



Millennium Ecosystem Assessment: Implications for the Americas

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Organization of American States
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Contents

- Background of the MA
- Main findings
- Latin America in the global context
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Ecosystem services







Question

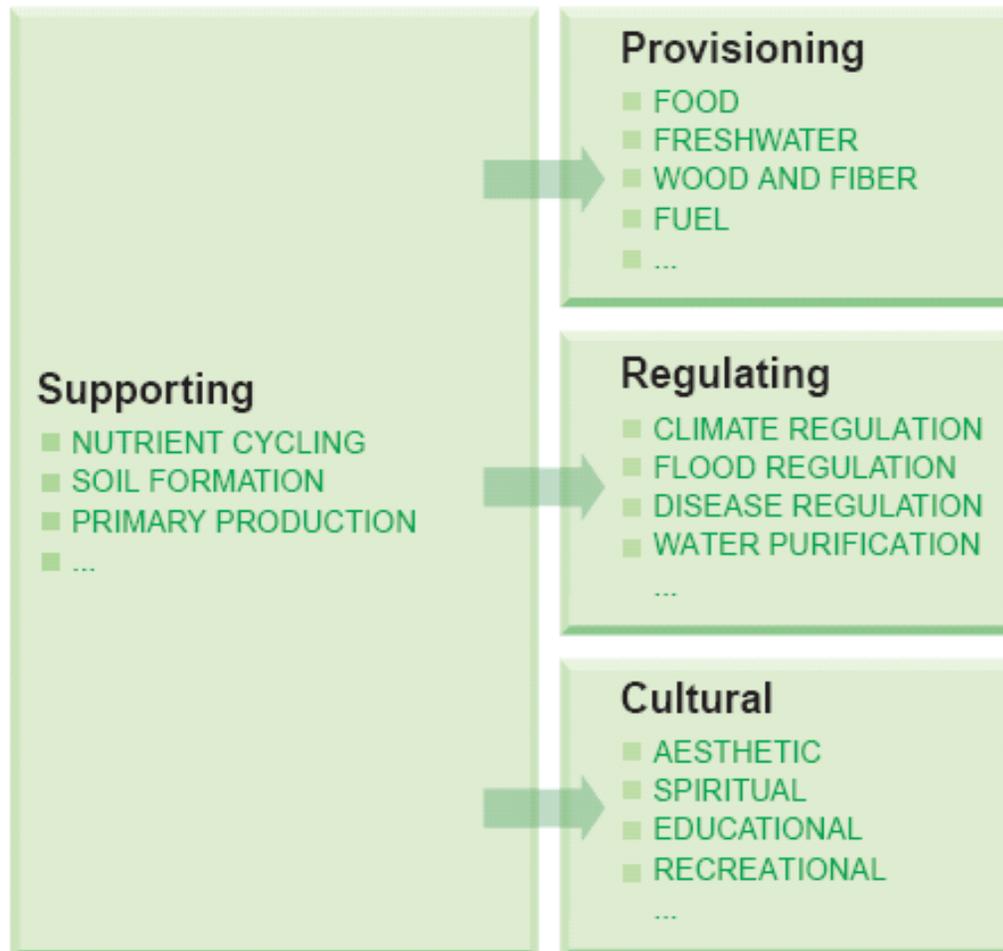
What are the conditions and trends in ecosystems and the services they provide, and the consequences for human well-being?



Focus: Ecosystem Services

The benefits people obtain from ecosystems

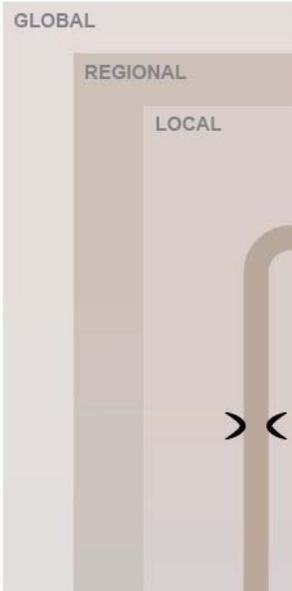
ECOSYSTEM SERVICES





Co...ork

Human Well-being and Poverty Reduction
Basic material for a good life
Health
Good Social Relations
Security
Freedom of choice and action



Ecosystem Services

Life on Earth: biodiversity

Indirect Drivers of Change
Demographic
Economic (globalization, trade, market and policy framework)
Sociopolitical (governance and institutional framework)
Science and Technology
Cultural and Religious

Direct Drivers of Change
Changes in land use
Species introduction or removal
Technology adaptation and use
External inputs (e.g., irrigation)
Resource consumption
Climate change
Natural physical and biological drivers (e.g., volcanoes)





MA Working Groups

Condition and Trends	Scenarios	Responses
<ul style="list-style-type: none">■ What is the current condition and historical trends of ecosystems and their services?■ What have been the consequences of changes in ecosystems for human well-being?	<ul style="list-style-type: none">■ Given plausible changes in primary drivers, what will be the consequences for ecosystems, their services, and human well-being?	<ul style="list-style-type: none">■ What can we do to enhance well-being and conserve ecosystems?

Sub-Global	<ul style="list-style-type: none">■ All of the above, at regional, national, local scales
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Assessment Panel

- Harold A. Mooney (*co-chair*), **Stanford University, United States**
- Angela Cropper (*co-chair*), **Cropper Foundation, Trinidad and Tobago**
- Doris Capistrano, **Center for International Forestry Research, Indonesia**
- Stephen R. Carpenter, **University of Wisconsin, United States**
- Kanchan Chopra, **Institute of Economic Growth, India**
- Partha Dasgupta, **University of Cambridge, United Kingdom**
- Rik Leemans, **Wageningen University, Netherlands**
- Robert M. May, **University of Oxford, United Kingdom**
- Prabhu Pingali, **Food and Agriculture Organization of the U.N., Italy**
- Rashid Hassan, **University of Pretoria, South Africa**
- Cristián Samper, **Smithsonian National Museum of Natural History, U.S.**
- Robert Scholes, **Council for Scientific and Industrial Research, South Africa**
- Zhao Shidong, **Chinese Academy of Sciences, China**
- Robert T. Watson, **World Bank, United States (*ex officio*)**
- A. H. Zakri, **United Nations University, Japan (*ex officio*)**
- MA Director:
 - Dr. Walter Reid, **Millennium Ecosystem Assessment**
- Editorial Board Chairs:
 - José Sarukhán, **Universidad Nacional Autónoma de México, Mexico**
 - Anne Whyte, **Mestor Associates Ltd., Canada**



Largest assessment of the health of the planet's ecosystems

- Experts and Review Process
 - Prepared by 1360 experts from 95 countries
 - 80-person independent board of review editors
 - Review comments from 850 experts and governments
- Governance
 - Called for by UN Secretary General in 2000
 - Partnership of UN agencies, conventions, business, non-governmental organizations with a multi-stakeholder board of directors
- Funding
 - \$ 23 million over five years



Defining Features

- Demand-driven
- Assessment of current state of knowledge
- Authoritative information
- Policy relevant not policy prescriptive
- Multi-scale assessment



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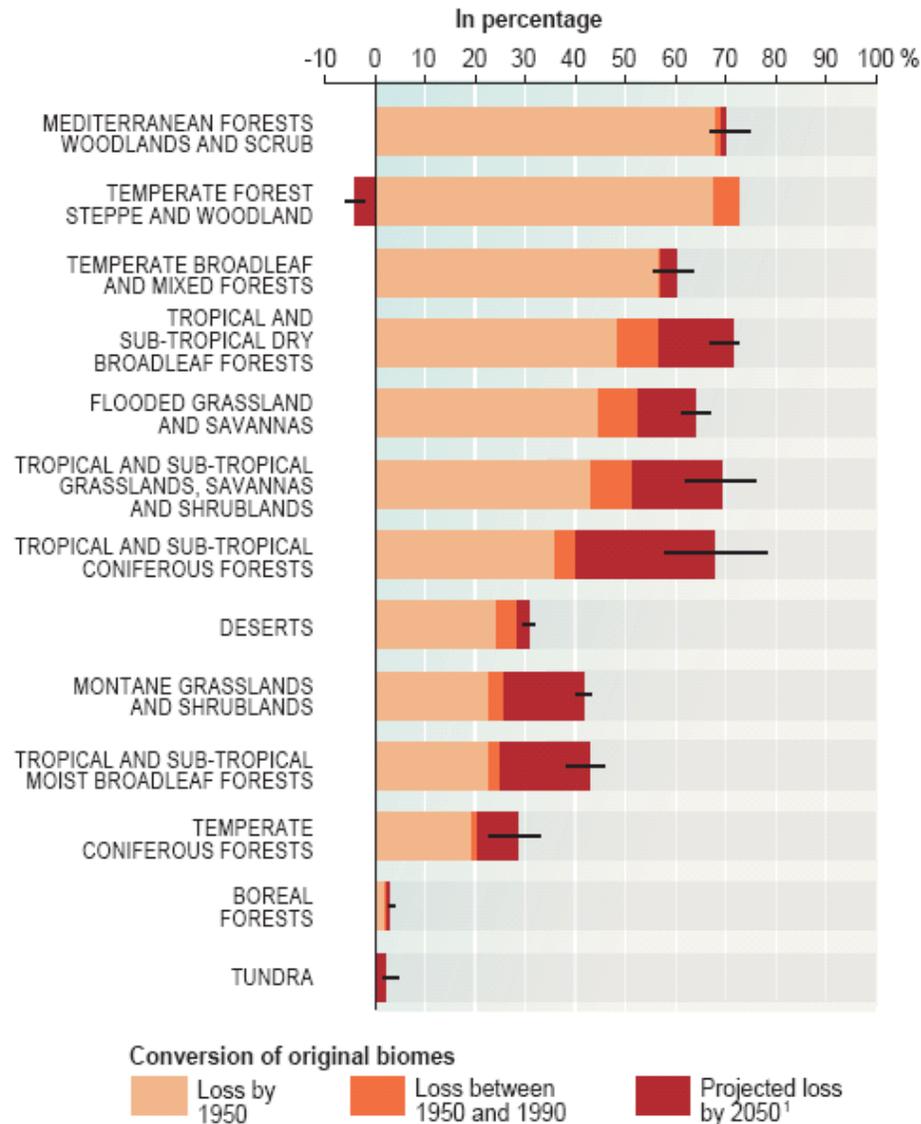


Finding #1

- Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history
- This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth



Ecosystem Change





Finding #2

- The changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development, but these gains have been achieved at growing costs
- These problems will substantially diminish the benefits that future generations obtain from ecosystems.

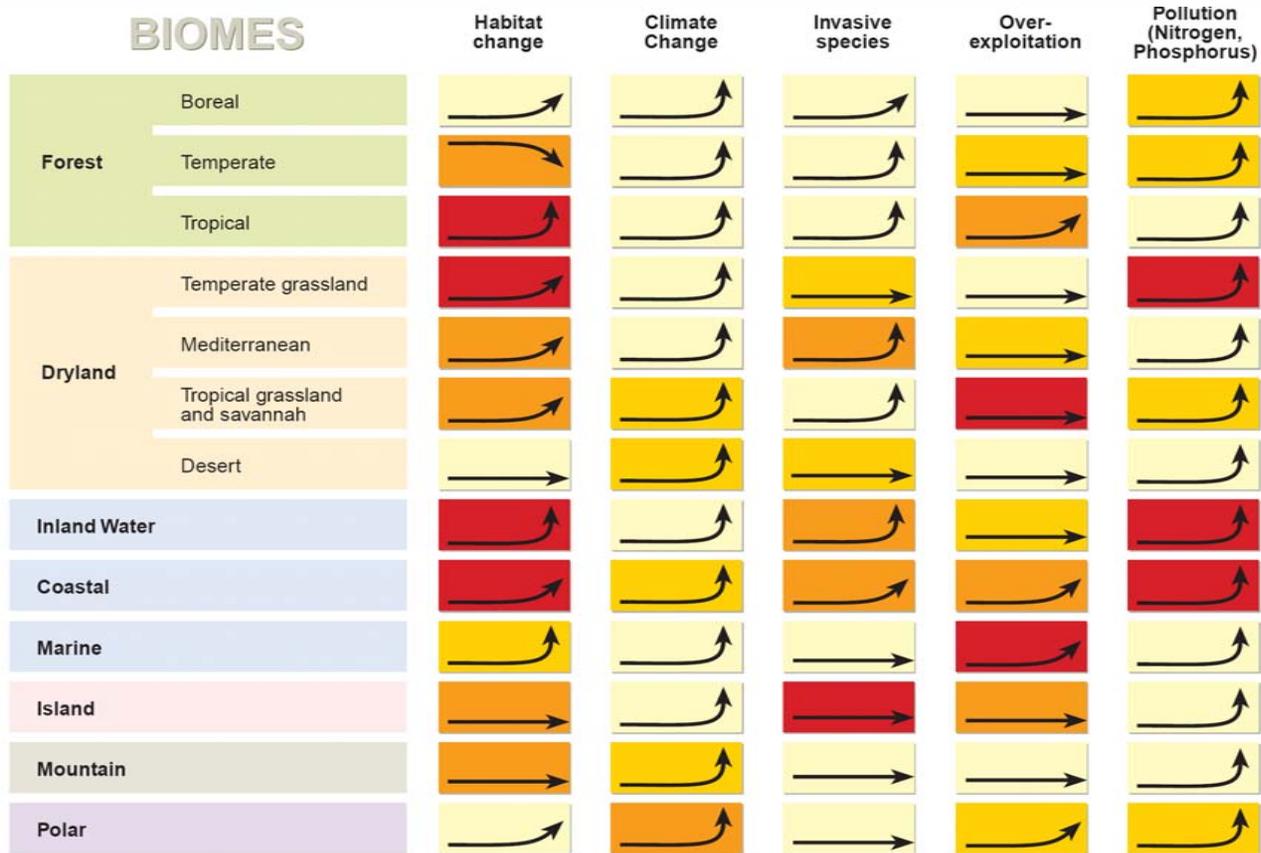


Finding #3:

- The degradation of ecosystem services could grow significantly worse during the first half of this century and is a barrier to achieving the Millennium Development Goals

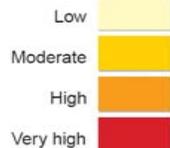


Direct drivers growing in intensity



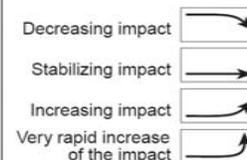
RESULT OF PAST EVOLUTION

Driver's impact on biodiversity over the last century



WHAT HAPPENS TODAY

Driver's actual trends



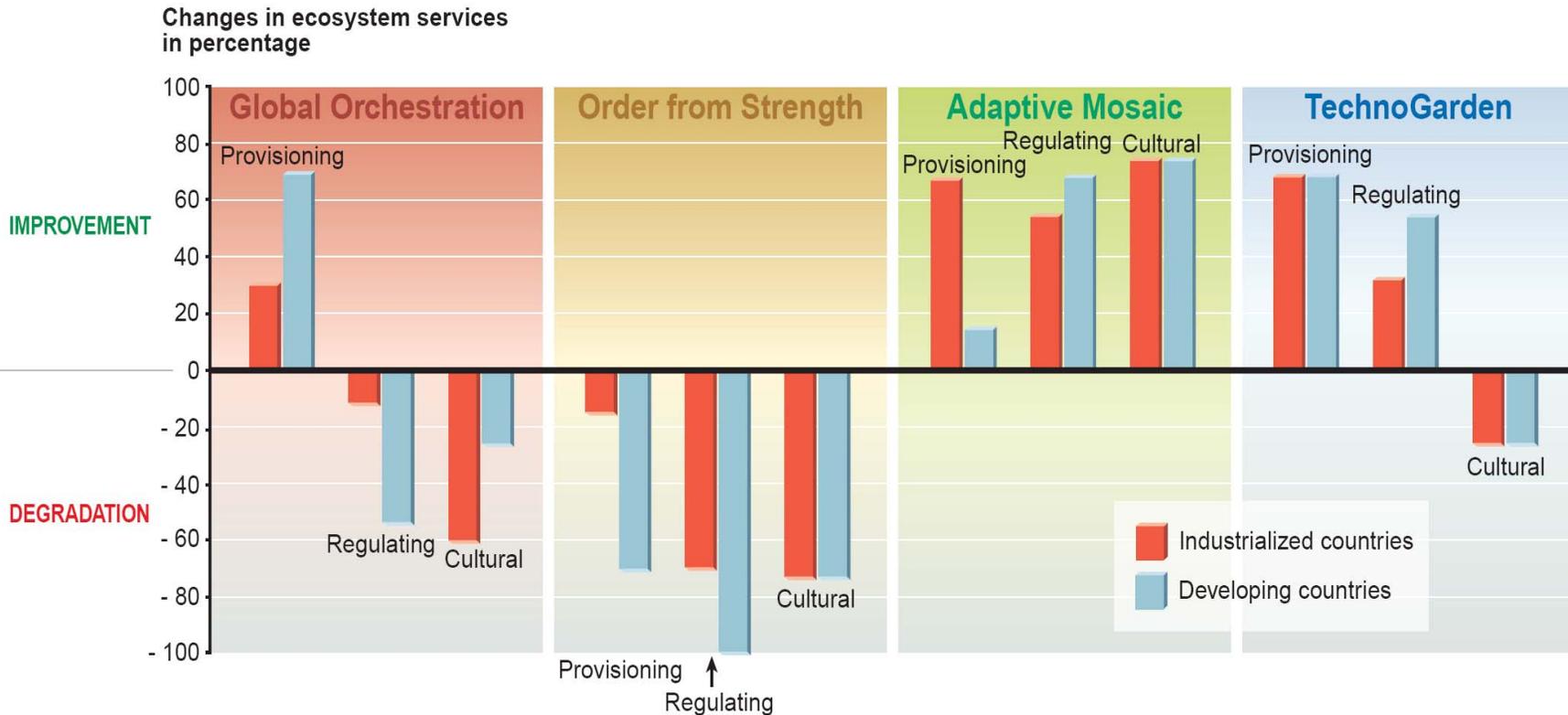


Finding #4:

- Many options exist to conserve or enhance specific ecosystem services in ways that reduce negative trade-offs or that provide positive synergies with other ecosystem services



Improvements in services can be achieved by 2050



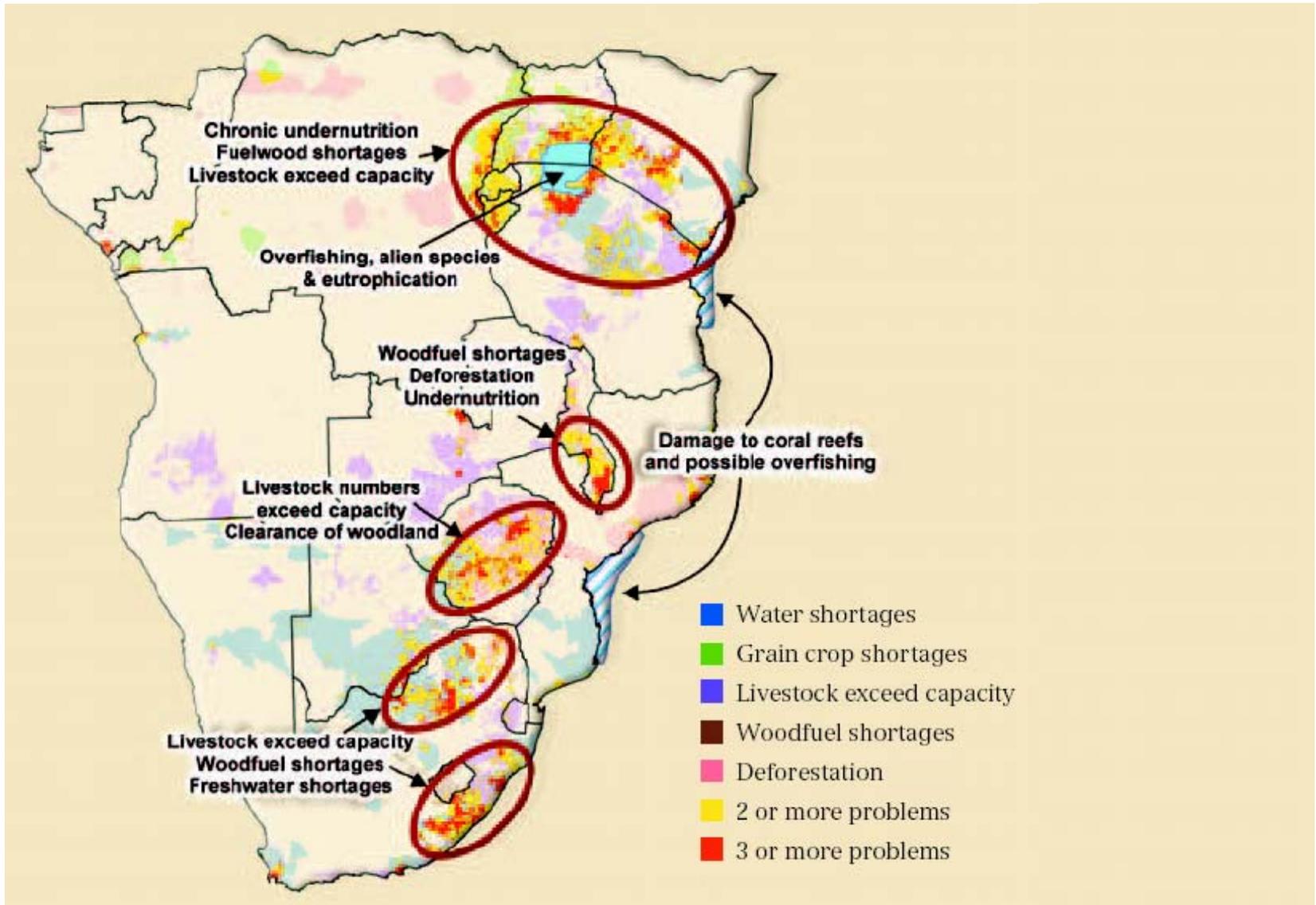


Finding # 5

- The scale of analysis has an important effect on assessment results, and the relative importance of services changes with scale.
- The use of different knowledge systems can provide useful insights that might otherwise be missed, and is most important at local scales



Places where ecosystem services fail are also centers of conflict



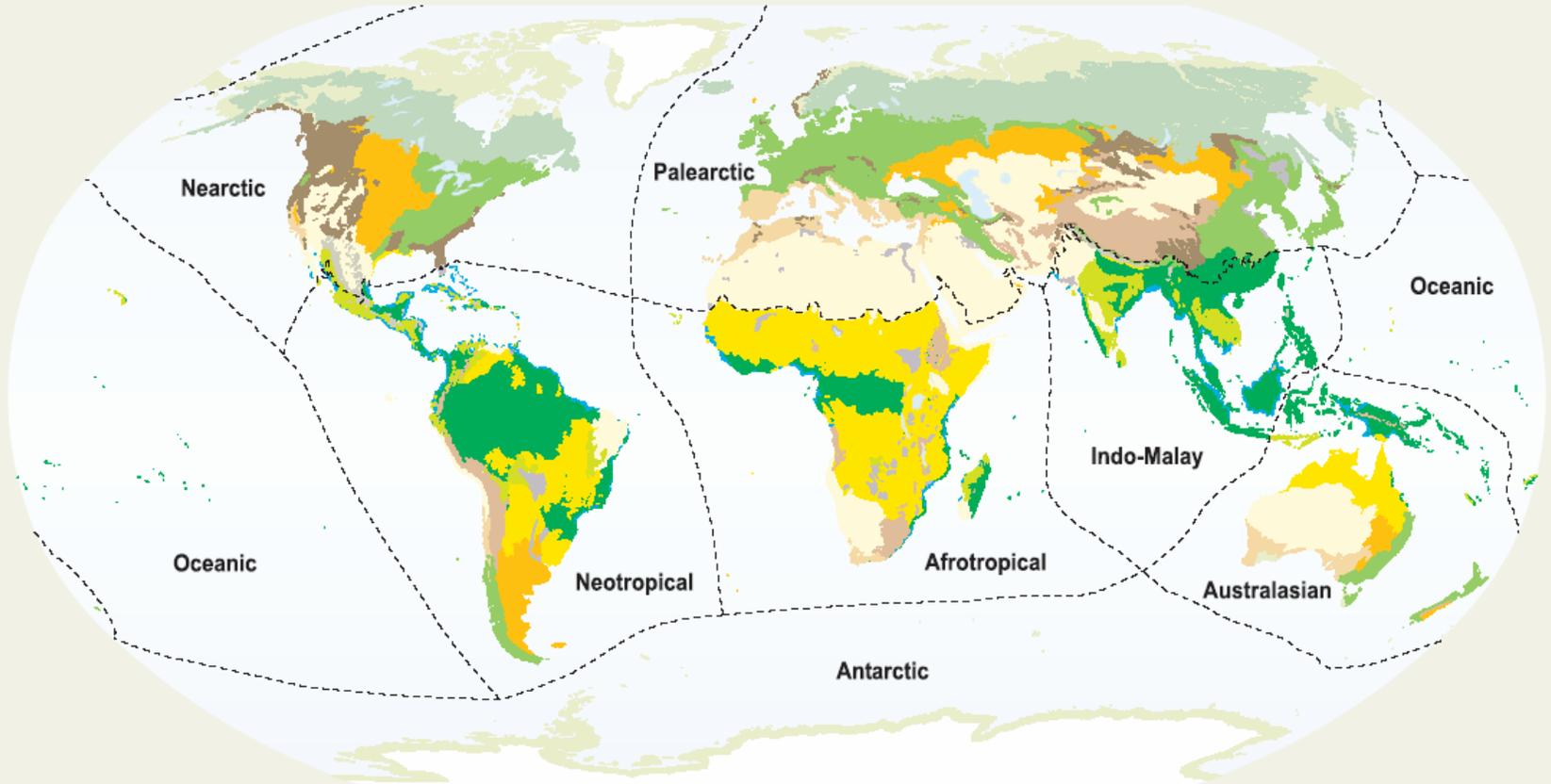


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Biogeography and biomes



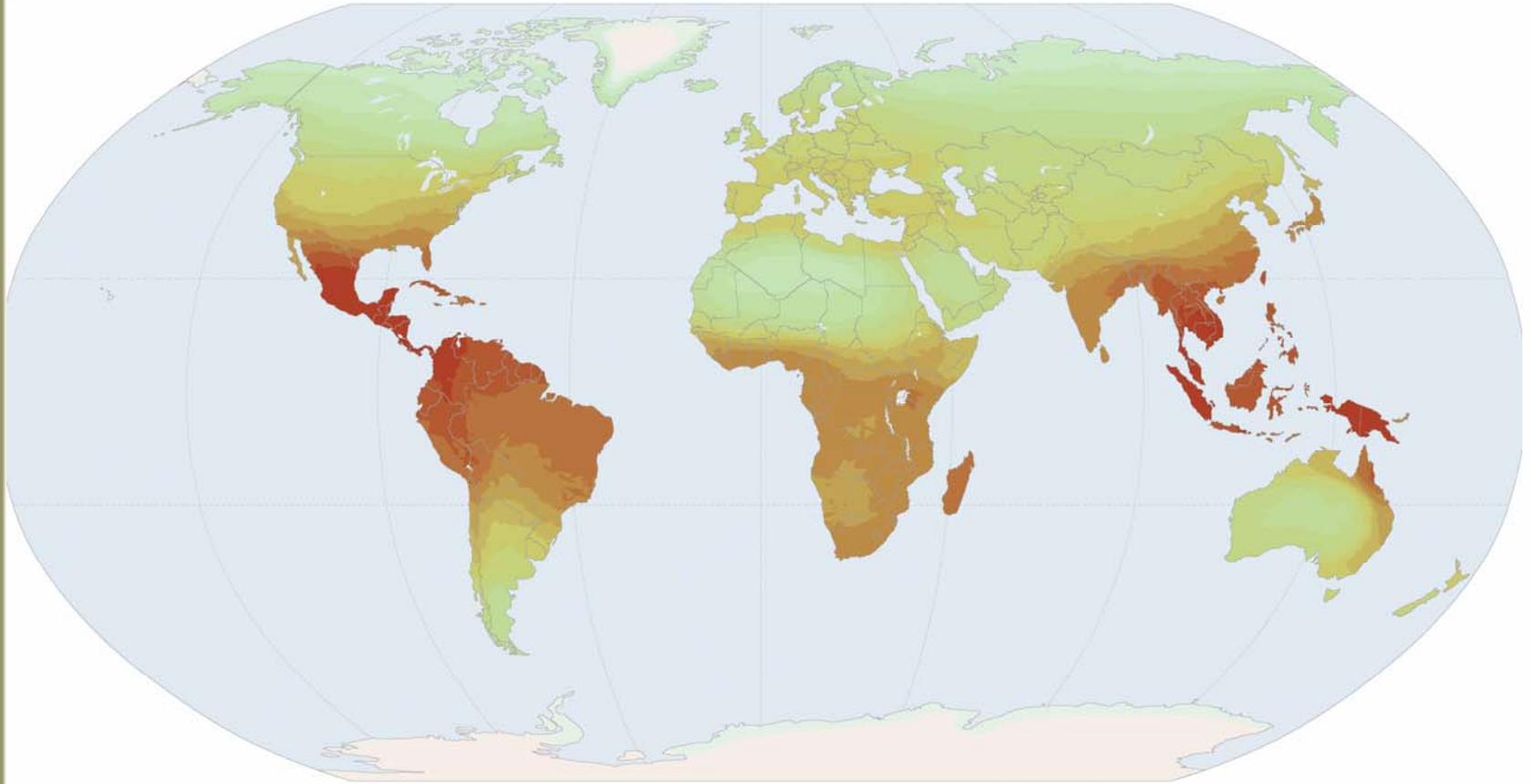
Terrestrial biomes

- | | | |
|---|---|---|
|  Tropical and sub-tropical moist broadleaf forests |  Tropical and sub-tropical grasslands, savannas, and shrublands | |
|  Tropical and sub-tropical dry broadleaf forests |  Temperate grasslands, savannas, and shrublands | |
|  Tropical and sub-tropical coniferous forests |  Montane grasslands and shrublands | |
|  Temperate broadleaf and mixed forests |  Flooded grasslands and savannas | |
|  Temperate coniferous forests |  Mangroves | |
|  Boreal forests / Taiga |  Deserts and Xeric shrublands |  Realm boundaries |
|  Tundra |  Rock and ice | |
|  Mediterranean forests, woodlands, and scrub | | |

Source: Millennium Ecosystem Assessment



Flowering plant family density



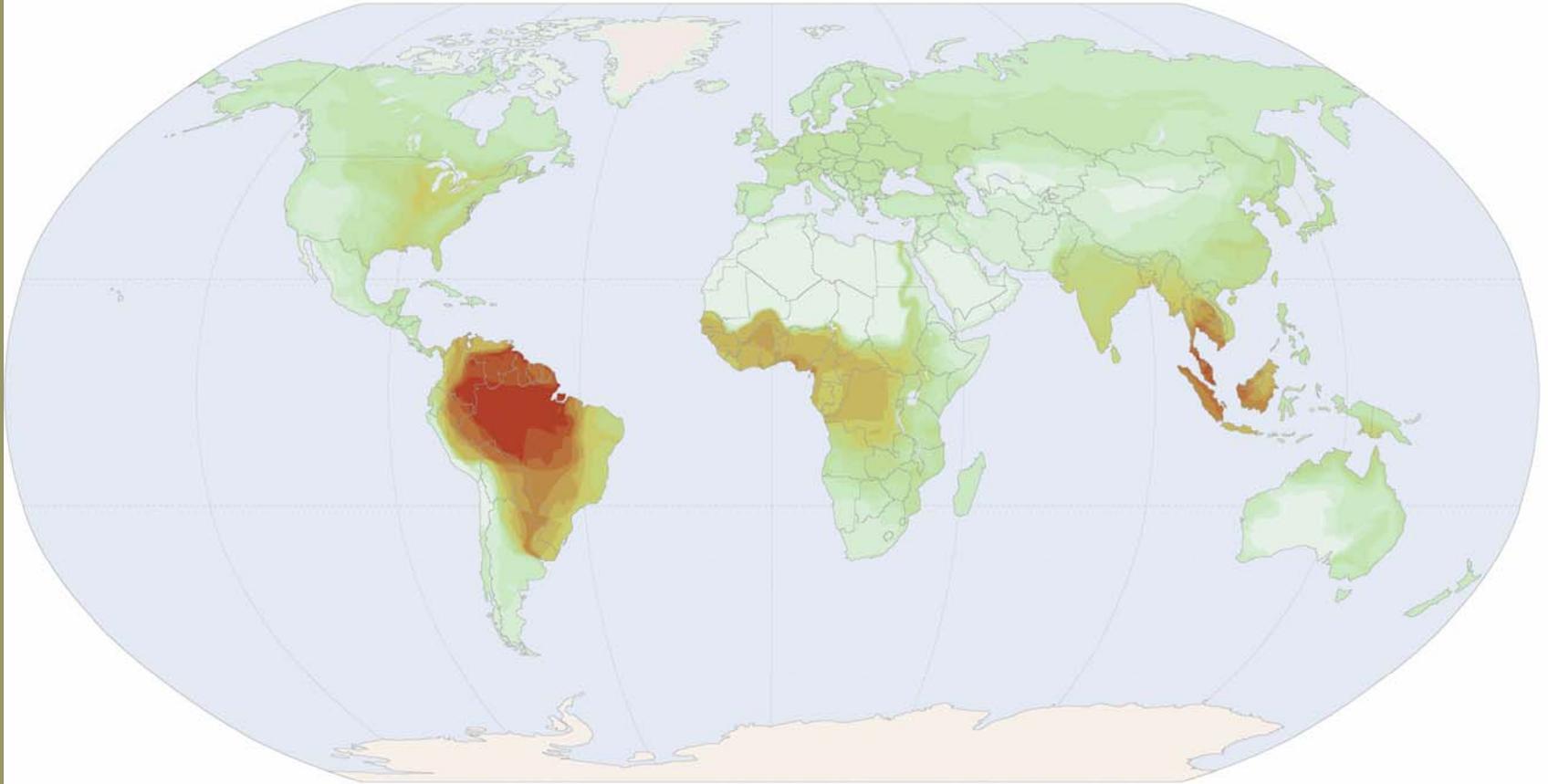
UNEP

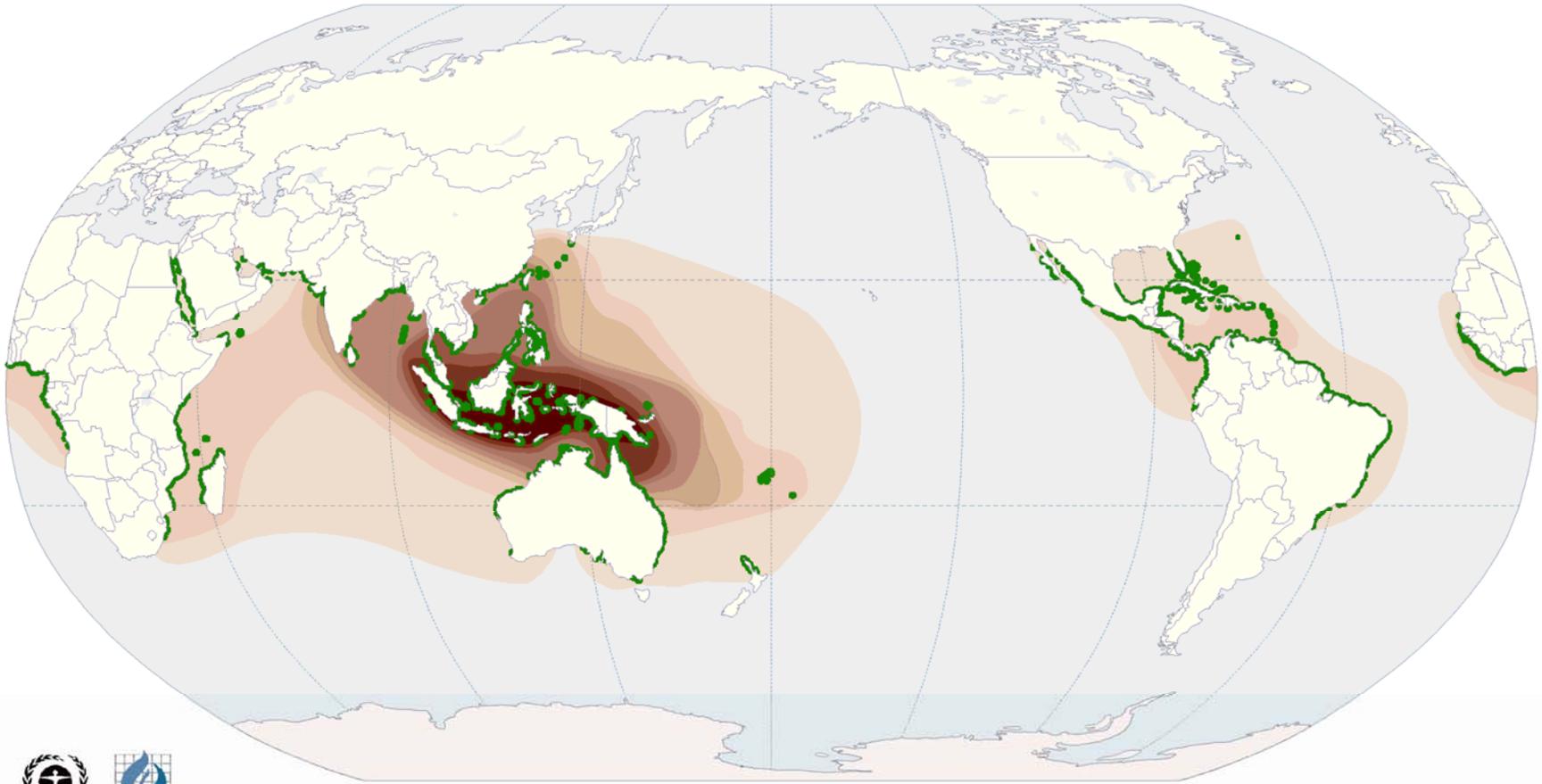


WCMC



Freshwater fish family density





 mangrove forest



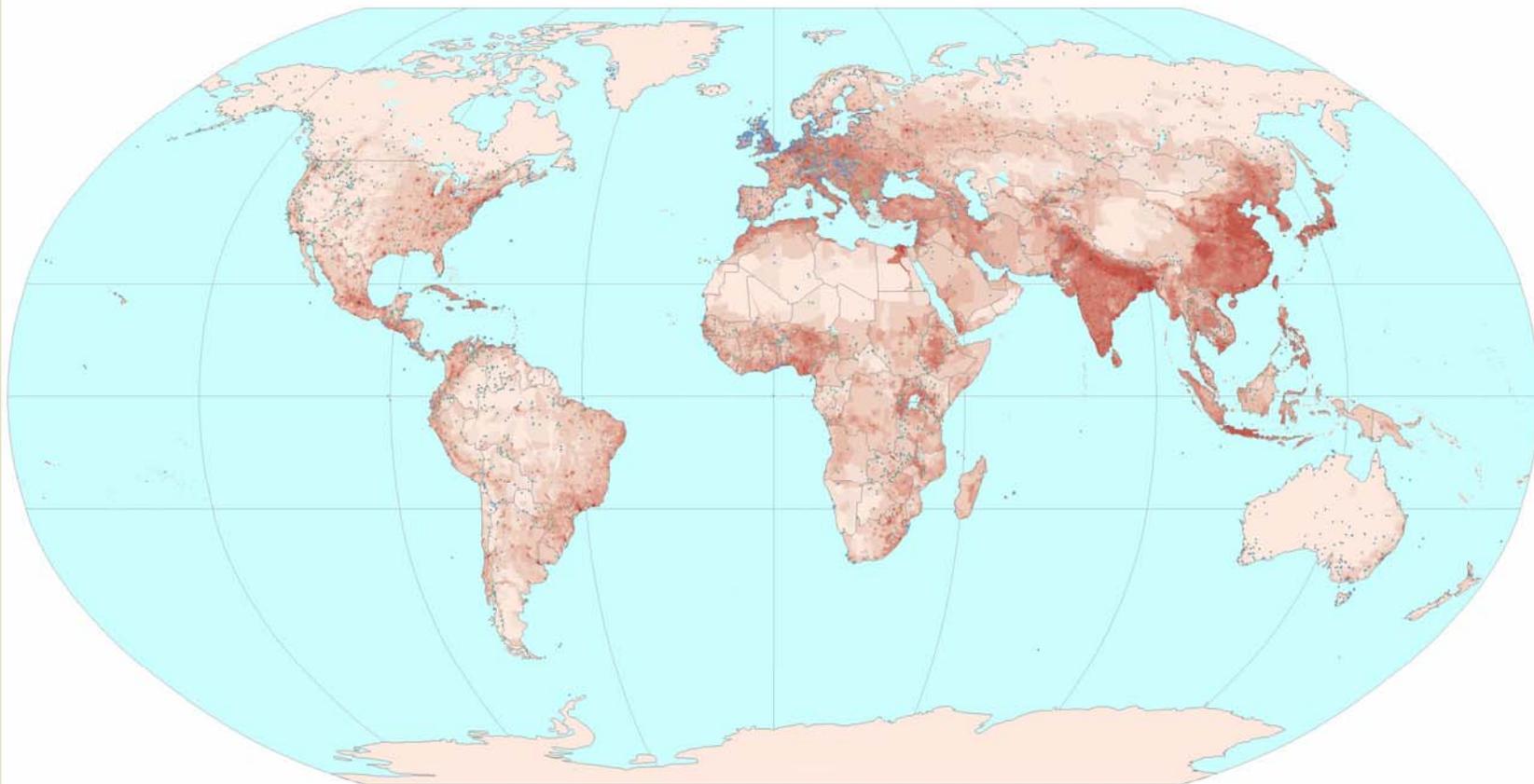
Mangrove diversity

This map shows the location of existing mangrove forest, together with contours representing gradients of mangrove species richness. Note that graphic presentation at this scale enormously exaggerates actual forest area.

Source: reproduced by permission, with modification, from Spalding (1998).

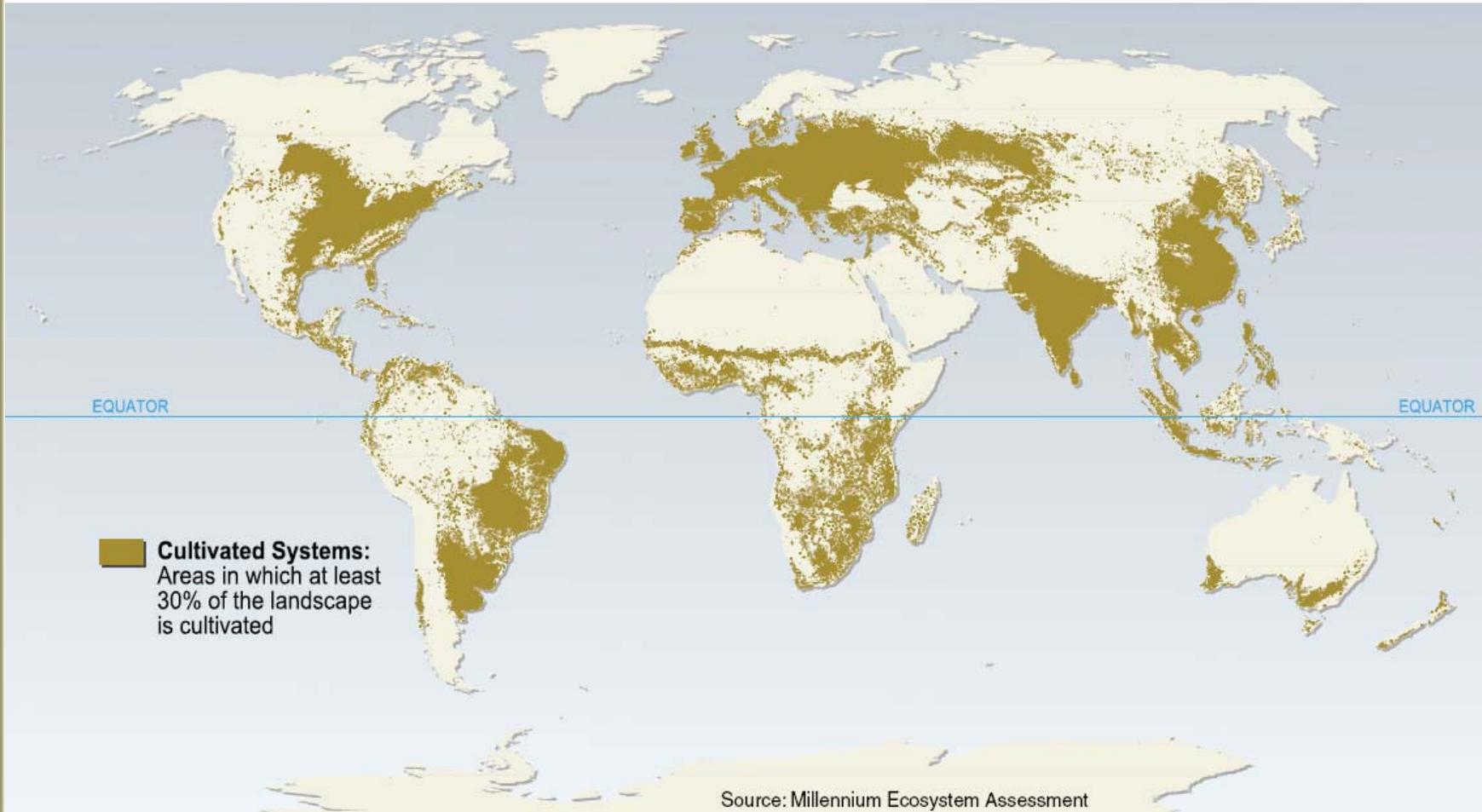


Human Population Density



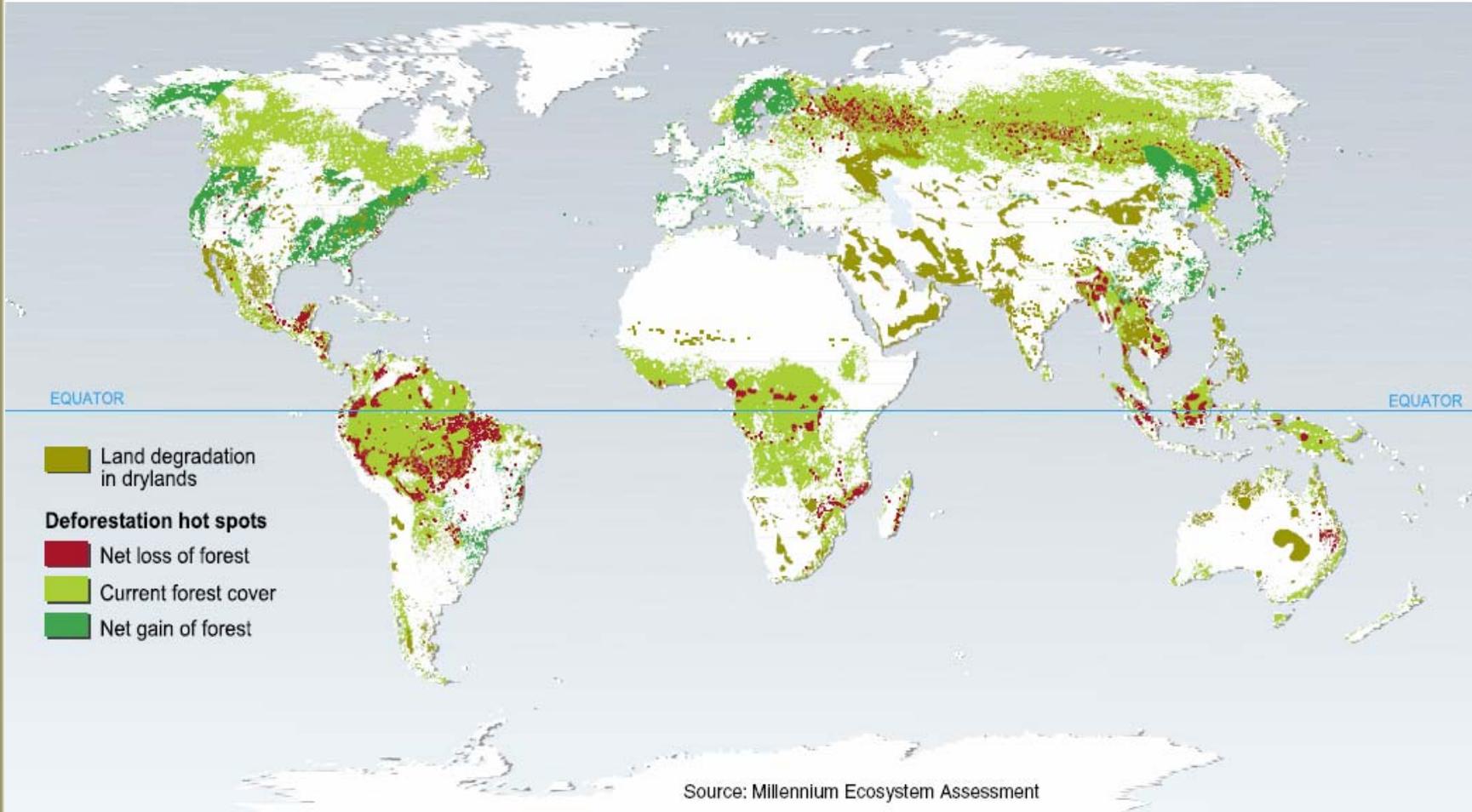


Cultivated systems



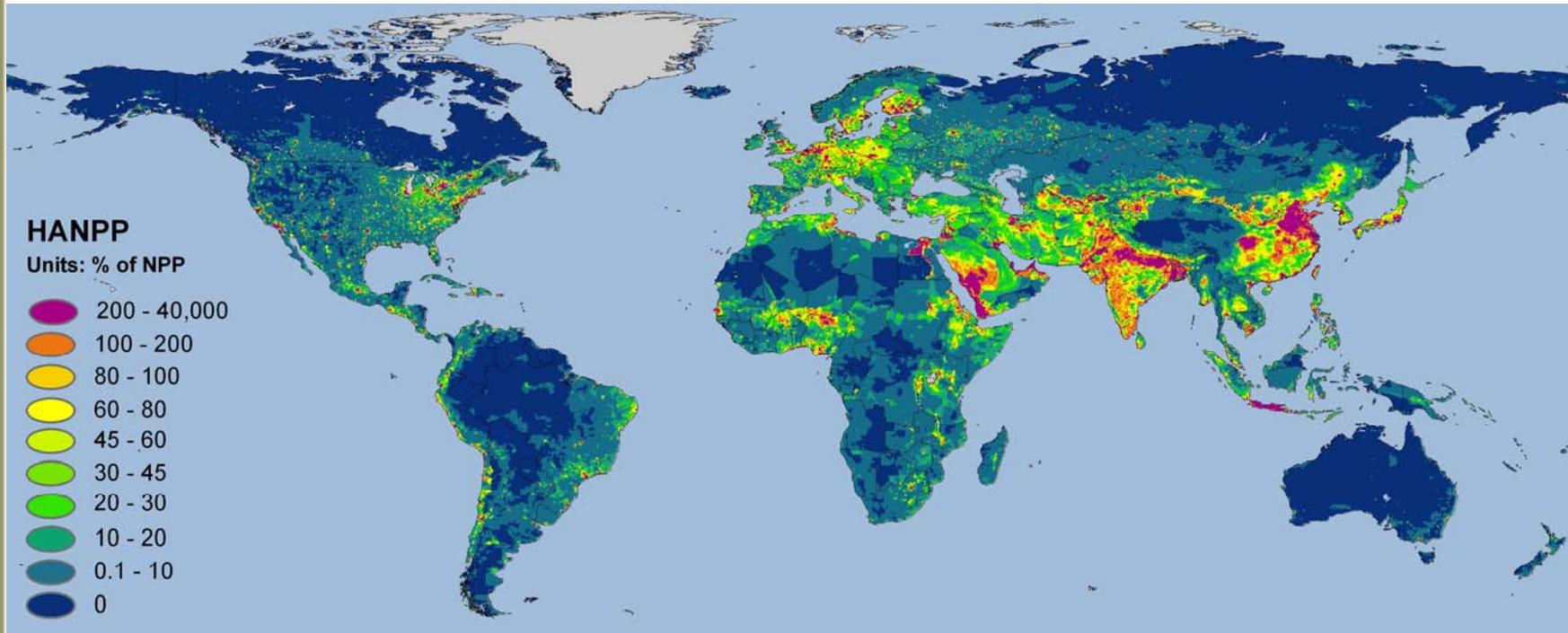


Areas of deforestation





Percent of Net Primary Productivity used



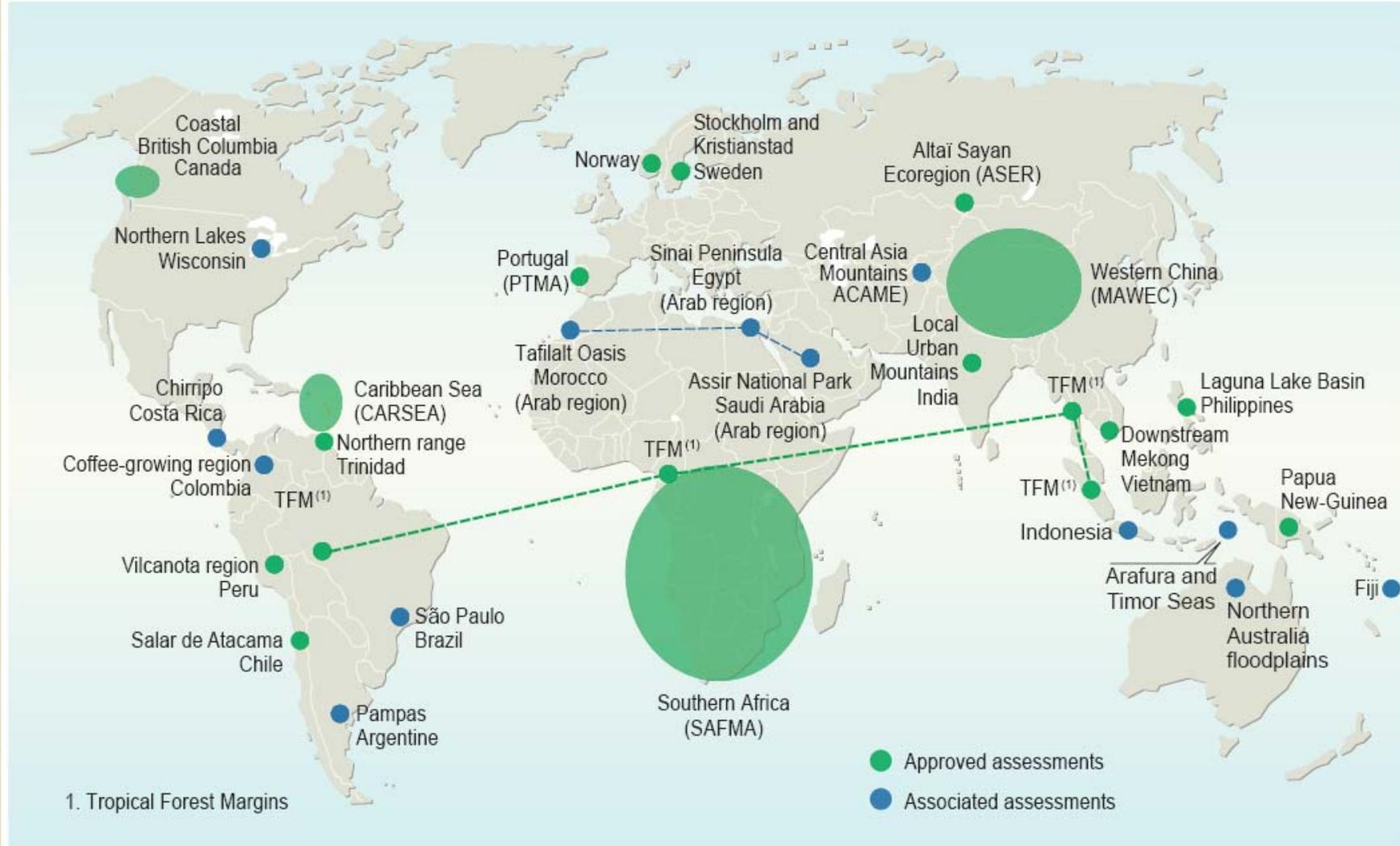


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Multi-scale assessment



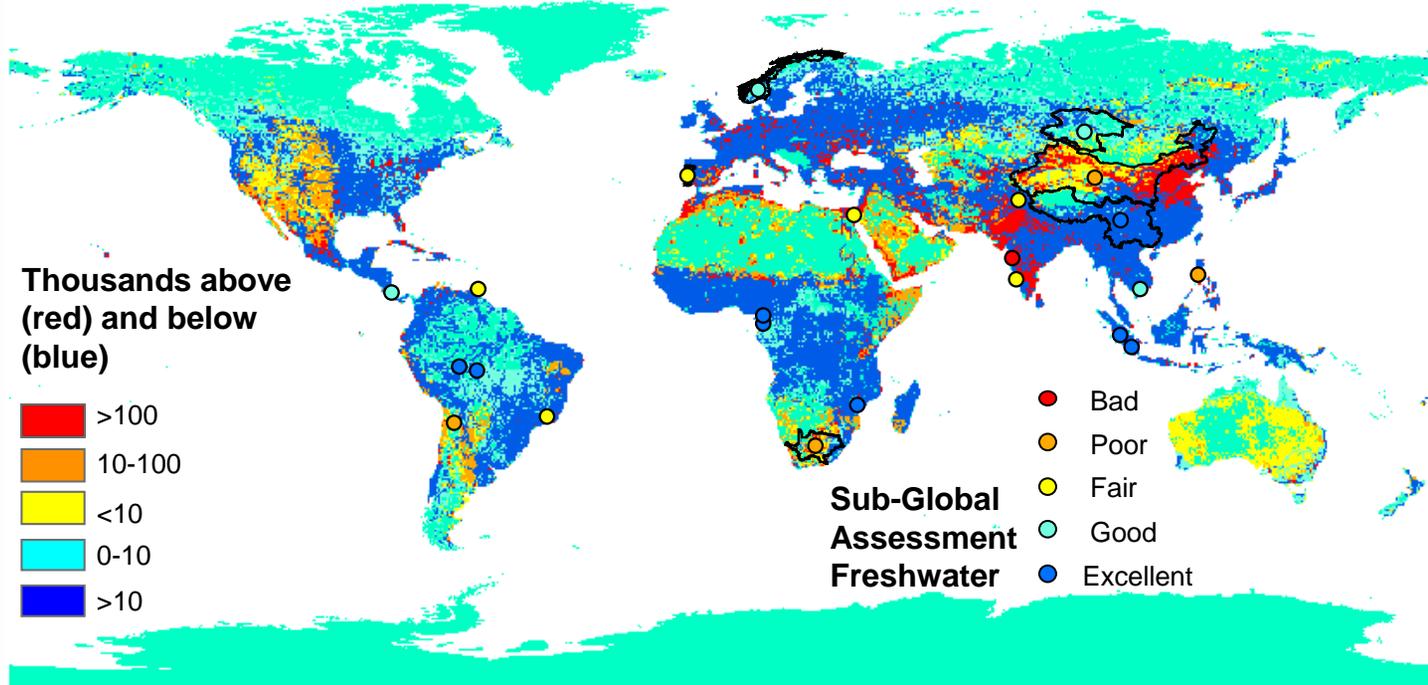


Why deal with scale?

- Ecological and social processes have a characteristic scale,
- Progressively greater spatial, temporal or causal detail considered as the scale becomes finer.
- Validation of larger-scale conclusions by smaller-scale studies
- Contextualization at larger scales of findings at smaller scales.
- Reporting and response options to matched to the scales at which social decision-making occurs,



1. Ecosystem services are important for many dimensions of human well-being, some of which are best observed at local scales



2. The condition and trends of ecosystem may depend on the scale of analysis



	Global	Regional	Local
Over-exploitation	Orange	Light Red	Red
Habitat change	Orange	Light Red	Red
Invasive species	Orange	Red	Red
Pollution	Light Red	Red	Red
Climate change	Red	Red	Red

3. Drivers of ecosystem change and response options depend on scale



4. Using different knowledge systems provides useful insights that might otherwise be missed



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Global

Regional

Local

Human Wellbeing & Poverty Reduction

- Health and disease
- Environmental security
- Cultural security
- Economic security
- Equity

Primary Drivers

- Demographic change
- Economic change (incl globalization, trade, market, & policy framework)
- Social and political change (incl governance, institutional, & legal framework)
- Technological change
- Lifestyle and behavioral change

Ecosystems & Their Services

- Supporting (biodiversity and ecosystem processes)
- Provisioning (food, water, fiber, fuel, other biological products)
- Cultural (social, aesthetic)

Life on Earth

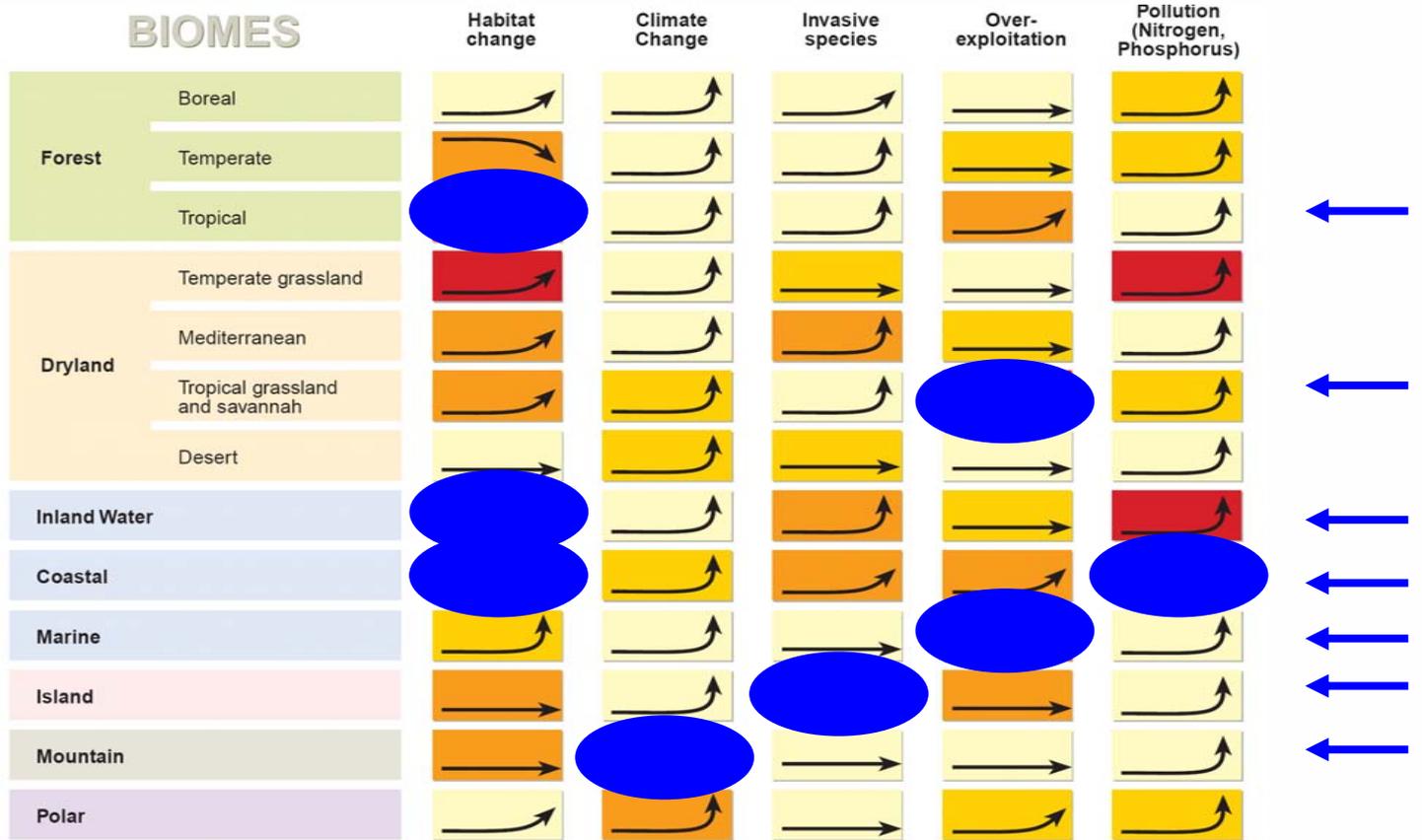
Proximate Drivers

- Climate change
- Land and water use & cover change
- Factor inputs (e.g. irrigation, fertilizers)
- Pollution
- Harvest
- Nutrient release
- Species introductions

 = Strategies and Interventions

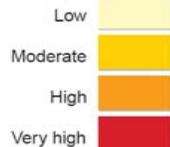


Direct drivers by biomes



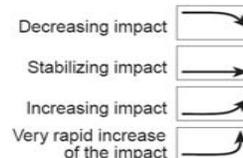
RESULT OF PAST EVOLUTION

Driver's impact on biodiversity over the last century



WHAT HAPPENS TODAY

Driver's actual trends





Response options

- Institutions
 - transparency and accountability
- Economics
 - Eliminate subsidies
 - Markets for ecosystem services
- Technology
- Social and behavioral
- Knowledge



OAS and the MA

- Use conceptual framework to analyze tradeoffs for ecosystem services
- Response options:
 - Markets for ecosystem services
 - Technology transfer
 - Institutional capacity
 - Information
- Support national and regional assessments

