"Áreas Marinhas Protegidas: Problema ou solução?"

IV Seminário Nacional Bandeira Azul
Sesimbra, 29 de novembro de 2013

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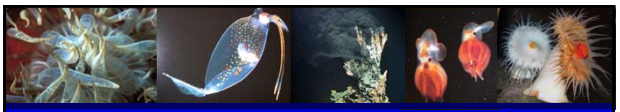
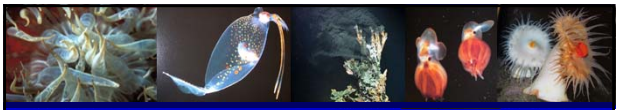


1. Estado de Saúde do Ambiente Marinho
2. O que são Áreas Marinhas Protegidas e para que servem?
3. São as Áreas Marinhas Protegidas um problema ou uma solução?



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The Future for Fisheries

Daniel Pauly[1]* Jackie Alder,[1] Elena Bennett,[2] Villy Christensen,[1] Peter Tyedmers,[3] Reg Watson[1]

Formal analyses of long-term global marine fisheries prospects have yet to be performed, because fisheries research focuses on local, species-specific management issues. Extrapolation of present trends implies expansion of bottom fisheries into deeper waters, serious impact on biodiversity, and declining global catches, the last possibly aggravated by fuel cost increases. Examination of four scenarios, covering various societal development choices, suggests that the negative trends now besetting fisheries can be turned around, and their supporting ecosystems rebuilt, at least partly.

Fisheries are commonly perceived as local affairs requiring, in terms of scientific inputs, annual reassessments of species-specific catch quota. Most fisheries scientists are employed by regulatory agencies to generate these quota, which ideally should make fisheries sustainable and profitable, contributors to employment and, through international trade, to global food security.

This perception of fisheries as local and species-specific, managed to directly benefit the fishers themselves, is conducive neither to global predictions nor the collaborative development of long-term scenarios. Indeed, recent accounts of this type, except those of the United Nations Food and Agriculture Organization (FAO) (*1*), tend to be self-conscious and layered in irony (*2–5*), perhaps an appropriate response to 19th-century notions of inexhaustibility.

The past decade established that fisheries must be viewed as components of a global enterprise, on its way to undermine its supporting ecosystems (*6–10*).

These developments occur against a backdrop of fishing industry lobbyists arguing that governments drop troublesome regulations and economists assuming that free markets generate inexhaustibility. The aquaculture sector offers to feed the world with farmed fish, while building more coastal feedlots wherein carnivores such as salmon and tuna are fed with other fish (*11*), the aquatic equivalent of robbing Peter to pay Paul.

The time has come to look at the future of fisheries through (i) identification and extrapolation of fundamental trends and (ii) development and exploration (with or without computer simulation) of possible futures.

The fisheries research community relied, for broad-based analyses, on a data set now shown to be severely biased (*10*). First-order correction suggests that rather than increasing, as previously reported, global fisheries landings are declining by about 500,000 metric tons per year from a peak of 80 to 85 million tons in the late 1980s. Because overfishing and habitat degradation are likely to continue, extrapolation may be considered (see below). This correction, however, does not consider discarded "by-catch" (about 30% of global landings), only one component of the illegal, unreported, or unregulated (IUU) catches that recently became part of the international fisheries research agenda (*12, 13*).

The geographic and depth expansion of fisheries is easier to extrapolate (Fig. 1). Over the past 50 years, fisheries targeting benthic and bentho-pelagic organisms have covered the shelves surrounding continents and islands down to 200 m, with increasing inroads below 1000 m, whereas fisheries targeting oceanic tuna, billfishes, and their relatives covered the world ocean by the early 1980s (*9*).

Extrapolating the bottom fisheries trends to 2050 is straightforward (Fig. 1). With satellite positioning and seafloor-imaging systems, we will deplete deep slopes, canyons, seamounts,

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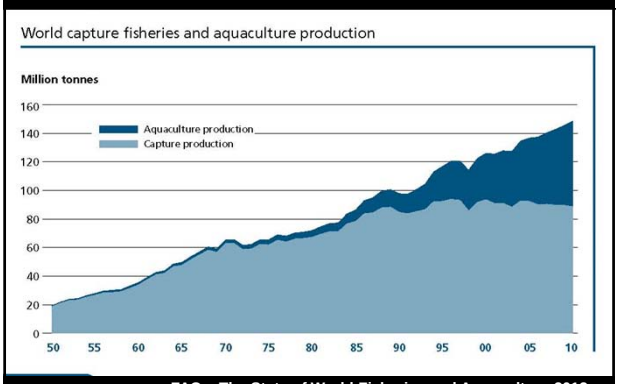
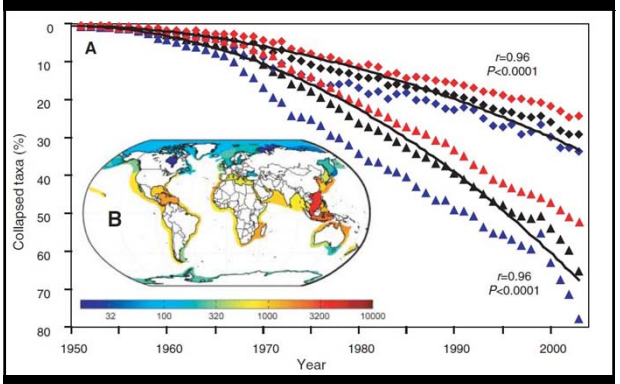
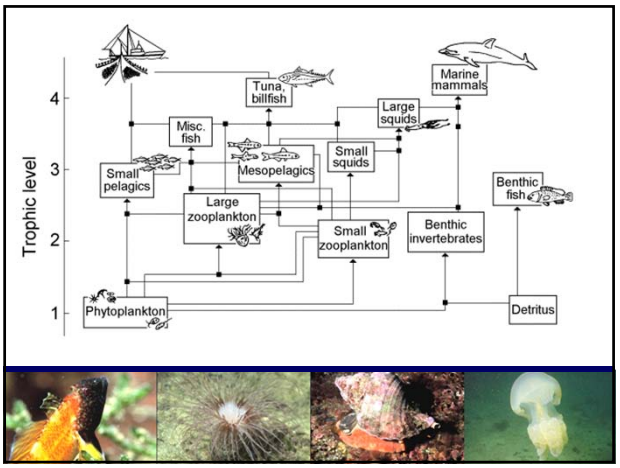
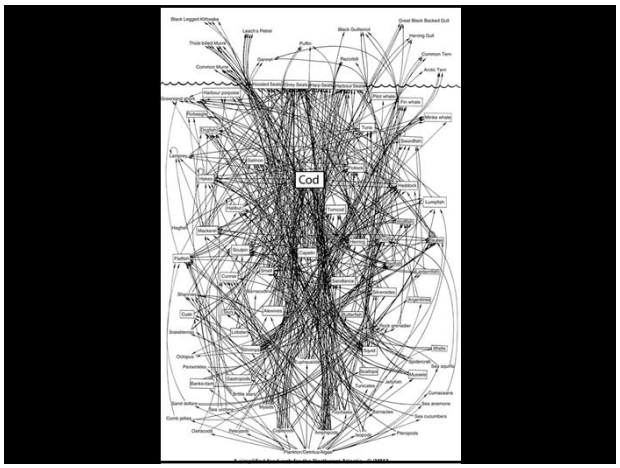


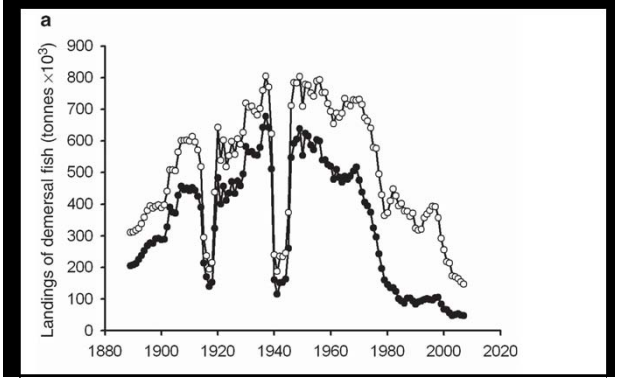
FAO – The State of World Fisheries and Aquaculture 2012

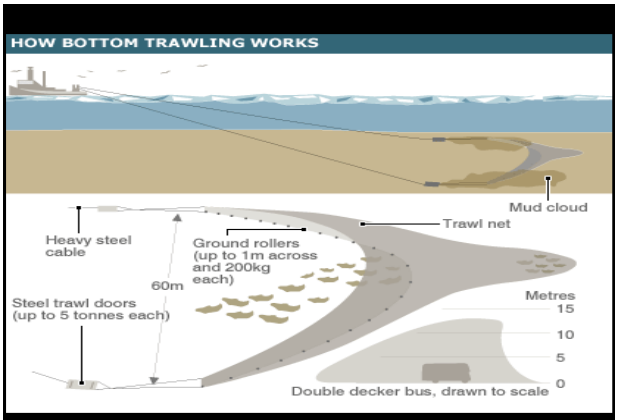


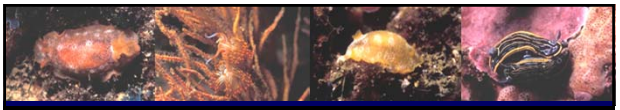




Os efeitos de 118 anos de pesca industrial de arrasto no Reino Unido. Thurstan et al. 2010 *Nature Communications*







Ameaças aos Ecossistemas Marinhos

4.265 anos

2.742 anos

- Não é evidentemente possível gerir os impactos em espécies com esta longevidade. O mesmo é válido para muitas outras espécies de animais do mar profundo.

Anos '50

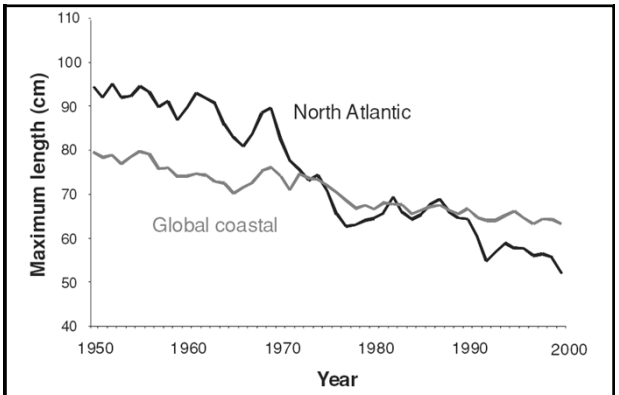
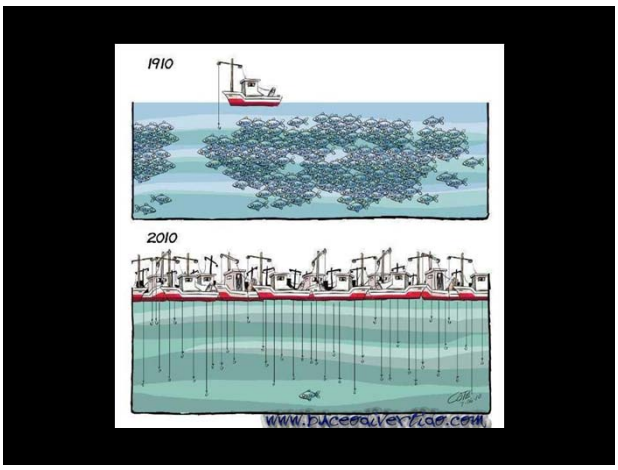


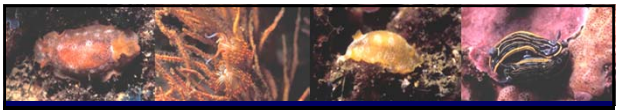
Fig. 2.4 Maximum length attained by species landed from 1950 to 2000. Adapted from R. Watson, unpublished data.



5 de Janeiro de 2013

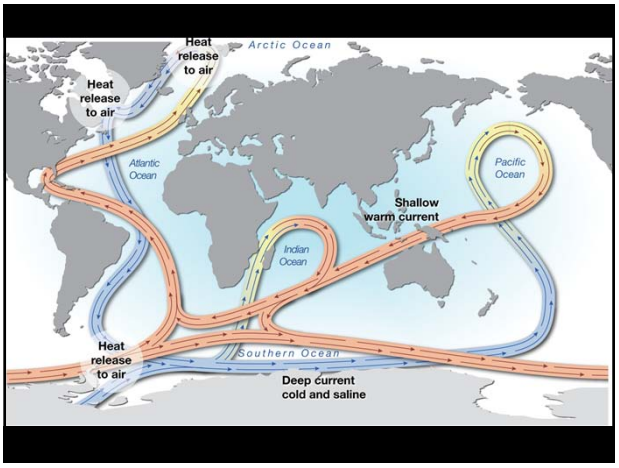
Um atum do Atlântico de 222 Kg foi vendido por 151.4 milhões de yen (=1.320.000 EUR)

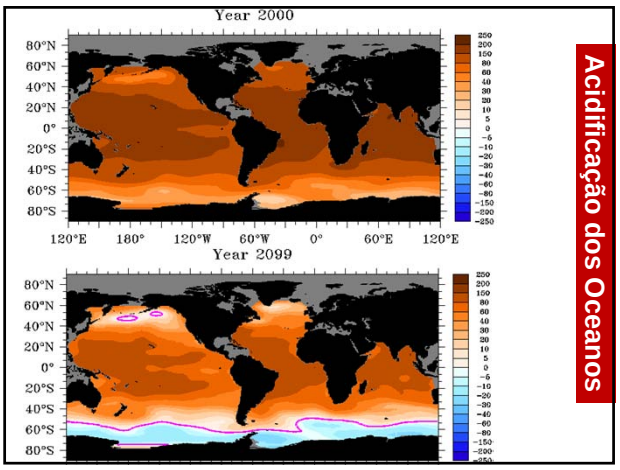
2010 = 595 €/kg
2011 = 815 €/kg
2012 = 2.136 €/kg
2013 = 5.495 €/kg



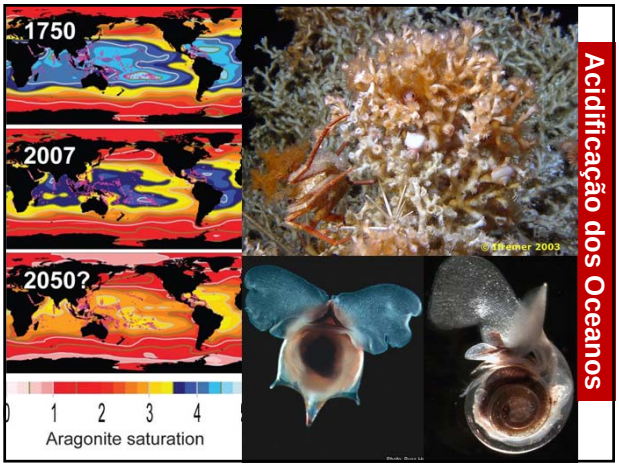
Ameaças aos Ecossistemas Marinhos

- o Aquecimento Global e a frequência crescente de "eventos extremos" (ex: El Niño/La Niña – ENSO) amplifica o ritmo de modificação dos ecossistemas marinhos, piorando a situação





Acidificação dos Oceanos



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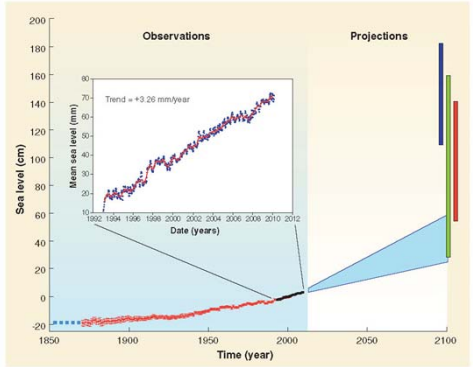


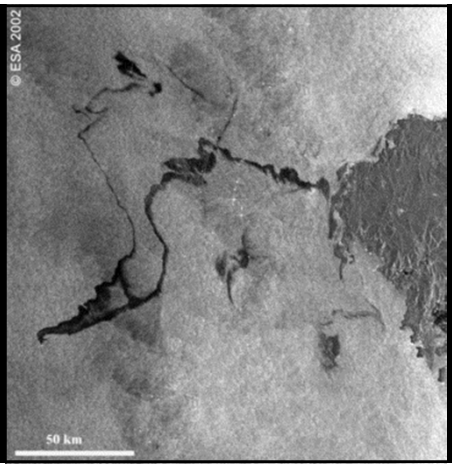
Fig. 1. Global mean sea level evolution over the 20th and 21st centuries. The red curve is based on tide gauge measurements (*10*). The black curve is the altimetry record (zoomed over the 1993–2009 time span) (*15*). Projections for the the 21st century are also shown. The shaded light blue zone represents IPCC AR4 projections for the A1FI greenhouse gas emission scenario. Bars are semi-empirical projections [red bar: (*32*); dark blue bar: (*33*); green bar: (*34*)].

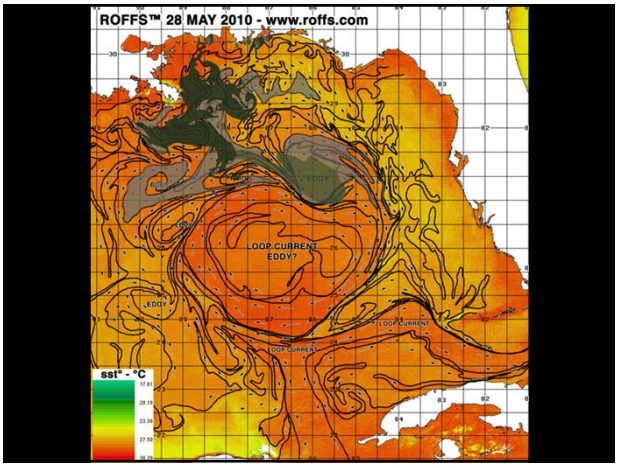
THE WORST SPILLS

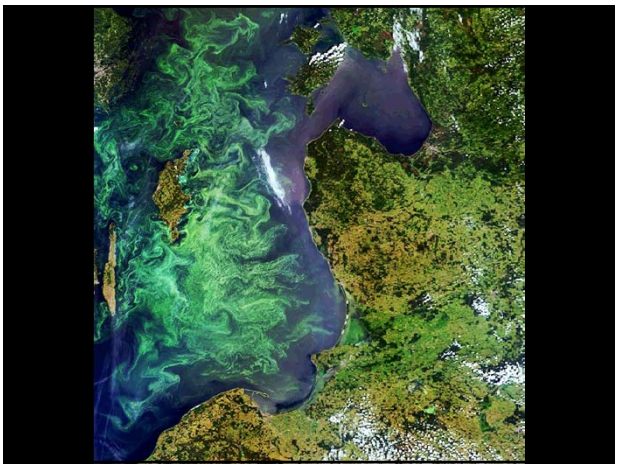
Although the Exxon-Valdez oil spill in 1989 led to many tanker safety reforms, the spill was small in scale when compared to some of the largest that have occurred around the globe. The volume of oil spilled has decreased in recent years.

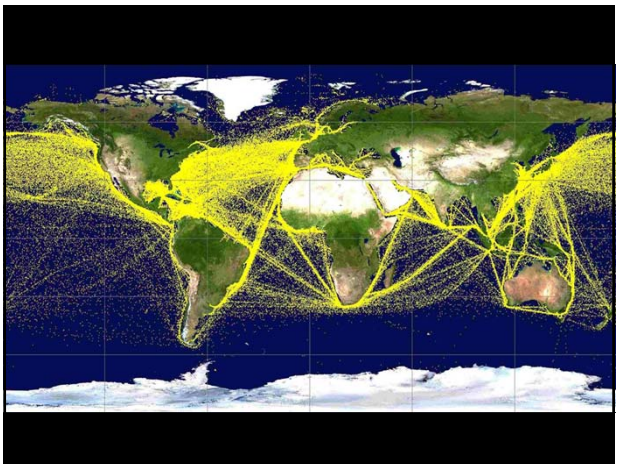
RANK	SHIPNAME	YEAR	LOCATION	SPILL SIZE (TONNES)
1	**Atlantic Empress**	1979	Off Tobago, West Indies	287,000
2	**ABT Summer**	1991	700 nautical miles off Angola	260,000
3	**Castillo de Bellver**	1983	Off Saldanha Bay, South Africa	252,000
4	**Amoco Cadiz**	1978	Off Brittany, France	223,000
5	**Haven**	1991	Genoa, Italy	144,000
6	**Odyssey**	1988	700 nautical miles off Nova Scotia, Canada	132,000
7	**Torrey Canyon**	1967	Scilly Isles, Britain	119,000
8	**Sea Star**	1972	Gulf of Oman	115,000
9	**Irenes Serenade**	1980	Navarino Bay, Greece	100,000
10	**Urquiola**	1976	La Coruna, Spain	100,000
11	**Hawaiian Patriot**	1977	300 nautical miles off Honolulu	95,000
12	**Independenta**	1979	Bosphorus, Turkey	95,000
13	**Jakob Maersk**	1975	Oporto, Portugal	88,000
14	**Braer**	1993	Shetland Islands, Britain	85,000
15	**Khark 5**	1989	120 nautical miles off coast of Morocco	80,000
16	**Prestige***	2002	Off the Spanish coast	77,000
17	**Aegean Sea**	1992	La Coruna, Spain	74,000
18	**Sea Empress**	1996	Milford Haven, Britain	72,000
19	**Katina P**	1992	Off Maputo, Mozambique	72,000
35	**Exxon Valdez**	1989	Prince William Sound, Alaska	37,000

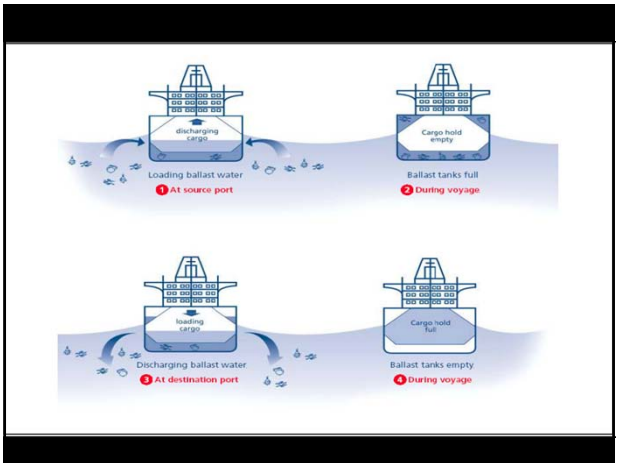
*The amount spilled by the Prestige includes all oil lost to the environment and that which remains in the sunken tanker sections.

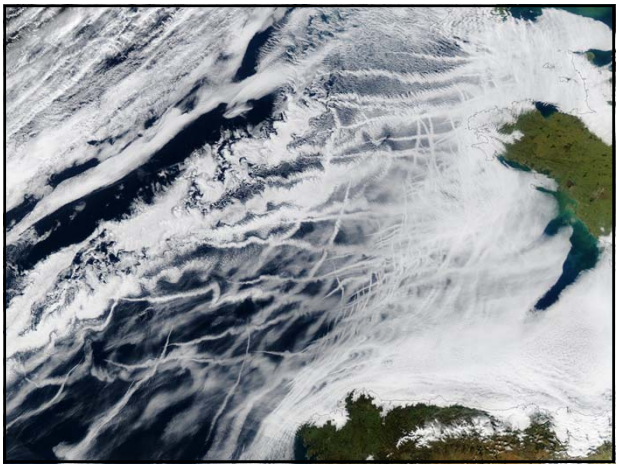


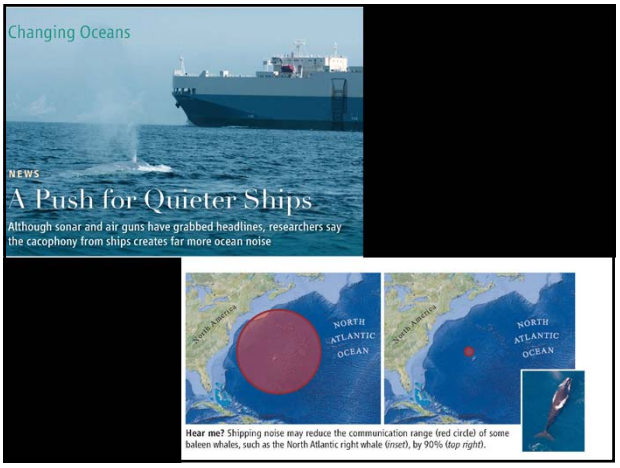


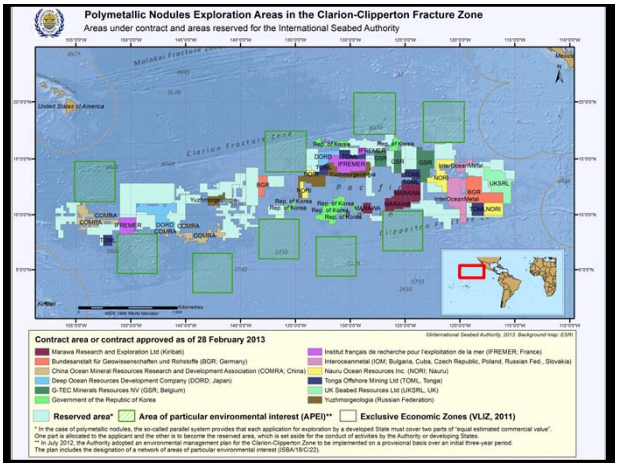


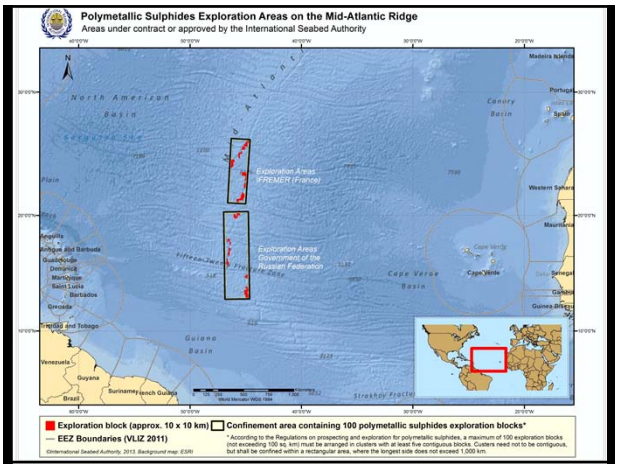


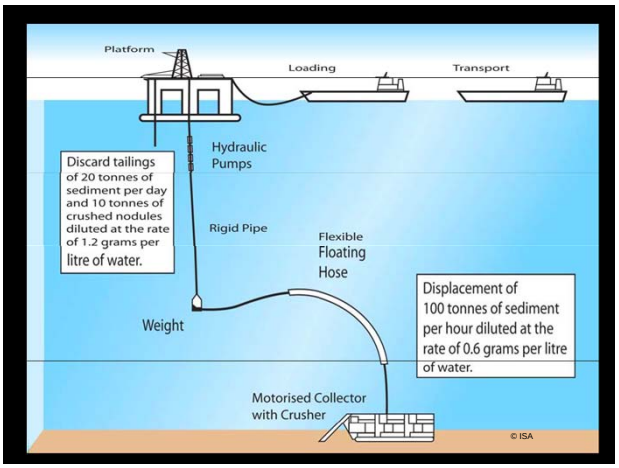

discharging cargo
Loading ballast water
1 At source port
Cargo hold empty
Ballast tanks full
2 During voyage
loading cargo
Discharging ballast water
3 At destination port
Cargo hold full
Ballast tanks empty
4 During voyage

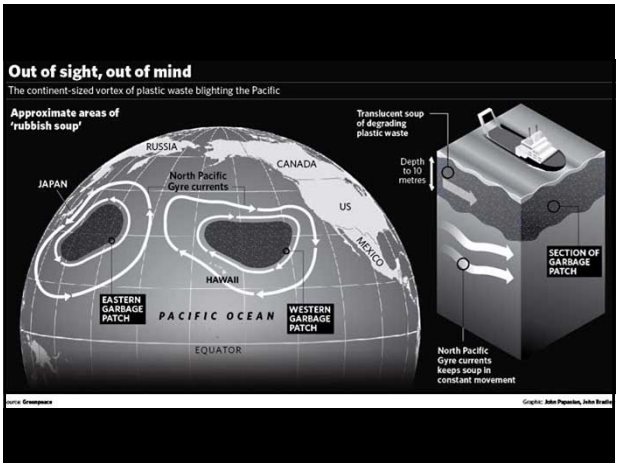


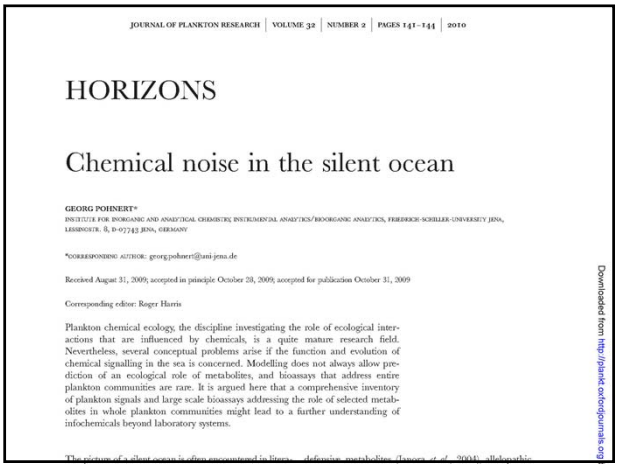

Changing Oceans
NEWS
A Push for Quieter Ships
Although sonar and air guns have grabbed headlines, researchers say the cacophony from ships creates far more ocean noise
North America
NORTH ATLANTIC OCEAN
Hear me? Shipping noise may reduce the communication range (red circle) of some baleen whales, such as the North Atlantic right whale (inset), by 90% (top right).


Polymetallic Nodules Exploration Areas in the Clarion-Clipperton Fracture Zone
Areas under contract and areas reserved for the International Seabed Authority
Contract area or contract approved as of 28 February 2013
Reserved area*
Area of particular environmental interest (APEI)**
Exclusive Economic Zones (VLIZ, 2011)









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HORIZONS

Chemical noise in the silent ocean

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*CORRESPONDING AUTHOR: georg.pohnert@uni-jena.de

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Corresponding editor: Roger Harris

Plankton chemical ecology, the discipline investigating the role of ecological interactions that are influenced by chemicals, is a quite mature research field. Nevertheless, several conceptual problems arise if the function and evolution of chemical signalling in the sea is concerned. Modelling does not always allow prediction of an ecological role of metabolites, and bioassays that address entire plankton communities are rare. It is argued here that a comprehensive inventory of plankton signals and large scale bioassays addressing the role of selected metabolites in whole plankton communities might lead to a further understanding of infochemicals beyond laboratory systems.

Downloaded from http://plankt.oxfordjournals.org/

Consequências da Presente Situação

Os Sistemas de Suporte de Vida do Planeta estão em Colapso!

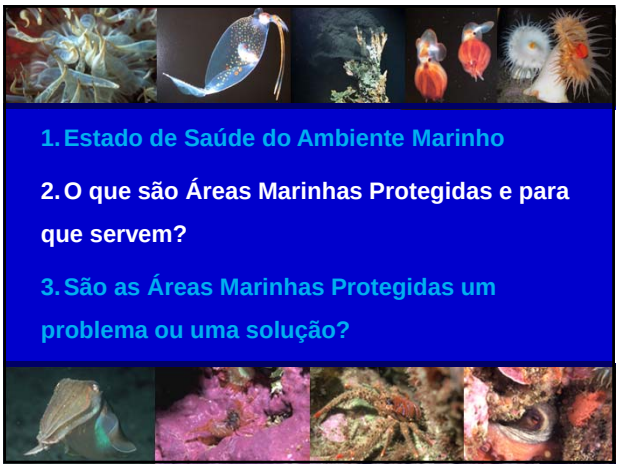
Está em Risco a Segurança e Futuro das Populações Humanas

Consequências da Presente Situação

Como foi isto possível???

1. Historicamente, o Oceano foi encarado como sendo inesgotável e impossível de danificar pelos Homens
2. Esta percepção, que ainda hoje existe, originou estratégias de gestão em que prevaleceu a visão de curto prazo maximizando as capturas
3. O resultado, no essencial, pode ser analisado de acordo com a "Tragédia dos Bens-Comuns" – em que um recurso comum, explorado de forma aberta inevitavelmente colapsa

4. Impera a visão sectorial
5. Divisão artificial entre os "amigos dos peixes e os amigos dos pescadores"
6. Políticas que inexoravelmente aumentam a insustentabilidade da exploração de recursos. E.g. injustiça na cadeia de valor; medidas avulsas sem base científica; falta de estratégias eficazes de conservação, etc.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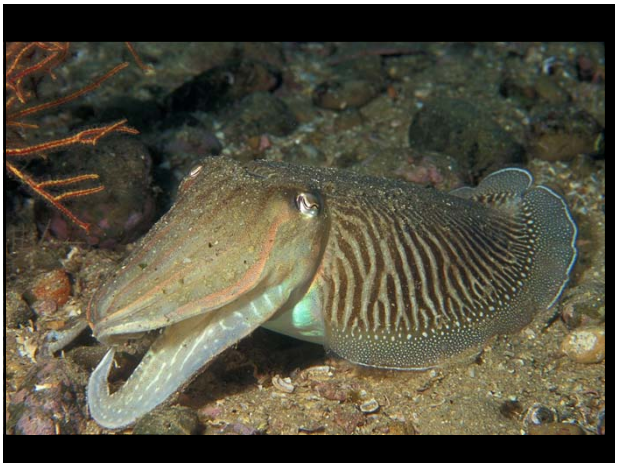
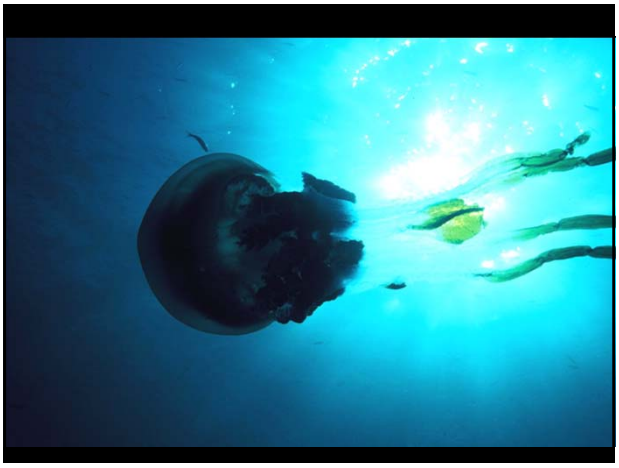
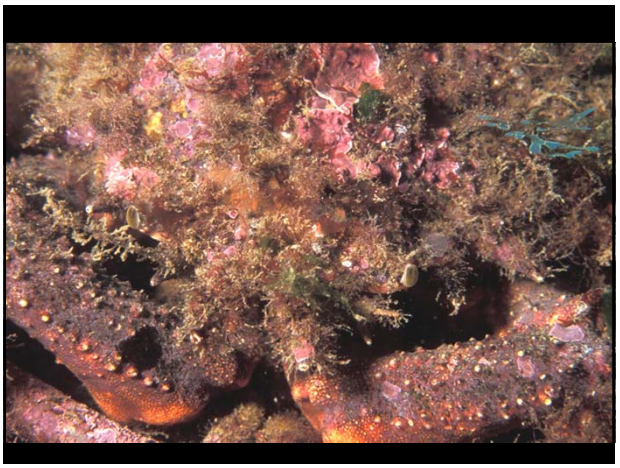
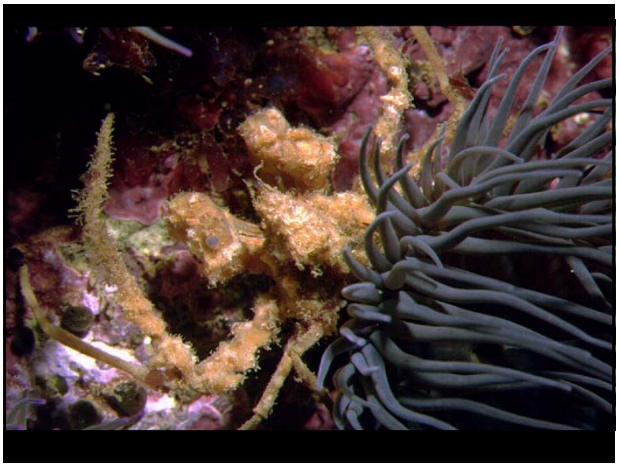
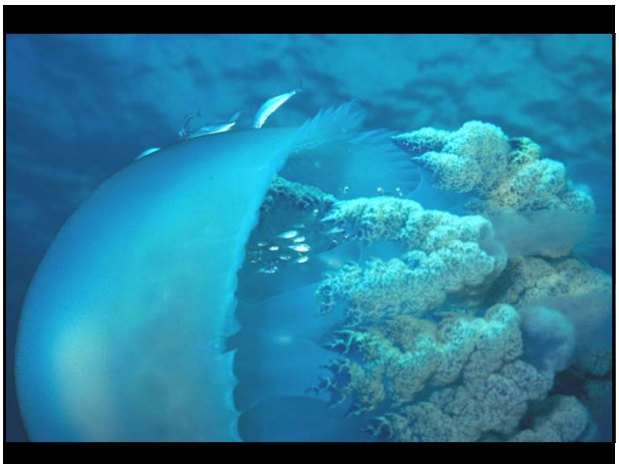
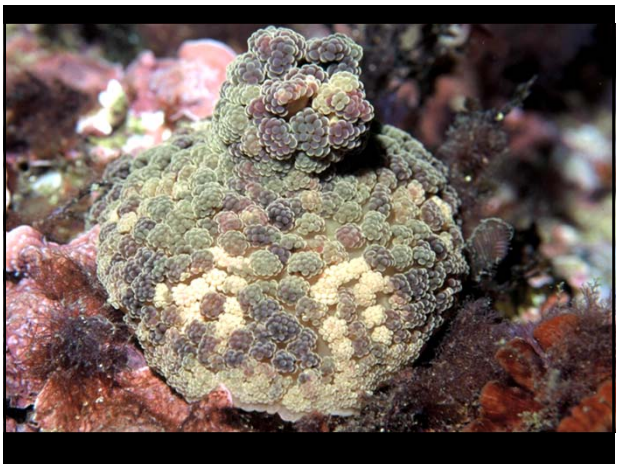




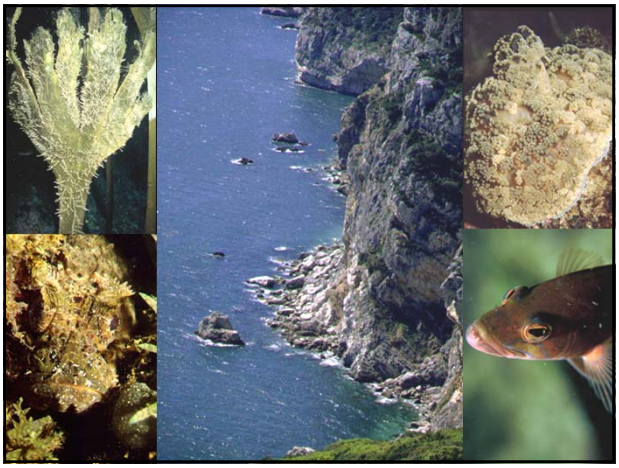


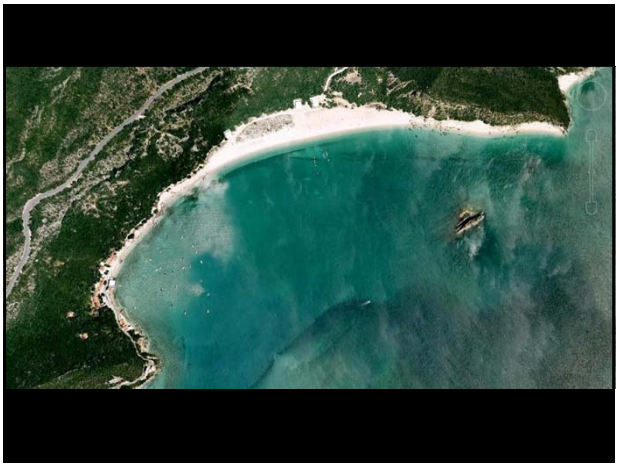




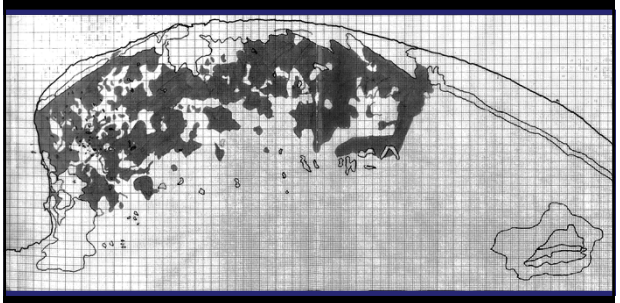


Grande Importância para a
Conservação da Natureza



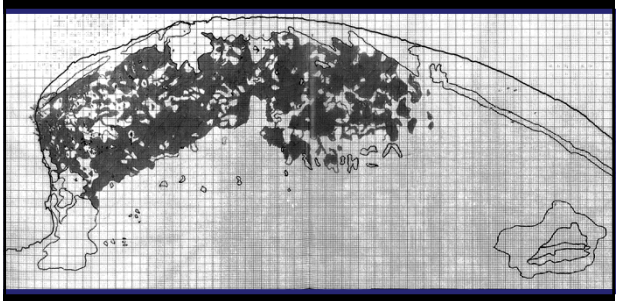


Pradaria do Portinho



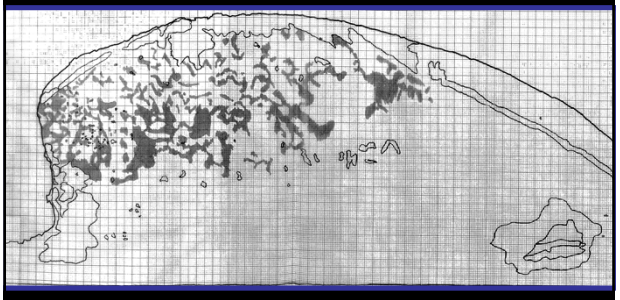
1946
Área = 26 hectares

Pradaria do Portinho



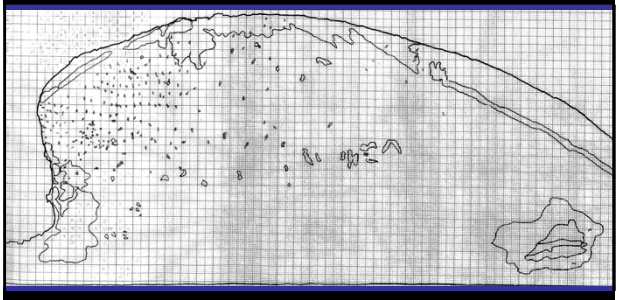
1983
Área = 14 hectares

Pradaria do Portinho



1989
Área = 8.1 hectares

Pradaria do Portinho



2003
Área = 0.007 hectares

Projecto Biomares

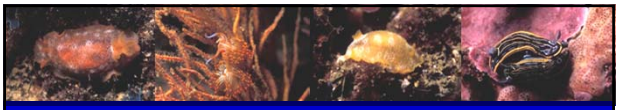
O que é uma Área Marinha Protegida?

Qualquer território intertidal ou subtidal, juntamente com a água que o cobre e a flora, fauna e características históricas e culturais associadas, que tenham sido reservados pela lei ou por outros meios efetivos que visem a proteção de parte ou da totalidade do meio ambiente aí existente.

IUCN 17th Assembleia Geral 1978

Principais Objetivos para as AMPs:

- Em geral, as razões para o estabelecimento de áreas protegidas variam, mas incluem fatores económicos, científicos, culturais e éticos.
- Podem categorizar-se maioritariamente em:
  - AMPs como instrumentos de gestão de pescas
  - AMPs para fins de conservação da natureza

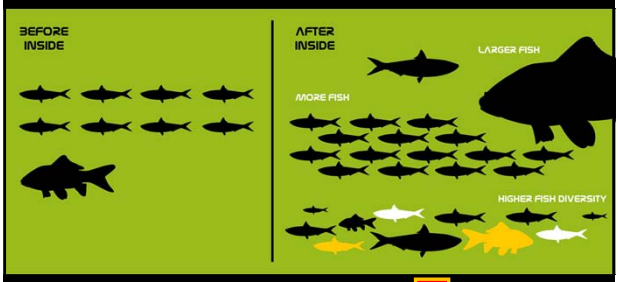


Missão das AMPs:

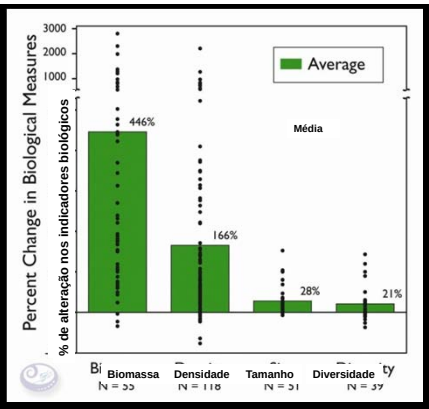
- manter sistemas ecológicos e de suporte de vida essenciais;
- assegurar o uso sustentável de espécies e ecossistemas; e
- preservar a diversidade biológica.

Reservas Marinhas

Halpern, 2003. *Ecological Applications*
Lester & Halpern 2008. *MEPS*
Lester et al. 2009. MEPS

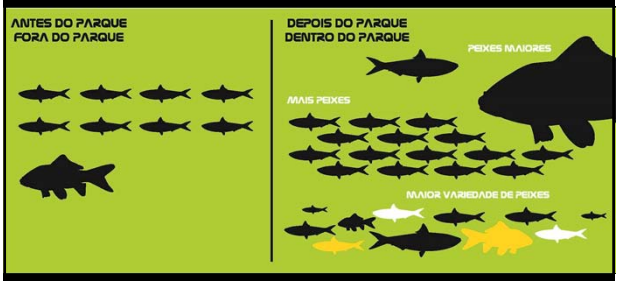


O "Efeito Reserva"



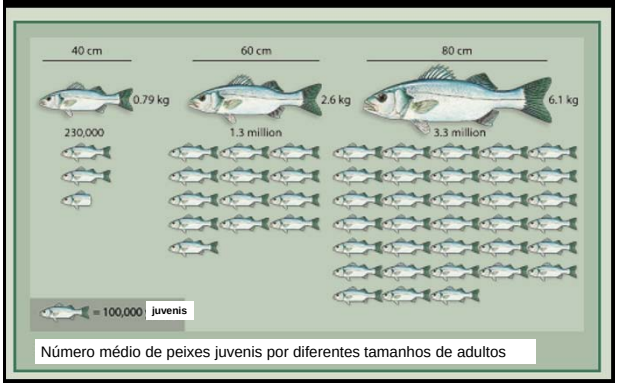
Resultados de 124 estudos em reservas no mundo

Objectivos das áreas marinhas protegidas

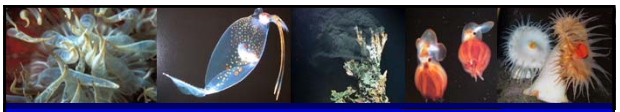


As reservas devem incluir:
- Diferentes tipos de fundo
- Dimensão adequada
- Medidas de proteção eficazes

Peixes maiores produzem mais juvenis



Número médio de peixes juvenis por diferentes tamanhos de adultos



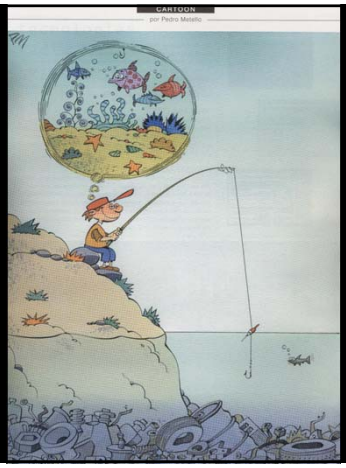
1. Estado de Saúde do Ambiente Marinho
2. O que são Áreas Marinhas Protegidas e para que servem?
3. São as Áreas Marinhas Protegidas um problema ou uma solução?

MENSAGENS PRINCIPAIS

Os impactos das actividades humanas no Oceano são globais e de grande magnitude

As actuais práticas de gestão são insustentáveis e de uma enorme irresponsabilidade e injustiça intergeracional que importa reparar

É preciso apostar num desenvolvimento que sirva a economia e respeite o ambiente e a cultura marítima



"Áreas Marinhas Protegidas: Problema ou solução?"

IV Seminário Nacional Bandeira Azul
Sesimbra, 29 de novembro de 2013

ISPA INSTITUTO UNIVERSITÁRIO CIÊNCIAS PSICOLÓGICAS, SOCIAIS E DA VIDA

OBRIGADO!