



Implementation of the Regional Seas Directions (RSSD) in the Black Sea

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Content



- Information on the Black Sea ecosystem
- Information on the Bucharest Convention and Black Sea Commission
- **Achievements and Challenges with respect to the Strategic Directions for the Regional Seas Programme 2004-2007**
- **Future Prospects**



The Black Sea Zooplankton: Composition, Spatial/Temporal Distribution and History of Investigations

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Introduction

The Black Sea is one of the most interesting seas of the world both in scientific and non-scientific aspects. Its history is full of romantic and dramatic events. Its diverse marine fauna has been influenced by the long and short term (geological, climatic, hydrological) natural and anthropogenic processes of the last three decades.

Noah Flood ?

(Ryan & Pitman 1998)

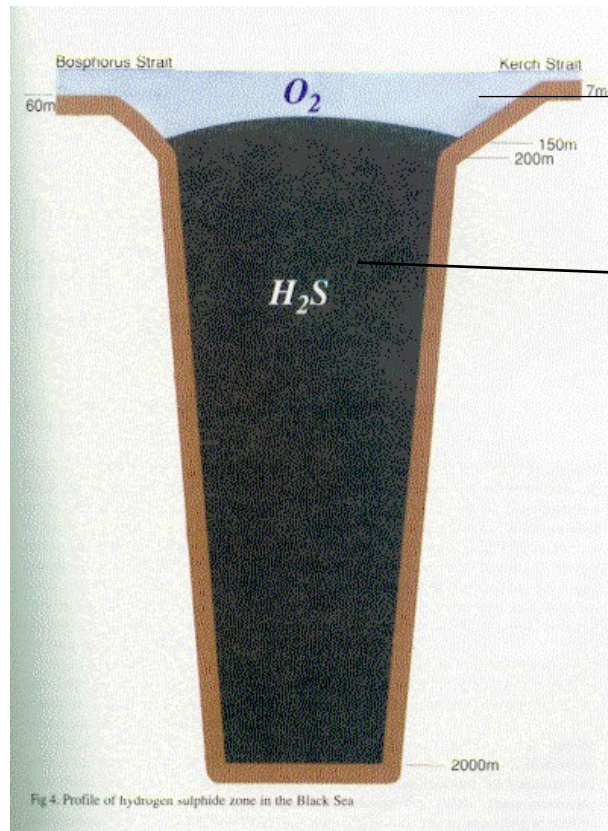


- **~6-7 thousand years ago:**

“It was still landlocked and fresh. But the Mediterranean Sea and Sea of Marmara had gradually risen to a level some 150 meters higher than the lake. Eventually, the ocean level rose high enough to slosh over into the Black Sea”

Source: MODIS

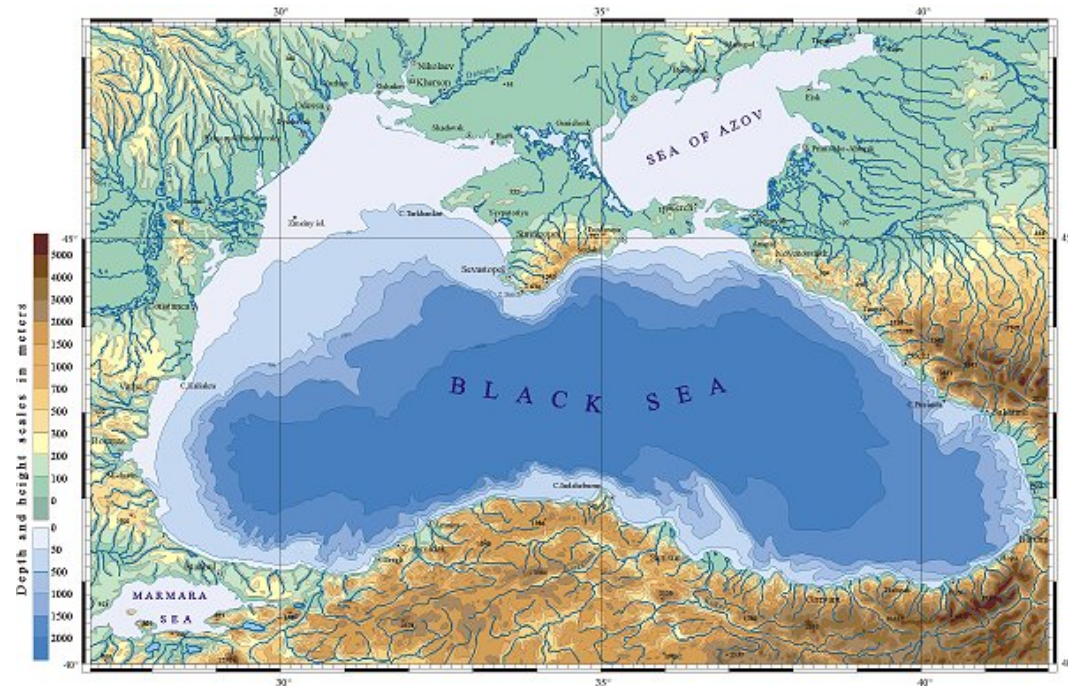
Bathymetry of the Black Sea & Permanent Anoxia (Zaitsev & Mamaev 1997)



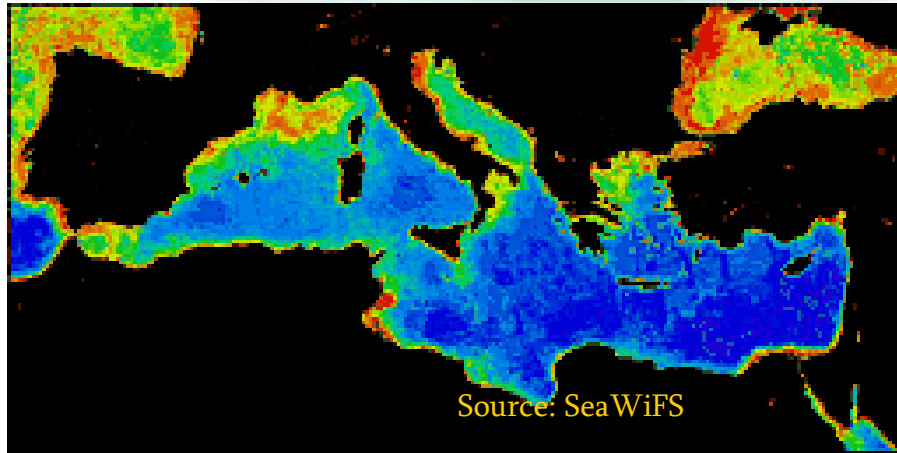
Salinity

18‰

21-22‰

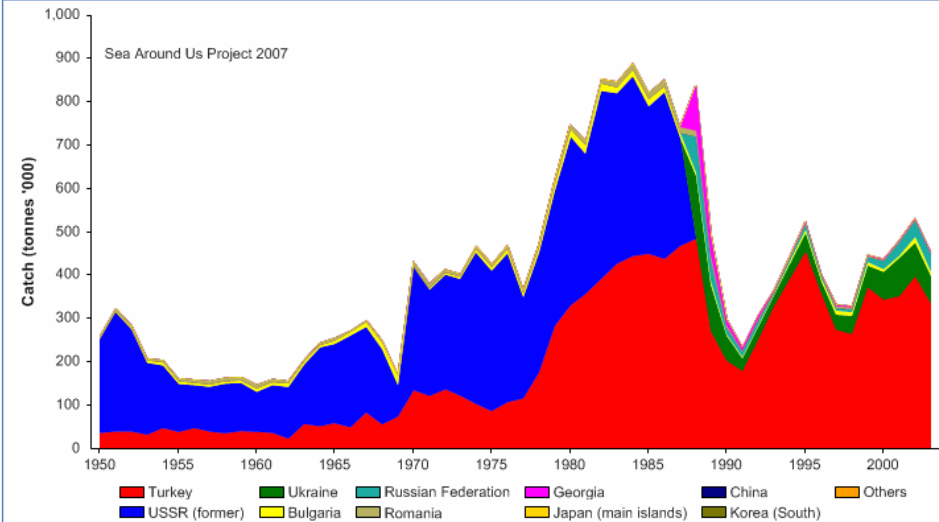


Fertility & fish catches...

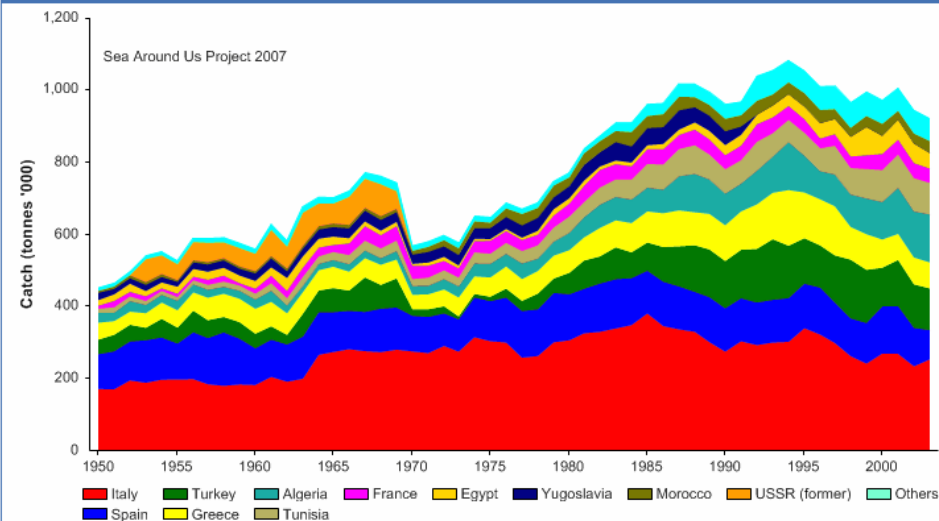


	Mediterranean	Black Sea
Area (million km ²)	2.5	0.5
Productivity (mgC·m ² /day)	385	882

Landings in Black Sea



Landings in Mediterranean Sea



Problems of the Black Sea: Transboundary Diagnostic Analysis 2007



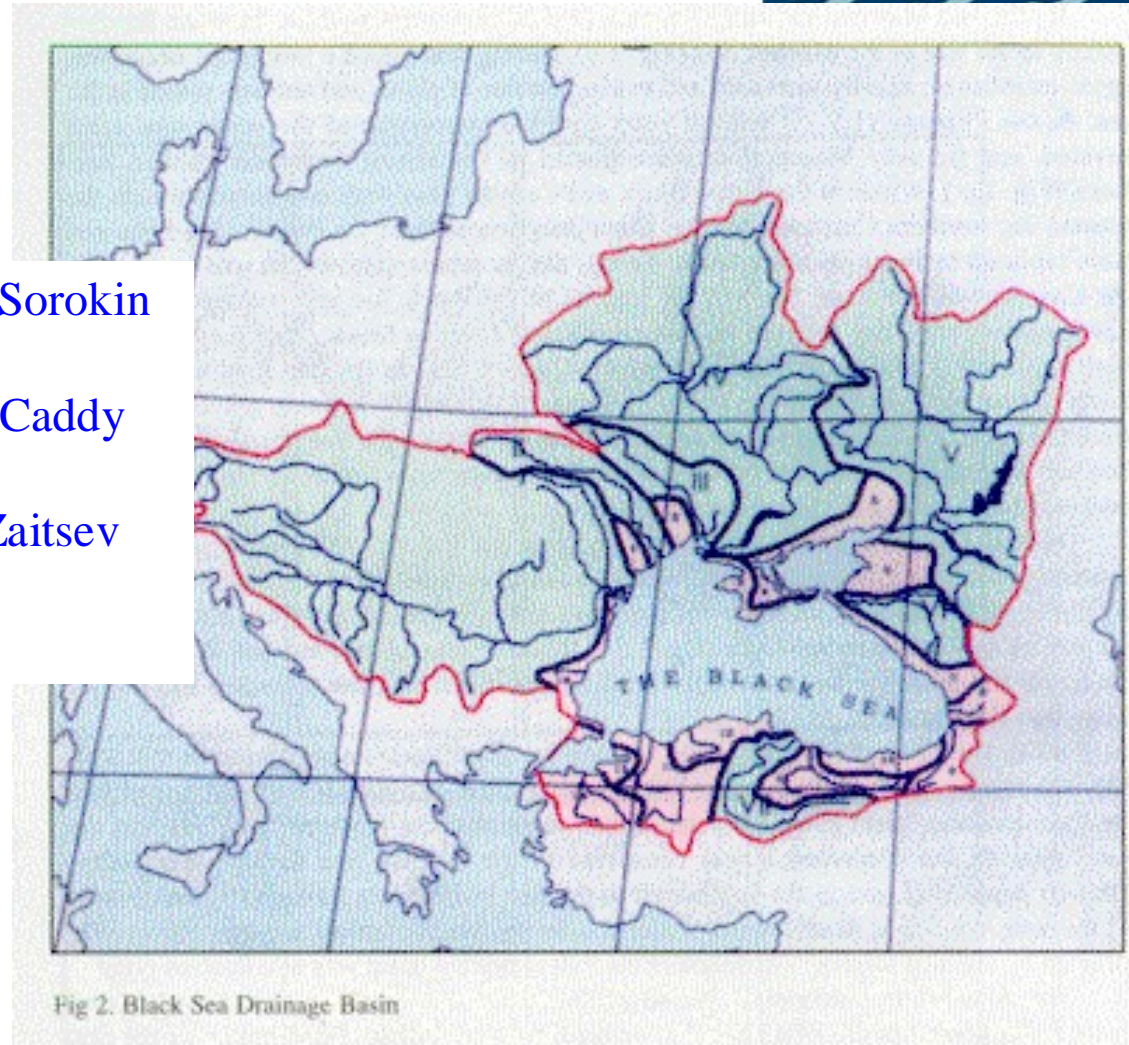
- Eutrophication/nutrient enrichment
- Adverse changes in marine living resources
- Chemical pollution (including oil)
- Biodiversity/habitat changes, including alien species introduction
- Climate change (as Cross-cutting Issue)

Large nutrient-rich riverine input as the main reason of eutrophication of the Black Sea

(>2 x10⁶ km²; Zaitsev & Mamaev 1997)



Black Sea was oligotrophic in 1940s (Sorokin 1983),
then mesotrophic and later eutrophic (Caddy 1993).
Some parts (NWS) even dystrophic (Zaitsev 1992).



Fisheries



Commission on the Protection of the Black Sea Against Pollution

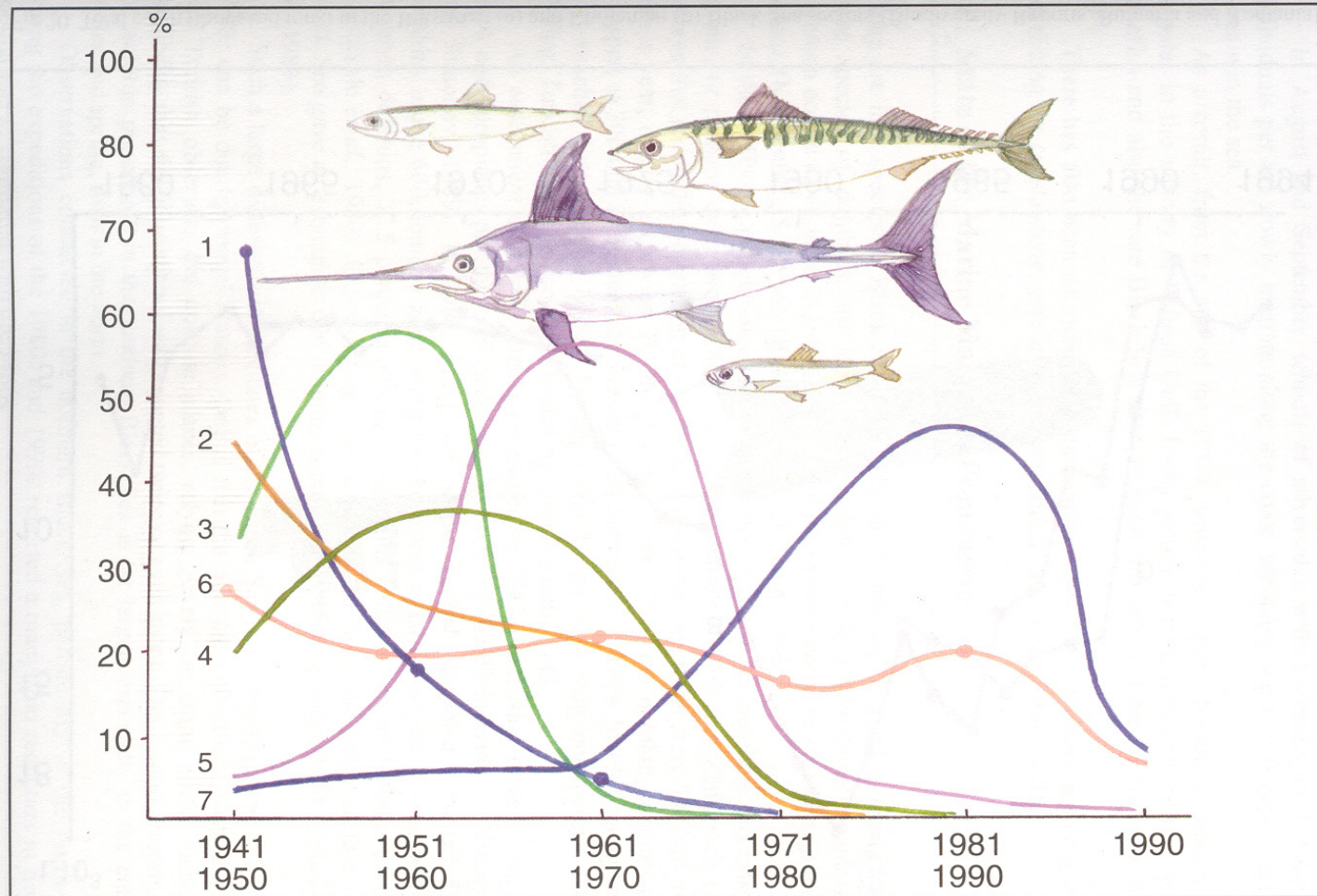


Fig 19. Trends (%) of mean catches per decade of pelagic top predators and forage fishes (anchovy and sprat) in 1941-1990 in the Bulgarian Black Sea waters: 1. tuna, 2. mackerel, 3. swordfish, 4. bonito, 5. blue fish, 6. anchovy, 7. sprat (Bulgarian National Report, 1995).

Increasing Oil Transport

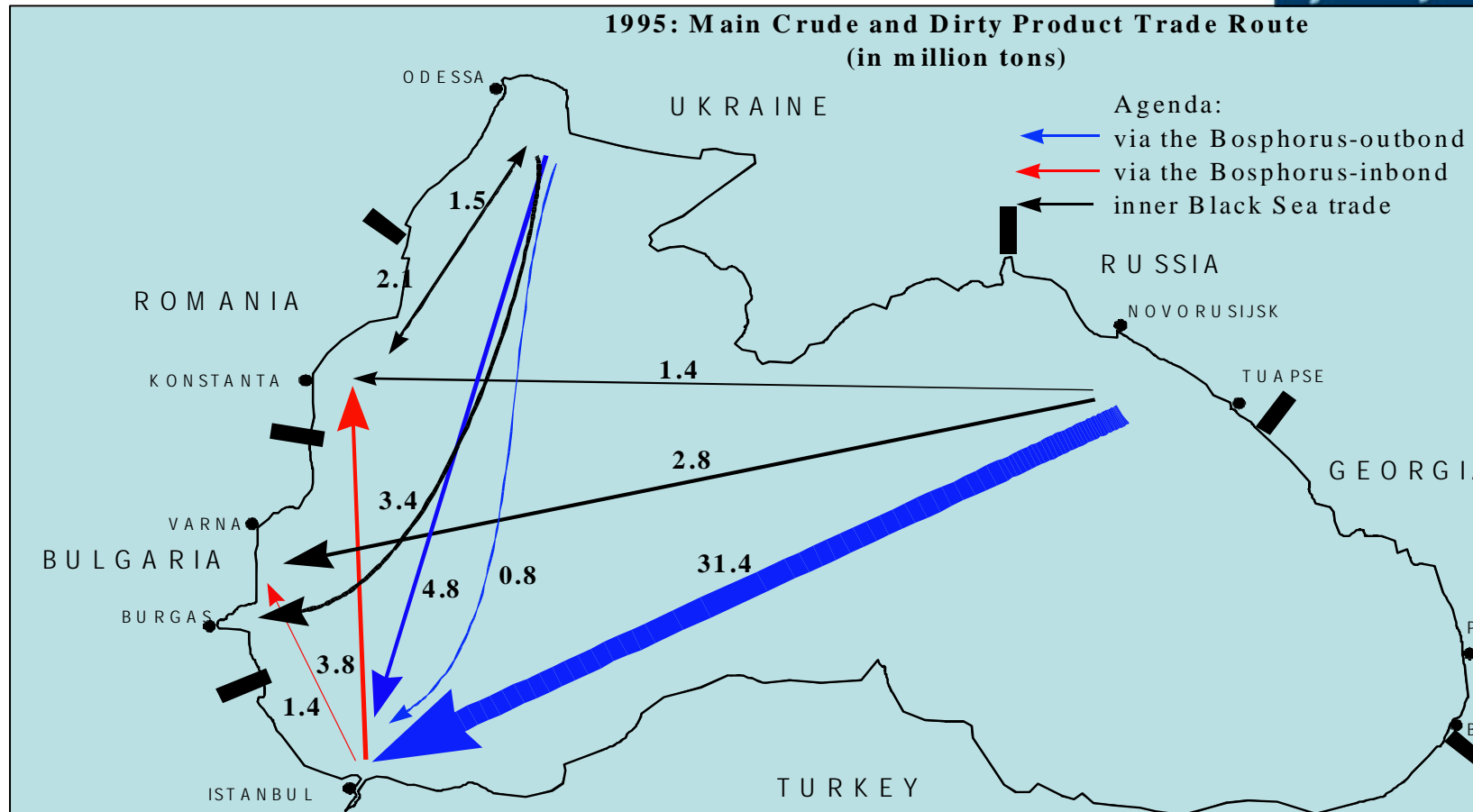


- Shipping is one of the important sources of oil pollution in the Black Sea;
- 50,000 merchant ships and 3200 tankers operate annually in the Black Sea region;
- Average age of the tankers operating in the region is more than 20 years - an additional high-risk element for the marine environment.

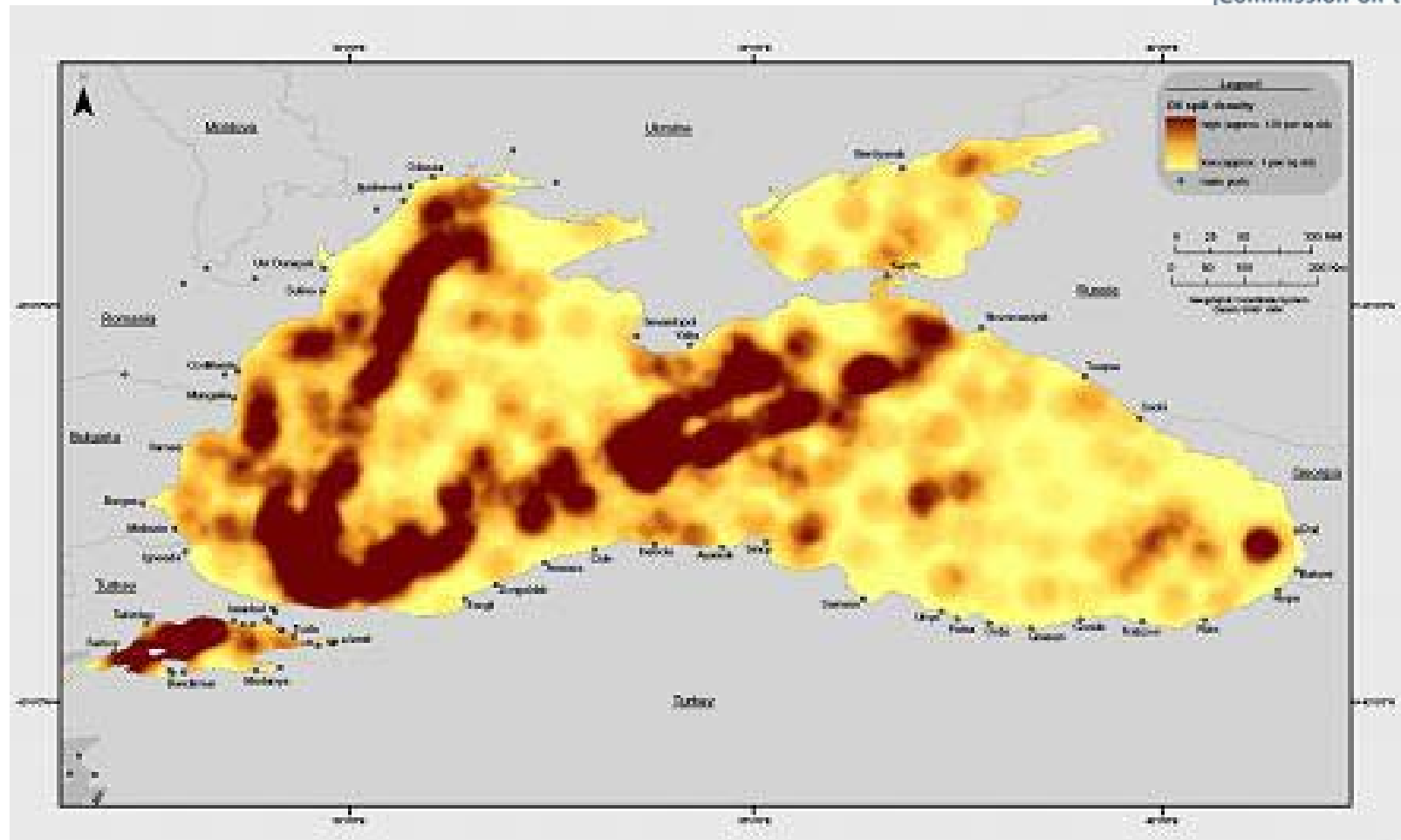
Large traffic of crude oil from different origins (TDA 1994)



Protection
Against Pollution



Number of likely oil spills per area of sea



*Remote sensing data from 2000, 2001, 2002 and 2004 (Tarchi *et al.*, 2006).

Another risk from increasing maritime transport: Introduced Species in the Black Sea (Zaitsev & Mamaev 1997)



Commission on the Protection of the Black Sea Against Pollution

Balanus in 1900s
from N America

Gambusia affinis in
1925 from Italian
coasts

Rapana in 1946
from Pacific

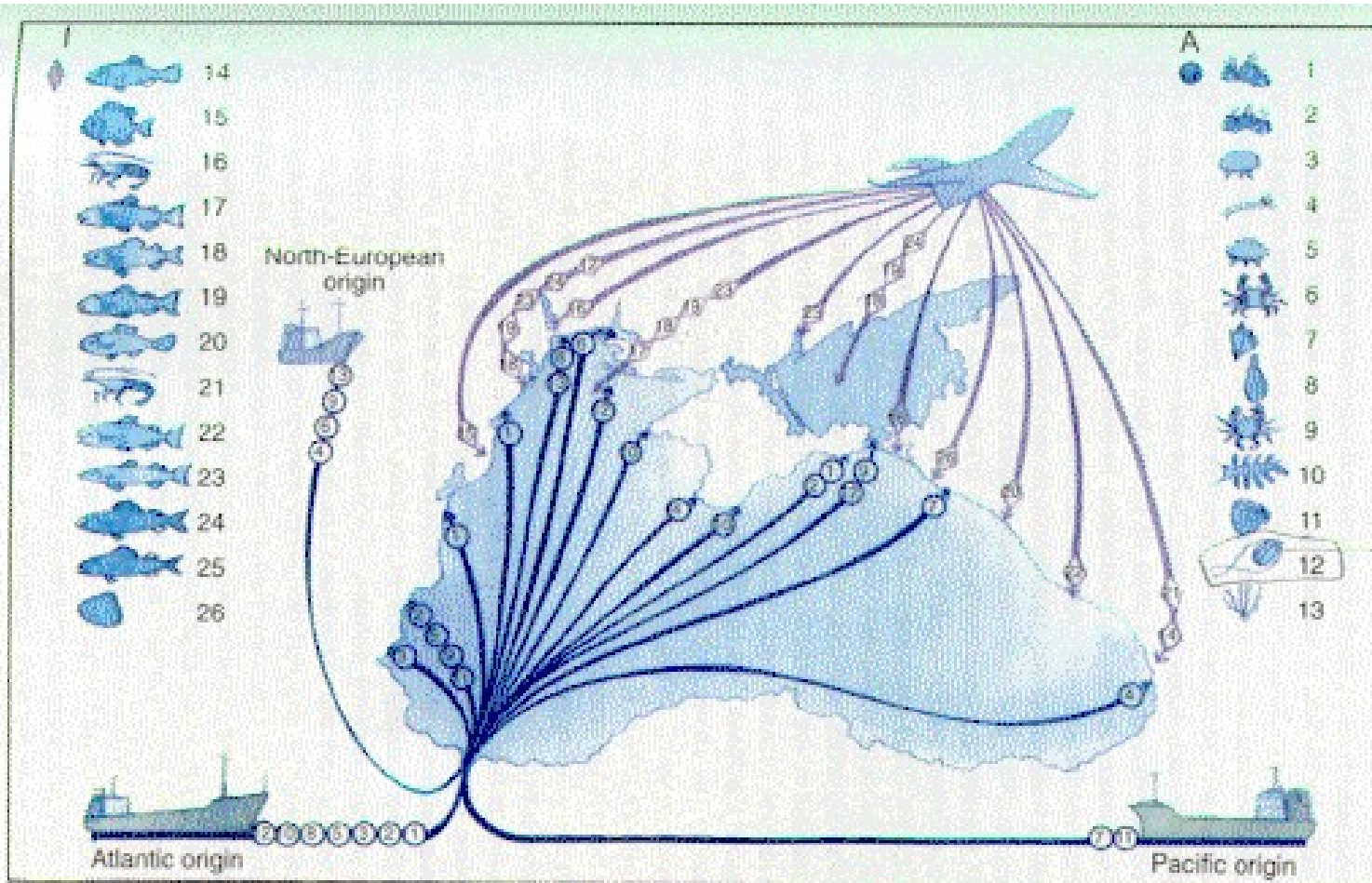
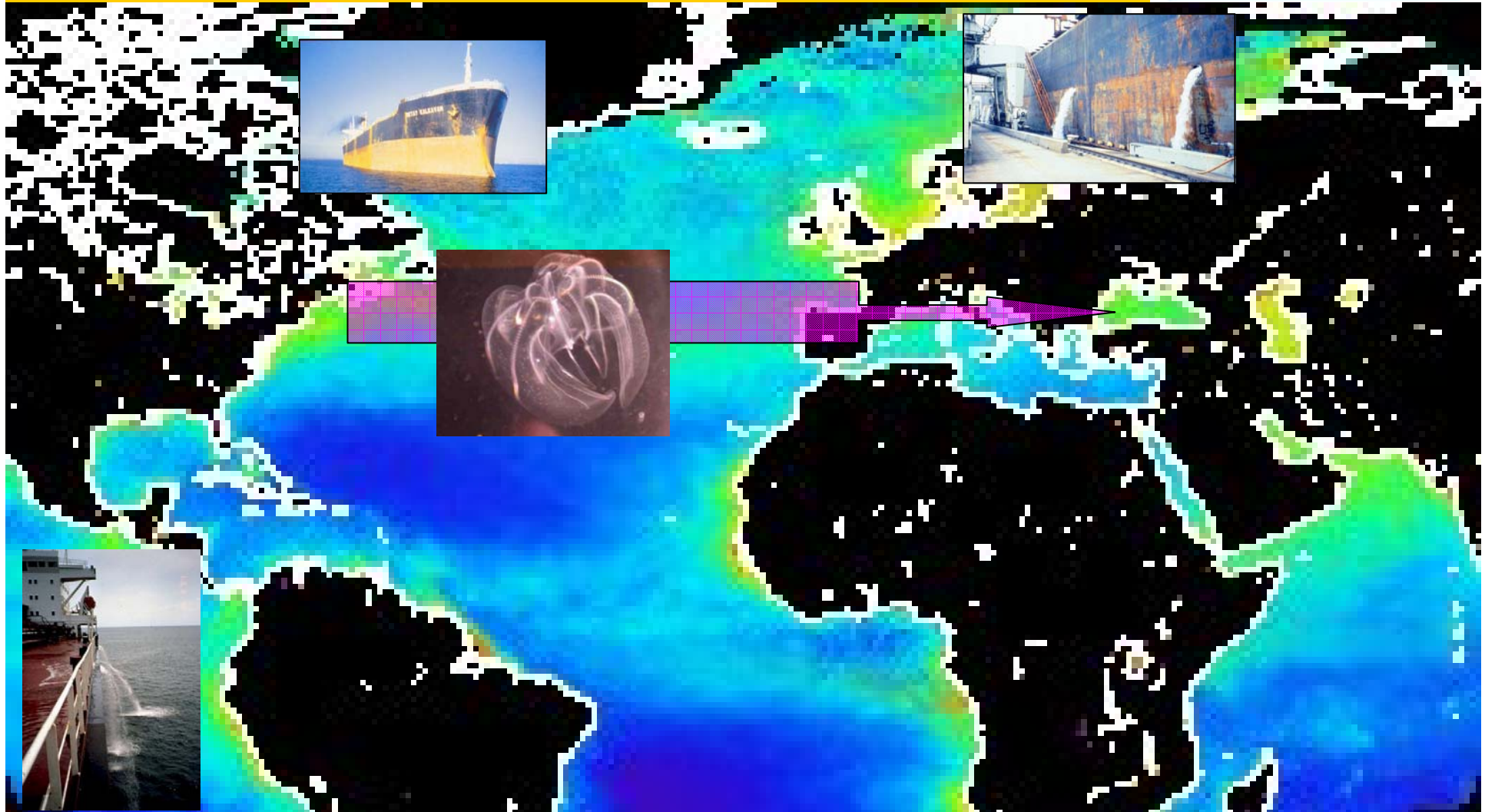


Fig 8. Introduction of exotic species into the Black Sea

- Accidental Introduction: 1. *Balanus improvisus*, 2. *Balanus eburneus*, 3. *Blackfordia virginica*, 4. *Mercierella enigmatica*, 5. *Bourgainvillia megas* (1933), 6. *Rhithropanopeus harrisi tridentata* (19837), 7. *Rapana thomasiana*, 8. *Mya arenaria*, 9. *Callinectes sapidus*, 10. *Doridella obscura*, 11. *Cunearca cornea*, 12. *Mnemiopsis leidyi*, 13. *Desmarestia viridis*.
- Intentional Introduction: 14. *Gambusia affinis* (1925), 15. *Lepomis gibbosus* (1930), 16. *Pandallus kessleri* (1939), 17. *Plecoglossus altivelis* (1963), 18. *Roccus saxatilis* (1965), 19. *Salmo gairdneri* (1965), 20. *Oryzias latipes* (1970s), 21. *Penaeus japonicus* (1970s), 22. *Oncorhynchus keta* (1972), 23. *Mugil soiyu* (1972), 24. *Dicentrarchus labrax* (1977), 25. *Lateolabrax japonicus* (1978), 26. *Crassostrea gigas* (1980).

Alien jellyfish (*Mnemiopsis leidyi*) in the Black Sea in the late 1980s



Relationship between the decrease in Turkish anchovy catch (Ktons) and *Mnemiopsis* outburst

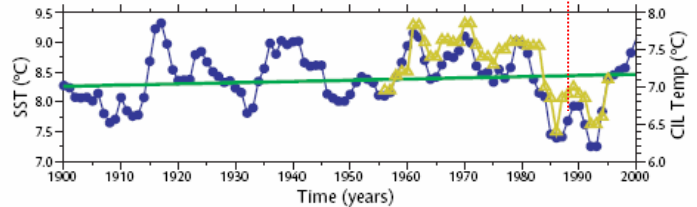
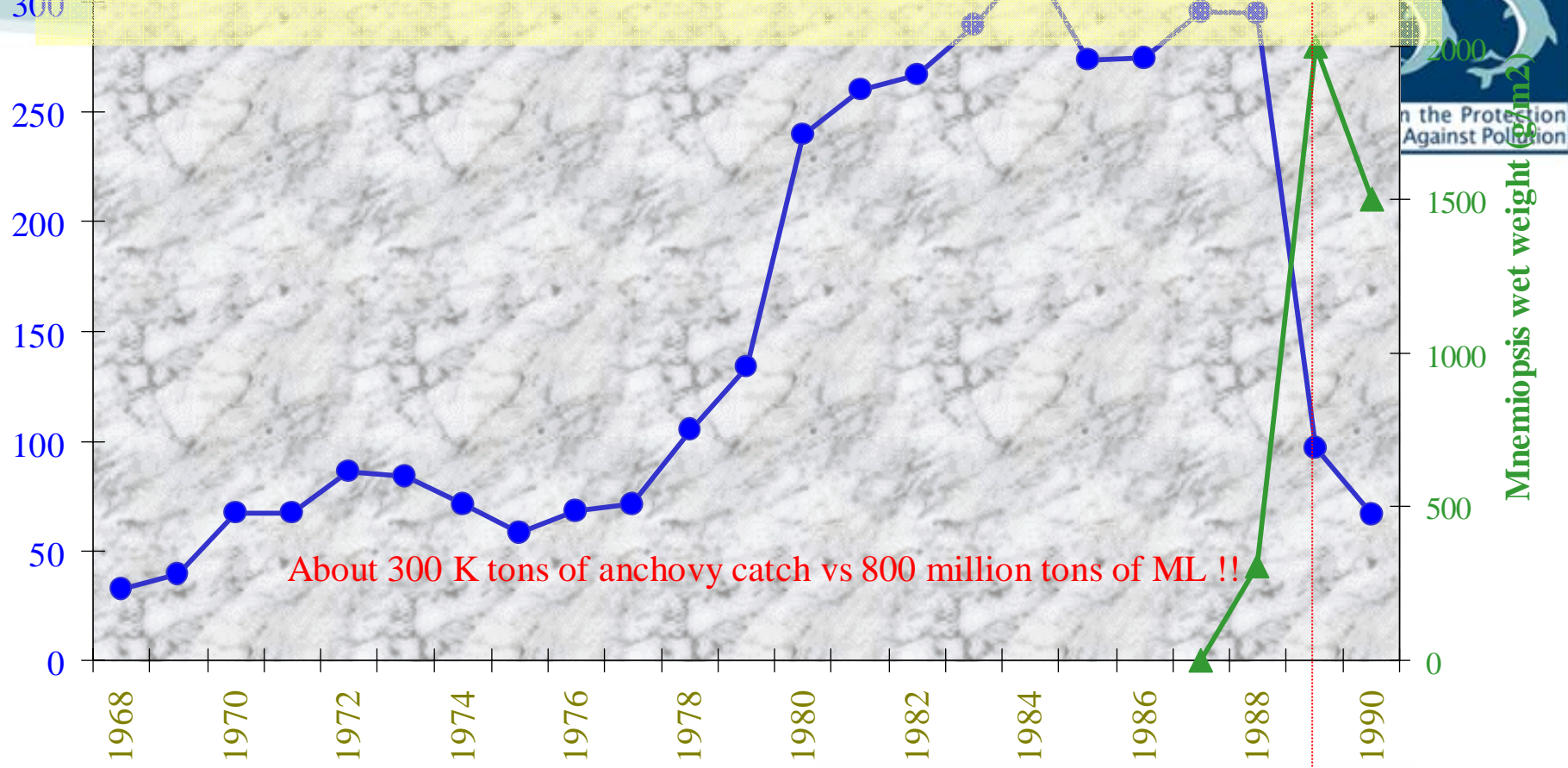
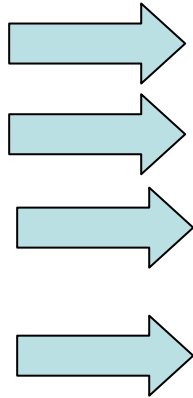
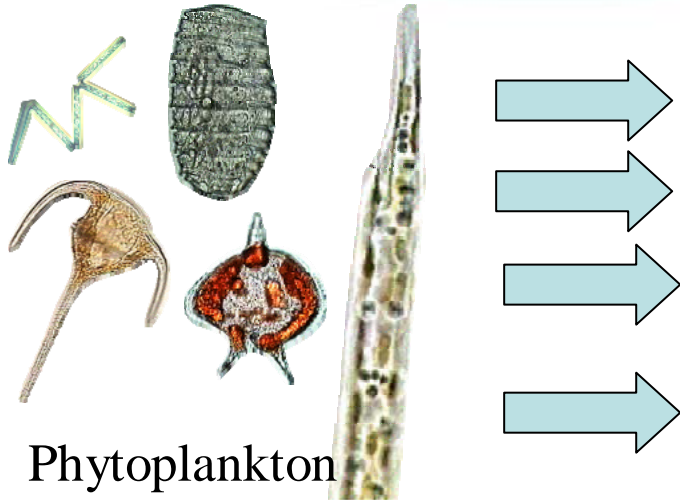
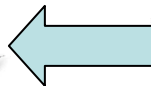
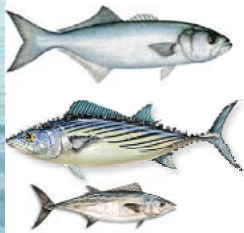


Figure 1. Temporal distribution of winter (December to March) mean sea surface temperature (SST) (°C) averaged over the interior basin with depths greater than 1500 m (dots) (after Rayner et al., 2003), and the mean temperature (°C) of the Cold Intermediate Layer (CIL Temp) for the May to November period (shown by triangles) (after Belokopytov, 2003).

Simplified Black Sea food chain



Zooplankton



Larger predators

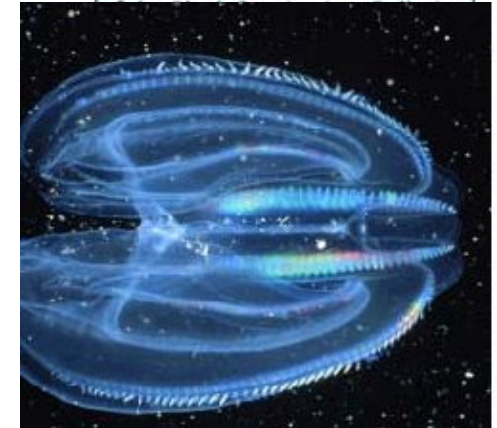
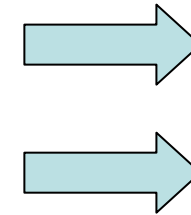
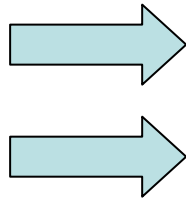
Larva and adults of small pelagics

www.acfishing.com/fishid/bonito.html

Another fish competitor in the food chain...



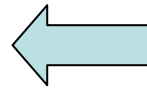
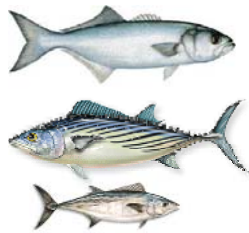
Commission on the Protection



Phytoplankton

Zooplankton

Mnemiopsis leidyi



Larva and adults of small pelagics

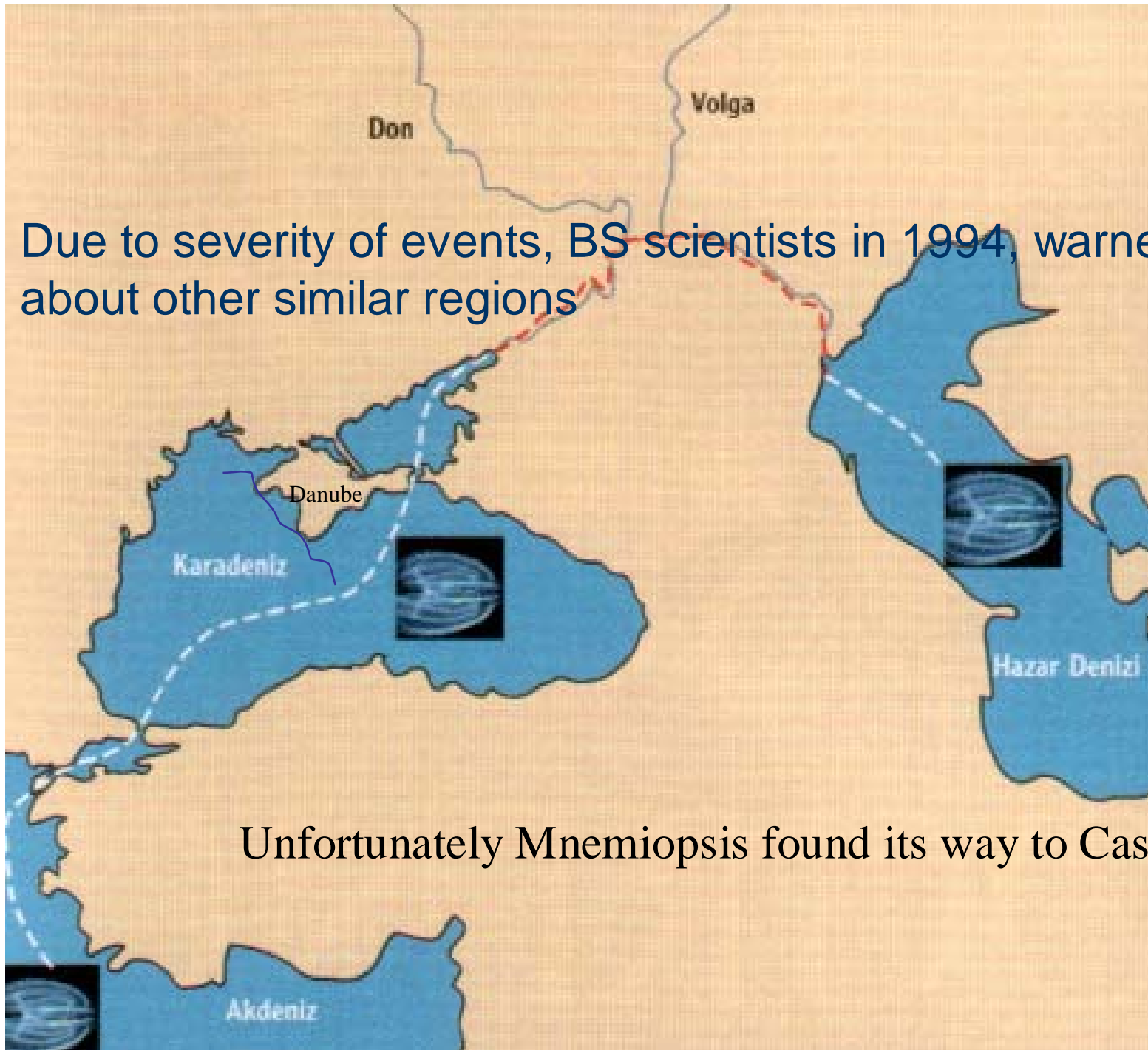
www.acfishing.com/fishid/bonito.html

Larger predators

The “Financial Revenue Loss” of Turkey alone would be **hundreds million Euro** due to these low levels of fishery.



Due to severity of events, BS scientists in 1994, warned about other similar regions



Unfortunately Mnemiopsis found its way to Caspian in 1997..



You are in: World: **Middle East**

Monday, 23 July, 2001, 22:34 GMT 23:34 UK

Monster muncher threatens Caspian fishing



Stocks of the tiny kilka fish have been devastated

By Jim Muir in the Caspian Sea

Hundreds of fishermen on the Caspian Sea risk losing their livelihood because of an invasion of a marine organism that is depleting the fishes'

See also:

- ▶ 20 Oct 00 | Europe
Caspian Sea threatened by new predator
- ▶ 22 Jun 01 | Europe
Caspian deal on caviar
- ▶ 20 Jul 01 | Europe
Russian ban on Caspian caviar

Top Middle East stories now:

- ▶ Israeli tanks enter Hebron
- ▶ Bush 'still undecided' on Iraq
- ▶ Straw concern over Saudi prisoners
- ▶ Iraq celebrates Saddam birthday
- ▶ Ramallah deal hinges on prisoners
- ▶ Baghdad's 'flourishing' art scene

Front Page

World



Africa

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South Asia

From Our Own Correspondent

Letter From

America

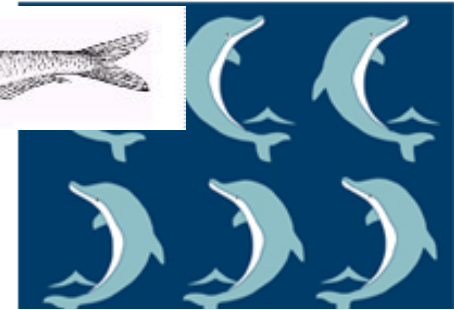
UK

UK Politics

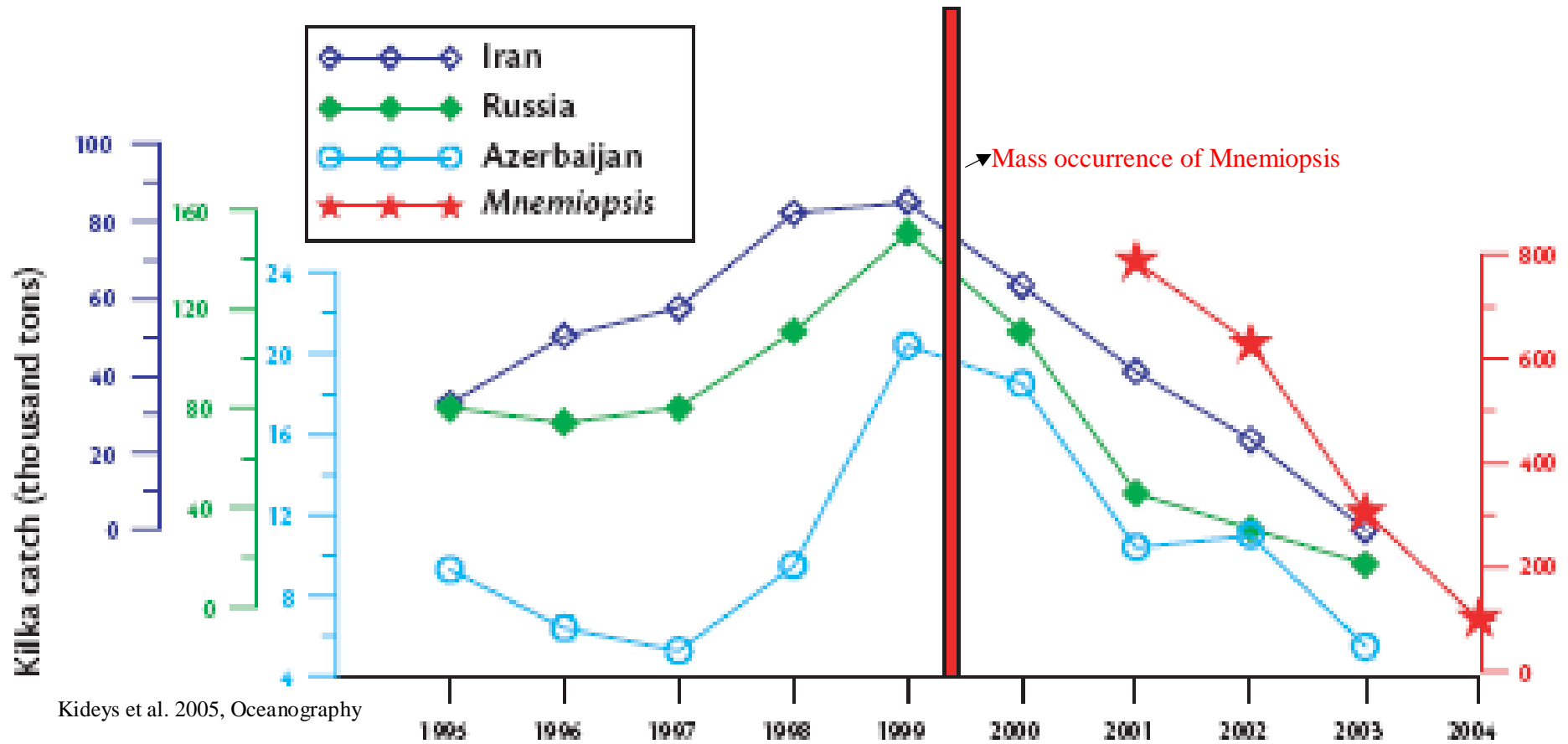
Business

Sci/Tech

Health



Sharp decrease in kilka fishery



Again hundreds million USD loss...

Mass seal mortalities!..

- As reported by the media, the mass deaths of Caspian seals (*Phoca caspica*) occurred in the northern Caspian Sea during the spring of 2000.

(Davis et al. 2003, Caspian Report)

How to Deal: Regional Agreements



- Most marine problems are transboundary and require collective action
- Environment, the easiest area of cooperation
- Regional Seas Agreements make the cooperation even easier



Convention on the Protection of the Black Sea Against Pollution



- Bucharest Convention was signed on 21-04-1992 by the environmental ministers of the 6 Black Sea countries (i.e. Bulgaria, Georgia, Romania, Russia, Turkey and Ukraine), and later ratified by their parliaments

Protocols to the convention



Pollution related

- **Land based sources**
- **Cooperation in emergency situations**
- **Dumping**

And

- **Black Sea Biodiversity and Landscape Conservation Protocol**
- **1996 Strategic Action Plan for the Protection and Rehabilitation of the Black Sea (BSSAP)**
-

Institutional Setup



BSC is the focal body in support to implementing the Bucharest Convention

The Commission for the Protection of the Black Sea Against Pollution

Permanent Secretariat

Advisory Groups

AG ESAS	AG PMA	AG LBS	AG ICZM	AG CBD	AG FOMLR	AG IDE
Environmental Safety Aspects of Shipping (AG ESAS)	Pollution Monitoring and Assessment	Control of Pollution from Land Based Sources	Development of the Common Methodologies for Integrated Coastal Zone Management	Conservation of Biological Diversity	Environmental Aspects of Fisheries and Other Marine Living Resources Management	Information and Data Exchange

Regional Activity Centers

Environmental Safety Aspects of Shipping (AC ESAS), <u>Varna</u> , Bulgaria	Pollution Monitoring and Assessment (AC PMA), <u>Odessa</u> , Ukraine	Control of Pollution from Land Based Sources (AC LBS), <u>Istanbul</u> , Turkey	Development of Common Methodologies for Integrated Coastal Zone Management (AG ICZM), <u>Krasnodar</u> , Russian Federation	Conservation of Biological Diversity (AC CBD), <u>Batumi</u> , Georgia	Environmental Aspects of Fisheries and Other Marine Living Resources Management (AG FOMLR), <u>Constanta</u> , Romania	Information and Data Exchange (AC IDE), <u>Permanent Secretariat</u> , Istanbul, Turkey
						

National Focal Points

Bg, Ge, Ro, Ru, Tr, Ua	Ua, Bg, Ge, Ro, Ru, Tr	Tr, Bg, Ge, Ro, Ru, Ua	Ru, Bg, Ge, Ro, Tr, Ua	Ge, Bg, Ro, Ru, Tr, Ua	Ro, Bg, Ge, Ru, Tr, Ua	Bg, Ge, Ro, Ru, Tr, Ua
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Strategic Directions for the Regional Seas Programme 2004-2007



- I. Increase Regional Seas' contribution to Sustainable Development***
- II. Increase country ownership, implement legislation, involve civil society and the private sector, build capacities and ensure viable national and international financial arrangement***
- III. Enhance Regional Seas' visibility***
- IV. Support knowledge-based policy making, through monitoring and assessment activities***
- V. Increase the use of Regional Seas as a platform for developing common regional objectives.***
- VI. Develop and promote a common vision and integrated management, based on ecosystem approaches.***

Achievements



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-partnerships and programs with UNDP/GEF, UNEP RSP, ICPDR, EC DG-ENV, ACCOBAMS, HELCOM, SIDA, OSPRI, DABLAS, IMO, FAO, GFCM, EMSA, JRC, GISP, WHO, London Convention, ESPOO and SIDA etc.

-development of policy guidelines and other basic documents such as SAP, ICZM, TDA and SoE report

-development of operational systems for monitoring,

Achievements



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- Amendments of several legal texts (including SAP, LBS protocol)

- Delta Exercise with OSPRI (Oil Spill Preparedness Regional initiative)

- Every Drop Counts Program of CocaCola

- SIDA related activities (Port Reception Facilities, detecting illegal oil discharges, Ballast Water Convention)

Achievements



•BS Conference, BS Day

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• **Organized and conducted the First Biannual Scientific Conference of the Black Sea Commission in 2006**

• **Prominent Scientists Awards**

• **Celebration of the International Black Sea Day**

• **Awards for service to protect the Black Sea environment**

2nd International Black Sea Conference
CLIMATE CHANGE IN THE BLACK SEA –PRESENT
IMPACT, FUTURE SCENARIOS AND MITIGATIONS
FOR THE ECOSYSTEM
BLACK SEA –HOT'2008

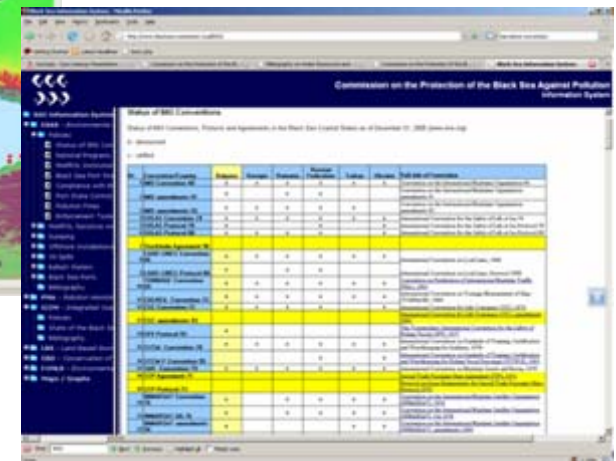
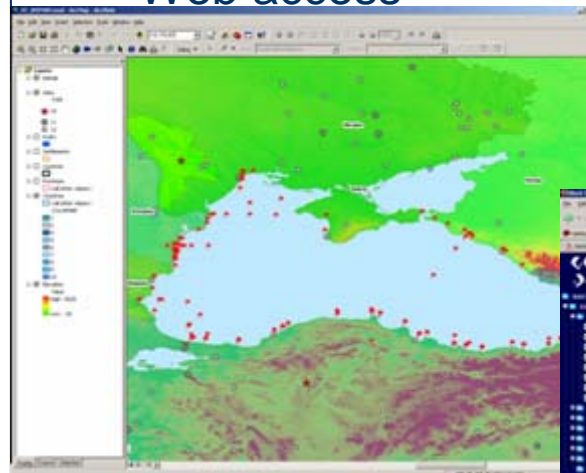
7-10 October-2008, Sofia, Bulgaria

Achievements



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- Improving National Reporting to the BSC
- Black Sea Integrated Monitoring and Assessment Programme (BSIMAP),
- Black Sea Information System (BSIS)
- Quality check (e.g. QUASIMEME)
- Web access



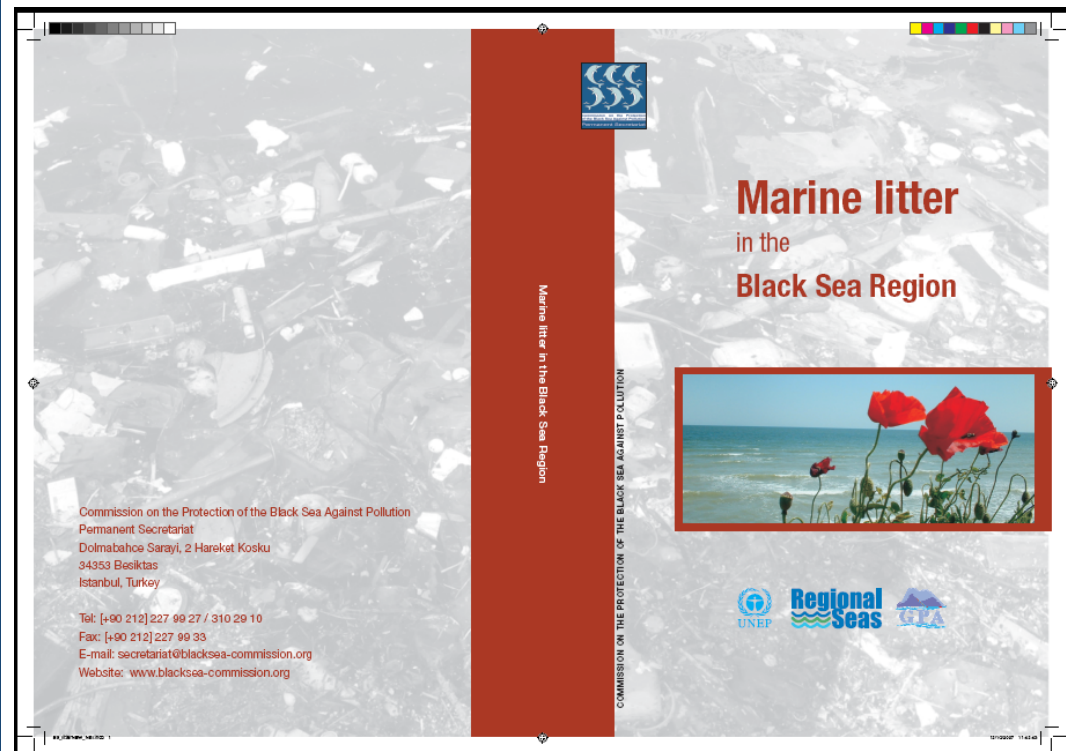
Commission on the Protection of the Black Sea Against Pollution Information System							
Value of BSIS Extensions							
Value of BSIS Extensions: Periodic and ad-hoc reports on the Black Sea (last data as of December 31, 2009)							
Country	Extension	Priority	Category	Status	Comments	Sub-Item of Extension	Responsible Party
Albania	BSIS Extension I						
Albania	BSIS Extension II						
Albania	BSIS Extension III						
Albania	BSIS Extension IV						
Albania	BSIS Extension V						
Albania	BSIS Extension VI						
Albania	BSIS Extension VII						
Albania	BSIS Extension VIII						
Albania	BSIS Extension IX						
Albania	BSIS Extension X						
Albania	BSIS Extension XI						
Albania	BSIS Extension XII						
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Albania	BSIS Extension XXV						
Albania	BSIS Extension XXVI						
Albania	BSIS Extension XXVII						
Albania	BSIS Extension XXVIII						
Albania	BSIS Extension XXIX						
Albania	BSIS Extension XXX						

Achievements



- I. *Increase Regional Seas' contribution to Sustainable Development*
- II. *Increase country ownership, implement legislation, involve civil society and the private sector, build capacities and ensure viable national and international financial arrangement*
- III. *Enhance Regional Seas' visibility*
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- V. *Increase the use of Regional Seas as a platform for developing common regional objectives.*
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- Marine Litter -> common policies
- Invasive Species -> common approach



Achievements



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- III. Enhance Regional Seas' visibility*
- IV. Support knowledge-based policy making, through monitoring and assessment activities*
- V. Promote synergies and coordinated regional implementation of relevant MEAs and global Organizations and initiatives*
- VI. Develop and promote a common vision and integrated management, based on ecosystem approaches.*

Update of main strategic and legal documents:

- The Convention
- BSSAP
- Documents of the Commission

Challenges



- Better implementation of the Convention and related documents
- Wider sharing of knowledge & involvement of public
- Strengthening of science-policy cooperation
- Stronger cooperation with other regional organisations



- **Thank you for your attention**



*sighting of the monk seal
in 2005, this marine
mammal was
considered as extinct in the
Black Sea*

