



# Introduction to Natural Capital

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# Outline of Presentation



- What is Natural Capital?
- Global status of biodiversity and ecosystems
- Potential impacts of ecosystem services on economic activities
- Conclusions



## What is Natural Capital?





# Natural Capital: Definition



**Natural capital is the stock of capital derived from natural resources such as biodiversity and ecosystems, in addition to geological resources such as fossil fuels and mineral deposits.” (TEEB 2013)**

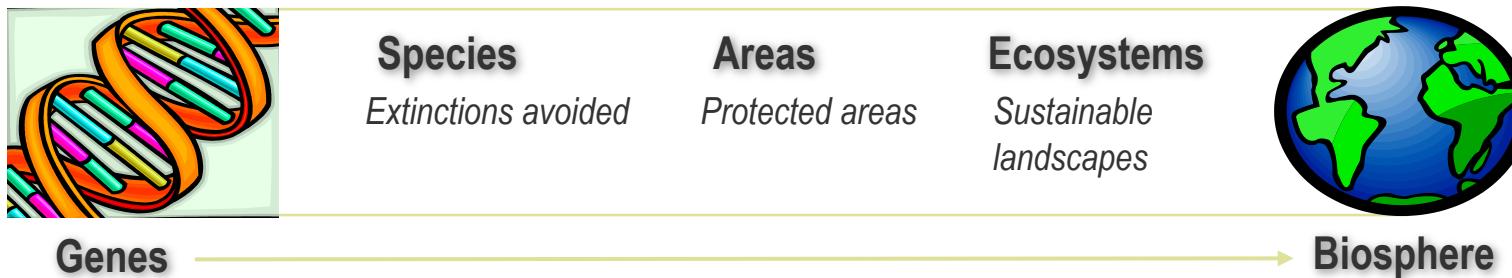




# Biodiversity and Ecosystem Services



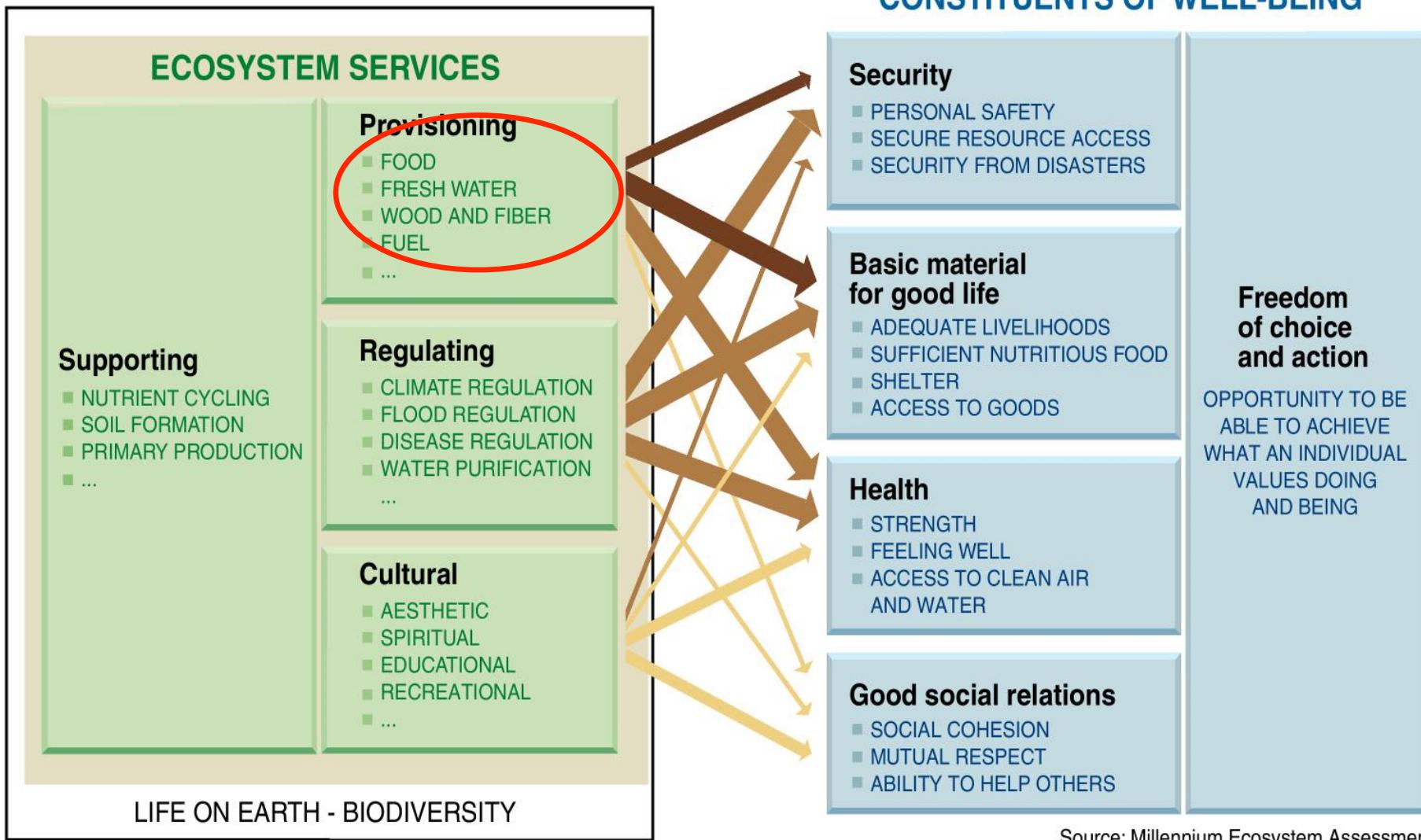
**Biodiversity** is the variety of living organisms including of terrestrial, marine and aquatic ecosystems and the ecological complexes of which they are part.



**Ecosystem Services** are the contributions that ecosystems (whether natural or semi-natural) make to human well-being.

- Regulating, Cultural, Provisioning, Supporting (MEA, 2005)

# + Ecosystem services and human well-being



Source: Millennium Ecosystem Assessment

# <sup>+</sup> Regulation Services

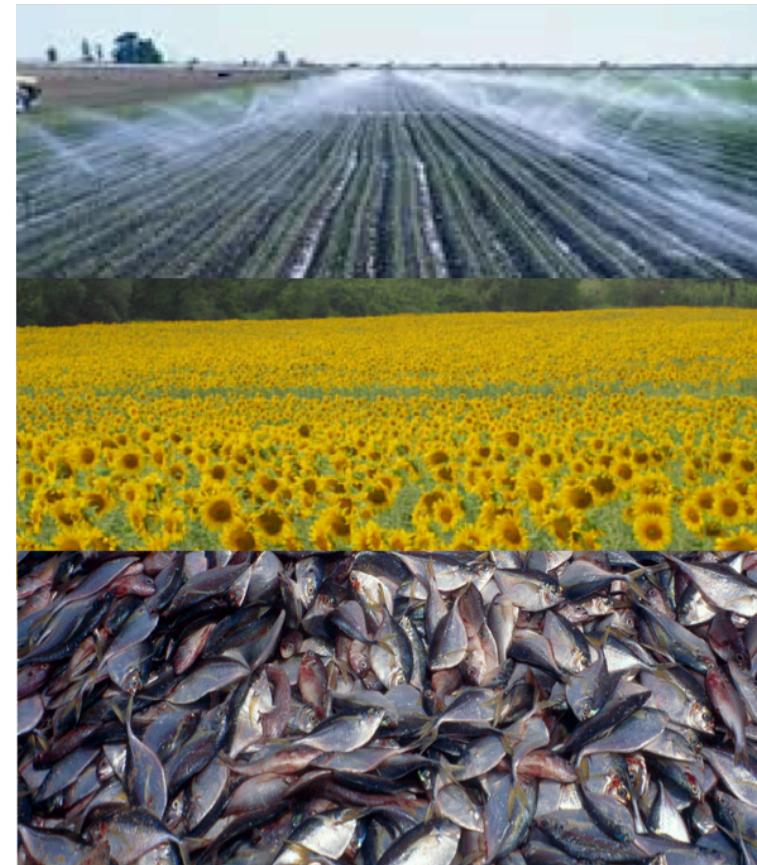
- Water regulation
- Disturbance regulation
- Erosion control
- Soil creation
- Pollination
- Climate regulation
- Nutrient cycling
- Biological control
- Waste absorption





# Provisioning Services

- Raw materials (construction and fuel wood, biofuels, plant oils, etc)
- Food production (wild and agro-ecosystems, marine and freshwater systems)
- Fresh water
- Medicinal resources



# <sup>+</sup> Cultural Services

- Non-material benefits
- Spiritual enrichment
- Recreation, tourism
- Cultural significance
- Scenery





# Supporting Services

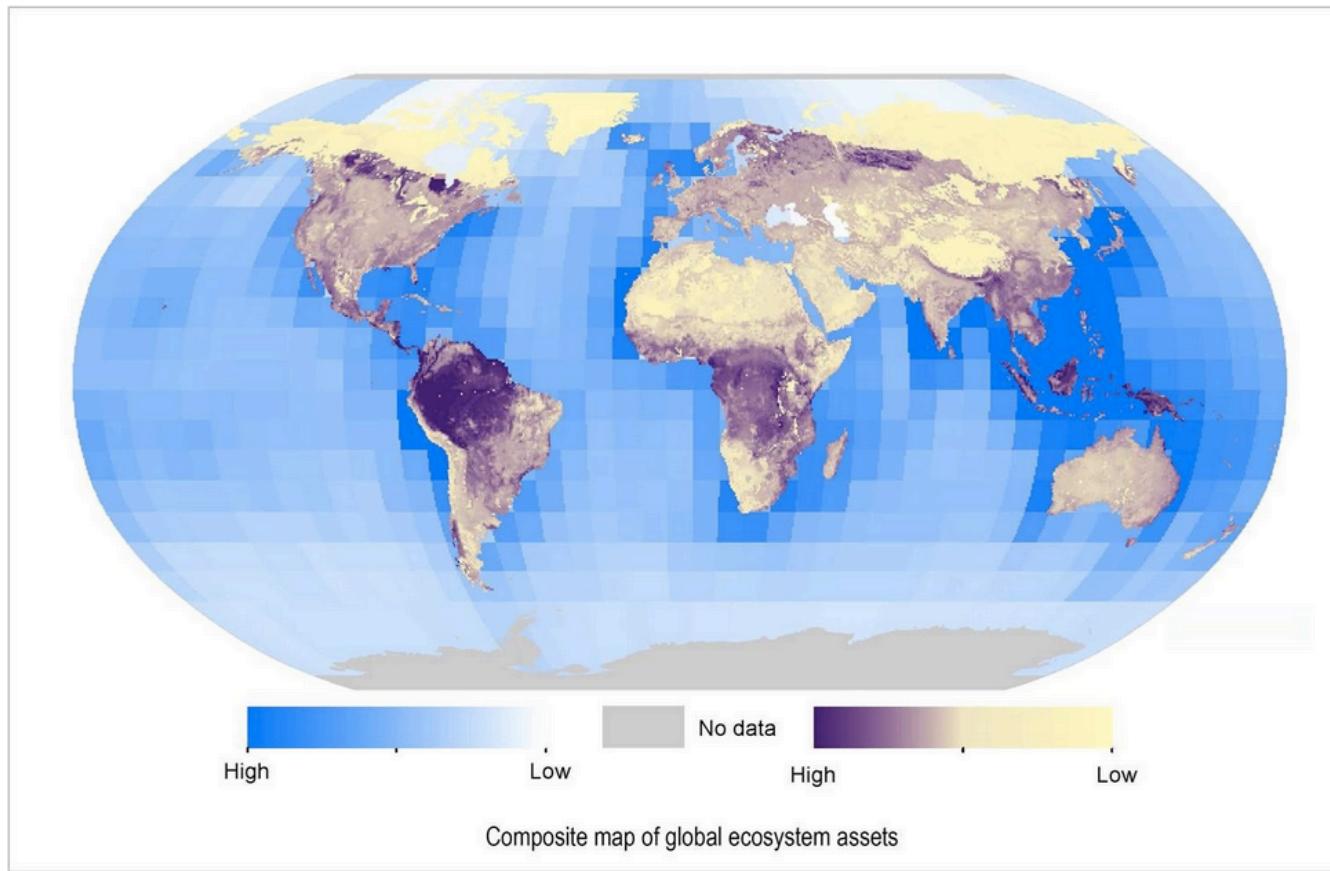
Necessary for the production of all ecosystem services:

- Biomass production
- Production of oxygen
- Soil formation and retention
- Nutrient cycling
- Water cycling
- Habitat
- Genetic diversity





# Global ecosystem assets



UNEP-WCMC, 2014



## Challenges with Natural Capital



- Concept involves identifying ecosystem services as first step
- Need to look beyond impacts to dependencies,
- Must consider stocks but also service flows
- Services are non-market goods—no price to indicate scarcity
- Optimizing use of one service could negatively affect others
- Multifunction of ecosystems needs to be maintained
- Valuation and aggregation remain controversial

+ Global status of biodiversity  
and ecosystems





## Global Status

- Natural resources are being consumed on average 50% faster than the biocapacity of the planet.
- 2/3 of biodiversity and ecosystem services (BES) are either degraded or in decline.
- Trend likely to continue due to population growth and increased pressures on natural resources.



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**66% of fish stocks are degraded**



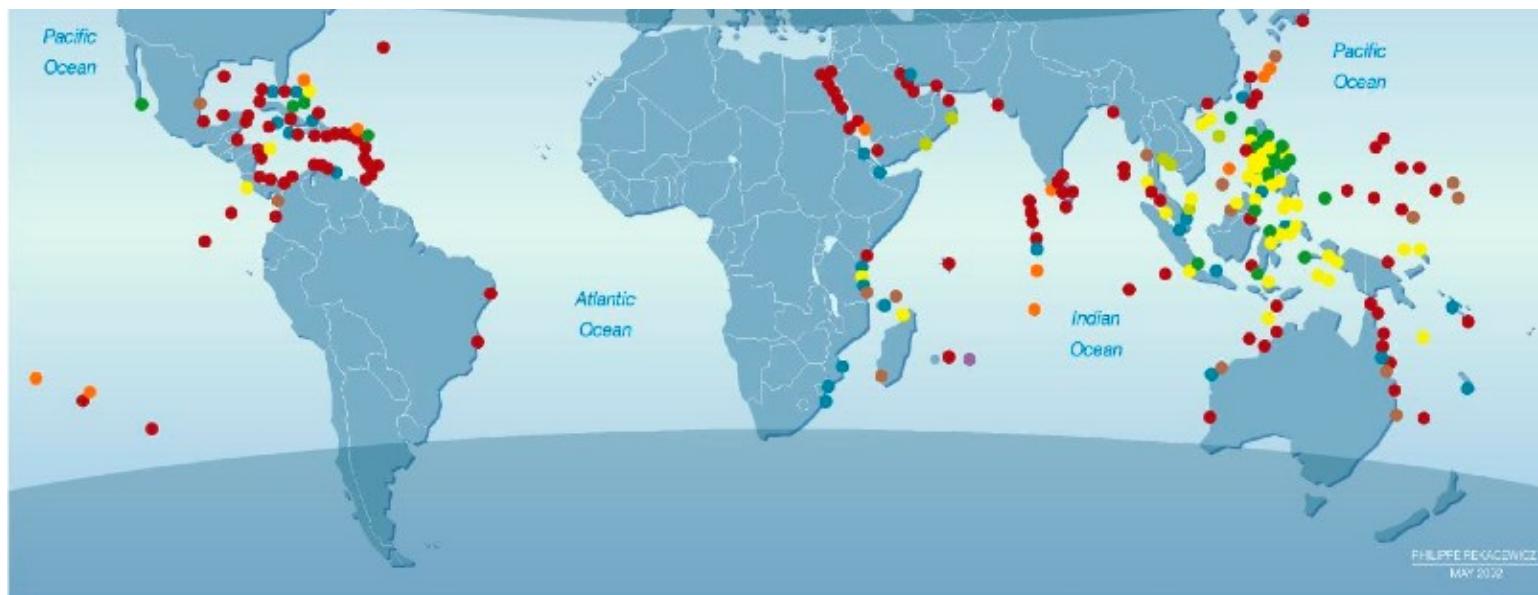
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20% of coral reefs have been lost  
and another 20% are degraded

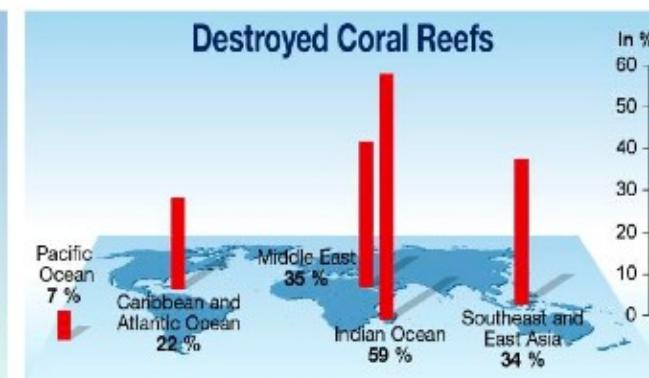
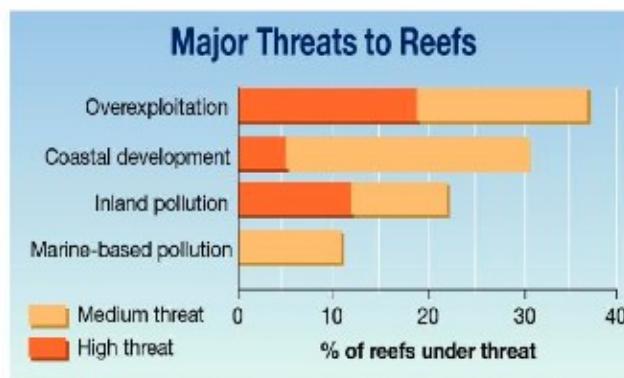




# Pollution and coastal zone development impact on reefs



Categories
Tourism
Poison fishing
Overexploitation
Sedimentation
Coral harvesting
Dynamite fishing
Pollution



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50% of mangroves have been lost  
in the last 5 decades



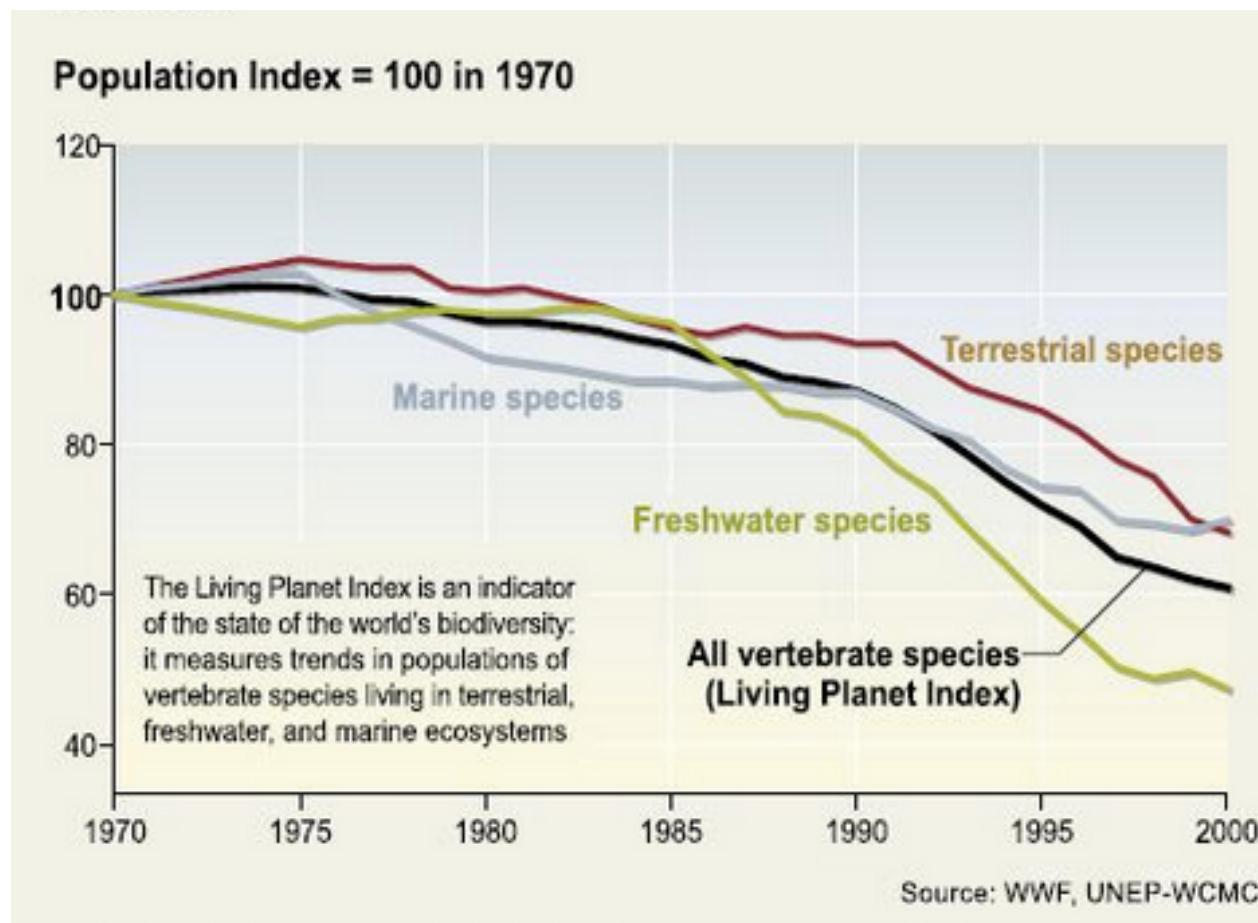
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**<1% of water is available and  
70% is used by agriculture.**



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## 40% decline in biodiversity in the last 30 years



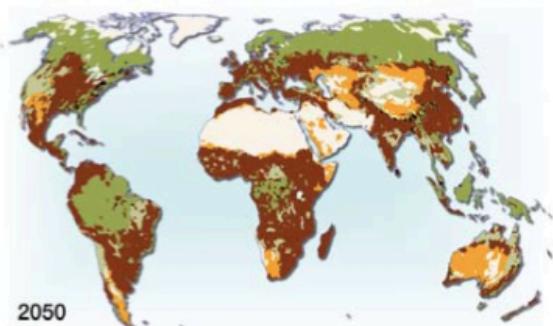
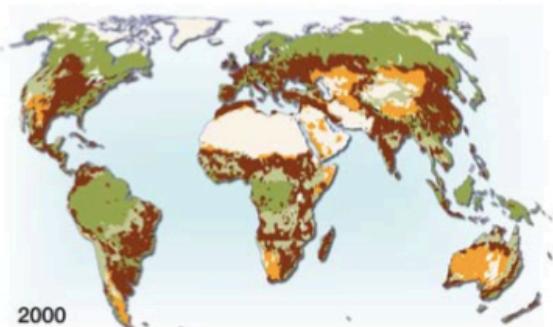
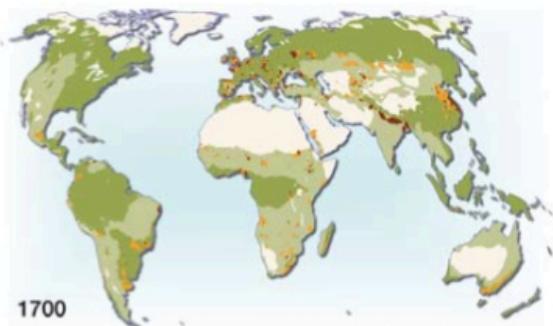


# Biodiversity hotspots





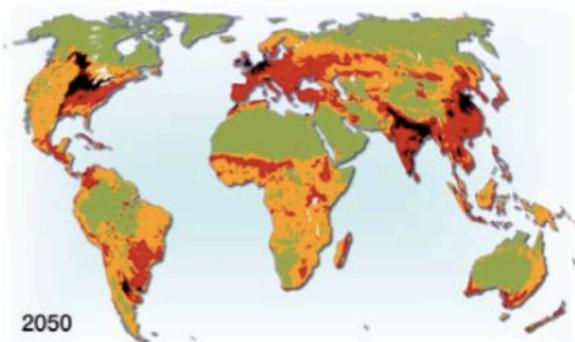
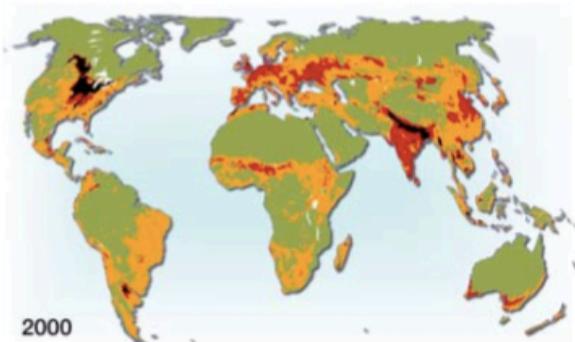
# Expansion of croplands



## Landuse and agriculture

- Agricultural land
- Extensive grasslands (incl pasture)
- Regrowth after use
- Forests
- Grasslands
- Non-productive land

## + Loss of global biodiversity due to cropland expansion



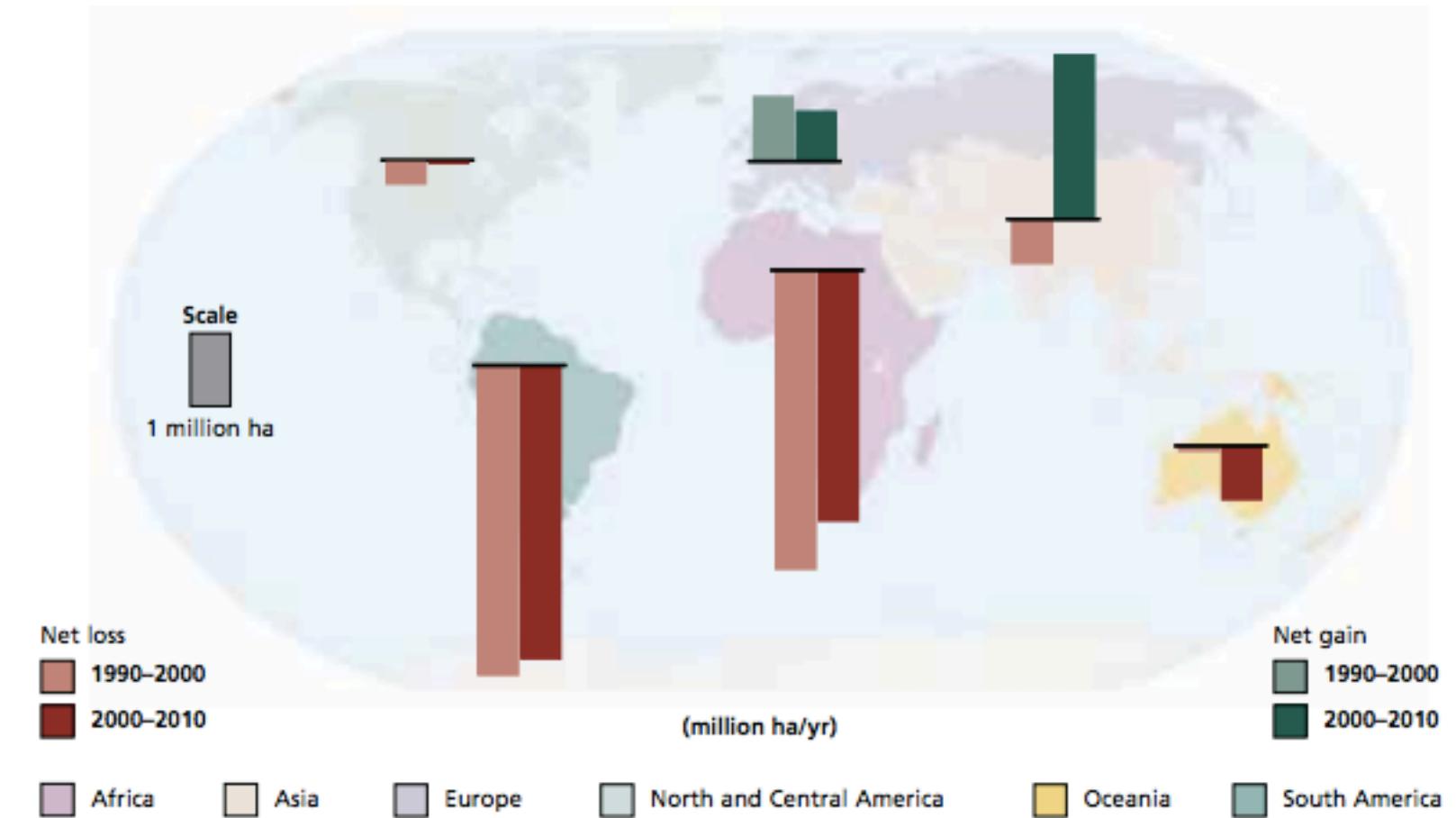
Biodiversity, as ratio of species abundance before human impacts

■	High impacts	0 - 25
■	High-medium impacts	25 - 50
■	Medium-low impacts	50 - 75
■	Low impacts	75 - 100 %

Mean species abundance (%)

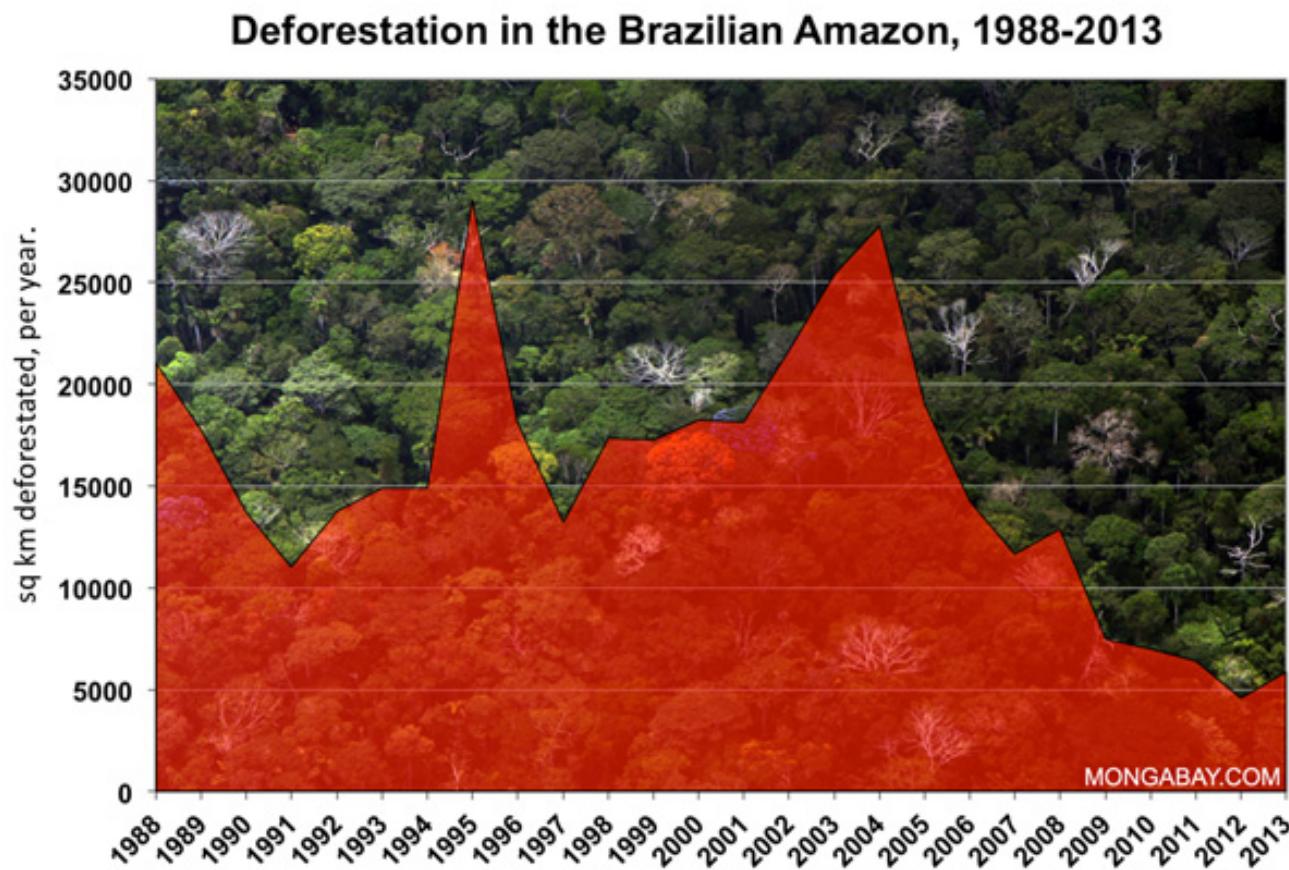


# Global Forest loss and regrowth





# Loss of the Amazon forest declined but rose in 2013



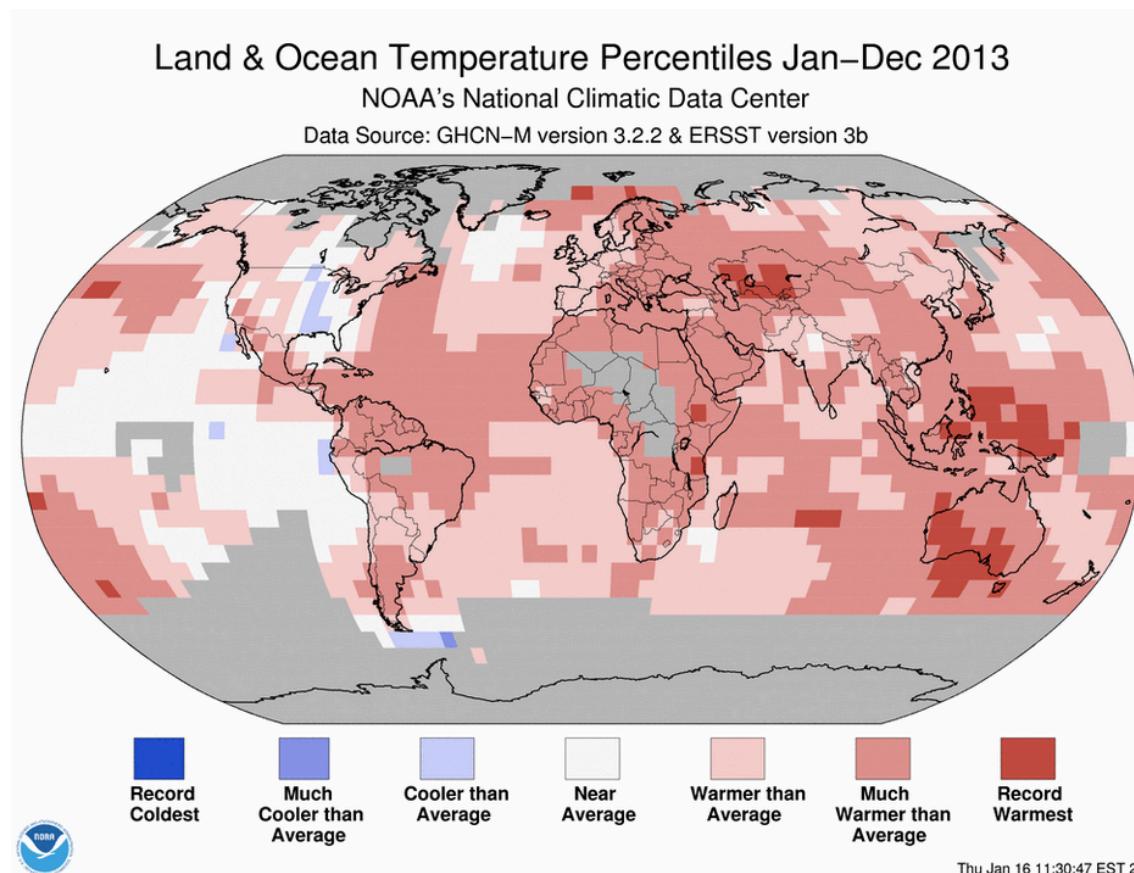
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**20% of GHG emissions are the result of forest loss**





# Climate change is evident, 2014 warmest year on record



# + Nature is necessary for well-being

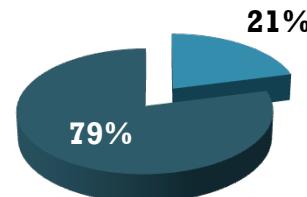
**“GDP of the Poor” is the most affected by ecosystem losses**



**Ecosystem services dependence**

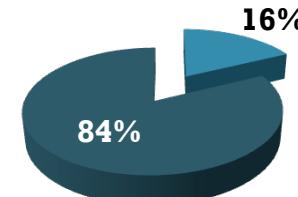
**Indonesia**

**99 million**



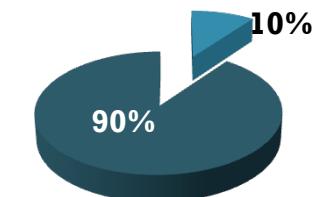
**India**

**352 million**

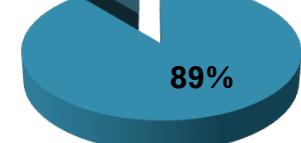
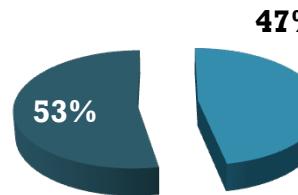
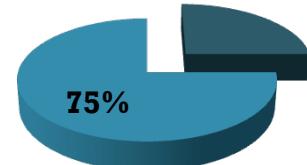


**Brazil**

**20 million**



**Ecosystem services as a Percentage of classical GDP**



**Ecosystem services**

**+** Impact of ecosystem service provision on economic activities



## + Why is natural capital relevant for Financial Institutions?

50% of company earnings could be at risk from environmental externalities. (PRI, 2013)

- Growing demand for natural capital
- Supply failure due to natural resource constraints.
- Supply chain impacts
- Delays in licenses
- New regulation and market demand
- WAVES - World Bank to include cost of biodiversity and climate in national accounts.



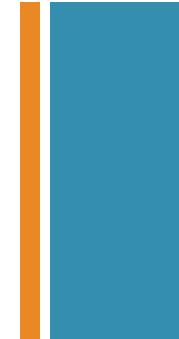
## Externalities generate high costs to society.



- Production (agriculture, forestry, fisheries, mining, oil & gas, utilities) and processing (cement, steel, pulp & paper, petrochemicals) sectors generate 7.3 trillion in externalities (13% of global economic output in 2009).
- Value of Top 100 externalities is estimated at US\$4.7 trillion
- Most costs from GHG (38%); water use (25%); land use (24%); air pollution (7%), land and water pollution (5%) and waste (1%).



# Policy implications



- Over 30 countries have legislation to enable compensation for BES impacts.
- National-level reviews of status of BES in Brazil, India, the UK, Germany and the Netherlands may lead to new regulation
- Valuation of natural capital is still missing from these.





## GREEN MARKETS: Scope for growth

TEEB for Business  
identified new markets for  
biodiversity and  
ecosystem services.

Table 2: Emerging markets for biodiversity and ecosystem services

Market opportunities	Market size (US\$ per annum)		
	2008	Estimated 2020	Estimated 2050
<b>Certified agricultural products</b> (e.g., organic, conservation grade)	\$40 billion (2.5% of global food and beverage market)	\$210 billion	\$900 billion
<b>Certified forest products</b> (e.g., FSC, PEFC)	\$5 billion of FSC-certified products	\$15 billion	\$50 billion
<b>Bio-carbon / forest offsets</b> (e.g., CDM, VCS, REDD+)	\$21 million (2006)	\$10+ billion	\$10+ billion
<b>Payments for water-related ecosystem services</b> (government)	\$5.2 billion	\$6 billion	\$20 billion
<b>Payments for watershed management</b> (voluntary)	\$5 million Various pilots (Costa Rica, Ecuador)	\$2 billion	\$10 billion
<b>Other payments for ecosystem services</b> (government-supported)	\$3 billion	\$7 billion	\$15 billion
<b>Mandatory biodiversity offsets</b> (e.g., US mitigation banking)	\$3.4 billion	\$10 billion	\$20 billion
<b>Voluntary biodiversity offsets</b>	\$17 million	\$100 million	\$400 million
<b>Bio-prospecting contracts</b>	\$30 million	\$100 million	\$500 million
<b>Private land trusts, conservation easements</b> (e.g., North America, Australia)	\$8 billion in U.S. alone	\$20 billion	Difficult to predict

Source: Adapted from Forest Trends and the Ecosystem Marketplace (2008)<sup>61</sup>



# Growing interest by Financial Institutions

- Water Disclosure through Carbon Disclosure Project supported by 354 investors (US\$43 trillion assets).
- Report from 8 investors (£787 billion assets) highlighted risks and opportunities in BES for extractives.
- Coalition of 30 investors (US \$170 billion) urged EPA to evaluate mine waste impacts on salmon.





## Conclusions





## Conclusions



- At least some externalities will at some point be internalized.
- The links between BES and corporate value through impacts on share prices are growing.
- Shareholders are becoming increasingly engaged on the issue.
- Governments are exploring regulatory or policy changes through frameworks for ecosystem services accounting and evaluating the status and value of ecosystem services.



# What is needed to advance Natural Capital approaches?

- **Awareness:** understanding of ecosystem services and links to business is still low.
- **Skills:** banks and companies lack the skills and experience to be able to understand ES issues and their potential impact on corporate value and performance.
- **Assessments:** evaluating the risks and opportunities associated with BES is difficult but necessary.
- **Valuation:** estimating financial value is challenging, methodologies are still developing.



*If financial markets begin to incorporate information about companies' impacts and dependencies on natural capital, and associated risks and opportunities, these signals will be transmitted to companies and governments. This information will shine a light on practices that undercut ecosystem functions and that must change.*



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