

Socio-Economic values of ecosystem services in the context of marine protected areas

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MPA's in the Netherlands

Integr. Management Plan (IBN) 2015
was adopted in **July 2005** -> 4 areas

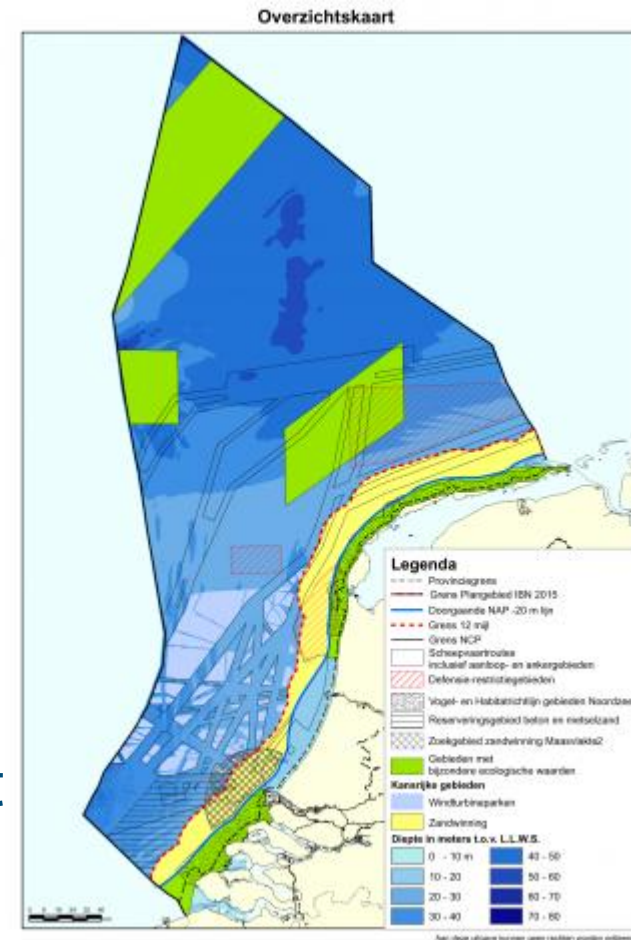
22 Jan. 2007: letter of Min Veerman to parliament to start the Natura 2000 process:

Early-2008: Draft-list of designated areas
+ Public consultation

Mid-2008: final list (4) submitted to EC
and OSPAR secretariat

Late-2008: approval by EC

As of 2009: draft planning-decision subject
to public consultation & final designation



GREEN AREAS: Friese Front, de Klaverbank, de Doggersbank
and parts of the coastal sea (N of Bergen and the SW Delta)

Conservation still seen as a cost ...

“Current” expenditures on all Protected Areas: 6-9 billion \$/y
needed 45-50 billion \$ (1 [of which for MPA: 5-19 billion \$/y]

Valentines day in USA 2005: 13 billion US\$

and on cigarettes 2009: 50 billion US\$



Benefits: >> 1,5 - 4,5 trillion* (return 1: 30-100)



Potsdam 2007-Meeting of the Environmental Ministers of the G8+5

“Potsdam Initiative – Biological Diversity 2010”

The economic significance of the global loss of biological diversity

- analysing the global economic **benefit of biological diversity**,
- the **costs of the loss of biodiversity** and
- the **failure to take protective measures versus the costs of effective conservation.**

Stern (2006):

“Invest 2% of GDP/year to avoid damage of 20%”

Sponsors: UNEP & EU
Germany + several other EU
Countries (& Japan)



COP 10 MOP 5
Nagoya, Japan 2010

Life in Harmony, into the future
いのちの共生を、未来へ



The Economics of Ecosystems & Biodiversity



www.teebweb.org



D0



Science & Economics
Foundations, Policy
Costs & Costs of Inaction

D1



Policy Evaluation
for Policy-Makers

D2



Decision Support
for Administrators

D3



Business Risks
& Opportunities

D4



Consumer
Ownership



22 Service types:

Provisioning

- 1 - Food
- 2 - Water
- 3 - Raw Materials
- 4 - Genetic resources
- 5 - Medicinal resources
- 6 - Ornamental resources

Regulating

- 7 - Air quality regulation
- 8 - Climate regulation (incl. C-sequestration)
- 9 - Moderation of extreme events
- 10 - Regulation of water flows
- 11 - Waste treatment

- 12 - Erosion prevention
- 13 - Maintenance of soil fertility
- 14 - Pollination
- 15 - Biological control

Habitat/Supporting

- 16 – Nursery service
- 17 – Genepool protection

Cultural [provide opportunities for:]

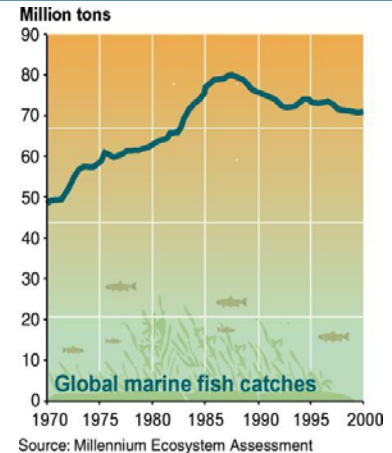
- 18 - Aesthetic enjoyment
- 19 - Recreation & tourism
- 20 - Inspiration for culture, art & design
- 21 - Spiritual experience
- 22 - Cognitive development

(1) Provisioning services (resources)



Global marine fish catch: 70 – 80 billion US\$/year (1)

Not sustainable, heavily subsidized (15-30 billion)
Peaked in 1994, collapse 2050? (2)



Bio-prospecting
(medicines, genetic res.)

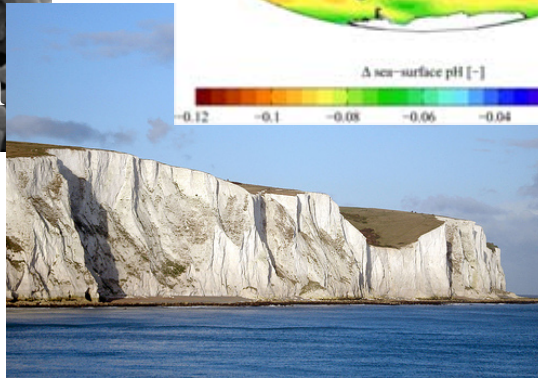
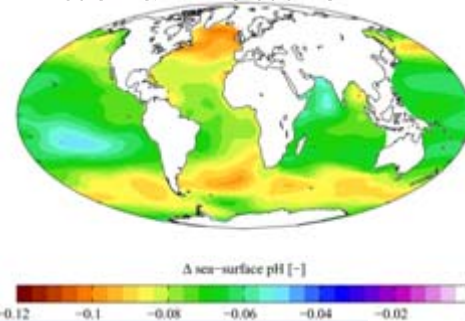
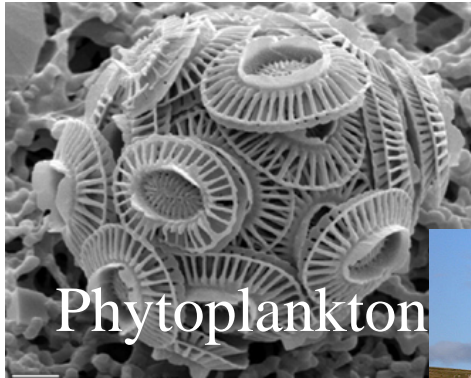


Many other provisioning services

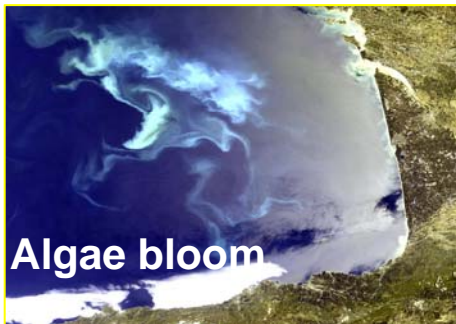
- Non-fishery food (e.g. algae)
- Raw materials (shells, etc)
- Energy, Fertilizer (eg seaweed)
- Animal feed (e.g. fishmeal)
- Ornamental resources
- Other ...?

(2) Regulating services

Climate-change (carbon-balance) acidification



fix tremendous
amounts of carbon
(Cliffs of Dover)



Waste treatment /
nutrient cycling

Gulf of Biscayne (17 May 2004)

Regulating Services

Carbon storage/**CO₂-O₂** flux

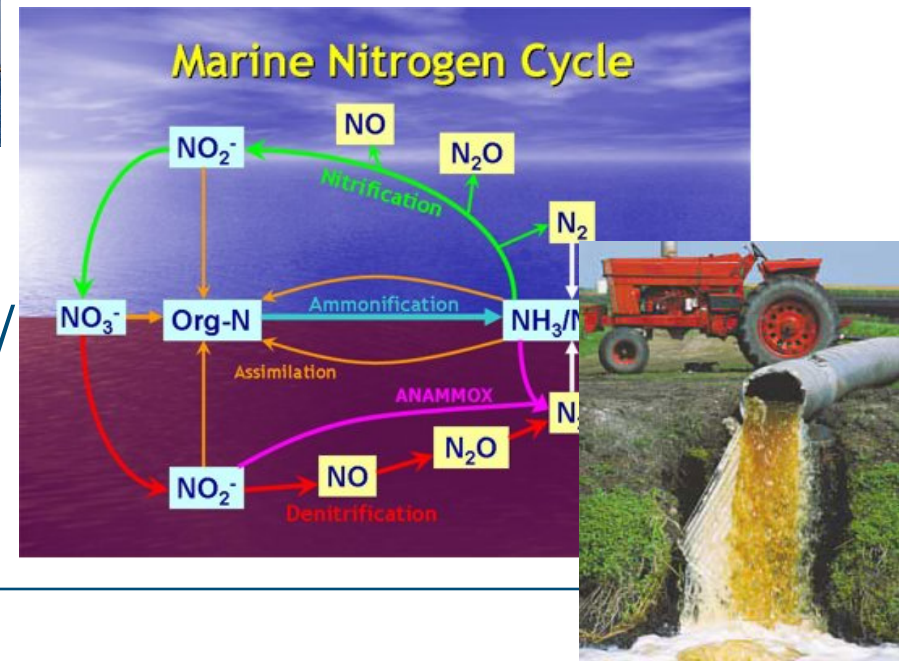
Climate regulation

Storm protection

Flood prevention

Waste treatment

Biological control



(3) Cultural (information) services

Aesthetic & recreational benefits

- diving, swimming, beach-recreation
- attractiveness for housing

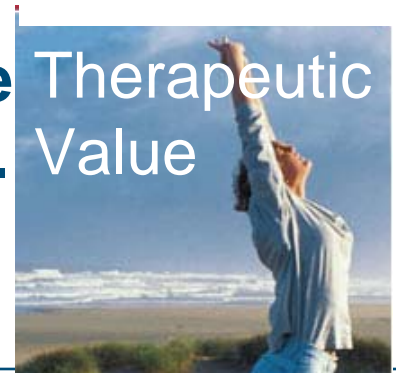


Inspiration (art, spiritual, science, education)



Cultural heritage identity, health ..

Therapeutic Value

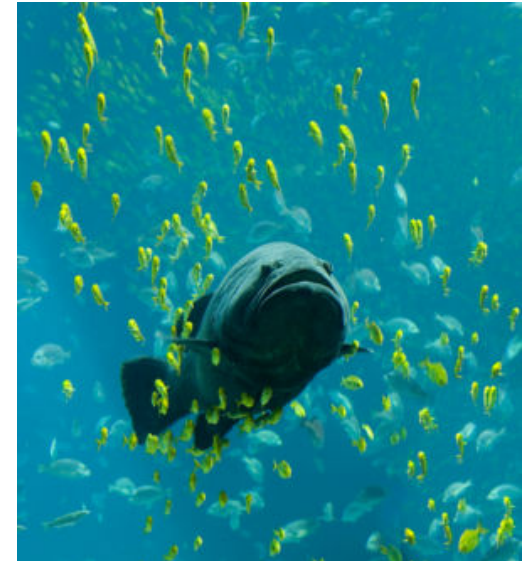


(4) Habitat / supporting services

Nursery function



Habitat / Biodiversity



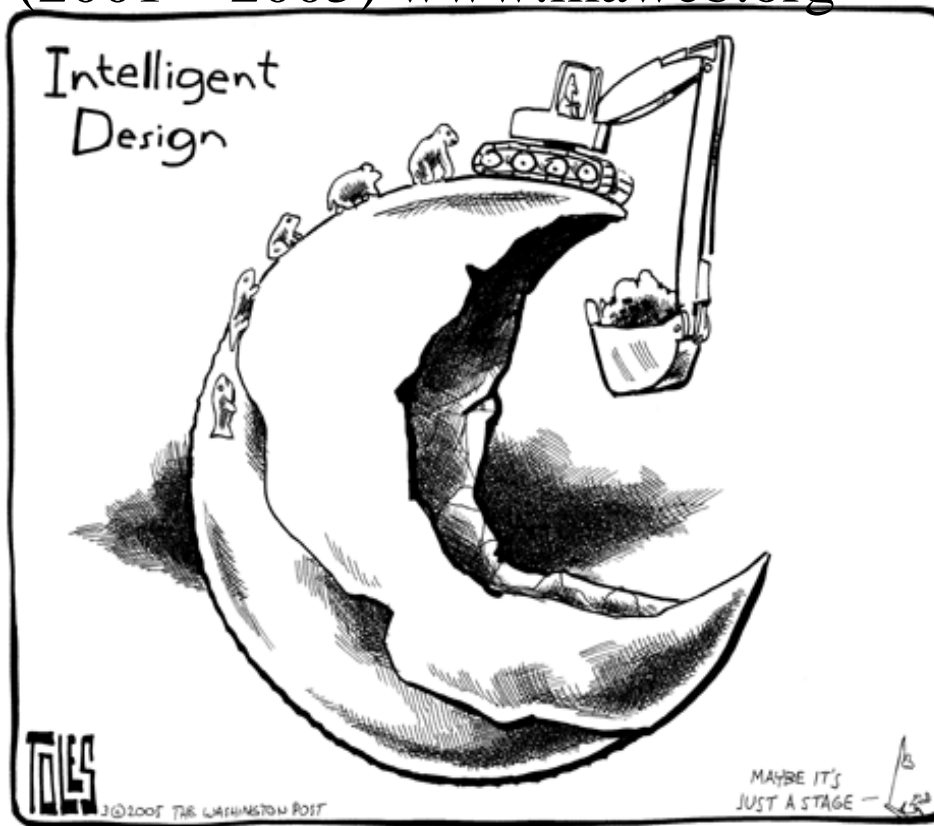
**Other “life support”
Services**

**e.g. Nutrient cycling /
Bio-geochemical cycling**

The Economics of Ecosystems & Biodiversity



Millennium Ecosystem Assessment
(2001 – 2005) www.maweb.org



MA: 60% of Ecosystem Services are lost or in decline (2005)



TEEB: What are the economic consequences ?

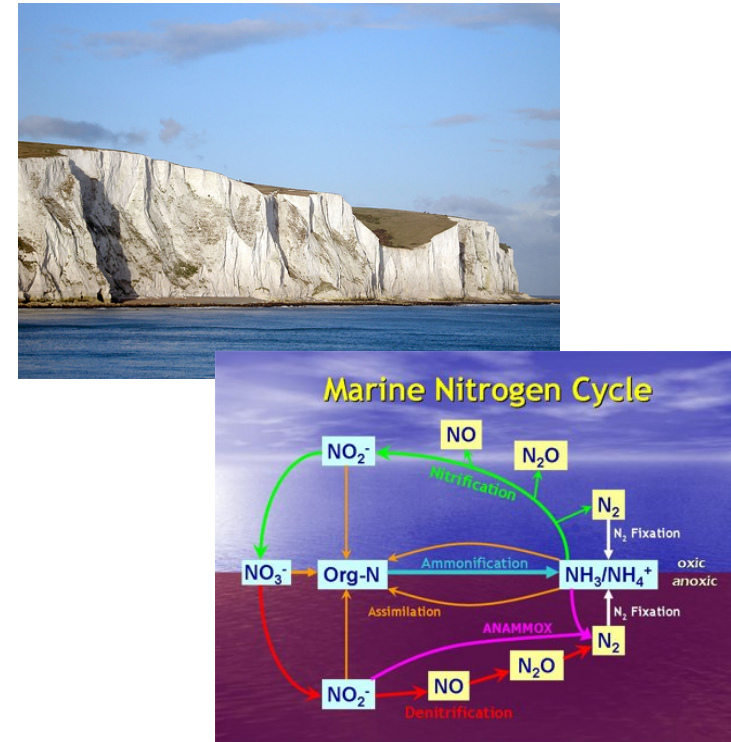
2008 – 2010 (www.TEEBweb.org)

Economic value / monetary valuation

1. Market Price



2. Shadow price (Indirect use value)



3. Non-use values (-> donations, vol. work etc)

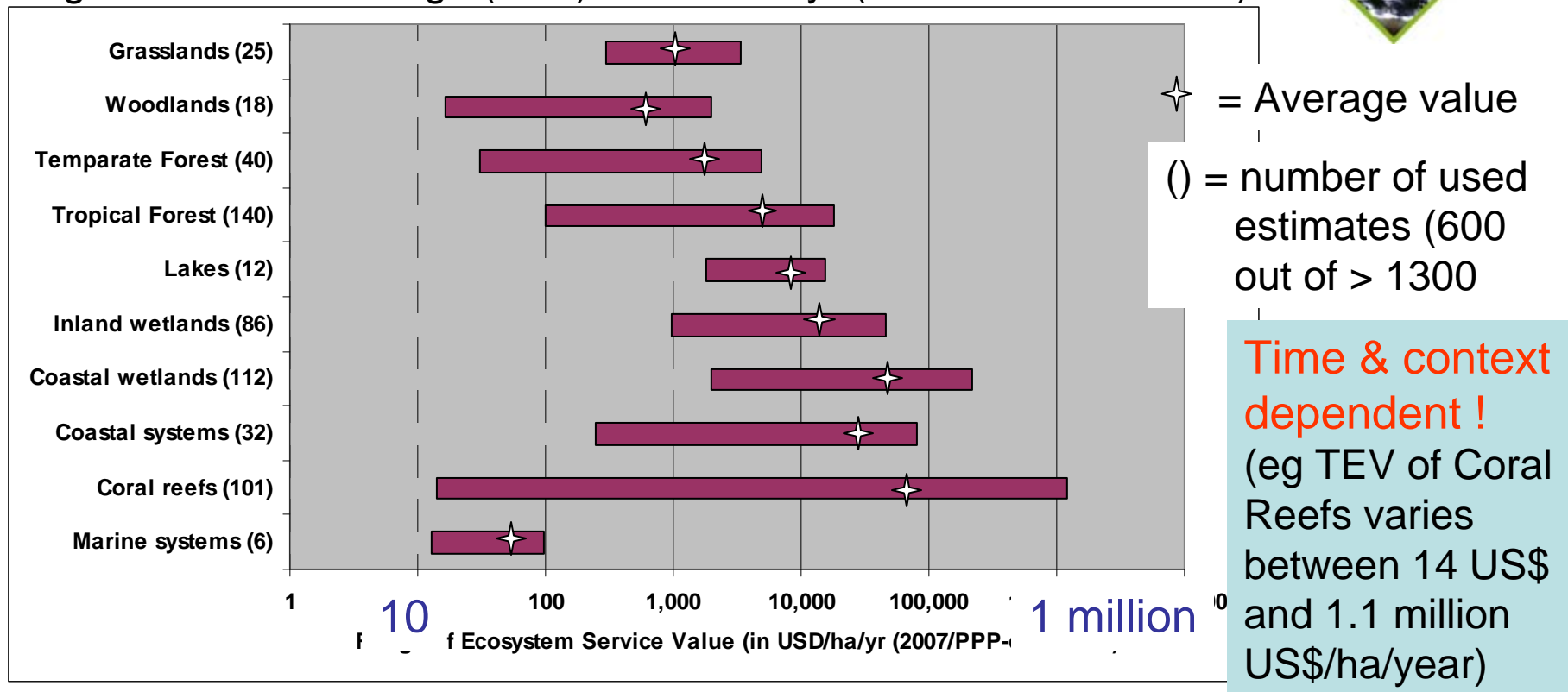


(avoided) damage cost,
replacement cost, etc

The Economics of Ecosystems & Biodiversity



Log-scale of value range (TEV) in US\$/ha/yr (2007 PPP corrected)



Oceans

49 US\$/ha/yr [climate regulation & fishery]

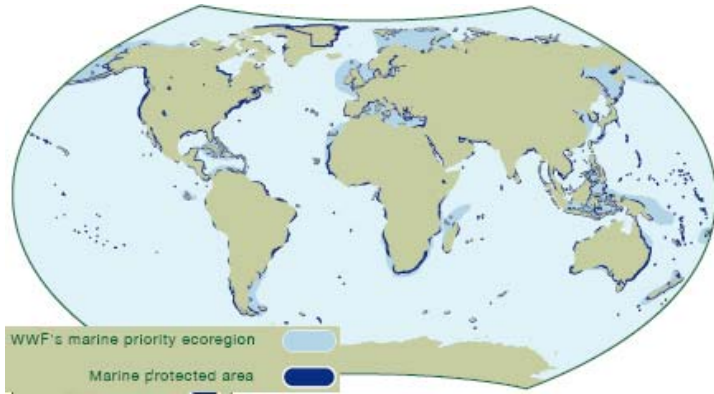
Mangroves

46.239 US\$/ha/yr [waste treatment & nursery]

Coral Reefs

92.775 US\$/ha/yr [tourism & storm protection]

Cost & Benefits of Marine Protected Areas (MPA)



Network of MPA's (by 2012...), protecting 20-30% of the world's seas and coastal systems would cost between **5-19 billion US\$/y** (1

This is **less than the yearly subsidies** for marine fisheries alone (15-30 billion), not counting other 'perverse' subsidies, eg. for converting mangroves to fish-ponds & shrimp farms ...

Average **management cost**:
775 US\$/km²/year =
less than 8 US\$/ha/y

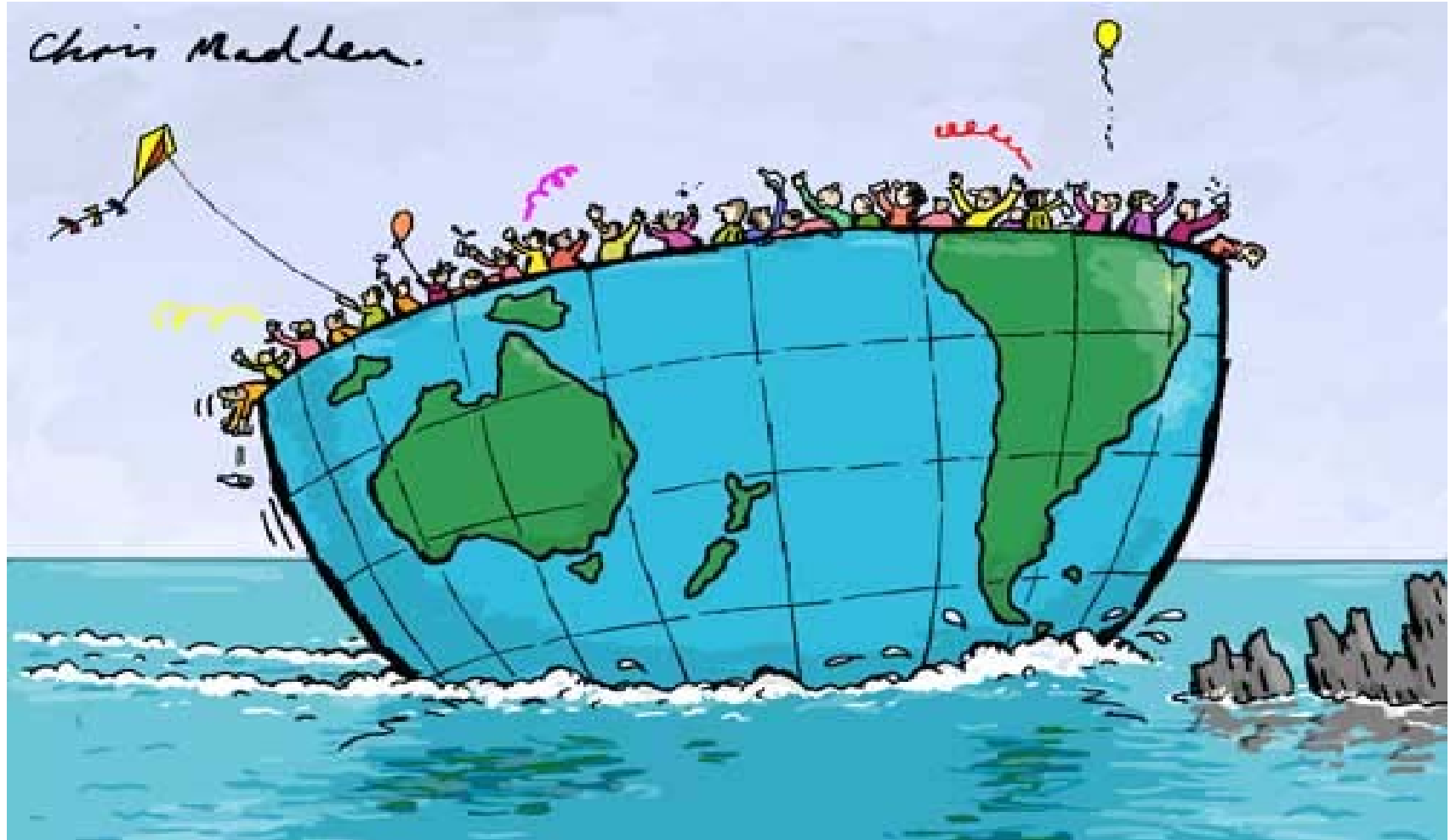
(average of 83 MPA's)

Benefits: between 50 and
100.000 US\$/ha/year [TEEB]

Benefit-cost ratio 6x ->>>100x

Why do we not invest more...?

Why didn't we meet the CBD targets set in 2002 ?



“The ship of fools and the rocks of short-term economic planning”

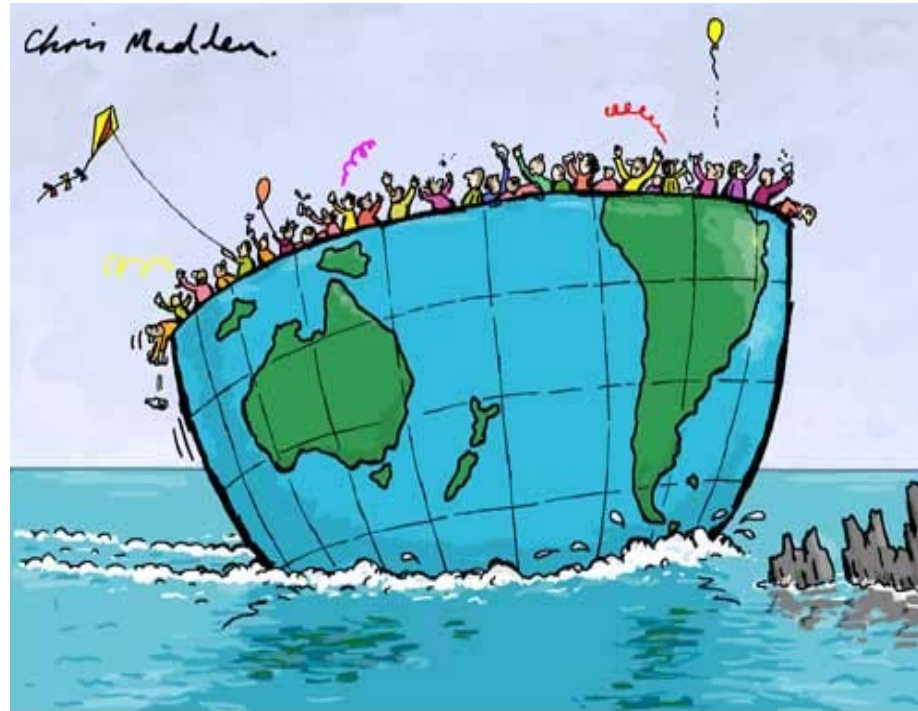
Shortcomings of economic theory and practice

* Value of most benefits of Ecosystem services is **under-estimated** because

they are **not** captured in conventional market economics ("free" services)

* **Lack of data** -> trade-off decisions are based on

incomplete information



THE SHIP OF FOOLS AND THE ROCKS OF SHORT-TERM ECONOMIC PLANNING

* **Market failures:**

externalities are not accounted for

(eg. costs of pollution, deforestation) (eg. fishery, shrimp farms, etc)

* **Wrong (per-verse) taxes & subsidies**

stimulate ecosystem loss



But How ??



1) New Economics (TEEB D3)

- Internalize **“externalities”**
positive (‘free services’)
& negative (biodiv. loss)
- Stop **discounting** interests of future generations

2) Policy Measures (TEEB D1 & D2)

- Adjust **taxing and subsidy-system** (reward sustainability/punish unsustainab.)
- Adjust **SEEA, Greening GDP** (or better replace by other welfare-measures)
- From CDM to **Green Development Mechanism** (reward prot. of biod.) **REDD**

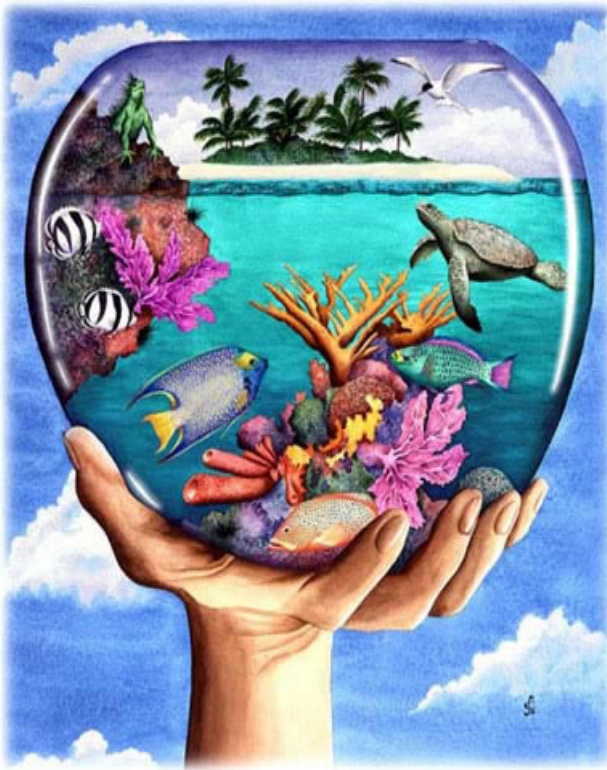
3) Awareness raising / TEEB for consumers (D4)

- **Fair prices**, eg. eco-labeling (e.g Fair Trade, FSC, MSC)
- > Fair society (private and corporate social responsibility)



It may cost some money [8 \$-5€/ha/y]

But INVESTING in MPA's pays ...!



„Every dollar invested saves anywhere between 7,5 and 200 US\$ in damage & repair costs“

TheEconomist
(23 April 2005)

www.es-partnership.org

ESP

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ES Networks
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Agenda
News
Vacancies
Links
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The Ecosystem Services Partnership

Worldwide Network to enhance the Science and practical Application of ecosystem services assessment

There is a growing demand for integrating ecosystem services research into policy and practice. The Ecosystem Services Partnership seeks to enhance this integration by coordinating collaborative efforts on ecosystem services at the global, national and local level. The ES-Partnership is a network organization that will link practitioners, researchers, and stakeholders around the world who are working toward better understanding, modeling, valuation and management of ecosystem services and natural capital.

[more information.](#) | [registration](#) | [member list](#) | [login](#) | [contact](#)

ESP Services

Infrastructure

(databases, networks and discussions)

- Databases
- ES Case studies
- Networks - Global / General
- Networks - National ESP's
- Working groups (on Biomes, Ecosystems and Ecosystem Services)
- Discussion Groups

Tools and topics

(concepts, methods, etc)

- ES Indicators
- ES Mapping
- ES Modeling
- ES Valuation
- Economic instruments
- Decision Support & Policy
- ES Management
- ES Business development

Support and Outreach

(support, cooperation, etc)

- Conferences and meetings
- ESP Publications
- Education and training
- Project and funding opportunities
- Vacancies
- Contributions to ES-Assessment and Policy advice

-Databases
-Working groups
-etc

-Conferences
4-7 October
“from science
to practice”

Organization, News and Agenda

ESP Organization

- ESP Aims + Organization
- Membership information
- Registration
- Member Organizations
- Contact us

Agenda

- **new!** 17-19 May 2011 - Regional Resources 2011, Dresden, Germany.
- 6-9 December 2010 - ACES 2010, Phoenix (AZ), USA.
- 14-15 October 2010 - Seminar - What about Urban Nature, Stockholm, Sweden

News, Vacancies and Links

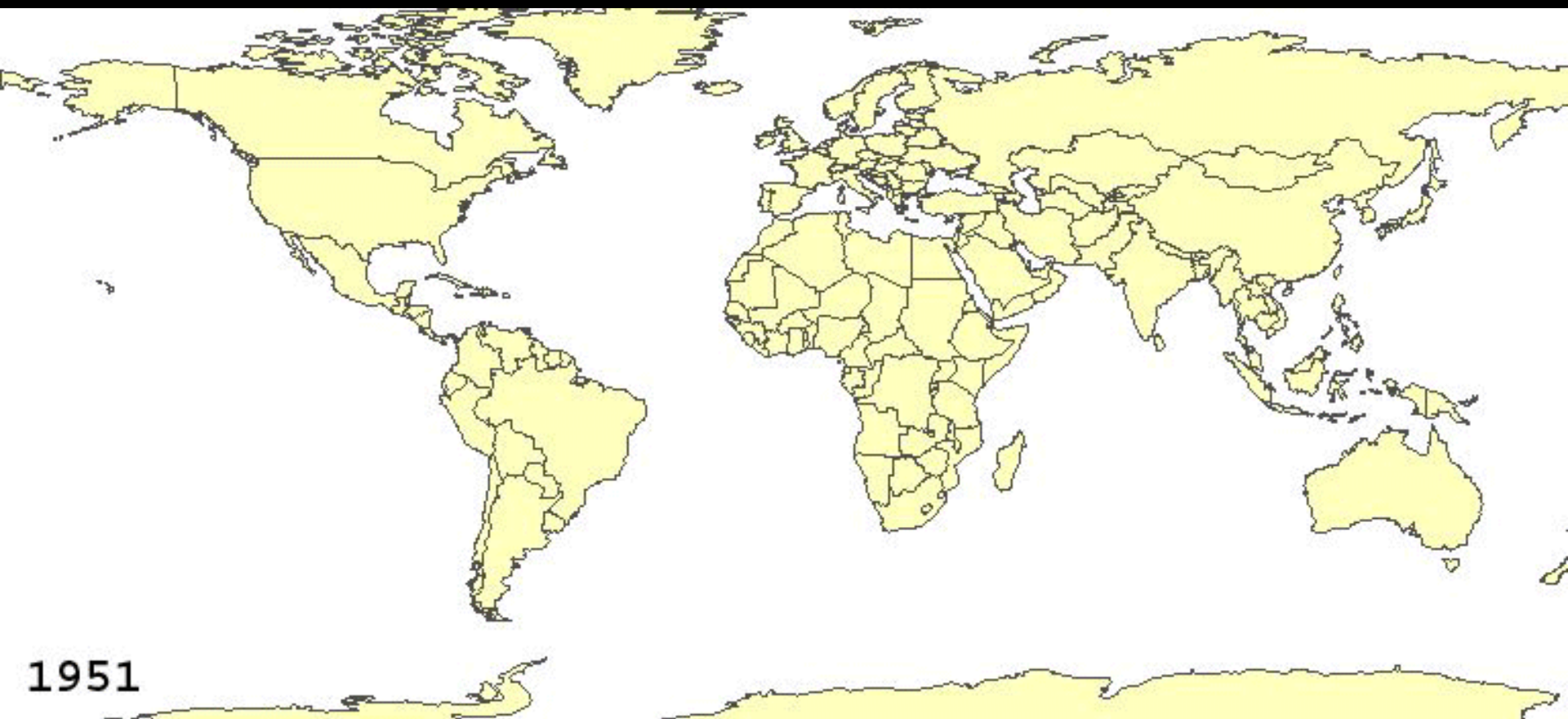
- **new!** JOBS - 2 PhD's and 1 junior researcher
- NEWS - TEEB for business report available! Including CNN article.
- NEWS - FSC certification to be expanded with Ecosystem Services



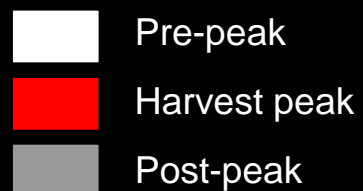
Year of Peak Fish Harvest



Source: Millennium Ecosystem Assessment and Sea Around Us project



Year of Peak Fish Harvest



Source: Millennium Ecosystem Assessment and Sea Around Us project