstellt mit Geoklima 2.1

Minneapolis/USA

44°53'N/93°13'W

254m



Monat	Temp. (°C)	Nied. (mm)
JAN	-11,0	18
FEB	-9,0	20
MRZ	-2,0	39
APR	7,0	47
MAI	14,0	81
JUN	20,0	102
JUL	23,0	83
AUG	21,0	81
SEP	16,0	62
OKT	9,0	40
NOV	-1,0	36
DEZ	-8,0	22

Temp.-Jahresmittel
6,6 °C

Niederschlagssumme
631 mm

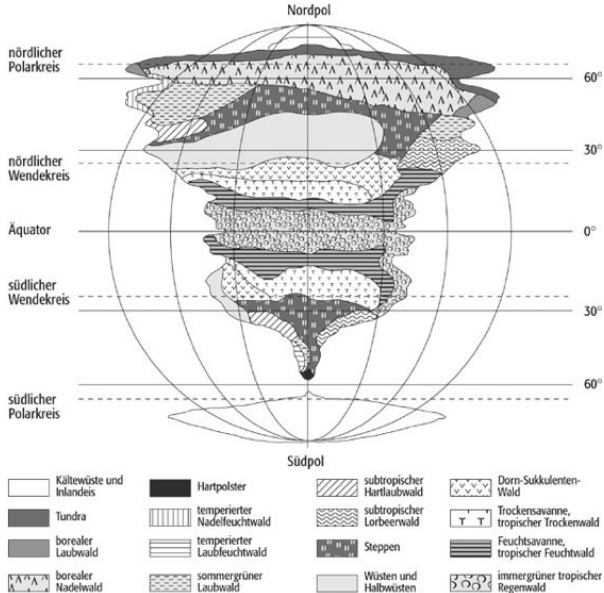


Climate and life

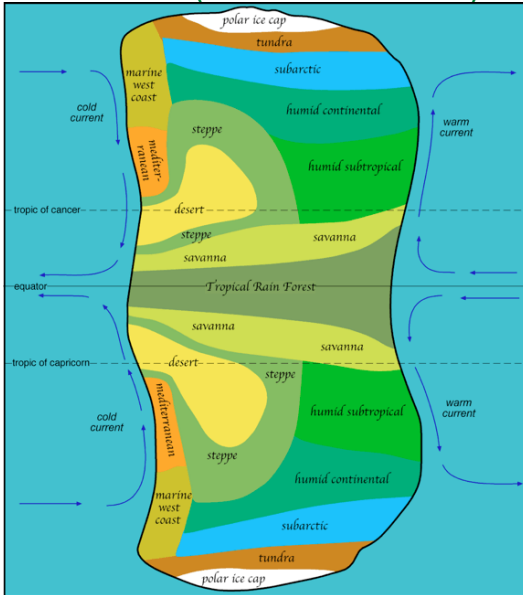
- ▶ Life zones are basing on temperature and precipitation
- ▶ Ideal continent (“Idealkontinent” in German)



Idealkontinent



Hypothetical continent (another version)



Summary

- ▶ Temperature seasons: axial, not orbital effects
- ▶ Tropical wet seasons (monsoons) are related with temperature seasons and circulation



For Further Reading



A. Shipunov.

Biogeography [Electronic resource].

2014—onwards.

Mode of access:

http://ashipunov.info/shipunov/school/biol_330



Major circles of latitude.

http://en.wikipedia.org/wiki/Circle_of_latitude



Atmospheric circulation.

http://en.wikipedia.org/wiki/Atmospheric_circulation

