Joint ECS/ASCOBANS/ACCOBAMS Workshop on
Conserving Cetaceans in the Seas around Europe through Synergy-building between the Relevant Legislative Frameworks

MONITORING AND MITIGATION OF CHEMICAL CONTAMINANTS IN MEDITERRANEAN SEA

M. Cristina Fossi

Matteo Baini, Cristina Panti and Letizia Marsili

University of Siena, Italy

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Multiple Stress Pressure in Mediterranean Cetaceans

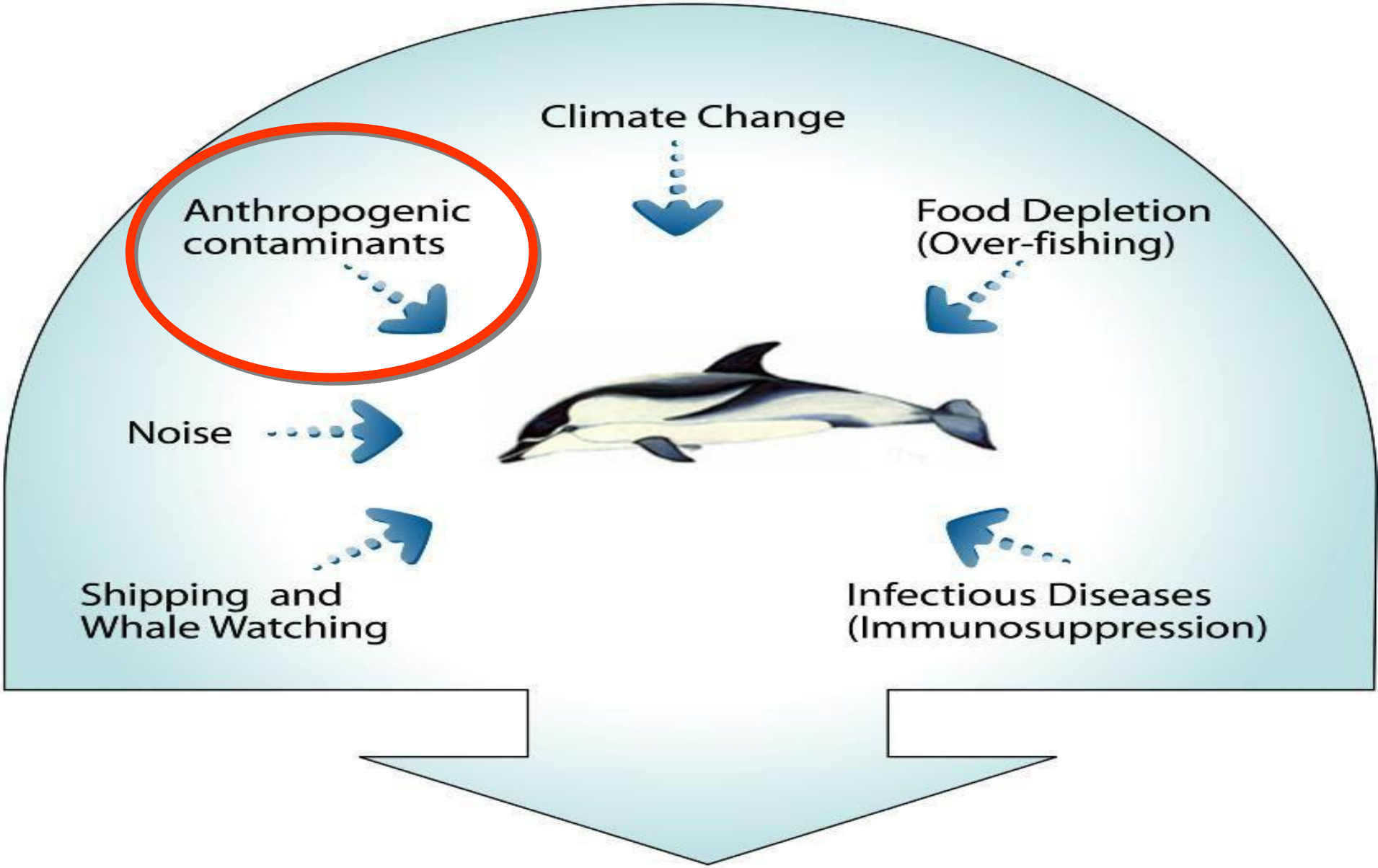
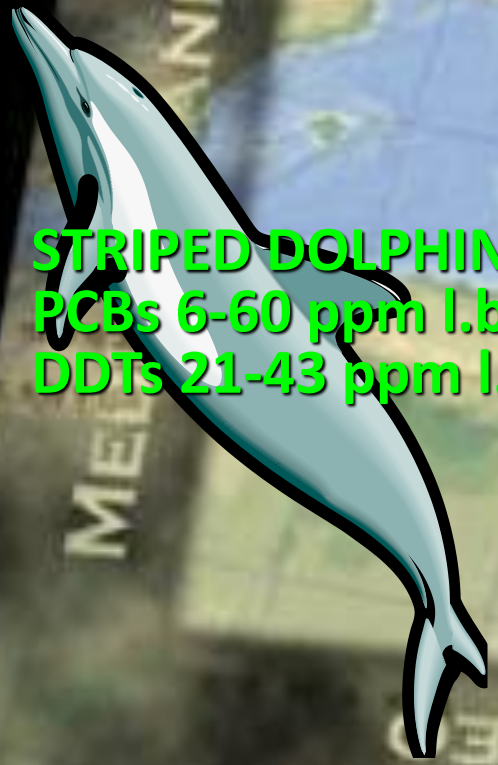


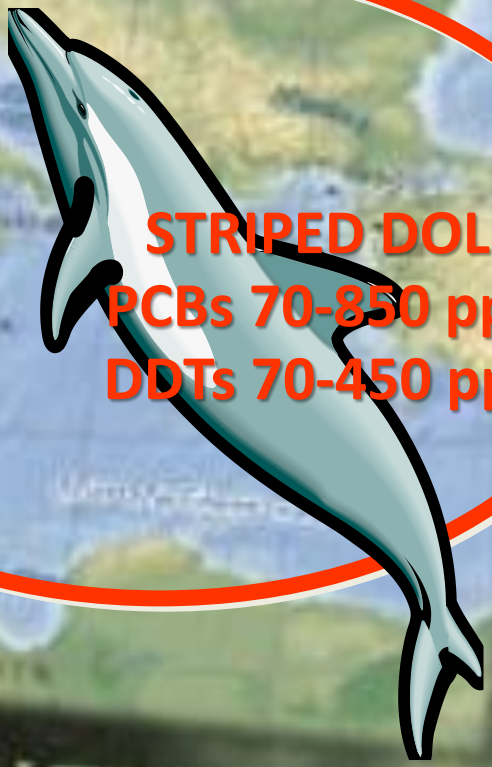
Fig1 .

MEDITERRANEAN SEA



STRIPED DOLPHIN
PCBs 6-60 ppm l.b.
DDTs 21-43 ppm l.b.

<



STRIPED DOLPHIN
PCBs 70-850 ppm l.b.
DDTs 70-450 ppm l.b.

Large Marine Vertebrates as sentinels of GES in MSFD

Marine Environmental Research 77 (2012) 156–158

Contents lists available at SciVerse ScienceDirect

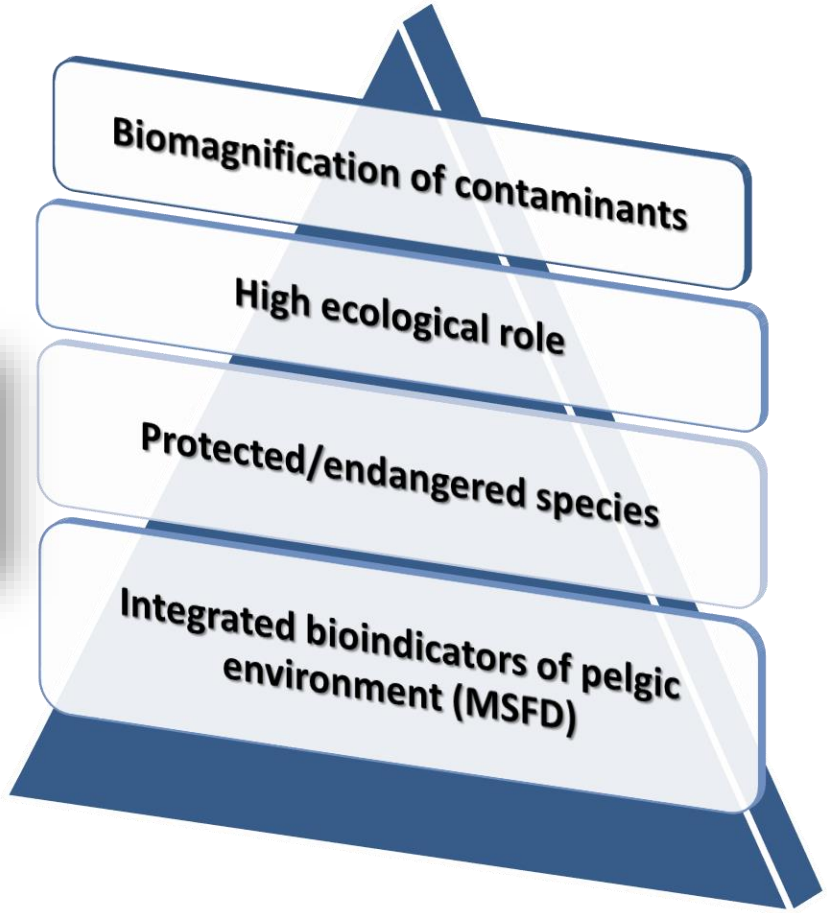
Marine Environmental Research

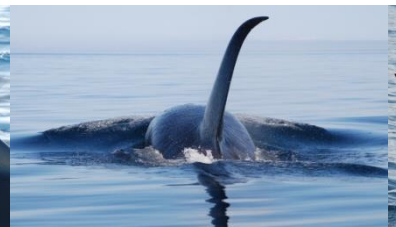
journal homepage: www.elsevier.com/locate/marenvrev

Short communication

The role of large marine vertebrates in the assessment of the quality of pelagic marine ecosystems

Maria Cristina Fossi [a,*], Silvia Casini [a], Ilaria Caliani [a], Cristina Panti [b], Letizia Marsili [a], Aldo Viarengo [c], Roberto Giangreco [d], Giuseppe Notarbartolo di Sciara [e], Fabrizio Serena [f], Atef Ouerghi [g], Michael H. Depledge [h]

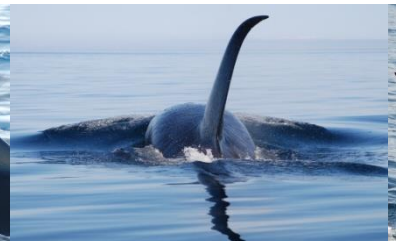




Qualitative Descriptors for determining Good Environmental Status (GES)

(1) Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.
(2) Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems.
(3) Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock.
(4) All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity.
(5) Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters.
(6) Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected.
(7) Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems.
(8) Concentrations of contaminants are at levels not giving rise to pollution effects.
(9) Contaminants in fish and other seafood for human consumption do not exceed levels established by Community legislation or other relevant standards.
(10) Properties and quantities of marine litter do not cause harm to the coastal and marine environment.
(11) Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment.



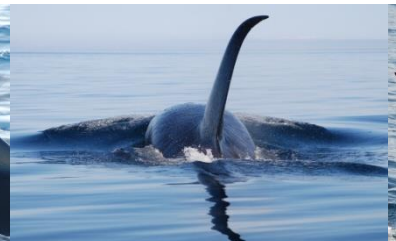




Descriptor 8 - MSFD

“Concentrations of contaminants are at levels not giving rise to pollution effects”

Descriptor 8 should be based upon monitoring programmes covering the **concentrations of chemical contaminants** and also biological measurements relating to the **effects of pollutants on marine organisms** in each of the assessment regions.



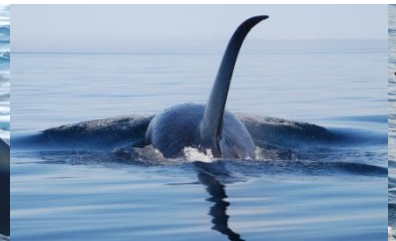

Descriptor 8 - MSFD

Monitoring programmes should also include the quantification of **biological effects of contaminants** at different levels of biological organization….

Undesirable Biological Effect

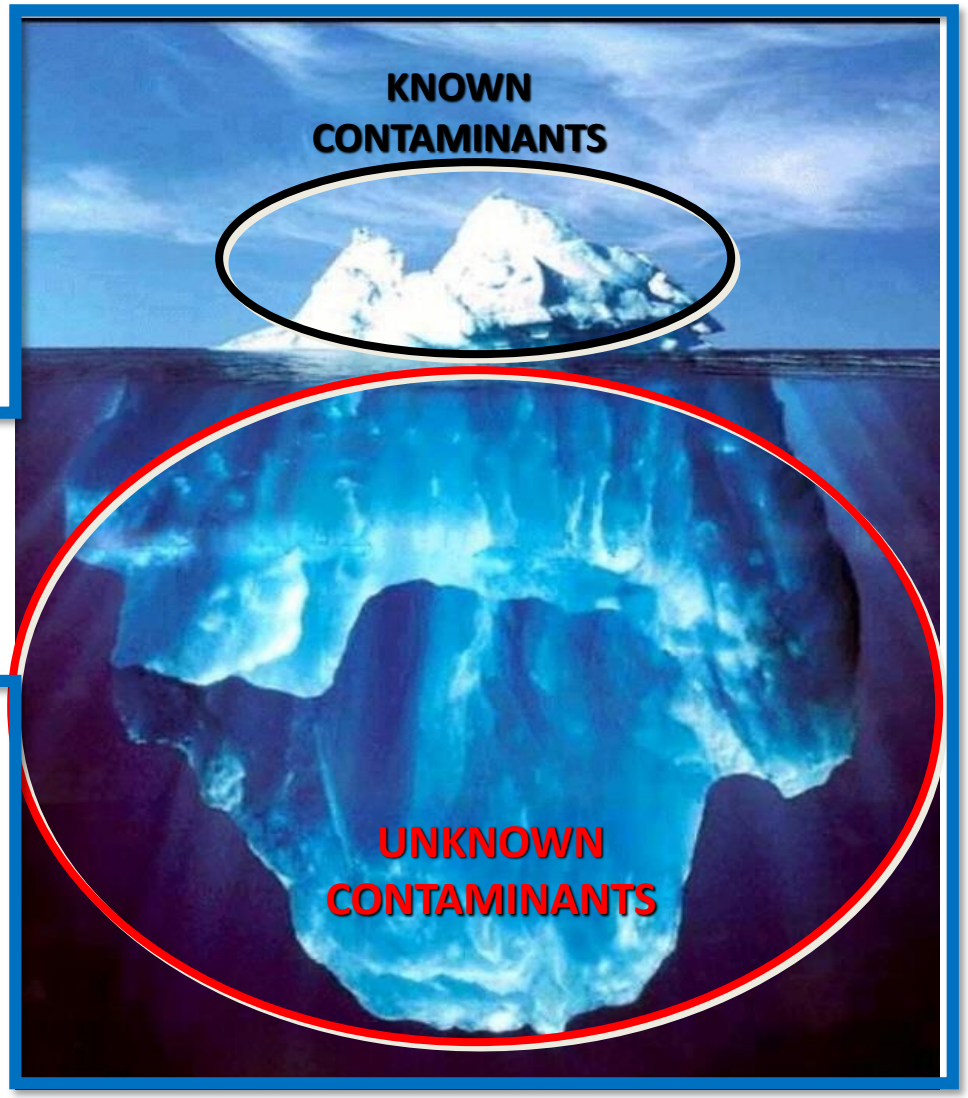
BIOMARKERS

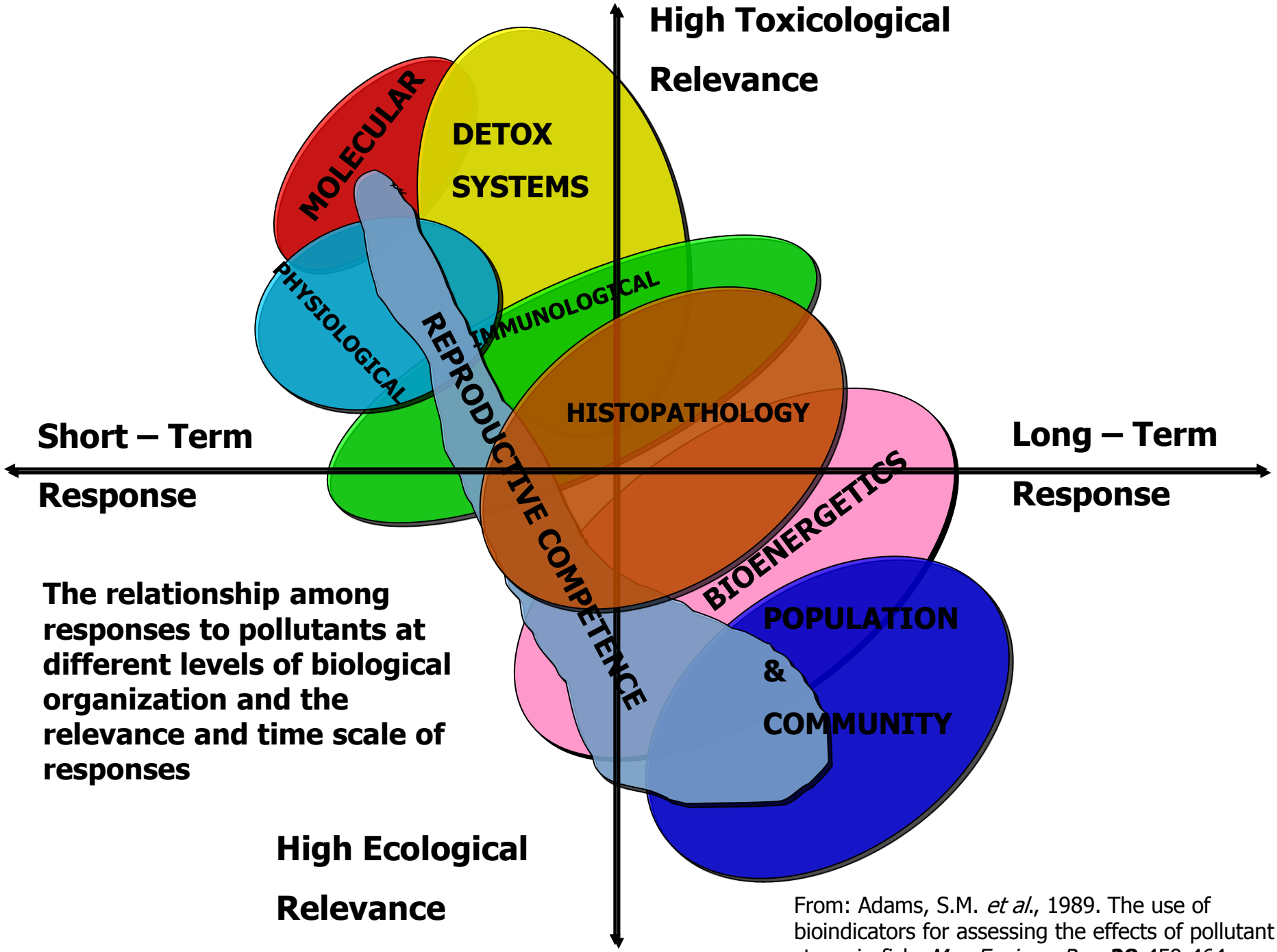



Why Biomarkers ?

Effects





The relationship among responses to pollutants at different levels of biological organization and the relevance and time scale of responses

From: Adams, S.M. *et al.*, 1989. The use of bioindicators for assessing the effects of pollutant stress in fish. *Mar. Environ. Res.* **28**:459-464

Contaminants Trend…

?

OCs

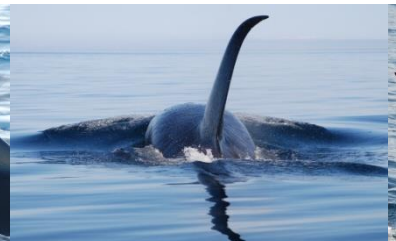
PBDEs

Aim

In this presentation we consider several **case studies** in Mediterranean Sea in which cetacean species can represent **potential indicator** species of **legacy contaminants** and **emerging threats**.

- Most relevant legislative instruments
- Recommendation for improvement



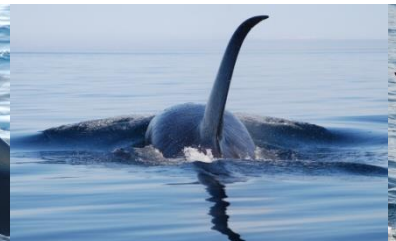

Old and New chemical threats

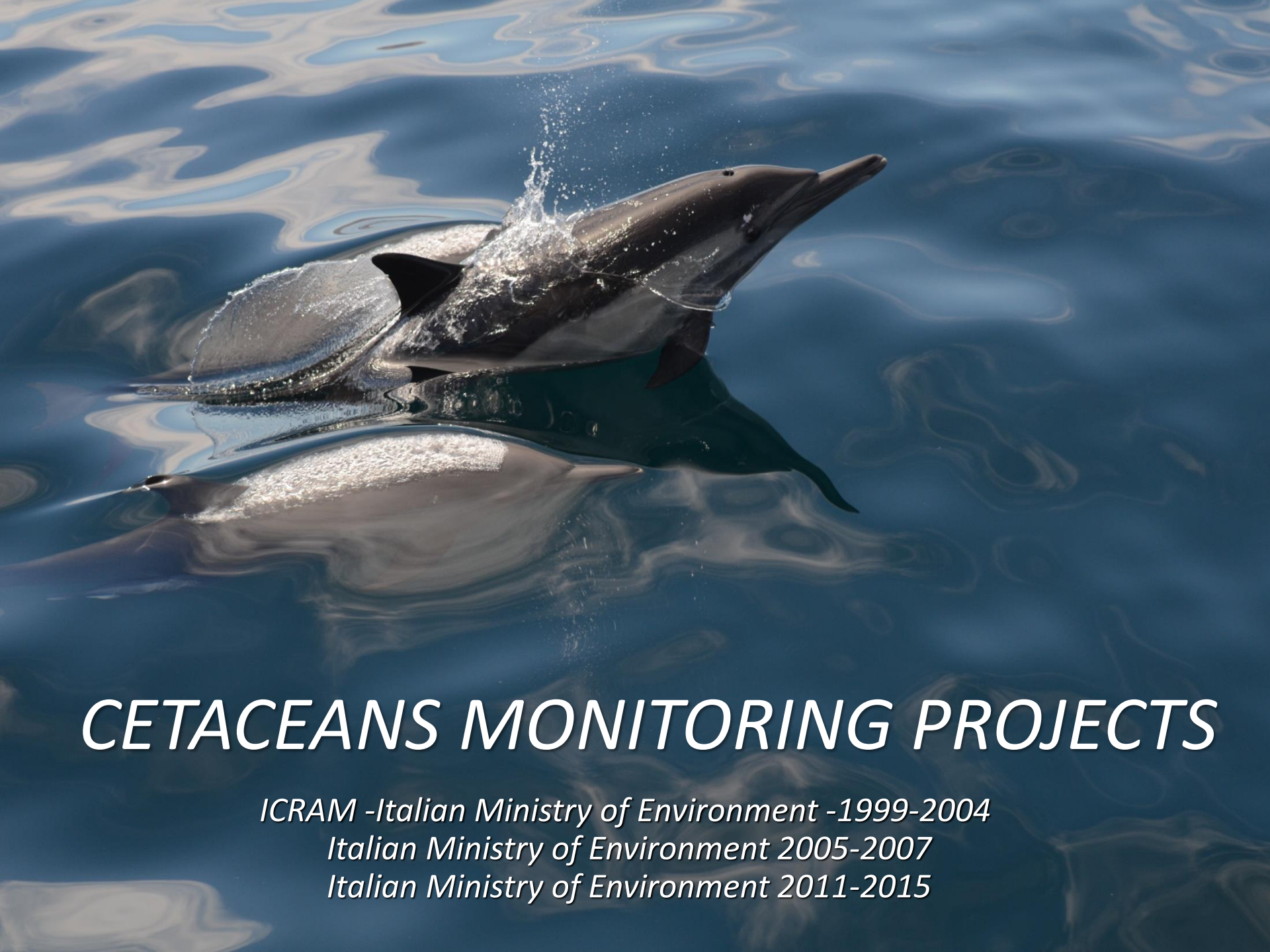
- ***Legacy contaminants*** (PBTs): PCBs, DDTs, Dioxins, PAHs, trace elements, etc.

- ***Emerging chemicals:*** Personal Care Products and pharmaceuticals (PCPPs), fluorinated compounds (PFOA, PFOS), Neonicotinoids (new pesticides), Plasticizers (phthalates, Bisphenol A, etc.), etc.

- ***Emerging threats***: microplastics, nanoparticles



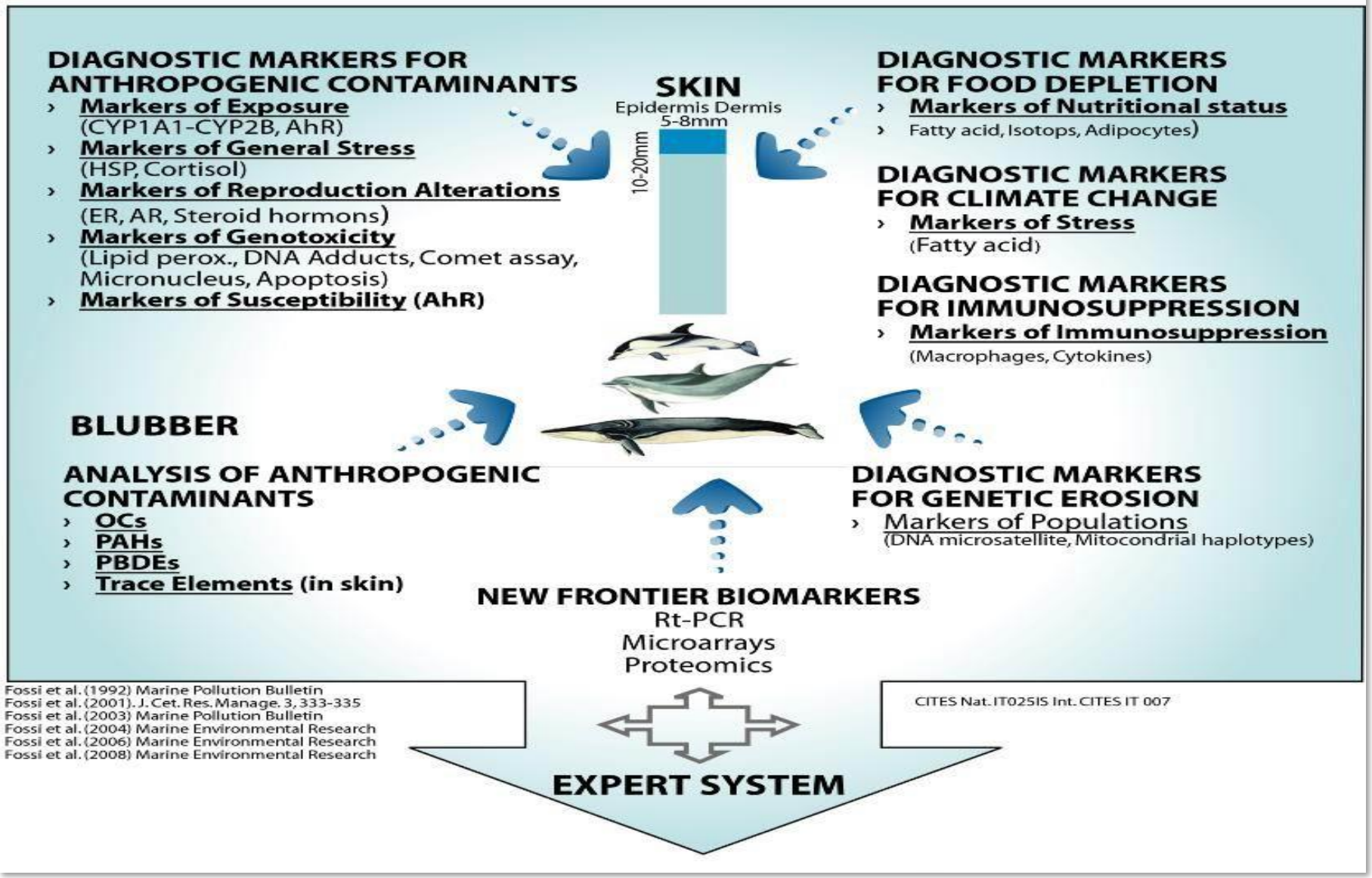



CETACEANS MONITORING PROJECTS

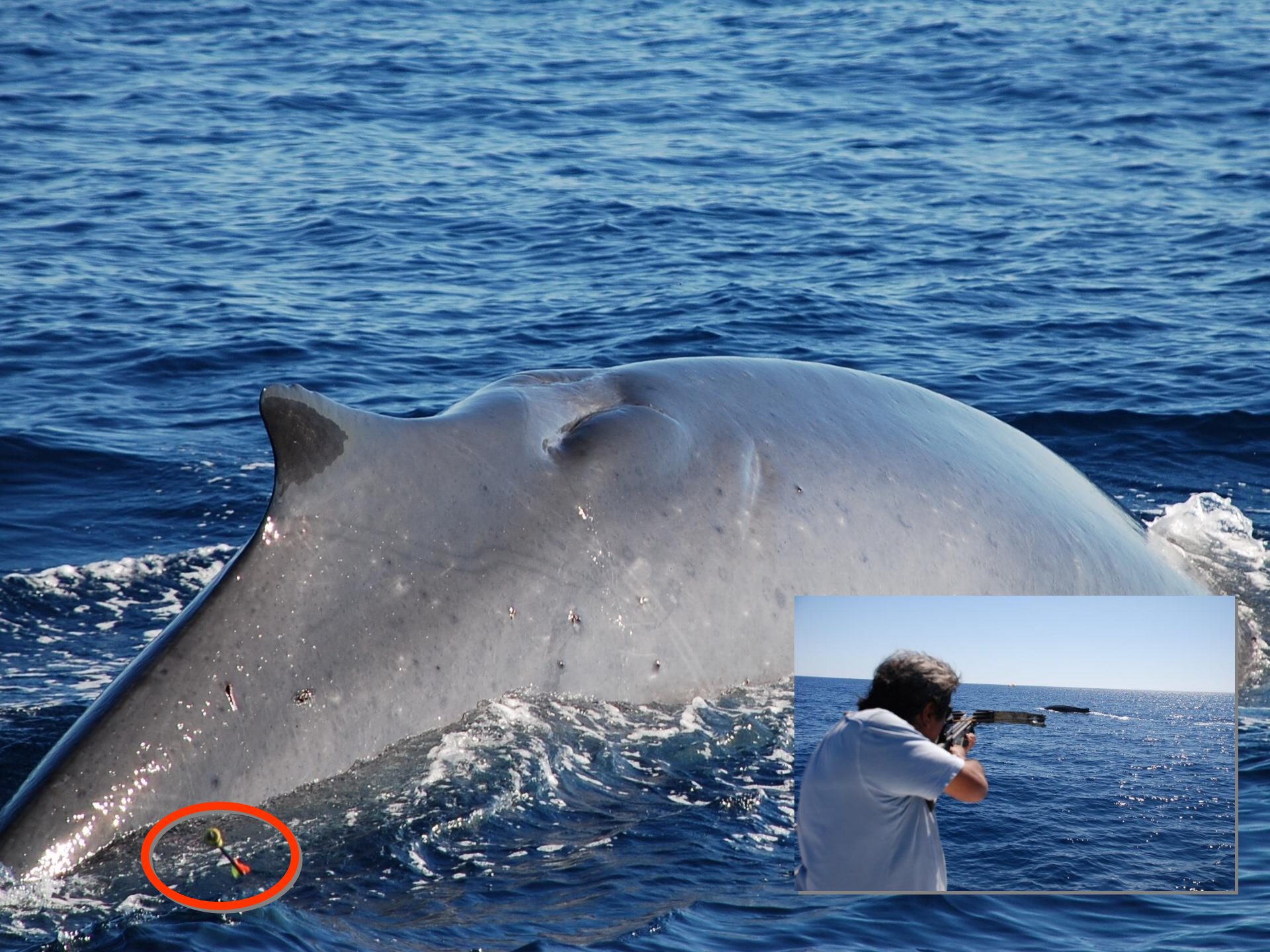
ICRAM -Italian Ministry of Environment -1999-2004
Italian Ministry of Environment 2005-2007
Italian Ministry of Environment 2011-2015

Multi -Trial Biomarker Diagnostic Tool in Skin Biopsy



Fossi et al. (1992) Marine Pollution Bulletin
Fossi et al. (2001). J. Cet. Res. Manage. 3, 333-335
Fossi et al. (2003) Marine Pollution Bulletin
Fossi et al. (2004) Marine Environmental Research
Fossi et al. (2006) Marine Environmental Research
Fossi et al. (2008) Marine Environmental Research

CITES Nat. IT025IS Int. CITES IT 007



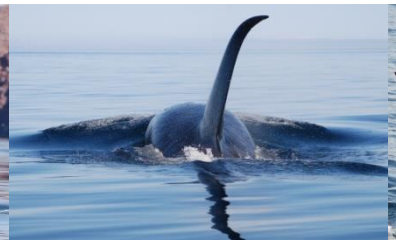
Project 1: OBJECTIVE

The main objective of this project was to investigate the temporal trends of POPs (OCs) in stranded and free-ranging **striped dolphin** (*Stenella coeruleoalba*) in Mediterranean Sea and particularly

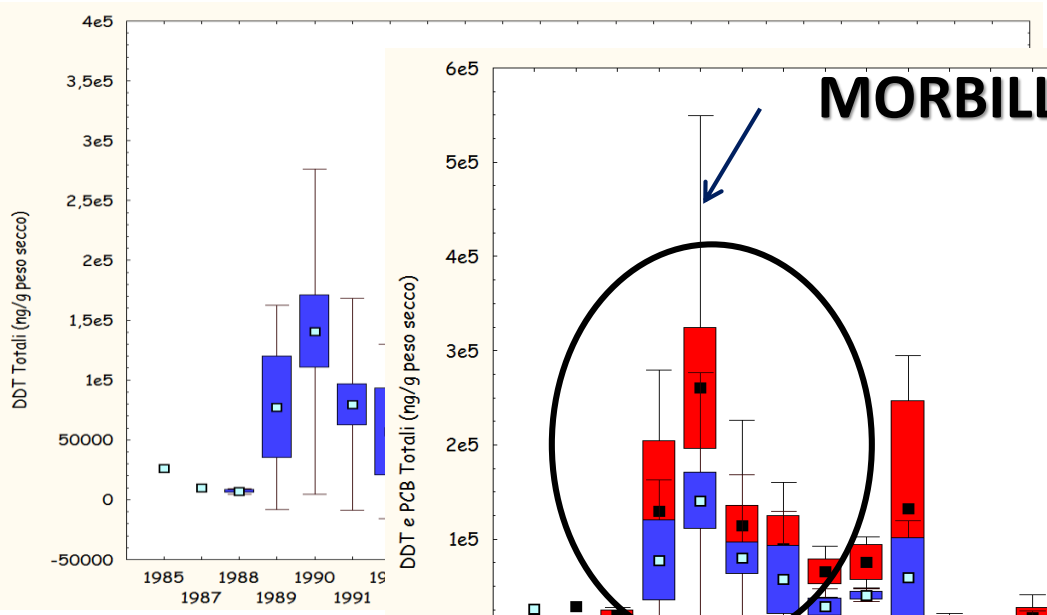
in the **Pelagos Sanctuary** between **1985 to 2013**

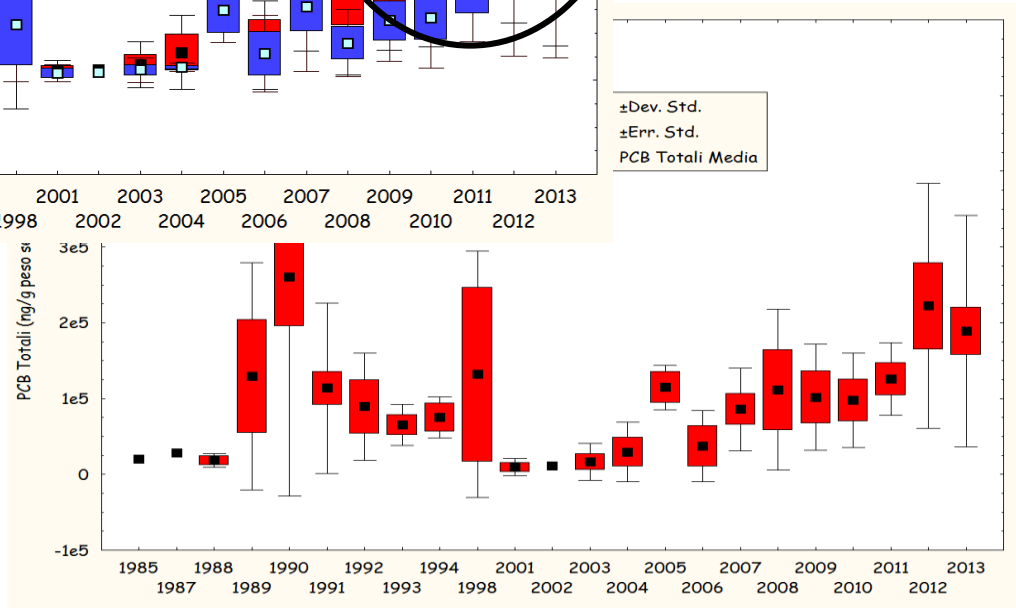
Potential sentinels of GES for the Pelagic Environment Descriptor 8



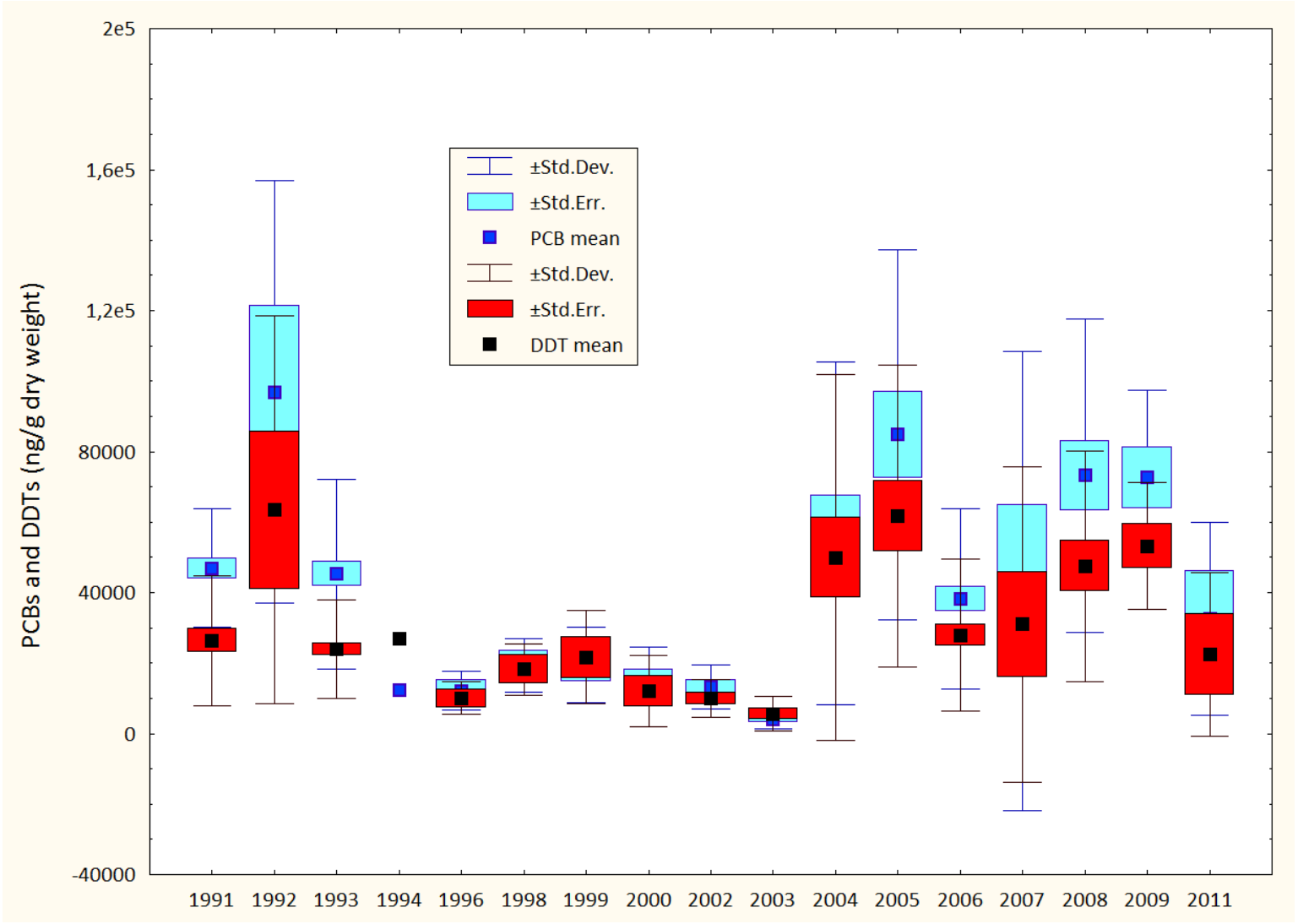

TEMPORAL TREND OF OCs IN STRANDED SPECIMENS of *Stenella coeruleoalba 1985-2013*





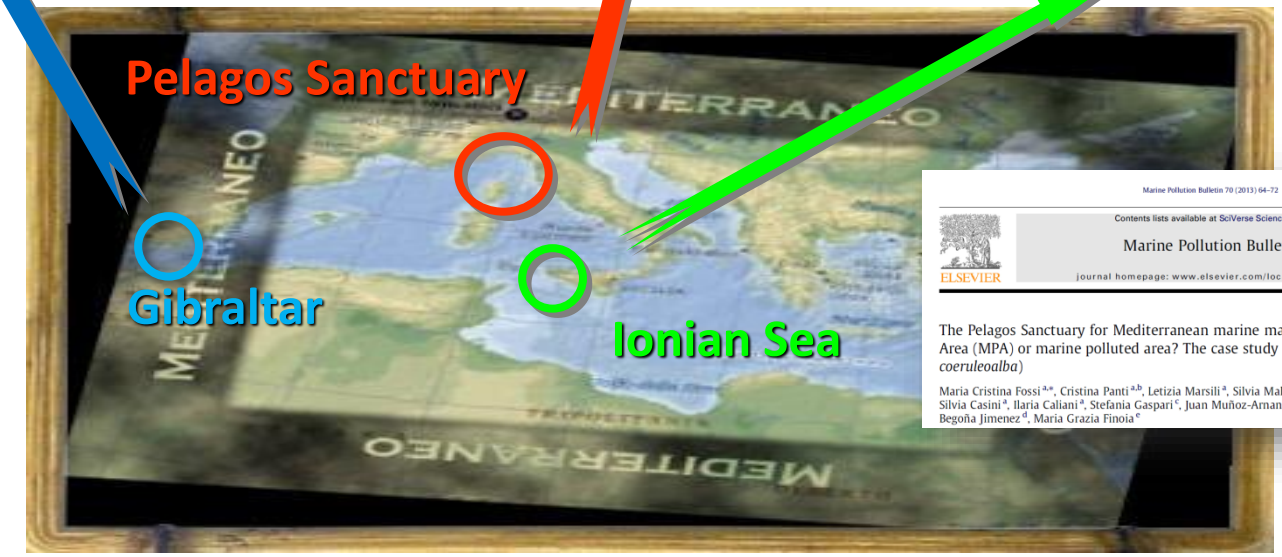
Marsili, personal comunication

TEMPORAL TREND OF OCs IN FREE-RANGING SPECIMENS of *Stenella coeruleoalba* 1991-2011



ACCOBAMS Project

Ecotoxicological diagnostic investigation using skin biopsy



Marine Pollution Bulletin 70 (2013) 64–72

Contents lists available at SciVerse ScienceDirect

Marine Pollution Bulletin

journal homepage: www.elsevier.com/locate/marpolbut

The Pelagos Sanctuary for Mediterranean marine mammals: Marine Protected Area (MPA) or marine polluted area? The case study of the striped dolphin (*Stenella coeruleoalba*)

Maria Cristina Fossi [a,*], Cristina Panti [a,b], Letizia Marsili [a], Silvia Maltese [a], Giacomo Spinsanti [b], Silvia Casini [a], Ilaria Caliani [a], Stefania Gaspari [c], Juan Muñoz-Arnanz [d], Begoña Jimenez [d], Maria Grazia Finoia [e]

Panti et al (2011), Ecotoxicology - Fossi et al. (2013), MPB

Project 2: OBJECTIVE

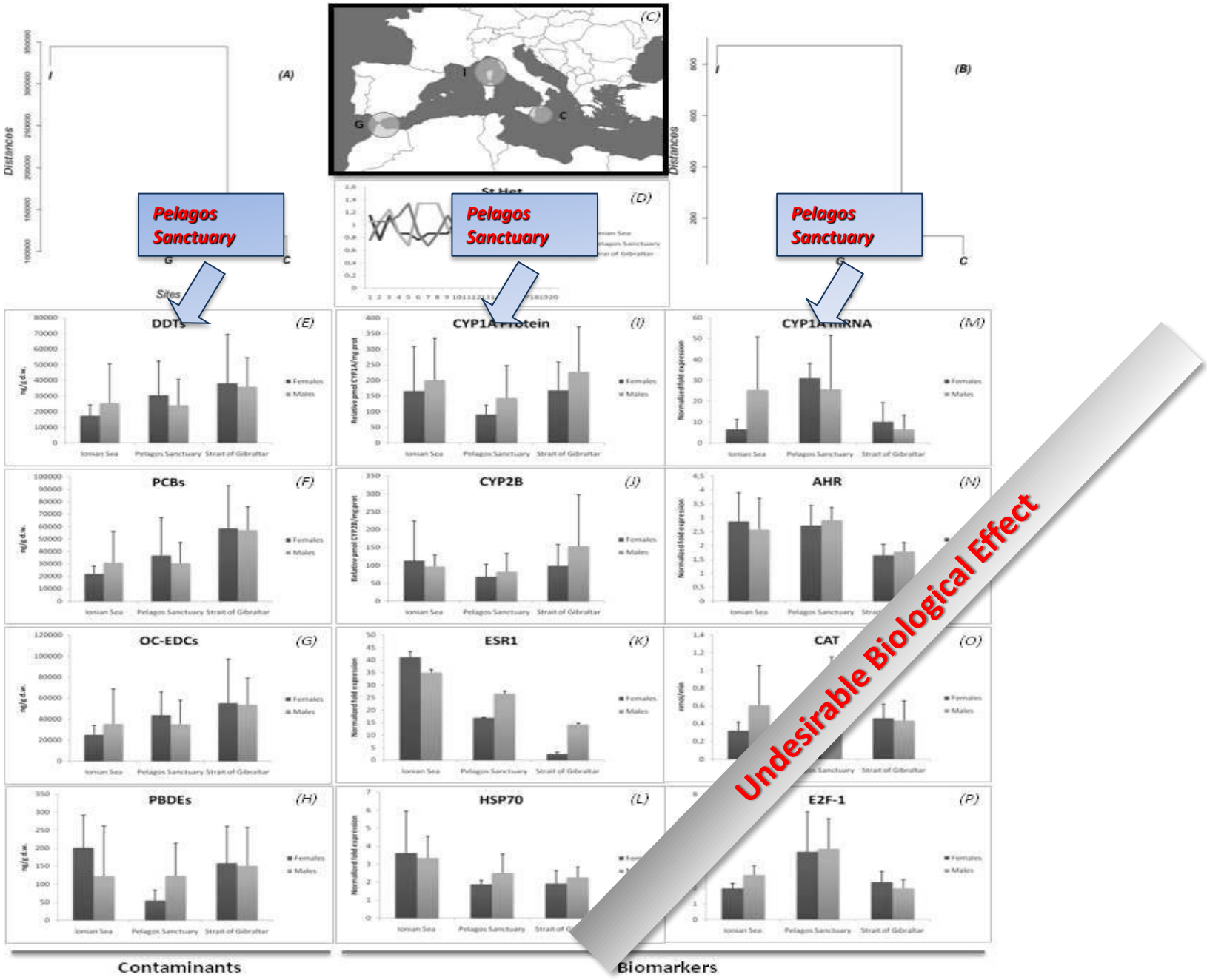
The main objective of this project was to validate a suite of sensitive **biomarkers** in **skin biopsy** of the target species, **striped dolphin** (*Stenella coeruleoalba*) to evaluate the toxicological status of this cetaceans in Mediterranean Sea and particularly in the **Pelagos Sanctuary**

Potential sentinels of GES for the Pelagic Environment

Descriptor 8

ACCOBAMS
An Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area

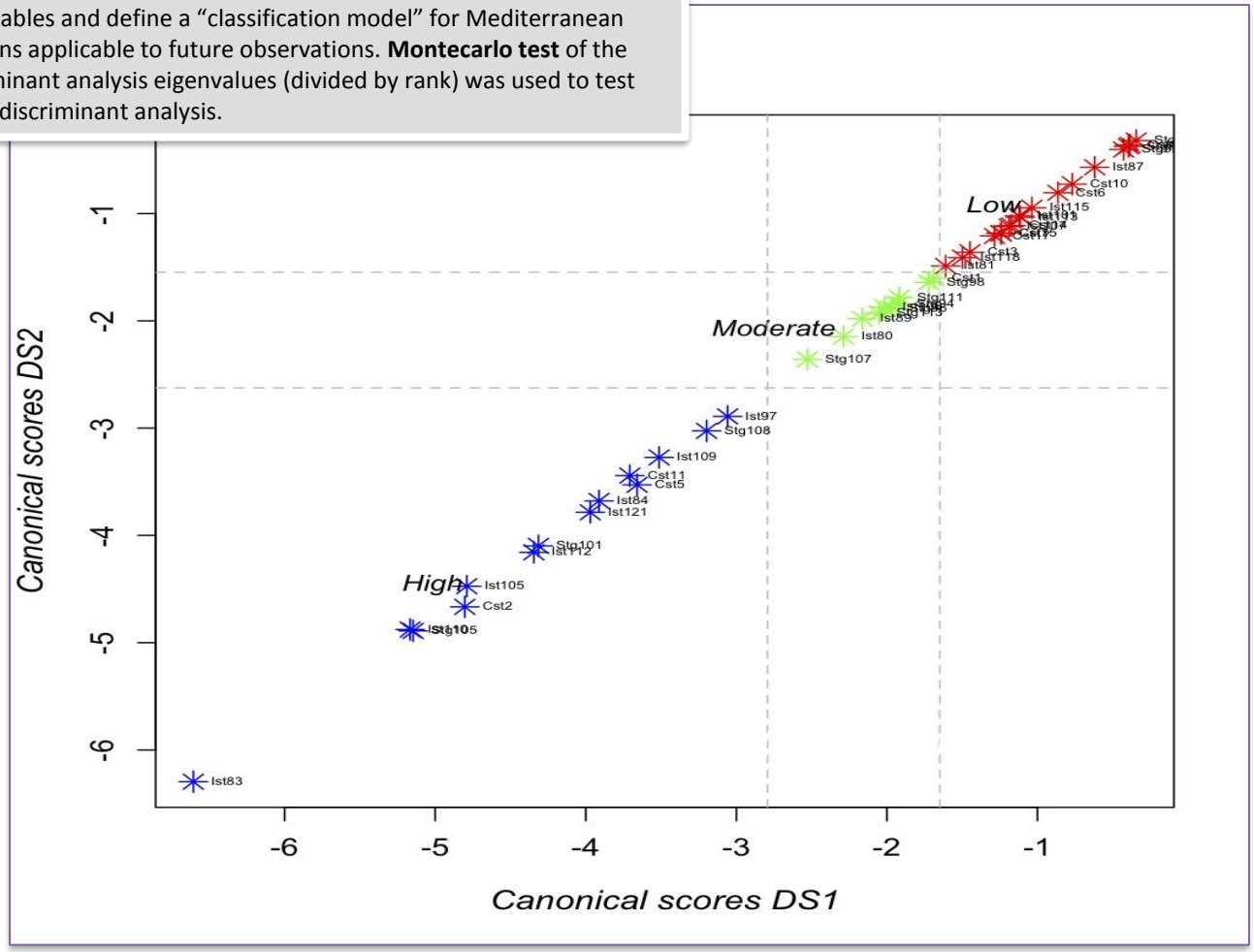
MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE


(A)
(B)
(C)
(D)
Distances
I
G
C
Sites
Pelagos Sanctuary
Pelagos Sanctuary
Pelagos Sanctuary
DDTs
(E)
CYP1A Protein
(I)
CYP1A mRNA
(M)
PCBs
(F)
CYP2B
(J)
AHR
(N)
OC-EDCs
(G)
ESR1
(K)
CAT
(O)
PBDEs
(H)
HSP70
(L)
E2F-1
(P)
ng/g d.w.
Females
Males
Ionian Sea
Pelagos Sanctuary
Strait of Gibraltar
Undesirable Biological Effect
Contaminants
Biomarkers

ST.R.E.S.S.

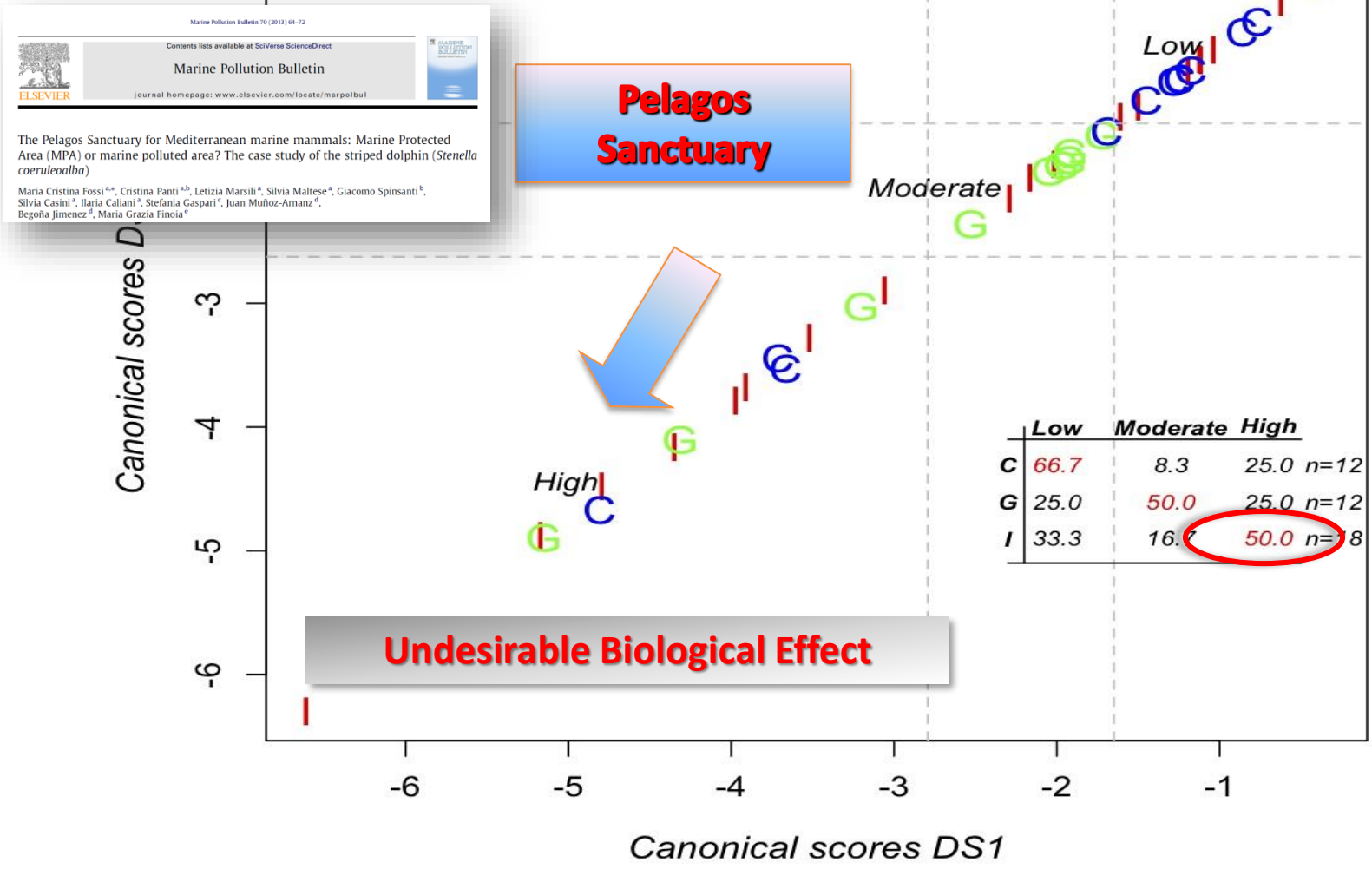
STATISTICAL RISK ELABORATION SYSTEM IN Stenella coeruleoalba FOR THE CONSERVATION OF CETACEAN'S BIODIVERSITY IN MEDITERRANEAN SEA

Canonical Discriminant analysis on PCA factors was performed to evidence clustering variables and define a "classification model" for Mediterranean striped dolphins applicable to future observations. **Montecarlo test** of the sum of discriminant analysis eigenvalues (divided by rank) was used to test the quality of discriminant analysis.



ST.R.E.S.S.

STATISTICAL RISK ELABORATION SYSTEM IN Stenella coeruleoalba



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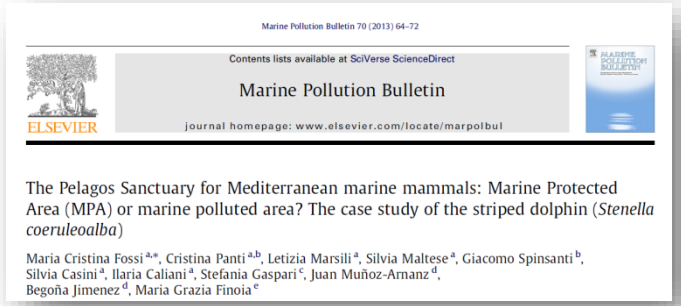
Pelagos Sanctuary

	Low	Moderate	High	
C	66.7	8.3	25.0	n=12
G	25.0	50.0	25.0	n=12
I	33.3	16.7	50.0	n=18

Undesirable Biological Effect



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ELSEVIER

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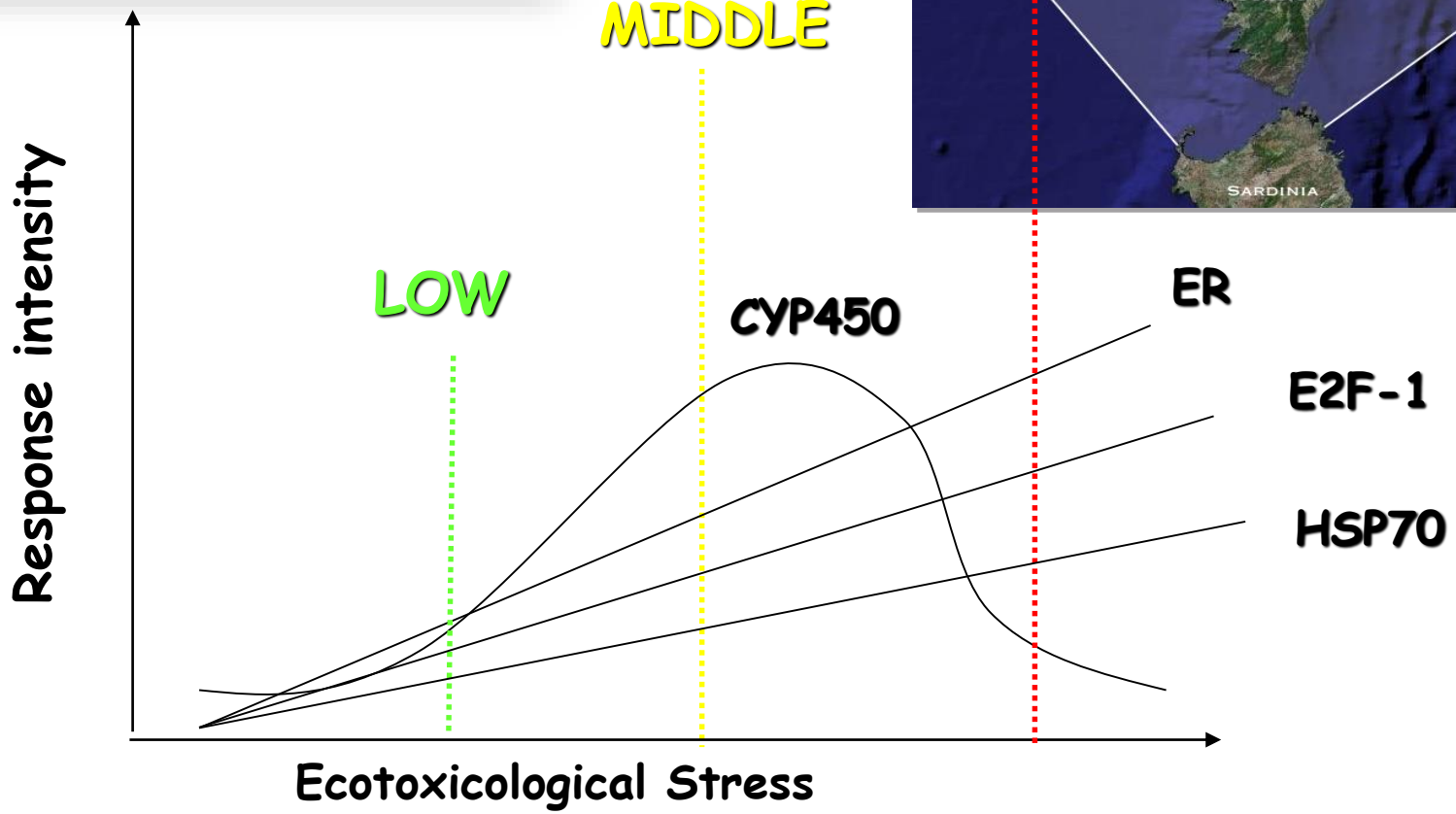
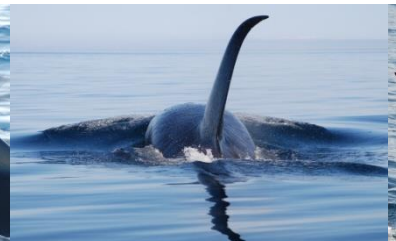


Descriptor 10 - MSFD

“Properties and quantities of marine litter do not cause harm to the coastal and marine environment”





The emerging threat of
MICROPLASTICS

Microplastics Fin whale

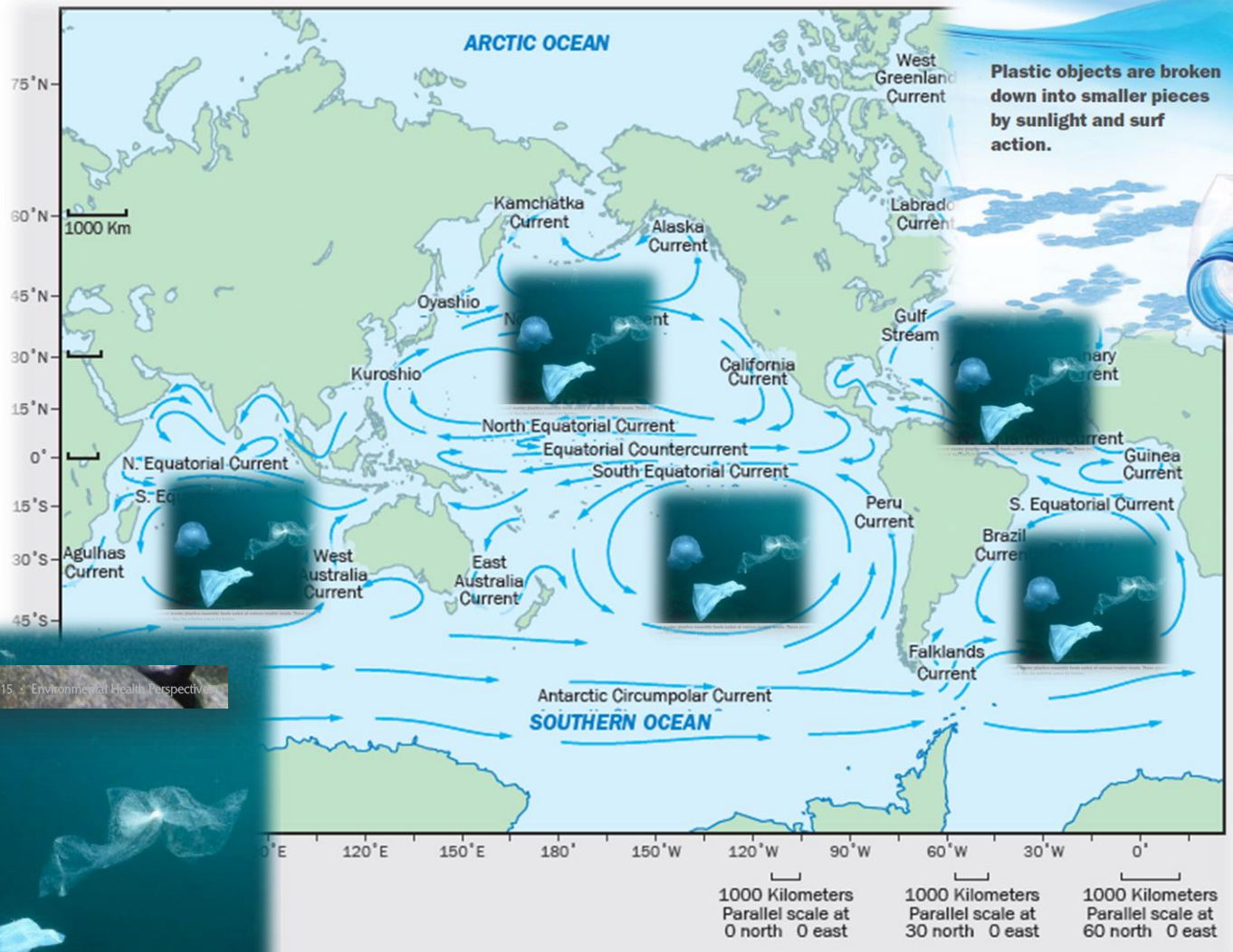
Project

MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE

Project 3: The emerging issue of the microplastics in the Mediterranean sea: the potential impact on the Mediterranean fin whale


Can Microplastics Affect
Mediterranean Biodiversity?

Plastic debris into five ocean gyres



Different marine plastics resemble foods eaten at various trophic levels. These plastic bags look like the jellyfish eaten by turtles.
© Norbert Wu/Minden Pictures/Corbis

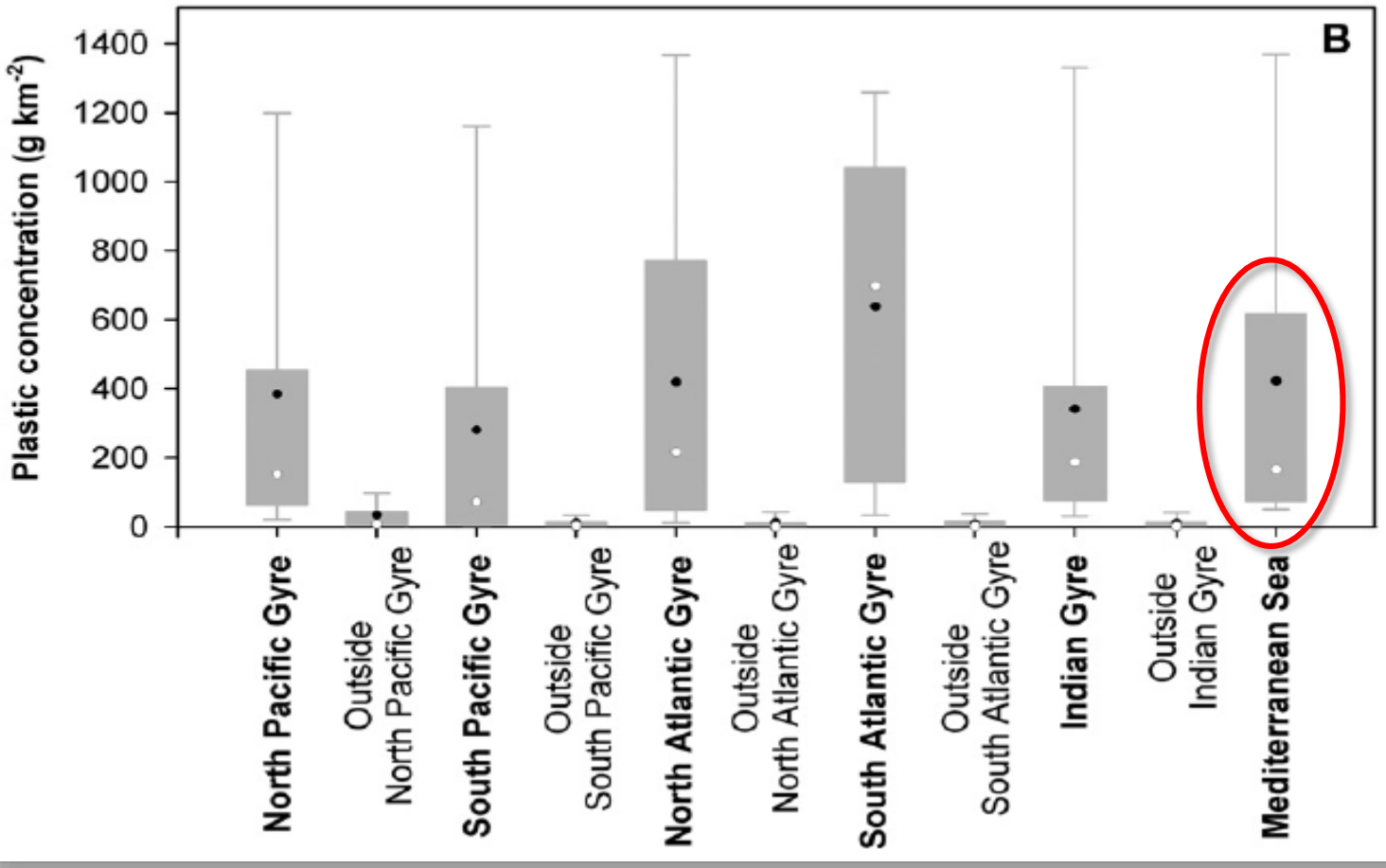
...rry plastic debris into the five major ocean gyres. Thousands of tons of ...estimated to bob in these gyres, but more than half of all plastic debris ...eaching ocean waters. © Jane Whitney

PLOS ONE

RESEARCH ARTICLE

Plastic Accumulation in the Mediterranean Sea

Andrés Cózar[1]*, Marina Sanz-Martín[2,3], Elisa Martí[1], J. Ignacio González-Gordillo[1], Bárbara Ubeda[1], José Á. Gálvez[1], Xabier Irigoien[4], Carlos M. Duarte[2,4]




Balaenoptera physalus

The idea …2011

Contents lists available at SciVerse ScienceDirect

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journal homepage: www.elsevier.com/locate/marpolbul

Are baleen whales exposed to the threat of microplastics? A case study of the Mediterranean fin whale (*Balaenoptera physalus*)

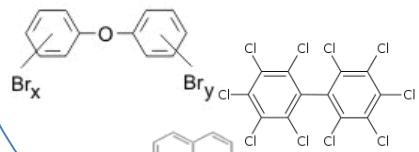
Maria Cristina Fossi [a,*], Cristina Panti [b], Cristiana Guerranti [a], Daniele Coppola [a], Matteo Giannetti [a,b], Letizia Marsili [a], Roberta Minutoli [c]

300 liters of water daily

70,000 liters of water

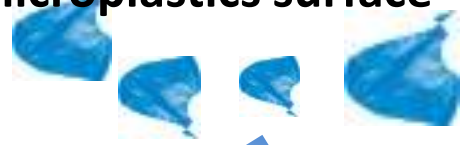
with each mouthful

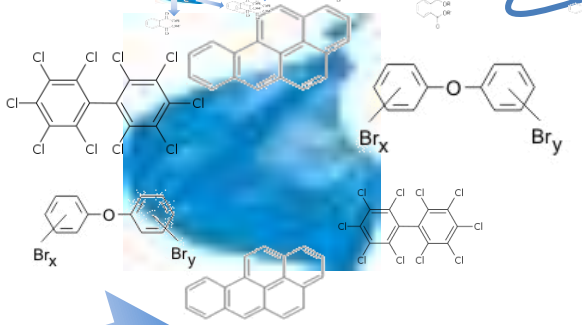
Microplastics and contaminants

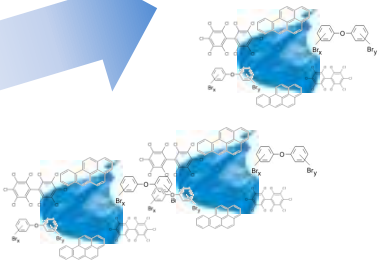


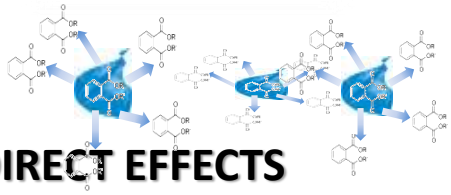
THE INDIRECT EFFECTS

Adsorption of PBTs on microplastics surface



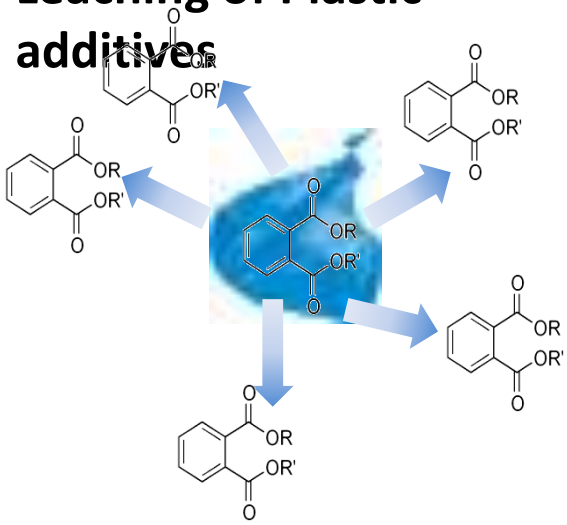






THE DIRECT EFFECTS

Leaching of Plastic additives



Current data


Environmental Pollution 209 (2016) 68–78

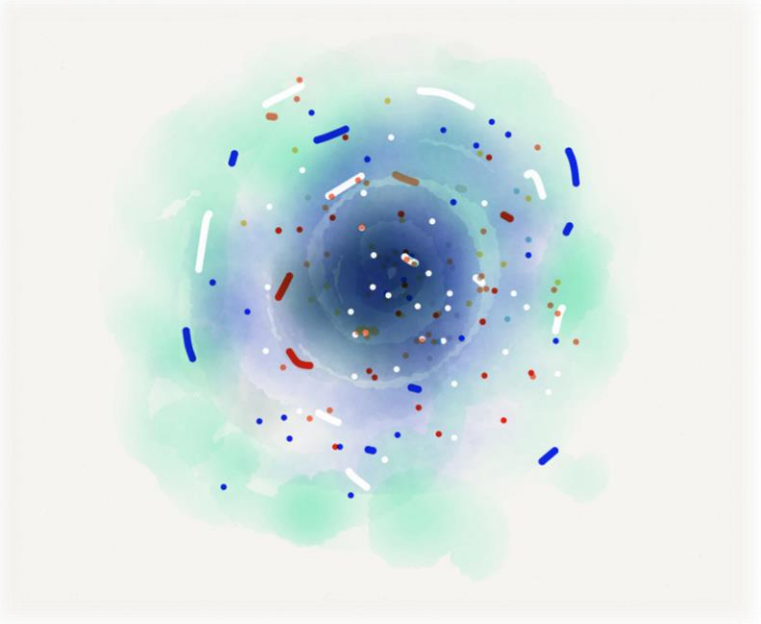
Contents lists available at ScienceDirect

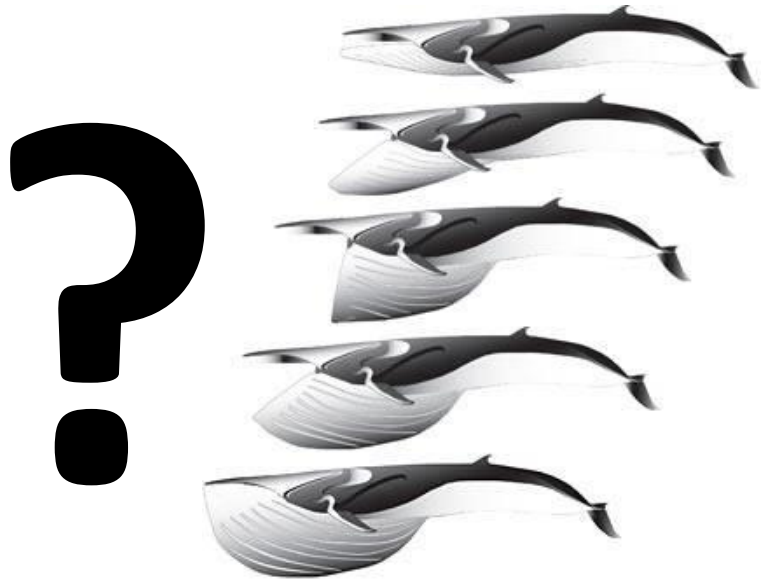
Environmental Pollution

journal homepage: www.elsevier.com/locate/envpol

Fin whales and microplastics: The Mediterranean Sea and the Sea of Cortez scenarios

Maria Cristina Fossi [a], Letizia Marsili [a], Matteo Baini [a], Matteo Giannetti [a, b], Daniele Coppola [a], Cristiana Guerranti [a], Ilaria Caliani [a], Roberta Minutoli [c], Giancarlo Lauriano [d], Maria Grazia Finoia [d], Fabrizio Rubegni [e], Simone Panigada [f], Martine Bérubé [g], Jorge Urbán Ramírez [h], Cristina Panti [a, *]

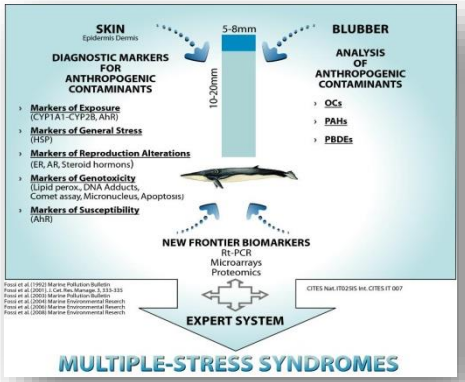




The 2015 study examined the interaction between free-ranging fin whales (*Balaenoptera physalus*) and microplastics by comparing populations living in two semi-enclosed basins, the Mediterranean Sea and the Sea of Cortez (Gulf of California, Mexico).

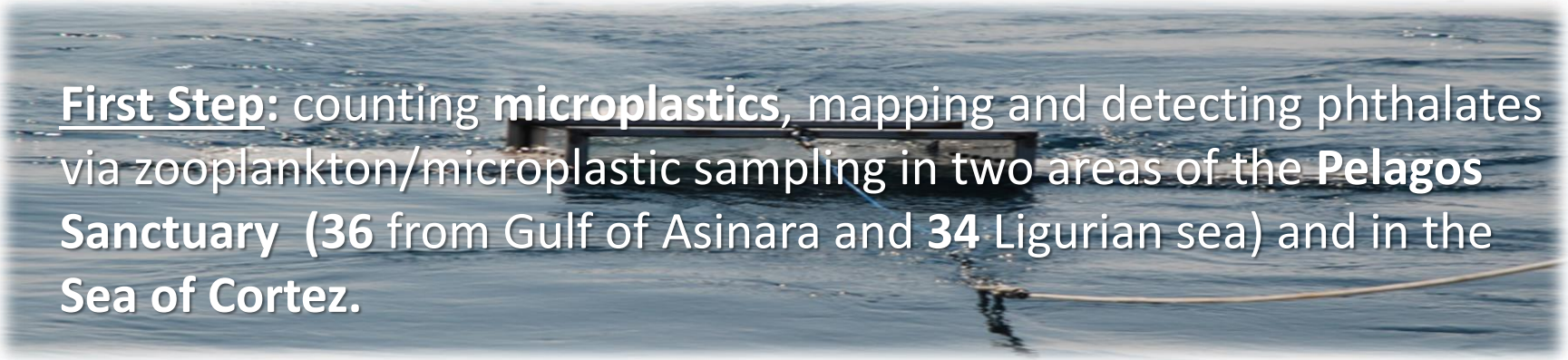
Experimental work

Pelagos Sanctuary



Sea of Cortez

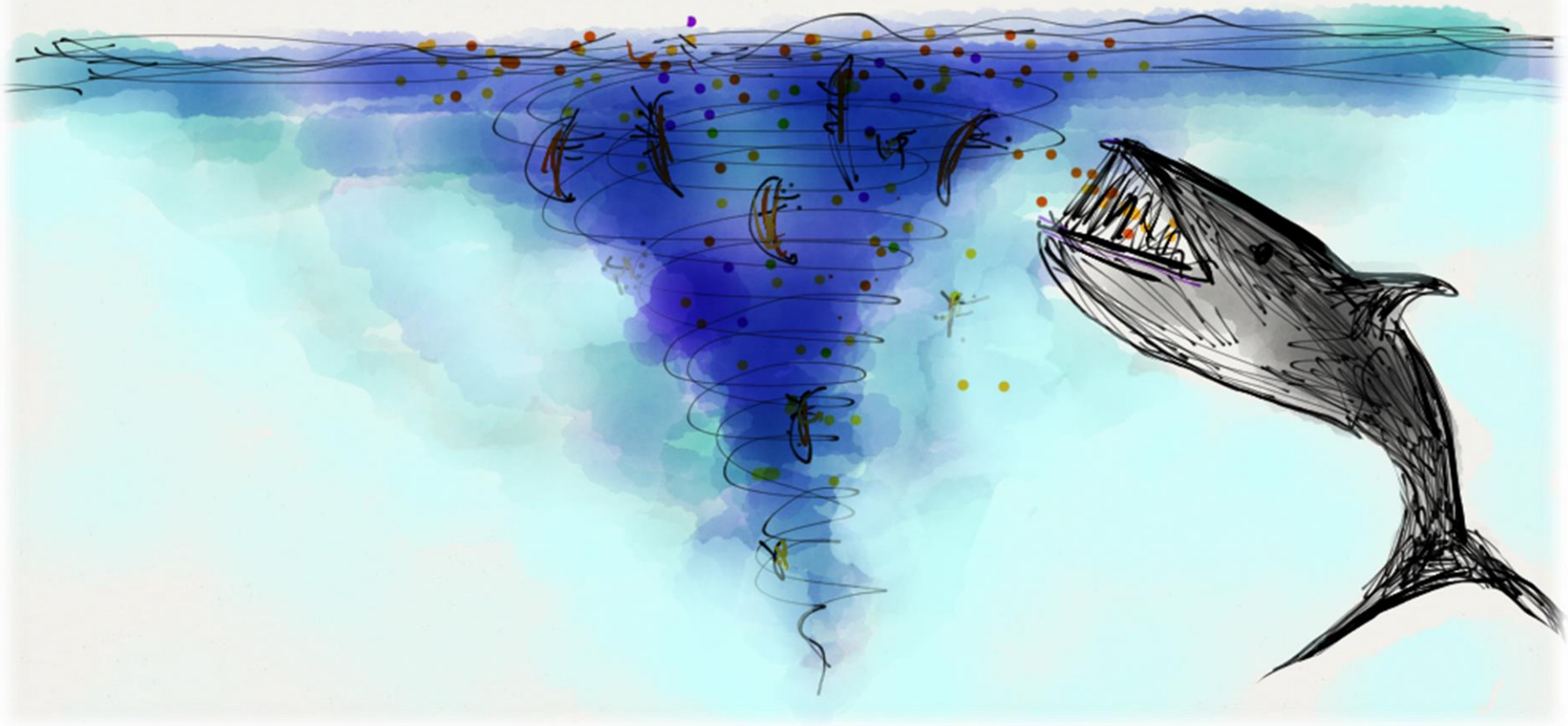
The study consists of two experimental steps:



First Step: counting **microplastics**, mapping and detecting phthalates via zooplankton/microplastic sampling in two areas of the **Pelagos Sanctuary (36** from Gulf of Asinara and **34** Ligurian sea) and in the **Sea of Cortez.**

Second Step: performing **genetic analysis** and detection **of phthalates, PBT chemicals and biomarker responses (CYP1A1, CYP2B and LPO) via biopsies of skin samples** collected from **fin whales**, collected at **three different times** (July, August and September) in the **Pelagos Sanctuary (n=40)** and in the **Sea of Cortez (n=10)**, to investigate the temporal and geographical differences in microplastic-related pollutants.

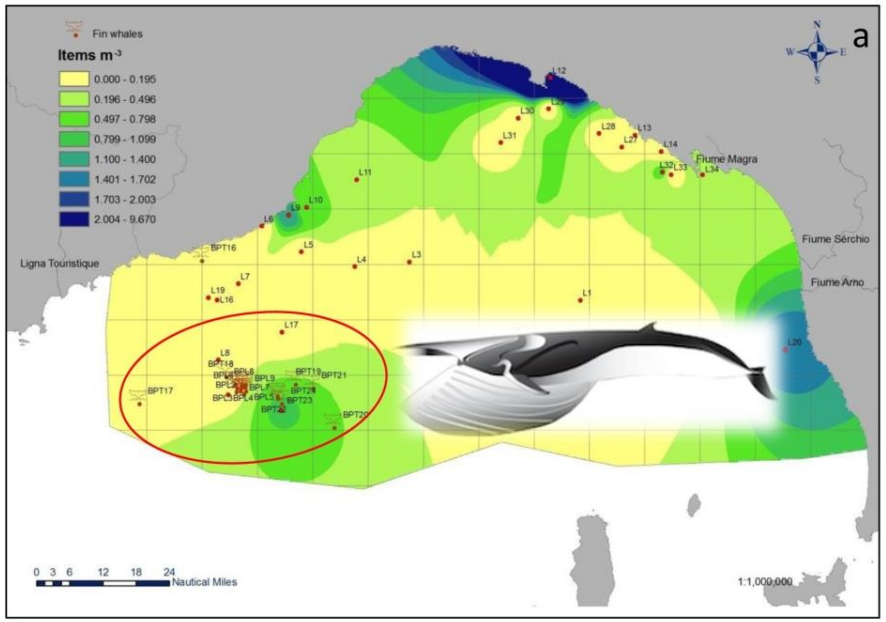
Do fin whales feed in areas affected by microplastics?



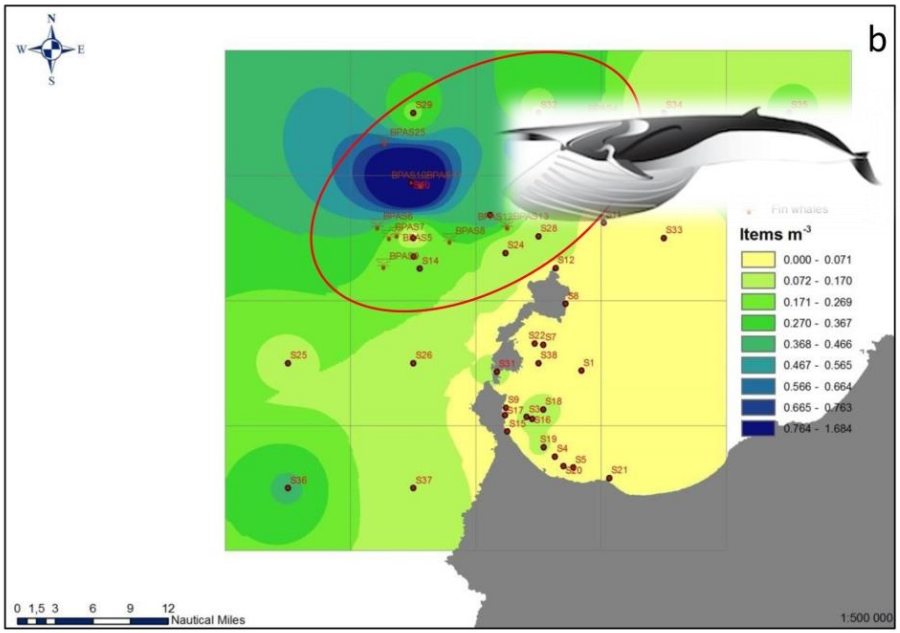
Microplastic density (items/m^3) in the Pelagos Sanctuary and Mediterranean fin whale sampling site/feeding grounds

Ligurian Sea: microplastic samples L1-L36 (expressed as items/m^3), fin whale sampling points (BPL-BPT);
Sardinian Sea: microplastic samples S1-S34 (items/m^3); fin whale sampling points (BPA).
The red circle represents where high-microplastic-density areas and fin whales sampling sites overlap.

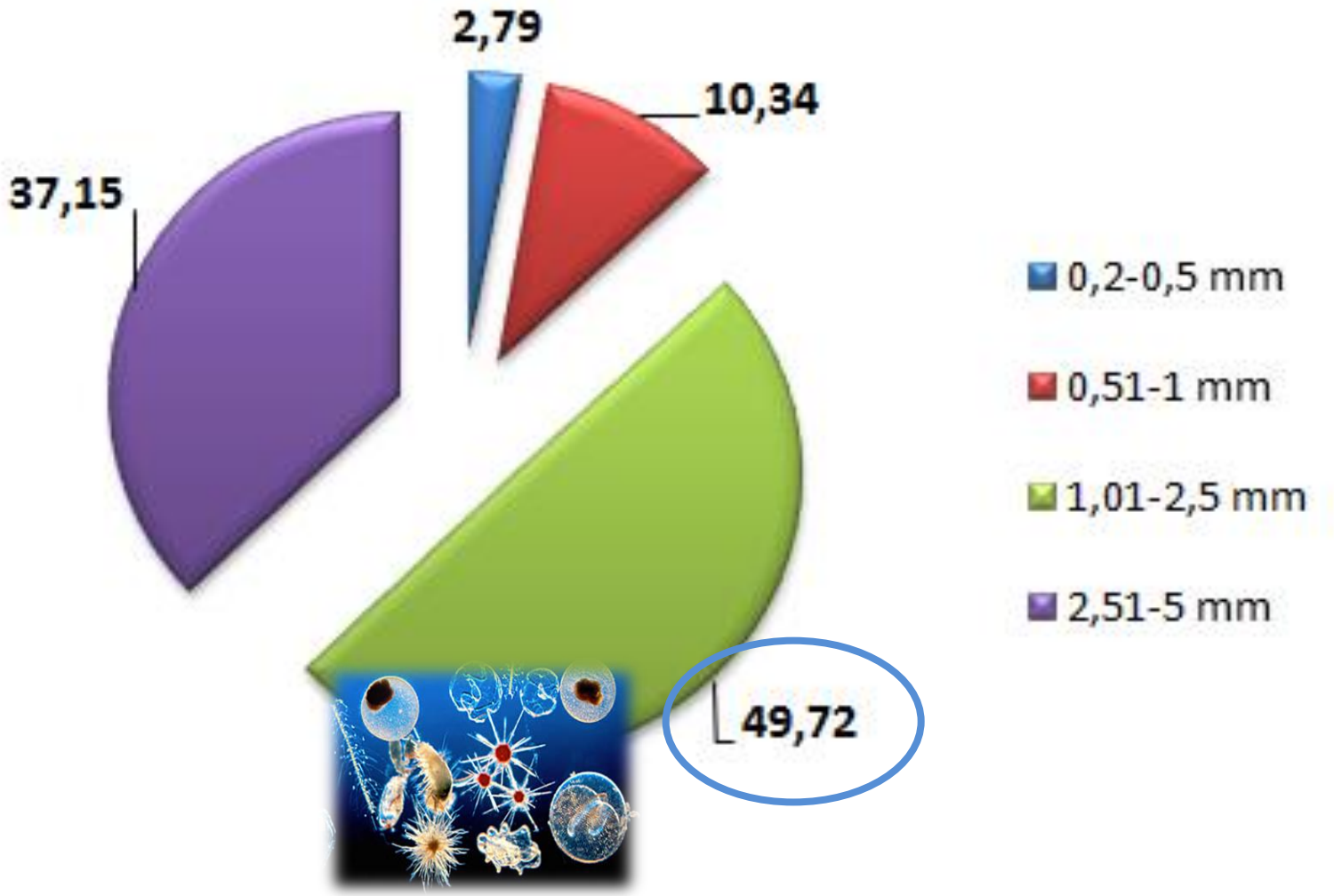
Ligurian Sea



Sardinian Sea



Percentage of microplastics size distribution (ranging from 0,2 to 5 mm) in the Pelagos Sanctuary sampling sites

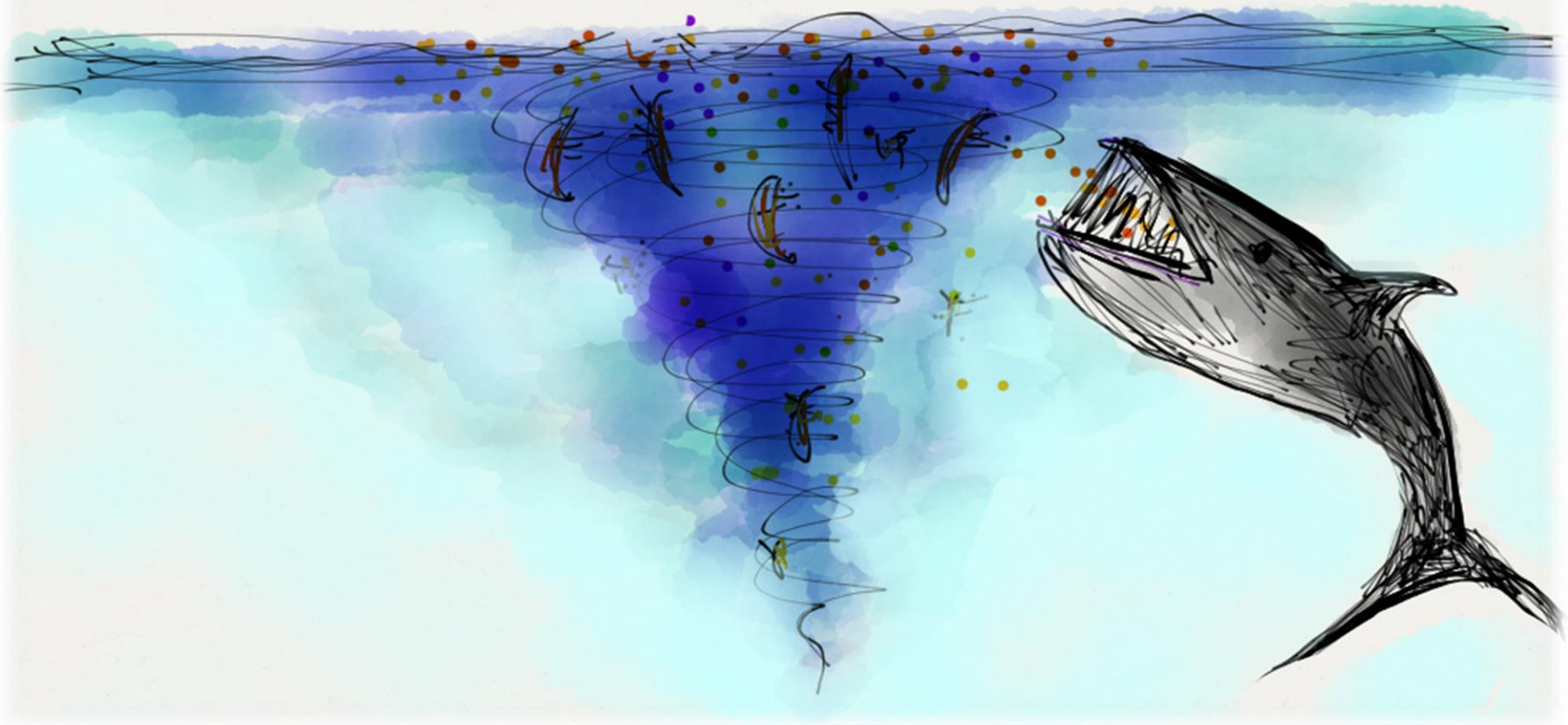


Potential MPs intake routes

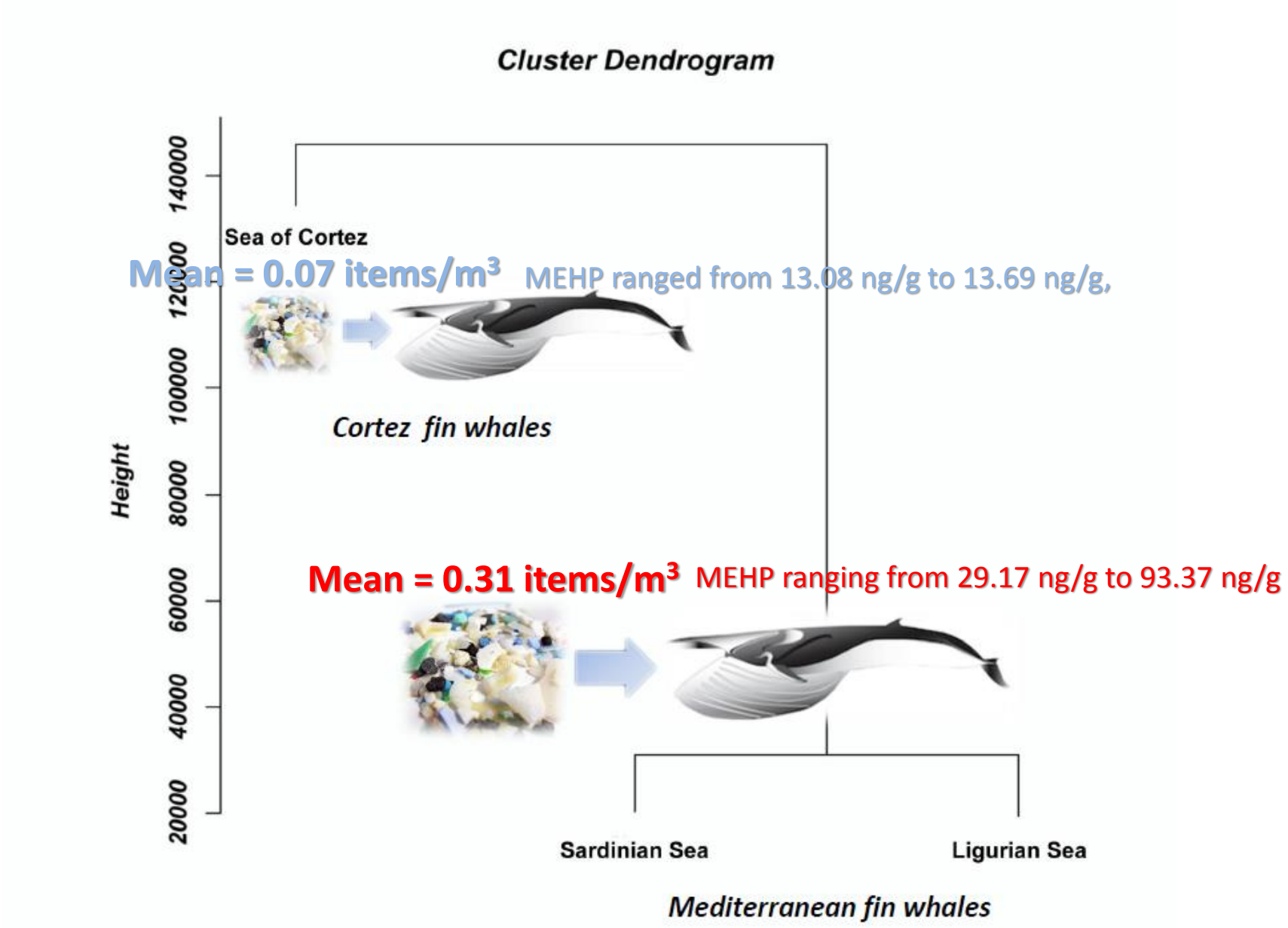
MEPH ranging from 8.87 ng/g to 21.79 ng/g *in M. norvegica*

In addition to direct intake, fin whales may also indirectly ingest microplastics through the consumption of large quantities of euphausiids and small schooling fish contaminated with microplastics

Is the toxicological pressure different for Mediterranean and Mexican fin whales?



Cluster dendrogram: phthalates, OCs and biomarkers responses in skin biopsies of fin whales collected in the Pelagos Sanctuary and Sea of Cortez



LEGISLATIVE INSTRUMENTS

European Commission

ENVIRONMENT

Stockholm Convention on persistent organic pollutants (POPs)





Stockholm Convention on persistent organic pollutants (POPs)

THE STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS WAS ADOPTED IN 2001

ALDRIN

CHLORDANE

DIELDRIN

TOXAPHENE

HEPTACHLOR

HEXACHLOROBENZENE

MIREX

POLYCHLORINATED DIBENZO-P-DIOXINS

ENDRIN

DDT

POLYCHLORINATED BIPHENYLS

CAMPHECHLOR

DIBENZOFURANS

PERSISTENT ORGANIC POLLUTANTS (POPs)

"THE DIRTY DOZEN"

THE NEW POPS UNDER THE STOCKHOLM CONVENTION 2015

PENTA POLYBROMINATED DIPHENYL ETHERS (Penta-BDE)
OCTA POLYBROMINATED DIPHENYL ETHERS (Octa-BDE)
HEXABROMOBIPHENYL (HBB)
HEXABROMOCYCLODODECANE (HBCD)
HEXACHLOROBUTADIENE (HCBD)
LINDANE (HEXACHLOROCYCLOHEXANE, HCH)

ALPHA HEXACHLOROCYCLOHEXANE (Alpha HCH)
BETA HEXACHLOROCYCLOHEXANE (Beta HCH)

PERFLUOROOCTANE SULFONIC ACID (PFOS) AND ITS SALTS AND
PERFLUOROOCTANE SULFONYL FLUORIDE (PFOS-F)
POLYCHLORINATED NAPHTHALENES (PCNs)
CHLORDECONE
PENTACHLOROBENZENE (PeCB)
PENTACHLOROPHENOL AND ITS SALTS AND ESTERS (PCP)
ENDOSULFAN

COMMISSIONE
EUROPEA

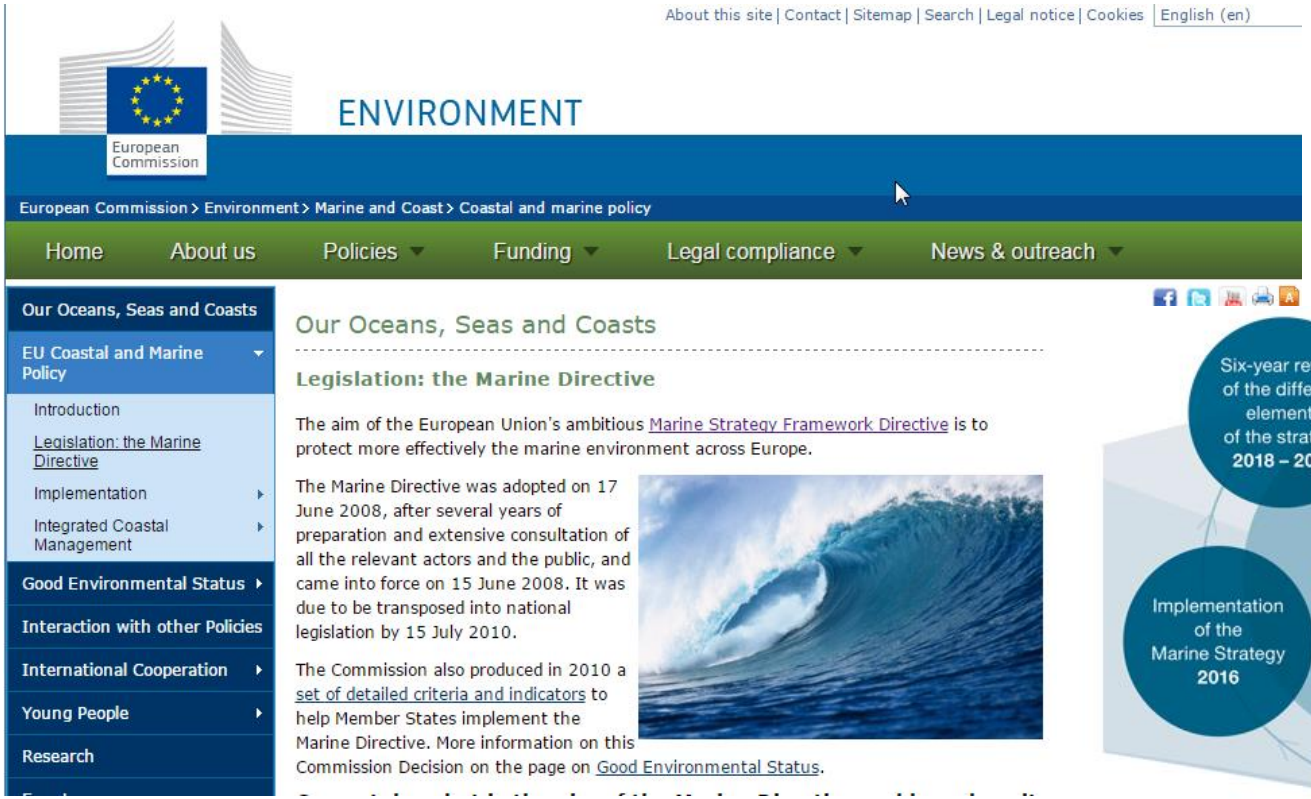
Bruxelles, 19.3.2015
COM(2015) 137 final

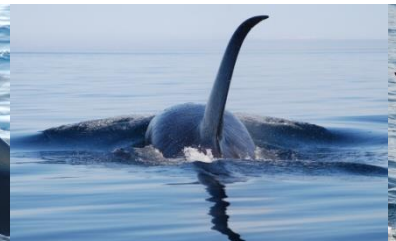
2015/0069 (NLE)

Two Member States have not yet ratified the 2001 Convention (Italy and Malta)

Chemical	Activity	Acceptable purpose or specific exemption
DDT (1,1,1-trichloro-2,2-bis (4-chlorophenyl)ethane) CAS No: 50-29-3	Production	Acceptable purpose: Disease vector control use in accordance with Part II of this Annex Specific exemption: Intermediate in production of dicofol Intermediate
	Use	Acceptable purpose: Disease vector control in accordance with Part II of this Annex Specific exemption: Production of dicofol Intermediate
Hexachlorobenzene CAS No: 118-74-1	Production	As allowed for the Parties listed in the Register
	Use	Intermediate Solvent in pesticide Closed system site limited intermediate
Polychlorinated Biphenyls (PCB)*	Production	None
	Use	Articles in use in accordance with the provisions of Part II of this Annex

EU MARINE STRATEGY FRAMEWOK DIRECTIVE





MSFD - Qualitative Descriptors for determining Good Environmental Status (GES)

(1) Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions.

(2) Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems.

(3) Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock.

(4) All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity.

(5) Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters.

(6) Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected.

(7) Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems.

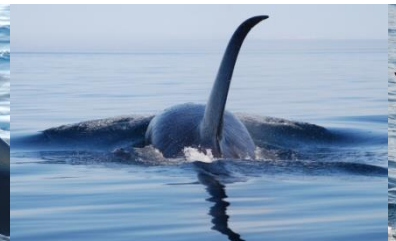
(8) Concentrations of contaminants are at levels not giving rise to pollution effects.

(9) Contaminants in fish and other seafood for human consumption do not exceed levels established by Community legislation or other relevant standards.

(10) Properties and quantities of marine litter do not cause harm to the coastal and marine environment.

(11) Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment.



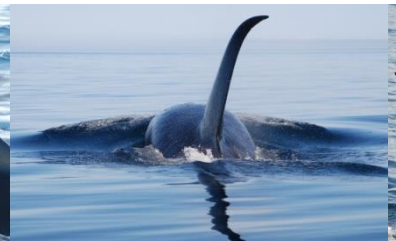




European Biodiversity Research Strategy 2010-2020

The '**Grand Challenge of biodiversity loss**' is highlighted in major policy documents like the Convention on Biological Diversity (CBD) and the **European Biodiversity Research Strategy 2010-2020.**

To achieve the strategies objectives intense research activity is needed, also focusing on delivering to policy makers powerful decision tools and **new indicator** for **Good Environmental Status** (GES) for improving effectiveness of conservation strategies

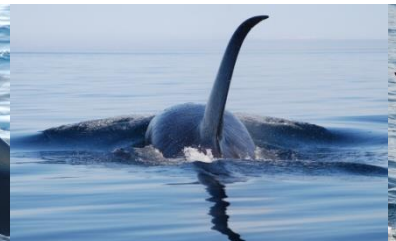



RAMOGE


Accord RAMOGE
Prévention & Lutte contre la Pollution du Milieu Marin
Accueil
Accord RAMOGE
Gestion intégrée de la zone côtière
Plan RAMOGEPOL
Education et Communication
Documents RAMOGE
Partenaires & Liens
Urgence
Contact
Gestion & Protection du Littoral
L'Accord & La Zone RAMOGE
GEnova
MOnaco
St RAphaël
Marseille
La Spezia
La zone RAMOGE comprend les zones maritimes de la Région Provence-Alpes-Côte d'Azur, de la Principauté de Monaco et de la Région Ligurie formant ainsi une zone pilote de prévention et de lutte contre la pollution du milieu marin.
L'Accord RAMOGE représente un instrument de coopération scientifique, technique, juridique et administrative où les gouvernements Français, Monégasque et Italien mettent en oeuvre des actions pour une gestion intégrée du littoral.
Actualités & Evènements
[20 novembre 2015]
Pollex 2015
Collision en zone frontalière : exercice de coordination franco-italo-monégasque pour la lutte antipollution et d'assistance à navire en difficulté (RAMOGEPOL 2015)
Voir toutes les actualités




UNEP/MAP

UNITED NATIONS ENVIRONMENT PROGRAMME
MEDITERRANEAN ACTION PLAN
for the Barcelona Convention

Advanced S
Francais

- HOME
- About MAP
  - The Action Plan
  - Barcelona Convention
  - Protocols
  - Compliance
- Structure
- Activities
- The MedPartnership

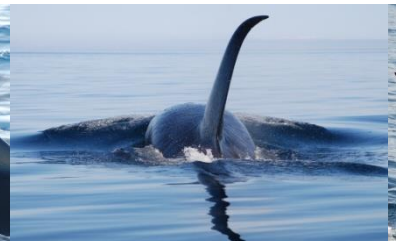
Regional Plan on Marine Litter Management in the Mediterranean to prevent and eliminate pollution enters into force

23.07.2014

Athens, 23 July 2014 - The measures and timetables of the Regional Plan on Marine Litter Management in the Mediterranean, adopted by the Contracting Parties to the Barcelona Convention and its Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities (LBS) in December 2013, became binding on 8 July 2014.

The Regional Plan addresses the complex challenges posed in the Mediterranean region by marine litter, a global issue dramatically affecting marine and coastal environment.




CMS

UNEP

CONVENTION ON MIGRATORY SPECIES

Distribution: Gene

UNEP/CMS/Resol

Original: English

MANAGEMENT OF MARINE DEBRIS

Adopted by the Conference of the Parties at its 11th Meeting (Quito, 4-9 November 2014)

Recalling CMS Resolution 10.4 on Marine Debris and *reiterating* the concern that marine debris has negative impacts on many species of migratory marine wildlife and their habitats;

Welcoming the Resolution 1/6 on Marine Plastic Debris and Micro Plastics adopted by more than 150 countries at the first United Nations Environment Assembly (UNEA), concluded on 27 June 2014;

Aware that entanglement in and ingestion of marine debris are both conservation and welfare concerns;

G7 GERMANY
2015 | Schloss Elmau

G7 countries outline measures against marine litter

© dedhed1950/Wikimedia, CC BY-SA 2.0

The G7 countries are developing an action plan to combat marine litter. Practical measures to reduce waste from land- and sea-based sources will be set out at a meeting in Berlin. This meeting will also focus on removing the existing waste in our oceans. During the G7 summit in Elmau at the start of June 2015, the G7 heads of state and government decided on a G7 action plan to combat marine litter and expressly committed themselves to concrete measures. Today in Berlin, State Secretary Jochen Flasbarth opened a workshop following up on the decisions taken in Elmau. He highlighted to workshop participants that "marine litter is the most visible sign of economic practices and a way of life that are not sustainable".

Today, there are an estimated 100 to 142 million tonnes of waste in our oceans. Most of this waste is packaging material and waste from fishing and shipping, 75 percent of this waste consists of plastics. Currently up to 10 million tonnes of waste are added to this each year.

State Secretary Flasbarth commented: "Marine litter has been a pressing matter on the agenda for marine conservation for a long time now, both nationally and internationally. There is also a common understanding among the G7 heads of state and government regarding the urgency of this issue and important fields of action and approaches. We are striving for a package of concrete implementation measures with which we can save our oceans from further pollution from vast quantities of waste, in particular plastic waste. What we need is a clear roadmap."

Union pour la Méditerranée
Union for the Mediterranean
الإتحاد من أجل المتوسط

<u>Lead promoter</u>: University of Siena (SDSN - MED Solutions) (IT)

UNEP/MAP along with its network MEDPOL designated monitoring laboratories
MIO-ECSDE, Mediterranean Information Office for Environment, Culture and Sustainable Development (GR)
IFREMER, Institut Français de Recherche Pour L'Exploitation de la Mer (FR)
SOCIB, Balearic Islands Coastal Ocean Observing and Forecasting System (ES)
ISPRA, Institute for Environmental Protection and Research, Laboratory of Ichthyology and Marine ecology (IT)
Biochemistry and Environmental Toxicology, Higher Institute of Agronomy, University of Sousse (TN)
IWRS, Institute for Water of the Republic of Slovenia (SI)
CNR, Consiglio Nazionale delle Ricerche, Consorzio Lamma (IT)
HCMR, Hellenic Centre for Marine Research (GR)
ISOTECH (CY) Consorzio Mediterraneo (IT)
ECNC Land & Sea Group (ES)
University of Bologna (IT)
FispMed

UNEP

SUSTAINABLE DEVELOPMENT
SOLUTIONS NETWORK
A GLOBAL INITIATIVE FOR THE UNITED NATIONS

Union pour la Méditerranée
Union for the Mediterranean
الإتحاد من أجل المتوسط

UNITED NATIONS ENVIRONMENT PROGRAMME
MEDITERRANEAN ACTION PLAN
for the Barcelona Convention

UNEP

PROJECT SCOPE

PLASTIC BUSTERS

The overall goal of the project is to contribute to the de-pollution of the Mediterranean sea through the promotion of the implementation of the Regional Plan on Marine Litter Management in the Mediterranean (Barcelona Convention - IG.21/9).

The main objectives and activities focus on:
a) addressing the marine litter related **knowledge gaps via monitoring, assessment** and **mitigation**;
b) developing and implementing **concrete actions to prevent, reduce identify convergence areas and remove marine litter**;
c) actions to enhance the **awareness of stakeholders** and catalyze change in their perceptions and attitudes towards waste.

PLASTIC-BUSTERS FOR A MEDITERRANEAN FREE FROM LITTER

PLASTIC-BUSTERS for a Mediterranean free from litter

17 / 02 / 2016

The overall goal of the project is to effectively tackle the issue of marine litter in the Mediterranean. The project directly supports the implementation of the UNEP/MAP Regional Plan on Marine Litter Management in the Mediterranean, linking and contributing also to the global Honolulu Strategy framework for prevention and management of Marine Debris. The project is also in line with the recommendations of the UfM Ministerial Meeting on Environment and Climate Change (May 2014) and the UfM Ministerial on Blue Economy (November 2015).

Marine litter has become a major pollution problem affecting all of the world seas. Increased levels of marine litter originate largely from land based activities (~80%). This includes, in particular, inadequate urban solid waste management (collection, transportation, treatment and final disposal) negative impacts on human health, marine wildlife, marine ecological systems, beach quality, and navigational safety as well as fishing and maritime industries.

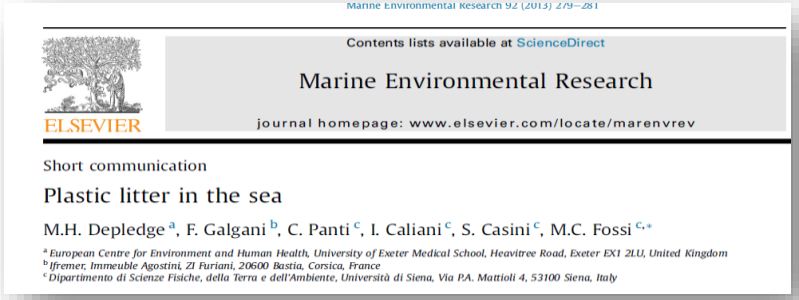
RELATED NEWS

UfM Member States further enhance regional cooperation in 2016 by endorsing 4 new development projects
19 / 02 / 2016


Implement actions to reduce Marine Litter
In Mediterranean Sea

RECOMMENDATIONS FOR IMPROVEMENT

MSFD: Descriptor 10 Marine Litter



Marine Environmental Research 92 (2013) 279–281

Contents lists available at ScienceDirect

Marine Environmental Research

journal homepage: www.elsevier.com/locate/marenvrev

Short communication

Plastic litter in the sea

M.H. Depledge [a], F. Galgani [b], C. Panti [c], I. Caliani [c], S. Casini [c], M.C. Fossi [c,*]

[a] European Centre for Environment and Human Health, University of Exeter Medical School, Heavitree Road, Exeter EX1 2LU, United Kingdom
[b] Ifremer, Immeuble Agostini, ZI Furiani, 20600 Bastia, Corsica, France
[c] Dipartimento di Scienze Fisiche, della Terra e dell'Ambiente, Università di Siena, Via P.A. Mattioli 4, 53100 Siena, Italy

Contents lists available at ScienceDirect

Marine Environmental Research

journal homepage: www.elsevier.com/locate/marenvrev

Monitoring the impact of litter in large vertebrates in the Mediterranean Sea within the European Marine Strategy Framework Directive (MSFD): Constraints, specificities and recommendations

F. Galgani [a,*], F. Claro [b], M. Depledge [c], C. Fossi [d]

[a] Ifremer, Immeuble Agostini, ZI Furiani, 20600 Bastia, Corsica, France
[b] Museum national d'Histoire naturelle, GTMF, CP41, 57 rue Cuvier, 75231 Paris cedex 05, France
[c] University of Exeter, Devon EX4 4QJ, United Kingdom
[d] University of Siena, Via Mattioli 4, 53100 Siena, Italy

The potential use of these species in the implementation of the **Descriptor 10 (marine litter)** in the **EU Marine Strategy Framework Directive (MSFD)**, as **sentinel** of the presence and impact of micro-litter in the **pelagic environment**

Marine Pollution Bulletin 74 (2013) 225–230

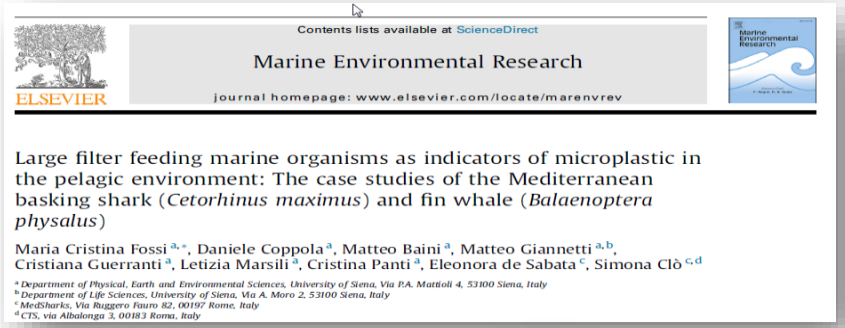
Contents lists available at SciVerse ScienceDirect

Marine Pollution Bulletin

journal homepage: www.elsevier.com/locate/marpolbul

Presence of plastic debris in loggerhead turtle stranded along the Tuscany coasts of the Pelagos Sanctuary for Mediterranean Marine Mammals (Italy)

Tommaso Campani [a], Matteo Baini [a,*], Matteo Giannetti [a,d], Fabrizio Cancelli [b], Cecilia Mancusi [c], Fabrizio Serena [c], Letizia Marsili [a], Silvia Casini [a], Maria Cristina Fossi [a]



Contents lists available at ScienceDirect

Marine Environmental Research

journal homepage: www.elsevier.com/locate/marenvrev

Large filter feeding marine organisms as indicators of microplastic in the pelagic environment: The case studies of the Mediterranean basking shark (*Cetorhinus maximus*) and fin whale (*Balaenoptera physalus*)

Maria Cristina Fossi [a,*], Daniele Coppola [a], Matteo Baini [a], Matteo Giannetti [a,b], Cristiana Guerranti [a], Letizia Marsili [a], Cristina Panti [a], Eleonora de Sabata [c], Simona Clò [c,d]

[a] Department of Physical, Earth and Environmental Sciences, University of Siena, Via P.A. Mattioli 4, 53100 Siena, Italy
[b] Department of Life Sciences, University of Siena, Via A. Moro 2, 53100 Siena, Italy
[c] MedSharks, Via Ruggero Fauro 82, 00197 Rome, Italy
[d] CTS, via Albalonga 3, 00183 Roma, Italy

Report of the 2013 IWC Scientific Committee workshop on Marine Debris

The **workshop recommended** that **baleen whales** and other **large filter feeders** should be considered in national and international marine debris strategies (e.g. **Descriptor 10** (marine litter) in the EU Marine Strategy Framework Directive) as **critical indicators** of the **presence and impact of microplastics** in the marine environment.

International Whaling Commission

Pelagos Sanctuary
protecting marine mammals in the Mediterranean Sea

Main threats for Pelagos species

Pelagos_CST7_Doc10

Allegato 3: priorità di ricerca stabilite dal 6° Comitato Scientifico e Tecnico dell'Accordo Pelagos

Questa grida è basata sul censimento degli studi scientific relativi ai mammiferi marini e finanziati dalle Parti Francese e Italiane (cf. appendice) e è stata adottata dalla 1ª Riunione dei Punti Focali Nazionali.

	Mammiferi marini						Minacce (e/o cause di mortalità)					Totale Per specia
SPECIE	Abbondanza	Distribuzione	Stagionalità	Demografia	Dieta	Genetica	Inquinamento	Collisioni (traffico marittimo)	Pesca	Rumore	Whale watching	
B. physalus	2	2	1	2	1	2	2	3	1	2	1	19
B. acutorostrata												
P. macrocephalus	3	2	3	2	1	2	2	3	1	3	1	23
S. coeruleoalba	2	2	2	2	1	1	2	1	2	1	1	17
T. truncatus	3	2	2	2	2	3	3	1	2	3	1	24
D. delphis	2	2	1	1	1	1	3	1	2	1	1	16
G. griseus	3	2	2	2	1	2	2	1	1	1	1	18
G. melas	3	2	2	2	1	2	3	1	1	2	1	20
Z. cavirostris	3	2	2	2	1	2	2	1	1	3	1	20
O. orca												
P. crassidens												
S. bredanensis												
ECOSISTEMI												
Habitat generale												
Totale per tema	21	16	15	15	9	15	19	12	11	16	8	

Legenda:
Priorità alta 3
Priorità media 2
Priorità bassa 1

Sintesi dei risultati per ordine di priorità:

T. truncatus	(abbondanza, inquinamento, genetica, rumore)
P. macrocephalus	(abbondanza, stagionalità, collisioni, rumore)
G. melas	(abbondanza, inquinamento)
Z. cavirostris	(abbondanza, rumore)
B. physalus	(collisioni)
G. griseus	(abbondanza)
S. coeruleoalba	(stato sanitario)
D. delphis	(inquinamento)

Thank you for your attention!

Siena University





Acknowledgements

Projects were partially supported by the **Italian Ministry for Environment and Territory**

MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE

REGIONE TOSCANA

SUSTAINABLE DEVELOPMENT SOLUTIONS NETWORK
A GLOBAL INITIATIVE FOR THE UNITED NATIONS

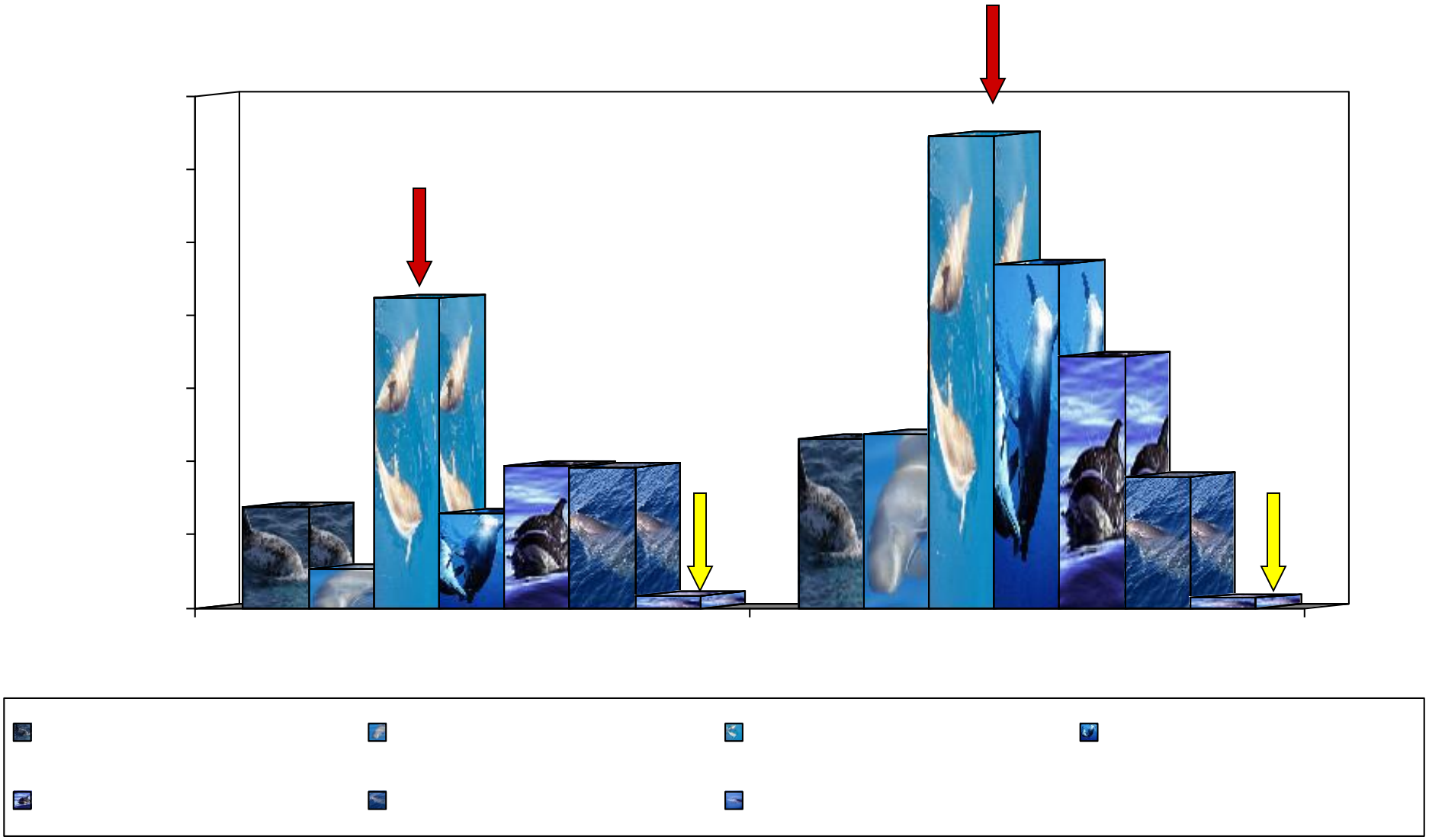
CONSORZIO LaMMA

Ifremer

ISPRA
Istituto Superiore per la Protezione e la Ricerca Ambientale

NOVAMONT

tara EXPEDITIONS



Marsili e Focardi, 1997 - Environ. Mon. Ass., 45: 129-130
Marsili, 2000 - Int. J. Environm. Poll., 13(1-6): 416-452
Marsili 2007 - unpublished data

Annex A (Elimination)

Parties must take measures to **eliminate** the production and use of the chemicals listed under Annex A. Specific exemptions for use or production are listed in the Annex and apply only to Parties that register for them.

Aldrin	Chlordane	Chlordecone
Dieldrin	Endrin	Heptachlor
Hexabromobiphenyl	Hexabromocyclododecane (HBCD)	Hexabromodiphenyl ether and heptabromodiphenyl ether
Hexachlorobenzene (HCB)	Hexachlorobutadiene	Alpha hexachlorocyclohexane
Beta hexachlorocyclohexane	Lindane	Mirex
Pentachlorobenzene	Pentachlorophenol and its salts and esters	Polychlorinated biphenyls (PCB)
Polychlorinated naphthalenes	Technical endosulfan and its related isomers	Tetrabromodiphenyl ether and pentabromodiphenyl ether
Toxaphene		

Pesticide Industrial chemical Unintentional production

Annex B (Restriction)

Parties must take measures to **restrict** the production and use of the chemicals listed under Annex B in light of any applicable acceptable purposes and/or specific exemptions listed in the Annex.

DDT	Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride

Annex C (Unintentional production)

Parties must take measures to reduce the **unintentional releases** of chemicals listed under Annex C with the goal of continuing minimization and, where feasible, ultimate elimination.

Hexachlorobenzene (HCB)	Pentachlorobenzene	Polychlorinated biphenyls (PCB)
Polychlorinated dibenzo-*p*-dioxins (PCDD)	Polychlorinated dibenzofurans (PCDF)	Polychlorinated naphthalenes

Pesticide Industrial chemical Unintentional production