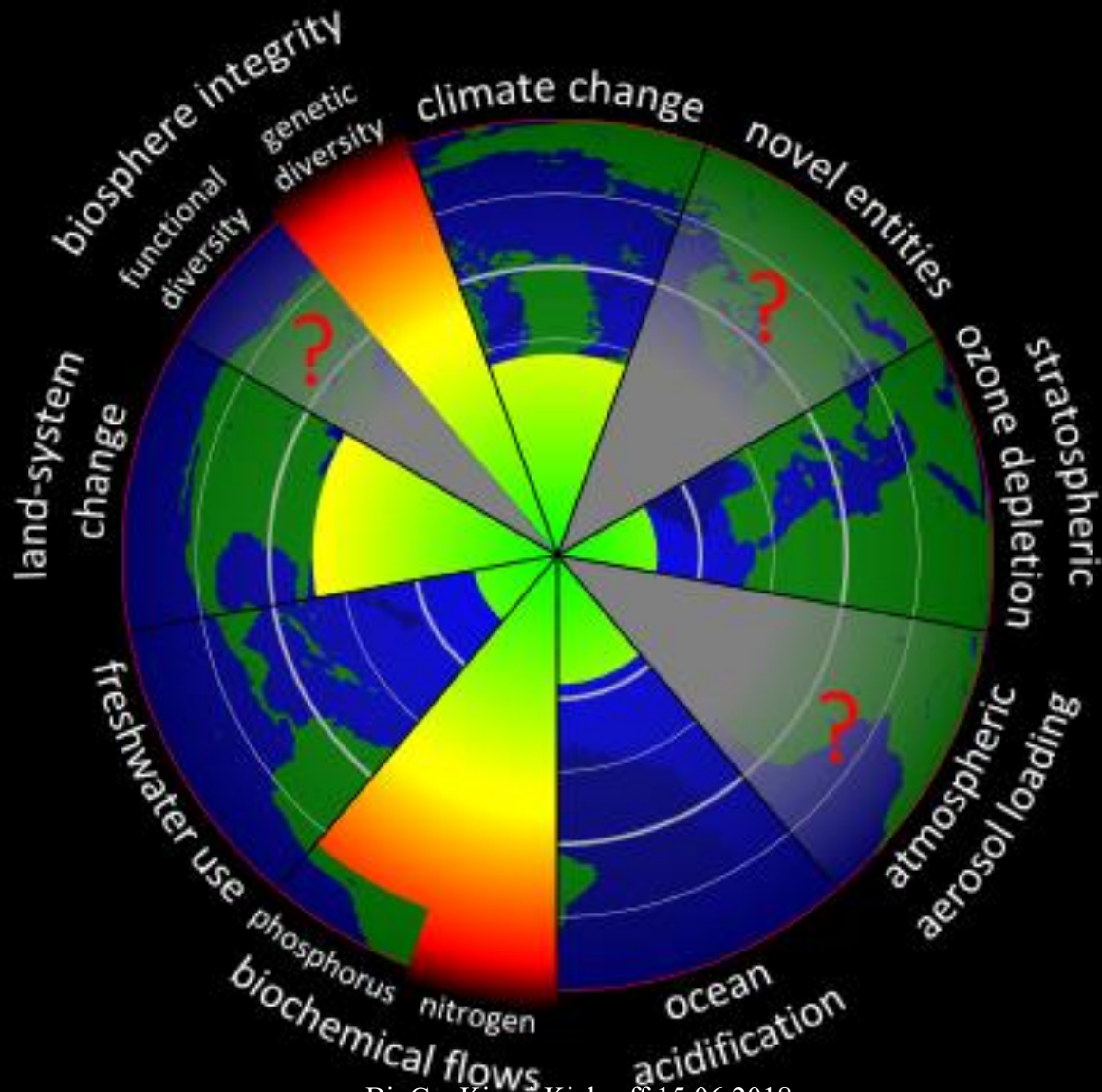


Bestandstap, artsutryddelse og  
tapt natur  
– hva er konsekvensene?

Dag O. Hessen

Inst. Biovitenskap, UiO

# Rammebetingelser



# Verden: Antropocen – en ny tid



- Klodens CO<sub>2</sub>-konsentrasjon har passert 400 ppm, restkapasiteten for utslipp ca 800 gt)
- Verdens dyrebestander er halvert i løpet av 40 år (og vi er avhengig av intakte økosystemer)
- Vektforhold mellom terrestre dyr: mennesker 36%, husdyr: 60%, ville dyr: 4%
- Global footprint: årskapasiteten brukt opp 1.8

# Jorda er termodynamisk ustabil– takket være biologi

- Mars; CO<sub>2</sub>: 96.0 %, N<sub>2</sub>: 1.9%, O<sub>2</sub>: 0.145%; - 63 °C
- Venus; CO<sub>2</sub>: 96.5 %, N<sub>2</sub>: 3.5%, O<sub>2</sub>: 0.0...%; 327 °C
- Jorda; CO<sub>2</sub>: 0.04 %, N<sub>2</sub>: 78%, O<sub>2</sub>: 21%; 15 °C
  
- The Earth has a thermodynamically unstable atmosphere, it was anoxic for nearly 2 billion years, life itself creates a “perfect” climate and gas composition and is instrumental to climate



REPORT

INT

2016

THIS REPORT HAS BEEN PRODUCED IN COLLABORATION WITH:

ZSL  
LET'S WORK FOR WILDLIFE



# Living Planet Report 2016

## Risk and resilience in a new era



BBC

News Sport Weather Capital Future Shop

## NEWS SCIENCE & ENVIRONMENT

Home UK Africa Asia Europe Latin America Mid-East US & Canada Business Health Sci/Enviro

30 September 2014 Last updated at 08:20 GMT



### World wildlife populations halved in 40 years - report

COMMENTS (657)

By Roger Harrabin  
BBC environment analyst

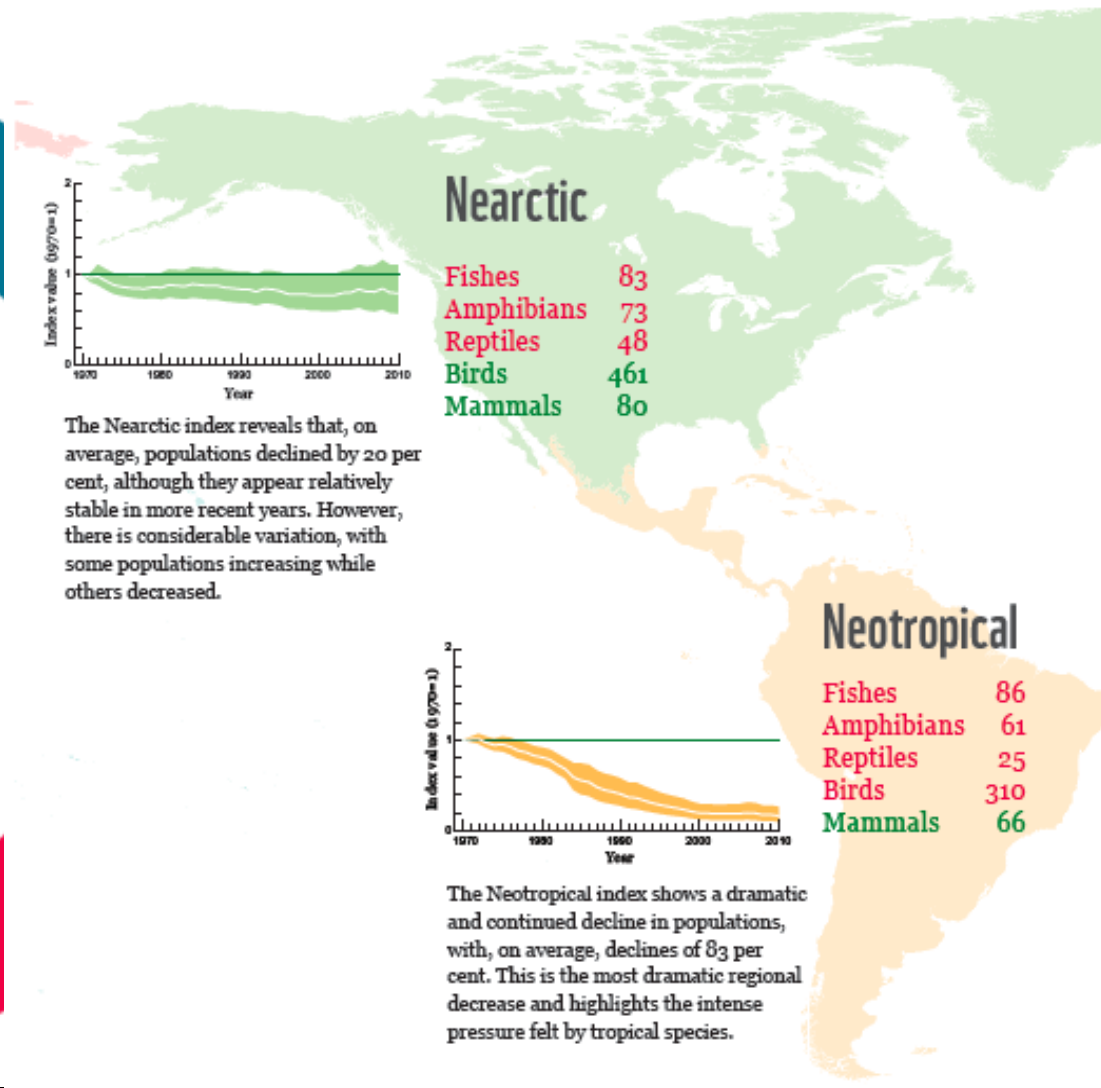
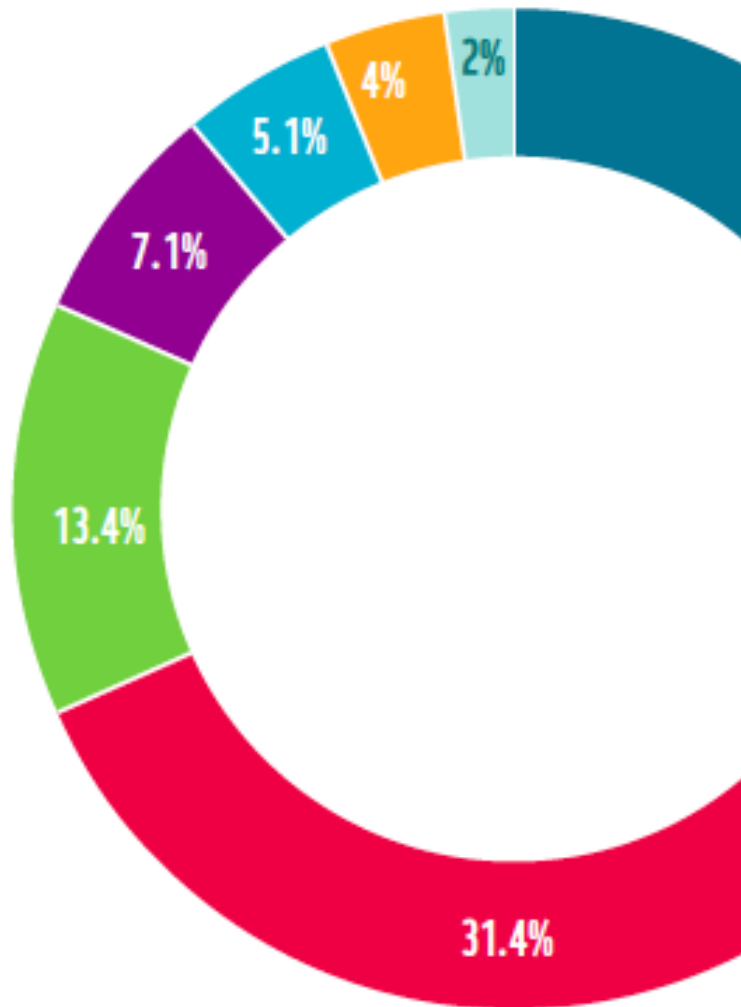


Habitat loss and hunting have reduced tigers from 100,000 a century ago to just 3,000

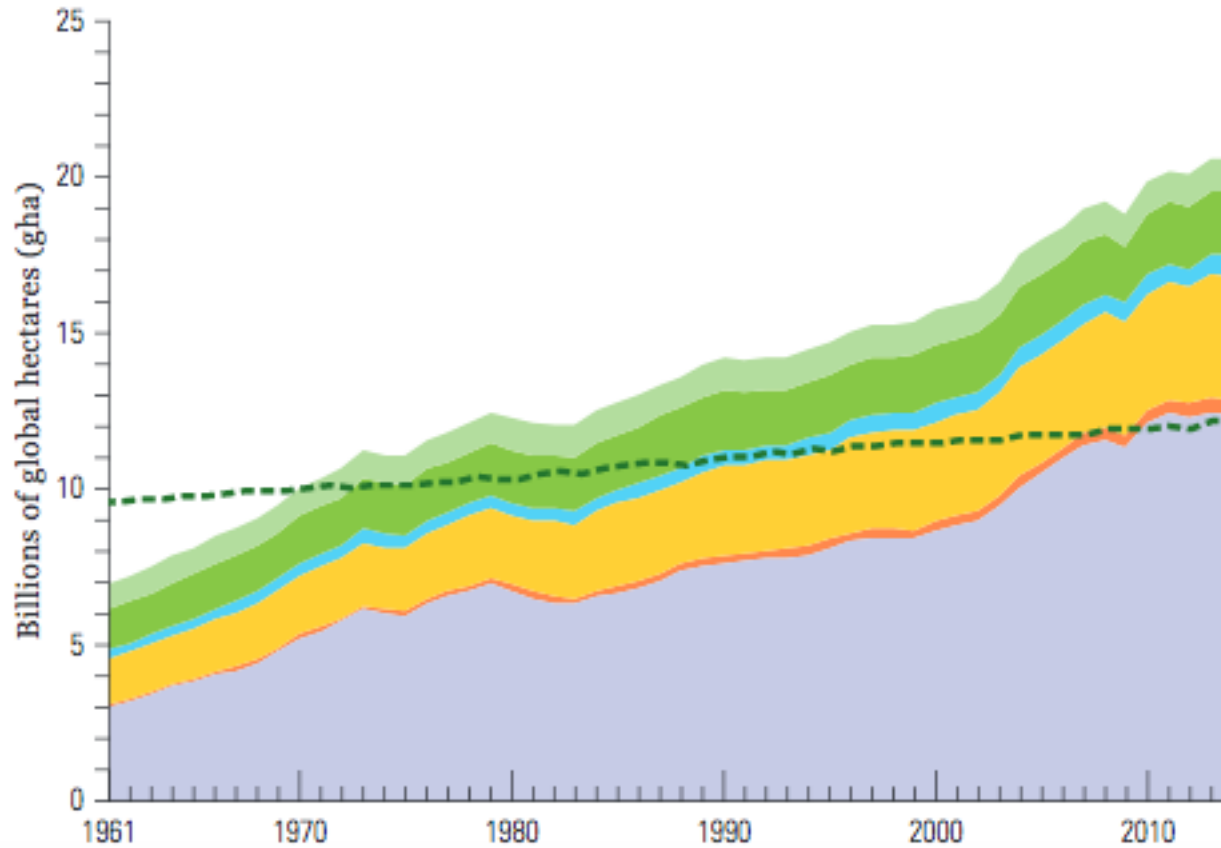
The global loss of species is even worse than previously thought, the London Zoological Society (ZSL) says in its new Living Planet Index.

Related Stories

# “Halvering av verdens dyrebestander” – bestandsutvikling, ikke bare artstap



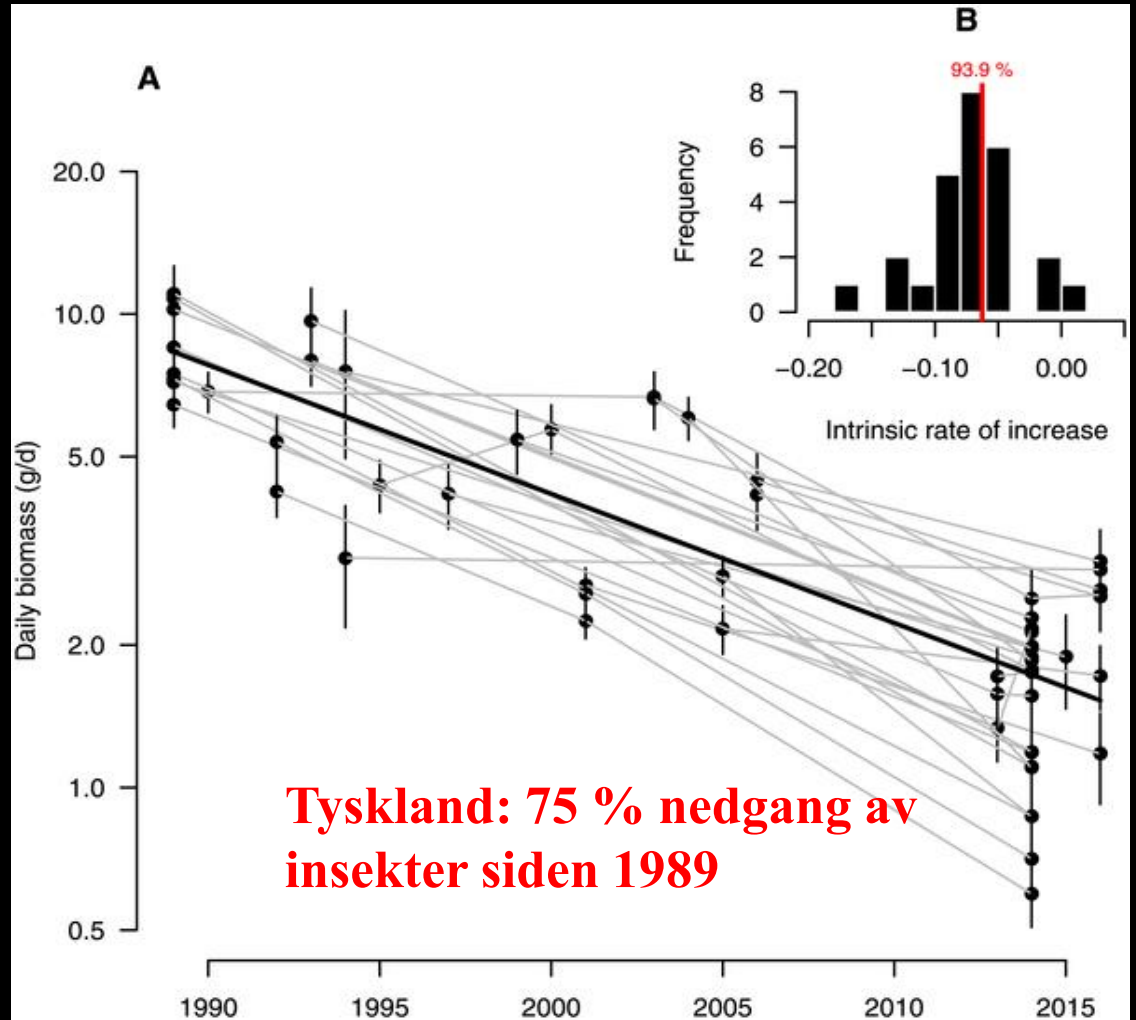
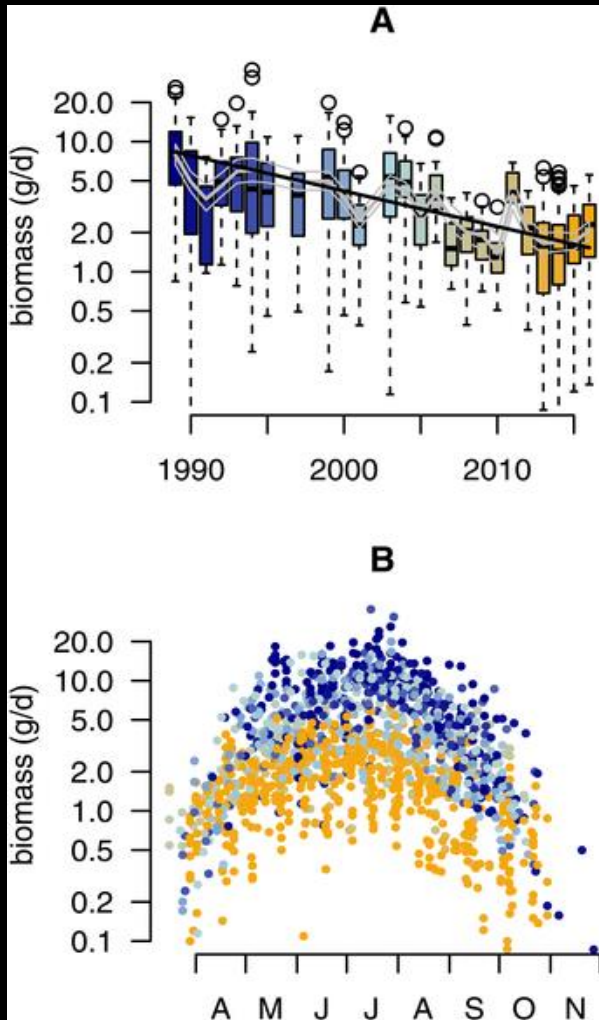
# Living Planet Report 2018



**Figure 5:**  
World Ecological Footprint of consumption by area type in global hectares, 1961-2014. The largest contribution to the Ecological Footprint is carbon emissions from fossil fuel burning (60%)<sup>3</sup>.

#### Key

- Grazing land
- Forest products
- Fishing grounds
- Cropland
- Built-up land
- Carbon
- World biocapacity



Hallmann CA, Sorg M, Jongejans E, Siepel H, Hofland N, et al. (2017) More than 75 percent decline over 27 years in total flying insect biomass in protected areas. PLOS ONE 12(10): e0185809. <https://doi.org/10.1371/journal.pone.0185809>  
<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0185809>



# Og hvor mange kan dø ut?

OPINION

## Are We in the Midst Of a Sixth Mass Extinction?

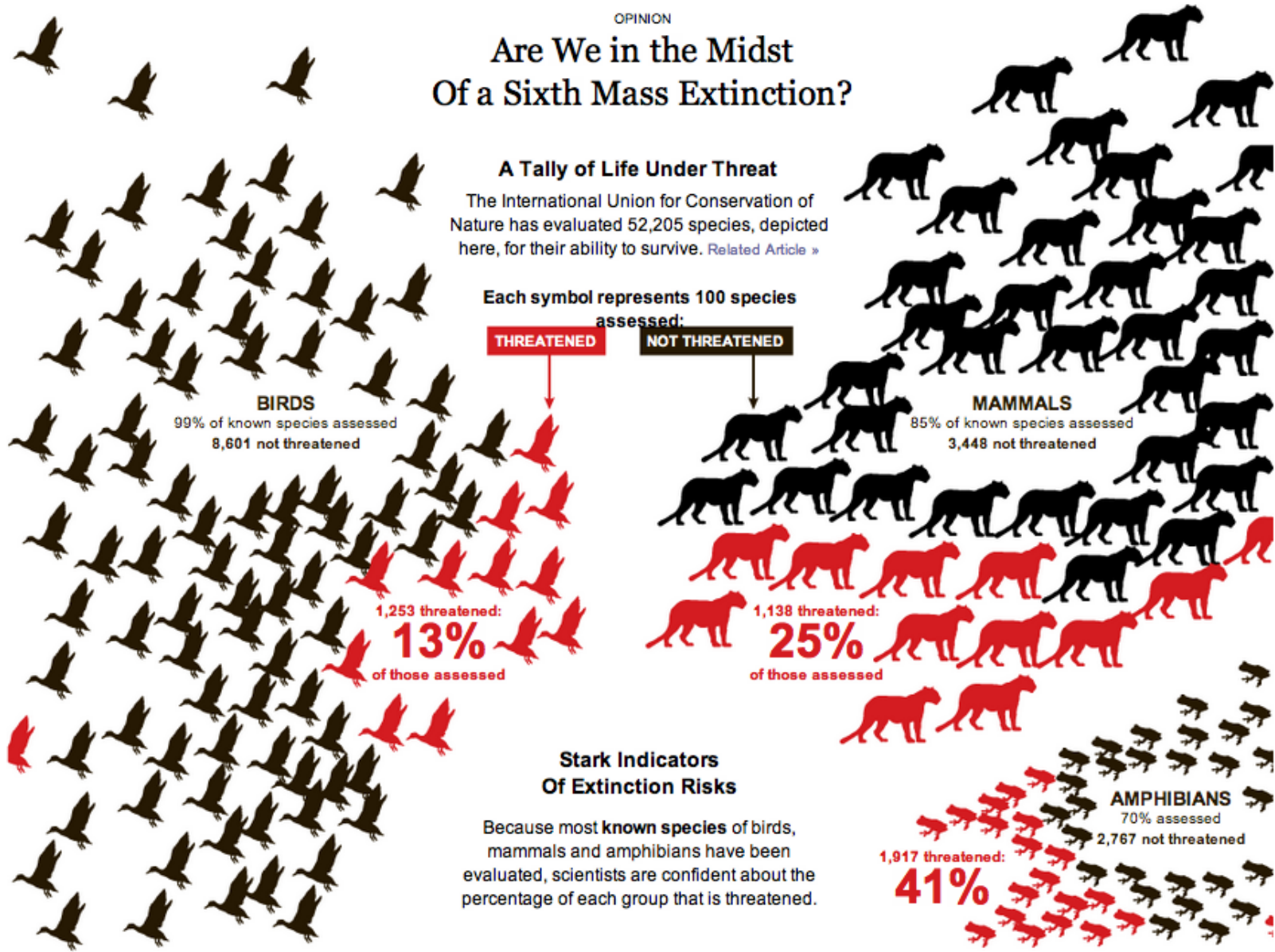
### A Tally of Life Under Threat

The International Union for Conservation of Nature has evaluated 52,205 species, depicted here, for their ability to survive. [Related Article »](#)

Each symbol represents 100 species assessed:

**THREATENED**

**NOT THREATENED**



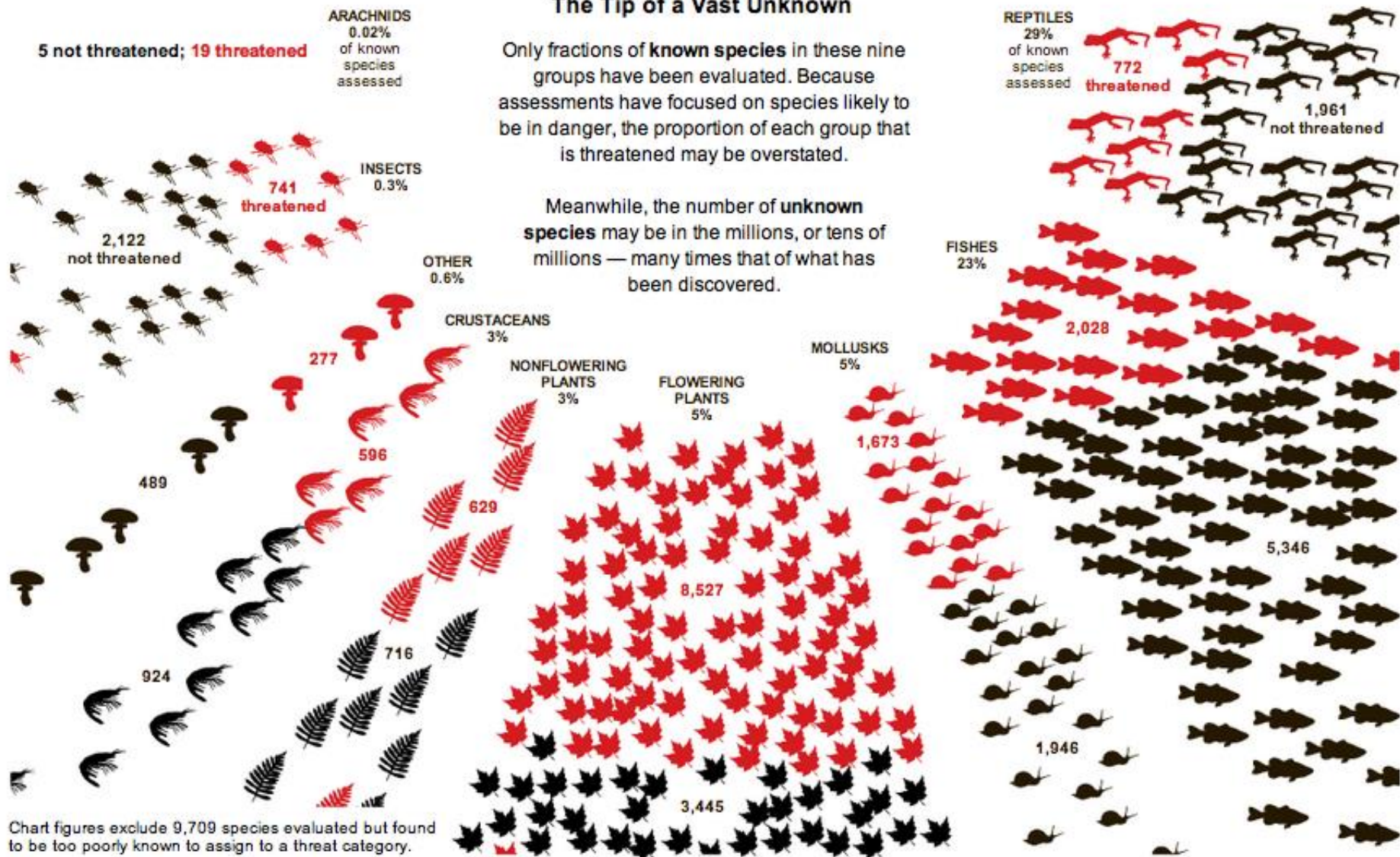
### Stark Indicators Of Extinction Risks

Because most **known species** of birds, mammals and amphibians have been evaluated, scientists are confident about the percentage of each group that is threatened.

## Other Threatened Life: The Tip of a Vast Unknown

Only fractions of **known species** in these nine groups have been evaluated. Because assessments have focused on species likely to be in danger, the proportion of each group that is threatened may be overstated.

Meanwhile, the number of **unknown species** may be in the millions, or tens of millions — many times that of what has been discovered.

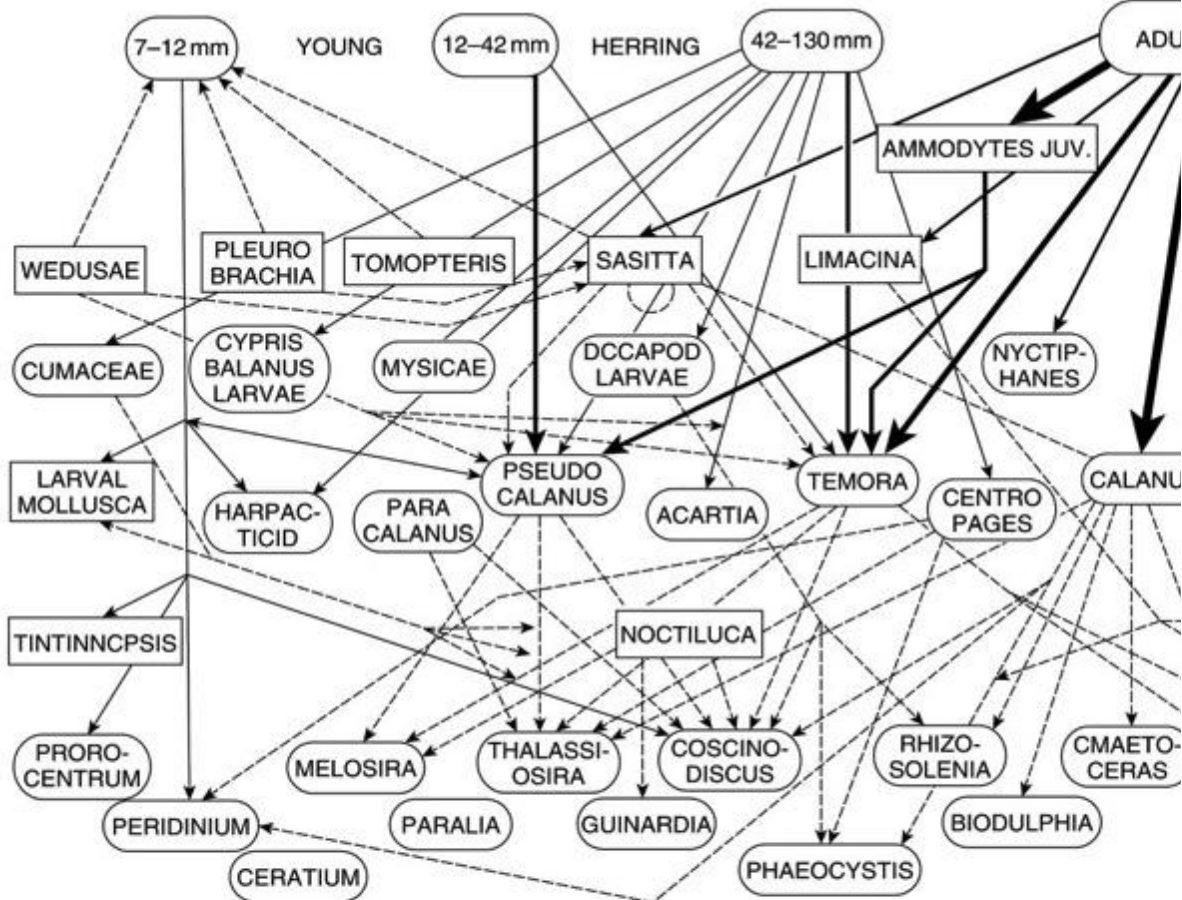


### Already Gone

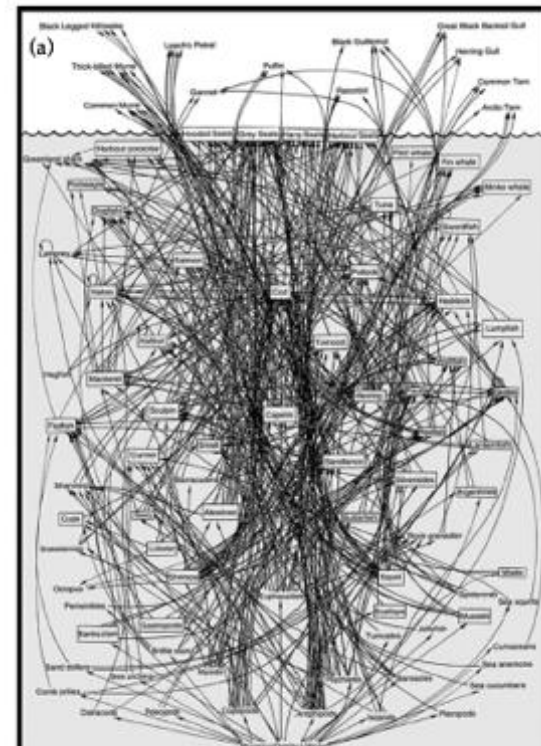
Species known to be extinct, or extinct in the wild, since 1500:

Mollusks	Birds	Flowering plants	Mammals	Fishes	Insects	Amphibians	Reptiles	Crustaceans	Nonflowering plants	Others	No known arachnid extinctions.
327	136	110	79	68	60	39	22	12	10	2	

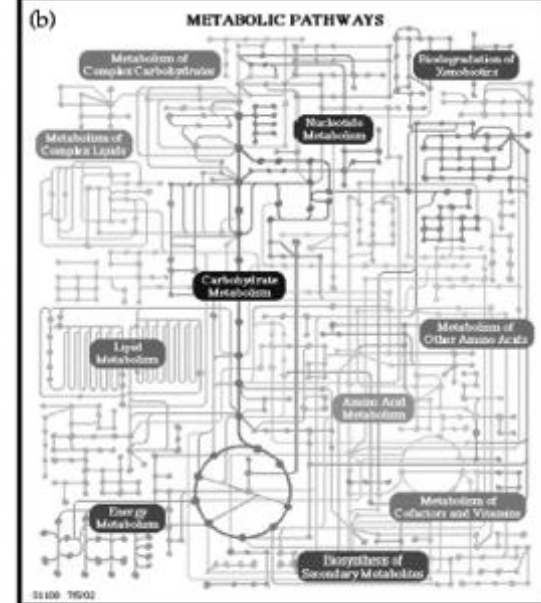
# Alt henger sammen...?



*Biological Oceanography*, Second Edition. Charles B. Miller, Pa  
 © 2012 John Wiley & Sons, Ltd. Published 2012 by John Wiley



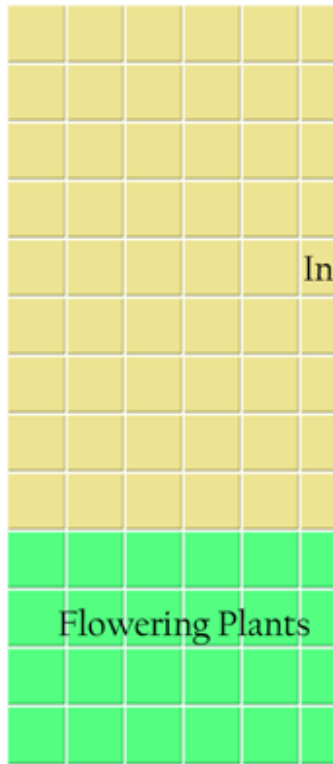
A simplified food web for the Northwest Atlantic



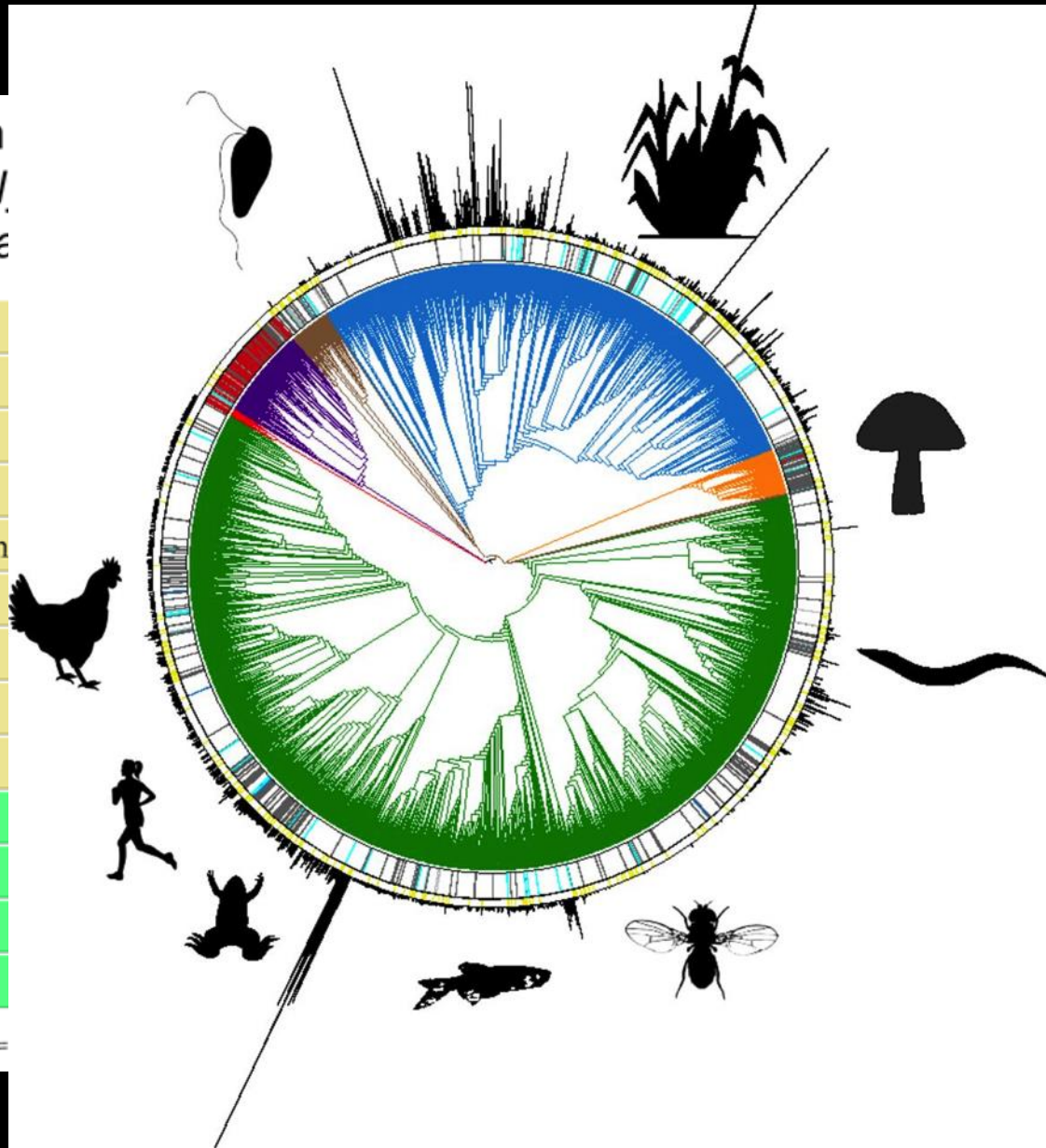
**Fig. 9.1** Alister Hardy's (1924) classic pelagic food-web diagram from large phytoplankton to herring. All of these li herring (and trophic levels above those) were also known in 1924. Recent insights introduce much more complexity at th (After Hardy 1924.)

# Hvor mange arter?

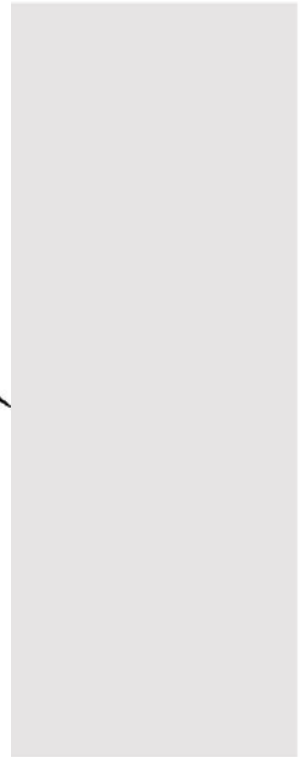
Known  
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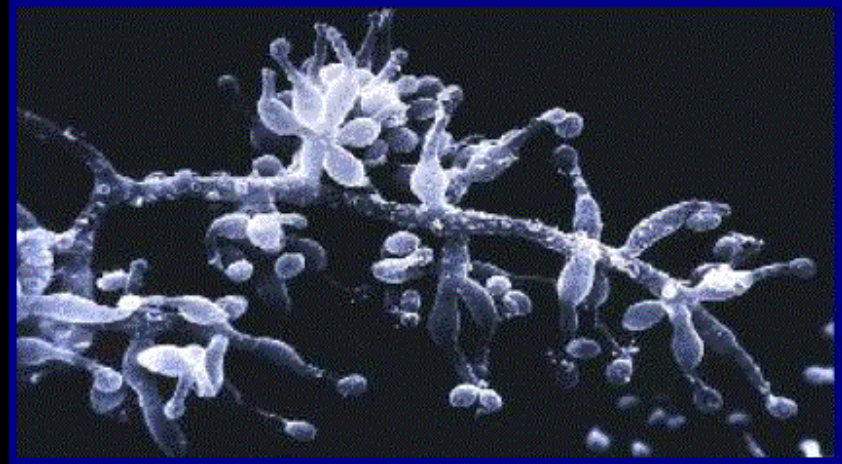


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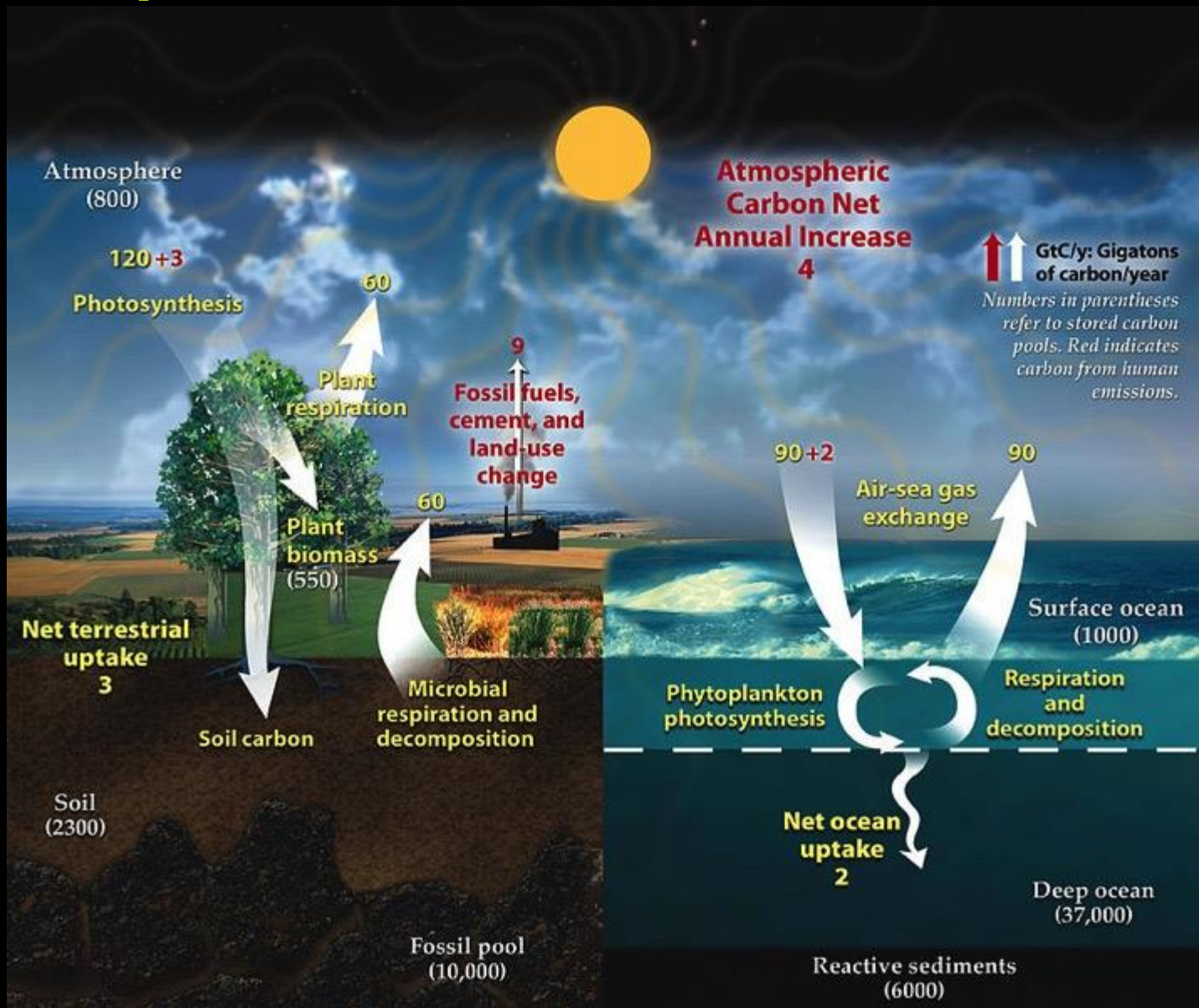


# Bier, blomster og økosystemtjenester

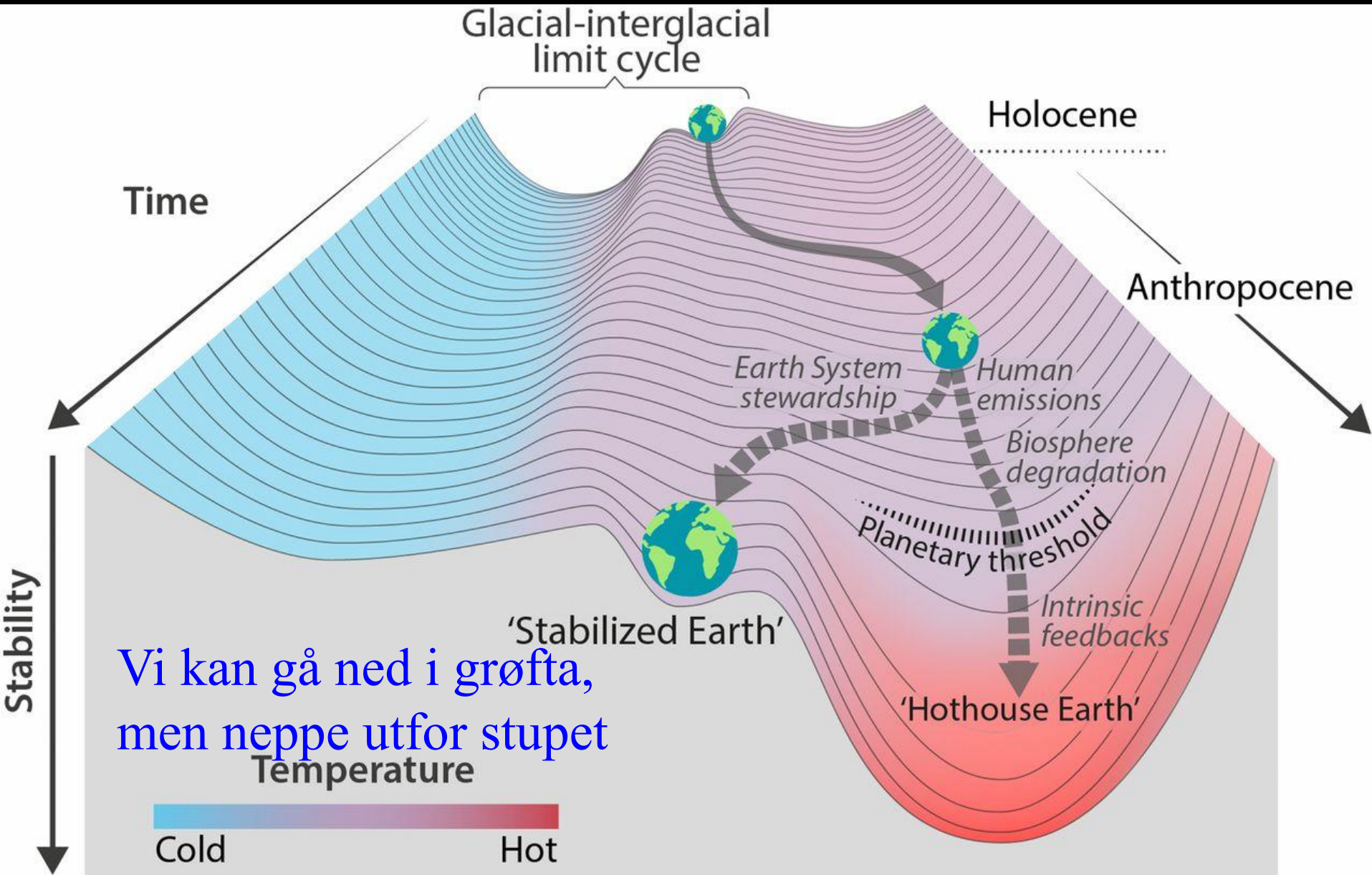
- Blomster og bier:
  - \$153 milliarder per år globalt
- *Coffea arabica* (C=0,39)  
Uganda \$227.000.000 \* 0,39 = \$88.500.000
- *Coffea canephora* (robusta)  
Vietnam €450.000.000 \* 1 = €450.000.000



# C-syklus domineres av biologi



# Verden er ikke lineær –



# Folkehelse og natur

- Mindre smerte, mindre frykt, redusert blodtrykk, mindre stresshormoner... ved opplevelser av natur og dyr
- **Natur istedet for piller**
- Natur stimulerer kreativitet
- Natur gir bedre livskvalitet
- Natur er god samfunnsøkonomi
- *Altså: natur må ikke være en salderingspost, men blir det i møte med "realitetene".*
- *Mer fokus på byutvikling og nærnatur*





# Bærekraftsmålene må integreres i opplæring og undervisning – fra barnehage til universitet

