



Millennium Ecosystem Assessment

Millennium Ecosystem

Largest assessment of the health of Earth'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
- Authorized by governments through 4 conventions
- Partnership of UN agencies, conventions, business, non-governmental organizations with a multi-stakeholder board of directors

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MA Board

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(full list available at www.MAweb.org)

Global Environment Facility

United Nations Foundation

David and Lucile Packard Foundation

World Bank

**Consultative Group on International Agricultural
Research**

United Nations Environment Programme

Government of China

Government of Norway

Kingdom of Saudi Arabia

Swedish International Biodiversity Programme

Asia Pacific Network for Global Change Research;

Association of Caribbean States

British High Commission, Trinidad & Tobago;

Caixa Geral de Depósitos, Portugal

Canadian International Development Agency

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Cropper Foundation

Environmental Management Authority of Trinidad and
Tobago

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Government of India

International Council for Science

International Development Research Centre

Island Resources Foundation;

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Laguna Lake Development Authority

Philippine Department of Environment and Natural
Resources

Rockefeller Foundation

U.N. Educational, Scientific and Cultural Organization;

UNEP Division of Early Warning and Assessment

United Kingdom Department for Environment, Food and
Rural Affairs

United States National Aeronautic and Space
Administration

Universidade de Coimbra, Portugal

Defining Features

Demand-driven

- Providing information requested by governments, business, civil society

Assessment of current state of knowledge

- A critical evaluation of information concerning the consequences of ecosystem changes for human well-being
- Intended to be used to guide decisions on complex public issues

Authoritative information

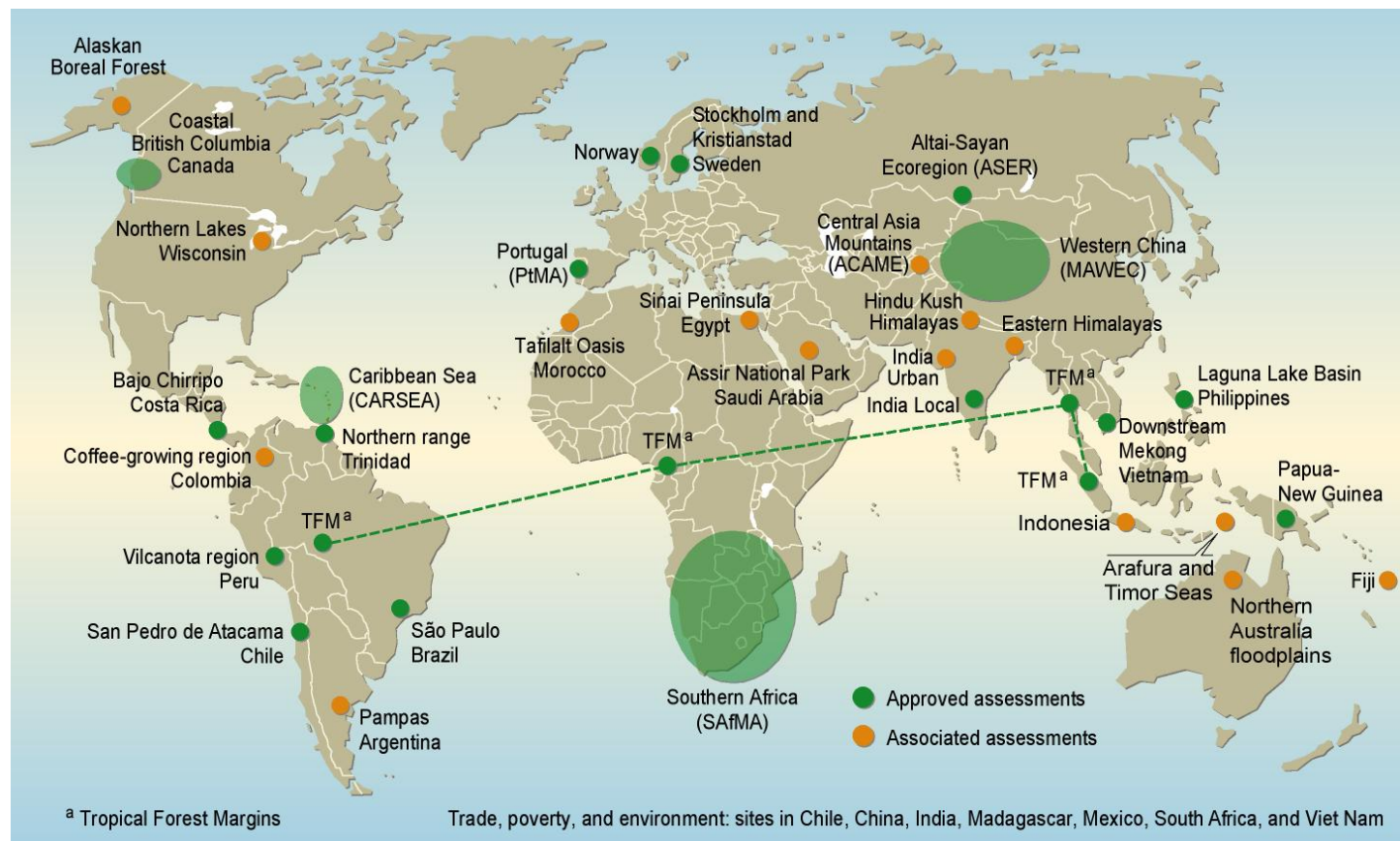
- Clarifies where there is broad consensus within the scientific community and where issues remain unresolved

Policy relevant not policy prescriptive

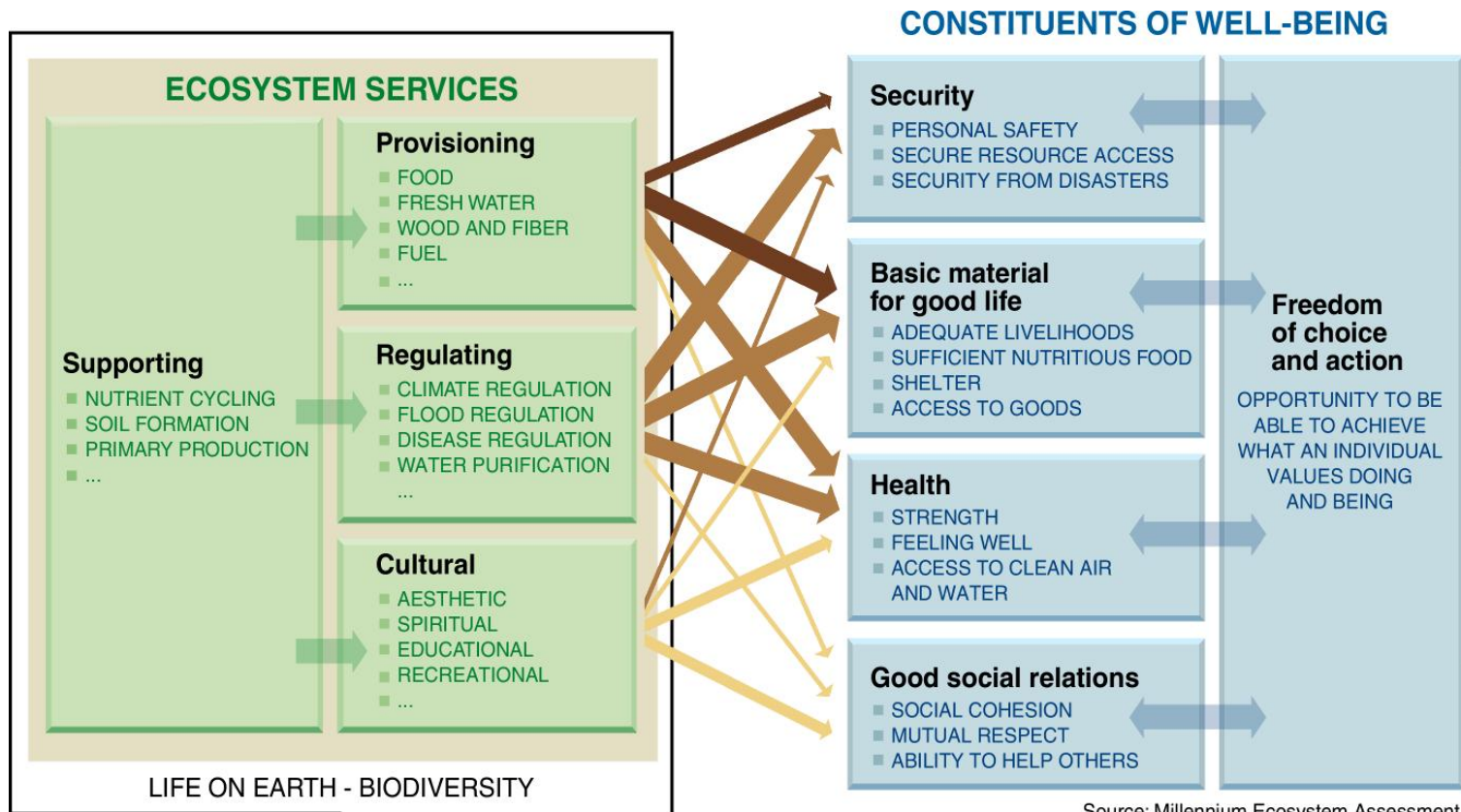
Defining Features

Multi-scale assessment

- Includes information from 33 sub-global assessments



Focus: Consequences of Ecosystem Change for Human Well-being



Source: Millennium Ecosystem Assessment

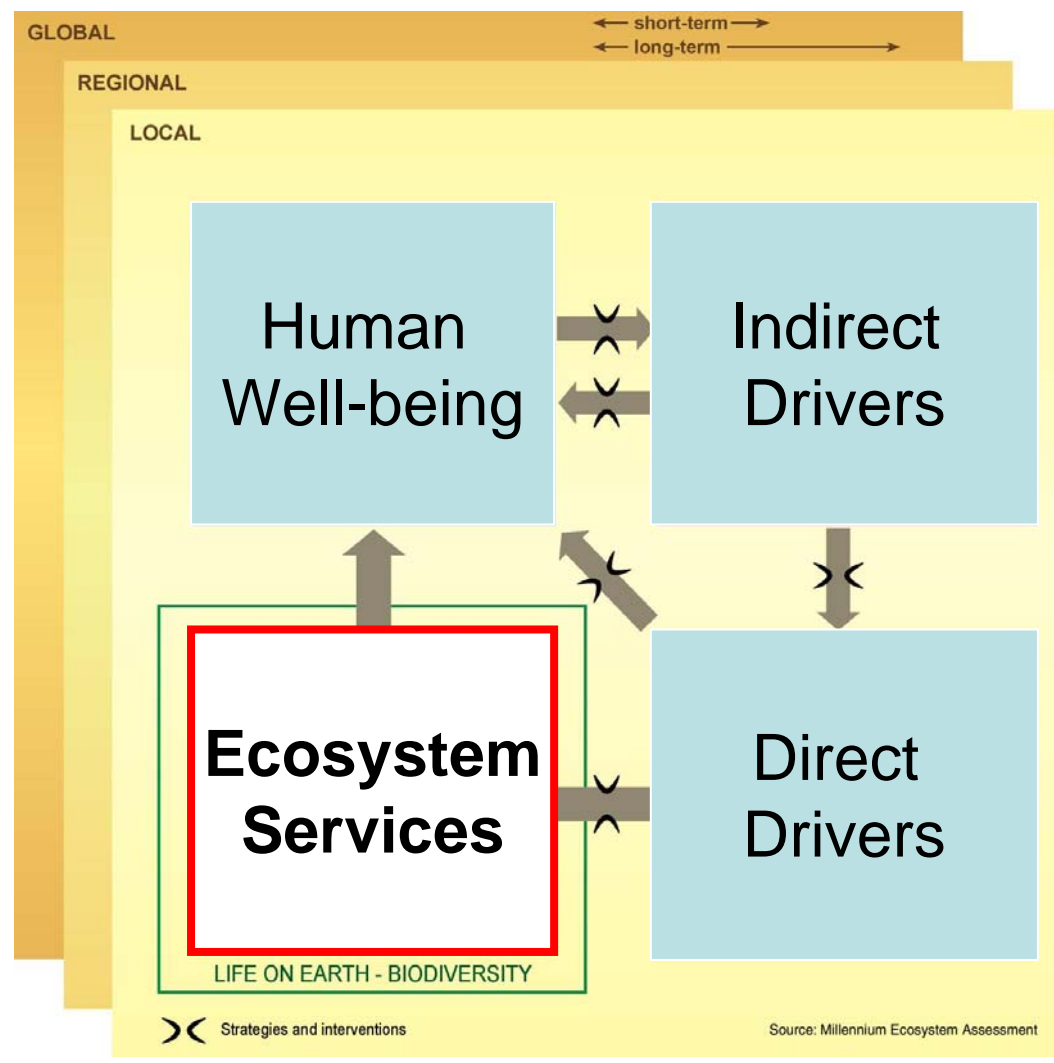
ARROW'S COLOR
Potential for mediation by socioeconomic factors

- Low
- Medium
- High

ARROW'S WIDTH
Intensity of linkages between ecosystem services and human well-being

- Weak
- Medium
- Strong

MA Framework



Four 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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MA Findings - Outline

1. Ecosystem Changes in Last 50 Years

2. Gains and Losses from Ecosystem Change

Three major problems may decrease long-term benefits

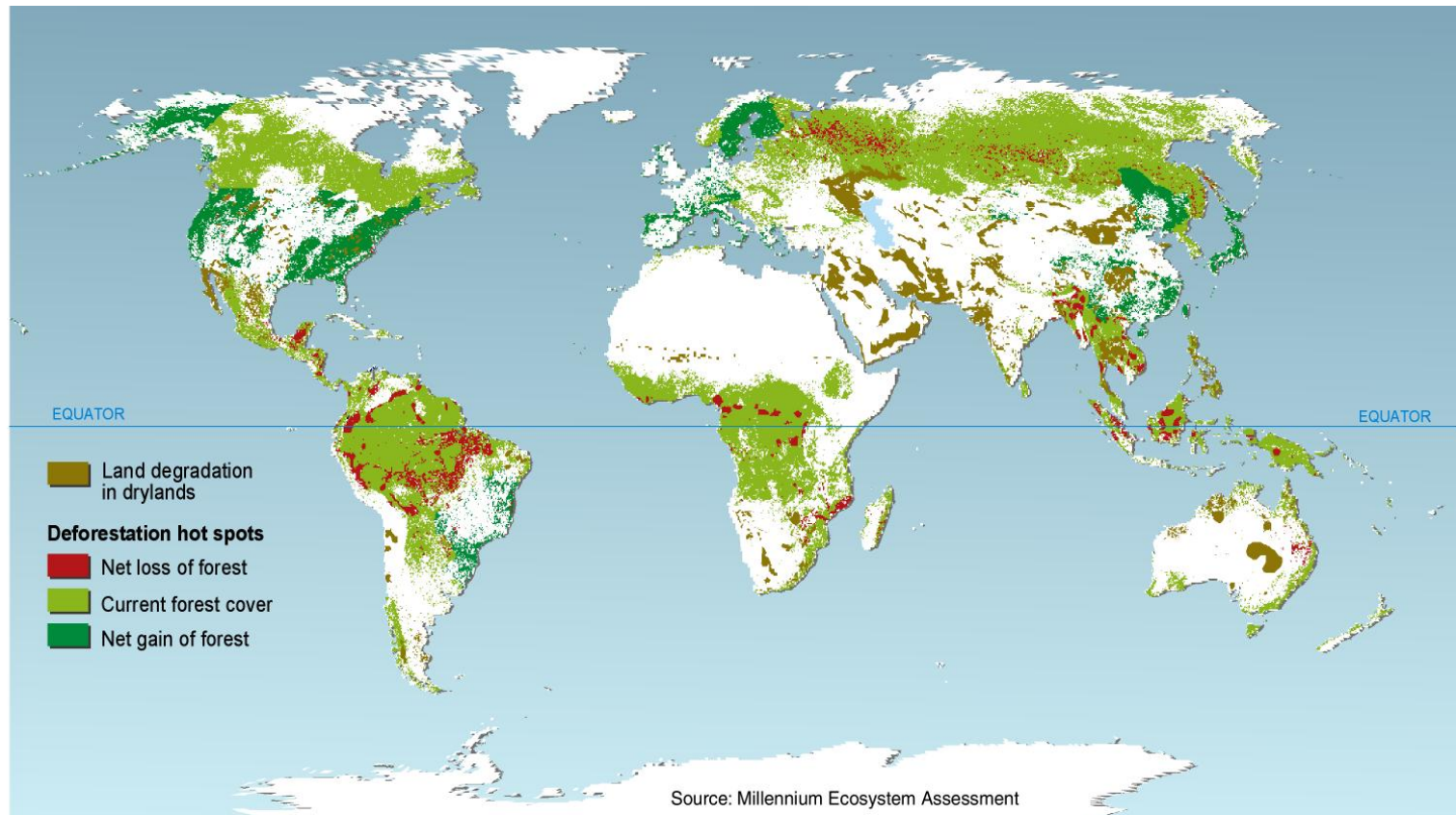
- Degradation of Ecosystem Services
- Increased Likelihood of Nonlinear Changes
- Exacerbation of Poverty for Some People

3. Ecosystem Prospects for Next 50 Years

4. Reversing Ecosystem Degradation

Some ecosystem recovery now underway but high rates of conversion continue

- Ecosystems in some regions are returning to conditions similar to their pre-conversion states
- Rates of ecosystem conversion remain high or are increasing for specific ecosystems and regions



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Changes to ecosystems have provided substantial benefits

Rapid growth in demand for ecosystem services between 1960 and 2000:

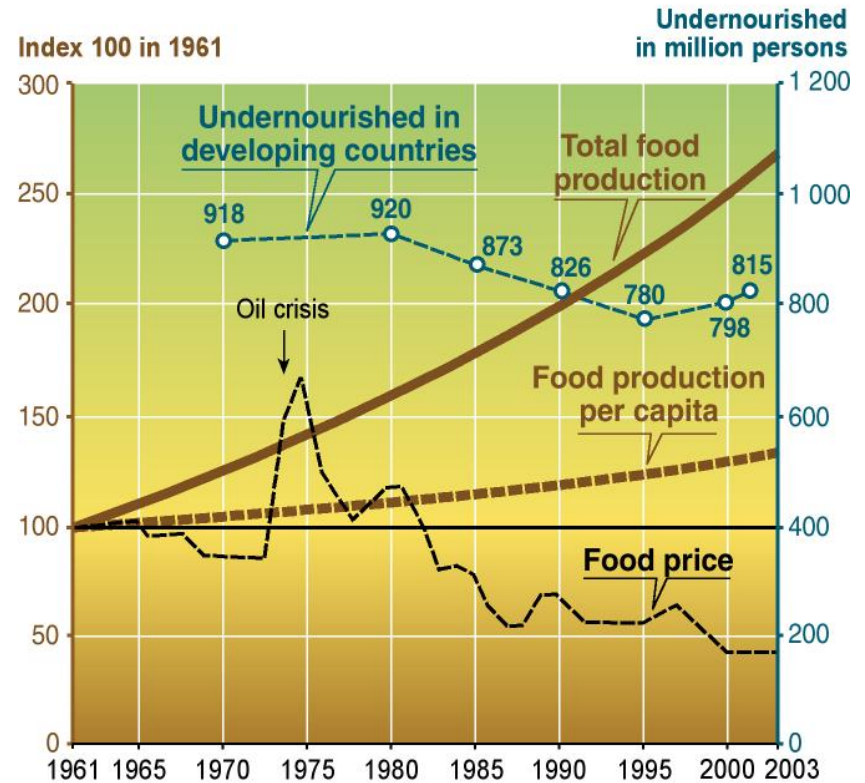
- world population **x2**
- global economy **x6**

To meet this demand:

- food production **x2.5**
- water use **x2**
- wood harvests **x3**
- timber production **x1.5**
- installed hydropower **x2**

Changes to ecosystems have provided substantial benefits

- Food production has more than doubled since 1960
- Food production per capita has grown
- Food price has fallen



Sources: FAOSTATS, SOFI, Millennium Ecosystem Assessment

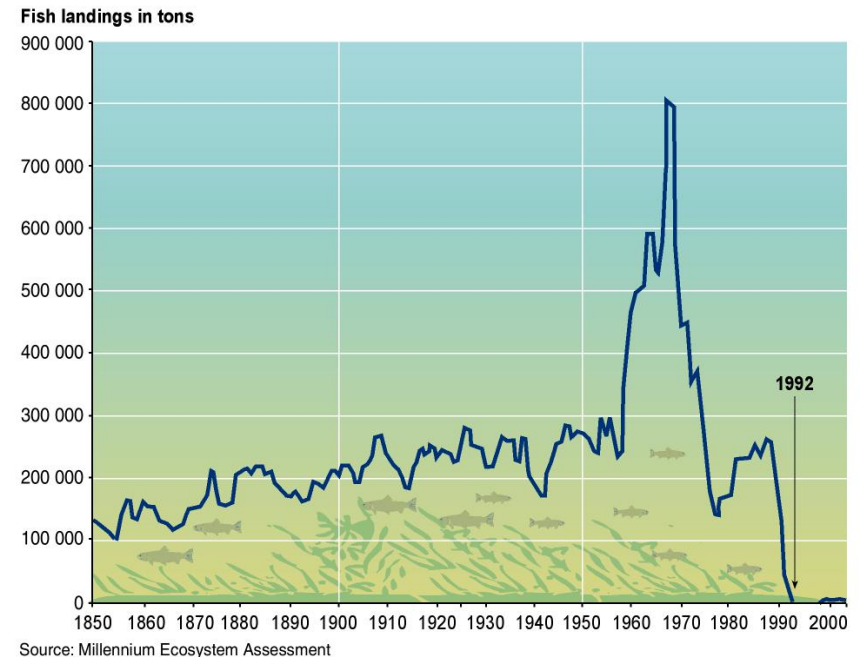
Status of Provisioning Services

Service		Status
Food	crops	↑
	livestock	↑
	capture fisheries	↓
	aquaculture	↑
	wild foods	↓
Fiber	timber	+/-
	cotton, silk	+/-
	wood fuel	↓
Genetic resources		↓
Biochemicals, medicines		↓
Fresh water		↓

Examples of nonlinear change

Fisheries collapse

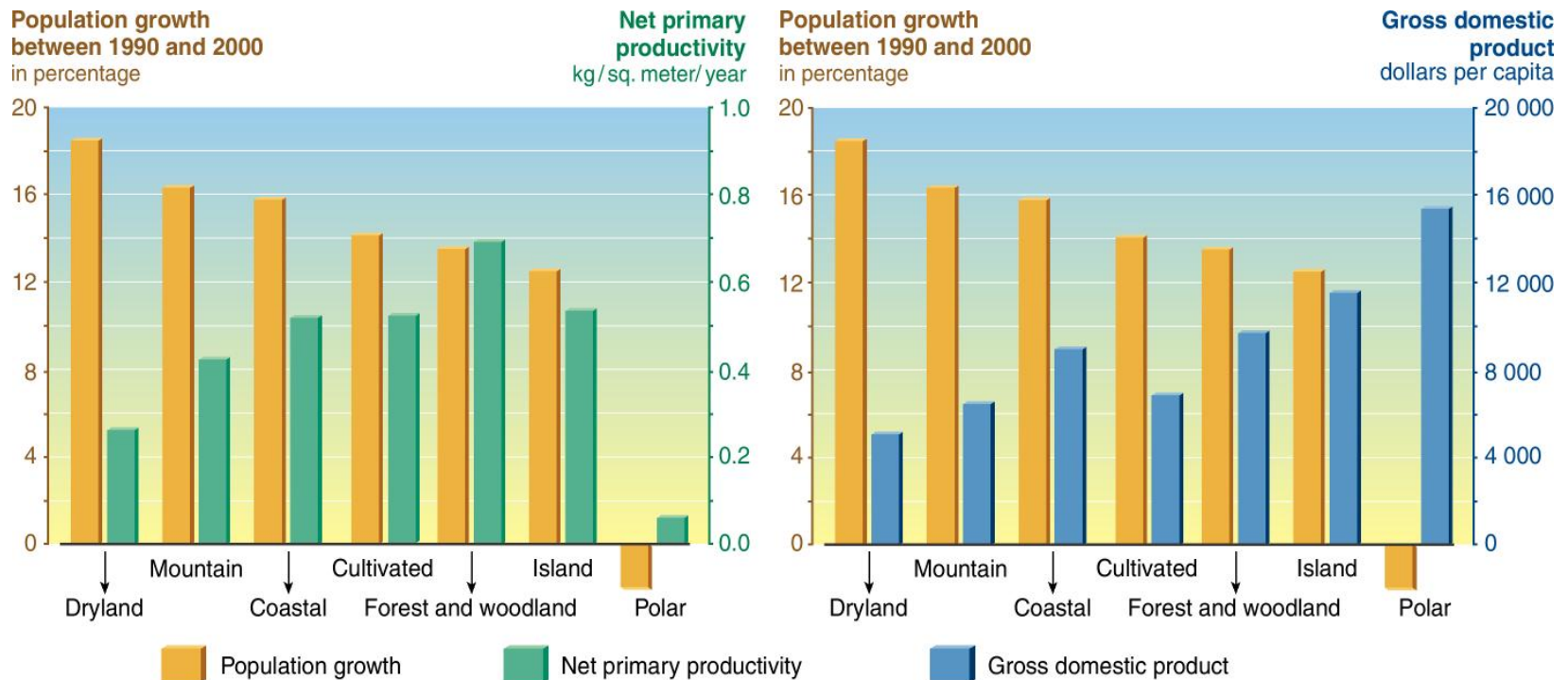
- The Atlantic cod stocks off the east coast of Newfoundland collapsed in 1992, forcing the closure of the fishery
- Depleted stocks may not recover even if harvesting is significantly reduced or eliminated entirely



Ecosystem services and poverty reduction

Critical concern: Dryland systems

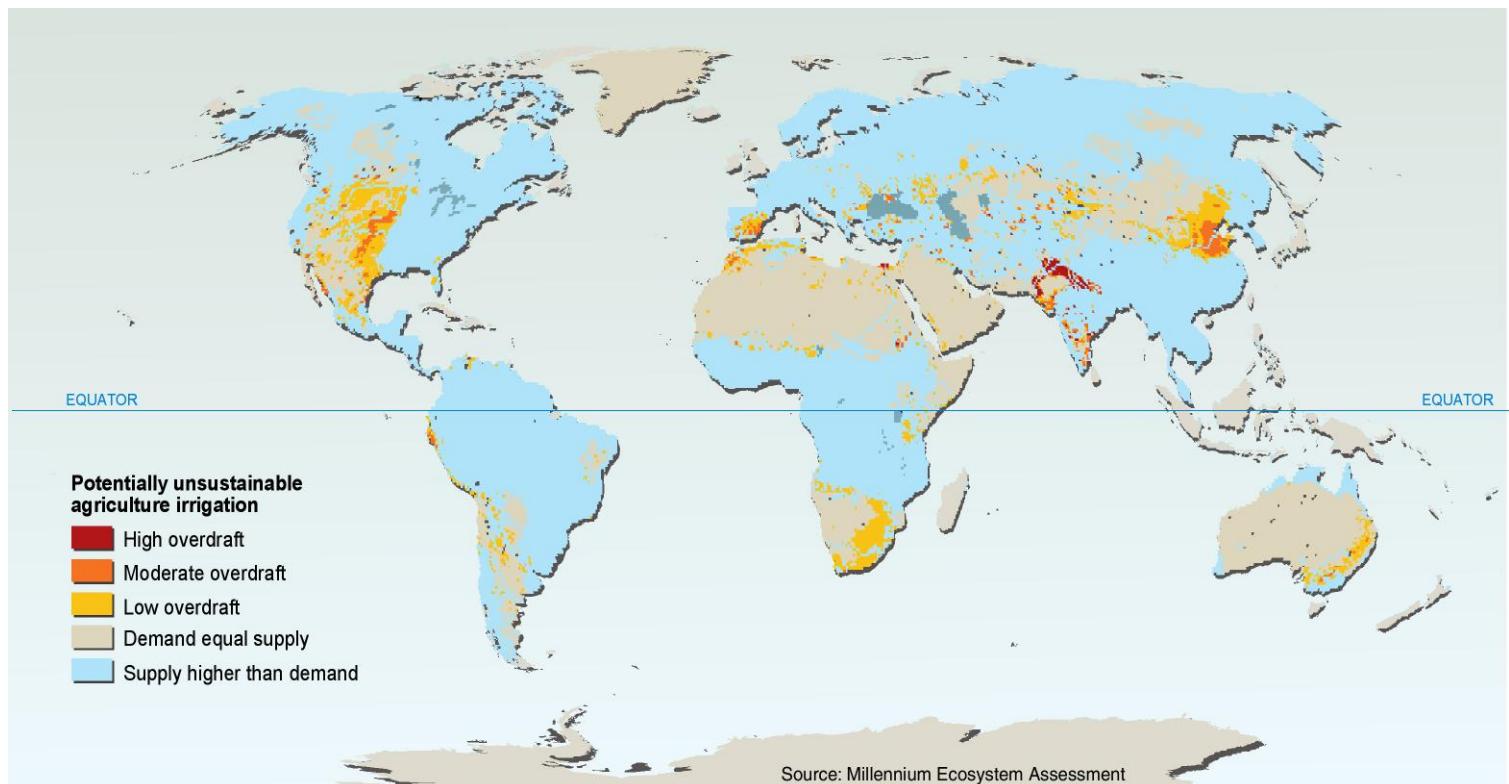
- Dryland systems experienced the highest population growth rate in the 1990s



Sources: Millennium Ecosystem Assessment

Water

- 5 to possibly 25% of global freshwater use exceeds long-term accessible supplies (*low to medium certainty*)
- 15 - 35% of irrigation withdrawals exceed supply rates and are therefore unsustainable (*low to medium certainty*)



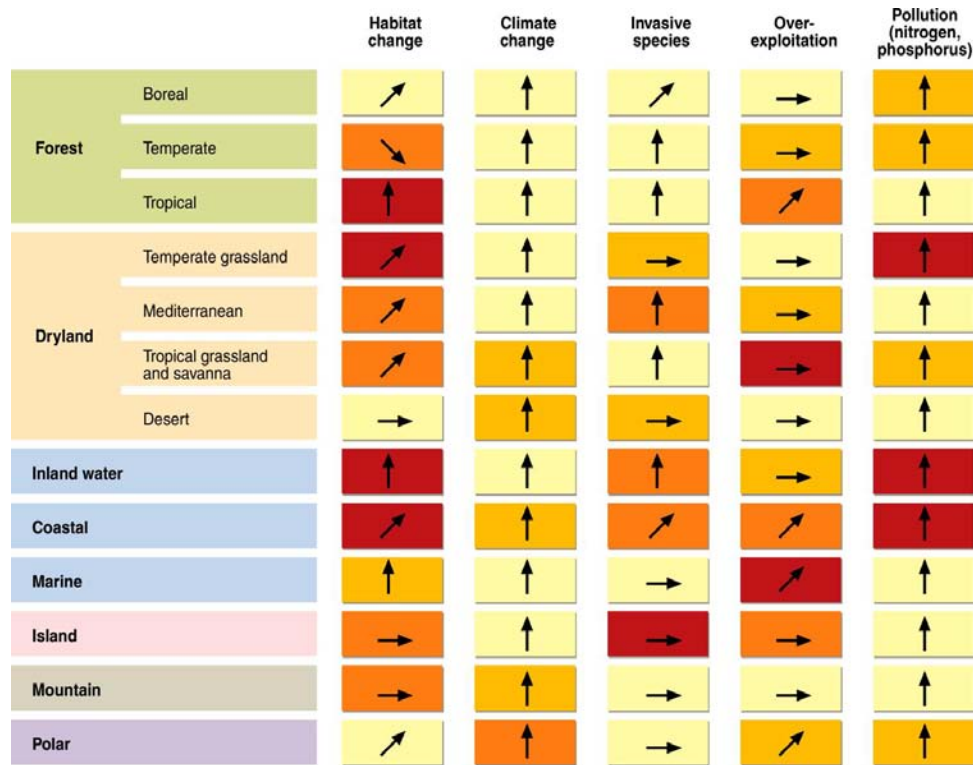
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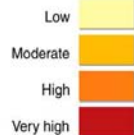
Direct drivers growing in intensity



Most direct drivers of degradation in ecosystem services remain constant or are growing in intensity in most ecosystems

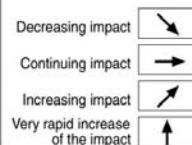
RESULT OF PAST EVOLUTION

Driver's impact on biodiversity over the last century



WHAT HAPPENS TODAY

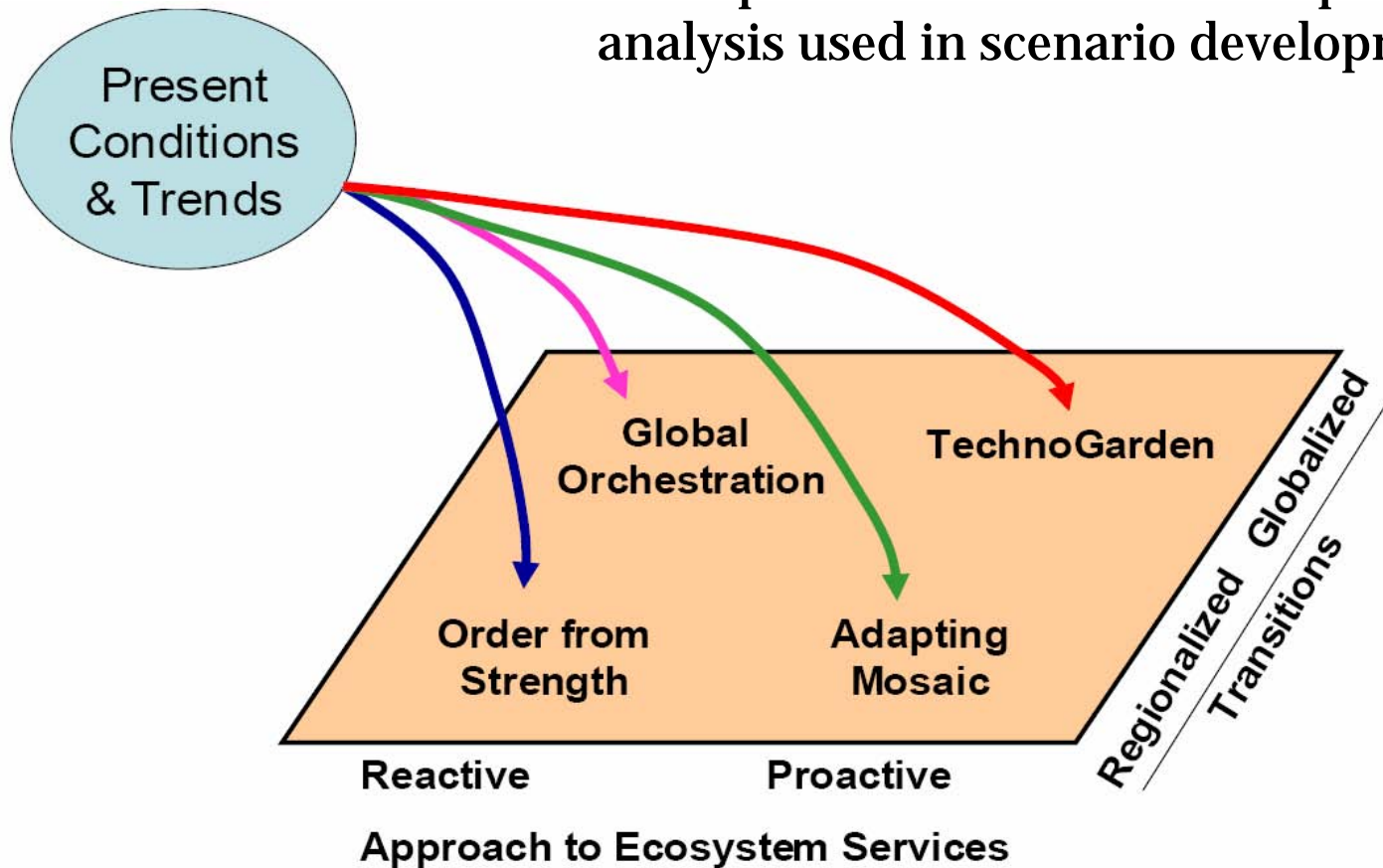
Driver's actual trends



Source: Millennium Ecosystem Assessment

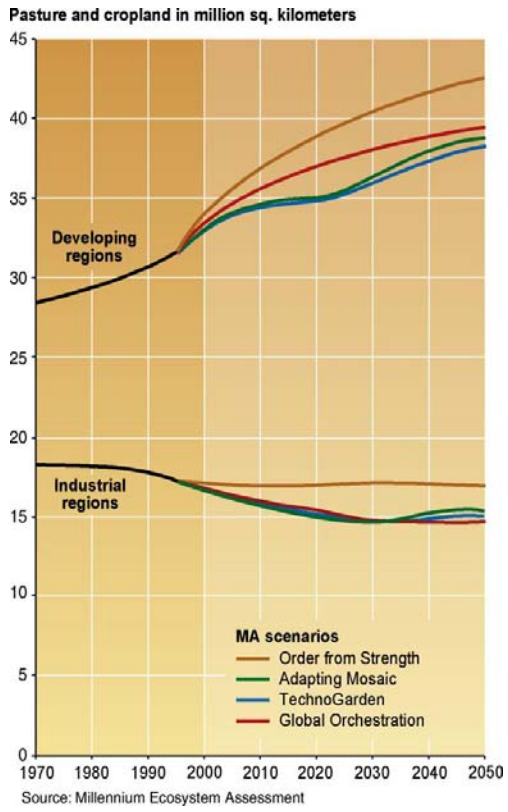
MA Scenarios

- Not predictions – scenarios are plausible futures
- Both quantitative models and qualitative analysis used in scenario development

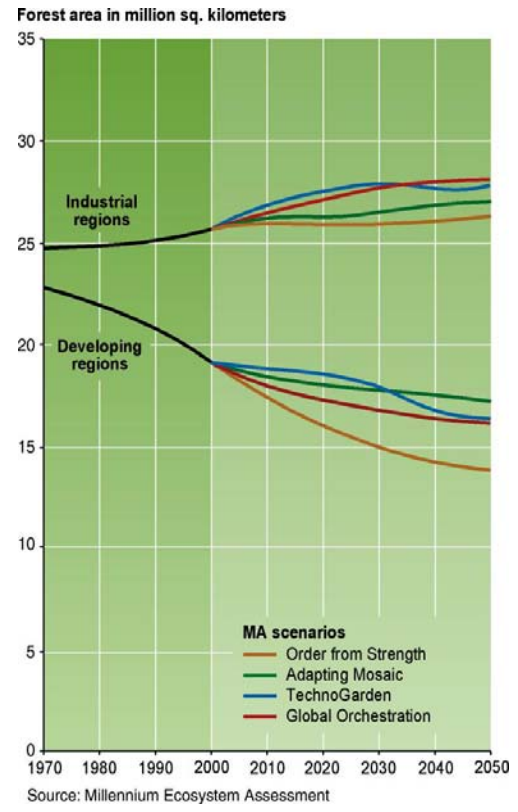


Changes in direct drivers

Changes in crop land and forest area under MA Scenarios



Crop Land



Forest Area

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Examples of changes in policies and practices that yield positive outcomes

Global Orchestration

- Major investments in public goods (e.g., education, infrastructure) and poverty reduction
- Trade barriers and distorting subsidies eliminated

Adapting Mosaic

- Widespread use of active adaptive management
- Investment in education (countries spend 13% of GDP on education, compared to 3.5% today)

TechnoGarden

- Significant investment in development of technologies to increase efficiency of use of ecosystem services
- Widespread use of 'payments for ecosystem services' and development of market mechanisms

MA Responses Assessment

The MA assessed 74 response options for ecosystem services, integrated ecosystem management, conservation and sustainable use of biodiversity, and climate change

Responses: Economics

Economic and financial interventions provide powerful instruments to regulate the use of ecosystem goods and services

Promising Responses

- **Elimination of subsidies** that promote excessive use of ecosystem services (and, where possible, transfer these subsidies to payments for non-marketed ecosystem services)
 - *Subsidies paid to the agricultural sectors of OECD countries between 2001 and 2003 averaged over \$324 billion annually, or one third the global value of agricultural products in 2000*
 - *Compensatory mechanisms may be needed for poor people who are adversely affected by the removal of subsidies*
 - *removal of agricultural production subsidies within the OECD would need to be accompanied by actions to minimize adverse impacts on ecosystem services in developing countries*

Responses: Economics

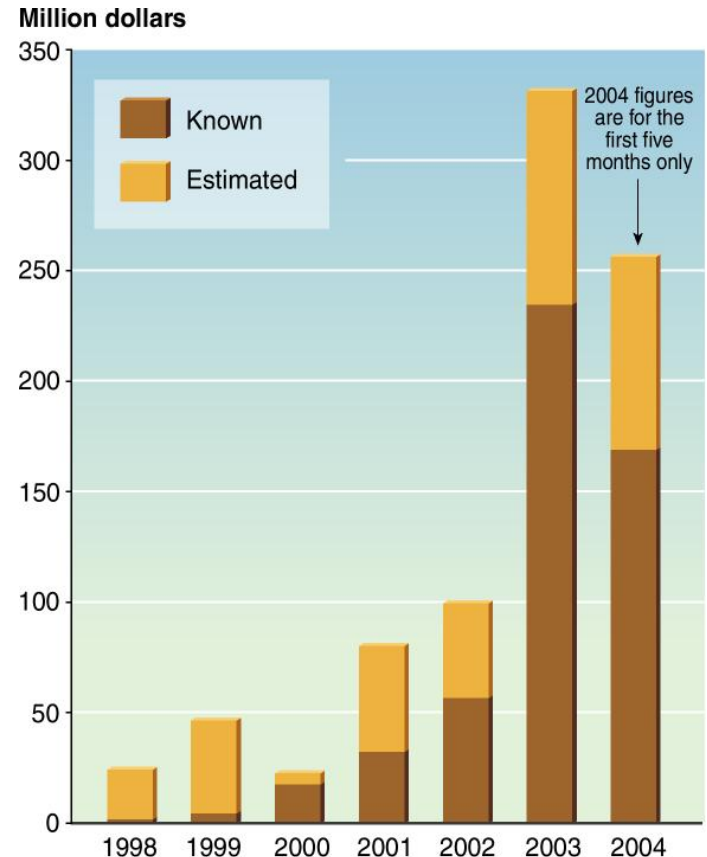
Promising Responses

- Greater use of **economic instruments and market-based approaches** in the management of ecosystem services (where enabling conditions exist):
 - *Taxes or user fees for activities with “external” costs (e.g. include taxes on excessive application of nutrients)*
 - *Payment for ecosystem services*

For example, in 1996 Costa Rica established a nationwide system of conservation payments under which Costa Rica brokers contracts between international and domestic “buyers” and local “sellers” of sequestered carbon, biodiversity, watershed services, and scenic beauty
 - *Mechanisms to enable consumer preferences to be expressed through markets such as existing **certification schemes** for sustainable fisheries and forest practices*

Responses: Economics

- **Market-based approaches**
- **Creation of markets, including through cap-and-trade systems**
 - One of the most rapidly growing markets related to ecosystem services is the carbon market. The value of carbon trades in 2003 was approximately \$300 million. About one quarter of the trades involved investment in ecosystem services (hydropower or biomass)
 - It is speculated that this market may grow to some \$44 billion by 2010



Total Carbon Market Value per Year

Summary

- Over the past 50 years, humans have changed ecosystems more **rapidly and extensively** than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber and fuel
- 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** in the form of the degradation of many ecosystem services, increased risks of nonlinear changes, and the exacerbation of poverty for some groups of people
- 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
- The challenge of reversing the degradation of ecosystems while meeting increasing demands for their services **can be partially met** under some scenarios that the MA has considered but these involve **significant changes in policies, institutions and practices**, that are not currently under way

Visit the MA Website

www.MAweb.org

All MA reports available to download

Access to core data

MA 'outreach' kit

- Slides
- Communication tools

Millennium Ecosystem Assessment
 Strengthening Capacity to Manage Ecosystems Sustainably for Human Well-Being

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News Updates

Findings of the Millennium Ecosystem Assessment: Authors finalize reports for Board approval & release in March

TUESDAY, FEBRUARY 22, 2005 | PENANG, MALAYSIA

The completion of the review process for the synthesis reports on February 4 marks the near final stage of the Millennium Ecosystem Assessment (MA). Review comments were received and discussed by MA authors during the Final Synthesis Teams meeting in the Netherlands on January 12-14, 2005.

On March 19-21, 2005 in New York, the Board Technical Committee will meet with the Assessment Panel and Synthesis Team Chairs to review the reports and submit them for approval by the Board on March 22-23, 2005.

The MA will release its findings and reports starting March 30, 2005 during press conferences at the Royal Society in London, the National Press Club in Washington, DC as well as in Tokyo, Beijing, New Delhi, Brasilia, Cairo, Nairobi and Rome.

Copies of the reports, embargoed for March 30, 2005, are now available here. Please check the site often for the final versions of the MA reports.

[Read more](#)

Southern Africa Assessment Reports Now Available

TUESDAY, SEPTEMBER 28, 2004 | PRETORIA, SOUTH AFRICA

Assessment reports from the MA sub-global assessment in southern Africa, SAFA, are now available. A nested, multi-scale set of assessments undertaken at regional, basin and local levels, SAFA was undertaken over the course of 3 years, involving assessment teams and institutions in locations across the region. For further information, and copies of the SAFA reports, see the Southern Africa sub-global assessment page.

Linking Local Knowledge to Global Science

SUNDAY, MARCH 21, 2004 | ALEXANDRIA, EGYPT

On March 17-20, 2004, the MA held a conference "Bridging Scales and Epistemologies: Linking Local Knowledge and Global Science in Multi-Scale Assessments." Approximately 220 indigenous peoples, academics and practitioners from nearly 50 countries gathered to discuss two central challenges faced by the MA: how to undertake a "multi-scale" assessment and how to create mechanisms that enable the integration or coordination of information and insights from individuals who possess different "ways of knowing the world."

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Featured Documents

- Newsletter - September 2004 pdf, 100 KB
- Ecosystems & Human Well-being: Summary (English) pdf, 467 KB

Upcoming MA Meetings

- Board Technical Meeting - review technical reports and syntheses New York, USA | Mar 19 - 21, 2005
- Final Board Meeting to approve MA reports New York, USA | Mar 22 - 23, 2005
- International Council for Science (ICSU) 28th General Meeting Suzhou, China | Oct 17 - 21, 2005