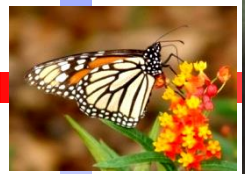
Biodiversity

"Scientists know we must protect species because they are working parts of our life-support system."

Paul Ehrlich



"Our health relies entirely on the vitality of our fellow species on Earth."

Harrison Ford

http://biodiversity.eionet.europa.eu/announcements/ann1270635623
http://www.unmultimedia.org/radio/english/detail/102144.html

Biological Diversity

It refers to a great variety of life forms, from the molecular level, to the level of ecosystems.

It is reflected in the number of species, ecological systems and genetic variability that make them unique in every corner of the planet.

It represents the variety of life and its forms: genetic, species and ecosystems

Estimated number of species by major groups (thousands)

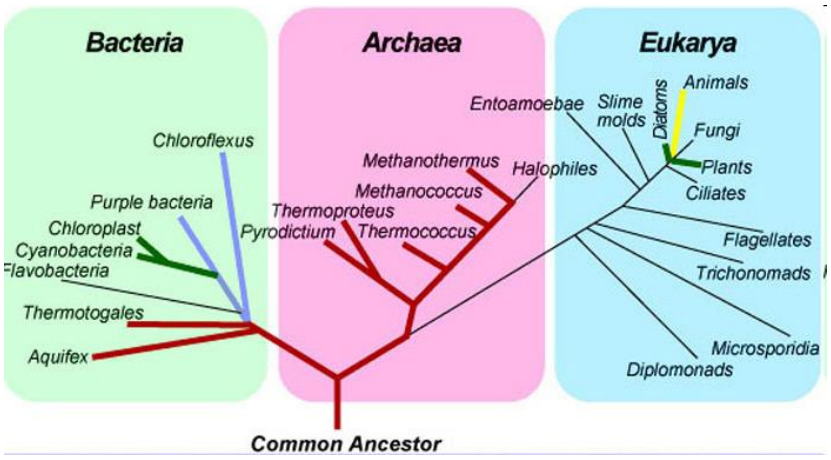
Group	# described	Estimation HIGH	Estimation LOW	Aprox.	Certainty
Virus	4	1,000	50	400	Very low
Bacteria	4	3,000	50	1,000	Very low
Fungi	72	2,700	200	1,500	Moderate
Protozoa	40	200	60	200	Very low
Algae	40	1,000	150	400	Very low
Plants	270	500	300	320	Good
Nematods	25	1,000	100	400	Low
Crustaceans	40	200	85	150	Moderate
Spiders	75	1,000	300	750	Moderate
Insects	950	100,000	2,000	8,000	Moderate
Molluscs	70	200	100	200	Moderate
Cordata	45	55	50	50	Good
Others	115	800	200	25	Moderate
TOTALS	1,750	111,655	3,635	13,620	Very low

http://www.sustainablescale.org/AreasofConcern/Biodiversity/BiodiversityandScale/QuickFacts.aspx

Biodiversity

Biodiversity is an expression of how living systems use the elements that translate into a wide range of complexities, from genes to biomes.

It is a unique example of nature and its ability to solve survival challenges in a wide range of conditions. This translates into the great diversity of life forms.



http://www.sustainablescale.org/AreasofConcern/Biodiversity/BiodiversityandScale/QuickFacts.aspx

Megadiversity: Mammals % endemisms

Brasil	524	26
Indonesia	515	39
China	449	15
Colombia	456	6
México	450	31
USA	428	24
Congo	359	7
India	350	13
Perú	344	13
Uganda	315	?

From a total of 5,487 species

In Memoriam: Lobo mexicano, hunted to extinction in the 1950's (some individuals survive in zoos)

≈25% of marine mammals are classified as threatened

http://www.press.uchicago.edu/Misc/Chicago/468283.html

http://www.vivanatura.org/Biodiversity_causes.html
http://www.ciceana.org.mx/contenido.php?cont=220

Megadiversity: Birds % endemism

Colombia	1,815	8
Peru	1,703	6
Brasil	1,622	12
Ecuador	1,559	2
Indonesia	1,531	26
Venezuela	1,360	3
India	1,258	4
Bolivia	1,257	1
China	1,244	8
Congo	1,094	2

Hawaii is the locality with the highest extinction rate of birds, followed by Indonesia y Brazil

http://www.camacdonald.com/birding/actionalerts.html

IN MEMORIAM

The last Po'o-uli (one of the Hawaiian Honeycrepers) died in in captivity at the San Diego Zoo in November, 2004.

Passenger Pigeon "Martha" the last individual, died on 1 Sep 1914 at Cincinnati OH, Zoo.

http://www.press.uchicago.edu/Misc/Chicago/468283.html

Megadiversity: Anphibians % endemisms

Colombia	583	63
Brasil	517	57
Ecuador	402	34
México	284	60
China	274	64
Indonesia	270	37
Perú	241	27
India	206	53
Venezuela	204	37
Paupa N.G.	200	67

http://www.press.uchicago.edu/Misc/Chicago/468283.html

http://www.claudeschneiderphotography.com/photoblog/category/animals/
http://www.treehugger.com/files/2008/11/ubercool_mexica.php

Megadiversity: Reptiles % endemism

Australia	755	82
México	717	51
Colombia	520	19
Indonesia	511	29
Brasil	468	37
India	408	46
China	387	34
Ecuador	374	30
Paupa N.G.	315	30
Madagascar	300	91

Lonesome George, the last male of its species, hunted to extinction in the Galapagos Islands

http://www.press.uchicago.edu/Misc/Chicago/468283.html

http://blocs.xtec.cat/whitefields/2009/02/13/darwin-turtles-and-ants/
http://www.reptile-treasures.com/4newsletters/2005%20July/00-Front_Page.htm

Megadiversity: Butterflies % endemisms

Perú	3,550	10
Brasil	3,150	6
Colombia	3,100	10
Bolivia	3,000	7
Venezuela	2,300	5
México	2,250	9
Ecuador	2,200	9
Indonesia	1,900	37
RD Congo	1,650	?
Camerún	1,500	?

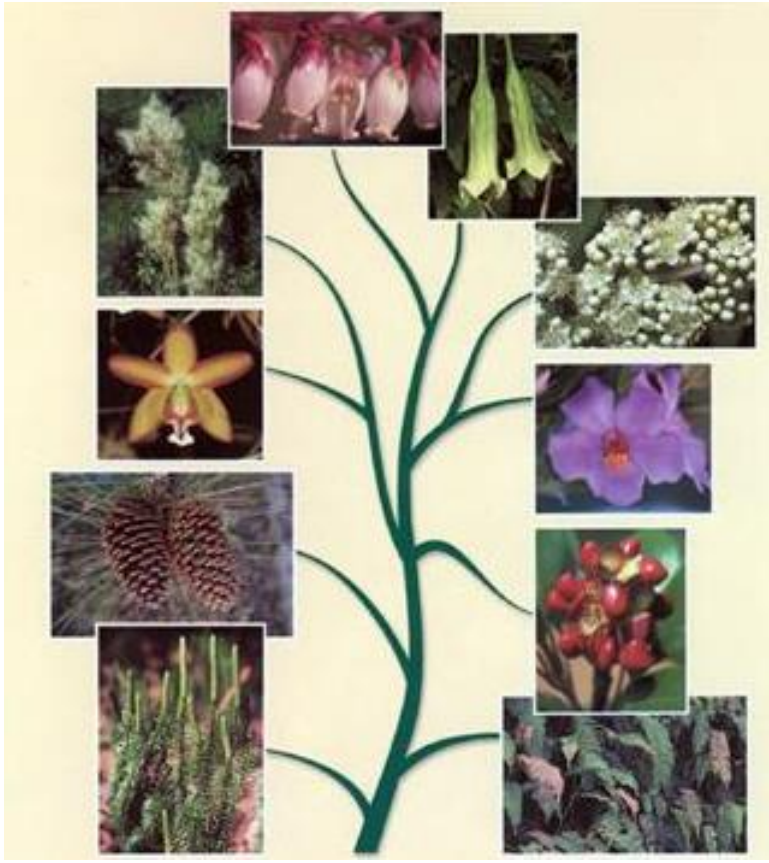
http://www.press.uchicago.edu/Misc/Chicago/468283.html

http://yale1962.org/speakout/?p=3

http://www.sunstreakbooks.com/Swift%20Guide%20to%20the%20Butterflies%20of%20Mexico.html

Megadiversity: Flowering Plants

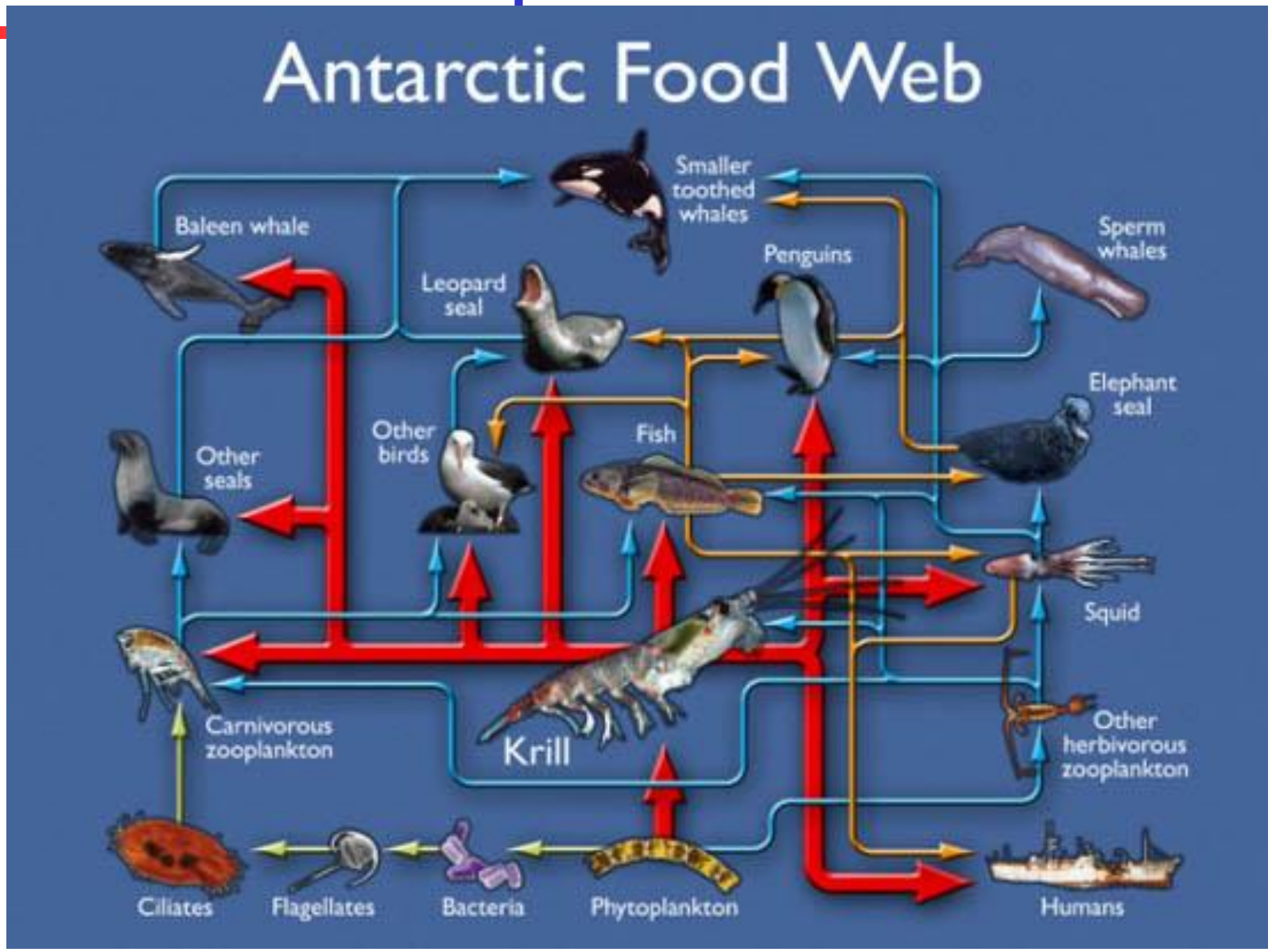
Brasil	55,000
Colombia	45,000
China	27,000
México	25,000
Australia	23,000
Sudáfrica	21,000
Indonesia	20,000
Venezuela	20,000
Perú	20,000
USSR (antigua)	20,000



http://www.env.go.jp/en/wpaper/1992/eae210000000005.html

http://web.pdx.edu/~mfish/index.php?go=courses
http://www.estrellamountain.edu/faculty/farabee/biobk/BioBookDiversity_6.html

Trophic Web!



Simplified picture of the Southern Ocean food web, showing the importance of krill in supporting directly and indirectly (via the fish link in food chains) a diverse and abundant range of higher predators, as well as several major human fisheries. These short food chains (shown in red) link microscopic plants (phytoplankton) at the base of the food chain, via krill to large predator species.

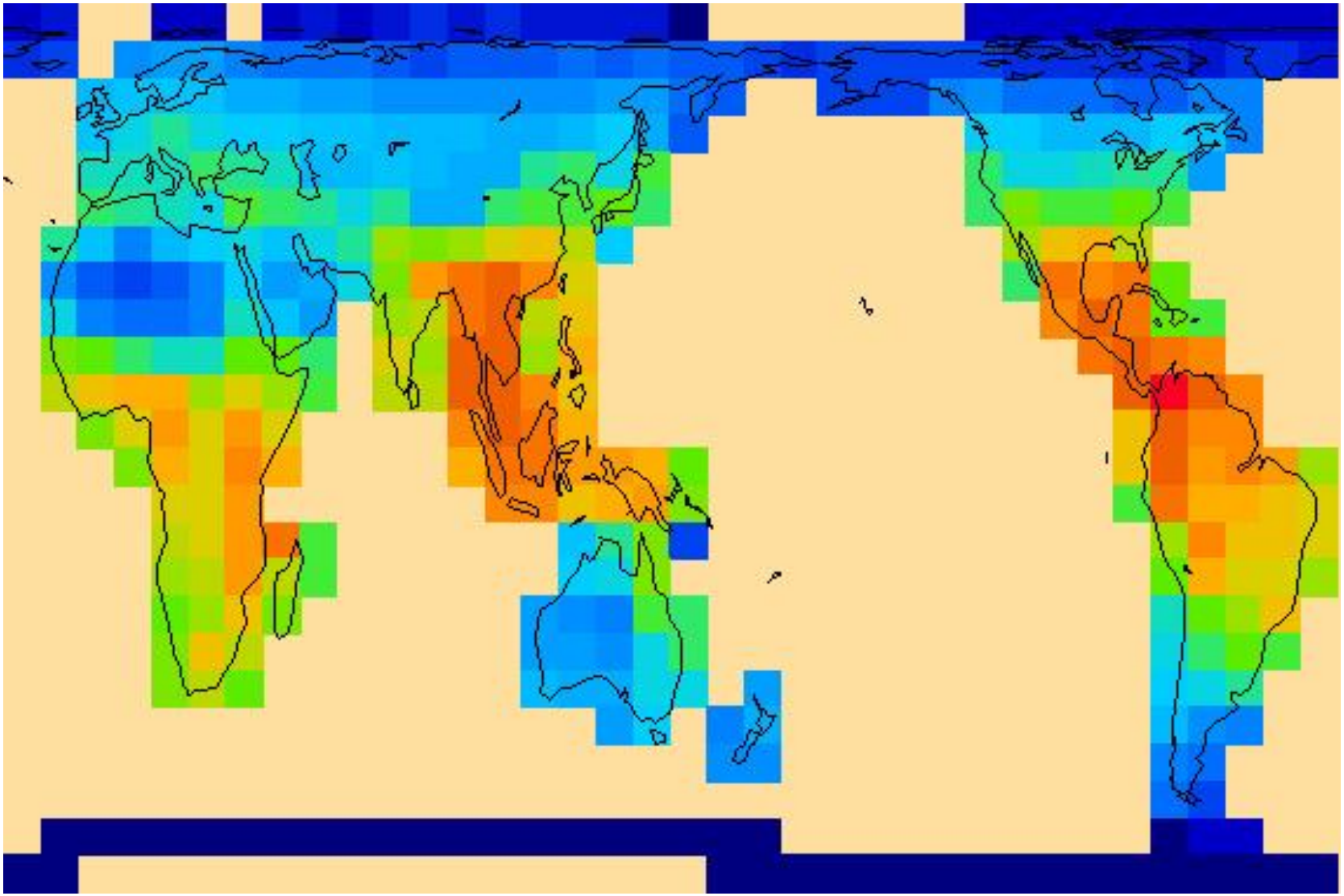
http://www.classroomatsea.net/JR161/about.html

Megadiverse contries

There are 175 million identified species (from bacteria to mammals) (Heywood et al, 1995), 70% of the species are distributed in only 12 of the 170 countries.

http://www.biogrid.cn/megadiversity.jpg

Megadiversity



Human dependency

40% of the world economy

80% of the needs of companies

A greater biological wealth:

- More sources of possible medical, industrial discoveries
- More source of possible foods
- Greater possibility of economic development
- Greater possibility of adaptation to the challenges of climate change

Human dependency

100 YEARS OF AGRICULTURAL CHANGE: SOME TRENDS AND FIGURES RELATED TO AGROBIODIVERSITY

* Since the 1900s, some 75 percent of plant genetic diversity has been lost as farmers worldwide have left their multiple local varieties and landraces for genetically uniform, high-yielding varieties.
* 30 percent of livestock breeds are at risk of extinction; six breeds are lost each month.
* Today, 75 percent of the world's food is generated from only 12 plants and five animal species.
* Of the 4 percent of the 250 000 to 300 000 known edible plant species, only 150 to 200 are used by humans. Only three - rice, maize and wheat - contribute nearly 60 percent of calories and proteins obtained by humans from plants.
* Animals provide some 30 percent of human requirements for food and agriculture and 12 percent of the world's population live almost entirely on products from ruminants.

Source: FAO. 1999b

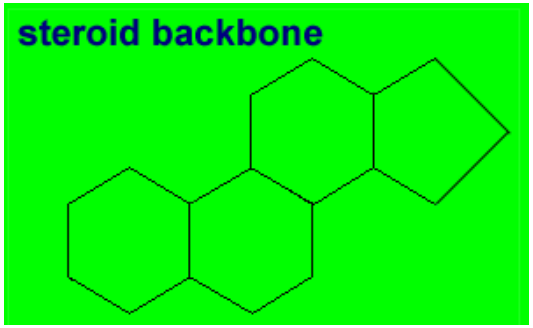
Decline in Biodiversity

Throughout the 20th century, agrobiodiversity has decline steadily, why?

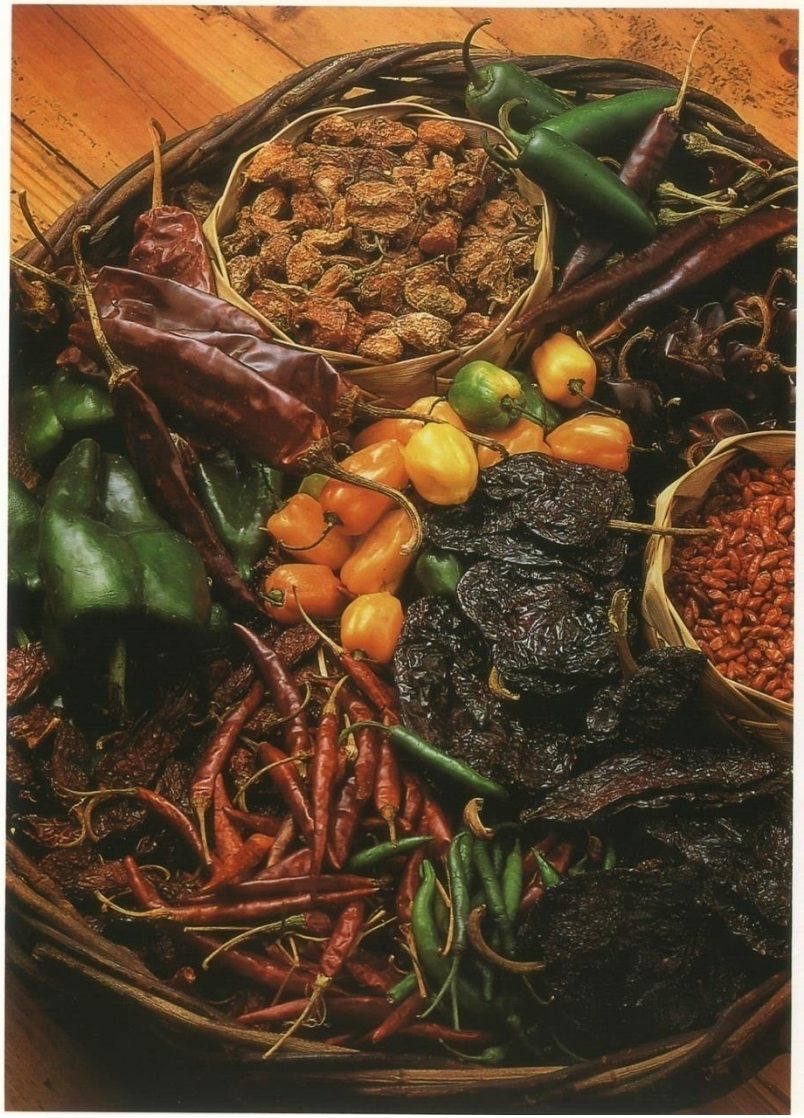
- The rapid expansion of industrial and Green Revolution agriculture.
- Globalization of the food system and marketing
- Replacement of local varieties by improved or exotic varieties and species
- Greater possibility of adaptation to the challenges of climate change

Medicinal

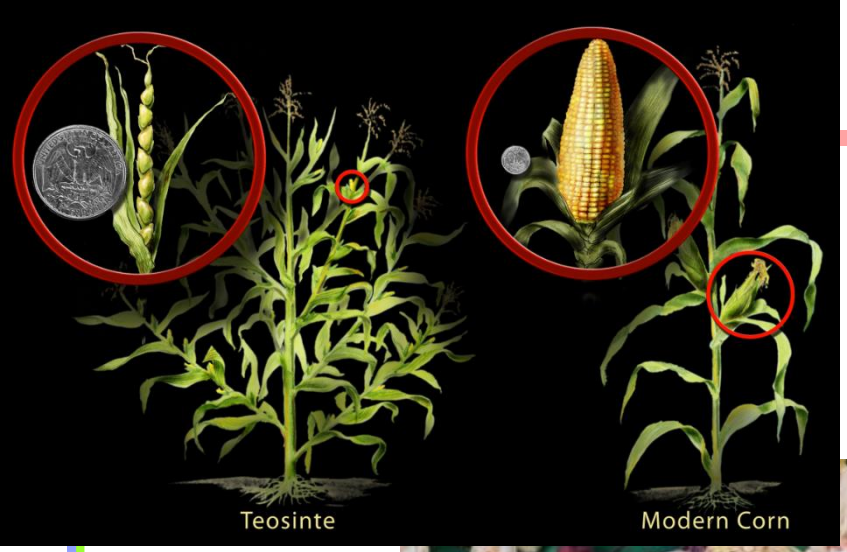
Dioscorea composita.
Diosgenina. Endemica to the tropical forest of Mexico.
Steroids. Testosterone, Progesterone
Contraceptives, anti-inflammatory, Autoimmune treatment, etc.



Cultural



Economic



http://oer.uaf.edu/learn/nrm101-v1/2010/07/12/a-history-of-corn/
https://www.iucn.org/news/commission-environmental-economic-and-social-policy/201711/public-and-private-sector-engagement-agrobiodiversity-conservation

Modern varieties are dangerously suspended by a very thin rope. The larger the bag, the more likely it is that the rope will break.

New Varieties

In 1970 a plague caused by a fungus (*Heminthosporium maydis*) reduced more than half of the corn crops in the USA. In the last and desperate moment an improvised technical remedy was to introduce resistant varieties of Mexico "their place of origin".

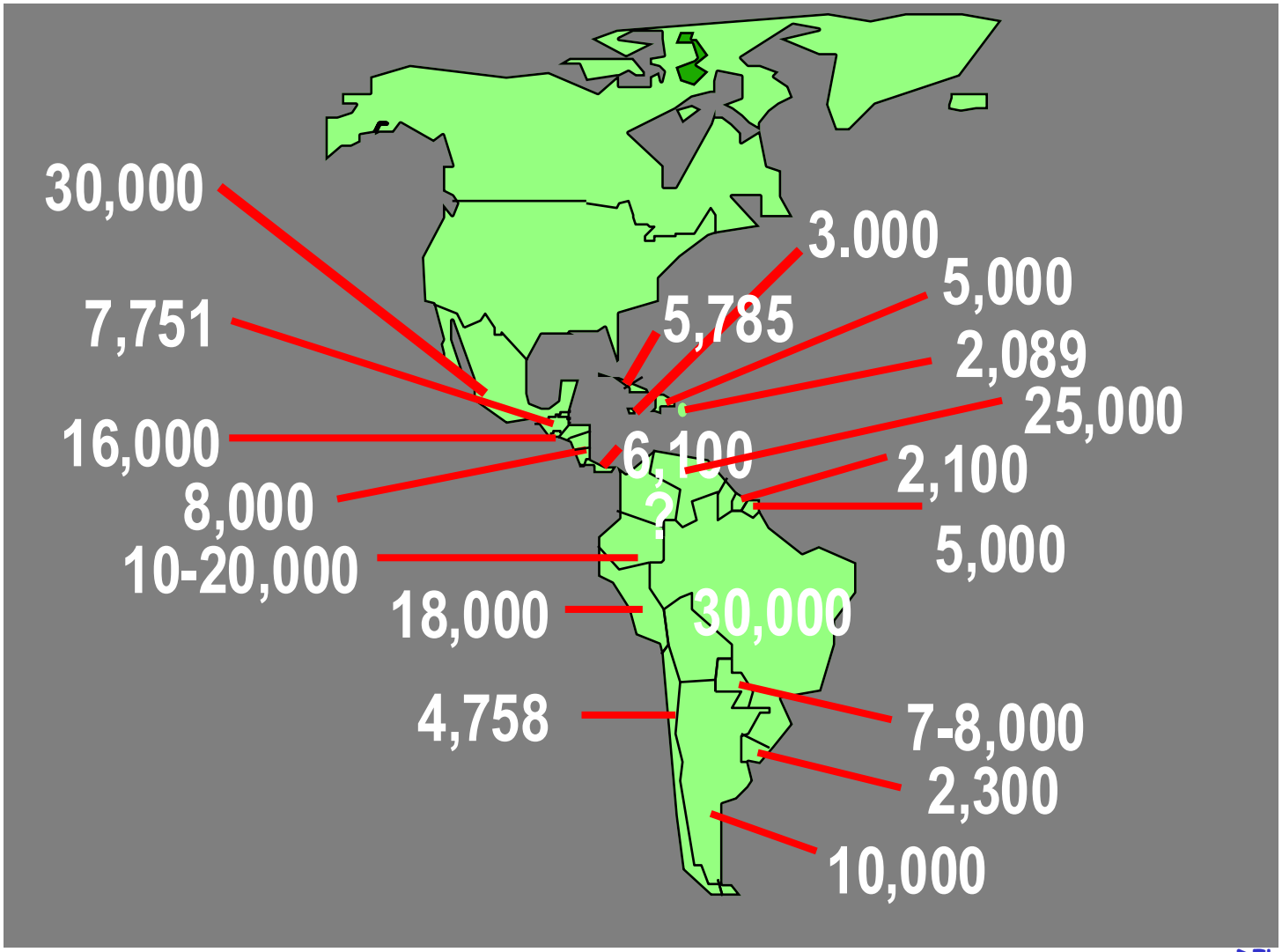
https://docs.lib.purdue.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1003&context=larstechhttp://myveritas.ca/northern-corn-leaf-blight/
http://myveritas.ca/northern-corn-leaf-blight/

Peoples and believes

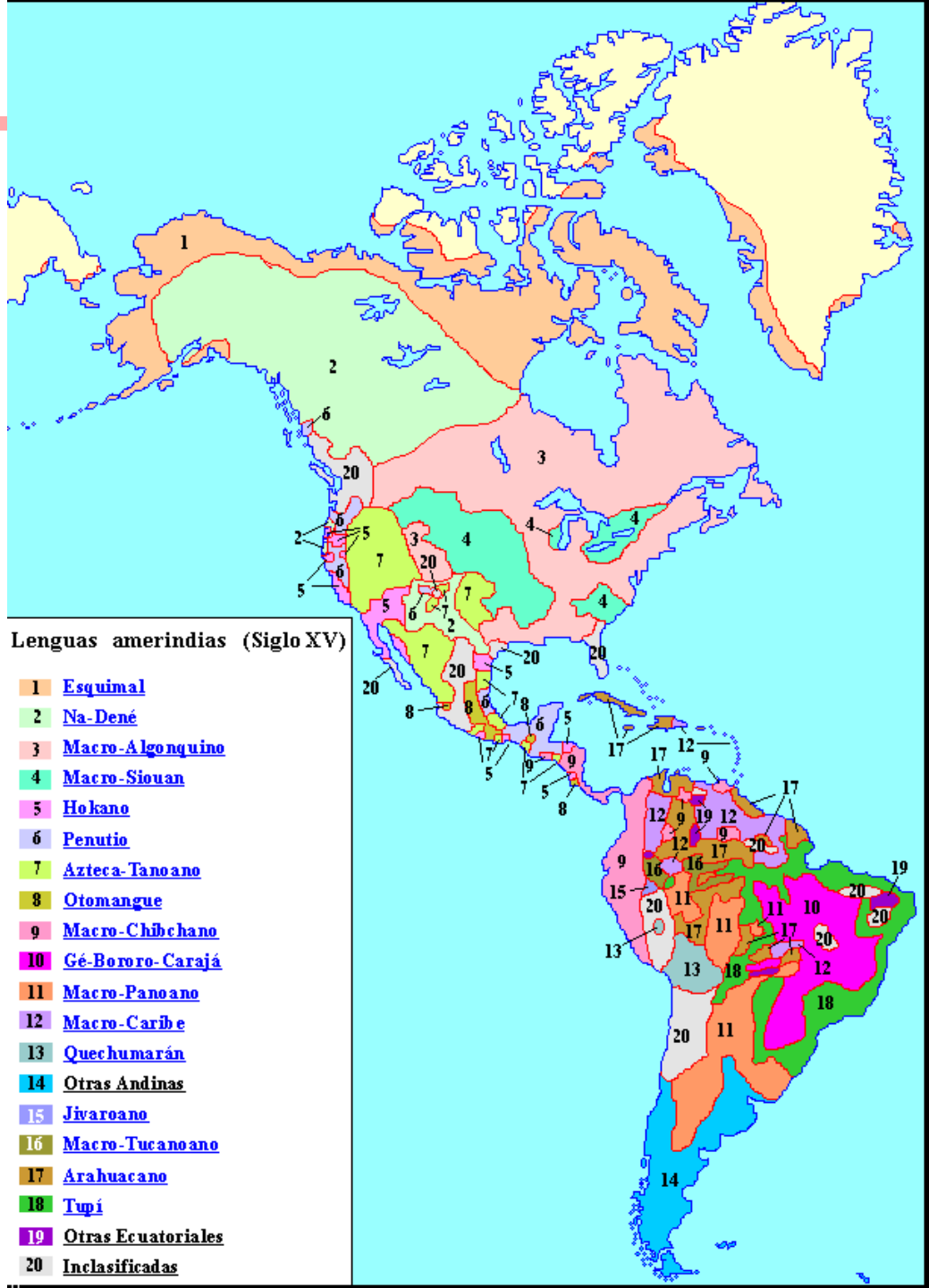
http://peacemonger.org/faqs.html

http://www.eco-pros.com/biodiversity-genetic.htm

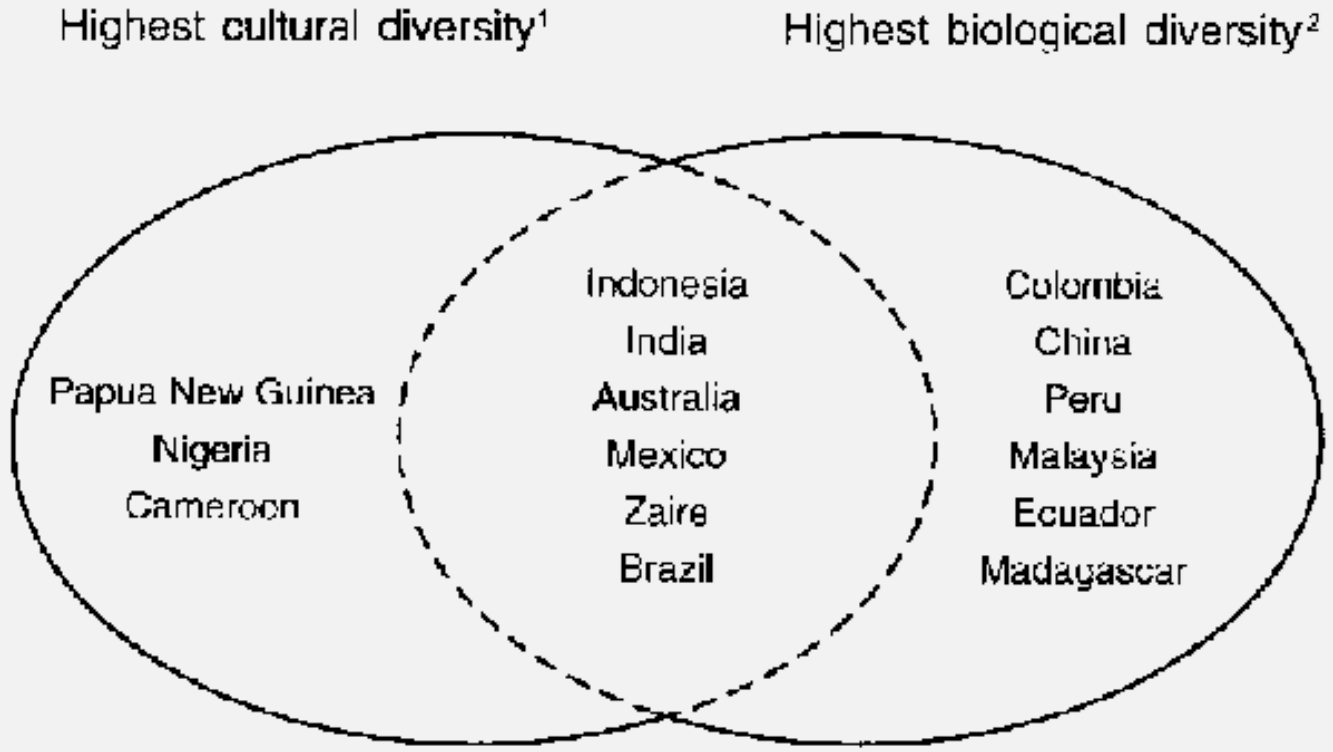
Number of flowering plants in Latin-American



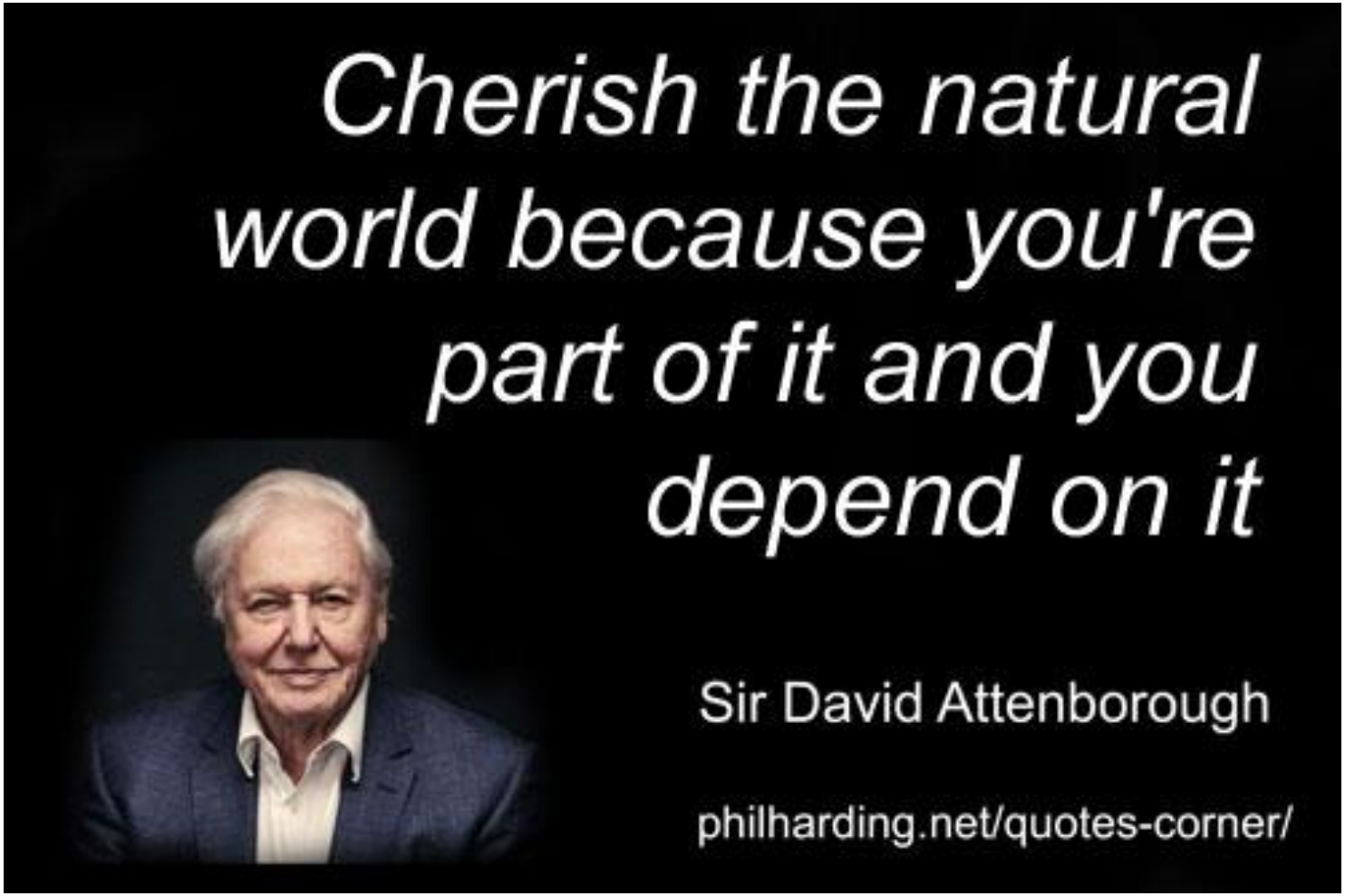
Ethnolinguistic groups



Megadiversity
Cultural and Biological



http://www.fao.org/docrep/w1033E/w1033e09.htm


Cherish the natural world because you're part of it and you depend on it
Sir David Attenborough
philharding.net/quotes-corner/