

# Biodiversiteit houdt mensen gezond (?)

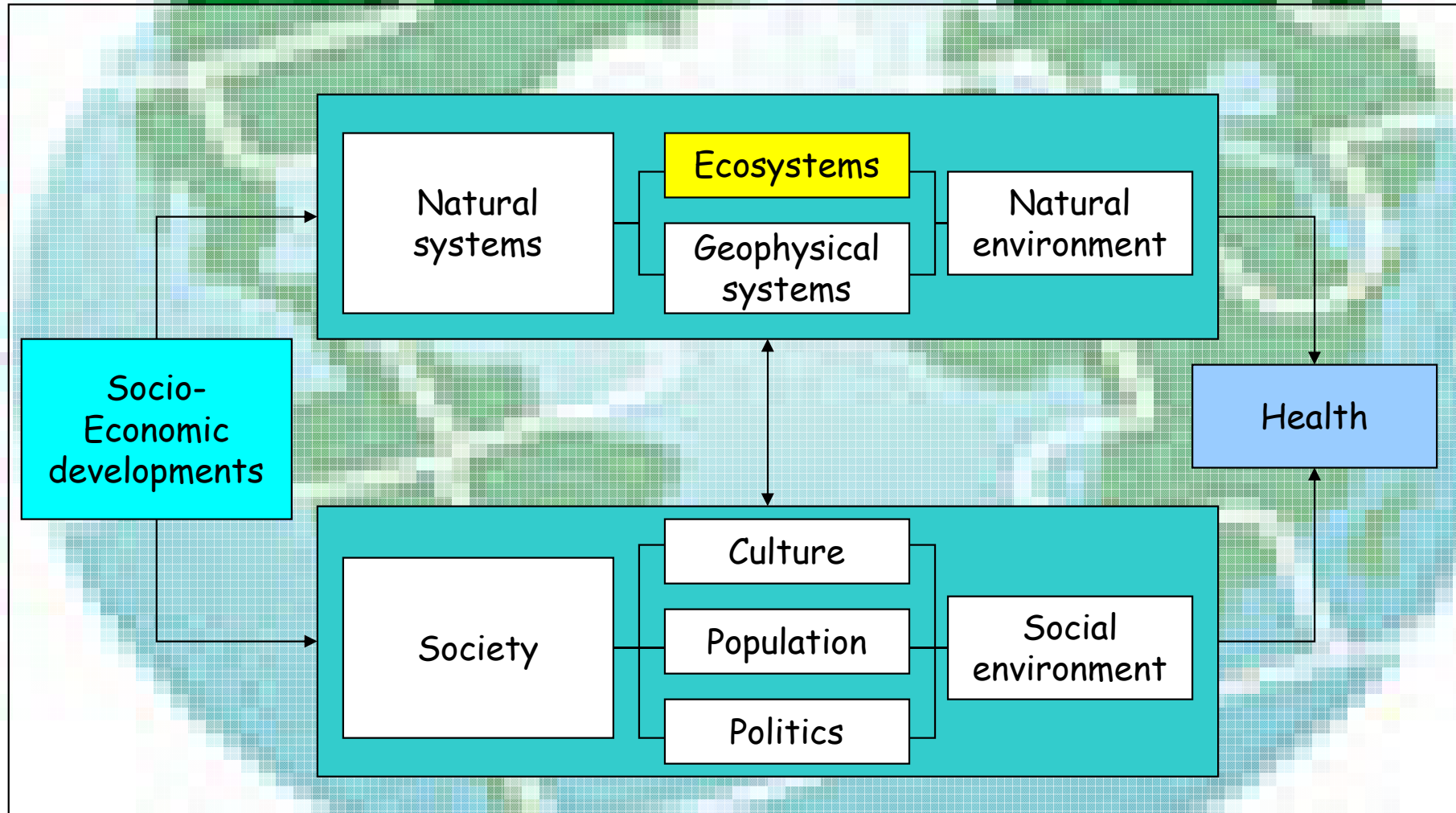
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-Stellenbosch University

Met dank aan Carijn Beumer en Dolf de Groot



# Health as an integrated sustainability index



# “The world’s Tropical Forests are in trouble

”

....

Land clearing (for  
Cultivation etc)



Climate change



Oil Palm Plantations  
(& other “energy crops”



Over-use of resources

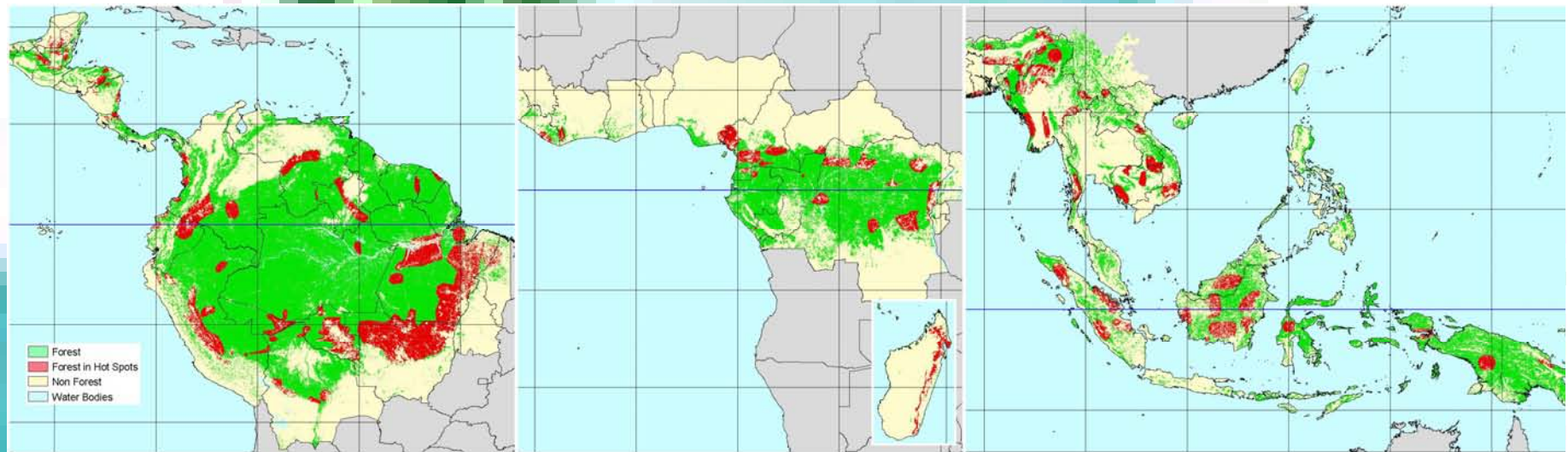


Logging

(& poaching, collecting etc)

Pollution (mining  
gold, bauxite, etc.)

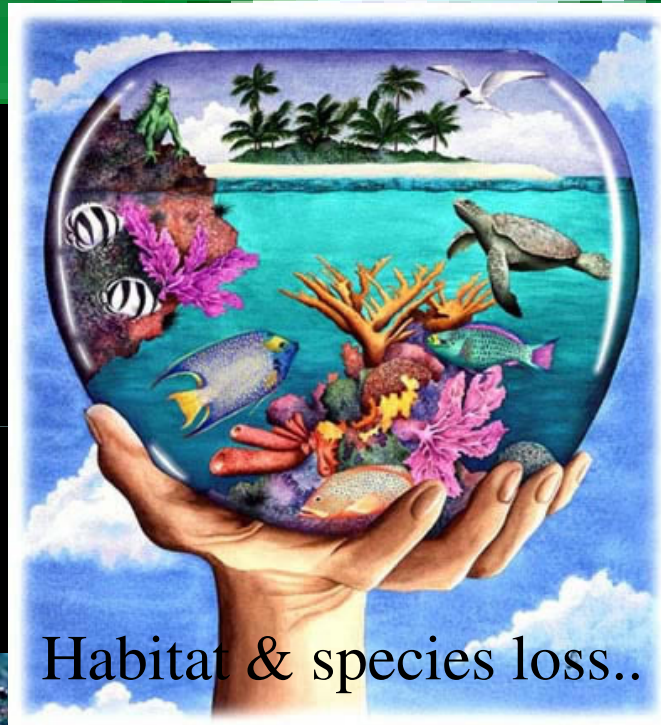




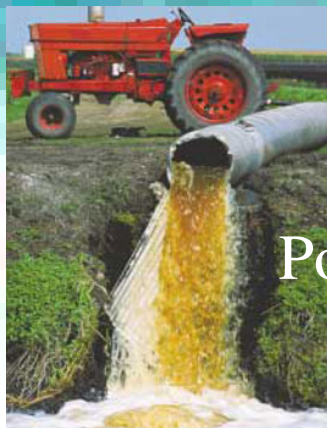
Lepers et al. 2003, based on data from Archard et al. 2002, De Fries et al. 2002 and Landsat Pathfinder

**Hot spots of tropical deforestation, and the causative patterns of tropical deforestation from 1850 to 1997, showing the proximate and underlying drivers of change**

# “The world’s Oceans are in trouble ...”

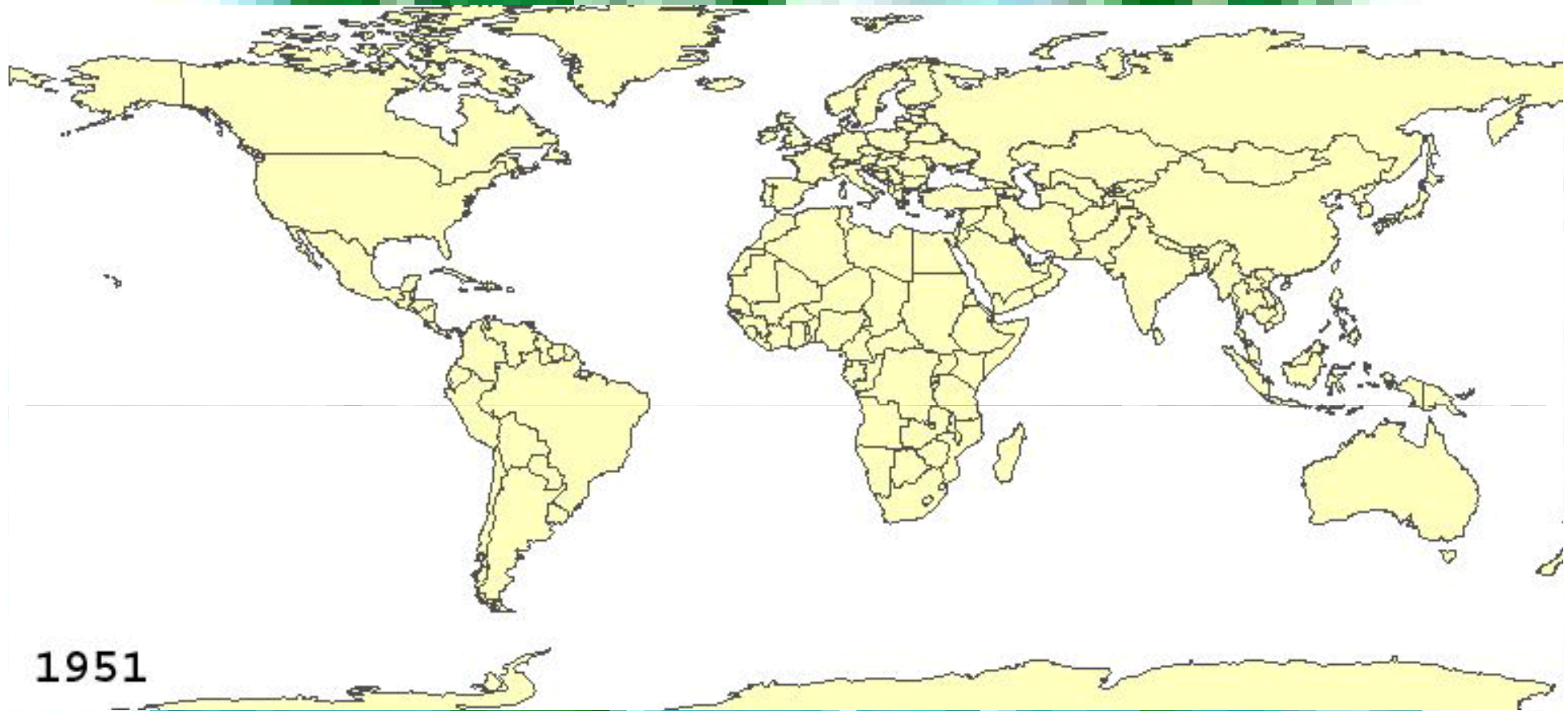


Over-fishing



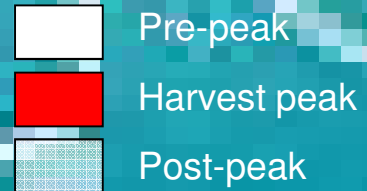
Transport





1951

## Year of Peak Fish Harvest



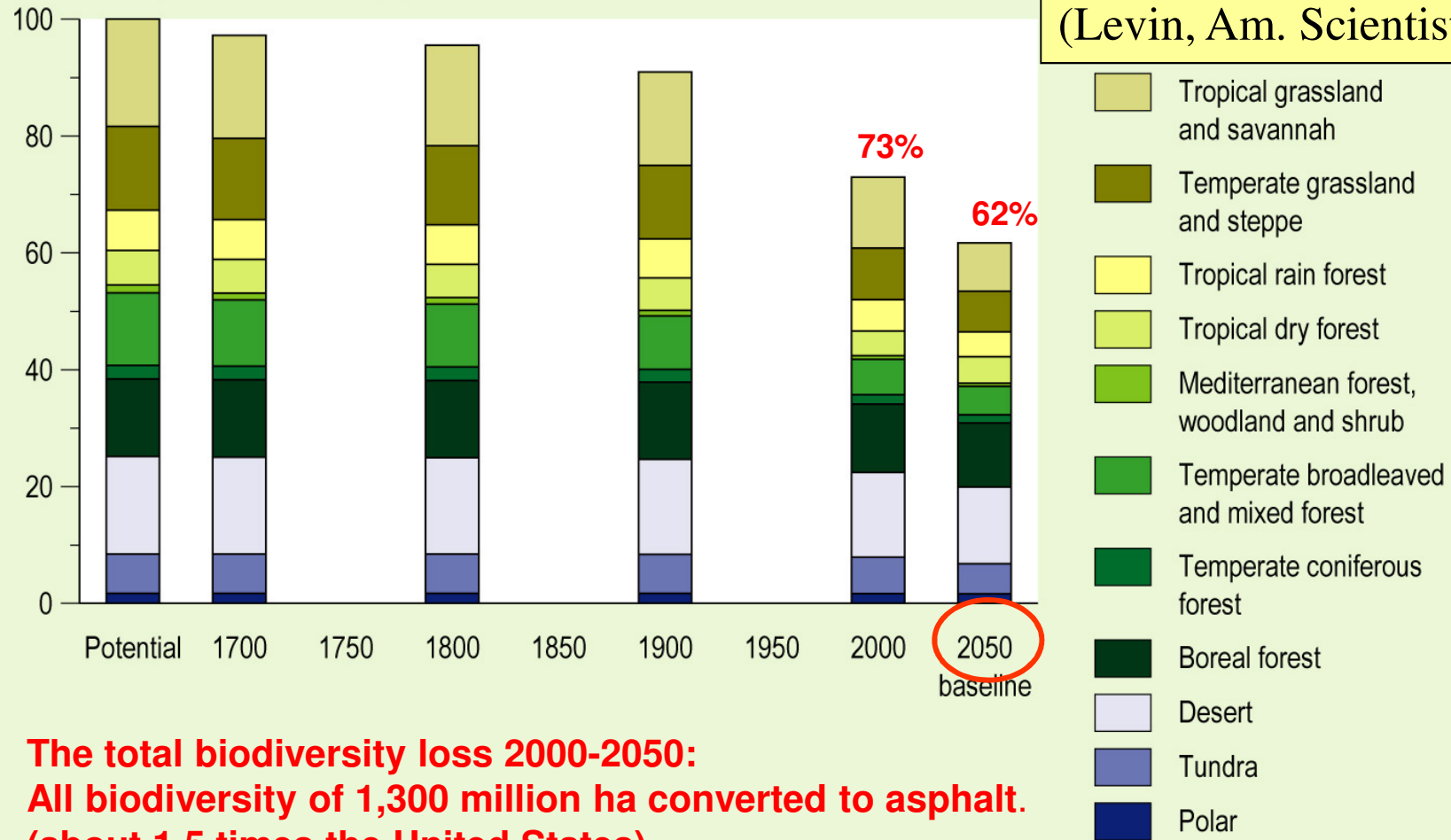
Source: Millennium Ecosystem Assessment and Sea Around Us project

# The Global Loss of Biodiversity

## Historic and future development of global biodiversity

1-30 million

Mean species abundance (%)



Estimated **loss of species:**  
 27.000 per year (or one species every 20 minutes)  
**100-1000 times faster than natural extinction rates**  
 (Levin, Am. Scientist, 2002)

**The total biodiversity loss 2000-2050:  
 All biodiversity of 1,300 million ha converted to asphalt.  
 (about 1.5 times the United States)**

# Is this a problem ..??

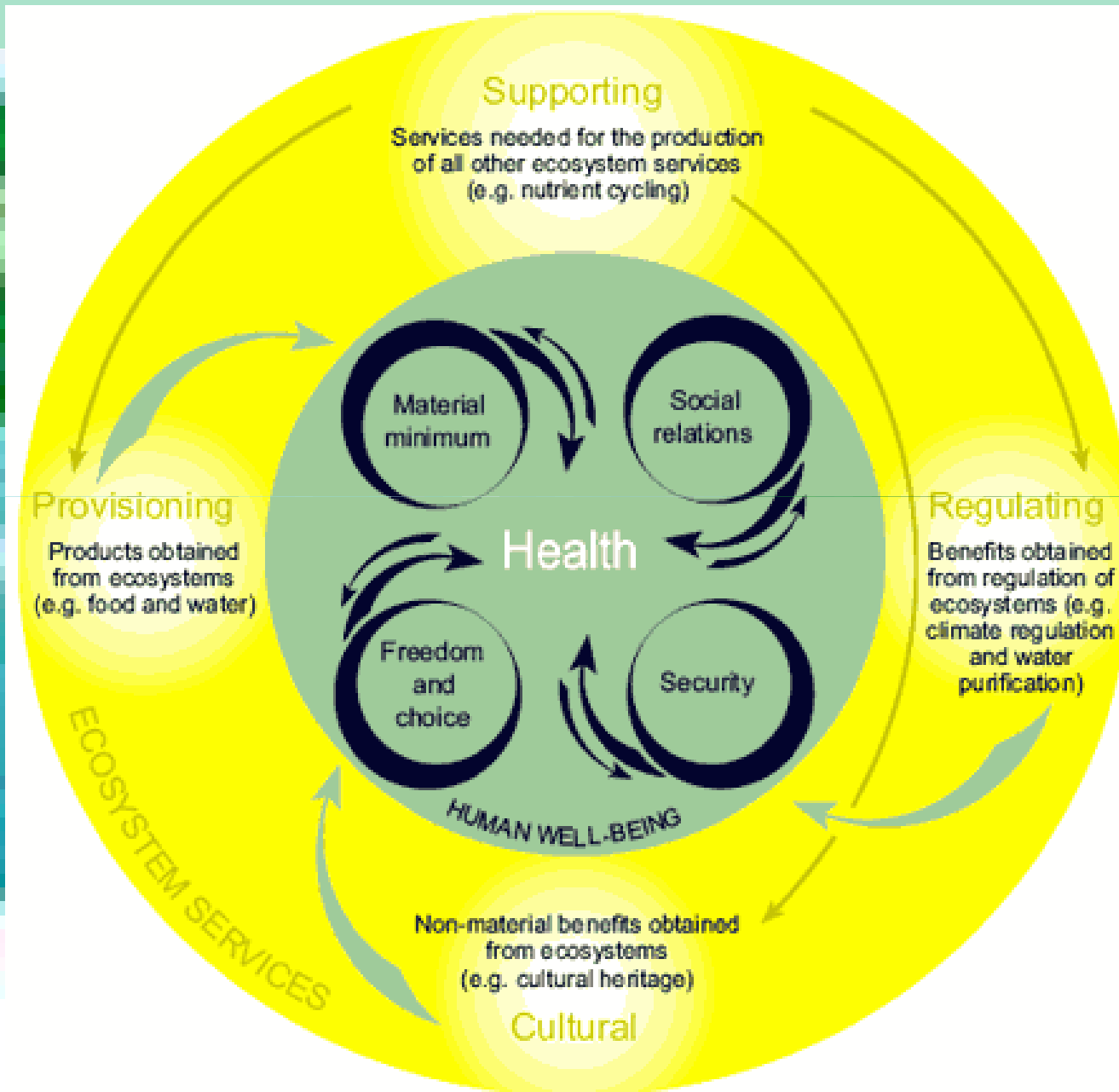
**True value (importance) often only becomes clear after what we valued is gone**



Or: why are (natural) ecosystems important ?



# Biodiversity and ecosystem functions crucial for human health



# Provisioning Services



Water



Food



Wood, Fiber, other  
Raw materials



Ornaments & souvenirs  
Medicines

# bio-prospecting - coral reef biodiversity

Alzheimer's Disease

Cancer

*The substance this worm, *Paranemertes peregrina*, uses to paralyze its prey can also serve as a treatment of Alzheimer's disease* © Harbor Branch Oceanographic Institution at Florida Atlantic University

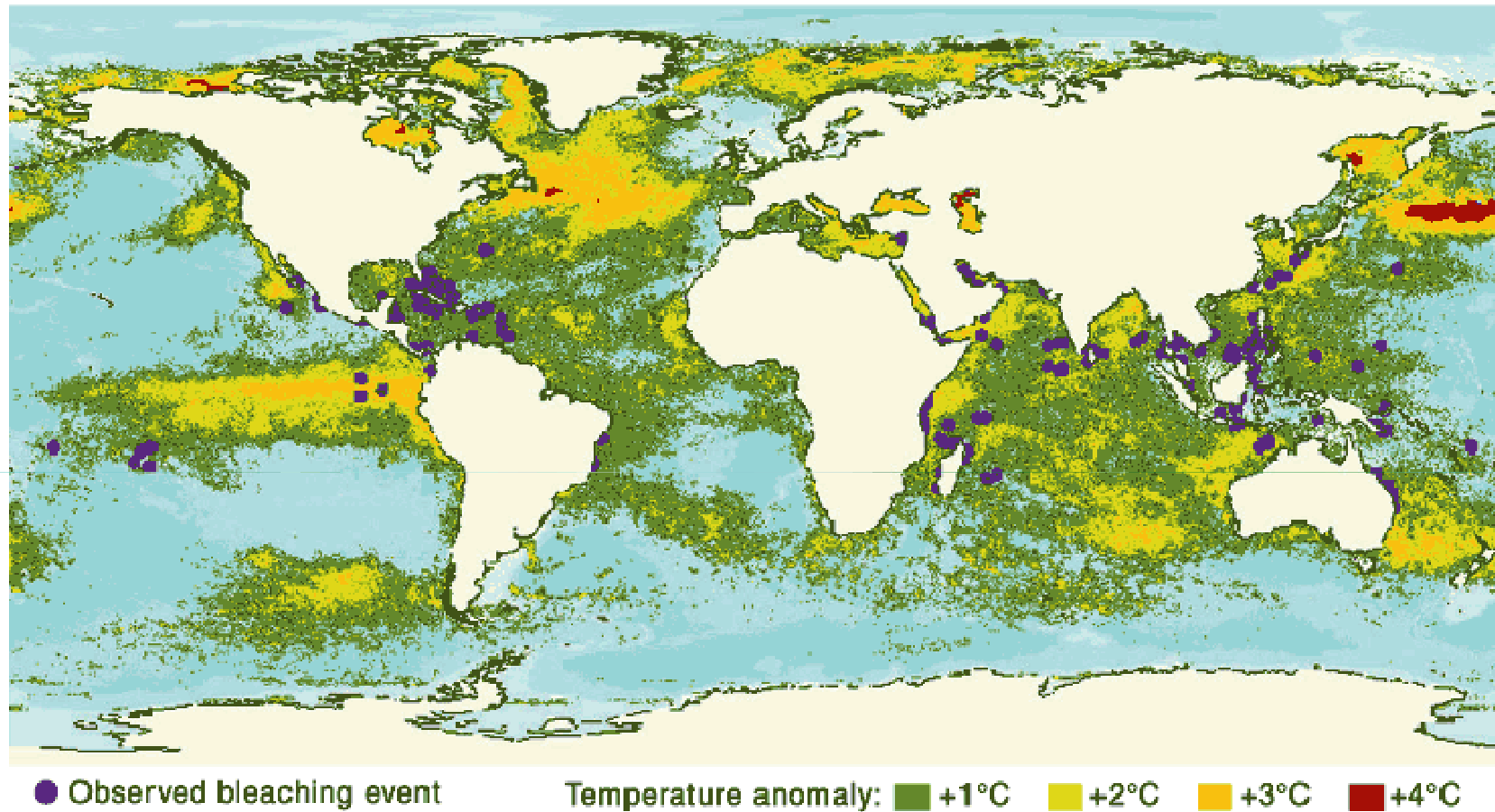


*This coral produces an anti-cancer drug currently under preclinical investigation* © Harbor Branch Oceanographic Institution at Florida Atlantic University



*Source : Manfred Walser / Christian Neumann, June 2008, "The Value of our Oceans", WWF Germany*

# Increasing SST and Coral Bleaching





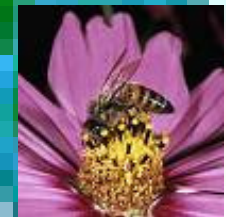
Images: Great Barrier Reef Marine Park Authority, Australia

# Regulating services: Biological Control



Animals that eat insects and small mammals have an important **pest-control** function

Many commercial crops depend on natural **pollination** by birds & insects



## Regulating services:

### Water purification capacity of Wetlands



Organic Matter & Nutrients  
*(based on sustainable use levels)*

Org. matter : 26 kg BOD/ha/day  
*(=ca 300 pers.equiv.)*

Nitrogen: 365 - 2.715 kg/ha/year

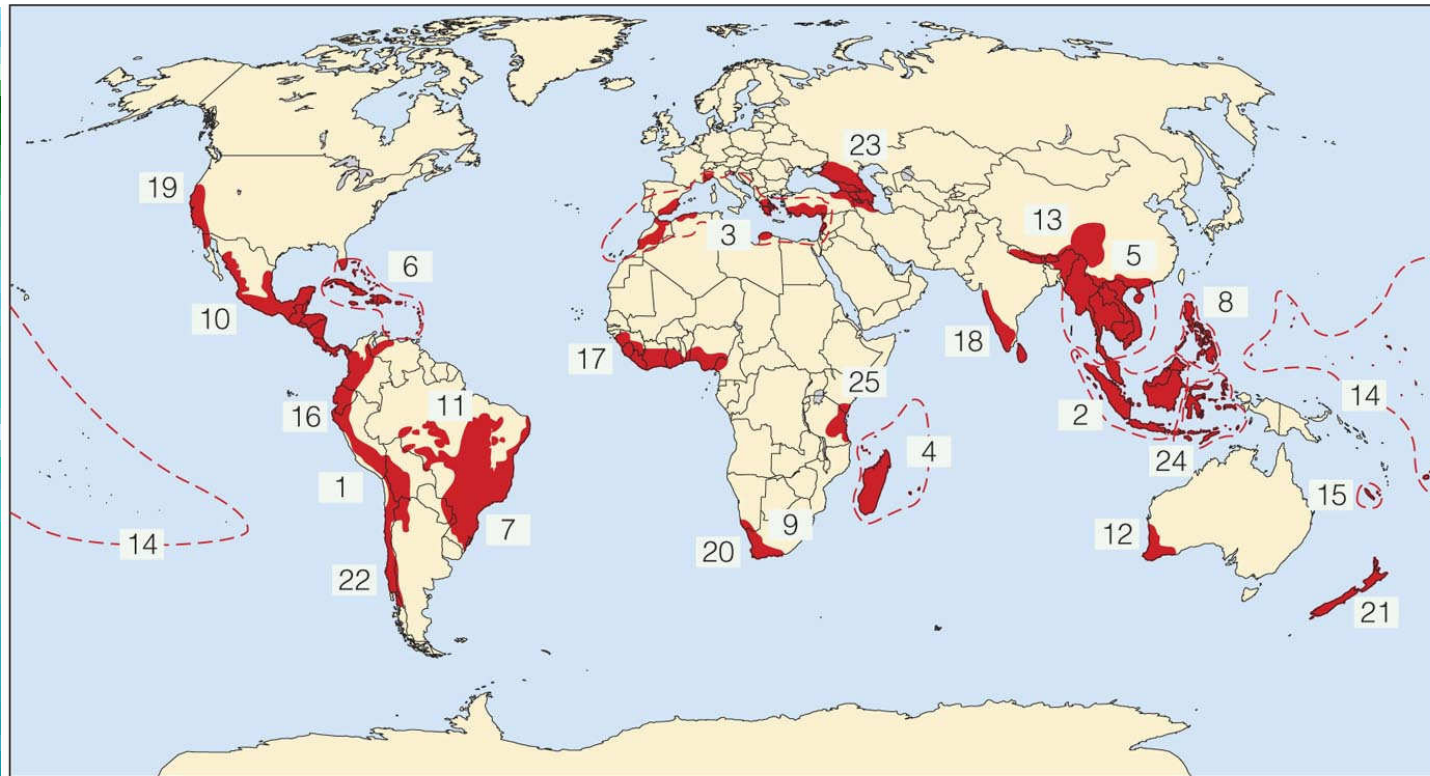
Phosphate: 365-1.330 kg/ha/year

**Other (human) waste:**

eg. pesticides, metallic elements (eg. mercury), oil, etc.  
*(danger of accumulation and irreversable effects)*

# Supporting services: Genepool protection (& evolutionary processes)

Centers of Genetic Diversity coincide largely with Biodiversity Hotspots

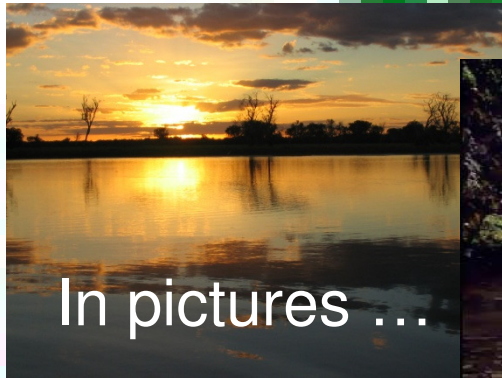


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Most of our **food** comes from only 11 crops (eg. rice, maize, potatoes)  
To maintain their **vitality** and **productivity**, they need regular cross-breeding with their wild ancestors



# Cultural & Amenity Services



In pictures ...



Screen-savers



Eco-tourism

Amenity value

in books, lit, painting



Therapeutic Value



Nature in Art



Science & Education



# More biodiversity: improved health?

Exotic species (Travel, transport)  
Insects and rodents



Trade-offs:

Eradication Bats Latin America – decline rabies and other diseases  
-improved health through healthy livestock –  
more mosquitoes – risks malaria & dengue

Water-management Great Lakes – less swamps – less mosquitoes –  
- But decline local fisheries

Nature is "priceless" ...

