BIODIVERSITÀ E PRESENZA UMANA NELLE "ALTE TERRE" ITALIANE

Alessio Martinoli
Università degli Studi dell'Insubria

alessio.martinoli@uninsubria.it

INTRODUCTION

Himmelbjerget (Danemark)
transl. «The Sky Mountain»
147 m a.s.l.

Garth Hill (S Wales, UK)
307 m / 1,007 ft a.s.l.

INTRODUCTION

INTRODUCTION

El Alto (Bolivia)
4,150 m a.s.l. / 1,100,000 inhab.

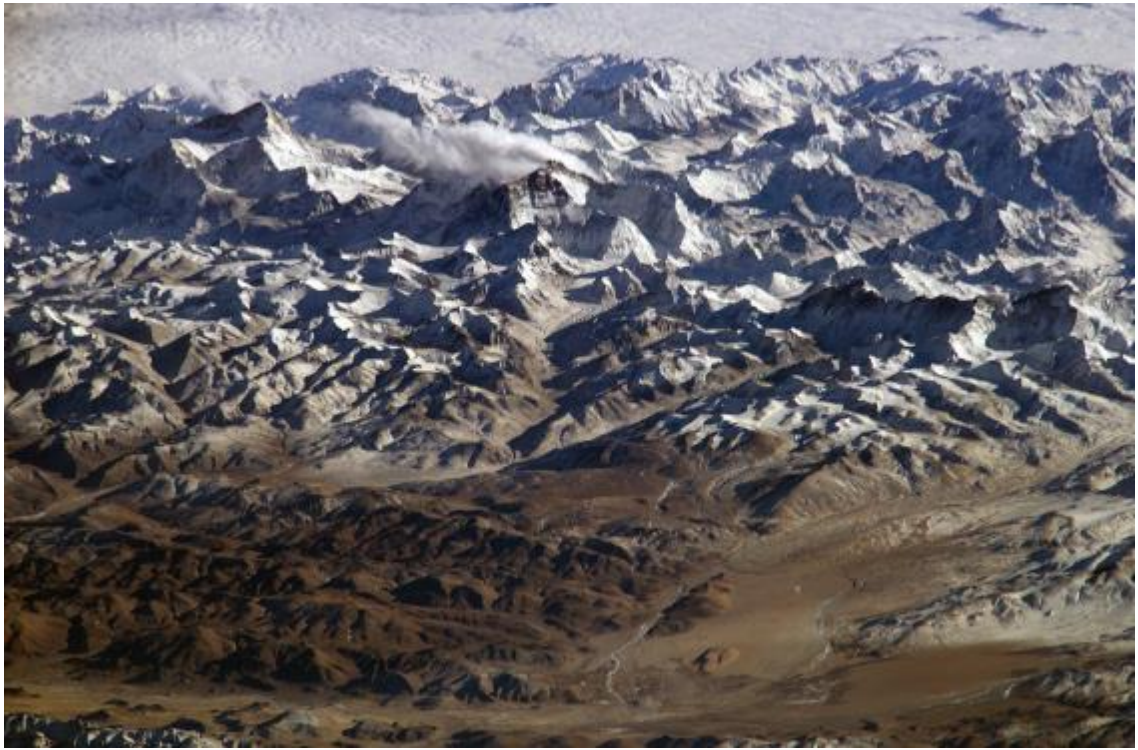
INTRODUCTION

INTRODUCTION

We do also have a distorted image of mountains…

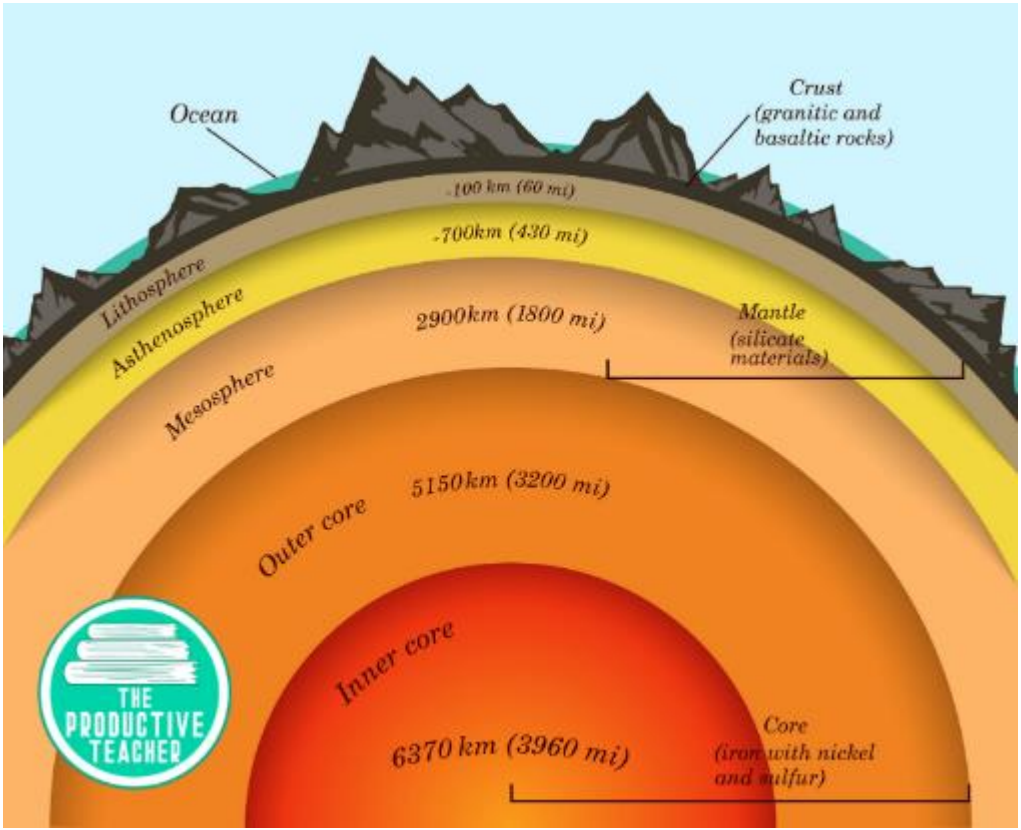
Does it look high?

We do also have a distorted image of mountains…

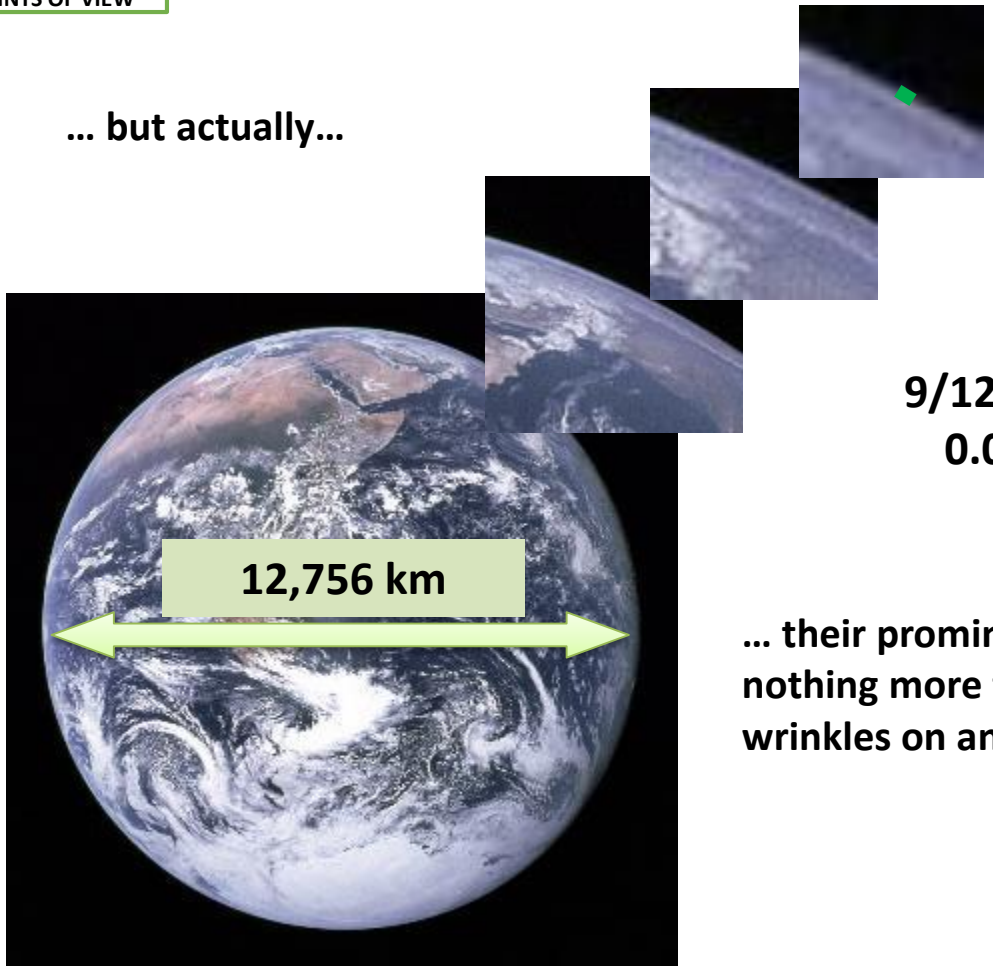


Does they look low?

This is our image of mountains…



… but actually…



9 km

9/12756 = 0.07%

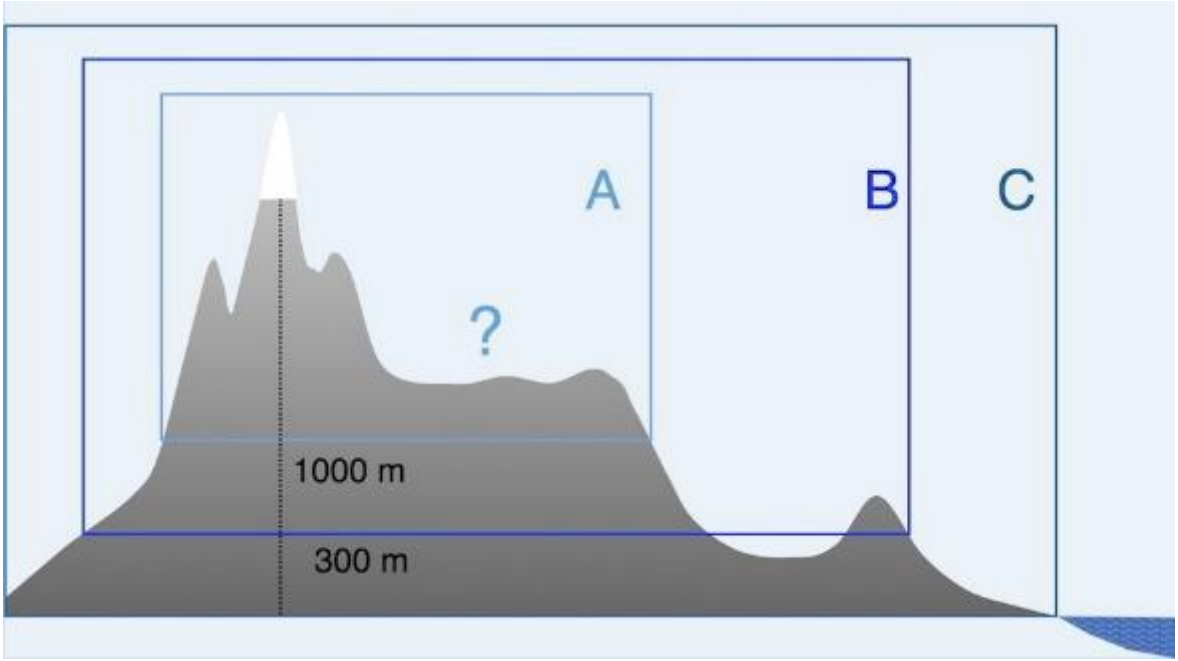
… their prominence is nothing more than wrinkles on an orange!


-BEST1-
L'Italia ripresa dal satellite durante l'alba, non smetterei mai di vederla per quanto è bella

FAKE NEWS

POINTS OF VIEW

WHAT IS A MOUNTAIN?



Mountain

"Landform that rises prominently above its surroundings, generally exhibiting steep slopes […]. Mountains generally are understood to be larger than hills, but the term has no standardized geological meaning. Very rarely do mountains occur individually […]. When an array of such ranges is linked together, it constitutes a mountain belt"

A bit too vague…!

Britannica

«A mountain **cannot be defined by elevation**, simply because there are elevated plateaus such as the North-American short-grass Prairies at around 2,000 m elevation or the vast plateaus in central Asia […].

Similarly, mountains **cannot be defined by climate**, given that any cold category would include arctic and antarctic lowland [….].

The only common feature of mountains is their steepness […] which causes the forces of gravity to shape them and create habitat types and disturbances typical for mountains and which make exposure a driving factor of life»

Körner et al. 2011

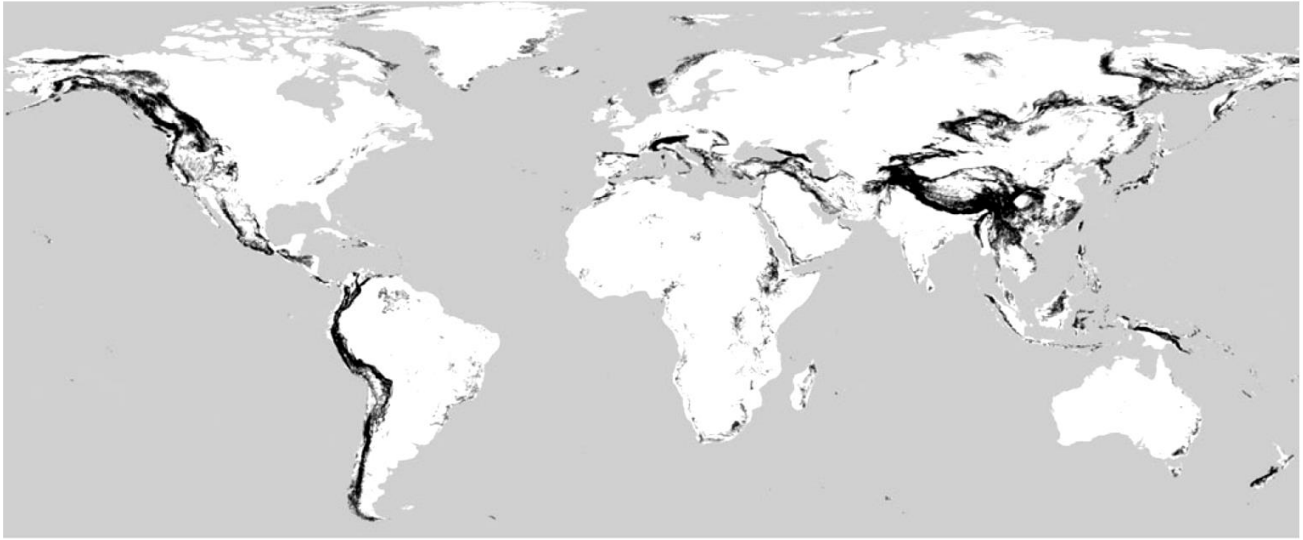
GLOBAL MOUNTAIN BIODIVERSITY ASSESSMENT

UNIVERSITÄT BERN

A MOUNTAIN IS…
any land meeting one condition

>200 m elevational difference in an approx. 3x2 km area (7% slope or 77 m / km)

Körner et al. 2011



➔ **12.3% of landmasses are mountain**

➔ **511 million people**

Körner et al. 2011

UN environment programme WCMC

A MOUNTAIN IS…
any land meeting one of several conditions

>2,500 m
1,500–2,499 m if the slope is >2°
1,000–1,499 m if the slope is 5° and local elevat. range (radius 7 km) >300 m
300–999 m if local elevat. range (radius 7 km) >300 m

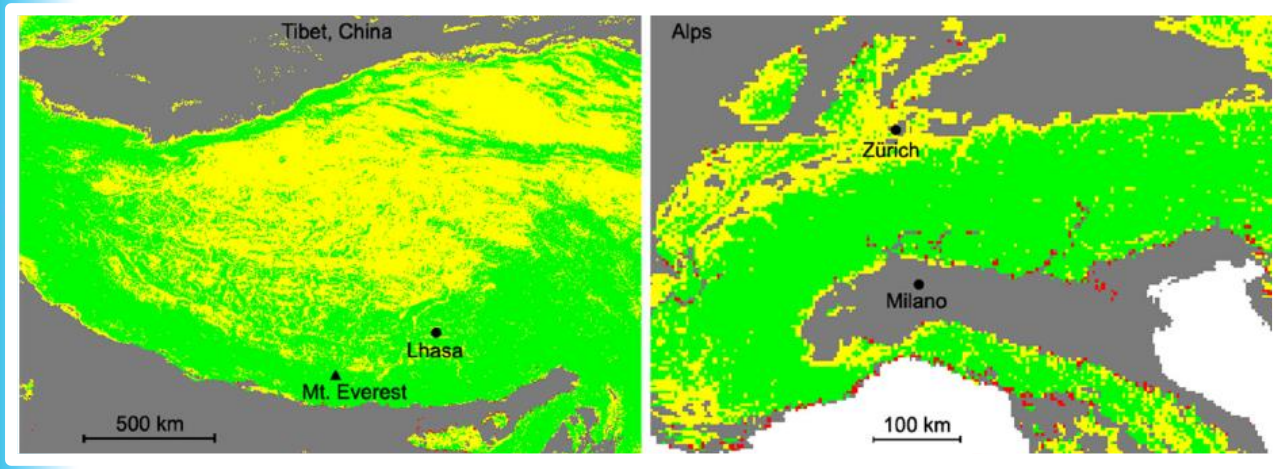
Kapos et al. 2000

➔ **22.3% of landmasses are mountain**

➔ **1.27 billion people**

Kapos et al. 2000

According to the definition, areas can be either classified as mountains or not



Kapos et al. 2000

100 m a.s.l.

500 m a.s.l.

1000 m a.s.l.

1500 m a.s.l.

2000 m a.s.l.

2500 m a.s.l.

3000 m a.s.l.

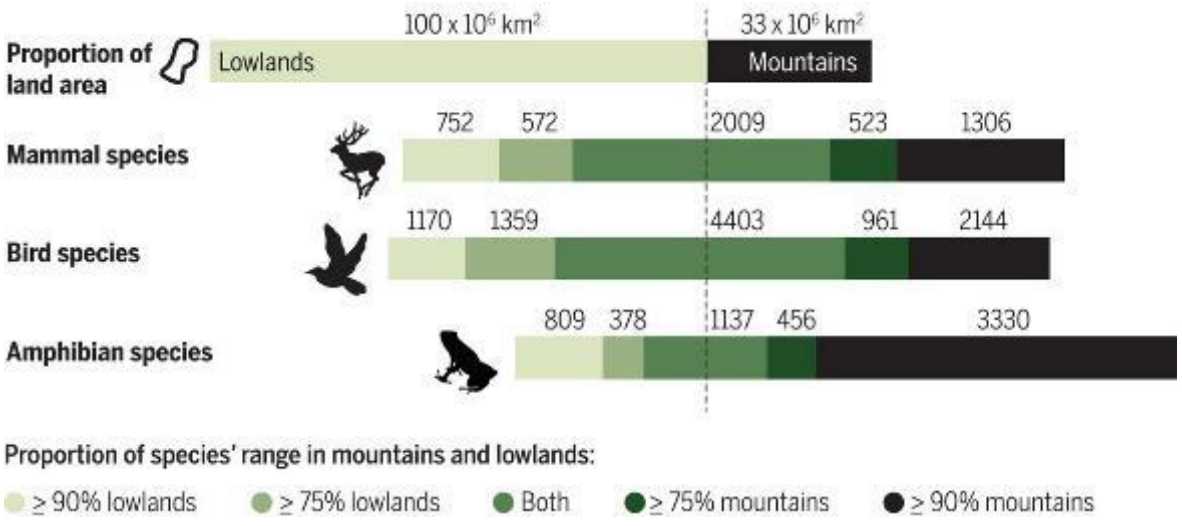
4000 m a.s.l.

Whatever is the classification considered,

mountain biodiversity (i.e. the species richness) is HUGE

"With about 25% of all land area, mountain regions are home to more than **85% of the world's species of amphibians, birds, and mammals**, many entirely restricted to mountains"

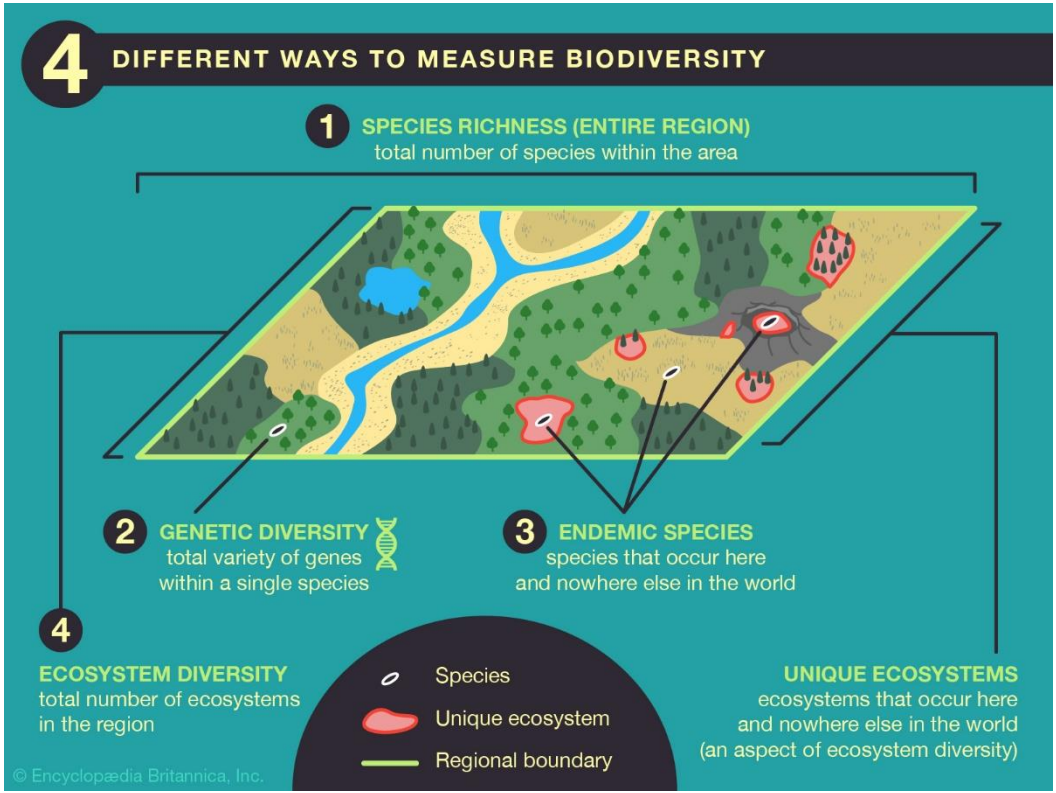
Rahbek et al. 2019



Rahbek et al. 2019

Biodiversity (Wilson 1988)

➔ the diversity (= heterogeneity) of living organisms



Ecosystems

Biodiversity

➔ **Biodiversity makes the ecosystems work!**

DEFINITIONS

1 Trophic relationships *
- 1.1 heterotrophic consumer (an organism that is unable to manufacture its own food and must feed on other organisms)*
  - 1.1.1 primary consumer (herbivore; an organism that feeds primarily on plant material) (also see below under Herbivory) *
    - 1.1.1.1 foliovore (leaf eater) *
    - 1.1.1.2 spermivore (seed eater) *
    - 1.1.1.3 browser (leaf, stem eater)
    - 1.1.1.4 grazer (grass, forb eater)
    - 1.1.1.5 frugivore (fruit eater) *
    - 1.1.1.6 sap feeder
    - 1.1.1.7 root feeders *
    - 1.1.1.8 nectivore (nectar feeder)
    - 1.1.1.9 fungivore (fungus feeder) *
    - 1.1.1.10 flower/bud/catkin feeder
    - 1.1.1.11 aquatic herbivore
    - 1.1.1.12 feeds in water on decomposing benthic substrate (benthic is the lowermost zone of a water body)
    - 1.1.1.13 bark/cambium/bole feeder
  - 1.1.2 secondary consumer (primary predator or primary carnivore; a carnivore that preys on other vertebrate or invertebrate animals, primarily herbivores) *
    - 1.1.2.1 invertebrate eater
      - 1.1.2.1.1 terrestrial invertebrates
      - 1.1.2.1.2 aquatic macroinvertebrates (e.g., not plankton)
      - 1.1.2.1.3 freshwater or marine zooplankton
    - 1.1.2.2 vertebrate eater (consumer or predator of herbivorous or carnivorous vertebrates) *
      - 1.1.2.2.1 piscivorous (fish eater) *
    - 1.1.2.3 ovivorous (egg eater)
  - 1.1.3 tertiary consumer (secondary predator or secondary carnivore; a carnivore that preys on other carnivores)
  - 1.1.4 carrion feeder (feeds on dead animals)
  - 1.1.5 cannibalistic (eats members of its own species)
  - 1.1.6 coprophagous (feeds on fecal material)
  - 1.1.7 feeds on human garbage/refuse
    - 1.1.7.1 aquatic (e.g., offal and bycatch of fishing boats)
    - 1.1.7.2 terrestrial (e.g., garbage cans, landfills)
- 1.2 prey relationships
  - 1.2.1 prey for secondary or tertiary consumer (primary or secondary predator)

2 Aids in physical transfer of substances for nutrient cycling (C,N,P, etc.) *

3 Organismal relationships *
- 3.1 controls or depresses insect population peaks *
- 3.2 controls terrestrial vertebrate populations (through predation or displacement) *
- 3.3 pollination vector
- 3.4 transportation of viable seeds, spores, plants, or animals (through ingestion, caching, caught in hair or mud on feet, etc.) *
  - 3.4.1 disperses fungi
  - 3.4.2 disperses lichens
  - 3.4.3 disperses bryophytes, including mosses
  - 3.4.4 disperses insects and other invertebrates (phoresis)
  - 3.4.5 disperses seeds/fruits (through ingestion or caching)
  - 3.4.6 disperses vascular plants *
- 3.5 creates feeding, roosting, denning, or nesting opportunities for other organisms *
  - 3.5.1 creates feeding opportunities (other than direct prey relations) *
    - 3.5.1.1 creates sapwells in trees
  - 3.5.2 creates roosting, denning, or nesting opportunities *
- 3.6 primary creation of structures (possibly used by other organisms) *
  - 3.6.1 aerial structures (typically large raptor or squirrel stick or leaf nests in trees or on platforms, or barn swallow/cliff swallow nests)*
  - 3.6.2 ground structures (above-ground, non-aquatic nests and ends and other substrates, such as woodrat middens, nesting mounds of swans, for example)*
  - 3.6.3 aquatic structures (muskrat lodges, beaver dams)*
- 3.7 user of structures created by other species
  - 3.7.1 aerial structures (typically large raptor or squirrel stick or leaf nests in trees or on platforms, or barn swallow/cliff swallow nests)
  - 3.7.2 ground structures (above-ground, non-aquatic nests and ends and other substrates, such as woodrat middens, nesting mounds of swans, for example)
  - 3.7.3 aquatic structures (muskrat lodges, beaver dams)
- 3.8 nest parasite
  - 3.8.1 interspecies parasite (commonly lays eggs in nests of other species)
  - 3.8.2 common interspecific host (parasitized by other species)
- 3.9 primary cavity excavator in snags or live trees (organisms able to excavate their own cavities)
- 3.10 secondary cavity user (organisms that do not excavate their own cavities and depend on primary cavity excavators or natural cavities)
- 3.11 primary burrow excavator (fossorial or underground burrows)
  - 3.11.1 creates large burrows (rabbit-sized or larger)
  - 3.11.2 creates small burrows (less than rabbit-sized)
- 3.12 uses burrows dug by other species (secondary burrow user)
- 3.13 creates runways (possibly used by other species; runways typically are worn paths in dense vegetation)
- 3.14 uses runways created by other species
- 3.15 pirates food from other species
- 3.16 interspecific hybridization (species known to regularly interbreed)

4 Carrier, transmitter, or reservoir of vertebrate diseases
- 4.1 diseases that affect humans *
- 4.2 diseases that affect domestic animals
- 4.3 diseases that affect other wildlife species

5 Soil relationships *
- 5.1 physically affects (improves) soil structure, aeration (typically by digging) *
- 5.2 physically affects (degrades) soil structure, aeration (typically by trampling) *

6 Wood structure relationships (either living or dead wood) *
- 6.1 physically fragments down wood *
- 6.2 physically fragments standing wood *

7 Water relationships *
- 7.1 impounds water by creating diversions or dams *
- 7.2 creates ponds or wetlands through wallowing

8 Vegetation structure and composition relationships *
- 8.1 creates standing dead trees (snags) *
- 8.2 herbivory on trees or shrubs that may alter vegetation structure and composition (browsers)
- 8.3 herbivory on grasses or forbs that may alter vegetation structure and composition (grazers)

85 functions in boreal temperate ecosystems!

Marcot e Vander Heyden, 2001

What causes such diversity?

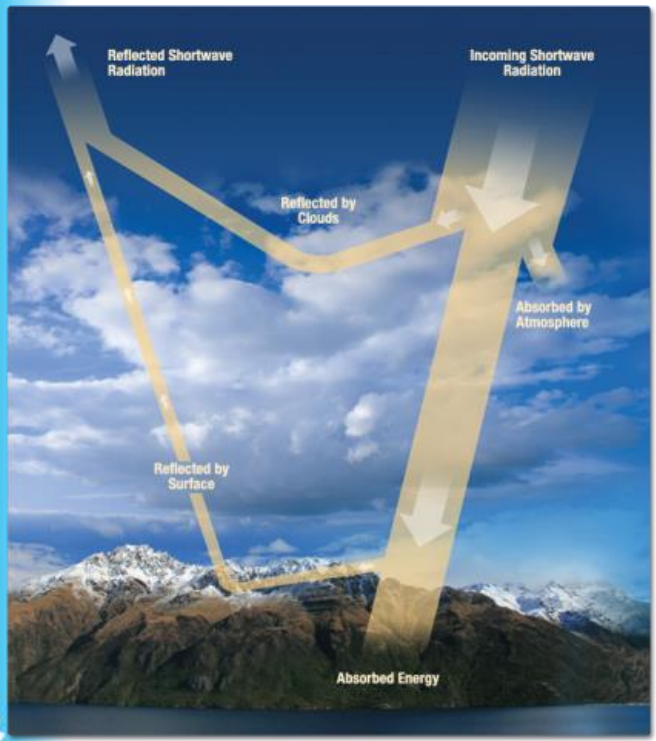
Ecosystems are shaped by peculiar **environmental constraints** that change along steep **gradients** (= at small spatial scale)

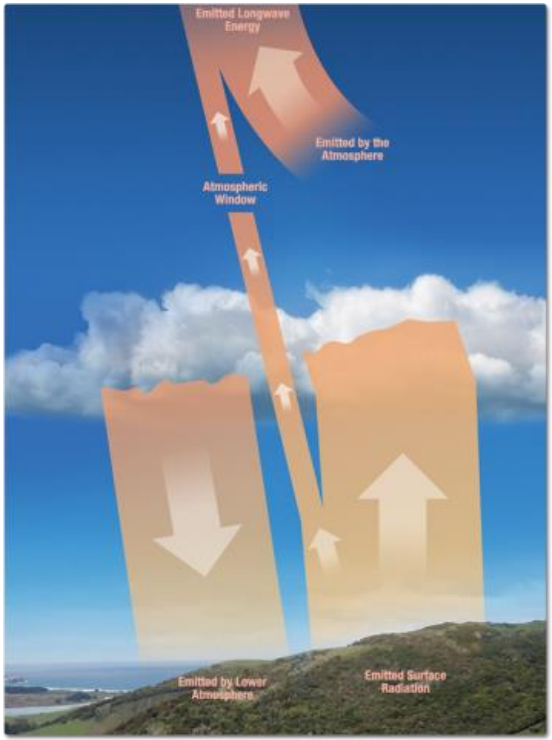
Thermal / air pressure gradient

Slope

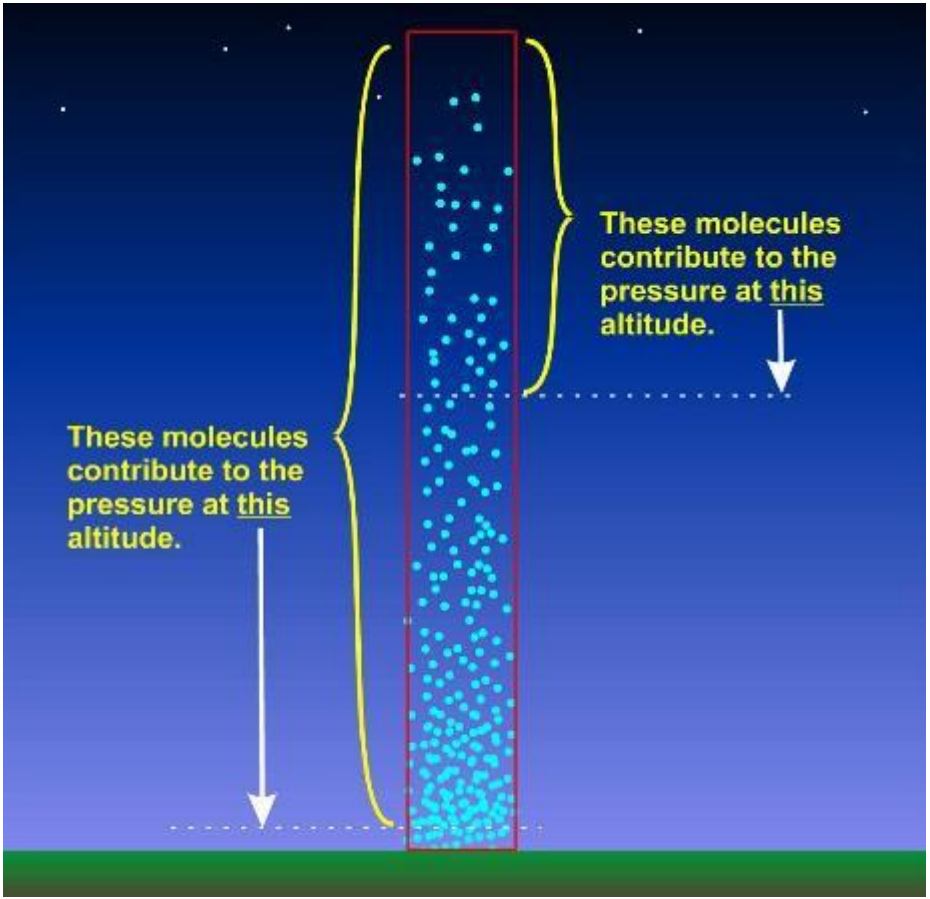

CONGRATULATIONS
YOU ARE NOW AT
UHURU PEAK, TANZANIA
AFRICA'S HIGHEST POINT

TEMPERATURE GRADIENT

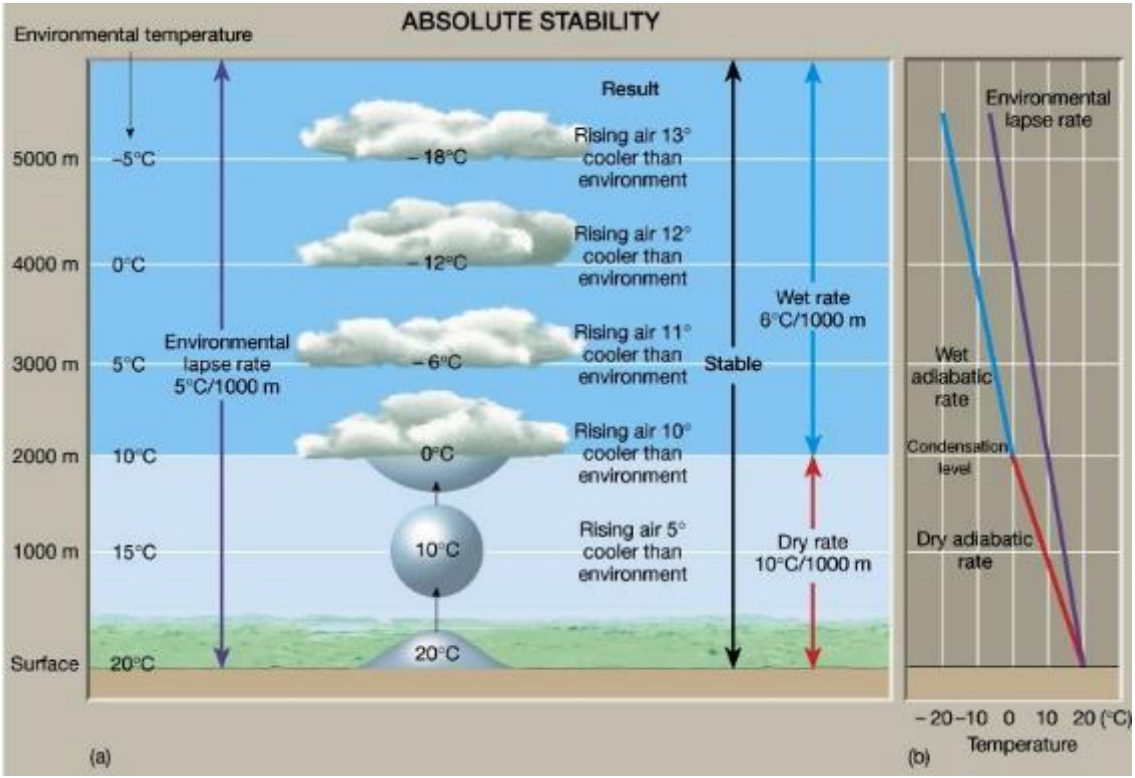




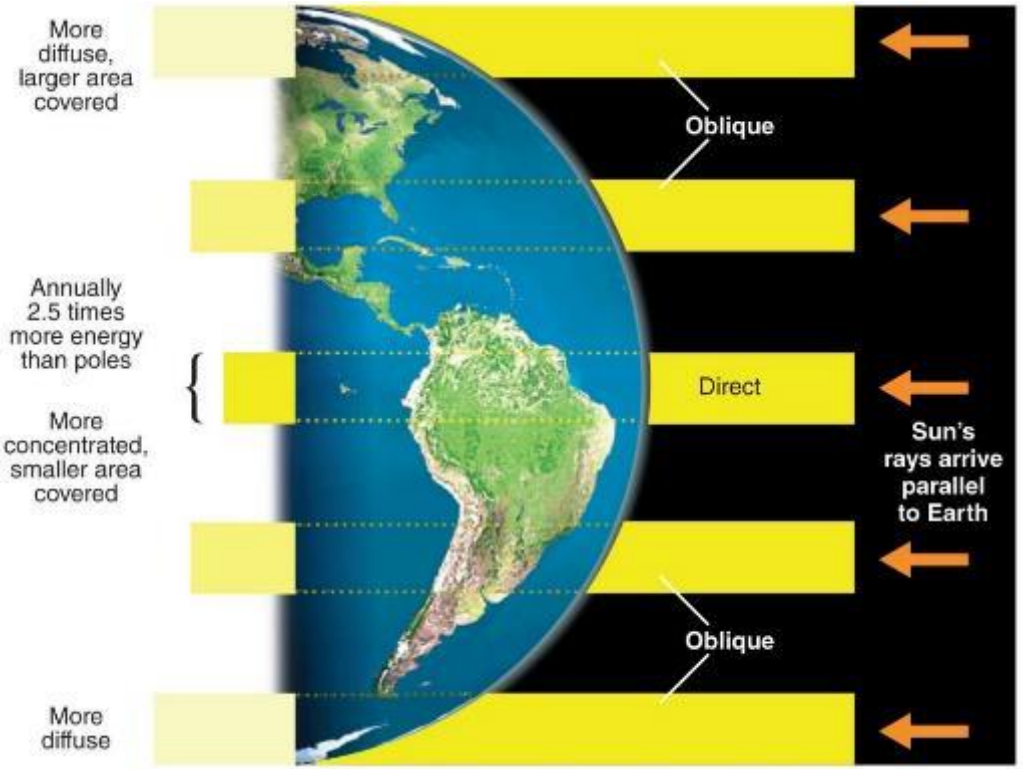
TEMPERATURE GRADIENT



-6.5°C / 1000 m ➔ -1°C / 153 m



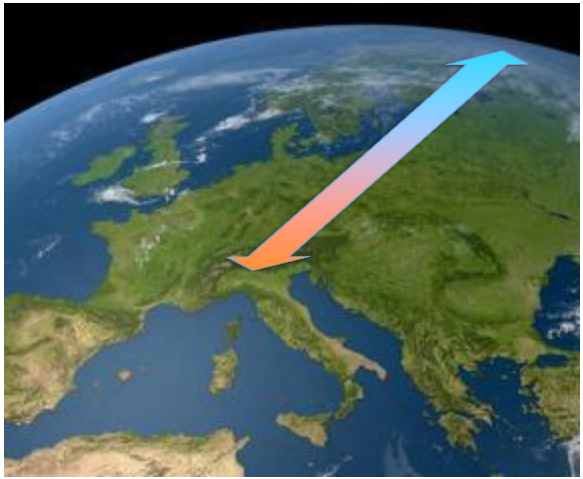
-0.7°C / 1° lat ➔ -1°C / 150,000 m

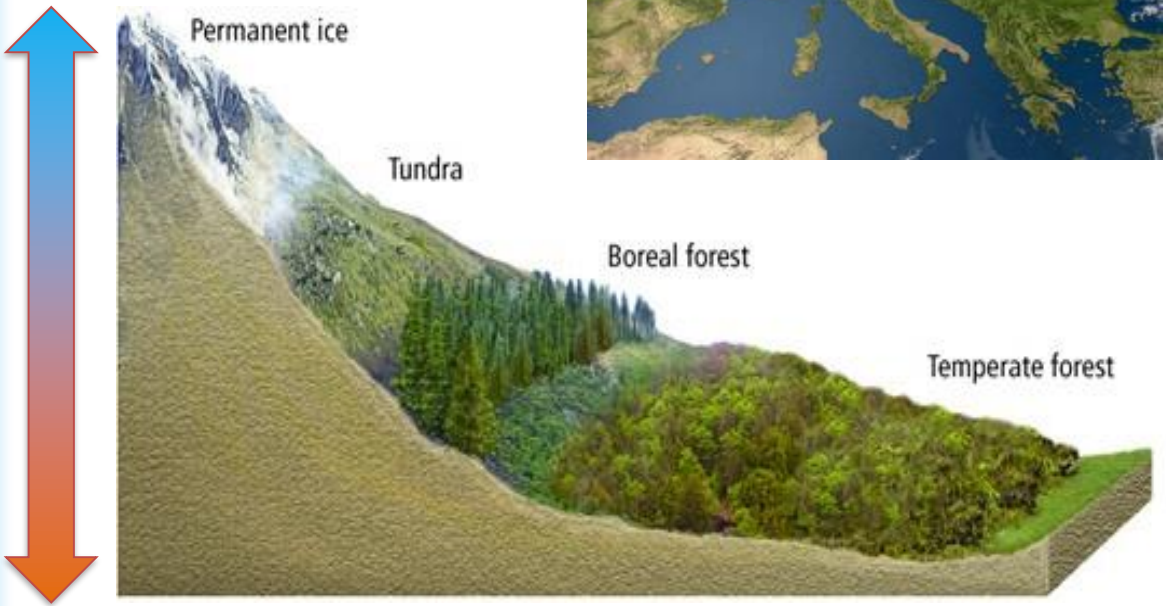


Elevational gradient

=

«shrunk» latitudinal gradient






GERMANY


VARESE


DANEMARK


COMO


S FINLAND


VERBANIA


N FINLAND


VERBANIA

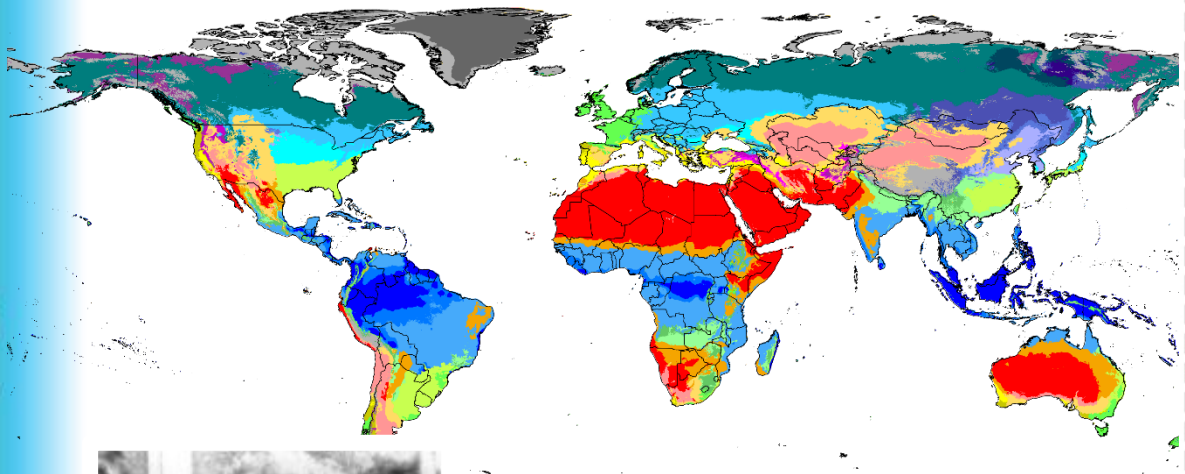

SVALBARD


SONDRIO


GREENLAND


AOSTA

Köppen–Geiger climate classification map (1980–2016)



Wladimir P. Köppen (1846-1940)

TROPICAL

T_{mean} coldest month > 18°C

DRY (DESERT AND STEPPE)

little precipitation

TEMPERATE

0°C > T_{mean} coldest month < 18°C

>1 month T_{mean} > 10°C

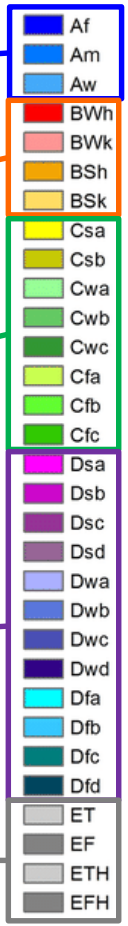
CONTINENTAL

>1 month T_{mean} < 0°C

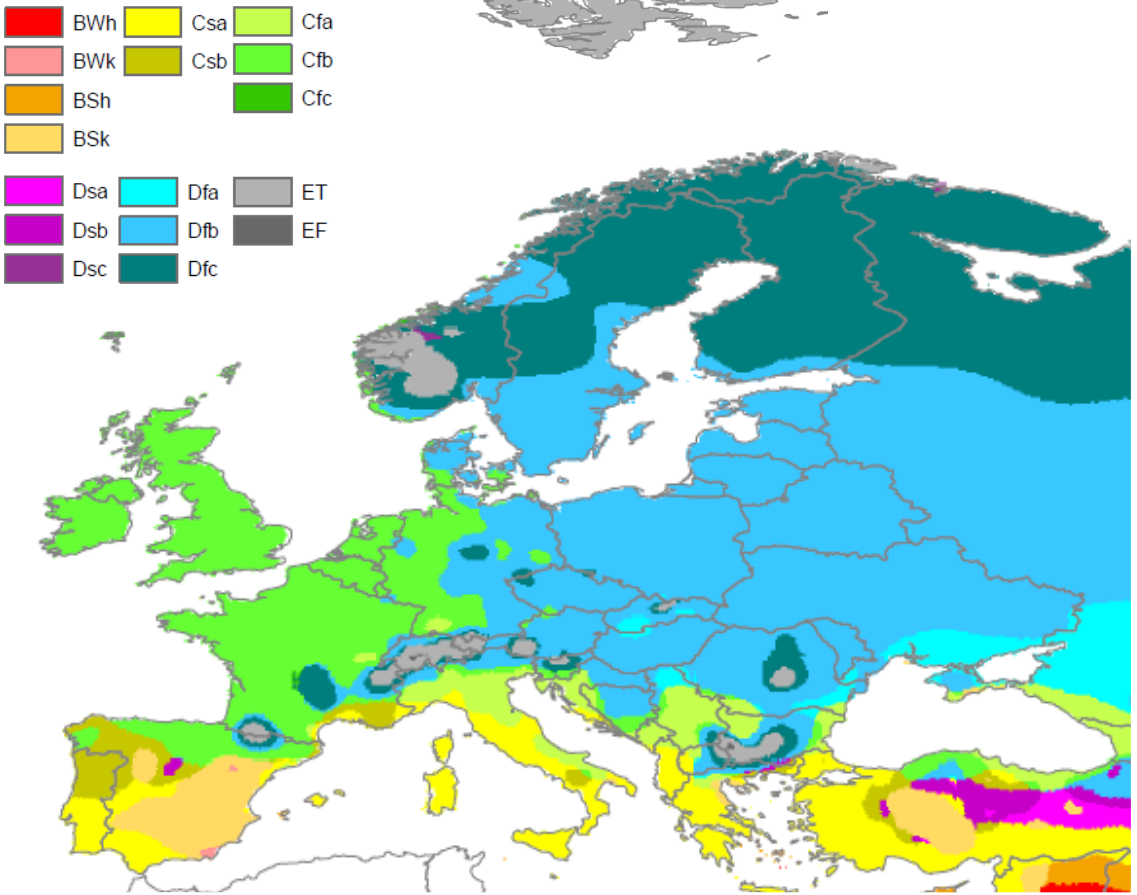
>1 month T_{mean} > 10°C

POLAR/ALPINE

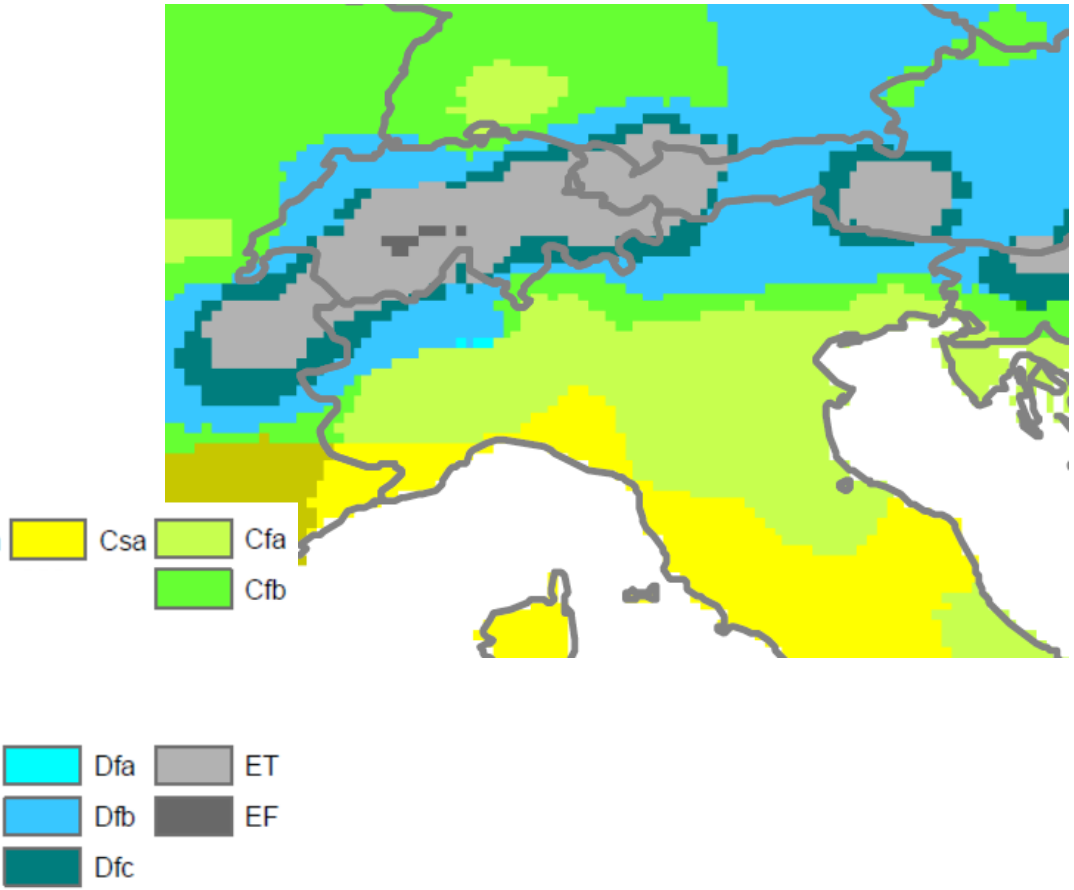
All months T_{mean} < 10°C

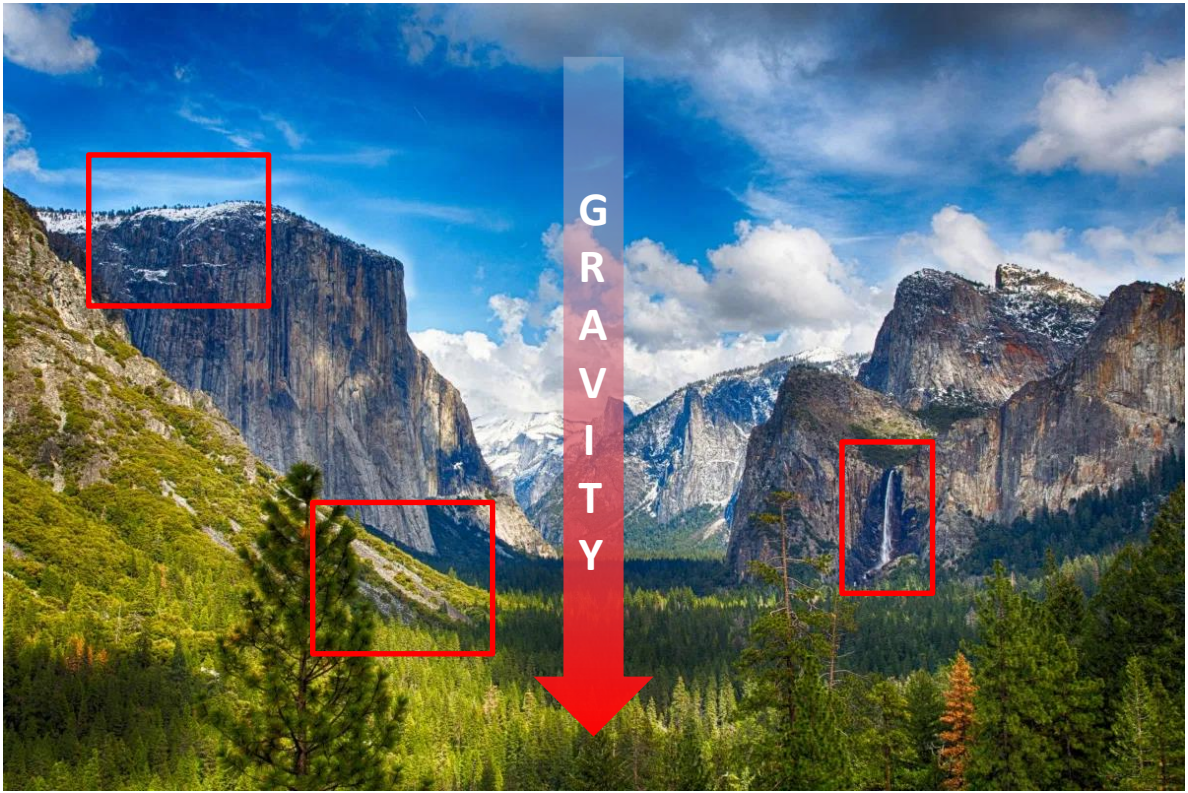


CLIMATES

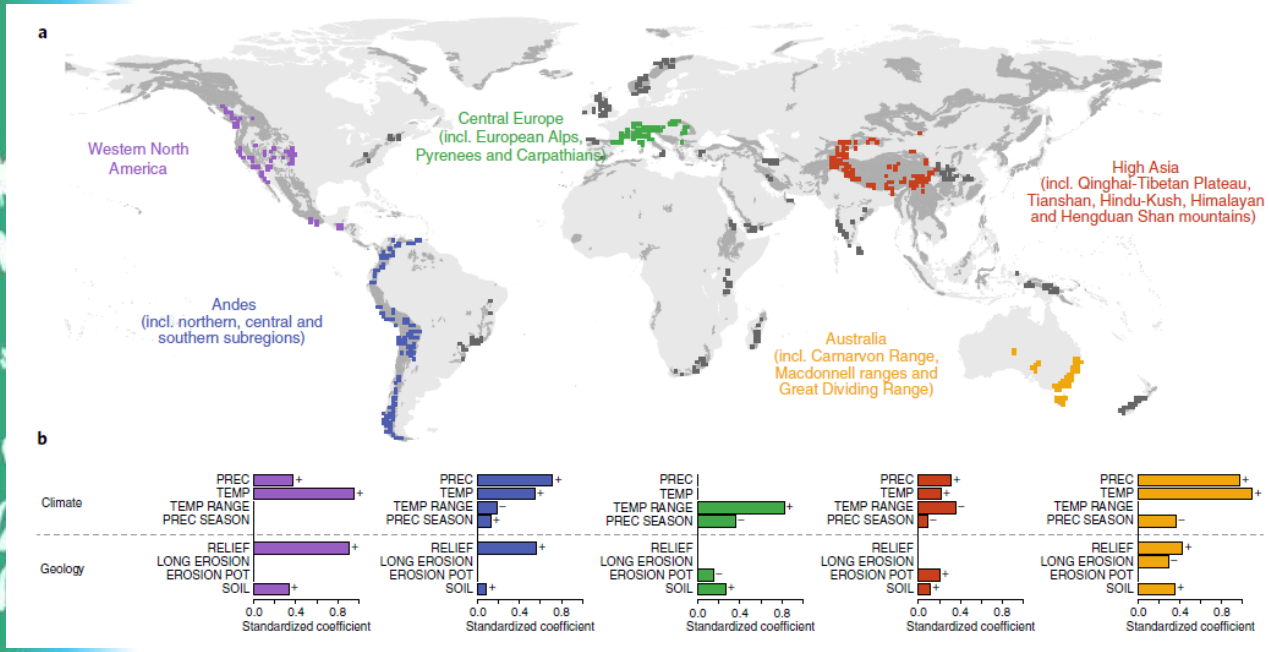


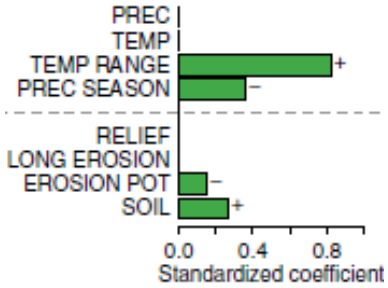
CLIMATES




GRAVITY

SLOPE





Temperature ranges may not always be the main driver of biodiversity in mountains

Antonelli et al. 2018

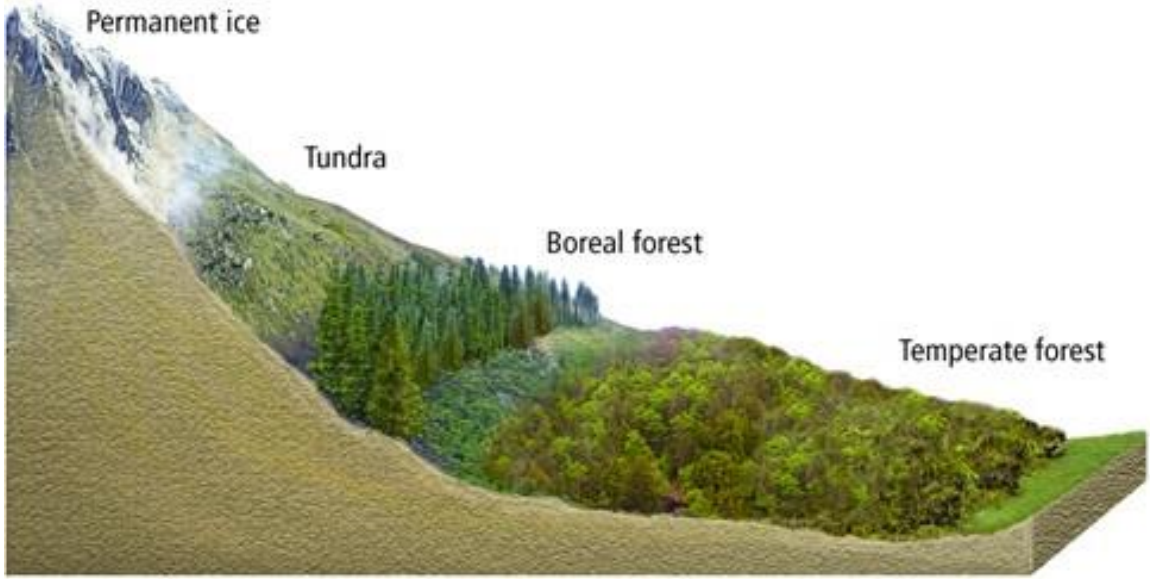
AN OVERVIEW

Alps are hotspots of biodiversity

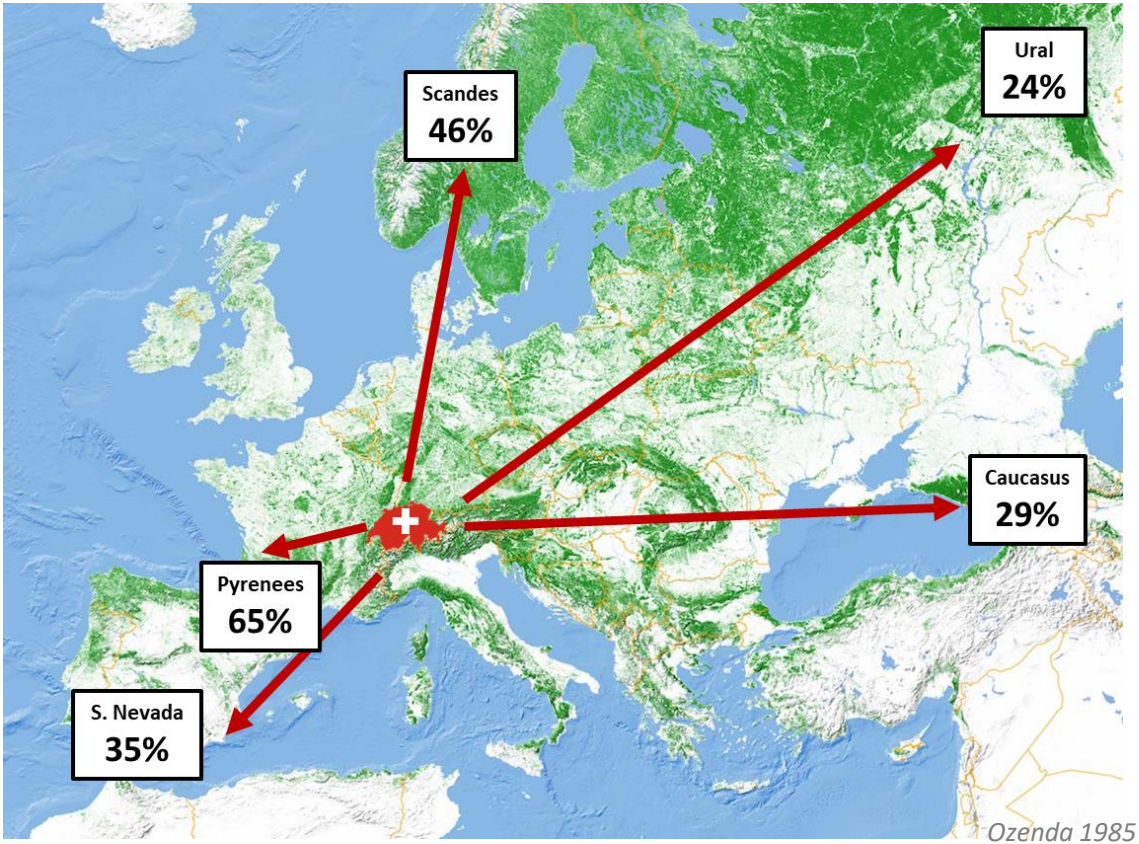
100 out of 198 European habitats
40% of the European flora in 2% of the area
10% endemic plant species
30,000 animal species

Ozenda 1985; Theurillat 1995; Chemini and Rizzoli 2003; Körner and Spehn 2003

Elevational gradient



Geographic position



Ozenda 1985

Quaternary glaciations

«Arctic-alpine distributions»

Traditional human activities

How do species cope with low temperatures and slope in European mountains?

Anatomical / physiological adaptations

Behavioural adaptations

Bumblebee (*Bombus sp.*)

Red fox (*Vulpes vulpes*)

Fur / feathers (permanent)
to insulate

Rock ptarmigan (*Lagopus muta*)


Red deer (*Cervus elaphus*)

Fur / feathers
(seasonal) to insulate

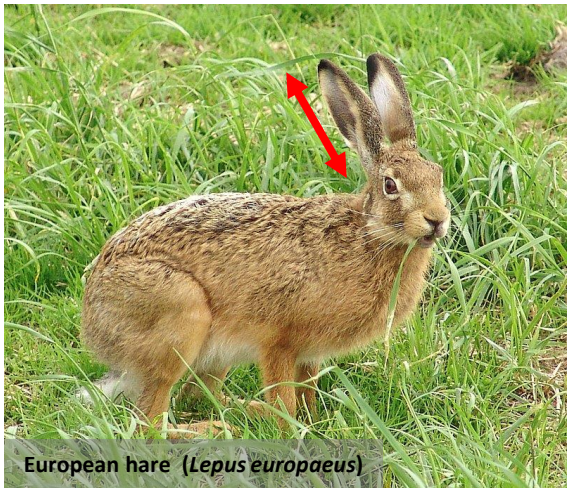

Black grouse (*Lyrurus tetrix*)

Rock ptarmigan (*Lagopus muta*)

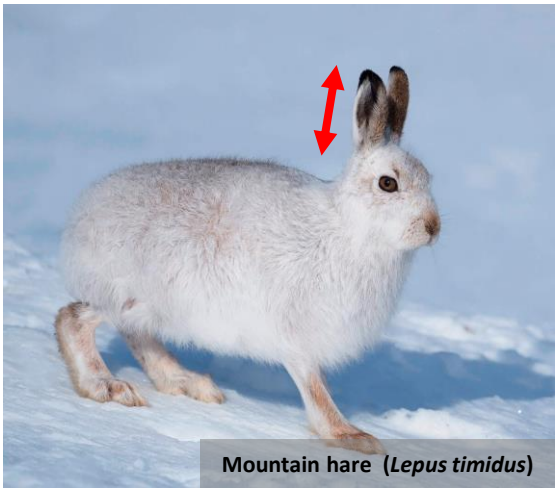
Stoat (*Mustela erminea*)

Fur / feathers seasonal colour change

(to match the environment and enhance mimicry)



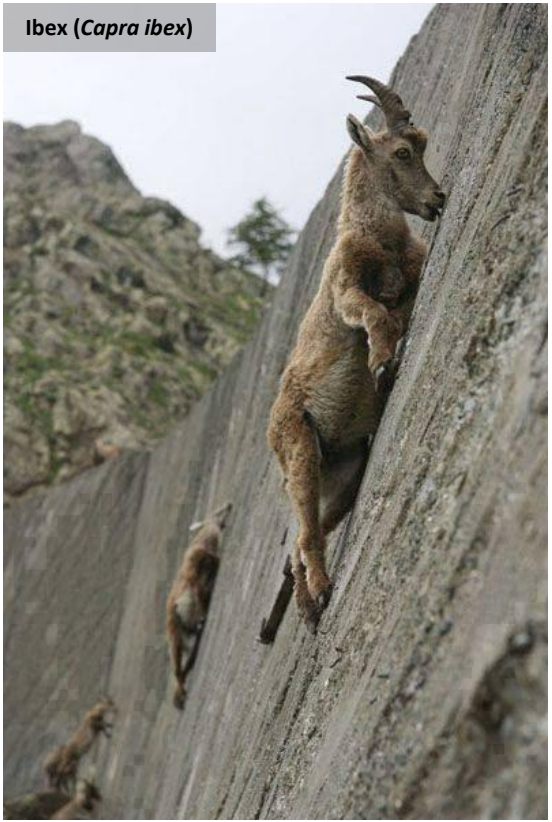
European hare (*Lepus europaeus*)



Mountain hare (*Lepus timidus*)

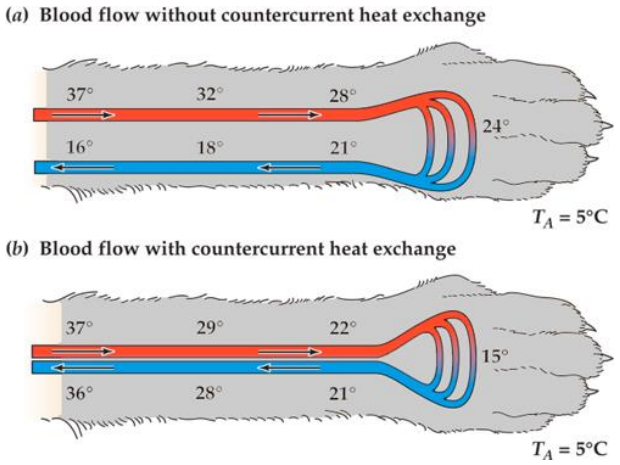
Smaller / more rounded body shape and reduced appendages (e.g. ears) (minimises body exposure to cold)

Ibex (*Capra ibex*)

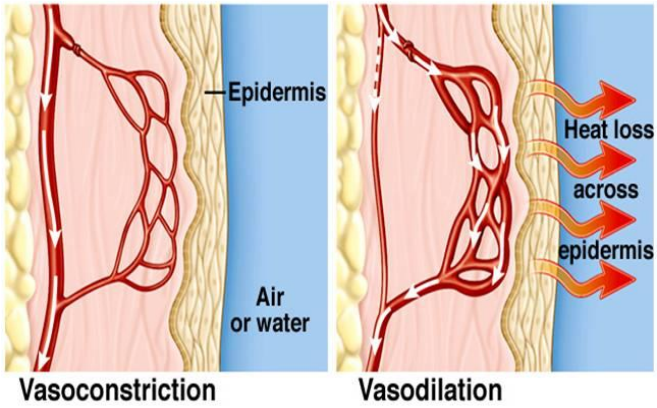


Hooves specially designed

(hard and sharp outer edge and soft inner pad)



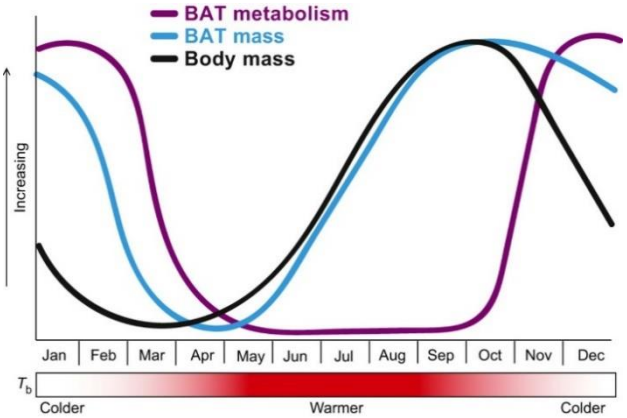
Countercurrent heat exchange (warm arterial blood flows close to colder vein blood)



Vasoconstriction

Shivering thermogenesis

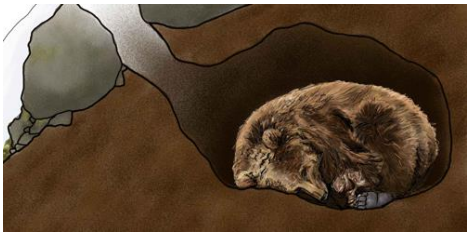
(muscule contractions which produce heat)



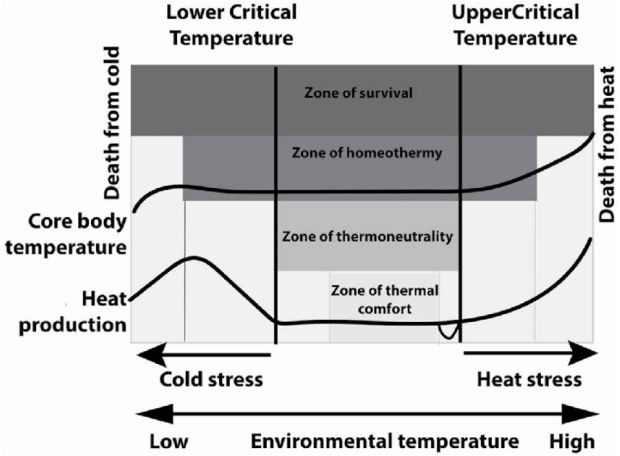
Non shivering thermogenesis

in hibernating mammals

(metabolism of brown fat)



Piloerection («goosebumps»)



Low thermoneutral zone
(environmental T°C where the body do not need to shiver or to sweat to keep homeothermy. In humans, around 20°C, in alpine galliforms can be as low as 3-4°C)


Common lizard (*Zootoca vivipara*)

Ovoviviparity of reptiles

(eggs are retained and hatch inside the mother)


Adder (*Vipera berus*)

Melanism

(to increase heat absorbance)


Erebia pluto

Pulsatilla sp.

Pubescence

(reduces convective heat loss by trapping a warm air layer and water loss from transpiration)

Nigritella nigra

Dark colours

(to increase heat absorbance)

Creeping growth form

(protection against wind and maximises heat gain from sun)

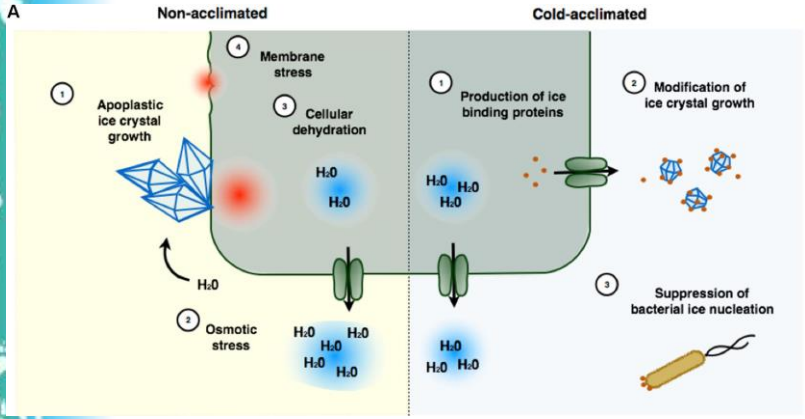
Cushion growth form

(up to 15°C warmer!)

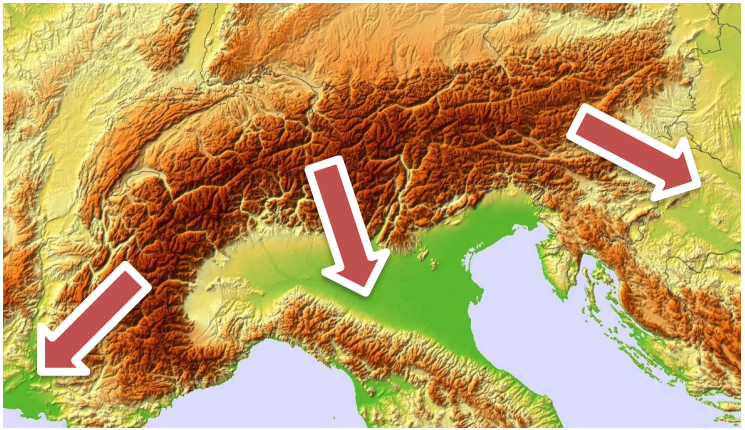
Deep roots (e.g. taproots)
(to cope with thin soils and to act as water and nutrients storage when it comes to grow fast)

Flexible branches (bend but are hardly crashed by snow)

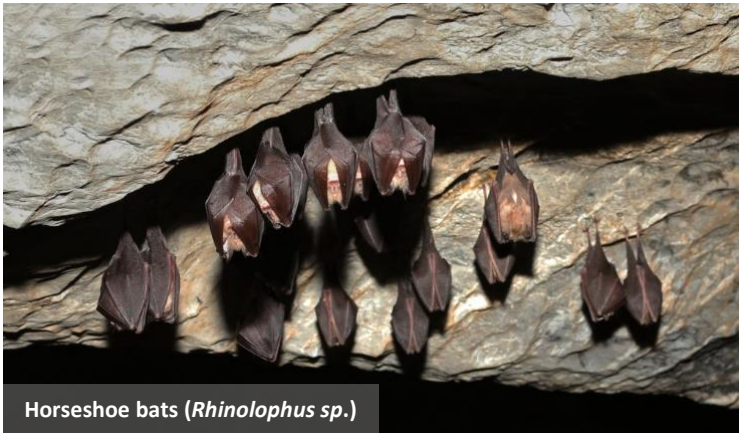
Freezing point depression by increasing sugar concentration in cells (protection against wind and maximises heat gain from sun)



Deep supercooling / freeze tolerance (prevention of ice formation within tissues to-40°C by inhibiting ice nucleation / water segregation outside cells)



Migration (birds and, partially, large mammals)



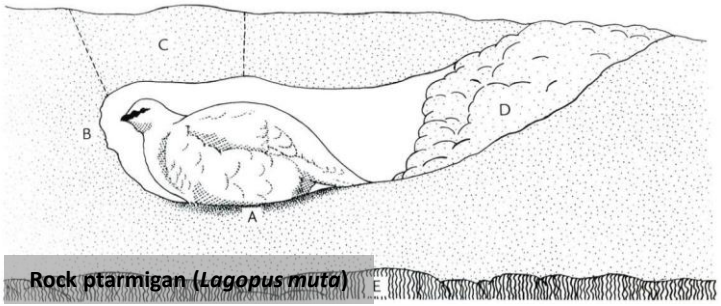
Horseshoe bats (*Rhinolophus sp.*)

Hibernation (only <u>few</u> mammals, amphibians, reptiles and <u>very few</u> insects)

Red squirrel (*Sciurus vulgaris*)

Reduced activity

(to warmest hours only)



Rock ptarmigan (*Lagopus muta*)

Snow roosting

(snow insulates, T°C inside the roost can be up to 40°C warmer than outside)

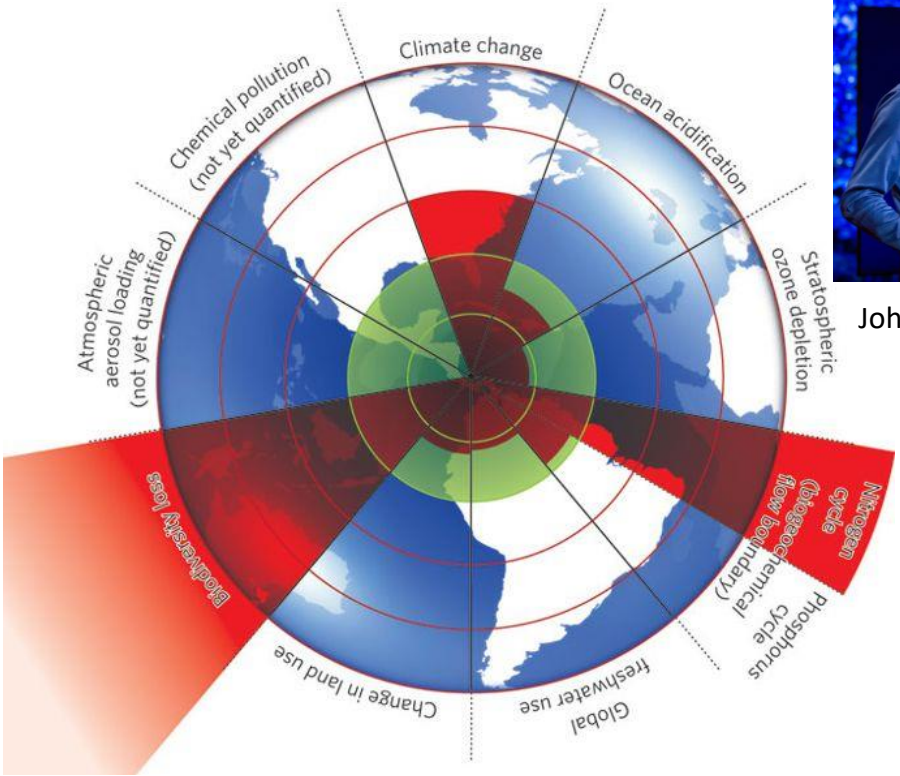

Capercaillie (*Tetrao urogallus*)


Red squirrel (*Sciurus vulgaris*)

Thriving on low energy food (available all year round)

Hoarding food
(which may retrieved in case of food scarcity)

Nice picture, but we have a problem…



Johan Rockström (2008)

Conservation Biology

Contributed Paper

Estimating the normal background rate of species extinction

Jurriaan M. De Vos,*† Lucas N. Joppa,‡ John L. Gittleman,§ Patrick R. Stephens,§ and Stuart L. Pimm**

*Institute of Systematic Botany, University of Zurich, Zollikerstrasse 107, 8008, Zürich, Switzerland
†Department of Ecology and Evolutionary Biology, Brown University, Box G-W, Providence, RI, 02912, U.S.A.
‡Microsoft Research, 21 Station Road, Cambridge CB1 2FB, United Kingdom
§Odum School of Ecology, University of Georgia, Athens, GA, 30602, U.S.A.
**Nicholas School of the Environment, Duke University, Durham, NC, 27708, U.S.A., email stuartpimm@me.com

Paper submitted February 11, 2014; revised manuscript accepted June 22, 2014.

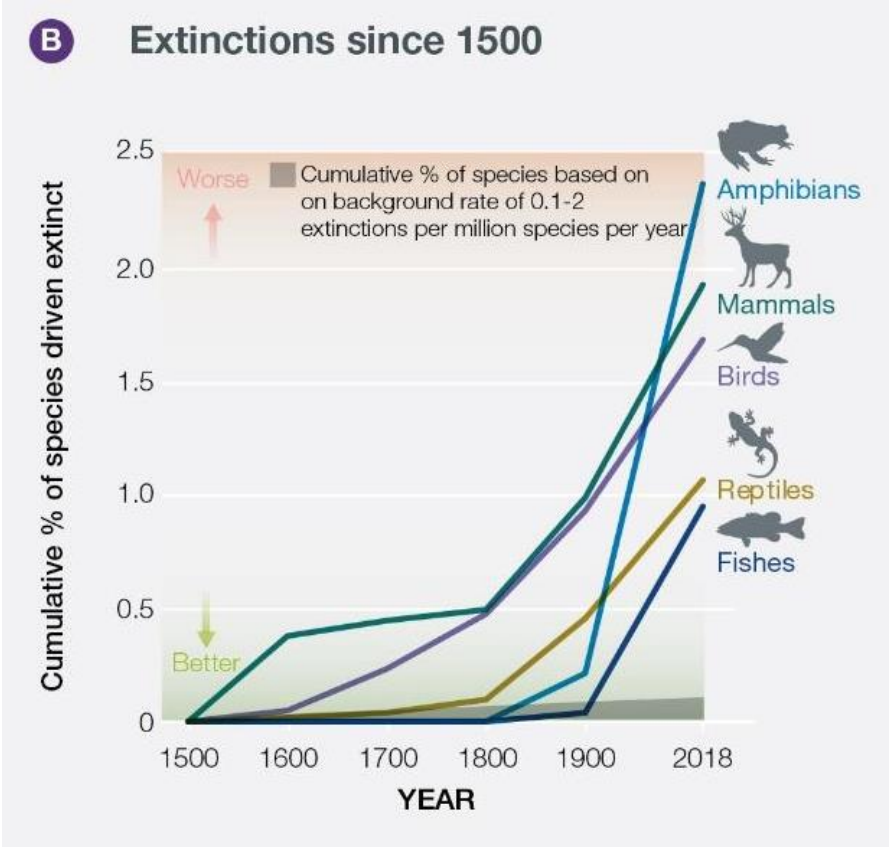
452
Conservation Biology, Volume 29, No. 2, 452–462

DOI: 10.1111/cobi.12380

Abstract: *A key measure of humanity's global impact is by how much it has increased species extinction rates. Familiar statements are that these are 100–1000 times pre-human or background extinction levels. Estimating recent rates is straightforward, but establishing a background rate for comparison is not. Previous researchers chose an approximate benchmark of 1 extinction per million species per year (E/MSY). We explored disparate lines of evidence that suggest a substantially lower estimate. Fossil data yield direct estimates of extinction rates, but they are temporally coarse, mostly limited to marine hard-bodied taxa, and generally involve genera not species. Based on these data, typical background loss is 0.01 genera per million genera per year. Molecular phylogenies are available for more taxa and ecosystems, but it is debated whether they can be used to estimate separately speciation and extinction rates. We selected data to address known concerns and used them to determine median extinction estimates from statistical distributions of probable values for terrestrial plants and animals. We then created simulations to explore effects of violating model assumptions. Finally, we compiled estimates of diversification—the difference between speciation and extinction rates for different taxa. Median estimates of extinction rates ranged from 0.023 to 0.135 E/MSY. Simulation results suggested over- and under-estimation of extinction from individual phylogenies partially canceled each other out when large sets of phylogenies were analyzed. There was no evidence for recent and widespread pre-human overall declines in diversity. This implies that average extinction rates are less than average diversification rates. Median diversification rates were 0.05–0.2 new species per million species per year. On the basis of these results, we concluded that typical rates of background extinction may be closer to 0.1 E/MSY. Thus, current extinction rates are 1,000 times higher than natural background rates of extinction and future rates are likely to be 10,000 times higher.*

we concluded that typical rates of background extinction may be closer to 0.1 E/MSY. Thus, current extinction rates are 1,000 times higher than natural background rates of extinction and future rates are likely to be 10,000 times higher.

[…] current extinction rates are 1.000 times higher than natural […] and future rates are lileky to be 10.000 times higher


B
Extinctions since 1500
Cumulative % of species driven extinct
2.5
2.0
1.5
1.0
0.5
0
Worse
Better
Cumulative % of species based on on background rate of 0.1-2 extinctions per million species per year
Amphibians
Mammals
Birds
Reptiles
Fishes
1500
1600
1700
1800
1900
2018
YEAR

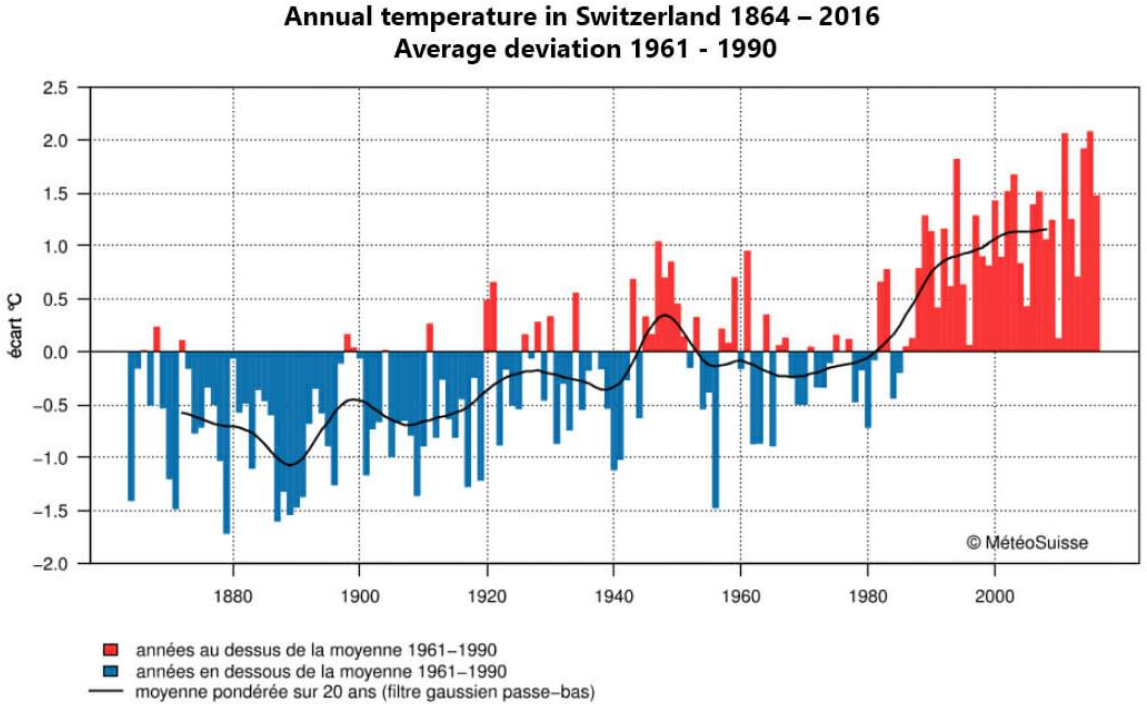
What are the main threats to Italian mountain biodiversity?

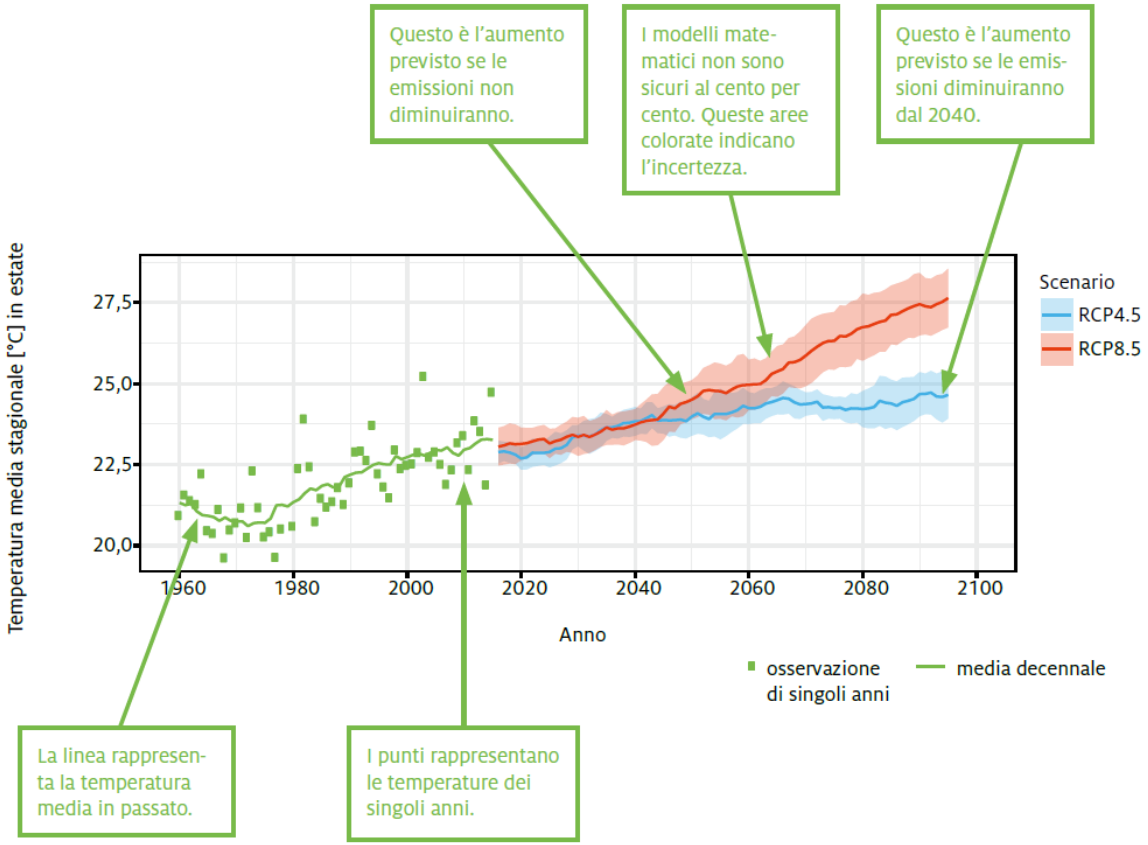
Global warming

Land use change

Recreational activities

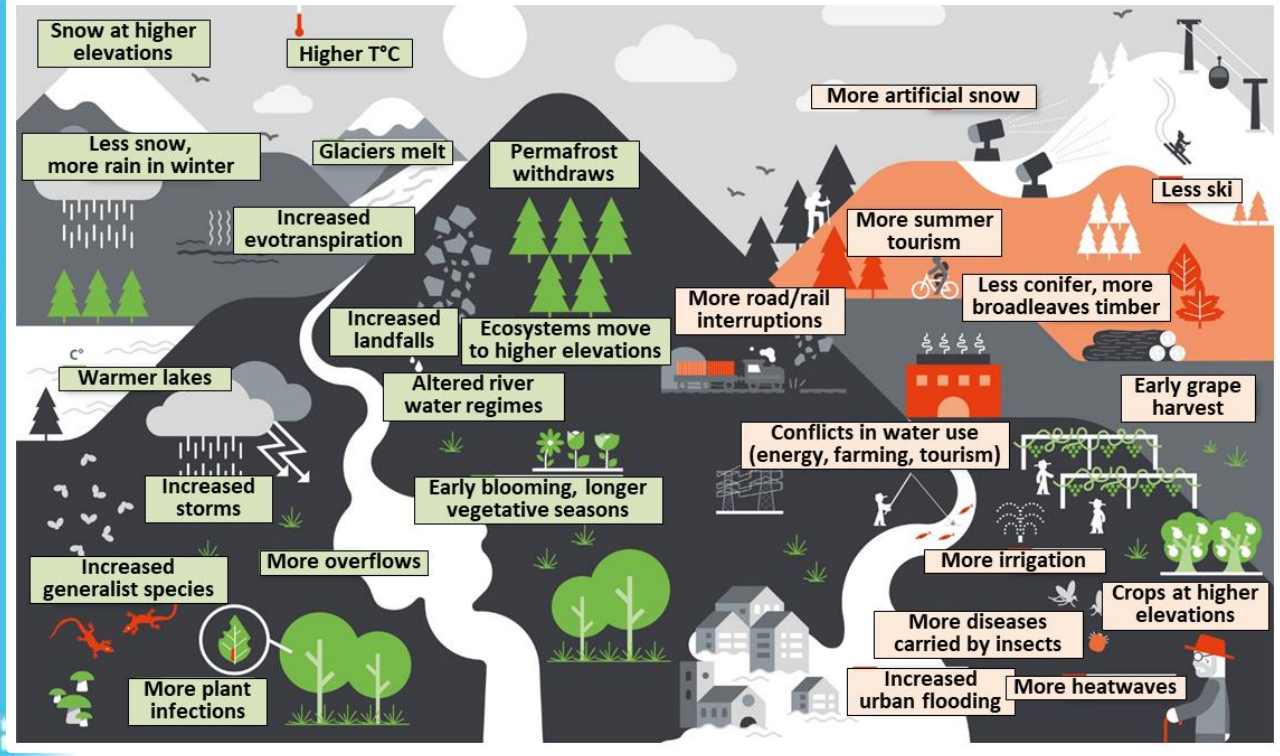
Social issues with large mammals


Annual temperature in Switzerland 1864 – 2016
Average deviation 1961 - 1990
écart °C
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
1880
1900
1920
1940
1960
1980
2000
© MétéoSuisse
années au dessus de la moyenne 1961–1990
années en dessous de la moyenne 1961–1990
moyenne pondérée sur 20 ans (filtre gaussien passe–bas)

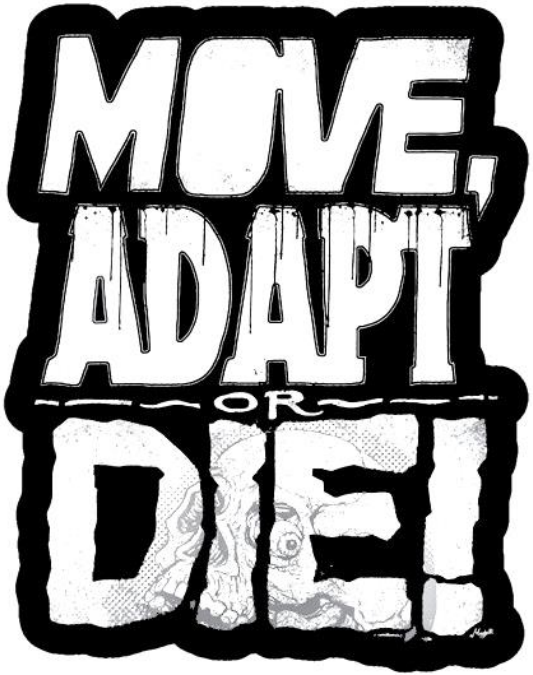

Questo è l'aumento previsto se le emissioni non diminuiranno.
I modelli matematici non sono sicuri al cento per cento. Queste aree colorate indicano l'incertezza.
Questo è l'aumento previsto se le emissioni diminuiranno dal 2040.
Temperatura media stagionale [°C] in estate
27,5
25,0
22,5
20,0
1960
1980
2000
2020
2040
2060
2080
2100
Anno
Scenario
RCP4.5
RCP8.5
osservazione di singoli anni
media decennale
La linea rappresenta la temperatura media in passato.
I punti rappresentano le temperature dei singoli anni.

Consequences on nature

Consequences on society

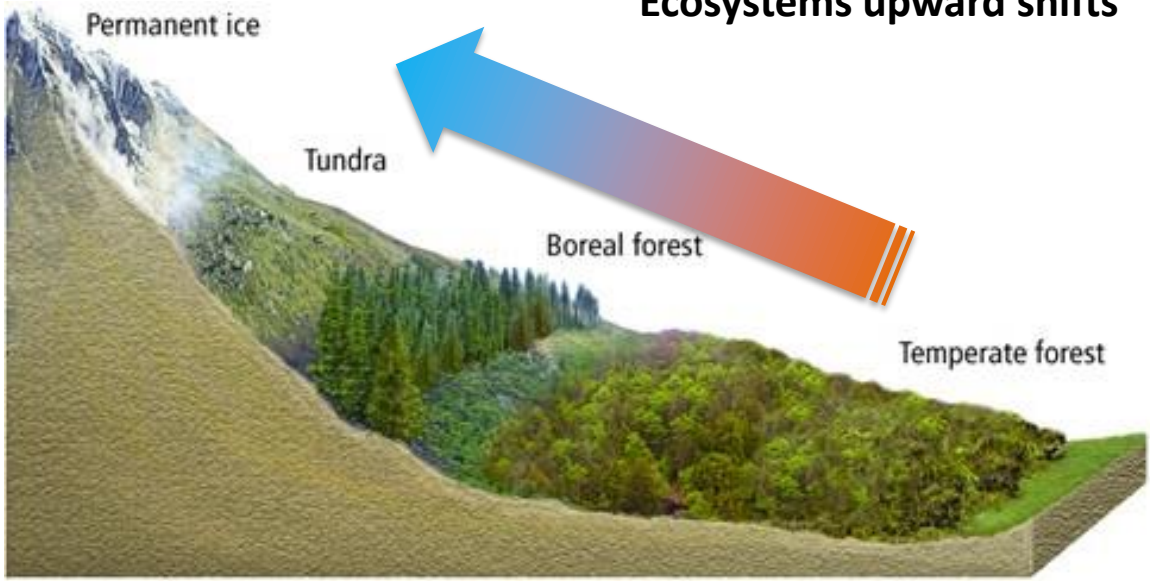


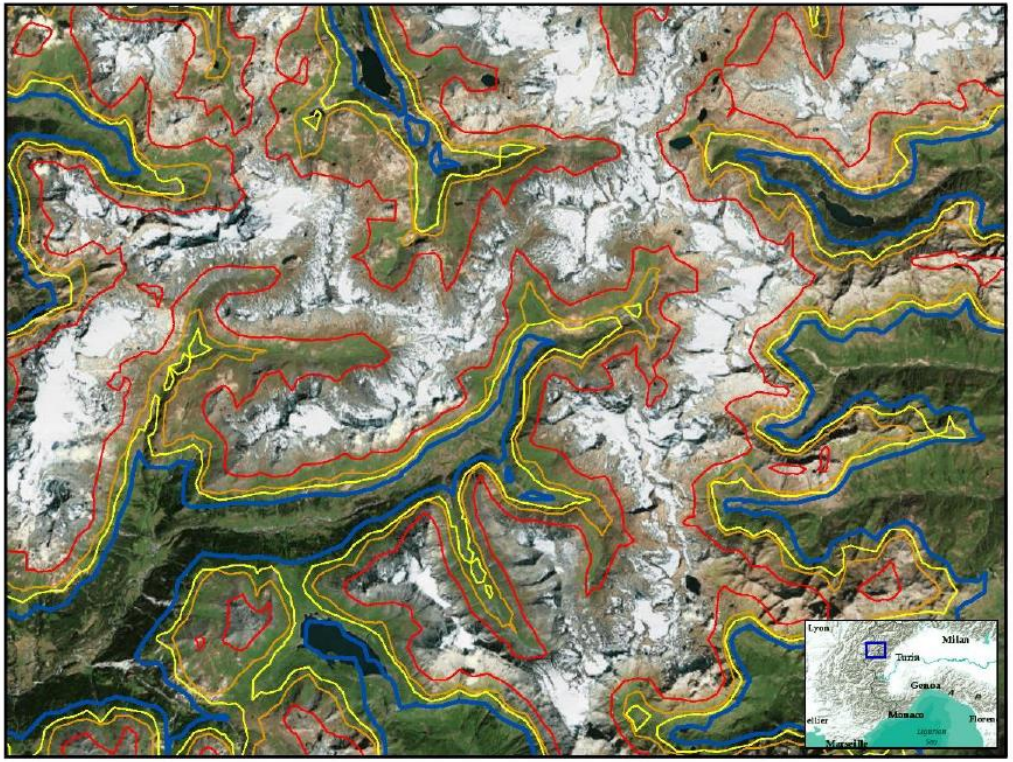
The new law under global warming…



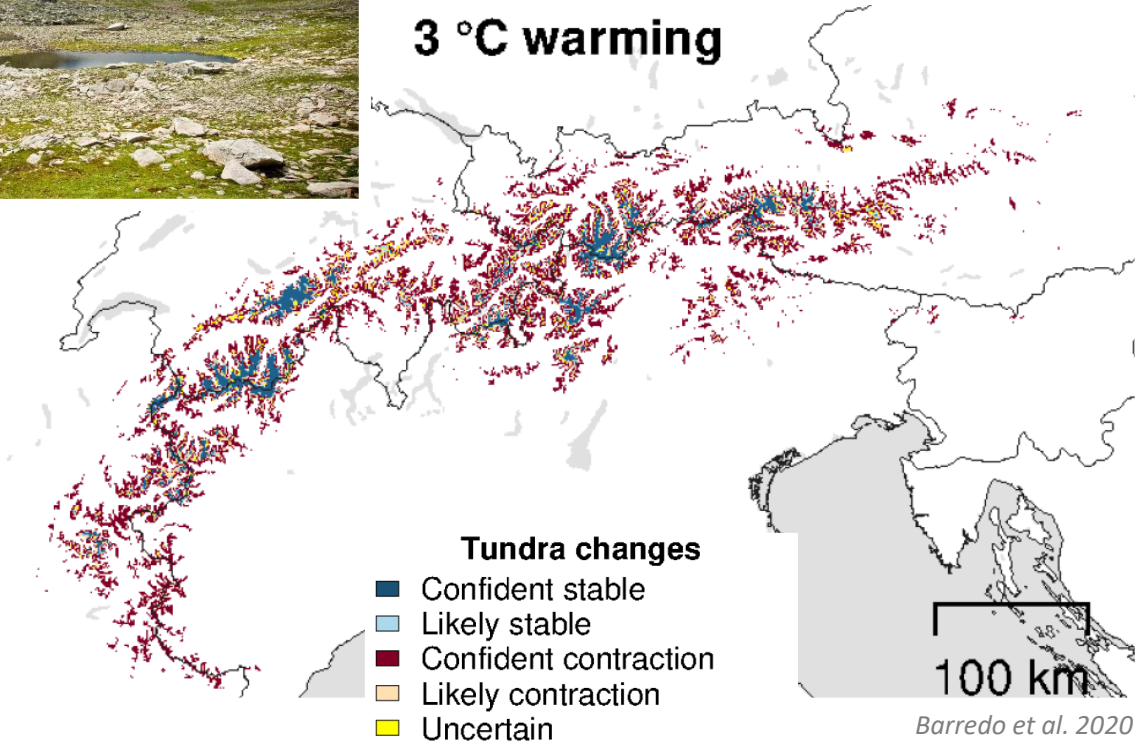
It applies to biodiversity… and to humankind

Ecosystems upward shifts

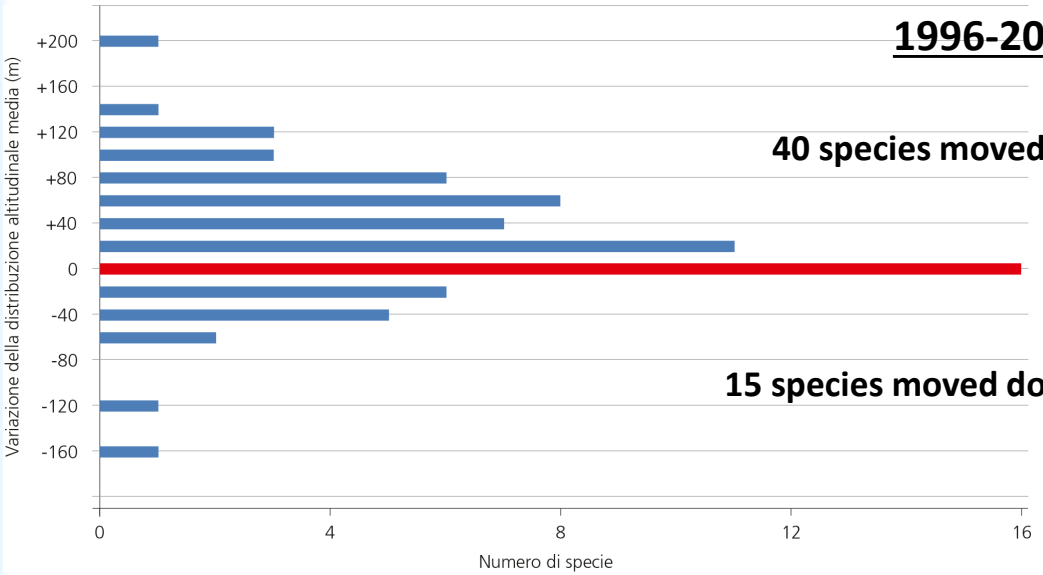




Barredo et al. 2020



Barredo et al. 2020



1996-2016

40 species moved upwards

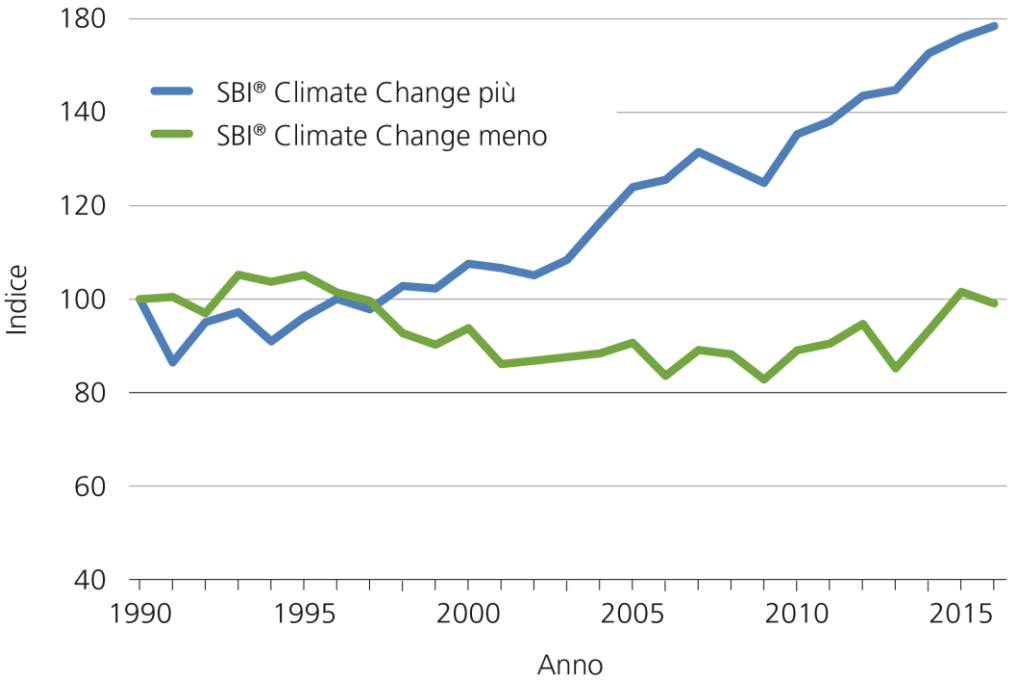
16 stable

15 species moved downwards

Evoluzione	Schemi
Verso l'alto (40 specie)	20 specie diminuiscono a bassa quota e aumentano ad alta quota
	9 specie diminuiscono soprattutto a bassa quota
	9 specie aumentano soprattutto ad alta quota
	2 specie con schema complesso

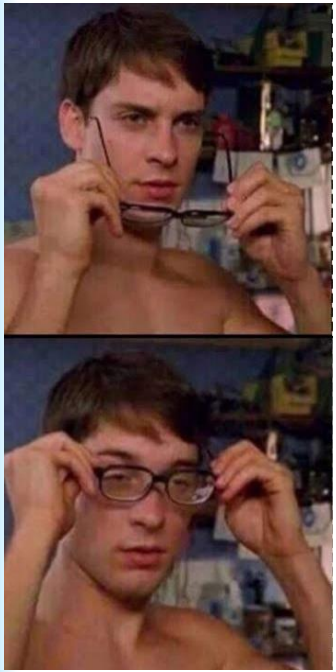
➔ Distribution shift

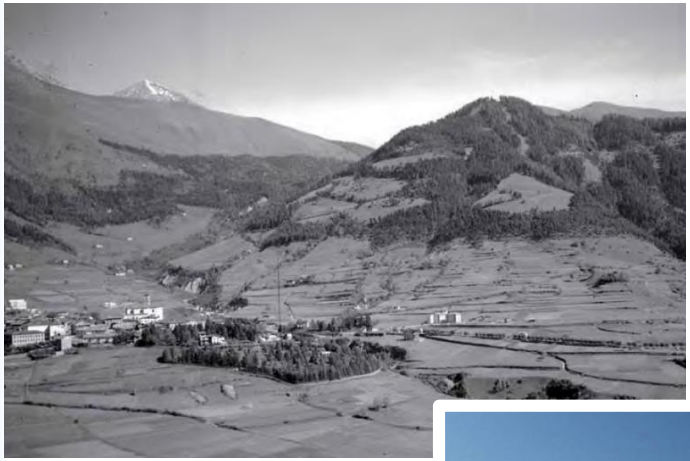
➔ Distribution shrink
➔ Distribution enlargement



Knaus et al. 2018

Snowfall delays in autumn are highly appreciated by eagles…





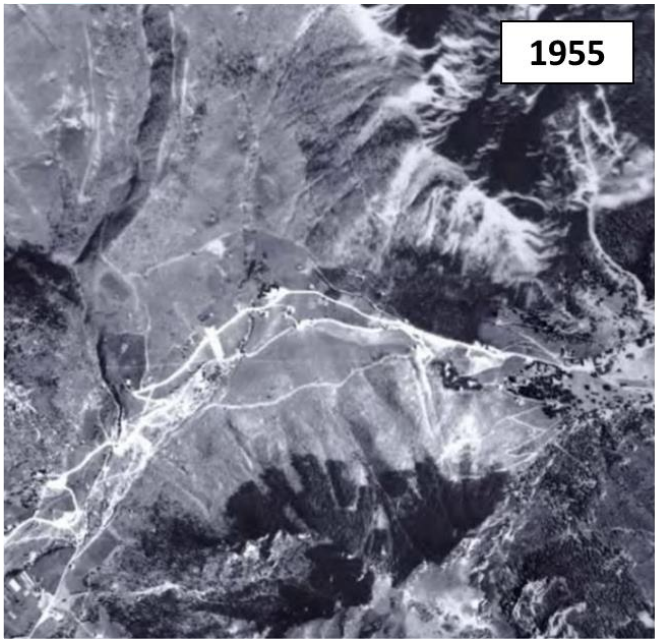
Land abandonment + urbanization

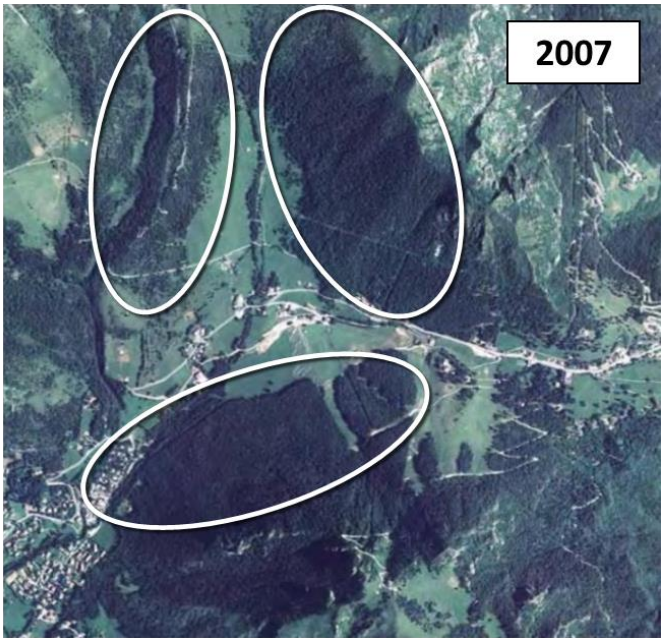
1931

1953

1991

Presolana (BG)



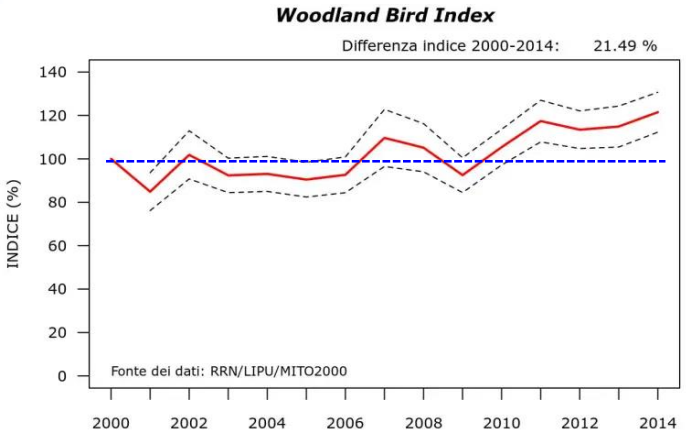


Discontinuation of traditional alpine farming (grazing + haymaking)

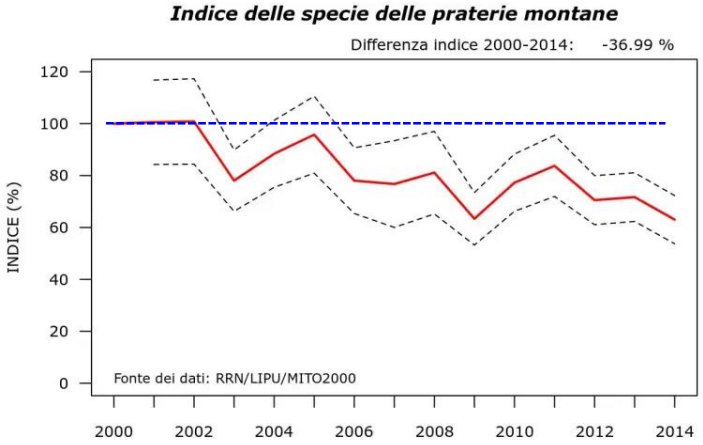
Land abandonment

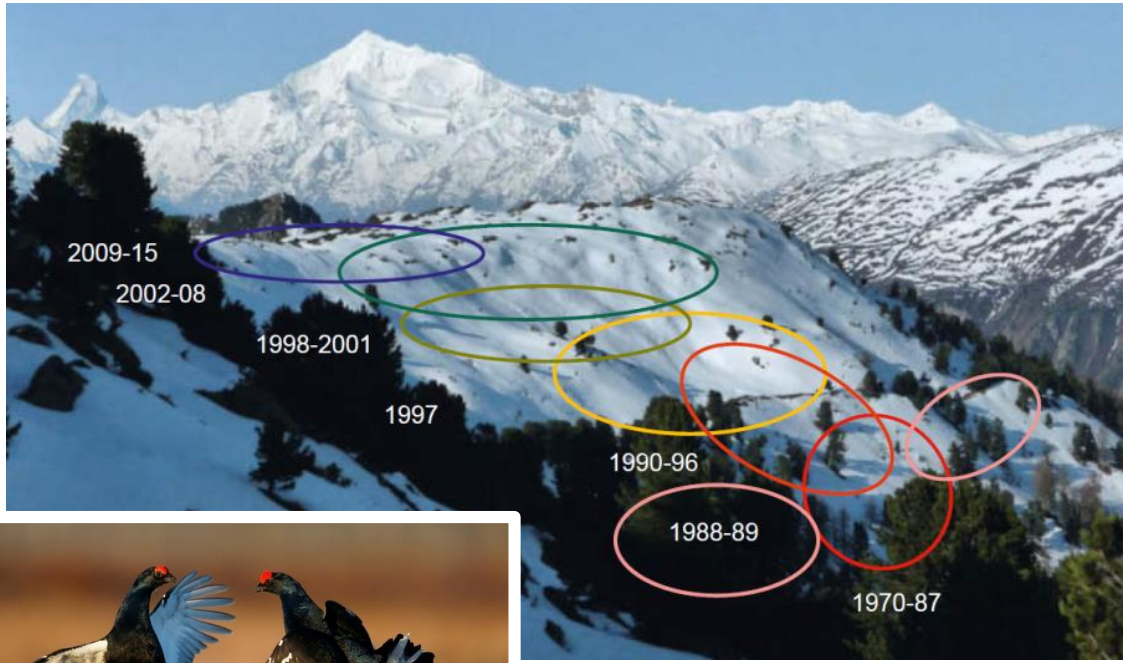
Shrub and forest encroachment into former pastures and hay meadows

Ultimately….

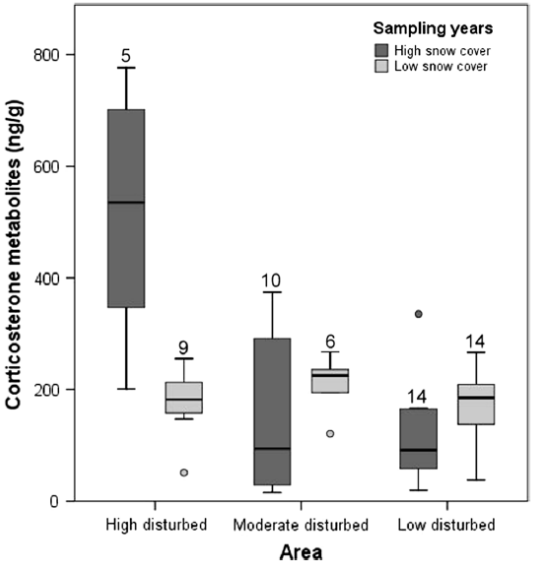


… biodiversity loss





Marti et al. 2018


Sampling years
High snow cover
Low snow cover
Corticosterone metabolites (ng/g)
0
200
400
600
800
5
9
10
6
14
14
High disturbed
Moderate disturbed
Low disturbed
Area


Eurasian lynx (*Lynx lynx*)

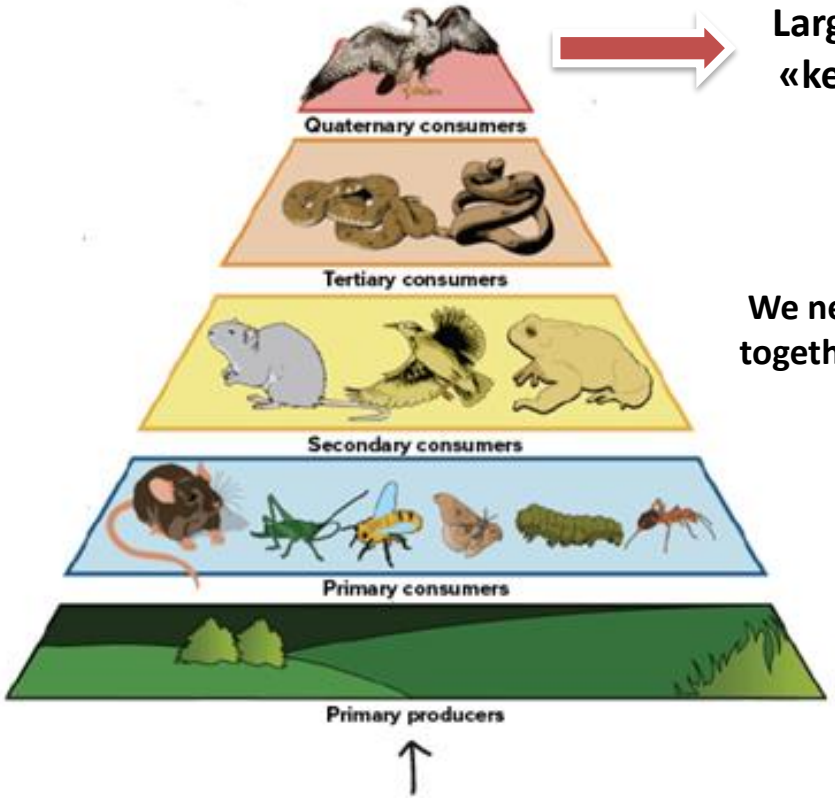

Wolf (Canis lupus)


Brown bear (Ursus arctos)

Predation on livestock

Attacks to humans

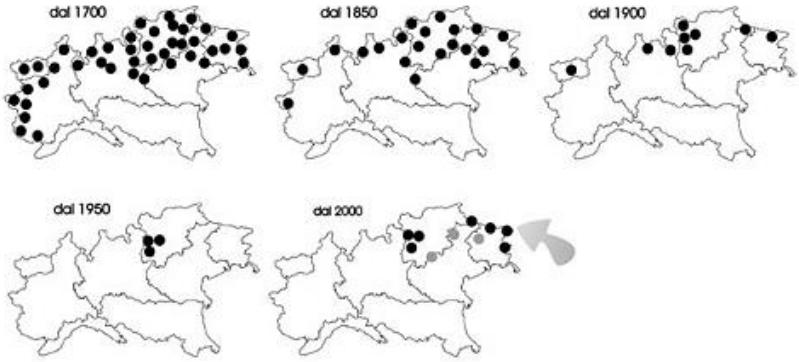
Damages to beekeeping



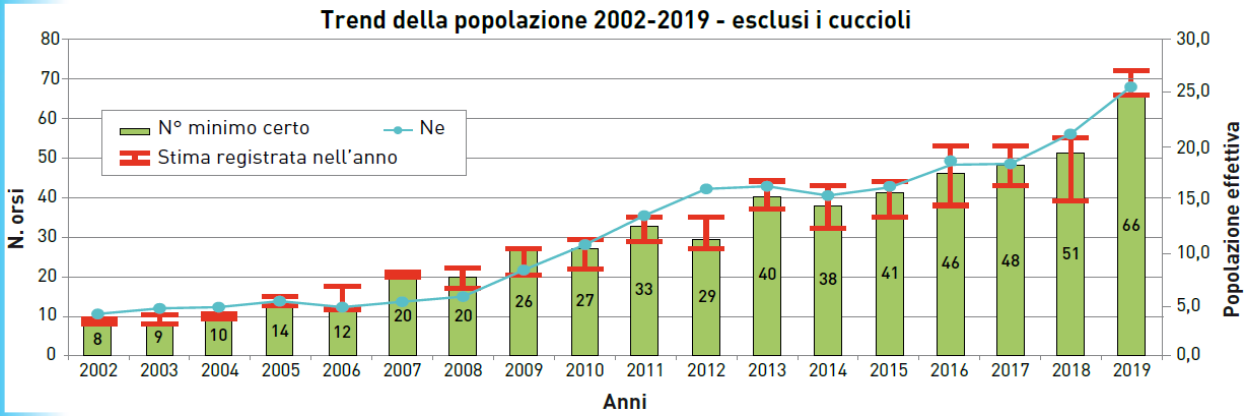
Large carnivores are «keystone species»

We need to find a way to live together with large carnivores peacefully

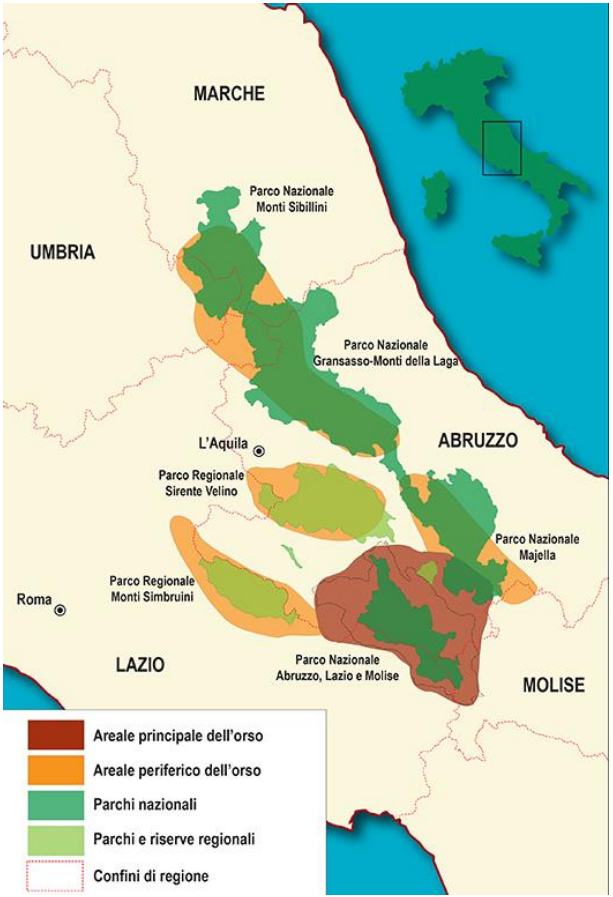
Reintroduced* in W Trentino from 2000



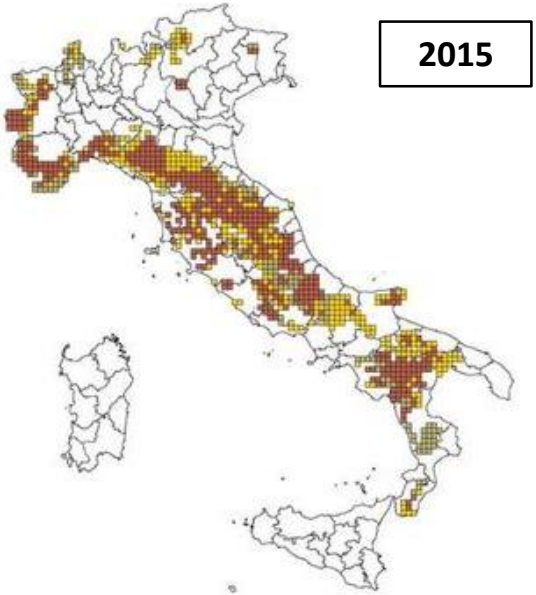
Groff et al. 2020



Groff et al. 2020

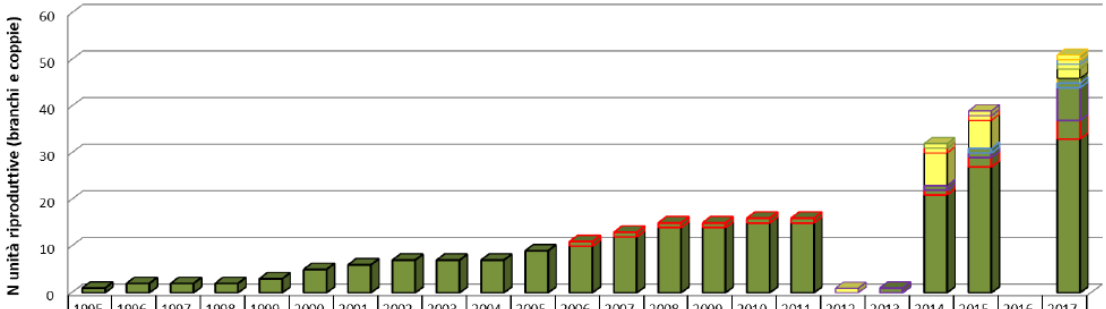

MARCHE
Parco Nazionale Monti Sibillini
UMBRIA
Parco Nazionale Gransasso-Monti della Laga
L'Aquila
ABRUZZO
Parco Regionale Sirente Velino
Parco Nazionale Majella
Parco Regionale Monti Simbruini
Roma
LAZIO
Parco Nazionale Abruzzo, Lazio e Molise
MOLISE
Areale principale dell'orso
Areale periferico dell'orso
Parchi nazionali
Parchi e riserve regionali
Confini di regione

Natural range expansion from the Apennines
NO reintroducion!



2015

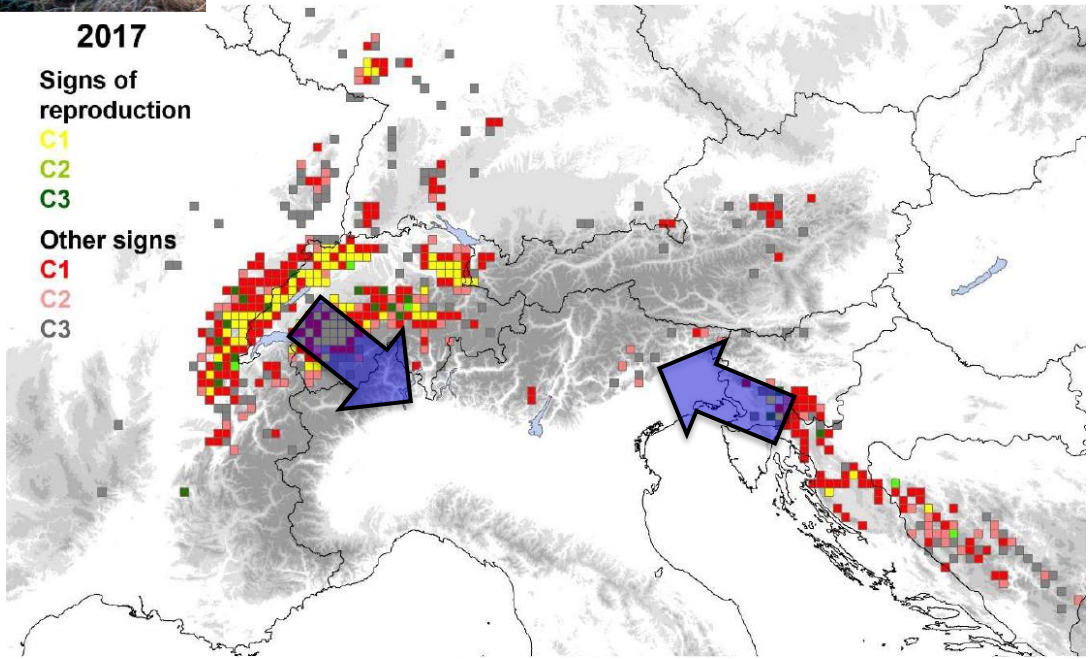
Branchi e coppie di lupo sulle Alpi italiane per Regione/Provincia autonoma dal 1995 al 2018



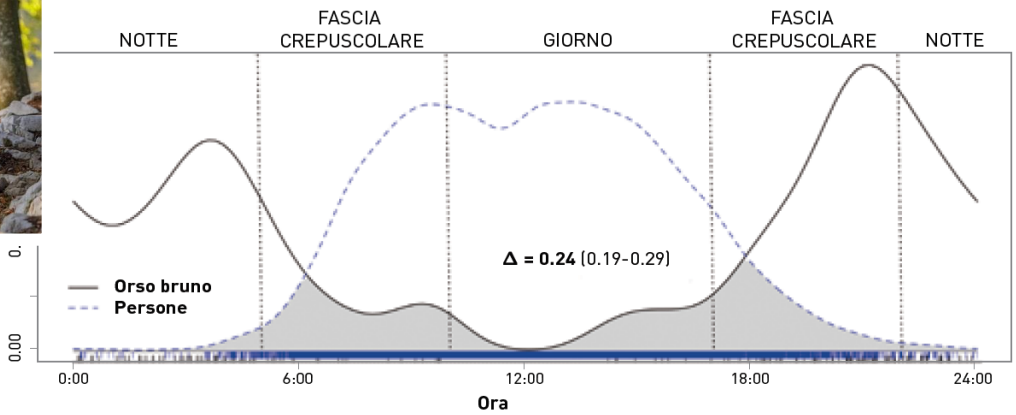
	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Coppie - Trento																							1
Coppie - Lombardia																							1
Coppie - Friuli Venezia Giulia																				1			1
Coppie - Veneto																		1			1		
Coppie - Valle Aosta																				1	1		
Coppie - Piemonte																				7	6		2
Branchi - Trento-Bolzano																							1
Branchi - Lombardia																					1		1
Branchi - Veneto																			1	1	1		7
Branchi - Valle Aosta												1	1	1	1	1	1			1	2		4
Branchi - Piemonte	1	2	2	2	3	5	6	7	7	7	9	10	12	14	14	15	15			21	27		33

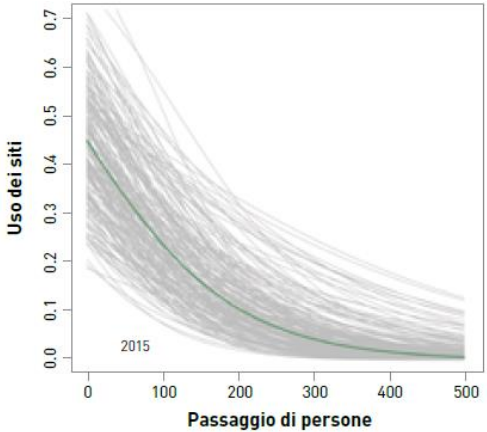
Marucco et al. 2018

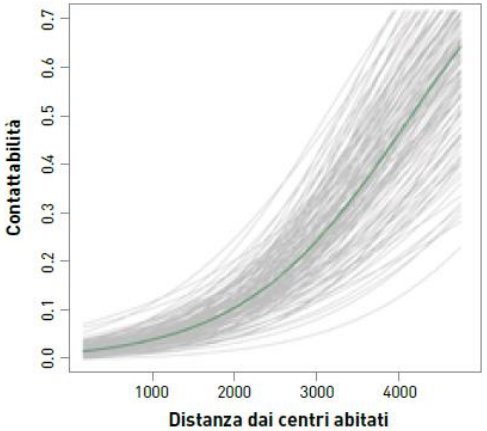
Range expansion from reintroduced populations in Switzerland and Slovenia



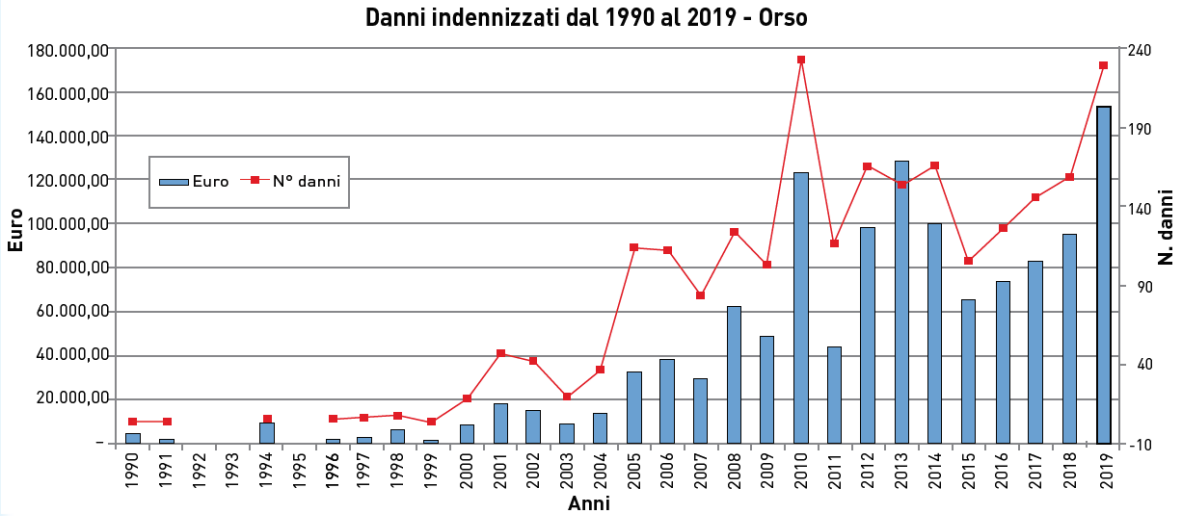
SOCIAL ISSUES WITH LARGE CARNIVORES



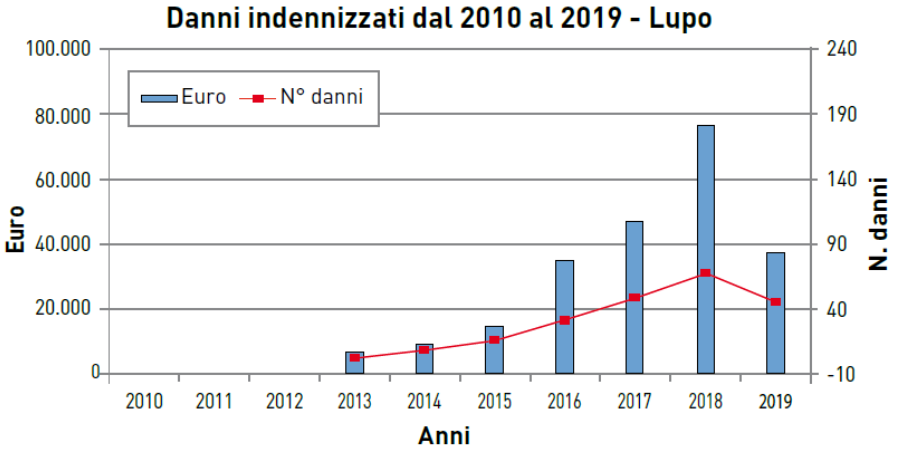




Groff et al. 2020

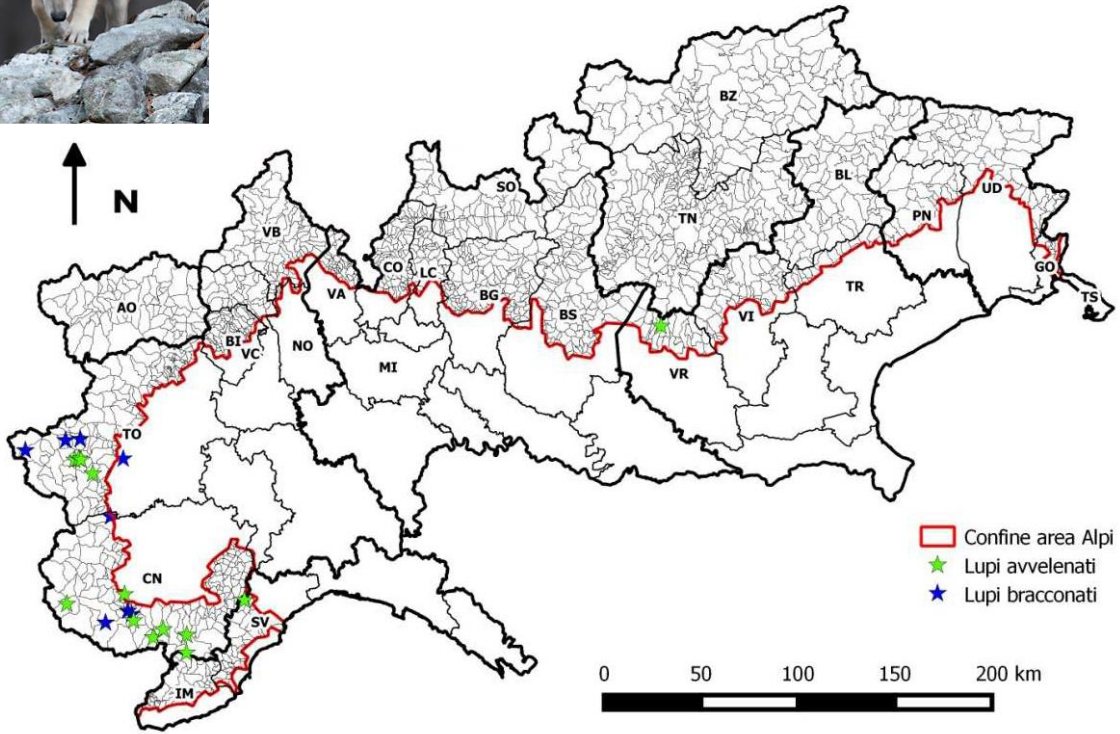


Groff et al. 2020



Groff et al. 2020

Poisoning and poaching



TRENTINO

L'orso è stato ucciso da un colpo di fucile: caccia ai bracconieri

La Procura apre un'inchiesta: perizia balistica sul proiettile. È il primo abbattimento da 40 anni: vittima M2, di 5 anni

Animali Orso

01 ottobre 2013 A- A+

il Centro 3.0°C Vai al meteo

HOME CHIETI L'AQUILA PESCARA TERAMO ABRUZZO ATTUALITÀ SPORT SPETTACOLI FOTO

Sei in: IL CENTRO > L'AQUILA > L'ORSO DI PETTORANO È STATO UCCISO...

L'orso di Pettorano è stato ucciso con un un colpo di fucile / Video

Le analisi condotte all'istituto zooprofilattico di Grosseto hanno rilevano la presenza di cinque pallettoni, tutti parte della stessa cartuccia. Uno di questi, penetrato nell'intestino, avrebbe provocato una peritonite fatale

18 settembre 2014

MENU CERCA

Il Messaggero

ANIMALI

Lupo ucciso a fucilate nel Veronese, incubo bracconaggio

SOCIETÀ > ANIMALI

Martedì 25 Settembre 2018 di Remo Sabatini

Il cadavere di un lupo è stato rinvenuto stamattina,da un agricoltore nei pressi di Roverè Veronese, in provincia di Verona. L'animale, secondo le

IN TOSCANA

Suvereto, i bracconieri uccidono un lupo e lo appendono scuoiato a un cartello stradale

La foto postata dal Comune: «Gesto infame speriamo che gli autori siano individuati». L'allarme del Wwf: «Ogni anno uccisi illegalmente 300 animali»

di Beatrice Montini

ata sul profilo Facebook del Comune di Suvereto

Lupo decapitato nel torinese: taglia da 7mila euro sui bracconieri

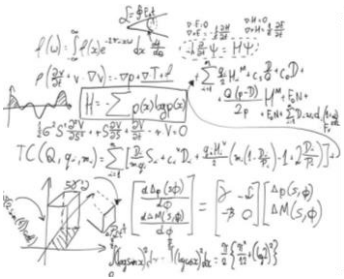
Redazione · 29 Novembre 2018 · 3 · Meno di un minuto

Foto Joel Sartore @National Geographic

Una **ricompensa di settemila euro** per chiunque fornirà informazioni sull'**uccisione di un lupo nel torinese**. Questo l'annuncio diffuso dall'**associazione animalista Lav** a seguito del **macabro ritrovamento**, lo scorso 13 novembre, della **testa dell'animale appesa a un cartello stradale** tra i comuni di Lanzo e Germagnano, nel Canavese.

SOCIAL ISSUES WITH LARGE CARNIVORES

There are no easy solutions to living together with large carnivores peacefully (complex problems require complex solutions)



Long term solutions need to be applied at large scale, local solutions are ineffective

There are national (e.g. PACOBACE for the bear) and international protocols and projects (mostly funded by the EU, e.g. LIFE WolfAlps EU)

LIFE WOLFALPS EU

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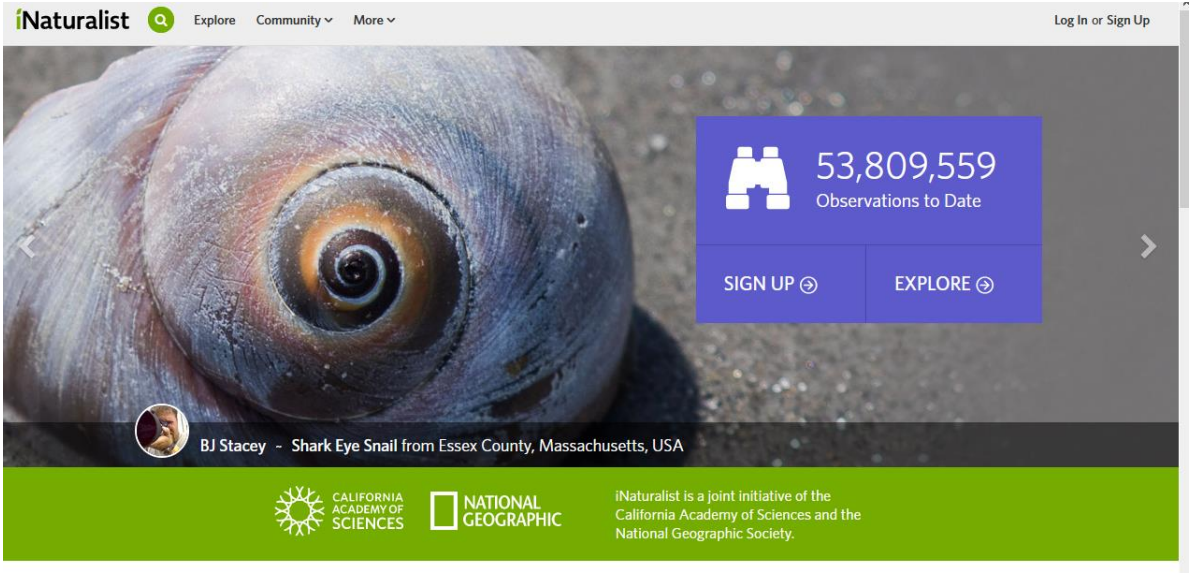

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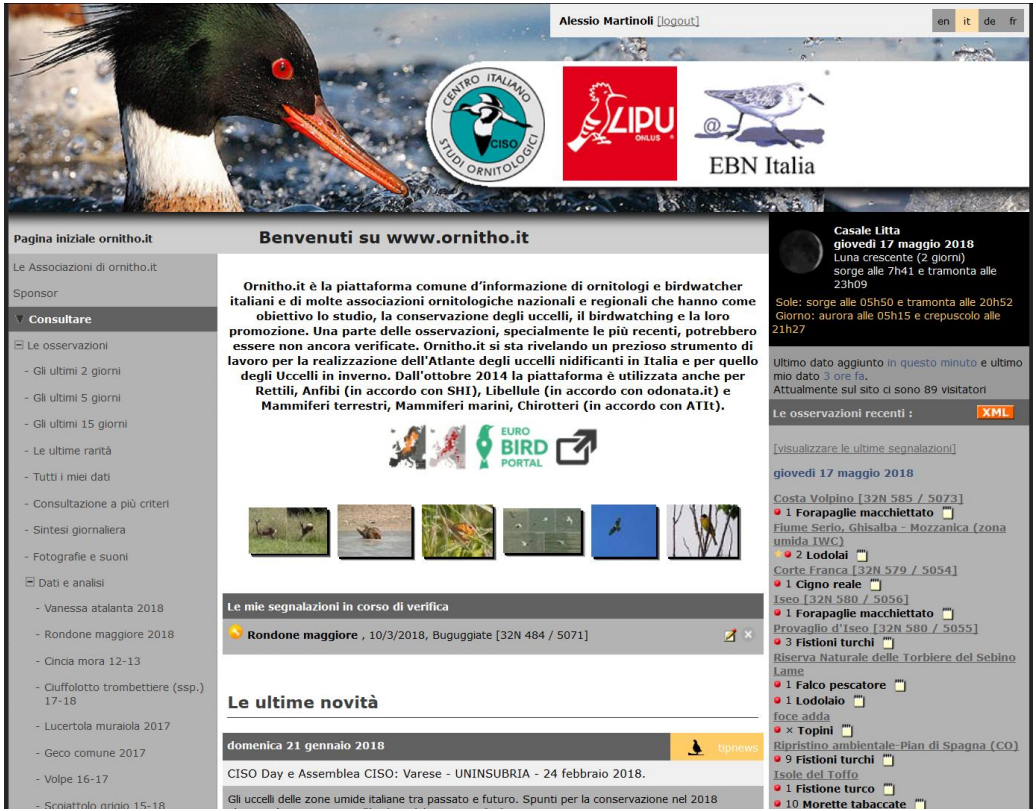

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ARTPORTALEN · Artsobservasjoner · Aves-Symfony · Birds.cz pozorování ptáků · DABAS DATI

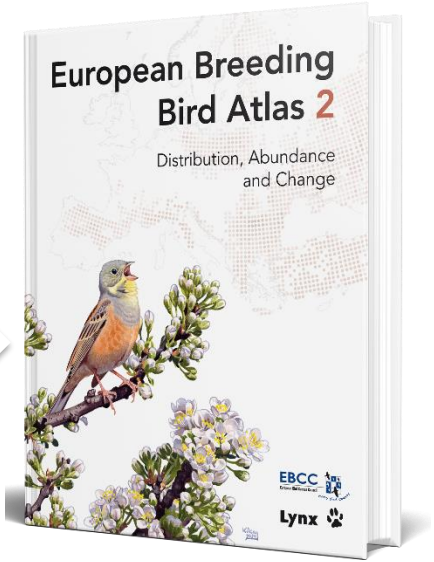
DOFbasen · Israel Birding Portal · MAP · Observation.org · OpenBirdMaps

ORNITODATA · Pl · eBird · Talleta havaintosi Tiiraan www.tiira.fi · Trektellen.org

EURO BIRD PORTAL

DEMO VIEWER

EBCC European Bird Census Council every bird counts



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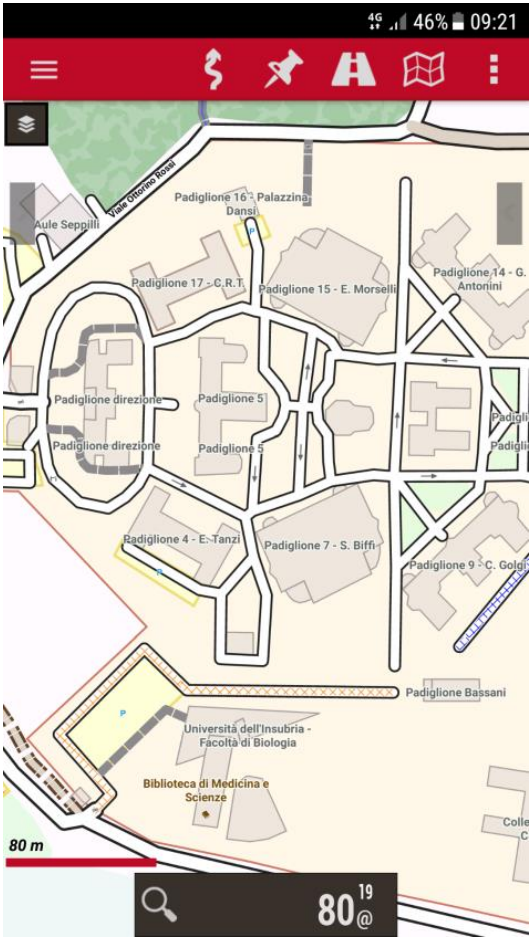

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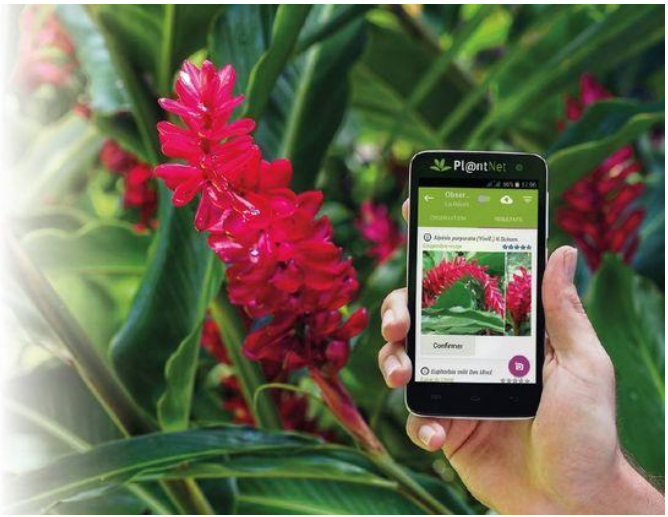

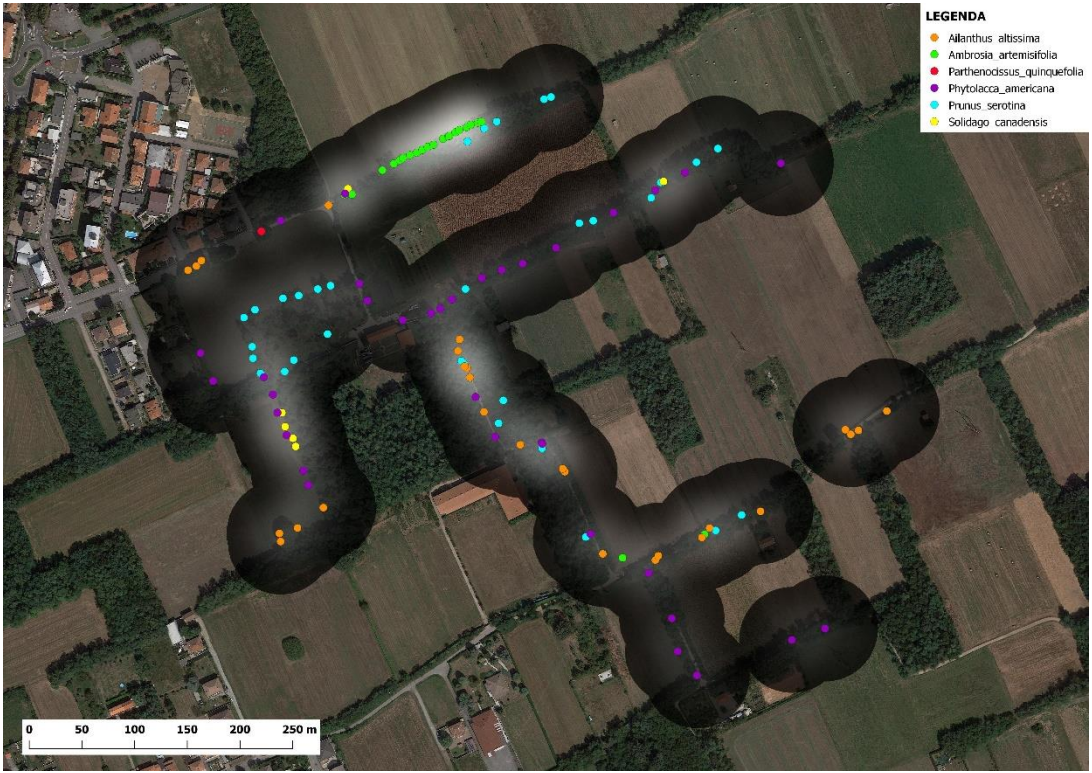

Progetto PON Liceo «Crespi» Busto Arsizio (VA) – 2019
Mappatura flora alloctona in parco di cintura metropolitana

GRAZIE PER L'ATTENZIONE !

alessio.martinoli@uninsubria.it
alessio.martinoli@gmail.com