

MISTRALS

Mediterranean Integrated Studies
at Regional And Local Scales

**“A decade to observe, understand, and predict the livability
of the Mediterranean area over a century”**



Fisheries Resources and Resource-dependent Communities Vulnerabilities to Global Change

A Need for a More Systemic Approach

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Top priority to study the threats of climate change to human society and natural ecosystems (IPCC Report 2007)

« Difficult to ignore the implications of climate change for fisheries and aquaculture activities and for coastal and riparian communities »

Social and Economical Extent of Fishery and aquaculture activities in the World.

- 43.5 million people work directly in the sector of fisheries and aquaculture.
- The most part in developing countries.
- The sector supports nearly 200 million livelihoods.
- 20% or more of average per capita animal protein intake for more than 1.5 billion people.

In the Mediterranean Sea

- Fishing activities : 1.3 million T and 93,000 fishing boats
- Mainly a small scale fishery : 90% of the fishing fleet lower than 10 meters in length.
- 300,000 people directly involved in the Fishery sector.
- The fishing sector supports nearly 900,000 livelihoods.
- The fish farming (Fresh and marine productions) : 1.3 million T(2002) around 30% from carp and tilapia farming in Egypt.
- According to GFCM(2010) the small pelagic fish populations are moderately or fully exploited but demersal fish populations are generally fully or over exploited.



Climate change a compounding threat to the sustainability of fisheries and aquaculture activities.

- **Ecosystem impacts**

1. Modification of the distribution of marine and freshwater species
2. Ecosystem productivity is likely to be reduced in a warm world
3. Alteration of marine and freshwater food webs with unpredictable consequences for fish production.
4. Modification of frequency and seasonality of extreme weather events
5. Sea level rise, glacier melting, ocean acidification and changes in precipitation groundwaters and river flows affect wetlands , rivers, estuaries, lakes and lagoons requiring adaptative measures to exploit opportunities and minimize impacts on fisheries and aquaculture systems.

Climate change a compounding threat to the sustainability of fisheries and aquaculture activities.

- **Impact on livelihoods.**
 1. Increase social pressures by reduced livelihood options inside and outside the fishery sector.
 2. Changes in the availability of aquatic foods, stability of supply, access to aquatic food.
 3. Change in the utilization of aquatic products (production of new species not traditionally consumed).

Climate change a compounding threat to the sustainability of fisheries and aquaculture activities.

- Adapting to changes

We have to consider impacts both short term (ex. events) and long term (decrease of ecosystem productivity) at different levels of adaptation (local, national and regional)

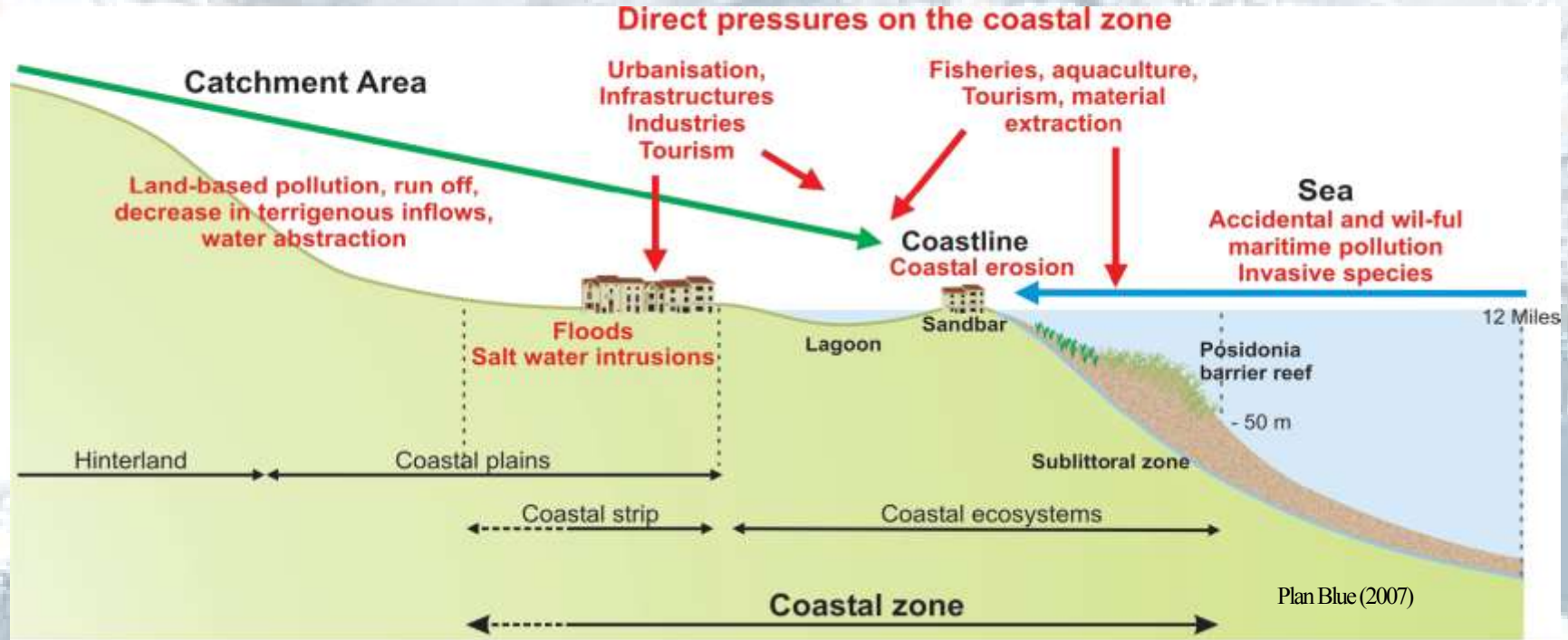
1. How to minimize the ecological footprints of the Fisheries and Aquaculture sectors on Aquatic Ecosystems (Energy, fish selectivity, fishing gear impact, fish farm pollution,...)
2. Implement the EAF and EAA should be adopted to increase the resilience of aquatic ecosystems, production systems and resource-dependent communities.
3. Considered in a more systemic framework the impact of global change: climate change + anthropogenic effects on the good and services of the environment.

Global change : « A growing concern over the ever-increasing human modification of other aspects of the global environment and the consequence implications for the human well-being ».

- 90% of the 28 millions of fishers in the World practise their activities in riparian, estuarian and coastal ecosystems.
- 80% of the pollution of the sea originate from land uses.
- The maximum level of the yield per recruit and consequently the level of the MSY depends on the quality of the environment (productivity).
- We need to include in the conventional approach, the impacts of all the anthropogenic effects on the aquatic ecosystem in order to use the fishing mortality as the only regulation factor.

$$N_{(t)} = N_{(t-1)} * \exp^{-(F+M)t} \quad \longrightarrow \quad N_{(t)} = N_{(t-1)} * \exp^{-(F+M+M')t}$$

A need to develop a more integrated research



Biodiversity erosion

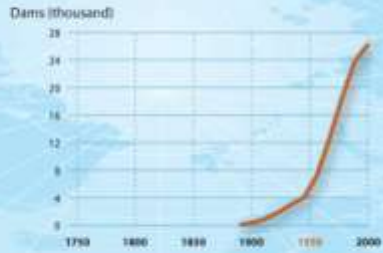
habitat alteration

Int. Water Res. Mgmt

Effects of land and marine pollutions

Demography and human migrations

Damming of rivers



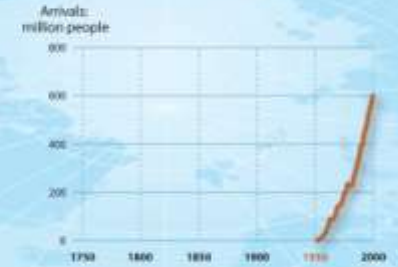
GLOBAL CHANGE SOURCE
World Commission on Dams (2000)
IGBP synthesis: Global Change and the Earth System, Steffen et al 2004

Fertiliser consumption



GLOBAL CHANGE SOURCE
International Fertiliser Industry Association (2003)
IGBP synthesis: Global Change and the Earth System, Steffen et al 2004

International tourism



GLOBAL CHANGE SOURCE
World Tourism Organization (2002) Tourism Industry trends
IGBP synthesis: Global Change and the Earth System, Steffen et al 2004

Population



GLOBAL CHANGE SOURCE
US Bureau of the Census (2000) International database
IGBP synthesis: Global Change and the Earth System, Steffen et al 2004

Water use



GLOBAL CHANGE SOURCE
Sklirisinos (1993) Global Water Resources
IGBP synthesis: Global Change and the Earth System, Steffen et al 2004

Ocean ecosystems



GLOBAL CHANGE SOURCE
FAO/STAT 2002 Statistical database
IGBP synthesis: Global Change and the Earth System, Steffen et al 2004

Trends of some anthropic impacts



Symposium "Biarritz 2011" - 18 to 21 October 2011

Call for communications

"Vulnerability of coastal ecosystems to global change and extreme events"
At the crossroads of knowledge to the benefit of coastal and marine ecosystem services

An international, multidisciplinary scientific symposium on "Vulnerability of coastal ecosystems to global change and extreme events" will be held in Biarritz, France, from 18 to 21 October 2011. It will cover the following topics:

- a) Ecosystem functioning and processes
- b) Assessment of system responses
- c) Management tools and strategies
- d) Integrated coastal and ocean management

The call for communications is now open. The deadline for the submission of abstracts is 31 May 2011. Information for communication submission and the pre-registration form are available on http://www.ifremer.fr/biarritz_2011 (in French and English languages). The communications (in English, 250 words summary) will be assigned to oral or poster sessions.

The scientific symposium will be linked with a technical exhibition for managers and users of the tools and services developed in the fields of observation, prediction, and mitigation of natural and anthropogenic impacts on marine ecosystems. This original combination will provide researchers with opportunities to exchange with the socio-economic sector.

Colloque Biarritz 2011 – du 18 au 21 octobre 2011

Appel à communications

« Vulnérabilité des écosystèmes côtiers au changement global et aux événements extrêmes »

*Croisement des disciplines et des savoirs
 pour assurer les services rendus par les écosystèmes côtiers et marins*

Un colloque pluridisciplinaire international sur la « Vulnérabilité des écosystèmes côtiers au changement global et aux événements extrêmes » aura lieu à Biarritz, en France, du 18 au 21 octobre 2011. Il portera sur les thématiques suivantes :

- a) Comprendre le fonctionnement de l'écosystème et des principaux processus de régulation
- b) Evaluation de la réponse du système
- c) Outils et stratégies de gestion
- d) Gestion intégrée de la zone côtière et de l'océan

L'appel à communication est maintenant ouvert et sera clos le 31 mai 2011. Retrouvez le programme, la procédure pour soumettre vos communications et le bulletin de pré-inscription sur http://www.ifremer.fr/biarritz_2011. Les propositions de communications (résumé en anglais de 250 mots) seront réparties entre communications orales et posters.

Le colloque sera couplé à un forum à l'intention des gestionnaires et des utilisateurs des développements dans le domaine de l'observation, de la prévision et de la mitigation des impacts des facteurs naturels et anthropiques sur les écosystèmes marins. Ce couplage original permettra aux scientifiques de dialoguer avec les acteurs sociaux-économiques.

