"Capacity Building and Strengthening Institutional Arrangement"

Analysis and Sampling of Water and Water Pollution

Adoption of oil indicators and environmental training

Mr. Gaetano Battistella, Mr. Alfredo Leonardi

APAT

Agency for Environmental Protection and Technical Services

Index

1. Safety and environmental aspects

The owner's responsibility of oil plants starts when are violated National laws, European directives or International convention

Since the 70's at international level there is a normative tendency oriented to protect more the marine environment than the economic management of the resources.

So it's came out the necessity to have laws that forbid oil pollution and oblige partners to cooperate at international level

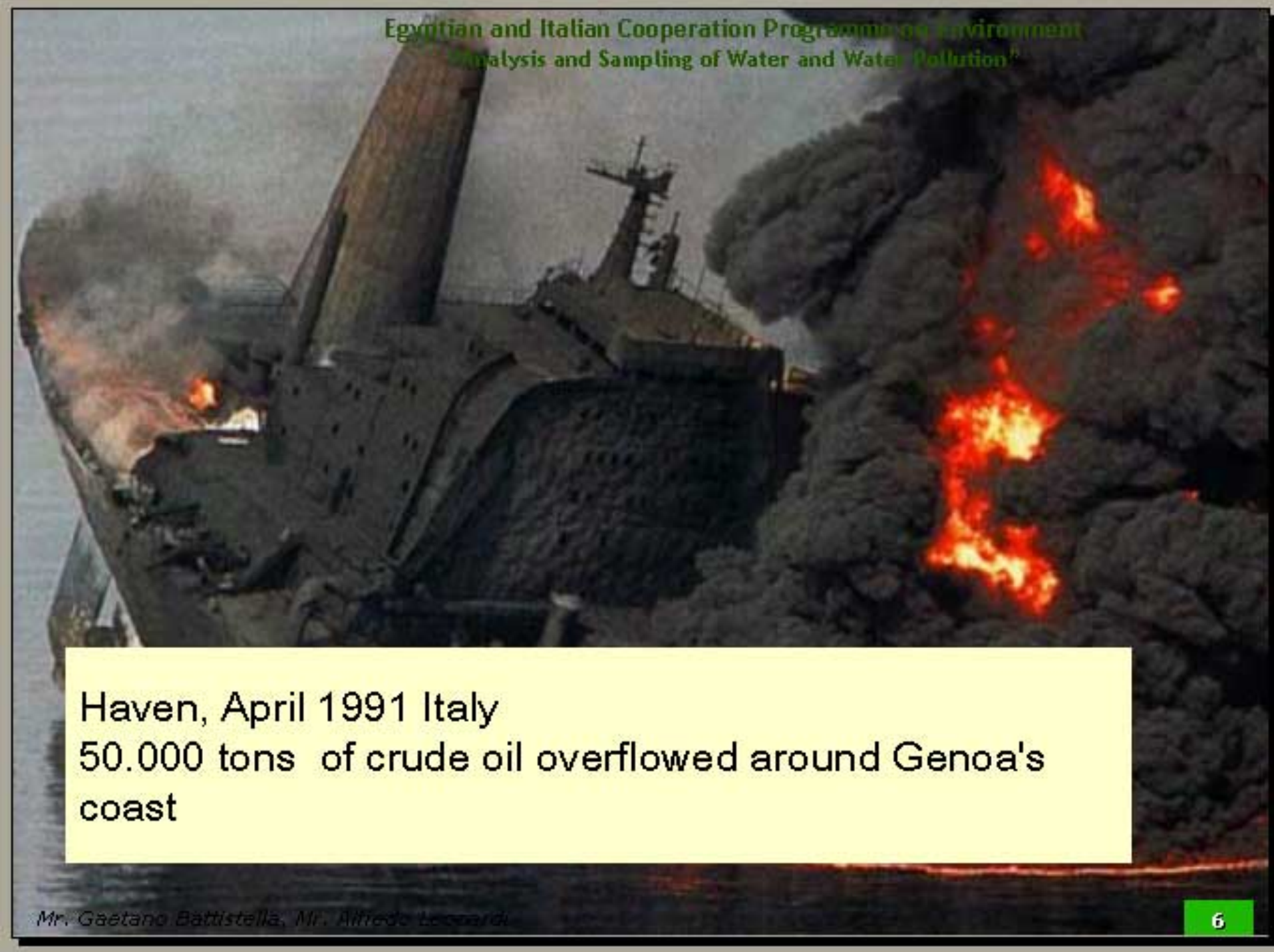
1. Safety and environmental aspects

The responsibility at sea

General principles applicable in different fields such as: military, merchant, fishing and nautical deport.

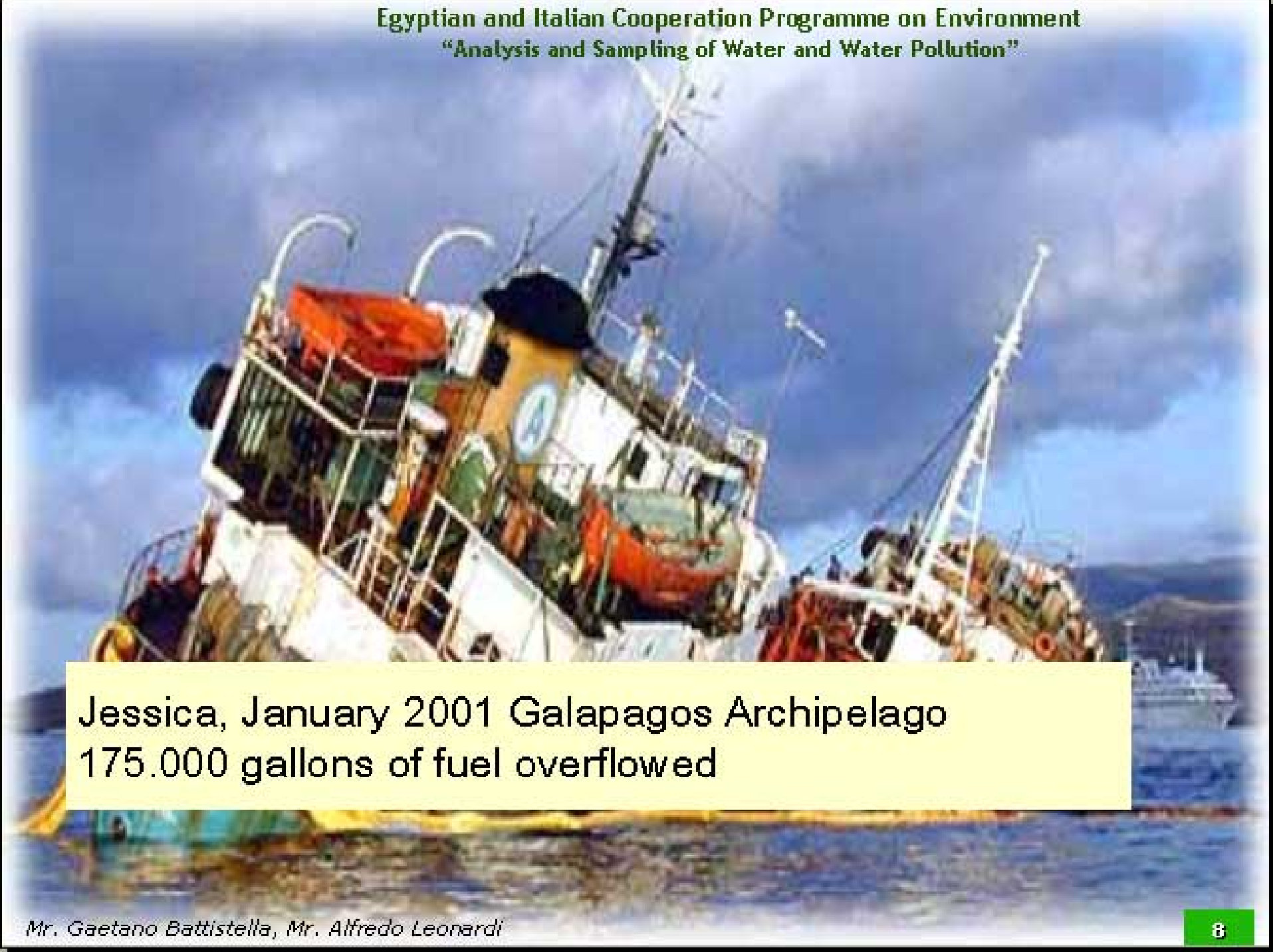
International maritime organization (I.M.O.)

Exxon Valdez, March 1989 Alaska
38.800 tons of crude oil overflowed
2.000 km of contaminated coasts
That has caused the dead of :
25.000 marine birds
2.800 otters
300 seals
250 eagles
22 whales



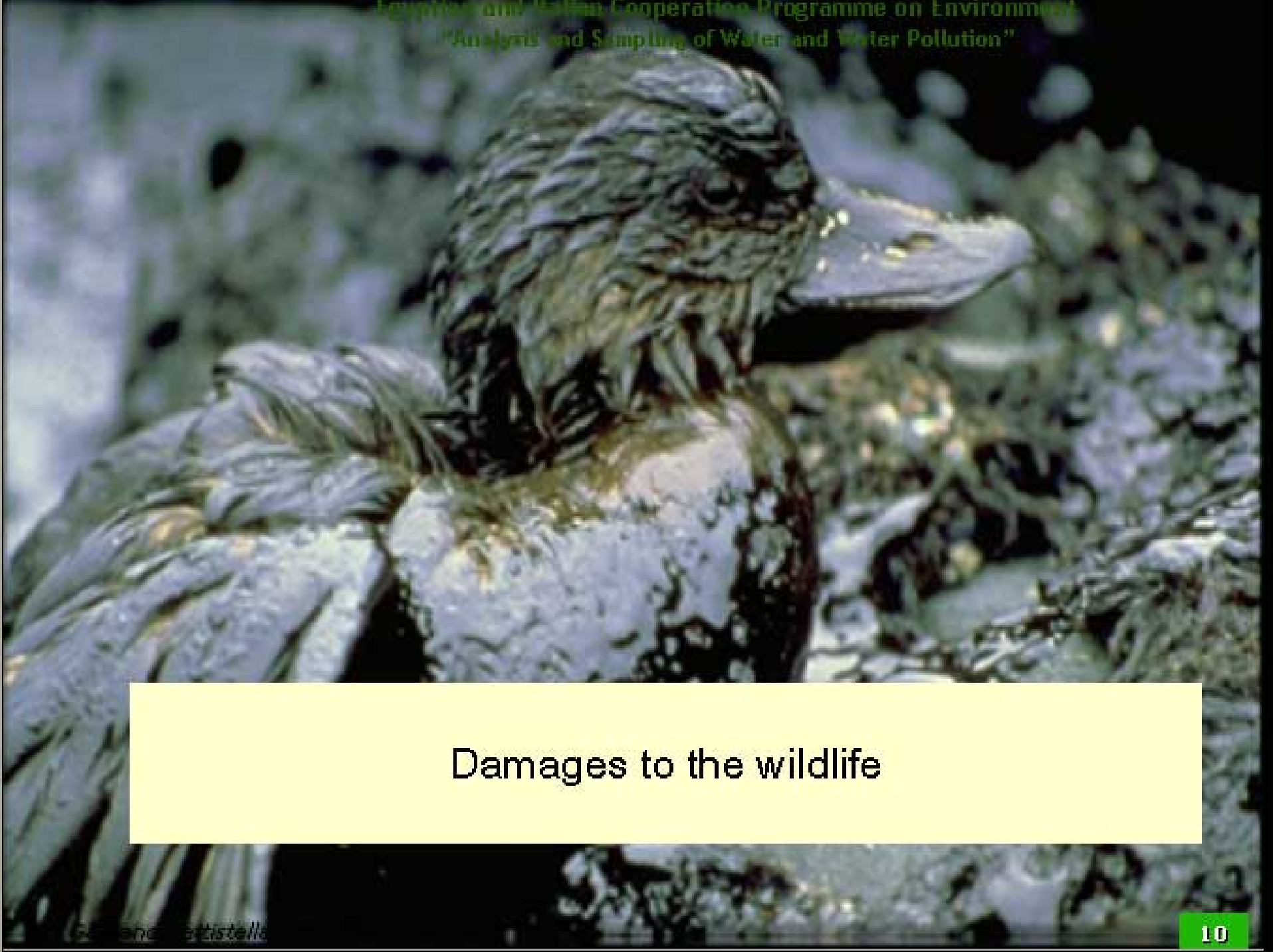
Haven, April 1991 Italy
50.000 tons of crude oil overflowed around Genoa's coast

Erika, December 1999 France
13.000 tons of diesel oil are dispersed around the North-occidental coast



Jessica, January 2001 Galapagos Archipelago
175.000 gallons of fuel overflowed

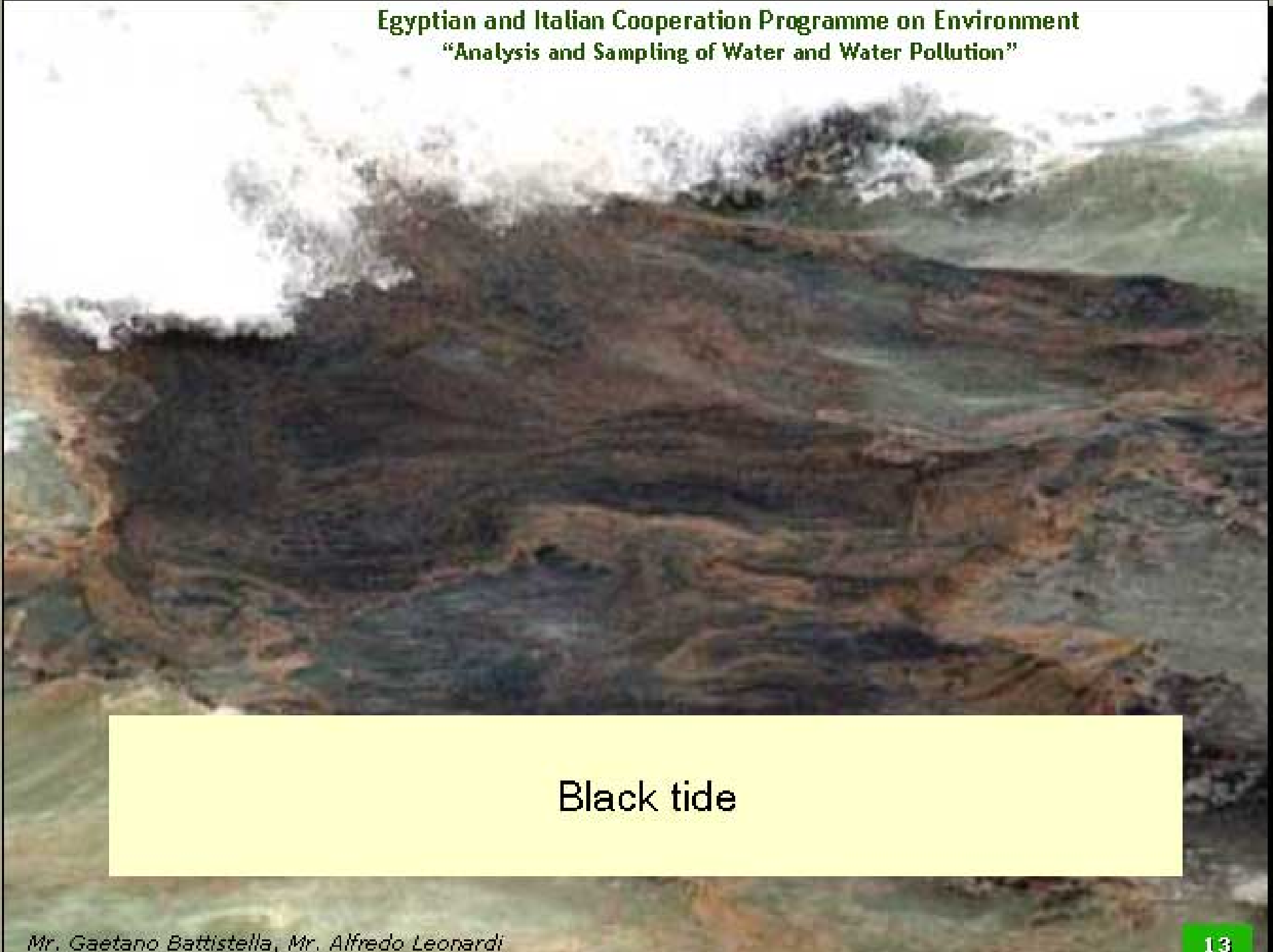
Prestige, November 2002 Spain
77.000 tons of crude oil overflowed around Atlantic Coast. Possible risks for the 'Marine Park' of the Atlantic Isles



Damages to the wildlife

Damages to the coast

Coast's reclaim



Black tide

1. Safety and environmental aspects

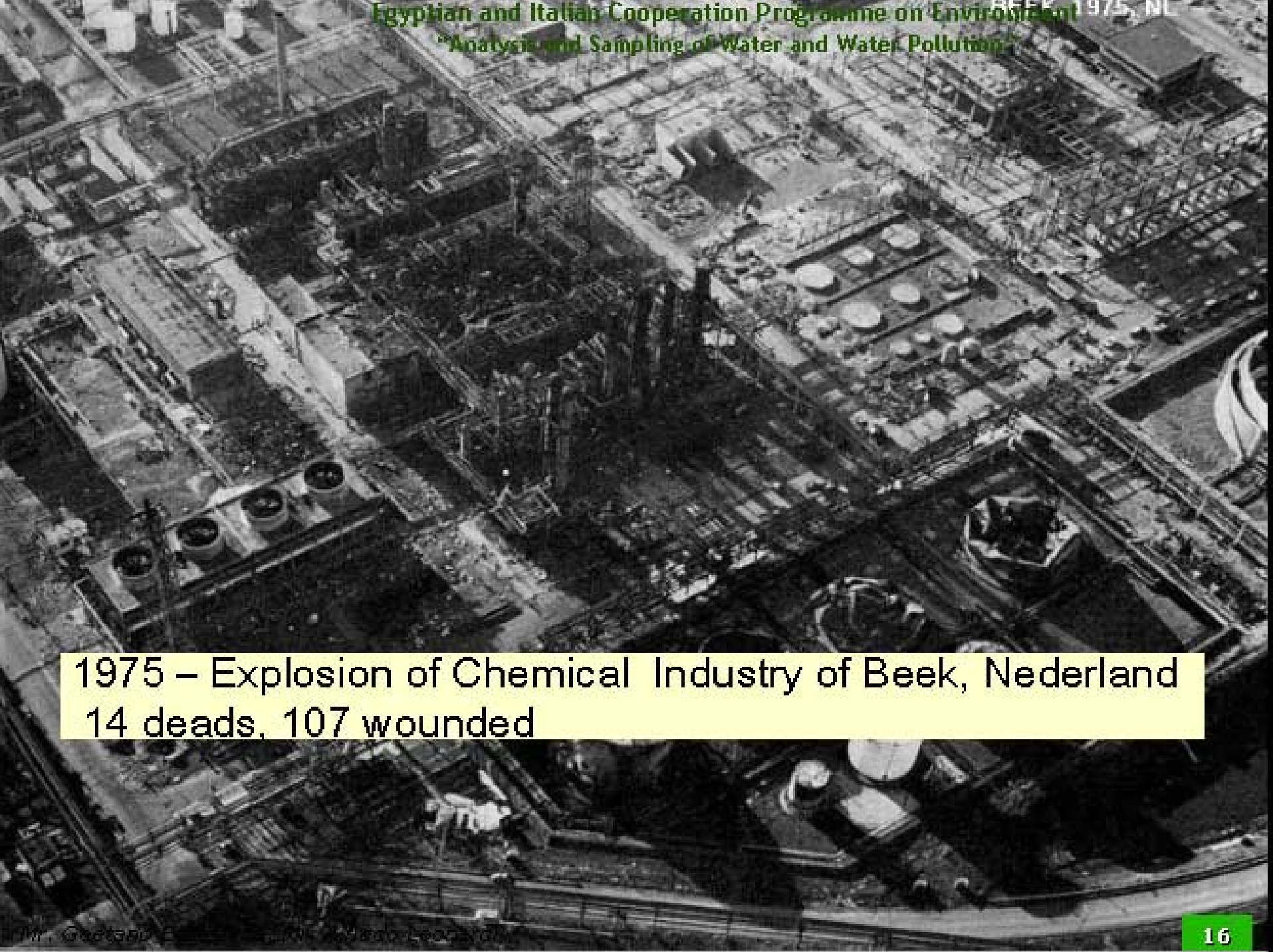
The responsibility at ground

- National Ports Codes

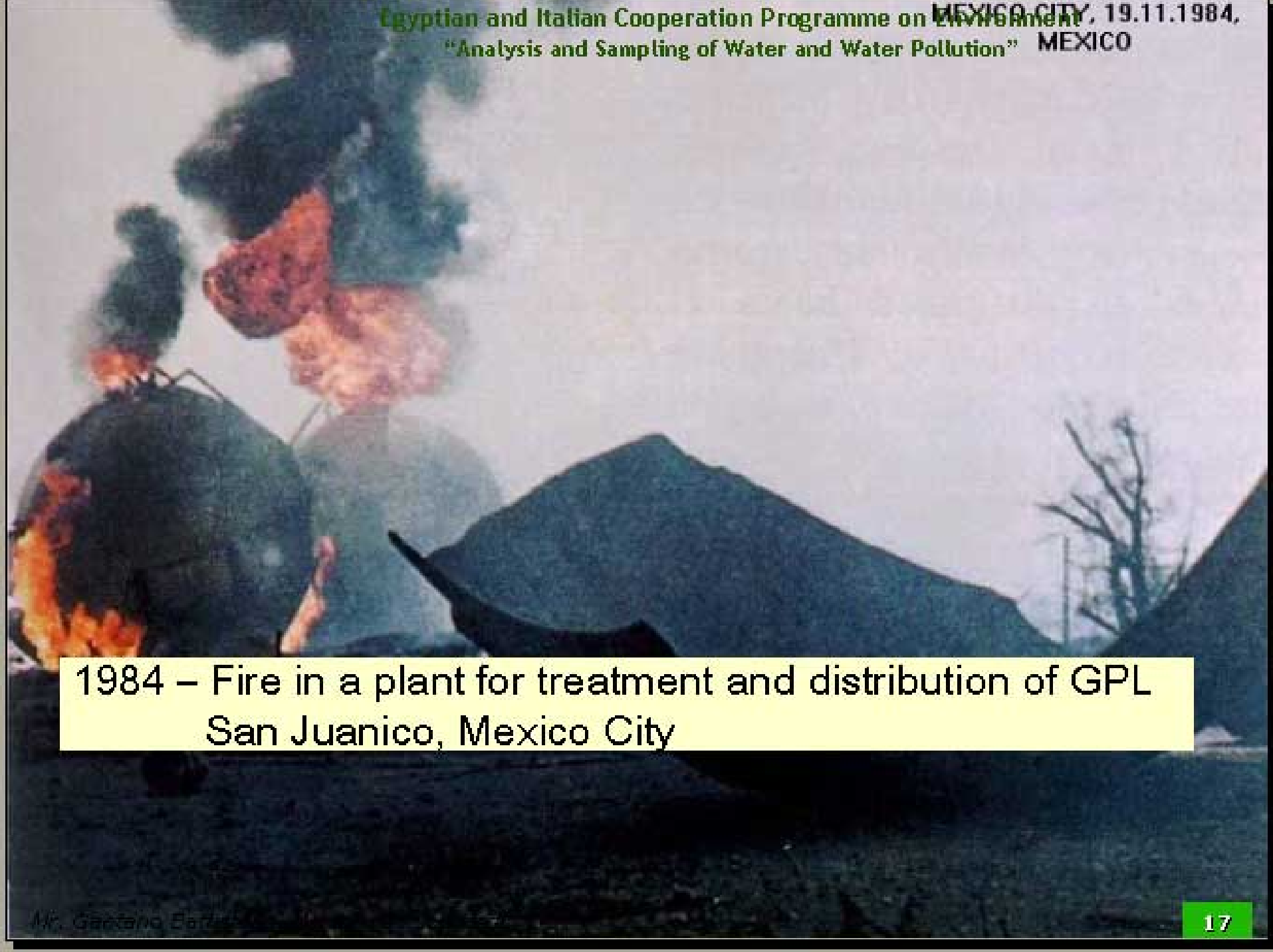
- Waste National Laws

- Major Hazardous Industrial Plants

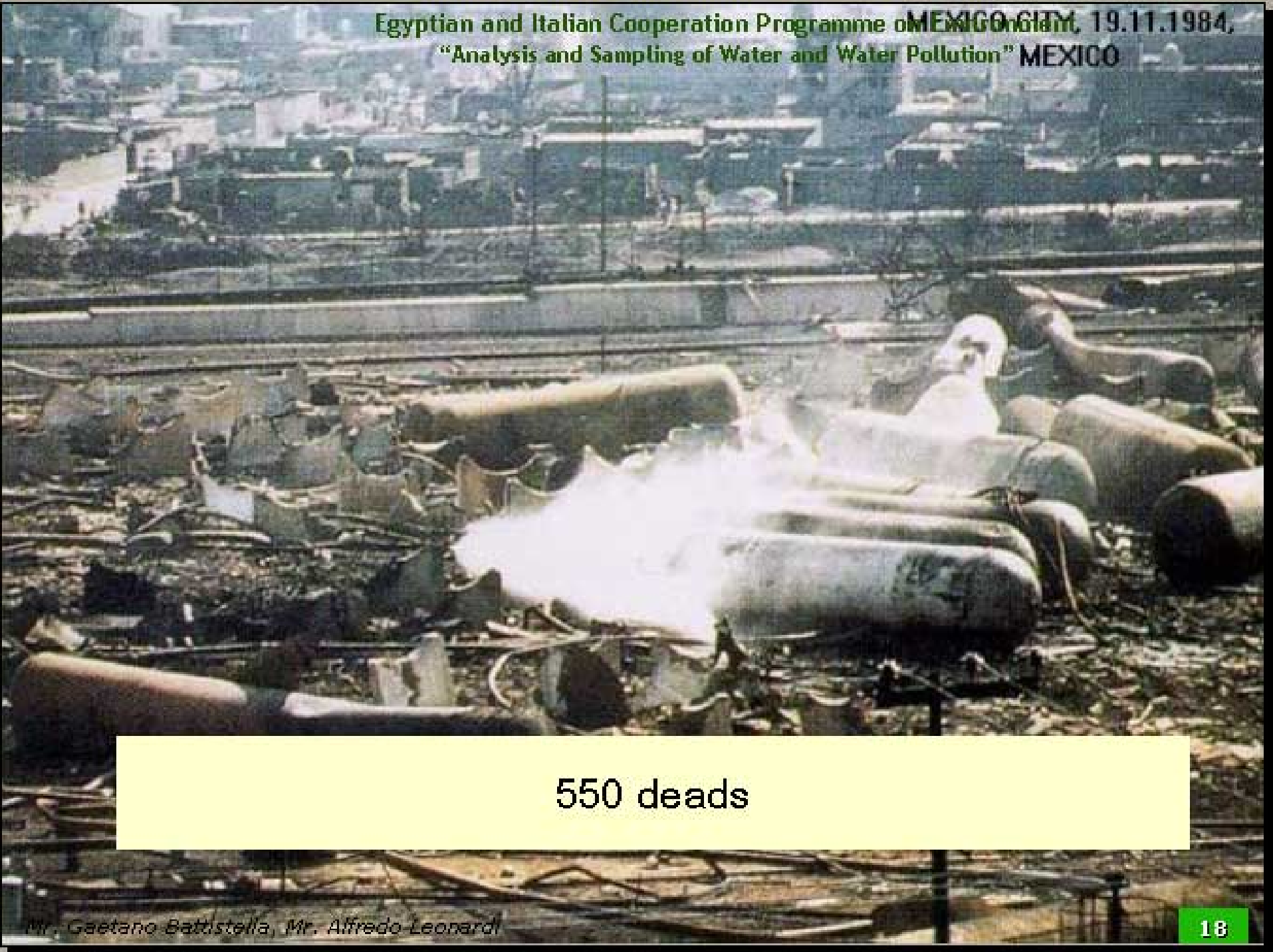
1974 – Explosion of Chemical Industry of Flixborough,England
28 deads, 36 wounded



1975 – Explosion of Chemical Industry of Beek, Nederland
14 deads, 107 wounded



1984 – Fire in a plant for treatment and distribution of GPL
San Juanico, Mexico City



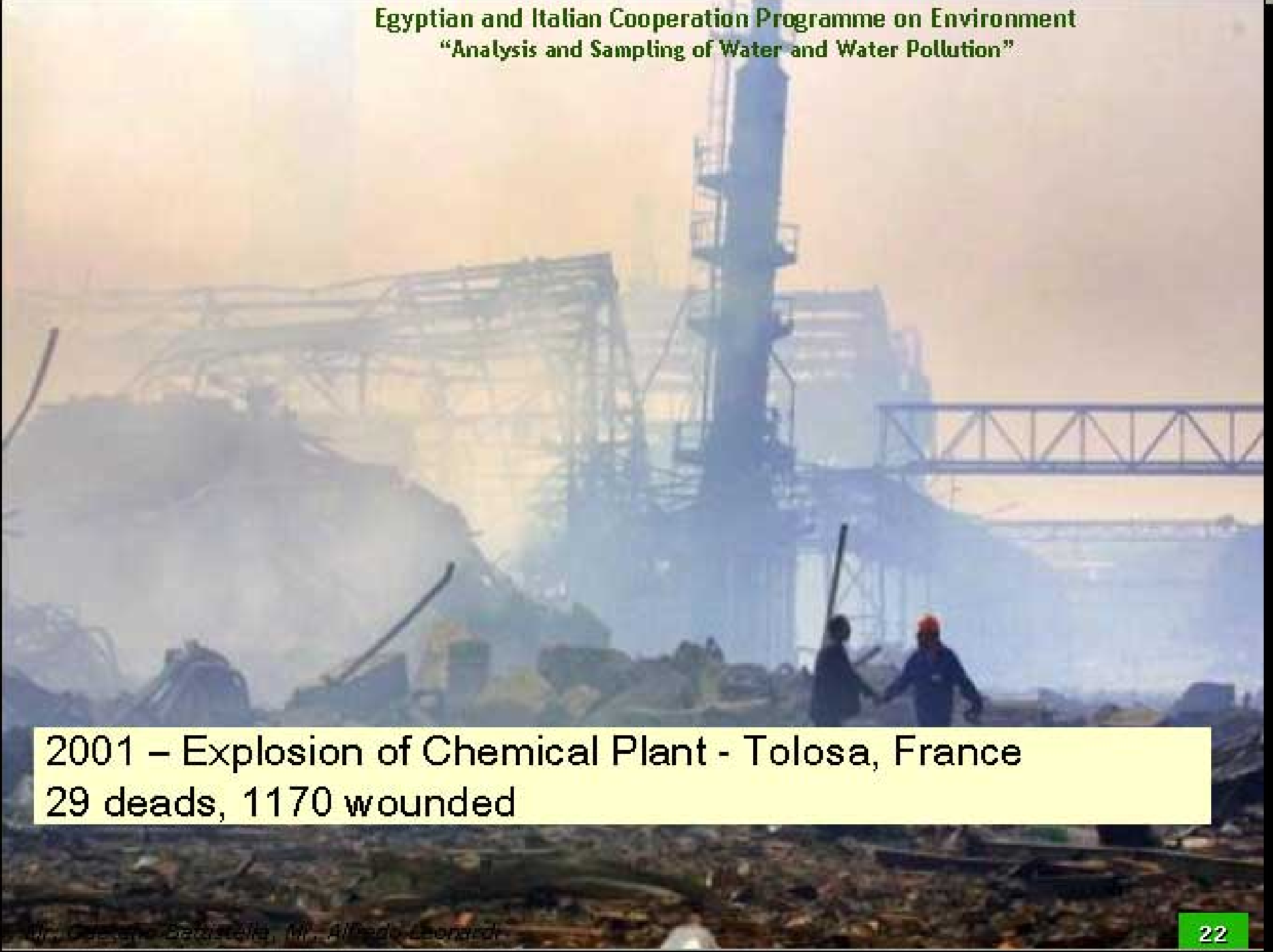
550 deads

1989 – Explosion of Petrolchemical Plant, Texas, USA

23 deads, 130-300 wounded

2000- Explosion of pipeline - Lagos, Nigeria

250 deads



2001 – Explosion of Chemical Plant - Tolosa, France
29 deads, 1170 wounded

1. Safety and environmental aspects

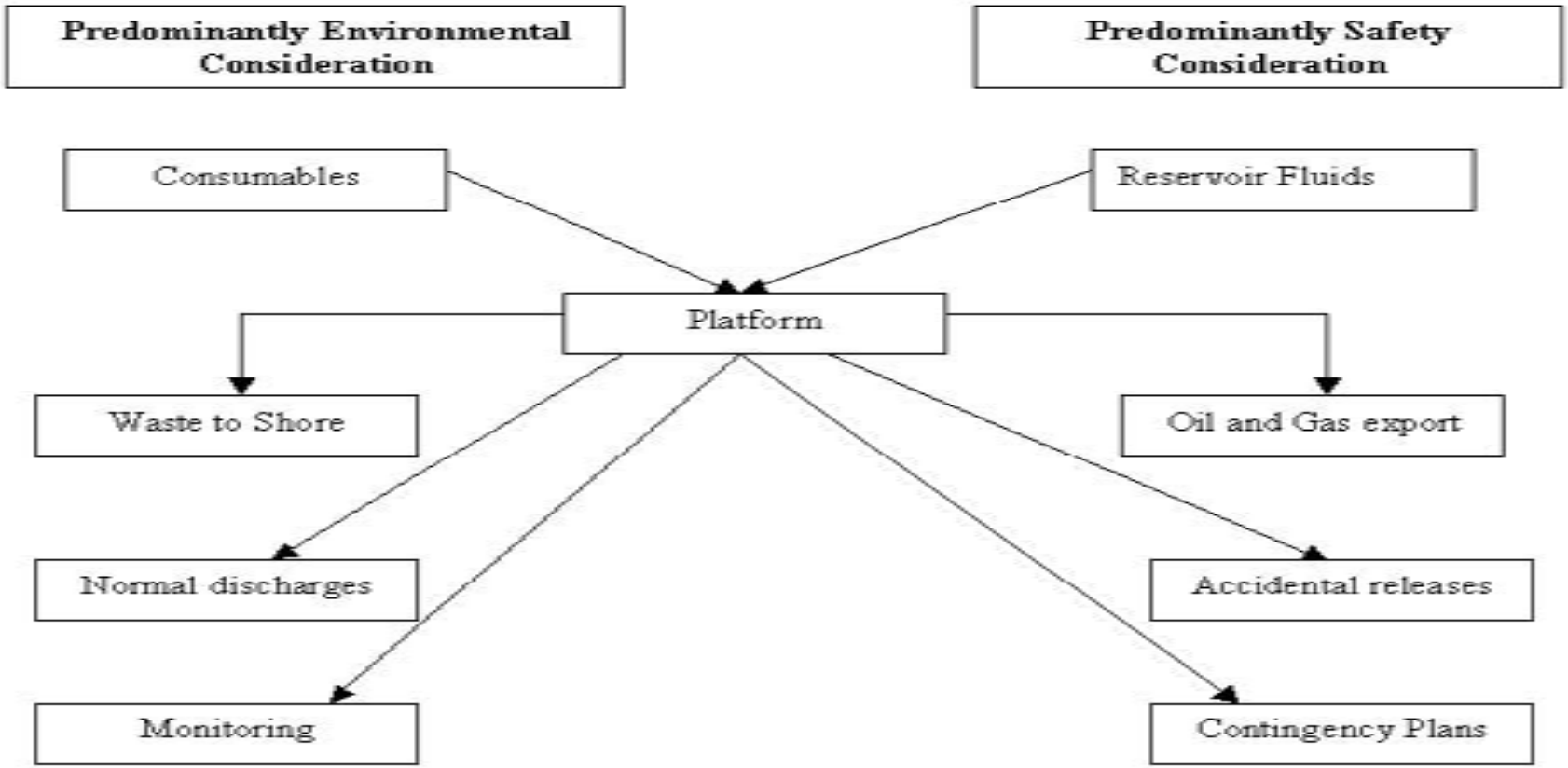
Italy has more that 7.500 km of coasts and the marine environment is subject to pressures caused by marine and fishing transports.

One third of the whole Italian population live in the coastal areas, where the density it's double than the national average

The owner's responsibility is a decisive factor for the marine environmental protection

2. Off-shore oil and gas platforms

Typical flow chart for platforms environmental and safety impacts



2. Off-shore oil and gas platforms

- Sea pollution produced by off-shore oil and gas activities became relevant public concern during last years

- Marine and coastal environment have been strongly affected by discharges on sea

- Importance of platform operators to be aware about above mentioned concerns

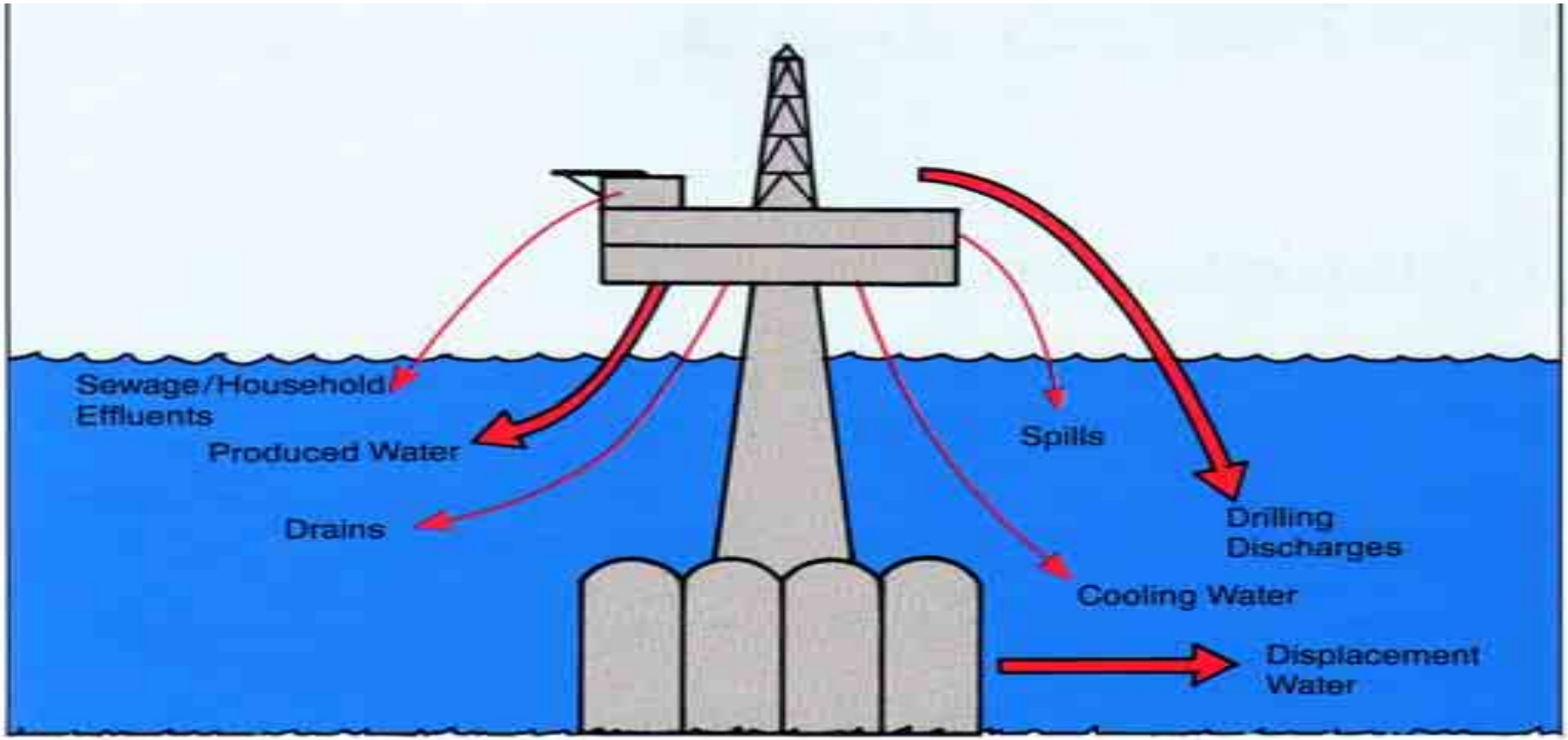
2. Off-shore oil and gas platforms

Main international laws on sea pollution

- OILPOL (1954)
- The Geneva conventions (1958)
- Oslo and London dumping convention (1972)
- The Paris convention (1974)
- MARPOL (1973-78)
- The law of the sea convention (1982)
- The Bonn agreement (1983)

2. Off-shore oil and gas platforms

Main pollution from platform activities



2. Off-shore oil and gas platforms

Main concerns of platform pollution is “Produced Water”

Formation water occurs together with oil and gas in the reservoirs A mixture of oil, gas and water flows to the production facility and the water, called ‘produced water’ is separated and treated for oil removal being discharged into the sea. On some installation sea water is injected into the reservoir for pressure maintenance Generally, produced water contains varying concentrations of natural compounds :

•Dispersed oil and dissolved oil (aliphatic hydrocarbons, aromatic hydrocarbons, phenols, carboxylic acids, metals, etc.)

• Minerals from the formation

2. Off-shore oil and gas platforms

Main limits for platform discharges

- Produced water max oil content 40 mg/l (Paris)
- Drainages max oil content 100 ppm (MARPOL)
- Drill cuttings max oil content 100 g/kg (Paris)

Competencies

Drilling authorization released by Ministry of Industry after approval of Environmental Impact Assessment by Ministry of the Environment and Land Protection.

Inspection and control by National Coast Guard

3. Ballast water

Ballast Water is used to stabilize vessel and its sediment can act as a vehicle for the transfer of marine species, disease and contaminant, polluting the marine environment

Zooplankton from Ballast Water

Ballast Water Release

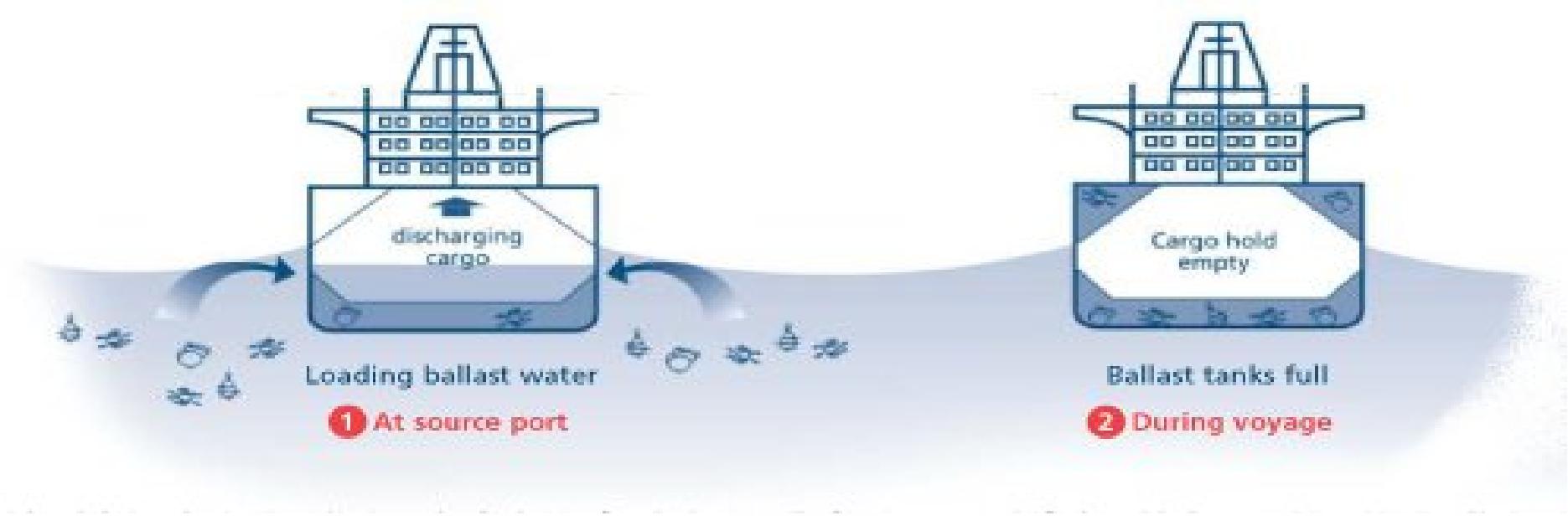
3. Ballast water

Water Ballast are used since the 1880' to improve stability, draft and maneuverability and to prevent stressing and structural damage which can be caused by uneven loading or rough seas. It is estimated that about 10 billion tonnes of water is transported globally per year

Operational issues

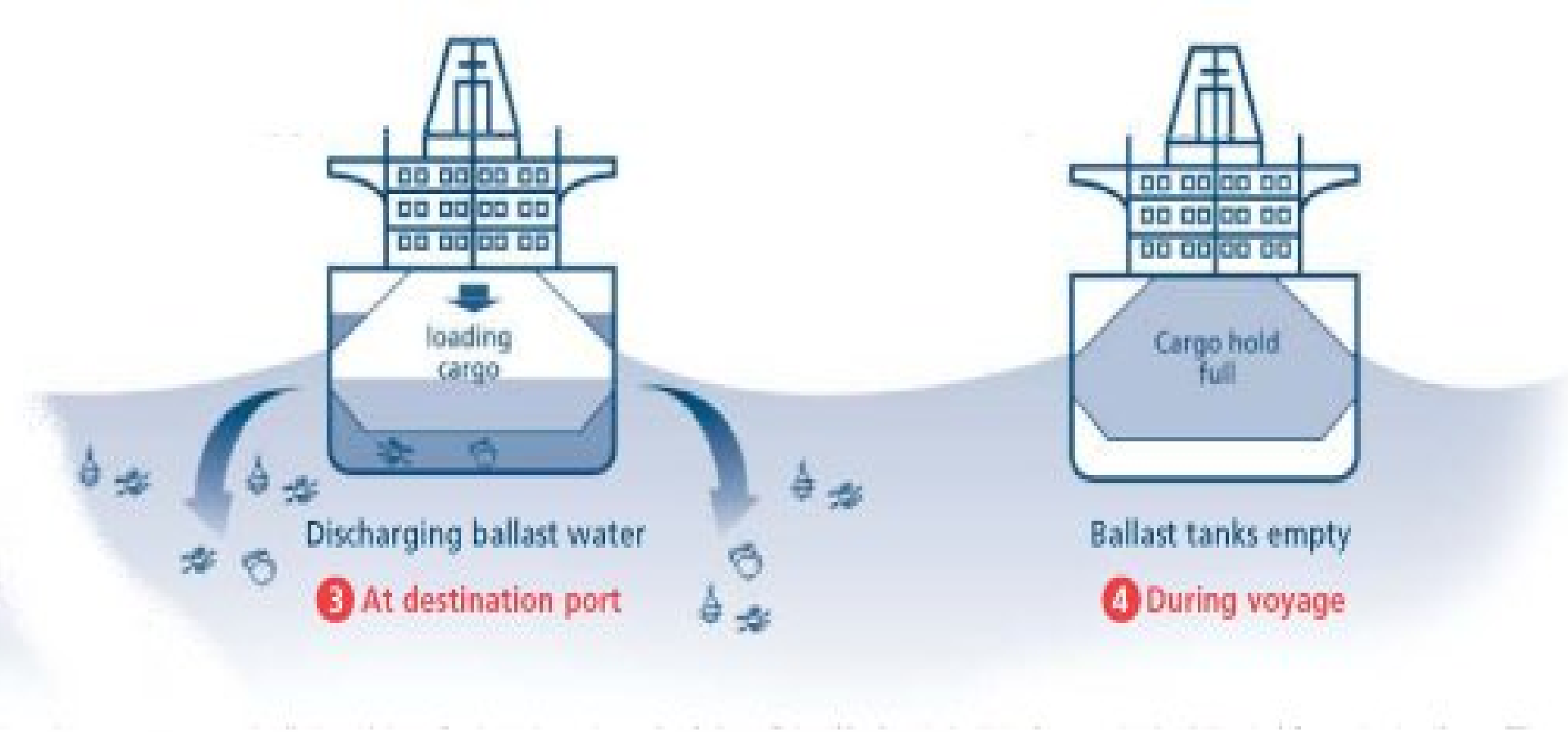
- Ballast water is loaded on vessel after oil discharge on port facilities and before the left
- Ballast water is unloaded on appropriate port facilities
- Stored in a number of ballast vessel (generally steel)
- Volume of ballast and configuration varies from vessel to vessel

3. Ballast water



Loading Ballast

3. Ballast water



Unloading Ballast

3. Ballast water

Vessels

Oil and Gas Tankers, Bulk Carriers

- Usually transport goods in one direction
- Return journeys “with ballast”
- Large ships, discharging large volumes of water on regular basis (tens of thousands of tons)
- About 75% of ballast water discharged is from Oil and Gas tankers

Container Ships, Ro-Ro vessels

- Variable and unpredictable volumes, usually smaller than tankers and bulk carriers ones

3. Ballast water

Ballast water can introduce non–indigenous and non-native species in a new environment, with the following consequences:

Dangerous effects

- competing with native species for food or space
- alteration to existing ecosystem, e.g. water quality, predators
- gene pool alteration
- displacement of native species
- introduction of disease or parasite
- toxic species leading to economic losses

3. Ballast water

Human health issues

- Toxic algal blooms
- Cholera
- Salmonella, Escherichia coli

Fisheries issues

- toxic algal blooms
- eutrophication

Examples

Zebra Mussel – Great Lakes (1988), *Mnemiopsis* Comb Jelly – Black Sea (1982), Gymnodinium Dinoflagellate – produces Saxitoxin –Tasmania 1980'

3. Ballast water

Management

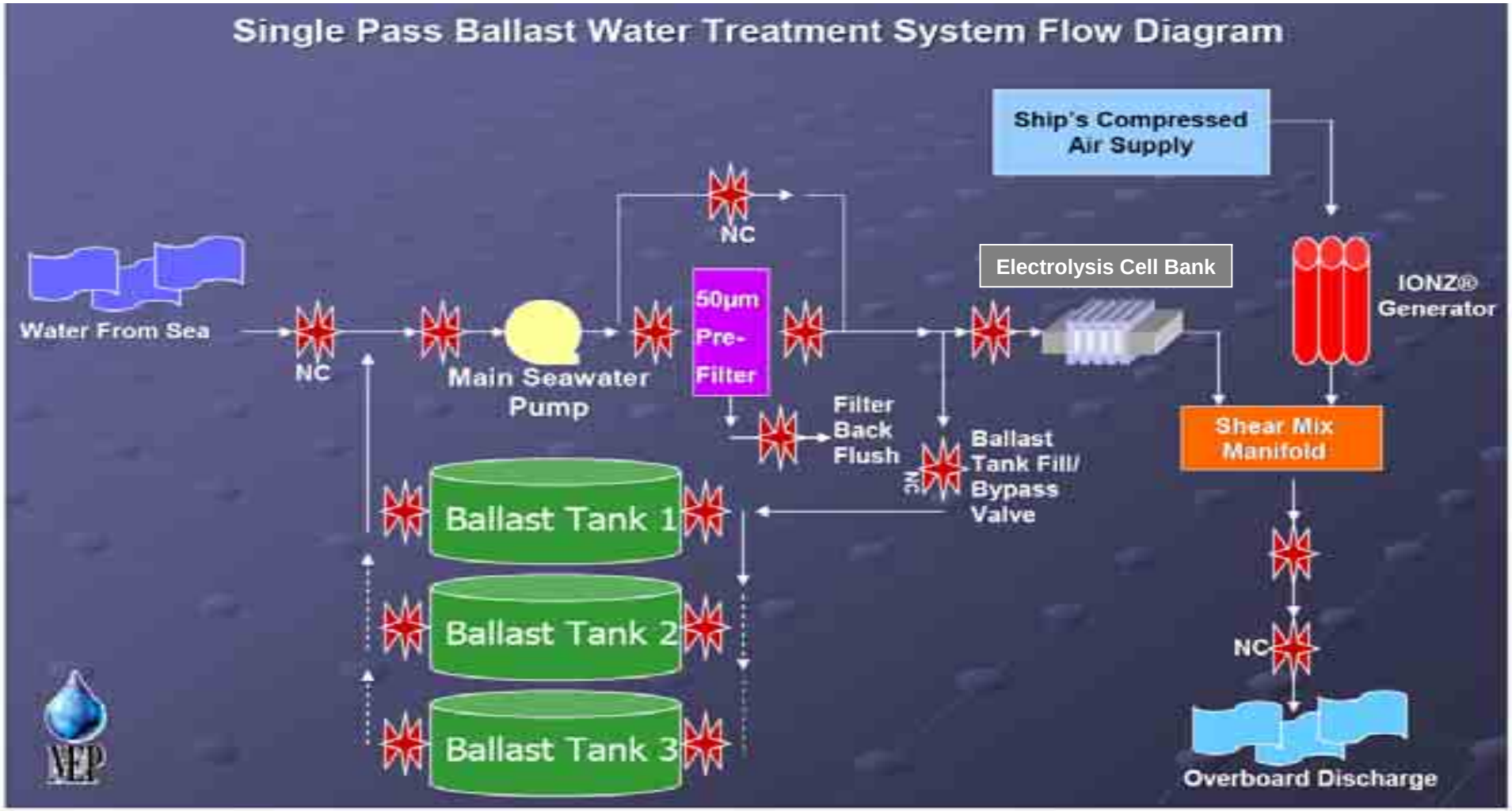
- Treatment of water on board (e.g. chlorination, hydrogen peroxide, heat, uv, filtration, deoxygenation)
- Treatment of water and sediment in port (e.g. port waste disposal)
- Areas and times management, sewage outfalls management, algal bloom management

Treatment

- Pre Treatment: Filtration
- Primary Treatment: Electrolysis
- Primary Treatment: Ionized Gas

3. Ballast water

Example of ballast water treatment system



3. Ballast water

- **Voluntary codes** – New Zealand, Canada, USA, Argentina, Chile and Israel
- **Mandatory codes** – Australia 2001, California 2001
- **IMO** MEPC Resolution 50(31) 1991, updated in 1997 A.868(20) "Guidelines for the control and management of ships' ballast water to minimize the transfer of harmful aquatic organisms and pathogens"
- **MARPOL**

Web-sites

- Australian Mandatory requirement
- http://globallast.imo.org/
- www.aqis.gov.aushipping
- http://www.intertanko.com/tankerfacts/environmental/ballast/ballastreq.htm - international requirements

4. Oil indicators

Use of oil indicators allow better understanding of oil pollution and related environmental problems. Statistic data and Indicators can support management and strategies identification for marine environmental protection

What is the current situation in Egypt?

Total Berths' Length of Main Maritime Commercial Ports (Km)	32,43
Total Area of Main Maritime Commercial ports Berths (Km^2)	479,77
Total length of the river Nile (km)	6695
Total Number of specialized ports	42
Tourist ports	9
Petroleum ports	14
Mining ports	11
Fishing ports	8

Source: Ministry of Transport, Egypt

4. Oil indicators

The Egyptian Ports' Capacity

Port Name	Total Area (km)	Land Area (km)	Port Maximum Capacity		Number of operating Berths	Total length of operating Berths (m)	Maximum Depth (m)	Total Area of Yards and Store Houses (m2)	Maximum Ship Size (Tonnage)
			Cargo (Million Tons)	TEU * (Millions)					
Alexandria	9.60	1.10	32.87	0.25	59	7966	12.8	687046	150000
EL-Dekheila	6.00	3.20	20.37	0.50	17	4073	18.89	593000	170000
Damietta	11.80	7.90	19.75	0.80	16	3950	14.50	83286	-
Port Said	3.00	1.30	14.13	0.82	33	4721	13.20	243253	-
EL-Arish	0.20	0.04	1.82	-	2	364	8.00	30000	10000
East Port Said	35.00	33.50	6.00	2.20	3	1200	14.00	642000	-
Suez		0.31	6.60	-	12	2070	8.00		-
Petrol Dock	160.40	1.16	4.14	-	7	828	9.00	24091	-
El-Adabiya		0.85	7.30	-	9	1460	12.00		-
El-Sokhna	87.82	22.3	8.50	0.90	5	1900	17.05	11140	-
Hurghada	8.36	0.02	-	-	3	190	3.60	-	-
Safaga	56.97	0.48	6.37	-	5	1273	14.00	40740	70327
AL-Tour	1.65	0.43	0.38	-	1	75	5.00	-	-
Nuweiba	9.87	0.34	1.90	-	4	380	8.00	22720	-
Sharm El-Sheikh	88.28	0.16	-	-	1	625	8.00	51500	-
Total	478.95	73.09	130.13	5.47	177	31075		2428776	

Source: Ministry of Transport, Egypt

* TEU: twenty foot equivalent unit

4. Oil indicators

Port traffic Number of Ships visiting Egyptian Ports during 2005

Port Name	General Cargo	Dry Bulk	Liquid Bulk	Containers	Passengers	Other	Total
Alexandria	2433	228	396	510	106	76	3749
El-Dekheila	327	276	76	311	0	10	1000
Damietta	1499	246	182	1042	1	160	3130
Port Said(West)	758	41	106	1005	226	344	2480
East Port Said	120	0	0	597	0	2	719
El-Arish	403	15	1	2	0	0	421
Suez	214	20	1	15	355	2	607
Adabiya	335	55	344	9	7	12	762
Sokhna	88	48	1	140	1	0	278
Safaga	146	49	17	2	660	0	874
Hamrawein	25	20	1	0	0	0	46
Abu Ghosoun	2	0	0	0	0	0	2
Sharm El Sheikh	1	1	0	0	257	2	261
Nowaiba	38	0	0	0	1269	0	1307
Total	6389	999	1125	3633	2882	608	15636

Source: Ministry of Transport, Egypt

4. Oil indicators

Accidents

2005							
Kind of Accident	Alexandria	Suez	Port Said	Damietta	Ras Gharib	Sharm El-Sheikh	Total
Colliding or friction of a vessel with a berth		1		3			4
Colliding or friction of a vessel with another vessel	1		1				2
Colliding or friction of a vessel with a scaffold				1			1
Contamination Accident				10			10
Vessel Drowning Accident		1					1
Maritime Unit Drowning Accident				2		1	3
Breakdown in Motor/Engine/Vessels' Machines					1		1
Total	1	2	1	16	1	1	22

Source: Ministry of Transport, Egypt

4. Oil indicators

Main oil indicators at International and European level

a) Oil spills at sea

b) Number of tankers

c) Length of oil pipelines

d) World merchant fleet

e) Lives lost at sea

Examples about above oil indicators is given on following slides

4. Oil indicators

a) Oil spills at sea

Number of oil spills, total amount spilt

Period		Number of 7 to 700 tonnes	Number over 700 tonnes	tonnes of oil spilt
1970-1979)	average	54	25	314 200
1980-1989)	per	36	9	117 600
1990-1999)	year	28	8	114 000
2000		19	4	14 000
2001		16	3	8 000
2002		12	3	67 000
2003		14	4	42 000
2004		12	5	15 000

Source : International Tanker Owners Pollution Federation Ltd.

4. Oil indicators

a) Oil spill at sea

Selected major oil spill

World outside Europe			
Shipname	Year	Location	Oil lost (t)
Atlantic Empress	1979	off Tobago, West Indies	287 000
ABT Summer	1991	700 miles off Angola	260 000
Castillo de Bellver	1983	off Saldanha Bay, South Africa	252 000
Odyssey	1988	700 miles off Nova Scotia, Canada	132 000
Sea Star	1972	Gulf of Oman	115 000
Hawaiian Patriot	1977	300 miles off Honolulu	95 000
Exxon Valdez	1989	Prince William Sound, Alaska	37 000

Europe			
Shipname	Year	Location	Oil lost (t)
Amoco Cadiz	1978	off Brittany, France	223 000
Haven	1991	Genoa, Italy	144 000
Torrey Canyon	1967	Scilly Isles, United Kingdom	119 000
Irenes Serenade	1980	Navarino Bay, Greece	100 000
Urquiola	1976	La Coruna, Spain	100 000
Independenta	1979	Bosphorus, Turkey	95 000
Jakob Maersk	1975	Oporto, Portugal	88 000
Braer	1993	Shetland Islands, United Kingdom	85 000
Prestige	2002	Cape Finistere, Spain	77 000
Aegean Sea	1992	La Coruna, Spain	74 000
Sea Empress	1996	Milford Haven, United Kingdom	72 000
Erika	1999	Brittany, France	20 000

4. Oil indicators

b) Number of tankers

World oil fleet (millions of tons of gross tonnage)

	1995	2000	2001	2002	2003	2004	2005
TANKERS							
10.000 - 19.999 DWT	6,8	8,6	8,8	8,9	9,3	9,4	10,0
20.000 - 29.999 DWT	13,1	11,9	11,0	10,8	10,2	9,4	8,2
30.000 - 44.999 DWT	26,0	26,8	26,8	27,4	27,9	28,8	28,6
45.000 - 59.999 DWT	16,5	12,3	12,8	13,1	13,0	14,5	19,0
60.000 - 79.999 DWT	39,6	14,7	15,1	14,8	14,5	14,6	16,6
80.000 - 119.999 DWT	46,6	49,8	50,8	50,6	53,7	58,9	62,6
120.000 - 199.999 DWT	33,2	40,2	40,9	39,5	41,8	43,4	46,1
200.000 - 319.999 DWT	81,0	105,1	111,9	110,6	115,8	121,8	128,9
320.000 DWT e oltre	10,0	18,3	16,8	14,2	9,0	4,3	3,8
Total	**272,8**	**287,7**	**294,9**	**289,9**	**295,2**	**305,1**	**323,8**
Mixed and polyvalent ships	5,4	14,7	14,8	14,3	12,1	11,7	10,5
Total fleet	**278,2**	**302,4**	**309,7**	**304,2**	**307,3**	**316,8**	**334,3**

Source: clackson tanker register 2005

DWT : Dead weight tonnage

4. Oil indicators

b) Number of tankers

World oil fleet (divided for countries)

	1995 Numero	1995 Migliaia DWT (•)	2005 Numero	2005 Migliaia DWT (•)	Quota % DWT
Panama	328	34,7	582	56,2	16,8
Liberia	511	58,2	478	45,6	13,6
Grecia	226	25,9	250	33,0	9,9
Bahamas	178	19,4	211	24,6	7,4
Norvegia	196	18,9	198	13,7	4,1
Malta	159	10,0	197	14,5	4,3
Singapore	99	8,4	223	20,4	6,1
Isole Marshall	13	3,3	257	25,8	7,7
Cipro	108	8,8	127	7,5	2,2
Stati Uniti	216	12,1	95	5,5	1,6
India	70	4,5	99	7,9	2,4
Giappone	56	9,2	22	4,2	1,3
Brasile	67	3,8	45	1,7	0,5
Iran	27	4,1	34	6,2	1,8
Cina	83	3,2	118	5,1	1,5
Italia	91	4,2	115	4,9	1,5
Regno Unito	93	9,9	47	1,9	0,6
Francia	28	3,6	30	3,3	1,0
Russia	78	3,0	65	4,6	1,4
Altro	562	33,0	690	47,8	14,3
TOTALE	3.189	278,2	3.883	334,3	100,0

56%

4. Oil indicators

c) Lenght of oil pipelines (km)

Italy →

E.U.

	1970	1980	1990	2000	2001	2002
BE	52	458	301	294	294	294
CZ				736	736	736
DK	-	77	444	330	330	330
DE	2 879	2 890	3 038	2 370	2 370	2 370
EE	-	-	-	-	-	-
EL	-	-	-	-	-	-
ES	930	1 653	2 678	3 780	3 779	3 784
FR	3 609	6 254	4 948	5 746	5 746	5 746
IE	-	-	-	-	-	-
IT	1 939	3 069	4 086	4 346	4 358	4 379
CY	-	-	-	-	-	-
LV			766	766	766	766
LT				500	500	500
LU	-	-	-	-	-	-
HU		1 067		848	848	848
MT	-	-	-	-	-	-
NL	323	391	391	418	418	418
AT	604	777	777	777	777	777
PL		1 975	2 039	2 278	2 286	2 286
PT	-	-	-	-	-	-
SI	-	-	-	-	-	-
SK	-	-	-	-	-	-
FI	-	-	-	-	-	-
SE	-	-	-	-	-	-
UK	1 634	3 166	2 462	3 964	4 368	4 367
EU25				27 143	27 575	27 600
EU15	11 970	17 625	19 125	22 015	22 440	22 465
BG			578	578	578	578
HR			865	601	601	601
RO			3 694	4 423	4 423	4 306
TR				2 112	2 112	
IS	-	-	-	-	-	-
NO			621	7 008	7 041	
CH			239	108	108	109

4. Oil indicators

d) World merchant fleet

by type of ship Total registered fleet January 1st, 2004 (ships of 300 gt and over)	Number		dwt (1000)	
	World	EU-25 flag	World	EU-25 flag
Oil tankers	7 565	1 472	317,8	79,3
Chemical tanker	1 328	235	8,8	1,6
Liquid gas tanker	1 139	189	20,8	3,3
Bulk carriers	5 977	1 343	289,5	68,0
Ore/bulk/oil carriers	173	8	12,1	0,6
General cargo	15 307	2 680	87,0	18,0
Container	3 036	760	90,2	27,1
Ro-Ro Cargo	1 180	*	8,2	*
Passenger & Passenger Ro-Ro	3 960	1 268	5,9	2,5
[**gt** (1000)]			[27.3]	[11.7]
Cruise ships	266	75		
[**gt** (1000)]			[11.2]	[2.9]

Source : Institute for Shipping Economics and Logistics, Bremen
Note: *: included in general cargo figures

4. Oil indicators

e) Lives lost at sea

Throughout the world, by type of ship								
Type of ship (100gt and above)	1996	1997	1998	1999	2000	2001	2002	2003
Oil and oil products	10	21	7	7	11	26	2	5
Bulk dry cargo	50	82	111	3	20	65	5	0
General cargo	172	108	158	257	107	118	82	130
Passenger / general cargo	0	2	0	0	0	0	0	11
RoRo cargo	1	2	2	0	0	43	2	7
Passenger / RoRo cargo	342	0	150	0	90	0	1119	15
Passenger	4	0	40	74	0	0	1	0
other	131	42	98	98	145	65	63	29
Total	710	257	566	439	373	317	1274	197

5. Training on oil spill response

In order to limit oil spill at sea and to minimize the possible environmental damages, usually are used different protection methods and cleanup techniques. In this sense, protection methods mean keeping oil out of a habitat or reducing the amount that enters, while cleanup involves treatment and/or removal of oil.

Unless protection of one habitat will threaten an adjacent, more sensitive habitat, protection should be the primary goal

The main oil spill techniques, some applicable for protection, some for cleanup and others for both are presented in the next slides

5. Training on oil spill response

- Beach cleaning machine : machines towed by tractor, or may be self-propelled. They may use a rotating sorbent belt or a wheel with spines to collect oiled sediment or tar balls for transport to a holding space
- Booms: containment booms are continuous, flexible floating barriers to prevent migration of oil spilled in open waters and to protect shoreline habitats
- Burial: oiled sediment is mechanically mixed into the substrate and buried on site
- Burning: controlled burning of oil slicks or stranded oil by addition of gasoline, kerosene or lighter fluids, or the use of wicking agents such as straw, moss or sawdust
- Dispersants: chemicals which cause oil to break into small droplets, forming an oil-in water emulsion, which is dispersed into the water column
- Herding: chemical agents applied to water adjacent to an oil slick to help control spreading of oil
- High pressure flushing: removing oil with ambient water streams at pressure high enough to cause transport of beach sediments and organisms
- Management of existing drainage: constructing small barriers or small channels to enhance natural flushing
- Manual removal : Removal of oil contaminated debris by hand tools such as rakes, scrapers, hoes, shovels and buckets
- Sorbents: natural and synthetic materials used to sorb oil

5. Training on oil spill response

- Natural cleaning: natural mechanism such as wind and wave action, sunlight and natural microbial action that promote removal, break-down and dispersal of oil. Cleansing occurs without use of added chemicals or physical labour
- Sand Blasting: removal of oil projecting a stream of sand or other abrasive against a solid surface
- Sinking Agents: sand, fly ash, clay, rubber and powdered cement are high density materials that absorb oil. Resulting agent/oil mass sinks to the ocean bottom
- Skimmers: mechanical devices, such as weir, suction, and sorbent-surface skimmers, used from water surface
- Steam cleaning: using steam or high temperature water under pressure to remove oil from solid surfaces
- Substrate displacement: moving oiled sediment to the lower interdital zone to be reworked and cleaned by natural processes
- Substrate removal: use of heavy equipment such as bulldozers,motorized scrappers, backhoes and graders to remove oiled substrate
- Surface treating agents: an agent applied to the shoreline to prevent oil from adhering to sediment or rock surfaces
- Vacuum pumping: use of a suction head, hose, pump and storage tank to recover oil on the water surface,underwater and on the shoreline
- Vegetation cropping: mechanical or hand harvesting of oiled vegetation and removal to a disposal site

5. Training on oil spill response

Protection Methods: summary

Methods / Habitats	Open Waters—Offshore/Nearshore	Open Waters—Enclosed Bays & Harbors	Soft Bottom Subtidal	Seagrass Beds	Rocky Subtidal—Open Hard Bottom & Rocky Reefs	Kelp Beds	Exposed Rocky Intertidal	Sheltered Rocky Intertidal	Sandy Beaches	Sheltered Tidal Flats	Gravel/Cobble Beach	Coral Reefs	Mangrove Forests	Salt Marshes	Special Use
Booms/Skimmers	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Burning	V														
Dispersants	P	V	V	V	V	V	V	V	P	P	P	P	P	P	P
Earth Barriers									P	P	V			P	
Herding		P	V	V	V	V								V	
High Pressure Flushing					V	V									
Sorbents	V	P											V	V	
Vacuum Pumping		V													

P:= preferred V= viable

5. Training on oil spill response

Protection Methods: summary

P= preferred
V= viable
NA = not advisable
A = avoid

Methods / Habitats	Open Waters - Offshore/Nearshore	Open Waters—Enclosed Bays & Harbors	Soft Bottom Subtidal	Seagrass Beds (Intertidal)	Seagrass Beds (Wade Zone Subtidal)	Rocky Subtidal—Open Hard Bottom & Rocky Reefs	Kelp Beds	Exposed Rocky Intertidal	Sheltered Rocky Intertidal	Sandy Beaches (Exposed)	Sandy Beaches (Sheltered)	Sheltered Tidal Flats	Gravel/Cobble Beach (Exposed)	Sheltered Gravel Beaches	Sheltered Cobble Beaches	Coral Reefs (Lagoons)	Coral Reefs (Deep Fore, Flats, Crests)	Mangrove Forests	Salt Marshes
Beach Cleaning Machines										P	P								
Booms/Skimmers	P	P					V	V	P			P				P		P	P
Burial				A						A	A	A	A	A					
Burning	NA	NA					A	NA	NA	A	A			A		A	A	A	A
Dispersants	P	V		NA	NA		NA	V	NA	V	A	NA	P	A	V	NA	V	P	V
Earth Barriers																			
Herding	V	V																V	V
High Pressure Flushing				A		NA	NA	NA	NA	A	A	A	NA	A	NA			NA	A
Low Pressure Flushing				V	V		V	V	V		V	P	P	V	P		V	P	P
Management (Drainage)																		P	P
Manual Removal			V	NA	NA	NA		V	V	P	P	V	NA	P	NA	V		V	A
Natural Cleansing	P	P	P	P	P	PV	P	P	NA	P	V	P	P	NA	P	P	P	V	P
Sand Blasting								A					NA		A				
Sinking Agents	A	A					A												
Sorbents	V	V		NA	V	V	V	V	V	V	V	P	NA	V	V	V	NA	V	V
Steam Cleaning								A	A				A		A				A
Substrate Displacement				A						P	A	A	A		A				
Substrate Removal			NA	A				A	A	P	NA	A	A	NA	A			A	A
Vacuum Pumping	V	V	NA	A	A	V	NA	V	V	P	P	V		P		P	V	V	V
Vegetation Cropping				A	NA		V	NA	NA										NA

6. Ecoports

WHAT IS ECOPORTS ?

- ECOPORTS is a European project to concentrate initiatives in Europe on port-related environmental issues.

- EcoPorts Foundation (EPF) is partner in the ECOPORTS research project, to facilitate participation of as many European ports as possible.

GOAL OF THE PROJECT

•Main goal is to harmonise the environmental management approach of ports in Europe, to exchange experiences and implement best practices on environmental issues

6. Ecoports

ECOPORTS CONCEPTS

- Try to eliminate the environment as a competitive factor between ports
- Create level playing field
- Focus on business opportunities
- Ports for ports
- Share costs of development of joint solutions

6. Ecoports

IMPROVEMENT IS KEY

- ECOPORTS is to support your environmental improvement programme, in a cost effective and environmental effective way:

1. Establish sound organisation: apply ECOPORTS environmental management and information system (EMIS)
2. Learn starting point / progress: apply Self Diagnosis Method: inventory of status quo and assessment of priorities
3. Start / structure / extend / your Environmental Improvement programme: share experiences with other ports, implementing best practices, start new projects
4. Monitoring progress: using ECOPORTS environmental indicators to measure improvement of the environmental programmes
5. Demonstrate good performance: apply for the ECOPORTS Certificate: documented proof , independently audited
6. Translation of the practical experiences into Policy recommendations

6. Ecoports

FACTS & FIGURES

- ECOPORTS project =
  - 26 partners / 3 years / 4.1 mln Euro
  - 12 seaports / inland ports / port organisations
  - EcoPorts Foundation: 50 affiliated ports
  - 5 universities
  - 7 environmental & ICT experts

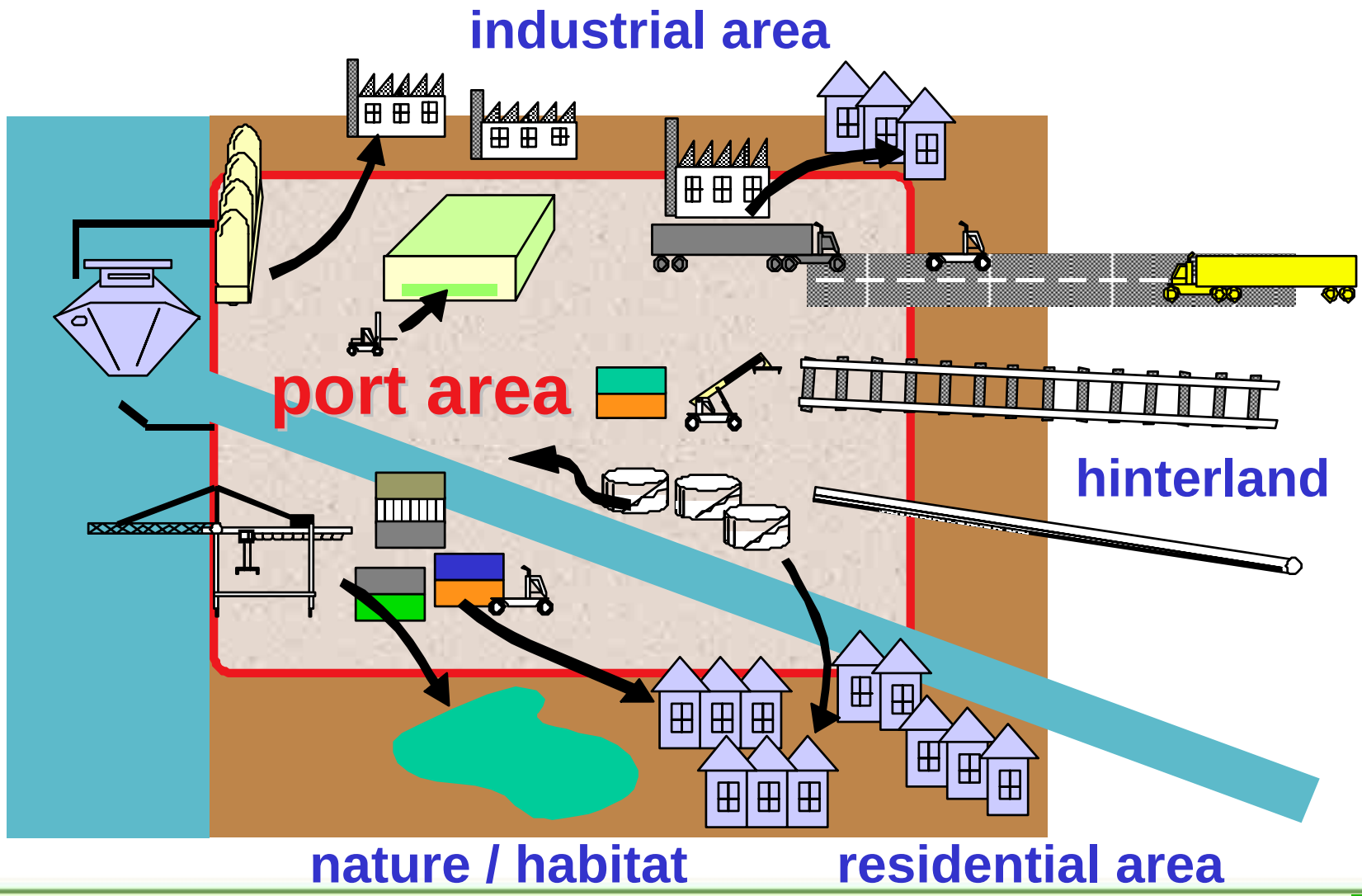
6. Ecoports

FOCUS OF ECOPORTS

- Port authorities (seaports, inland ports)
- The area between ship and hinterland: the port industrial area
- Between IMO and Industry
- Practical not policy
- Bottom up: ports define scope and results

6. Ecoports

PORT AREA RELATED ISSUES



6. Ecoports

FOCUS RESEARCH WORK

1. development of environmental management tools
2. exchange of experiences and best practices
3. training of port managers
4. execution of practical case studies
5. development of new projects
6. development of environmental indicators for impact assessment
7. creation of a Ports & Environment platform

6. Ecoports

EXAMPLE: SDM

- Self Diagnosis Method
  - To analyse the actual environmental situation in your port; on managerial level and in the port area
  - Simple checklist to be completed, leading to overview of points of attention / priorities
  - Benchmark with European average
  - Has been trailed by over 200 ports in Europe

6. Ecoports

SDM: DEMONSTRATES IMPROVEMENT !

	M4: Environmental Training	EMS						European Responses			
No:	Question	EMAS	ISO	1998	1999	2000	SWOT	Ans(%)	Yes(%)	Partial(%)	No(%)
4.01	Are all employees aware of the importance of compliance with environmental policy?							100.0%	31.3%	46.9%	21.9%
4.02	Are all employees aware of the potential environmental effects of their work activities?							100.0%	40.6%	50.0%	9.4%
4.03	Are all employees aware of their responsibility to conform to the environmental policy and management objectives?							100.0%	28.1%	40.6%	31.3%
4.04	Are all employees aware of consequences of non-compliance?							96.9%	19.4%	45.2%	35.5%
4.05	Are all employees aware of the environmental benefits of improved performance?							96.9%	19.4%	61.3%	19.4%
4.06	Are all employees aware of the economic benefits of improved performance?							96.9%	16.1%	48.4%	35.5%
4.1	**Have the environmental training requirements of employees been identified?**							93.8%	26.7%		73.3%
4.21	Are relevant Port personnel trained in standard environmental operating procedures?							100.0%	25.0%	40.6%	34.4%
4.22	Are relevant Port personnel trained in pollution prevention and reduction equipment use?							100.0%	40.6%	43.8%	15.6%
4.3	**Does the Port authority have an environmental training program for its employees?**							96.9%	16.1%		83.9%
4.4	**Do you maintain a full record of environmental training for each employee?**							96.9%	35.5%		64.5%
4.51	Trainees name, location and job description?							59.4%	57.9%		42.1%
4.52	Nature and date of training course?							59.4%	57.9%		42.1%
4.53	Trainee feedback?							59.4%	42.1%		57.9%
4.54	Effectiveness of training?							59.4%	26.3%		73.7%
								87.7%	32.2%		

6. Ecoports

EXAMPLE: PERS

Port Environmental Review System

– To provide proof (evidence) of good environmental performance: provide documents

– No checklist, but Set of Guidelines and Example Documents

– Possibility to have quality assessed independently and receive Certificate of Verification from the EcoPorts Foundation


CERTIFICATE OF VERIFICATION

ECOPORTS FOUNDATION

Dover Harbour Board
United Kingdom

Port Environmental Review System (PERS) version 1.2e

Activities, products and services of the port authority.

6. Ecoports

VALUE OF ECOPORTS

- Port Specific
- Putting policy into practice
- Learn from colleagues (ports for ports)
- Simplified schemes, based on internationally accepted tools
- Database with dedicated information
- Avoid double work, save money
- Link with ESPO

6. Ecoports

HOW TO CONTRIBUTE / BENEFIT

- Supply information to the network
  - ‘solution forms’ for the database
  - complete SDM and PERS
  - and become member of the EcoPorts Foundation
- Initiate and join working groups
- Act as an expert for your colleagues

6. Ecoports

HISTORY

1992: definition of ECEPA concept

1993: first workshop, Rotterdam

1994: workshop Barcelona, first project: Soil recycling

1995: second project: Silentports

1996: workshop Piraeus

1997: third project started: ECO-information

1998: workshop Helsinki, conference Lisbon

1999: regional workshops, workshop Genoa, conference Amsterdam, ECO-information finished, start EcoPorts Foundation (EPF)

2000: ECOPORTS project defined and submitted

2001: further development of Self Diagnosis Method by EPF task force

2001: pre-meeting ECOPORTS in Göteborg

2002: ECOPORTS started, Port Environmental Review System (PERS) developed and tested

6. Ecoports

STARTING MATERIAL

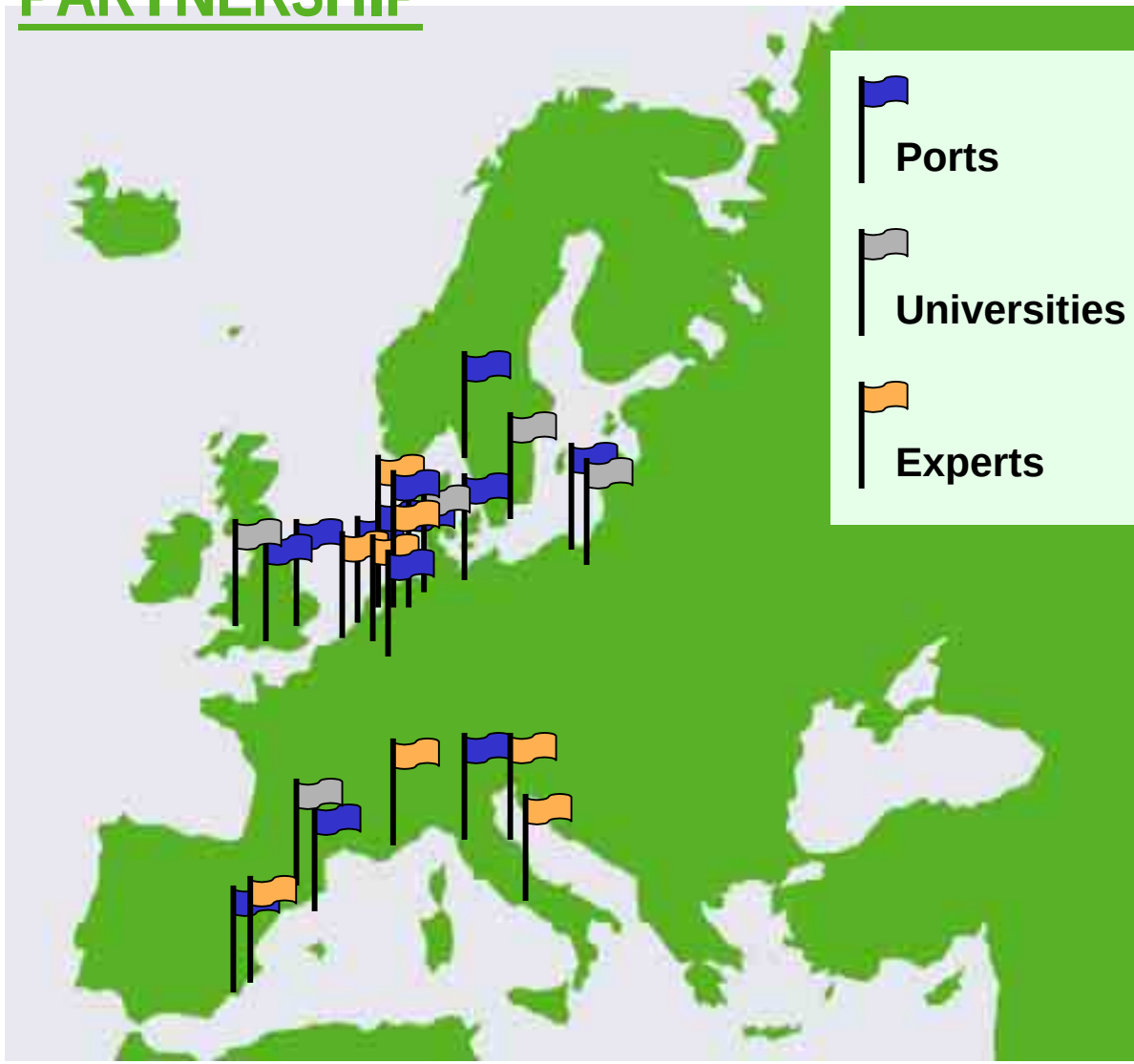
- Self Diagnosis Method: SDM98
- Environmental Management System, Valencia
- ECOPORTS database 1999: 100 solutions
- Network of ports: ± 75 ports involved
- ECOPORTS website: www.ecoports.com

6. Ecoports

PARTNERSHIP

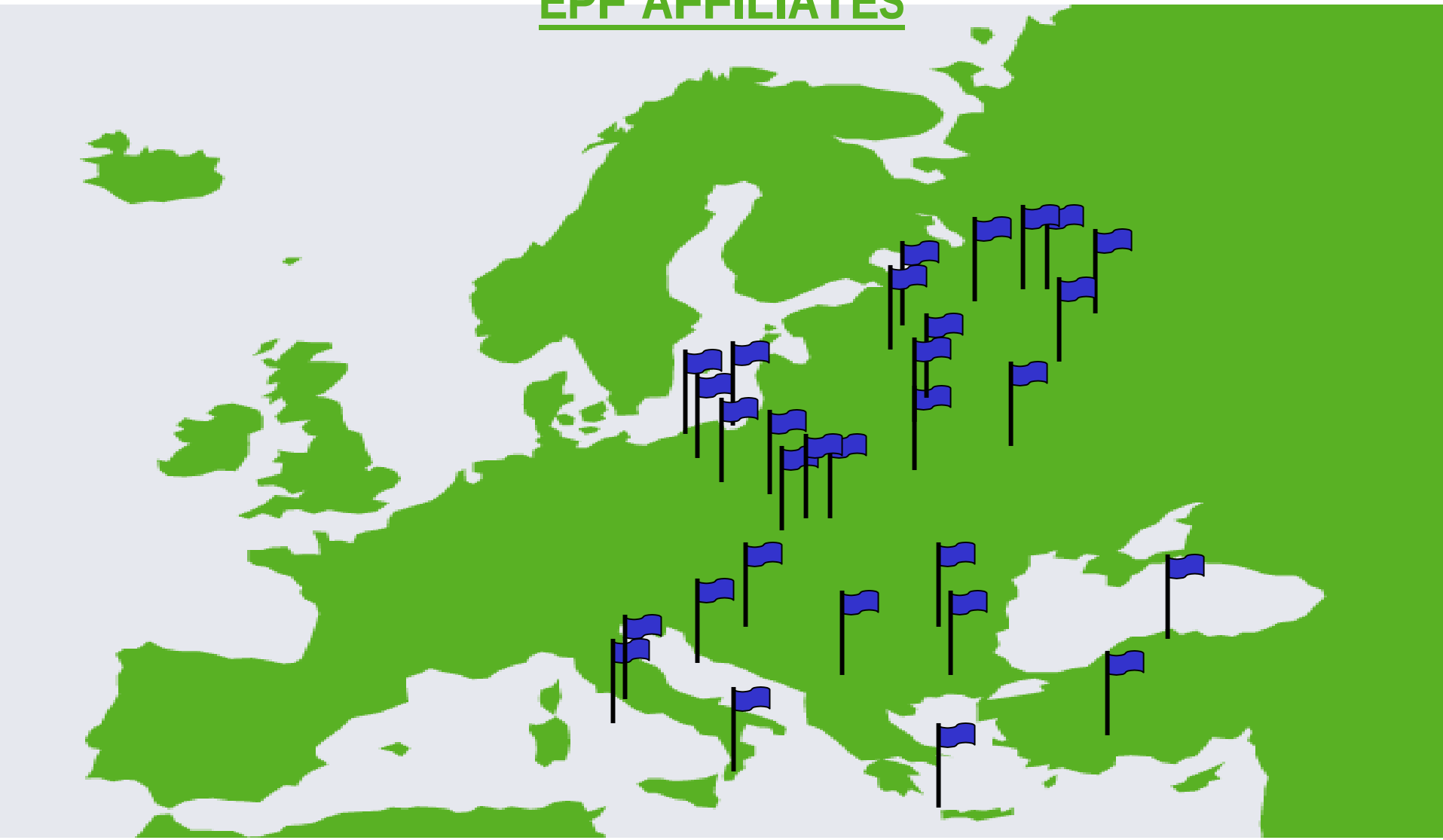
Port of Amsterdam
Port of Antwerp
Port of Barcelona
British Ports Association
Port of Genoa
Port of Göteborg
Port of Rotterdam
Port of Gdansk
EcoPorts Foundation
Port of Brussels
Port of Valencia
Port of Hamburg
Associated British Ports

Cardiff University of Wales
University of Amsterdam
Univ. Polytecnica, Barcelona
TU Gdansk
World Maritime University
APAT
Sogesca
CISCO Systems
Lloyd's Register
IPEC
EEIG Europhar
Artemis
IBM Dutch Headquarters



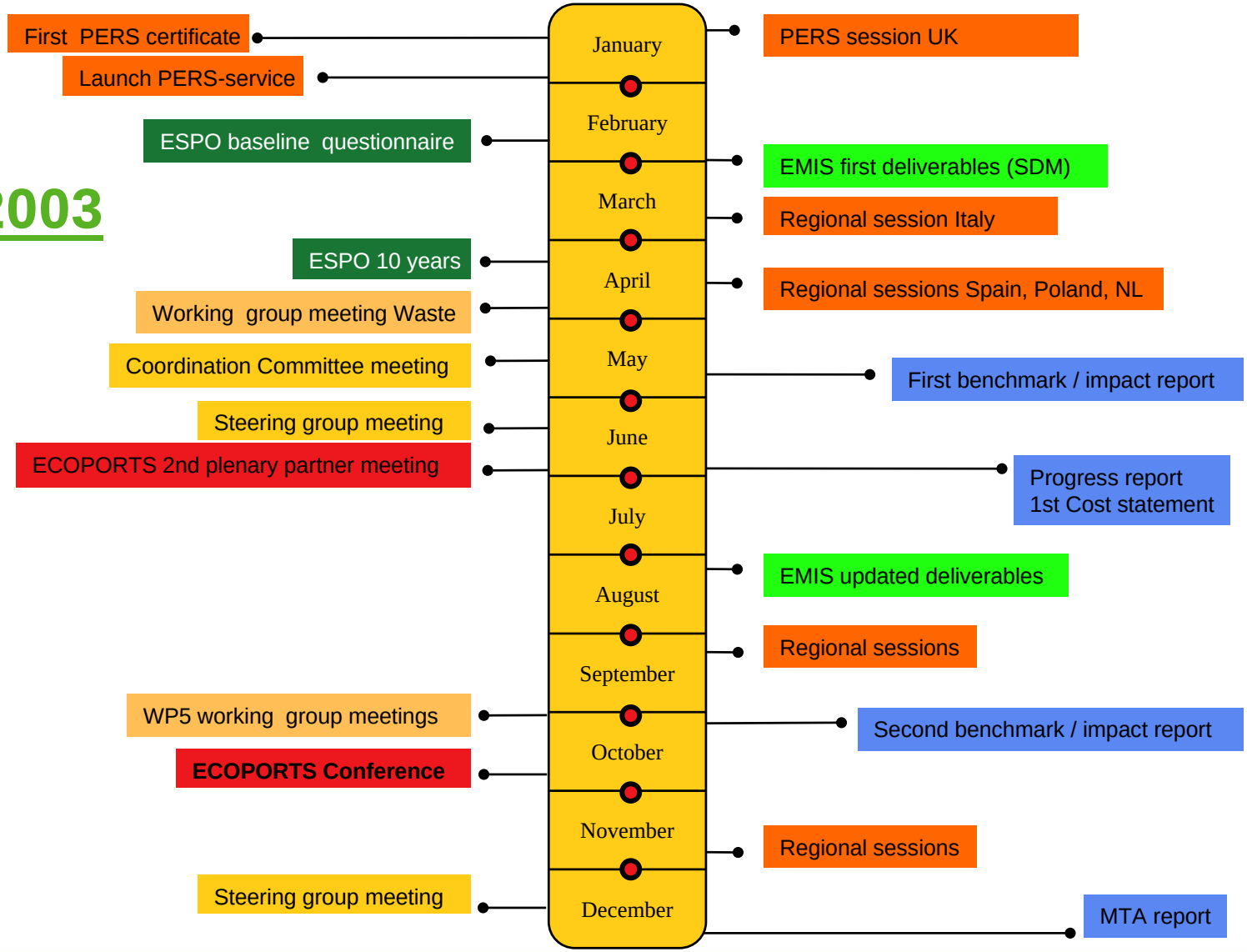
6. Ecoports

EPF AFFILIATES



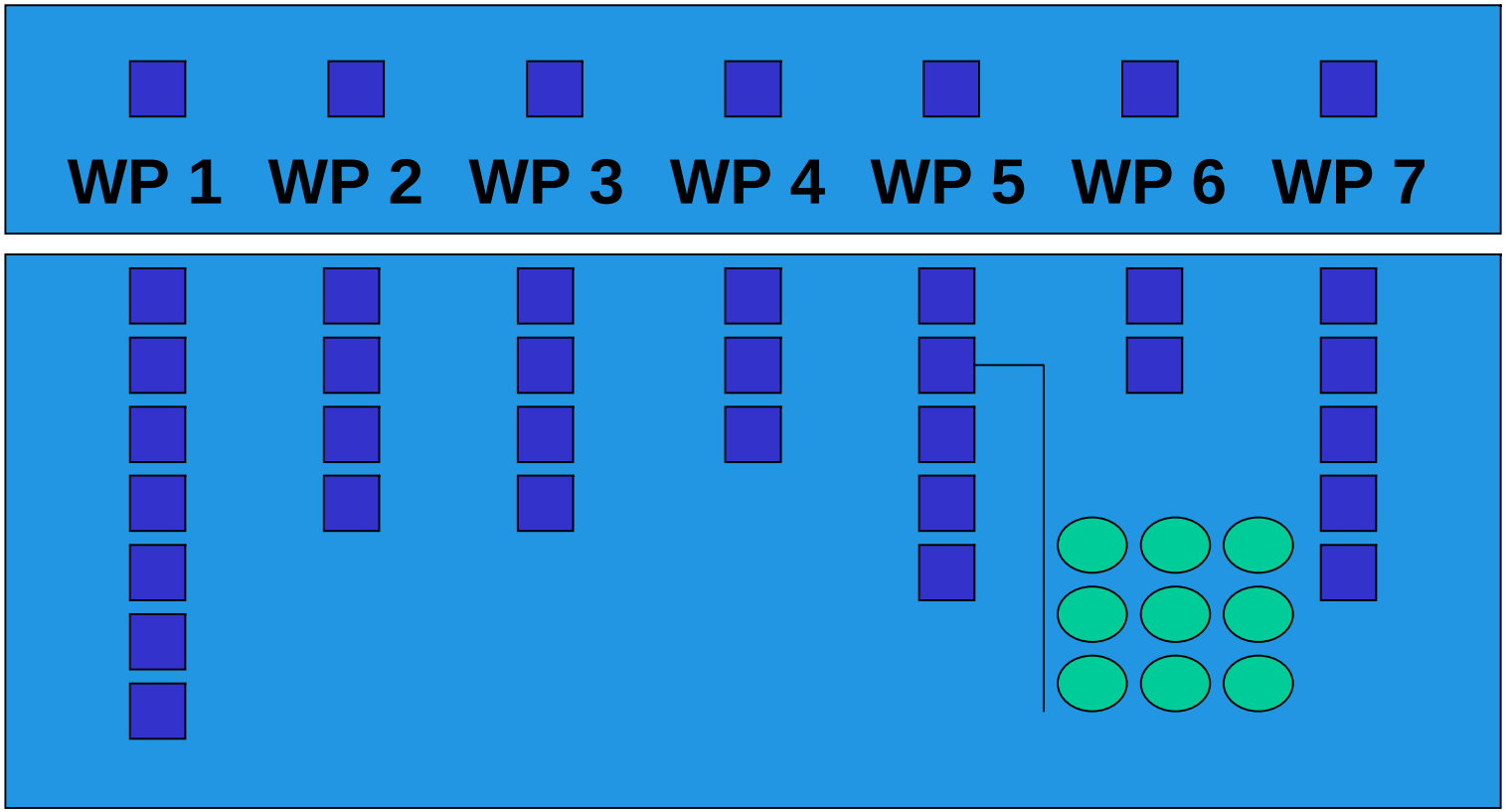
6. Ecoports

YEARPLAN 2003



6. Ecoports

STRUCTURE OF THE PROJECT



7 workpackages, 30 tasks

6. Ecoports

STRUCTURE OF THE PROJECT

- WP 1, 2 and 3 focus on the development of environmental management tools
- WP 4 focuses on training and demonstration
- WP 5 is for dedicated case studies and stimulation of new initiatives and projects
- WP 6 focuses on policy and impact assessment
- WP 7 is dedicated to network creation, management and communication

6. Ecoports

WP1, 2, 3 'TOOLS'

Development of Environmental Management and Information System (EMIS)

Objective

- development of questionnaires, database, website, etc. to support the implementation of environmental management procedures and to exchange know how

Results

- Self Diagnosis Method, Environmental Management System for Port Communities, Decision Support System, Database, Port Environmental Review System (PERS).

6. Ecoports

WP4 'TRAINING'

Development of training programme

Objective

- learn port managers to use the tools, to supply information on best practices and to formulate needs for the near future, 'exchange' port experts in Europe
- broad implementation of ECOPORTS system

Results

- training programme, plenary working sessions, country meetings, individual support, e-learning
- common approach in European ports
- network of trainers and environmental experts

6. Ecoports

WP5 'THINK TANKS'

Creation of basis for industrial bottom up R&D initiatives

Objective

- indepth case studies and quick scans should lead to collection of best practices, identification gaps, definition of new projects

Results

- at least 10 working groups to assess state of affairs in particular environmental topics, exchange solutions, and formulate goals for improvement
- initiate new projects

6. Ecoports

WP5 'THINK TANKS'

- Waste management
- Port-City relationship
- Habitats directive
- Sustainability in the logistic chain
- Dredging

6. Ecoports

WP6 'IMPACT ASSESSMENT'

Develop indicators to measure progress

Objective

- demonstrate the positive effects of ECOPORTS
- Demonstrate improvement of individual port + port sector
- Results
- environmental indicators
- impact assessment
  - contribution of ECOPORTS to the situation in Europe
  - effects of environmental topics on business development

www.ecoports.com

info@ecoports.com

project management :Willems & van den Wildenber eco@wnw.nl