European Maritime Safety Agency

EMSA Inventory of R&D projects relevant to marine pollution preparedness, detection and response

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Contents

1. Scope and aim of the R&D inventory

One of the tasks assigned to the European Maritime Safety Agency (EMSA) is to assist EU Member States and the Commission to address ship-sourced marine pollution from oil and other hazardous and noxious substances (HNS). This task, which covers the fields of pollution preparedness, detection and response, is implemented by EMSA through the provision of operational support to the EU Member States, as well as through activities facilitating cooperation and the dissemination of information in this area.

With this "*Inventory of R&D projects relevant to marine pollution preparedness, detection and response*", EMSA aims to collect, collate and disseminate, to the Member States and the general public, brief yet comprehensive information regarding two topics:

- Research and development (R&D) projects/programmes/studies/technologies linked to marine pollution preparedness, detection and response. Information provided (where available) includes the project's acronym and title, duration, coordinator, main objectives, outcomes and results, funding sources and direct links to the project's webpage(s), where interested parties can find more information on a specific project.

- European Community financial instruments that provide funding opportunities for R&D projects and activities linked to marine pollution preparedness, detection and response. Brief information is provided on the scope of the financial instrument, together with a link to the dedicated webpage, where more detailed information can be found. It should be noted that EMSA does not directly finance R&D activities.

256 R&D projects are included in this inventory. The projects presented in the inventory have been selected based on a combination of the following criteria:

- They are relevant to or address aspects linked to marine pollution preparedness, detection and response; Areas covered include for example: Oil spill monitoring; Decision support systems and software tools; Oil and chemical/HNS spill response; Risk assessment; Pollution detection; Aerial and satellite monitoring and surveillance systems; Modelling tools; Oceanographic and environmental monitoring; Cooperation and coordination actions.

- For the purposes of this inventory, "R&D projects" are broadly defined, including desk top studies, pre-operational models and tools, the development of marine pollution response equipment, as well as coordination and cooperation actions and networks.

- The projects included in this inventory are funded or coordinated by the European Union, regionally (within the framework of a Regional Agreement or a sub-region) or nationally (by an EU Member State, EFTA State or EU Candidate Country).

- The period covered in this inventory is from 2000 to 2009. The projects are divided in two tables and an annex. The first table lists 61 projects which are ongoing at the time

of writing (they have either been completed or are still ongoing in 2009). The second table lists 83 projects which have been completed in the period between 2000 and 2008. The table in the annex lists 112 projects related specifically to the *PRESTIGE* oil spill which have been nationally funded by Spain in the period from 2002 to 2007 (due to the large number of projects it has been decided to include these in an annex).

- All projects in tables one and two are listed in alphabetical order.

Where no information has been provided or found under a specific topic (e.g. project outputs/results or project webpage) the respective cell has been left blank.

In developing this inventory, EMSA collected data from the following sources:

- The relevant Directorates of the European Commission which either fund or coordinate R&D projects (e.g. DG Research, DG Environment, the JRC, DG Regio)
- The European Regional Agreements (e.g. HELCOM, Bonn Agreement, REMPEC)
- The EU Member States, the EU Candidate Countries, and the coastal EFTA States, through the Agency's Consultative Technical Group for Marine Pollution Preparedness and Response (CTG MPPR)
- A variety of sources based on internet and literature research conducted by EMSA.

Where available, the specific sources used to identify a project are mentioned in the inventory.

The data included in this inventory is for information purposes only. This updated inventory replaces the "*Overview of EU-funded R&D projects in the field of marine pollution*", which was published by EMSA in 2006. This updated inventory is published on the EMSA website (www.emsa.europa.eu) and it is the intention of the Agency to update it on a regular basis.

2. EC financial instruments providing R&D funding in the field of marine pollution

The following EC instruments have been identified as relevant for providing funding opportunities for R&D projects and activities linked to marine pollution preparedness, detection and response (this list is not exhaustive):

2.1 Seventh Framework Programme (FP7) of the European Community for research, technological development (RTD) and demonstration activities (2007-2013)

The Seventh Framework Programme (hereafter referred to as FP7) is the EU's main horizontal financial instrument for funding research in Europe for the period between 2007 and 2013, as it brings all research-related EC initiatives together under a common roof. The FP7 was adopted with *Decision No 1982/2006/EC of the European Parliament and of the Council of 18 December 2006 concerning the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013)*. FP7 is the natural successor to the Sixth Framework Programme (FP6) and is the result of consultation with the scientific community, research and policy making institutions, and other interested parties. The Framework Programmes were launched in 1984. FP7 supports research in selected priority areas.

The broad objectives of FP7 have been structured into 4 specific programmes:

1. Cooperation
2. Ideas
3. People
4. Capacities

The **Cooperation** programme supports research actions carried out in trans-national cooperation in the following 10 thematic areas corresponding to major fields of knowledge, science, research and technology, as shown in the table below:

1	Health
2	Food, agriculture and Fisheries, and Biotechnology
3	Information and Communication Technologies
4	Nano-sciences, Nano-technologies, Materials and New Production Technologies
5	Space
6	Energy
7	Environment (including Climate Change)
8	Transport (including Aeronautics)
9	Socio-economic Sciences and the Humanities
10	Security

The thematic areas "Environment", "Space" and "Transport" could be relevant to research needs related to marine environment, marine pollution and sustainable surface waterborne transport issues.

FP7 is designed to support a wide range of potential participants, such as public authorities, universities, regional authorities, public research organisations, private companies, small and medium sized enterprises (SMEs) and individual researchers.

For further information regarding FP7, please visit:

- www.cordis.europa.eu/fp7
- FP7 Brochure: http://ec.europa.eu/research/fp7/pdf/fp7-brochure_en.pdf
- http://ec.europa.eu/research/fp7/understanding/index.html
- FP7 National Contact Points: http://cordis.europa.eu/fp7/ncp_en.html

FP7 follows up on FP6 (Sixth Framework Programme for Research and Technological Development, which run from 2002 to 2006) and FP5 (Fifth Framework Programme for Research, Technological Development and Demonstration Activities, which run from 1998 to 2002).

For further information regarding FP6 and FP5, please visit:

- http://ec.europa.eu/research/fp6/index_en.cfm?p=0 and
- http://cordis.europa.eu/fp5/about.htm

Further funding opportunities under FP7:

- **The ERA-NET Scheme**
  The objective of the ERA-NET scheme is to develop and strengthen the coordination of national and regional research programmes through two specific actions:

  1. 'ERA-NET actions' - providing a framework for actors implementing public research programmes to coordinate their activities e.g. by developing joint activities or by mutually supporting joint calls for trans-national proposals.

  2. 'ERA-NET Plus actions'- providing, in a limited number of cases with high European added value, additional EU financial support to facilitate joint calls for proposals between national and/or regional programmes.

  Under the ERA-NET scheme, national and regional authorities identify research programmes they wish to coordinate or open up mutually. The participants in these actions are therefore programme 'owners' (typically ministries or regional authorities defining research programmes) or programme 'managers' (such as research councils or other research funding agencies managing research programmes).

  Examples of ERA-NET actions relevant for the marine pollution and the maritime sector include AMPERA (European Concerted Action to foster prevention and best response to Accidental Marine Pollution) and MarinERA (Co-ordination of National and Regional Marine RTD Activities in Europe).

  For further information regarding the ERA-NET scheme, please visit:
  http://cordis.europa.eu/fp7/coordination/eranet_en.html

- **The European Technology Platforms (ETPs)**
  European Technology Platforms bring together stakeholders, led by industry, to define medium to long-term research and technological development objectives and lay down markers for achieving them.
  Technology platforms play a key role in better aligning EU research priorities to industry's needs. They cover the whole economic value chain, ensuring that knowledge generated through research is transformed into technologies and processes, and ultimately into marketable products and services.

  For further information regarding the European Technology Platforms, please visit: http://cordis.europa.eu/technology-platforms/

  Example of a technologic platform relevant for the maritime sector is **WATER*BORNE.*** It is a forum where all stakeholders from the waterborne (sea & inland) sector define and share a common medium and long term vision, (Vision 2020), driving the innovation efforts, and also define and share a Strategic Research Agenda (SRA) describing the RDI initiatives necessary to materialise the vision.

  For further information regarding WATER*BORNE*, please visit:
  http://www.waterborne-tp.org/

2.2 The European Territorial Co-operation Objective (formerly known as INTERREG) (2007-2013)

Cohesion policy encourages regions and cities from different EU Member States to work together and learn from each other through joint programmes, projects and networks. The European Territorial Cooperation is one of the 3 objectives of the EU Cohesion Policy (alongside "convergence" and "competitiveness").

In the period 2007-2013 the European Territorial Co-operation objective (formerly known as INTERREG) is in its 4th phase (INTERREG IV). Since 1990, when the INTERREG Community Initiative was adopted, it has covered three phases: INTERREG I (19900-1994), INTERREG II (1994-1999) and INTERREG III (2000-2006).
The European Territorial Co-operation objective is financed by the **European Regional Development Fund (ERDF)**, which is one of the financial instruments of the EU's Cohesion Policy, and supports cross-border, transnational and interregional co-operation programmes. The budget available for this objective for the period 2007-2013 is €8.7 billion. For further information regarding the ERDF, please consult:
http://ec.europa.eu/regional_policy/funds/feder/index_en.htm

The European Territorial Co-operation objective covers the following three types of programmes:

1. Cross-border cooperation

2. Transnational cooperation
3. Interregional cooperation

A list of all the operational programmes funded under these three strands for the period 2007-2013 can be found at:
http://ec.europa.eu/regional_policy/cooperation/doc/authorities_websites.xls

2.2.1 (INTERREG IVA) Strand A: Cross-border Cooperation

Strand A covers 52 cross-border co-operation operational programmes along internal EU borders and deals with a wide range of issues. The ERDF contribution is €5.4 billion, which amounts to >70% of the budget.

For further information on the 52 cross-border programmes, please colsult the interactive map:
http://ec.europa.eu/regional_policy/atlas2007/eu/crossborder/index_en.htm

An example of a programme covered under the cross-border cooperation is:

- **Central Baltic INTERREG IV A Programme 2007-2013**
  Central Baltic INTERREG IV A Programme 2007-2013 is a European territorial co-operation programme funding cross-border projects in the central Baltic Sea area consisting of parts of Estonia, Finland (incl. Åland), Latvia and Sweden. The Programme aims at funding projects with altogether € 96 million from the European Regional Development Fund (ERDF) before the end of 2013, with a focus on environment, economic growth as well as attractive and dynamic societies

  For further information regarding this programme, please visit:
  http://www.centralbaltic.eu/

2.2.2 (INTERREG IVB) Strand B: Transnational Cooperation

Transnational cooperation works on a wider scale. It develops cooperation at a zonal level, in regions involving several countries. It includes 13 transnational co-operation programmes which cover larger areas of co-operation such as the North Sea, the Baltic Sea, the Atlantic Area, the Mediterranean and other regions. The ERDF contribution is €1.8 billion, which amounts to >25% of the budget.

Programmes covered under the transnational cooperation include the following (not exhaustive list):

- **Baltic Sea Region Programme (2007-2013)**
  The Baltic Sea Region is a co-operation programme under the European Territorial Co-operation Objective co-funded by the European Regional Development Fund (ERDF), and under the European Neighbourhood and Partnership Instrument (ENPI).

The EU's Baltic Sea Region programme promotes regional development through transnational cooperation, by funding projects fostering innovations, managing environmental resources and strengthening regions in the Baltic Sea Region. The programme is a tool to ensure the successful implementation of the **EU Strategy for the Baltic Sea Region**. Eleven countries, including Russia and Belarus, are working together in projects aiming to strengthen transnational cooperation. The total programme funding is €236 million, from the European Regional Development Fund (ERDF), from the European Neighbourhood and Partnership Instrument (ENPI) and from Norwegian national funding.

The Baltic Sea Region Programme covers projects related to marine pollution and the protection of the marine environment, as one of the 4 pillars of the EU Strategy for the Baltic Sea Region is to make the region a safe and secure place. Projects such as BRISK, SOKO II, Baltic Master II and EfficienSea are funded within the framework of the EU Strategy for the Baltic Sea Region.

For further information regarding the EU Baltic Sea Strategy and the projects funded under the Baltic Sea Region Programme, please visit:

- http://eu.baltic.net
- http://ec.europa.eu/regional_policy/cooperation/baltic/index_en.htm
- http://ec.europa.eu/regional_policy/cooperation/baltic/pdf/first24_project.pdf

- **INTERREG IV B North Sea Region Programme (2007-2013)**

  A principal aim of the Programme is to expand the scope of territorial cooperation and focus on high quality projects in innovation, the environment, accessibility, and sustainable and competitive communities. The 2007-2013 Programme connects regions from seven countries around the North Sea, incorporating policy level planning and the long lasting and tangible effects of projects.

  For further information regarding the North Sea Regiona Programme, please visit: http://www.northsearegion.eu/ivb/home/

- **Atlantic Area Transnational Cooperation Programme (2007-2013)**

  One of the programme's priorities is to protect, secure and enhance the marine and coastal environment sustainability. Marine pollution related projects, such as ARCOPOL, are funded under this programme.

  For further information regarding this programme, please visit: http://atlanticarea.inescporto.pt/

- **MED Operational Programme (2007-2013)**

  The MED programme is a transnational programme of European territorial cooperation. With a budget of more than € 250 million, the programme covers the coastal and Mediterranean regions of nine EU Member States. The partnership is enlarged by the

participation of Mediterranean countries which are candidates or potential candidates to the European Union.

Its priorities are:

- To improve the area's competitiveness in a way that guarantees growth and employment for the next generations (Lisbon strategy);
- To promote territorial cohesion and environmental protection, according to the logic of sustainable development (Goteborg strategy).

For further information regarding this programme, please visit:
http://www.programmemed.eu

2.2.3 Strand C: The interregional co-operation programme

Interregional cooperation works at pan-European level, it builds networks to develop good practice and facilitate the dissemination of lessons and experiences by successful regions. The interregional cooperation programme includes **INTERREG IVC)** and **3 networking programmes (Urbact II, Interact II and ESPON)** and covers all EU 27 Member States. They provide a framework for exchanging experience between regional and local bodies in different countries. The ERDF contribution for this strand is €445 million.

The INTERREG IVC Programme aims, by means of interregional cooperation, to improve the effectiveness of regional development policies and contribute to economic modernisation and increased competitiveness of Europe, by:

- Enabling local and regional actors across the EU to exchange their experiences and knowledge;
- Matching regions less experienced in a certain policy field with more advanced regions;
- Ensuring the transfer of good practices into Structural Funds mainstream programmes.

INTERREG IVC follows on from the INTERREG IIIC Programme that ran from 2002-2007.

For further information regarding Interreg IV C, please visit: http://www.interreg4c.eu/

2.3 LIFE+ Financing Instrument for the Environment (2007-2013)

LIFE is the European Union's financial instrument supporting environmental and nature conservation projects throughout the European Union and in some candidate and neighbouring countries. LIFE is a programme that was launched in 1992 by the European Commission and is coordinated by DG Environment. Since 1992 LIFE has co-financed some 2,750 projects for a total of €1.35 billion.

LIFE +, is the newest Financial Instrument for the Environment covering the period between 2007 and 2013, which entered into force with *Regulation (EC) No 614/2007 of the European*

Parliament and of the Council of 23 May 2007 concerning the Financial Instrument for the Environment (LIFE+). LIFE+ provides funding for projects linked to nature conservation, environmental technology and the communication of environmental matters.
LIFE+ has three components, with several principal objectives under each component:

1	LIFE+ Nature and Biodiversity
2	LIFE+ Environment Policy and Governance
3	LIFE+ Information and Communication

Projects financed by LIFE+ should contribute to the achievement of the specific objectives of more than one of these three components and to involve the participation of more than one Member State, as well as to contribute to the development of strategic approaches to meeting environmental objectives. Public and/or private bodies and institutions may receive financing through LIFE+. Many LIFE projects are located within the **Natura 2000** areas.

Depending on the specific subject matter, LIFE+ could finance marine pollution related projects.

For further information regarding LIFE+, please visit:

- http://ec.europa.eu/environment/life/funding/lifeplus.htm
- http://ec.europa.eu/environment/life/products/download/lifeplus_leaflet.pdf

For further information regarding financing of the Natura 2000 network, please visit:
http://ec.europa.eu/environment/nature/natura2000/financing/index_en.htm

2.4 Civil Protection Financial Instrument (2007-2013)

The Civil Protection Financial Instrument aims at supporting and complementing the efforts of Member States for the protection, primarily of people, but also of the environment and property, including cultural heritage, in the event of natural and man-made disasters, acts of terrorism and technological, radiological or environmental accidents. Furthermore, it intends to facilitate reinforced co-operation between the Member States in the field of civil protection.

The Civil Protection Financial Instrument covers three main aspects of civil protection activities: prevention, preparedness and response. The new financial instrument will cover:

- response and preparedness actions covered by the EU's civil protection mechanism;
- actions already covered by the 2000-2006 civil protection action programme, such as prevention (study of the causes of disasters, forecasting, public information) and preparedness (detection, training, networking, exercises, mobilisation of expertise) within the EU;
- new areas such as additional transport in response actions under the civil protection mechanism.

The financial envelope allocated to the instrument under the EU's 2007-13 financial framework amounts to €189.8 million.

For further information, please consult:
http://ec.europa.eu/environment/civil/prote/finance.htm

2.5 The European Neighbourhood and Partnership Instrument (ENPI) 2007-2013

Cross-border cooperation on the external borders of the EU shall be implemented through the European Neighbourhood and Partnership Instrument (ENPI) during the programming period 2007-2013. Until 31 December 2006, EC assistance to the countries of the European Neighbourhood Policy was provided under various geographical programmes including TACIS (for the EU eastern neighbours and Russia) and MEDA (for the EU southern Mediterranean neighbours), as well as thematic programmes such as the European Initiative for Democracy and Human Rights.

From 1 January 2007 onwards, as part of the reform of EC assistance instruments, the MEDA and TACIS and various other programmes have been replaced by a single instrument – the ENPI.

For further information regarding the ENPI (European Neighbourhood and Partnership Instrument), please consult: http://www.enpi-programming.eu/wcm/index.php

For further information regarding the European Neighbourhood Policy (ENP), please consult: http://ec.europa.eu/world/enp/index_en.htm

2.6 The Community Framework for Cooperation in the Field of Accidental or deliberate Marine Pollution (2000-2006)

In 2000, the European Community established the Community Framework for cooperation in the field of accidental or deliberate marine pollution, by Decision no 2850/2000/EC, with the aim of supporting and improving the Member States' efforts and capabilities for responding to marine pollution incidents, facilitating efficient mutual assistance and promoting the cooperation between Member States in this field. The framework for cooperation was run by DG Environment and provided financial support for actions such as workshops, training courses, exercises and pilot projects, in the field of preparedness and response to accidental and deliberate marine pollution. The Community Framework for Cooperation expired at the end of 2006.

For an overview of the projects and actions financed under the Community Framework for Cooperation in the field of accidental or deliberate marine pollution between 2000 and 2006, please visit:http://ec.europa.eu/environment/civil/marin/mp05_en_projects.htm

To read the Communication from the Commission regarding Cooperation in the field of accidental or deliberate marine pollution **after 2007**, please consult:
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2006:0863:FIN:EN:PDF

3. Further web-links of relevance to this inventory

- DG Environment: http://ec.europa.eu/environment/index_en.htm
- DG Energy and Transport, Transport service: http://ec.europa.eu/transport/index_en.htm
- DG Research: http://ec.europa.eu/research/index.cfm
- DG for Regional Policy: http://ec.europa.eu/dgs/regional_policy/index_en.htm
- DG Enterprise and Industry, Space Policy, GMES: http://ec.europa.eu/enterprise/policies/space/gmes/index_en.htm http://ec.europa.eu/gmes/index_en.htm http://ec.europa.eu/enterprise/policies/space/research/fp7-projects/index_en.htm
- Joint Research Centre (JRC): http://ec.europa.eu/dgs/jrc/index.cfm
- Maritime Affairs at the JRC: http://ipsc.jrc.ec.europa.eu/research.php?unit=4
- The Research Executive Agency of the European Commission (REA): http://ec.europa.eu/research/rea/index.cfm?pg=about#agency
- European Research Area (ERA): http://cordis.europa.eu/era/home_en.html
- ERAWATCH provides information on European, national and regional research policies, actors and programmes in the EU and beyond. ERAWATCH contributes to the realisation of the European Research Area (ERA) and currently covers 49 countries in total. http://cordis.europa.eu/erawatch/index.cfm
- CORDIS national service: http://cordis.europa.eu/national_service/home_en.html This service provides information on the national policies and frameworks for research throughout the European Union's Member States, candidate countries, associated countries and countries with S&T cooperation agreements. It also gives the latest research-related news and activities of the current and previous presidencies of the Council of the European Union
- European Research Council (ERC): http://erc.europa.eu/index.cfm
- Transport Research Knowledge Centre (TRKC): The Transport Research Knowledge Centre (TRKC) is designed to raise awareness of the outputs of transport research at European, national and international levels. TRKC provides analyses how the transport research results can be utilised to stimulate innovation in transport and to shape the European transport policy for sustainable mobility. To this end the TRKC collects,

structures and analyses transport research results from across the European Research Area. http://www.transport-research.info/web/

- Grants, Funds and Programmes by EU Policy: http://ec.europa.eu/grants/index_en.htm

- Practical Guide to EU funding opportunities for research and innovation: http://cordis.europa.eu/eu-funding-guide/home_en.html

- EurOcean (The European Centre for Information on Marine Science and Technology): http://www.eurocean.org/

- EurOcean European Marine Research Funded Projects: http://www.mapinfobase.eurocean.org/

- Belgian Federal North Sea Research Programme (BELSPO): http://www.belspo.be/belspo/Northsea/index_en.stm

- UK, MCA Research, Environmental Protection: www.ukshipregister.co.uk/mcga07-home/aboutus/mcga-aboutus-whatwedo/mcga-aboutus-research2/ds-newpage-29.htm

- RITMER: Network of Research and Technological Innovation (*Réseau de Recherche et d'Innovation Technologiques*, abbreviated as RRIT) on the theme of "Accidental Marine Pollution Events and their Ecological Consequences: http://www.ritmer.org/uk/index.html

- CETMAR - Centro Tecnologico del Mar: http://www.cetmar.org/en/default.aspx

4. Disclaimer

EMSA's aim has been to provide a brief overview of and direct links to further information sources regarding the material provided in this inventory. Data included in the inventory is for information purposes only. This inventory does not imply any endorsement, support, evaluation or assessment of any R&D project by EMSA, nor can EMSA guarantee that the information provided in the inventory is complete or still accurate. The material included in the inventory is based on information obtained from the sources mentioned on page 4 and/or information available on the projects' websites at the time of writing (November 2009). For further information on a project or a financial instrument please consult the dedicated web-pages or contact details, as provided in the inventory.

5. Table of ongoing R&D projects (2009)

Title & info source[1]	Marine pollution related areas[2]	Duration & coordinator	Objectives	Outputs/Results[3]	Funding instrument	Webpage(s)
"AMPERA" European coordination action to foster prevention and best response to Accidental Marine Pollution (AMP) (Source: European Commission, DG Research, Dir. B and AMPERA publication Nr 3)	Pollution preparedness and response, coordination of research activities	Duration: 01/04/2005-31/10/2009 Coordinator: Ministry of Education and Science (MEC), Spain	Specific objectives: • To set priorities in transdisciplinary AMP research • To improve linking of AMP research with prevention and mitigation activities • To improve coordination of national and regional research programmes on AMP • To design strategies to overcome barriers that hinder transnational cooperation • To launch long-term RTD strategies • To disseminate knowledge at different levels	Among the AMPERA deliverables: Inventory of R&D programmes conducted on aspects of accidental marine pollution http://www.cid.csic.es/ampera/images/reports/1D.1.1.1%20Inventory%20of%20R&D%20Programmes.pdf	EC funding (FP6): Funded under the "ERA-Net Scheme" of the 6th Framework Programme Total budget: € 1.569.415 EC funding: € 1.569.415	http://www.cid.csic.es/ampera/ AMPERA Reports: http://www.cid.csic.es/ampera/pages/reports.php
"ARCOPOL" The Atlantic Regions' Coastal Pollution Response (Source: Internet research)	Pollution preparedness & response; regional cooperation; oil and chemical/HNS spill response;	Duration: 2009 - 2011 Coordinator: CETMAR (Centro Tecnologico del Mar), Spain	ARCOPOL aims to improve prevention, response and mitigation capabilities against oil, HNS and inert spills and to establish the basis for a sustainable Atlantic network of experts supported by adequate information, data exchange and management tools.		EC funding : The Atlantic Area Transnational Programme of the European Territorial Co-operation	http://www.arcopol.eu/ Summary: http://www.cimar.org/cimar2008/pdf/jobs/

[1] Projects are presented in alphabetical order, irrelevant of project type, scale, outputs etc
[2] Marine pollution related areas include for example: risk analysis, pollution preparedness, pollution response, pollution detection, monitoring and surveillance systems, dispersant use, modelling tools, information tools and decision support services, regional cooperation; oil and chemical/HNS spill response; oceanographic and environmental monitoring
[3] Project outputs and results are only presented where available. If no information has been provided or found, this part has been left blank. Further updated information may be found on the project's dedicated webpage(s), if available

			ARCOPOL is a successor to the EROCIPS project.		Objective (ERDF) Total budget: € 3.072.233	ARCOPOL%20Summary.pdf
"ARGOMARINE" Automatic Oil-Spill Recognition and Geopositioning integrated in a Marine Monitoring Network (Source : European Commission, JRC, IPSC)	Oil spill monitoring in marine protected areas	Duration 2009 - 2012 Coordinator: JRC	• The ARGOMARINE project aims to develop a Marine Information System (MIS) to meet the needs for improved marine pollution monitoring and forecasting in support of emergency handling. • The scope of ARGOMARINE is to develop and test an integrated system for monitoring marine traffic and pollution events, including recreational boats through environmental-sensitive sea areas. • This monitoring will be implemented by means of electronic, geopositioning, and tools for transmitting ship navigation data through a high speed communication network. • Environmental data from different sensors (SAR, hyperspectral sensor, thermal sensors, electronic noses, and acoustic sensors) on satellites, aircraft, vessels, in situ anchored buoys and AUVs will be collected in test areas, and sent by telemetric links to a central server where all the data are integrated by use of web mapping technology.		EC funding (FP7): Funded within the GMES (Global monitoring for the environment and security) area of the "Space" area of the 7th Framework Programme Total budget: € 4.299.000 EC funding: € 3.270.000	http://cordis.europa.eu/fetch?CALLER=FP7_PROJ_EN&ACTION=D&RCN=92507 http://ipsc.jrc.ec.europa.eu/showca.php?id=97
"AS-MADE" Assessment of Marine Debris on the Belgian Continental Shelf:	Marine pollution, decision support systems and software tools	Duration : 2 years Coordinator: University of Ghent	The AS-MADE research project aims to address this data gap by performing the following research activities: ▪ Develop an integrated data base		National funding Programme: Science for a sustainable	http://www.belspo.be/belspo/Northsea/program/phaseVII_en.stm

Occurrence and effects (Source: BELSPO - Belgian Science Policy Office)			using existing information on the presence of marine debris in the various (Belgian) marine compartments; ▪ Conduct - using existing and newly developed techniques - dedicated quantitative monitoring surveys (temporal and geographical coverage in all marine compartments) to validate the developed data base; ▪ Assess the effects of this debris (including associated micro-contaminants) on selected marine species (invertebrates and birds), ▪ Evaluate the financial impact of this form of pollution (removal vs. prevention), and ▪ Propose science-based policy evaluation tools.		development (SSD) Total budget: € 179.619	
"Baltic Master II" (Source: Internet research)	Oil spill pollution prevention and response	Duration: 2009-2012 Coordinator: Region Blekinge, Sweden	Baltic Master II is an international project which aims to improve maritime safety by integrating local and regional perspectives. The overall aim of Baltic Master II is to improve the on-land response capacity to oil spills in the Baltic Sea as well as to enhance the prevention of pollution from maritime transport. Baltic Master II is a follow -up project to its successful predecessor Baltic Master I.		Part-financed by the ERDF within the framework of the Baltic Sea Region Programme 2007-2013, under the European Territorial Co-operation Objective Total budget: ~€4 million	http://www.balticmaster.org/index.aspx?page_id=1

"BOHASA" Behaviour of oil and other hazardous substances in Arctic waters (Source: Norwegian Coastal Administration, NCA)	Oil and HNS spill response	Duration: 2009-2010 Coordinator: Ole Bjerkemo, Norwegian Coastal Administration (NCA)	To gather and synthesize the current knowledge and expertise on the behaviour of oil and other hazardous substances (HNS) in Arctic waters, in order to promote the development and use of technologies and working methods that improve the capability to respond to accidents that involve substances.		Regional and national funding: Nordic Council, Norwegian Ministry of Foreign Affairs Total budget: € 110.000	
"BORIS II" Baltic Sea Oil Recovery Information System (Source: Finnish Environment Institute, SYKE)	Decision support systems and software tools	Duration: 2009- 2012 Coordinator: Finnish Environment Institute - SYKE	To continue the OILI project and update the BORIS (Baltic Oil Response Information System) map interface. (For more information on the OILI project, see table below of past/completed projects)		National funding	www.ymparisto.fi/syke/boris2
"BRISK" Sub-regional risk of spill of oil and hazardous substances in the Baltic Sea (Source: HELCOM)	Oil and chemical spills, pollution response, contingency planning, Baltic regional cooperation in marine pollution, risk assessment	Duration: 2008- 2011 (36 months) Coordinator: Admiral Danish Fleet HQ, Denmark	• To increase the preparedness of authorities in the Baltic Sea countries to jointly respond to accidental pollution from ships • To ensure early and well organized response operations in case of major shipping accidents • To enhance sub-regional cooperation	Expected outputs: • An overall risk assessment of pollution (by oil and hazardous substances) caused by shipping accidents covering the whole Baltic Sea; • Identification of missing response resources needed in all sub-regions of the Baltic to effectively tackle major spills of oil and hazardous substances;	EC and national funding from the Baltic States Total budget: € 3.510.541 EC funding: € 2.554.266 (from the ERDF, under the Baltic Sea Region Programme 2007-2013)	http://www.helcom.fi/projects/on_going/en_GB/BRISK/ and http://www.brisk.helcom.fi/

				• Agreement among the neighbouring countries on how to jointly fill in the identified gaps in response resources; • Progress in concluding bi- and multilateral agreements on joint response operations. • A report is expected in 2012	and € 180.000 (from the European Neighbourhood and Partnership Instrument - ENPI)	
"CLARA II" software Calculations related to accidental releases in the Mediterranean Sea (Source: Cedre & internet research)	Modelling chemical pollution	Duration: 2008-2010 Coordinator: Ecole des mines d'Ales, France	The aim of CLARA II is to develop an operational software tool for modelling chemical pollution in the Mediterranean Sea and assessing consequences and vulnerability. The CLARA II Project is a continuation of development of the CLARA project for the Mediterranean coasts.	• Slick drift in 2D; • Concentration in the water column and in the air (for both, map in 3D); • mass distribution of the product in terms of main behaviours (evaporation, dispersion, floating); • Assessment of the ecotoxicological impact; • Database on 100 chemicals, hydrodynamic data can be uploaded on a specific website, information on heat flow in case of slick burning, information on emergency response eventually applicable (feed back from past accidents); • results of the modelling are presented with a degree of confidence,	National funding: The project is supported by the French National Research Agency (ANR) Total Budget: €2.400.000	http://clara2.ema.fr/

				• maps on sensitivity and vulnerability of the shoreline (SIG).		
"DaGoRus" Safe and reliable transport of dangerous goods in the Russian-EU logistics chain (Source: Internet research)	Risk assessment, transport of dangerous goods	Duration: 2007-2009 Coordinator: Technical Research Centre of Finland, VTT	Background: Project DaGoB This is an extension of the DaGoB project (For more information on the DaGoB project, see table below of past/completed projects)	Expected results: • The current practices and operational procedures in EU and Russia will be identified. • Bottlenecks in the DG transport chain will be identified, thus giving the possibility to find out tools (risk control options) and new harmonized procedures to improve safety and reliability. • The project will provide a risk assessment in the DG supply chain by studying real life transport cases.	EC funding: From the External (Tacis) Funding of the Baltic Sea Region INTERREG III B Neighbourhood Programme (financed by the European Regional Development Fund (ERDF)	http://info.tse.fi/dagob/dagorus.asp and http://www.tlog.lth.se/forskning/dagorus/
"DeMarine" Environment relevant sub project: "Drift forecasting" (Source: BfG - Federal Institute of Hydrology, Germany)	Oil and chemical spills, pollution detection, aerial and satellite monitoring and surveillance systems, forecast models, information services, decision support systems and software tools	Duration: 3 years Starting date: February 2008 Coordinator: DLR (German Aerospace Center)	▪ Improving the monitoring of regional/national waters ▪ Use of remote sensing information by satellite and aircraft for starting oil spill drift model runs ▪ Develop software tools ▪ Optimize procedures & improve data flow ▪ Perform case studies for validation and give suggestions for improvement and adaptation of the drift model	▪ "Offline" processing chain established. ▪ First „offline" case studies with integration of remote sensing data (satellite and aircraft) into drift model runs	National funding by BMWi (Federal Ministry of Economics and Technology) Total budget of sub project: ~€180.000	www.demarine.de
"DEOSOM"	Pollution detection,	Duration:	To develop an innovative water	Expected result:	EC and national	http://www.ino

Detection and evaluation of oil spills by optical methods (Source: AMPERA publication Nr.3)	monitoring and surveillance	36 months Starting date: September 2008 Coordinator: INOV-INESC-Inovação, Portugal	inspection method for shipborne or airborne surveillance based on laser remote sensing, namely, on laser-induced fluorescence light detection and ranging (LIF LIDAR).	The project will result in the development of a low cost portable and modular Laser Fluorosensor for automatic oil spill detection. This instrument will be combined with a low-cost geo-referencing system in order to create an inexpensive sensor for automatic detection and characterisation of oil spills.	funding: Funded through the call for proposals on accidental marine pollution, within the framework of the AMPERA programme Budget: € 377.126	v.pt/pages_e/monitoring/deosom/deosom_e.php
"DISCOBIOL" Dispersants use in coastal areas & estuaries: Impact assessment of dispersed oil to implement the decision making process (Source: Internet research)	Dispersant use	Duration: 2008-2010	The Discobiol is a study project focusing on the use of chemical dispersants as a response technique in coastal areas. It aims to provide the responders with practical information needed to decide on the use of dispersants in coastal areas, including estuaries. The work program aims to acquire comparable and robust information on the impact of dispersed oils towards the different habitats and resources of estuaries and/or close bays.		National funding: Co-funded by the French ANR (Agence Nationale de la Recherche), the Marine Nationale and MEEDDAT-DE Total budget: €1 million	http://www.cedre.fr/project/discobiol/index.php
"DRIFTER" HNS, Oil and Inert Pollution: Trajectory modelling and monitoring	Modelling tools	Duration: 24 months Starting date: September 2008 Coordinator:	Specific project objectives include: • To improve the capability to follow up spills by identifying the most suitable drifting buoys to be used for the different spill types, exploring the application of dyes to mark colourless slicks of chemicals	The expected project outcomes are of high applicability and include among others guidelines for drifters and dyes application, wind and wave coefficients, operational	EC and national funding: Funded through the Call for proposals on accidental marine pollution,	http://www.intecmar.org/drifter/Exercise.aspx

(Source: AMPERA publication Nr.3)		Centro Technologico del Mar (CETMAR) Spain	and applying satellite and remote sensing technologies • To improve the capability to forecast drifts of oil, HNS and inert pollution • To review, identify and adapt oil spill monitoring and forecasting technologies to predict the behaviour and drifts of HNS and inert pollution	models, good practices protocols for communication and data exchange, new algorithms for segmentation, characterization and discrimination of oil spills, spectral studies of the different pollutants and information on the most adequate bands for their detection.	within the framework of the AMPERA programme Budget: € 408.038	
"EAUCBSDML" Assessment and analysis of the use of dispersants in biologically safe conditions in the coast. Technical and toxicological assessment. (Source: General Directorate of Merchant Marine, Spain)	Dispersant use	Duration: 2007- ongoing Coordinator: CSIC (Consejo superior de Investigaciones Científicas)- Instituto de Investigaciones Marinas, Spain	Feasibility analysis of the recuperation of rocky shores affected by the oil slick using biologically safe dispersants		Programme: PREVECMA network National funding: Ministry of the Presidency Total budget: € 55.000	
"ECBSea" Environmental Collaboration for the Black Sea, in Georgia, Russian Federation, Ukraine and Moldova (Source: Internet research)		Duration: 2007 – 2009 (30 months) Coordinator:	The Project seeks to strengthen regional co-operation, improve the main regional agreement, the Convention on the Protection of the Black Sea Against Pollution (the Bucharest Convention) and national capacities to implement the Convention. One of the major project goals is to prepare proposals on technical amendments to the Bucharest		EC funding under the Tacis programme Budget: €2.2 million	http://www.ecbsea.org/en/ Project leaflet: http://www.ecbsea.org/files//content/BlackSea_Booklet_eng_1.pdf

			Convention.			
"ECOOP" European Coastal Sea Operational Observing and Forecasting System (Source: Internet research)	Marine pollution, observation, forecasting	Duration: 2007-2010 Coordinator: Danish Meteorological Institute (DMI)	The overall aim is to consolidate, integrate and further develop existing European coastal and regional seas operational observing and forecasting systems into an integrated pan-European system targeted at detecting environmental and climate changes, predicting their evolution, producing timely and quality assured forecasts, providing marine information services (including data, information products, knowledge and scientific advices) and facilitate decision support needs. The MERSEA Integrated Project has looked at the provision of ocean basin scale forecast model outputs to a variety of intermediate users. The ECOOP Integrated Project will take the products made available by MERSEA and fine tune them to meet a variety of applications in European Coastal Seas such as: ▪ Ecosystem models ▪ HAB warning systems ▪ Oil spill and contaminant dispersion and forecast studies ▪ Maritime ship routing applications		EC funding (FP6): Under the priority 'Sustainable Development, Global Change and Ecosystems' Total budget: €11.238.655 EC funding: €6.990.251	http://www.ecoop.eu/ CORDIS wesbite
"ECORAID" Ecological Risk Assessment Information Data-mining and Comparison (Source: AMPERA	Risk assessment, chemical spills	Duration: 12 months Starting date: September 2008 Coordinator: University of	• To perform a desk top study to review literature and current best practice in the application of biotools in risk assessment • To produce a document providing guidelines on the incorporation of biotools with chemical and	Expected result: A document will be produced and disseminated providing guidelines to aid the integration of biotest results into the decision making process when	EC and national funding: Funded through the Call for proposals on accidental marine pollution, within the	

publication Nr.3)		Exeter, UK	ecological measurements into environmental assessments suitable for pollution response.	responding to spills.	framework of the AMPERA programme Budget: € 105.000	
"EfficienSea" Efficient, Safe and Sustainable Traffic at Sea (Source: Maritime Institute in Gdansk-MIG, Poland)	Risk assessment, maritime safety	Duration: 2009-2012 Coordinator: Danish Maritime Safety Administration (DaMSA)	The overall aim is to enhance maritime safety and the environmental state of the Baltic Sea region. The project will develop and test tools to improve maritime safety. EfficenSea will establish a dynamic risk management system to respond to the increasing traffic and deficits in the monitoring of ship traffic.		EC and national funding: Baltic Sea Region Programme 2007-2013, under the European Territorial Co-operation Objective Total budget: € 7.995.319 EC funding (ERDF): € 5.300.000 Norwegian funding: € 600.000	http://www.efficiensea.org
Establishing an oil recovery center in Finland (Source: Finnish Environment Institute, SYKE)	Marine pollution preparedness and response	Duration: ongoing Coordinator: Finnish Environment Institute, SYKE	To establish an oil recovery center that will be a training center and an equipment depot		National funding	

"FACE-iT" Fast Advanced Cellular and Ecosystems Information Technologies (Source: Internet research)	Marine pollution, risk assessment	Duration: 2005-2009 Coordinator: Department of Fundamental Microbiology University of Lausanne, Switzerland (faceit@unil.ch)	▪ To develop adequate and effective biological methods to detect the presence, nature and magnitude of pollution disasters and their effects on aquatic living beings. ▪ To predict the medium and the long-term consequences for the aquatic ecosystem and the self-regeneration capacity after an oil pollution disaster. ▪ To link different biological, physico-chemical and modeling approaches in order to achieve an integrated measurement and effect prediction. ▪ To disseminate the scientific and technical outcomes of the project to the different main actors of disaster management	Project deliverables: http://www.unil.ch/Jahia/site/face-it/pid/40055	EC funding (FP6): Funded by the 6th Framework Programme Total budget: €5.290.000 EC funding: €3.690.000	http://www.unil.ch/face-it
"HERMIONE" Hotspot Ecosystem Research and Man's Impact on European Seas (Source: European Commission, DG Research, Dir. I) (The HERMES project http://www.eu-hermes.net/ was the predecessor of HERMIONE)	Marine environment	Duration 3 years Starting date: 01/04/2009 Coordinator: National Oceanographic Center, Southampton, UK	4 main objectives: ▪ To investigate the dimensions, distribution and interconnection of deep-sea ecosystems ▪ To understand changes in deep-sea ecosystems related to key factors including climate change, human impacts (through fishing, resource extraction, seabed installations and pollution) and the impact of large-scale episodic events on deep-sea ecosystems ▪ To understand the biological capacities and specific adaptations of deep-sea organisms, and investigate the importance of biodiversity in the functioning of deep-water ecosystems ▪ To provide stakeholders and policymakers with scientific		EC funding (FP7): Funded under the 7th Framework Programme Total budget: € 10.885.000 EC funding: € 8.000.000	http://www.eu-hermione.net/

			knowledge to support deep-sea governance aimed at the sustainable management of resources and the conservation of ecosystems			
Identification in darkness and bad visibility (Source: Norwegian Coastal Administration, NCA)	Decision support system	Duration: 2008- 2010 Coordinator: NCA	Find different tools for detection of oil and HNS in darkness and bad visibility	Improved technology	Funding: Oil industry and Norwegian State	
"IMPRES" Environmental impact of the *Prestige* oil spill in the Basque coast (Source: General Directorate of Merchant Marine, Spain)	Marine pollution, pollution prevention, preparedness and response, risk assessment	Duration: 2004-? Coordinator: AZTI – Tecnalia, Spain	This project was requested by the Basque government due to the effects of the *Prestige* oil spill on the Basque coasts, as a continuation of the emergency response carried out during the first stage of the crisis. This project establishes the base for a comprehensive approach in the monitoring of environmental catastrophes.		Programme: ETORTEK action National funding: Basque regional government	
"INRAM" Integrated Risk Assessment and Monitoring of micro pollutants in the Belgian coastal zone (Source: BELSPO – Belgian Science Policy Office)	Marine pollution, risk assessment	Duration : 4 years (2006-2010) Coordinator: University of Ghent	Main objectives of INRAM are to: ▪ Study the environmental concentrations of established priority and emerging pollutants and their transfer to coastal waters; ▪ Apply a unique combination of novel field and laboratory ecotoxicological and chemical techniques to determine both effects and food chain transfer of these chemicals; ▪ Establish the relationship between local occurrence of hazardous		National funding Programme: Science for a sustainable development (SSD) Total budget: € 1.105.091	http://www.vliz.be/projects/inram/ and http://www.belspo.be/belspo/Northsea/program/phaseVII_en.stm

			compounds, ecosystem health and potential human health effects, through the use of consumer organisms as test/monitoring species; ▪ Develop and evaluate a framework and toolbox for monitoring the chemical anthropogenic pressures on coastal ecosystems and commercial marine products			
"JIP Oil in Ice" Joint Industry Program on Oil in Ice (Source: Norwegian Coastal Administration, NCA)	Spill response technology and equipment innovation	Duration : 2006 – 2009 Coordinator: SINTEF (NCA is observer to the project)	The overall objective of the program is to develop knowledge, tools and technologies for environmental beneficial oil spill response strategies for ice-covered waters. The program will: ▪ Improve the ability to protect the Arctic environment against oil spills ▪ Give improved basis for decision making ▪ Enhance the state-of-the-art in Arctic oil spill response The program covers the following R&D areas: ▪ Mechanical recovery ▪ Use of dispersants ▪ Burning of oil spills ▪ Remote sensing and ▪ Numerical modelling		Funding: Oil industry	http://www.sintef.no/Projectweb/JIP-Oil-In-Ice/
"KBUOY" Automatic kit for spill monitoring (Source: General	Spill monitoring & surveillance systems	Duration: 2008-? Coordinator: MAREXI	Spill surveillance using autonomous GPS buoys		Programme: KBUOY Private, national funding	

Directorate of Merchant Marine, Spain)						
"LIMES" Land and Sea Integrated Monitoring for Environment and Security (Source: European Commission, DG Enterprise and Industry, Dir. H)	Satellite monitoring and surveillance systems, environmental monitoring, information services, maritime surveillance	Duration: 2007-2010 Coordinator: Telespazio S.p.A.	• Coastal and open-water surveillance • Sensitive cargo surveillance (e.g. cargoes containing hazardous material) at EU level • Area surveillance outside the EU, including non-EU coasts and sensitive hot-spots	Expected results: The services developed by LIMES will support the building up of a common cooperation framework between the major EU research and operational actors on Security management	EC funding (FP6-IP): Funded within the GMES (Global monitoring for the environment and security) area of the "Space" thematic priority Total budget: € 21.248.000 EC funding: € 11.980.000	http://www.fp6-limes.eu and http://isferea.jrc.ec.europa.eu/Activities/ProjectPortfolio/Pages/Limes.aspx
"MarinERA" Co-ordination of national and regional marine RTD activities in Europe	Coordination of research activities	Duration : 2004-2009 Coordinator : Institut francais de recherché pour l' exploitation de la mer (IFREMER), FRANCE	• To map European marine RTD programmes and contribute to the development of a European marine research policy; • To facilitate the networking of marine RTD funding agencies in the EU; • To provide a basis for the sharing of available resources to address priorities.		**FP6**: Funded under the "ERA-Net Scheme" (2002-2006), regarding the coordination of research activities Project cost: €2.95 million EC funding: €2.95 million	CORDIS FP6 http://www.marinera.net/
"MARTEC" ERA-NET Maritime Technologies	Research fields : Shipbuilding, Ship and port operation,	Duration: 01.06.2006-31.12.2010	The overall objective of the MARTEC ERA-Net is to form a sustainable network and partnership of key funding agencies and ministries aiming at	Europe's approach to maritime research is fragmented. MARTEC will define topics for future	EC funding under the FP6**:** €2 million	http://www.martec-era.net

(Source : Internet research)	Maritime equipment and services, Inland water and intermodal transport, Offshore industry, Offshore structures for renewable energy, Fishing/aquaculture, Polar technology, Environmental impact, Safety and security, Human elements	Coordinator: Research Centre Juelich GmbH Germany	deepening the understanding of conditions for management of maritime technologies research. The project will: • Analyse national programme objectives and priorities • Map management procedures • Identify gaps in existing programmes • Define topics for future research activities and calls • Suggest ways of removing administrative barriers • Develop strategies and an action plan for the mutual opening-up of national programmes, leading to the development of jointly funded research activities between different European countries Improve researcher mobility	research activities and calls.		
"MIDSIS TROCS" (Source: REMPEC)	Decision support systems and software tools	Duration: 2 years(ongoing) Coordinator: REMPEC	To review the MIDSIS TROCS decision support tool already available.	Improved capacity to take informed decisions for chemical spills.	Regional funding: MTF (Mediterranean Trust Fund) Total budget: € 10.000	http://www.rempec.org
"MODELKEY" Models for Assessing and Forecasting the Impact of Environmental Key Pollutants on Marine and		Duration: 2005-2010 Coordinator: UFZ Centre for Environmental Research Leipzig-Halle, Germany	MODELKEY comprises a multidisciplinary approach aiming at developing interlinked and verified predictive modelling tools as well as state-of-the-art effect-assessment and analytical methods generally applicable to European freshwater and marine ecosystems		EC funding under the FP6	http://www.modelkey.org/

Freshwater Ecosystems and Biodiversity (Source: Internet research)						
"MONINFO" Environmental Monitoring of the Black Sea Basin: Monitoring and Information Systems for Reducing Oil Pollution (Source: Black Sea Commission (BSC)	Marine pollution, pollution prevention, preparedness and response, oil spills, pollution detection, aerial and satellite monitoring and surveillance systems, environmental monitoring	Duration: 2 years (ongoing) Coordinator: George Balashov, BSC	▪ To improve the safety of oil transfer; ▪ To collect and access information on the oil pollution and environmental impact by oil and oil derivatives on the Black Sea marine ecosystem; ▪ To improve the exchange of oil-related information in the region; ▪ To update and improve national and regional contingency plans for oil pollution; ▪ To efficiently respond to any oil spill accident or emergency situation; ▪ To perform risk and impact assessments; ▪ To reduce and eventually eliminate illegal discharges of ship-generated wastes in the Black Sea	Expected results: ▪ Improved information system for combating oil pollution ▪ Enhanced monitoring system of operational and accidental pollution ▪ Enhanced response capabilities, including risk management and emergency preparedness planning	EC and regional funding Total budget: €1.250.000 EC funding: € 1.000.000 Regional funding: €250.000	www.blacksea-commission.org
"MONRUK" Monitoring the marine environment in Russia, Ukraine and Kazakhstan using Synthetic Aperture Radar (SAR) (Source : European Commission, JRC,	Satellite monitoring and surveillance systems, environmental, monitoring, regional and international cooperation	Duration 24 months Starting date: 01/07/2007 Coordinator: Nansen Environmental and Remote Sensing Centre (NERSC)	Overall objective: • To develop and implement satellite Synthetic Aperture Radar (SAR) monitoring of the marine environment in Russia, Ukraine and Kazakhstan (for the Barents, Black and Caspian seas) as a component of GMES. Specific scientific objectives: • Develop and test algorithms for retrieval of marine geophysical parameters from Synthetic Aperture		EC funding (FP6-STREP): Funded within the GMES (Global monitoring for the environment and security) area of the "Space" thematic priority Total budget: € 1.044.228	http://monruk.nersc.no

IPSC and DG Enterprise and Industry, Dir. H)			Radar images, including open ocean parameters as well as sea ice parameters; • Improve the forward modelling of sea surface radar scattering, including effects of current features, ocean fronts and slicks; • Apply retrieval algorithms and radar scattering models as methods in the analysis of SAR images for improved quantification of sea surface parameters with focus on oil spill and sea ice monitoring.		EC funding: € 632.314	
"MyOcean" Development and pre-operational validation of upgraded GMES Marine Core Services and capabilities (Source: European Commission, DG Enterprise and Industry, Dir. H)	Satellite monitoring and surveillance systems, oceanographic and environmental monitoring, information services, oil spills	Duration: 39 months (01/01/2009 – 31/03/2012) Coordinator: Mercator Ocean	• To deploy the first integrated pan-European capacity for ocean monitoring and forecasting • To support applications linked to maritime security, oil spill prevention, water quality, marine resources management, coastal activities, seasonal forecasting, climate change and ice sheet surveys.	To set up a new European service for Ocean Monitoring and Forecasting	EC funding (FP7-CP): Funded within the GMES (Global monitoring for the environment and security) area of the "Space" thematic priority Total budget: € 55.024.887 EC funding: € 33.800.000	http://www.myocean.eu.org/
"NASARM" North Atlantic Sensitivity and Response Map (Source: Environment	Marine pollution preparedness, pollution response, risk assessment, information services, decision support systems	Duration : February 2009 – September 2010 Coordinator: Environment Agency of Iceland	▪ Collect information on nature and wildlife in the North Atlantic from the east cost of Greenland, through the waters around Iceland and Faroe Islands to the coast of Norway. ▪ Collect information on possible	Expected result: Web based map or information system aimed to support decision when planning pollution preparedness and/or pollution response.	Regional funding: Nordic Council of Ministers Total budget: 2.100.000 DKK	

Agency of Iceland)			pollution sources in the area and on preparedness and response capacity and equipment.			
"OILDEBEACH": Buried fuel in the intertidal beach zone: coupling between beach morphodynamic, natural degradation, forcing mechanisms and biological activity (Source: AMPERA publication Nr.3)	Marine pollution	Duration: 36 months Starting date: September 2008 Coordinator: University of Vigo, Marine and Environmental Geology Group, Spain	Primary project objective: To study the fate of buried oil in the intertidal zone of beaches, in order to improve the applicability of morphodynamic driven oil burial models to support decision-making in the clean-up design.		EC and national funding: Funded through the Call for proposals on accidental marine pollution, within the framework of the AMPERA programme Budget: € 200.000	http://oildebeach.geoma.net/
"OILRISK" (Source: Finnish Environment Institute, SYKE)	Marine pollution, environmental monitoring	Duration : 2009-2012 Coordinator : Kotka Maritime Research Centre (KMRC)	To refine and develop the results of the OILECO- project (integrating ecological values in the decision making process on oil spill combating in the Gulf of Finland) (For more information on the OILECO project, please see table below of past/completed projects)		Funding: EC/Interreg and national funding (cities of Kotka and Porvoo) Total budget: € 1.000.000	

"OP-ENVIRONMENT" Operational Programme of the III CSF-Environment (Source: Ministry of Mercantile Marine, Aegean & Island Policy, Greece)	Dispersant use, marine pollution preparedness and response	Duration: Up to 31-12-2009 Coordinator: Ministry for the Environment, Physical Planning and Public Works	▪ The supply of 3 dispersant application equipment ▪ The supply of 7 oil skimmers		EC and national funding Programme: Operational Programme of the III CSF (Community Support Framework) Total budget: € 42.000 (for the dispersant appl. Equipment) & € 217.284 (for the oil skimmers)	www.epper.gr
"OP-RAPUD" Operational Programme of the III CSF-Road Axes, Ports and Urban Development (Source: Ministry of Mercantile Marine, Aegean & Island Policy, Greece)	Marine pollution preparedness and response	Duration: Up to 31-12-2009 Coordinator: Ministry for the Environment, Physical Planning and Public Works	The supply of 4 sea mop skimmers		EC and national funding Programme: Operational Programme of the III CSF Total budget: € 104.244	www.epoalaa.gr
"OSERIT" Development of an integrated software for forecasting the impacts of accidental oil	Marine pollution, oil and chemical spills, dispersant use, decision support systems and software tools	Duration: 2 years Coordinator: MUMM, Belgium	The objectives of the research project OSERIT are double: ▪ The first, scientific objective is the development of a mathematical model that directly simulates the time and space evolution of oil concentration in the water column		National funding Programme: Science for a sustainable development (SSD)	http://www.belspo.be/belspo/Northsea/program/phaseVII_en.stm

pollution (Source: BELSPO – Belgian Science Policy Office)			as well as the exposure time of a predefined set of oil-sensitive environmental targets. ▪ The second objective is the development of an operational decision-making tool that integrates all the relevant pieces of information in order to rapidly perform a *Net Environmental Benefit Analysis* in the turbid shallow waters of the Belgian continental shelf.		Total budget: 179.410 €	
"PREMIAM" Pollution Response in Emergencies – Marine Impact Assessment and Monitoring (Source: Internet research)		Duration: 2009-2012 Coordinator: Cefas, UK	PREMIAM aims to: • Develop marine assessment and monitoring guidelines (the PREMIAM Plan) • Develop and maintain a network of scientific and logistical partners to deliver the plan (the PREMIAM Network)		National Funding: PREMIAM is a Defra funded project (Centre for Environment, Fisheries and Aquaculture Science).	http://www.premiam.org/
"PREVECMA" Prevention and response to marine pollution (Source: General Directorate of Merchant Marine, Spain)	Prevention, preparation and response to marine spills	Duration: 2006- ongoing Coordinator: Centro Tecnológico del Mar-Fundación CETMAR, Spain	PREVECMA is a technological network which has the objective to promote the research and technological development for the prevention, response, reparation and minimization of the environmental and socioeconomic impact caused by hydrocarbon spill and dangerous or harmful substances transported by sea. Prevecma's work is organized through different interest theme groups of multidisciplinary and multi-industry character.		Programme: Convocatoria de Redes Tecnológicas National funding: Ministry of Science and Innovation, CETMAR Total budget: €85.000€	www.prevecma.es
"RAMOCS"	Risk assessment,	Duration:	Primary project objective:	Expected results include:	EC and national	

Implementation of Risk assessment Methodologies for Oil and Chemical Spills in the European Marine Environment (Source: AMPERA publication Nr.3)	regional cooperation	36 months Starting date: October 2008 Coordinator: Consejo Superior de Ivestigaciones Cientificas (CSIC), Spain	To develop fingerprinting tools for heavy oils and new products and to assess their risk in spills in different European regional seas scenarios (This project is closely aligned to the TOXPROF project - see below)	• To identify and prioritise the oil products and transported HNS through the EU marine environment. • To develop fast fingerprinting tools to assess the source recognition and the weathering processes. • To estimate the risk associated with the different oil and HNS products	funding: Funded through the Call for proposals on accidental marine pollution, within the framework of the AMPERA programme Budget: € 554.597	
Response Vessels: 4 new response vessels (Source: Swedish Coast Guard, Sweden)	Marine pollution, ship structure and construction	Duration: 2009-2012 Coordinator: Swedish Coast Guard	4 new response vessels KBV 031 series	Enhanced response capacity	National funding Budget: €1,5 million	
"SAFGOF" Evaluation of traffic increase in the Gulf of Finland 2007-2015 and the effect of the increase on the environment and traffic chain activities (Source: Internet research)	Risk assessment, marine pollution	Duration: 3 years (ongoing) Coordinator: Kotka Maritime Research Centre (KMRC), Finland	Maritime traffic in the Gulf of Finland has increased remarkably during the last years and it is expected to increase further during the coming years. The growing maritime traffic will also increase the environmental risks through direct environmental effects and rising accident risk. The project SAFGOF aims to study in a cross-disciplinary manner, how the traffic patterns are estimated to change in the Gulf of Finland by the year 2015. Based on these estimates, the effects on risk levels for ship collisions and groundings will be studied. Once the		EC co-funding from the European Regional Development Fund (ERDF) Total budget: €2.200.000	http://www.merikotka.fi/uk/SAFGOF.php

			traffic pattern estimates have been evaluated, the environmental effects of traffic can also be studied.			
"Ship Arrestor" (Source: Internet research)		Duration 24 months Starting date: 1 October 2008 Coordinator: MiKo Marine AS, Norway	This project aims to develop a helicopter applied tool for attaching a towline to a drifting tanker. At the end of the towline there will be a large scale sea anchor. This combined system will then: • Put the vessel-in-distress' bow up against the weather • Reduce the roll of the casualty and associated wave impact forces • Reduce the drift speed • Allow towing of the casualty without putting rescue personnel aboard the vessel		EC funding, under the FP 7 (Research for SMEs)	http://www.shiparrestor.com/
"SHIPFLUX" Atmospheric deposition fluxes to the Belgian marine waters originating from ship emissions (Source: BELSPO – Belgian Science Policy Office)	Marine pollution	Duration : 2 years Coordinator : University of Antwerp	Project objectives: • To carry out measurements of the concentrations of nutrients and persistent pollutants (e.g. PAHs and heavy metals) in the air of the Southern Bight of the North Sea on research vessels crossing the shipping lanes, on a radar platform near the shipping lanes and at a Belgian coastal site; • To calculate deposition fluxes of relevant compounds from the measured concentrations using suitable models; • To extend the limited existing shipping emission inventories in terms of considered chemical components, geographical region and spatial resolution;		National funding Programme: Science for a sustainable development (SSD) Total budget: € 179.761	http://www.belspo.be/belspo/Northsea/program/phaseVII_en.stm

			• To calculate shipping emissions for a base case (2009) and two scenario cases (2005 and 2010) in line with current and forthcoming international regulations; • To improve the deposition routines of the BelEUROS and AURORA regional chemical transport models, especially above sea areas, and to calculate the regional air quality and deposition of nutrients, POP's and heavy metals for the region of interest for the base year 2009; • To validate the model results for the concentrations of relevant compounds using the results of the measurements carried out in this project at the coastal sampling location at De Haan and at the sea borne locations; • To carry out model calculations to quantify the contribution of shipping emissions to the deposition of relevant compounds to the Belgian marine waters • To compare the calculated fluxes of nutrients and bioaccumulable toxic substances to the Belgian marine waters to the known fluxes of these compounds as introduced by rivers.			
"SÖKÖ II" A joint development program for shoreline response to worst case oil	Marine pollution preparedness and response, oil and chemical spills, spill response technologies	Duration: 2007-2011 Coordinator: Kymenlaakso University of	To continue the work of the *SÖKÖ I* project and develop guidebooks for additional regions of Finland. The project produces comprehensive plans for oil spill management for the	The SÖKÖ II-guidebook for the shoreline response of the mid and western parts of the Gulf of Finland. Three new guidebooks are	National funding & EC funding from the European Regional Development	www.kyamk.fi/soko (SÖKÖ info in English)

spill. (Unofficial translation from Finnish: *"Coordination of a large oil pollution response operation in the coastal zone – procedure for the authorities responsible for coastal zone pollution response operations")* (Source: Finnish Environment Institute, SYKE)		Applied Sciences (KyAMK), in Kotka, Finland	Regional Rescue Services, the Regional Environmental Centres and the Response Commander. The SOKO plan provides detailed information on how to conduct oil combating when oil reaches the shores after a worst case oil spill. (The *SÖKÖ I* project covered the eastern part of the Gulf of Finland and its main aim and objectives are described in the table below of past/completed projects)	to be produced by the year 2011 including regional updates and new topics.	Fund (ERDF) Total budget : € 800.000	
SOx and NOx measuring equipment from aircrafts (Source: Swedish Coast Guard, Sweden)	Aerial and satellite monitoring and surveillance systems, air pollution	Duration: 2007-2012 Coordinator: Chalmers Technical University	To develop and test techniques for remotely measuring emissions of SOx and NOx from ships	The project so far has developed a tool that has been tested (field tests performed). The next step will be to have this tool adapted to fit in the new air crafts. Report is expected	National funding (mainly financed by the Swedish research body VINNOVA) Total budget: ~ € 2 million (Budget for the next three years: € 200.000)	
"SPORT" Feasibility study for a St. Petersburg Oil Recovery Training Centre (Source: Finnish	Marine pollution, prevention, preparedness and response	Duration : 2008-2009 Coordinator : City of Kotka, Finland	The objective of the project is to make construction and training plans for an oil recovery training centre and oily waste treatment centre to be built in St. Petersburg. The work is done by experts from the Finnish-Russian partner consortium.	Feasibility study for the St. Petersburg Oil Recovery Training Centre (SPORT): http://www.merikotka.fi/tiedotteet/SPORTREPORT_finalized.pdf	EC and national funding: Funded by the South-East Finland – Russia New Neighbourhood Programme,	http://www.merikotka.fi/uk/SPORTesittely.php

Environment Institute, SYKE)			This will create a permanent improvement in oil spill response regionally. The centre will also be a part of the training course for response personnel.		Finland and Russia Total budget: € 240.000	
"STOCA" Study of cargo flows in the Gulf of Finland in emergency situations (Source: Internet research)	Cargo flows, risk assessment	Duration: 2008-2010 (2 years) Coordinator: Kotka Maritime Research Centre (KMRC), Finland	The STOCA project analyses various options for the region, in order to be prepared in the event an emergency situation occurred and the usual transport flows could not function normally. Such changes would occur, for example, if a port or several ports or sea routes would be closed down due to an economic crisis or an environmental hazard. The emergency plan will include an analysis on the capacity and potential for alternative routing in Finland and Estonia as well as estimations on the changes in traffic pattern and size of vessels. The cargo flows in the Gulf of Finland will be examined, with special focus on the movement of cargo in emergency situations in an economic and environmentally sustainable way.	Report: Traffic flows in Finnish Gulf of Finland ports: http://www.merikotka.fi/stoca/Lumijarvi_2009_TRAFFIC_FLOWS.pdf	EC and regional funding: • €666.822 from the ERDF through the Central Baltic INTERREG IV A Programme 2007-2013 ▪ The Regional Council of Southwest Finland ▪ The Estonian Maritime Academy and the National Emergency Supply Agency Total budget: €865.170	http://www.merikotka.fi/uk/STOCAesittely.php
"STW/AIS/SAT" Project to further integrate the Seatrack Web oil drift forecasting system with existing information	Forecast models	Duration: 2007-ongoing Coordinator: SMHI	To improve the likelihood of identification of polluters at sea with more accurate prognoses and back tracking functions	Results of the continuous development of the STW system: ▪ Improvement and simplification in the AIS functionality of the STW/AIS ▪ Pre-feasibility study on	National and regional funding: HELCOM, Sweden, Finland Total budget: € 70.000/year	http://seatrack.smhi.se/seatrack/ and http://www.helcom.fi/projects

systems (AIS and satellite detections) for a better law enforcement (Source: HELCOM and Swedish Coast Guard)				technical solutions on how to integrate satellite surveillance information into STW/AIS ▪ Integration of satellite imagery information into the tool		/Archive/en_GB/STW_AIS_SAT/
"SUSY" Surfacing System for Ship Recovery (Source : European Commission, DG Research, Dir. H)	Marine environment	Duration: September 2009 – August 2012 Coordinator: British Maritime Technology (BMT), UK	The main goal of the project is to develop a well-known submarine rescue technology into systems usable for merchant ships in emergency situations. Instead of cleaning the polluted areas the SUSY system will avoid the spillages by stabilising vessels immediately after an accident.		EC Funding: FP7 (Preventive and emergency interventions to protect marine, coastal and land environments) Total budget: € 4.015.891 EC funding: € 2.650.000	CORDIS website
Technology development program on oil spill response ('Oil Spill Response 2010') (Source: Norwegian Coastal Administration, NCA)	Spill response technology and equipment innovation	Duration: April 2009 – December 2010 Coordinator: Norwegian Clean Seas Association for Operating Companies (NOFO)	The program covers four main topics: a. Oil recovery technology b. Dispersant application c. Remote sensing d. Coastal and shoreline operations	Improved technology	Funding: The oil industry and the Norwegian State. Total budget: NOK 30million	http://www.nofo.no (see link 'Oljevern 2010') In English: http://www.nofo.no/stream_file.asp?iEntityId=457

"TOXPROF" Toxicity profiling of the major EU transported HNS and oil types (Source: AMPERA publication Nr.3)	Oil, HNS pollution, risk assessment	Duration: 24 months Starting date: September 2008 Coordinator: Norwegian Institute for Water Research (NIVA)	Primary project objective: To develop fingerprinting tools for heavy oils and new products and to assess their risk in spills in different European regional seas scenarios	Expected results include: • To identify and prioritise the oil products and transported HNS through the EU marine environment. • To develop fast fingerprinting tools to assess the source recognition and the weathering processes. • To estimate the risk associated with the different oil and HNS products	EC and national funding: Funded through the Call for proposals on accidental marine pollution, within the framework of the AMPERA programme Budget: € 421.120	www.niva.no/toxprof
"TRACECA" Sub-project: Development of a common security management system and cooperation in the area of maritime safety and ship pollution prevention for the Black Sea and Caspian Sea (Source: Internet research)	Maritime transport, maritime safety, marine pollution prevention and response	Duration: 2009-2011 Coordinator: Team Leader Captain Fernando Pardo	The main objectives are to: • improve safety of maritime transport, • improve prevention of and response to maritime pollution and • ensure security of ships and ports. The project offers technical assistance, advice and training to institutions and authorities in the Partner Countries that are tasked with ensuring maritime safety and environmental protection.		EC funding: ENPI This project is part of the broader EC Tacis TRACECA Programme (the Transport Corridor Europe-Caucasus-Asia) Total budget: € 3.5 million	http://www.enpi-info.eu/files/features/IW02east%20Pardo%20EN.pdf http://www.enpi-info.eu/maineast.php?id=309&id_type=10 http://www.traceca-org.org/default.php?l=en

Tracking and predicting the behaviour of submerged and sunken oil (UK MCA research project Nr 595) (Source: Internet research - MCA website)	Oil pollution	Duration: 2008-2009 (12 months)	To identify definitive parameters which influence the behaviour of submerged and sunken oils: ▪ To identify key parameters and their comparative significance essential to devise algorithms to develop realistic modelling of the behaviour of partially submerged and sunken VHFOs in seawater ▪ To develop a methodology to incorporate such algorithms into existing modelling capability ▪ To determine appropriate oil recovery techniques for submerged and sunken oils.	▪ Five processes are identified as leading to spilled oil sinking or submerging at sea. ▪ Algorithms for decision supporting outputs are provided for the addition to existing models. ▪ Eight recommendations are made including further studies, practical testing, training of response personnel, contingency planning and better assessment and records of effectiveness of monitoring, detection, containment and recovery strategies at future sunken and submerged spills.	Joint funding: UK Maritime and Coastguard Agency (MCA) and International Tanker Owners Pollution Federation (ITOPF)	http://www.mcga.gov.uk/c4mca/mcga-mnotice.htm?textobjid=73B8714897A5EBD1) Final Report (Feb. 2009): http://www.mcga.gov.uk/c4mca/s_mca_019_sunken__and__submerged__oils_final_report_270209-3.pdf
UK Risk Assessment for Hazardous and Noxious Substances (UK MCA research project Nr 593) (Source: Internet research - MCA website)	Risk assessment, HNS marine pollution	Duration: 2008-2009 (13 months)	To investigate the fate and effects of higher risk Hazardous and Noxious Substances (HNS)	The project: ▪ Identifies relevant literature sources for HNS data and makes an assessment of data quality, accessibility and presentation ▪ Developed a decision support system to provide a practical and transparent approach to aid the MCA in emergency response. The decision support	National funding: UK Maritime and Coastguard Agency (MCA)	Draft Final Report to MCA (June 2009): http://www.mcga.gov.uk/c4mca/master_final_report_03-07-11.pdf

				system provides an aide memoir, and identifies various checklists that might be important in different incidents ▪ Identifies gaps in data relating to chemical behaviour and HNS modelling and makes recommendations.		
Use of HUGIN (Source: Norwegian Coastal Administration, NCA)	Oceanographic and environmental monitoring	Duration: 2009 Coordinator: NCA	The overall objective is to test the capability of AUV HUGIN in search for shipwrecks. The project aims to use the AUV to search for shipwreck posing a risk of pollution from oil and other substances. The AUV is developed and owned by the Norwegian defence Research Establishment	The evaluation is ongoing and results from the program will be available in the future	Total budget: € 100.000 Funding: National (NCA and Navy)	
"VESPO" Vessel Surveillance and Port Security (Source : European Commission, JRC, IPSC)	Monitoring maritime traffic, satellite detection of oil spills	Duration Coordinator: JRC	VESPO aims to provide scientific and technical support to the policy makers (DG TREN, MARE, JLS, ENV, ENTR, etc.) in the context of the EU integrated maritime policy for aspects related to maritime safety and security, including illegal immigration, maritime transport, IUU fishing, protection of the marine environment, and port security. R&D in the field of monitoring oil spills is performed in the framework of a specific agreement with EMSA. VESPO activities in the field of monitoring oil pollution are focused		EC Funding (FP7) JRC Institutional Action	http://ipsc.jrc.ec.europa.eu/showaction.php?id=28

			on: 1. Fully automatic oil spill detection algorithm; 2. Feasibility study on the operational use of NASA MODIS medium-resolution optical data for oil spill detection; 3. Environmental ancillary probability maps in GIS layer format. Moreover, VESPO supports the scientific networking of international, regional and national competent authorities, providing advice and assuring the Secretariat of the European Group of Experts on Monitoring sea-based oil pollution (EGEMP). EGEMP meets twice a year jointly with the EMSA CleanSeaNet user group.			

6. Table of completed/past R&D projects (2000-2008)[4]

Title & info source[5]	Marine pollution related areas[6]	Duration & coordinator	Objectives	Outputs/Results[7]	Funding instrument	Webpage(s)
"ARCOP" Arctic operational platform	Safety of maritime transport, regional cooperation	Duration: 2002-2005 Coordinator: Aker Yards, FINLAND	The main target is the efficient and safe movement of oil and gas from the Arctic region in Europe. There are a number of alternative routes for conveying oil and gas, all of which must be further developed to increase security of supply and cost-efficiency. This project aims to develop an alternative that will make use of the Northern Sea Route.		FP5: Co-funded/partially funded under the "Competitive and Sustainable Growth" (GROWTH) thematic programme	http://www.arcop.fi CORDIS FP5
"ASMA" Analyses of survey, modelling & remote sensing techniques for monitoring and assessment of environmental	Oil spill monitoring	Duration: Coordinator: DHI – Water & Environment, DENMARK	• To identify needs and constraints of techniques and means for locating and quantifying slicks or patches of submerged oil by reviewing past accidents; • To improve capability to locate and quantify submerged oil by testing and refining remote sensing	ASMA Final Report: http://ec.europa.eu/environment/civil/marin/pdfdocs/asma_report.pdf	Co-funded/partially funded under the DG ENV – Call for proposals 2005 of the Community framework for	http://asma.dhigroup.com/index.html

[4] The information presented in this table covers projects completed in the period between 2000 and 2008 and has been derived from the relevant Commission services and from research of internet and literature sources

[5] Projects are presented in alphabetical order, irrelevant of project type, scale, outputs etc

[6] Marine pollution related areas include for example: risk analysis, pollution preparedness, pollution response, pollution detection, monitoring and surveillance systems, dispersant use, modelling tools, information tools and decision support services, regional cooperation; oil and chemical/HNS spill response; oceanographic and environmental monitoring

[7] Project outputs and results are only presented where available. If no information has been provided or found, this part has been left blank. Further updated information may be found on the project's dedicated webpage(s), if available

impacts of submerged oil during spill incidents			techniques; • To provide real-time means to predict trajectories of submerged oil by improving and testing oil drift models; • To provide input to guidelines for future mapping of submerged oil		cooperation in the field of accidental or deliberate marine pollution	
Assessment of probability of oil spill risk along the Polish coasts (Source: Maritime Institute in Gdansk, Poland)	Risk assessment	Duration: 2003-2005 Coordinator: MIG (Maritime Institute in Gdansk)	To map the probability of oil spills in the Polish EEZ of the Baltic Sea based on the analysis of available environmental data, sea transport, collisions and oil spill data	Information on the danger degree of oil spills along Polish coasts. Seasonal dependence of the danger has been shown.	Total budget: 130.000 PLN National funding: State Committee for Scientific Research, Poland	
"Baltic Master I" Maritime Safety – Transport and Environment in the South Baltic Sea Region	Maritime safety, transport and environment	Duration: 2005-2007 Coordinator: Region Blekinge SWEDEN	To improve maritime safety by integrating and bringing forward local and regional perspectives. This includes measures to improve the prevention and the preparedness for ship accidents.	Main results: http://www.balticmaster.org/media/files/general_files_719.ppt	INTERREG III B: Baltic Sea Region INTERREG III B programme which is financed by the European Regional Development Fund (ERDF) Total budget: € 3.600.000 EC funding: € 2.100.000	http://www.balticmaster.org/general.aspx?page_id=3 and http://www.bsrinterreg.net/programm/project.php?id=10553
"BOSSS" Baltic Oil Spill Safety System (Source: Finnish Environment	Pollution preparedness, contingency planning, risk assessment	Duration : 2004-2006 Coordinator : COWI A/S (Denmark)	▪ Developing a feasibility study on establishment of a pollution response coordination and information center. ▪ Updating the risk analysis ▪ Analyzing the pollution response	All objectives were fulfilled and reports handed over to the Russian authorities and the EU	Financed by the EU TACIS Programme Total budget: € 2.000.000	

Institute, SYKE)			practices in the Baltic Sea states and based on this study propose Russian Baltic contingency plan ▪ Analyzing the remote sensing capacity and practices in Russian Baltic Sea area ▪ Making a proposal on the needed pollution response equipment			
"CAROCS" Computer Aided Rescue and Oil Combating System (Source: Maritime Institute in Gdansk (MIG), Poland)	Decision support systems and software tools	Duration : ? Coordinator : MIG	• To support the Polish Search and Rescue (SAR) Service • To fulfil the Helcom Recommendation 12/6 concerning development and use of oil drift forecasting	A Computer Aided Rescue and Oil Combating System, which is a useful tool for the purposes of SAR actions and combating oil spills	National funding (Ministry of Infrastructure)	
Chemical Spill Risk Assessment (UK MCA Research project Nr 447) (Source: Internet research – MCA webpage)	Chemical pollution, risk assessment		▪ To produce quantitative estimates of the risks of spills of chemicals carried in bulk in UK waters. The estimates will show the geographical distribution of the risk broken down by accident type, type of chemical and spill size (Spills from offshore installations and in port areas do not form part of this study.) ▪ To produce a set of scenarios to test response options and resources required. ▪ To carry out a scoping study to determine if it is feasible/practical to extend the study to packaged chemicals	Final report (May 2001): http://www.ukshipregister.co.uk/rp447_-_chemical_spill_risk_assessment_full_report.pdf	National funding: UK Maritime and Coastguard Agency (MCA)	
"CLARA"	Modelling chemical	Duration:	The aim of this project is to develop a	• Slick drift in 2D;	National funding:	http://www.ce

software Calculation related to accidental spills at sea (Source: Cedre & internet research)	pollution	2003 - 2006 Coordinator: Ecole des mines d'Ales, France	new computer-based decision support system for chemical spills at sea, a pre-operational product for the Atlantic coast. More specifically, it aims to: • Predict the evolution of the product in the marine environment • Determine the concentrations and/or the location of dispersed chemicals • Assess atmospheric evaporation and dispersion • Assess the toxicological consequences on humans, and maritime flora and fauna	• Concentration in the water column and in the air (for both, map in 3D); • mass distribution of the product in terms of main behaviours (evaporation, dispersion, floating); • Assessment of the ecotoxicological impact	French Research Ministry Total budget: €920.000	dre.fr/en/publication/jourinfo08/5aprin_gb.pdf http://www.meteorologie.eu.org/mothy/references/iosc2008_clara.pdf
"CleanMag" Demonstration and large scale application of the new magnetic method "CleanMag" for the clean-up of waterborne oil spills	Oil spill response	Duration: 1999-2003 Coordinator: Technological Educational Institute of Piraeus GREECE	The project objective was the large scale application at open sea of a new technique for cleaning up waterborne oil spills. This technique is based on the magnetic separation method of two liquid phases (one water and the other oil), by using the recently discovered and patented oleophilic magnetic oil absorbing material "CleanMag", which is a non-toxic porous foam with a density lower than that of water.	The project achieved its main objective which consisted of producing the innovative material CleanMag, its demonstration in open water and the optimisation of its performance criteria. A prototype anti-pollution boat was also constructed during the project, with a specially designed magnetic drum which is lowered into the water to collect the material CleanMag once it has absorbed the oil spill. The project did not manage to have more than one actual application at sea.	Co-funded/partially funded under the LIFE 99-ENV Programme (DG ENV) Total budget: €920,947 EC funding: €920.947	http://gun.teipir.gr/~kalgar/CleanMag/cleanmag.html

"CLEOPATRA" Chemical effluent & oil pollution alert and tracking	Monitoring & surveillance	Duration: 2003-2005 Coordinator: Laboratory for Meteorology and Environmental Modelling (LaMMA), ITALY	To achieve an integrated chain (covering research on input data, modelling and output interface) able to feed an advanced service supporting prevention, mitigation and assessment of oil or chemical marine pollution in waters of prime European interest (Mediterranean sea).		**FP5**: Co-funded/partially funded under the "Energy, Environment and Sustainable Development" (EESD) thematic programme	http://www.eurimage.com/cleopatra/
"Coastal and Marine Resource Atlas" Mapping Sensitive Ecological Sites for National Contingency Planning (UK MCA Research project Nr 517) (Source: Internet research – MCA webpage)	Marine pollution preparedness, oil spill contingency planning	Duration: 2003-2006	Objective: ▪ To revise the existing Nature Conservation Sensitivity Maps by developing a digital database and sustainable update process. ▪ To produce a new digital atlas of habitats and species in marine and coastal areas of Britain. This represents a complete revision to the hardcopy atlas produced in the early 1990s. The project was split into two phases. ▪ Phase I reviewed the feasibility of producing a digital atlas by identifying relevant priority datasets and determining what information was available and in what format; ▪ Phase II took the project forward by collecting relevant datasets and building the digital atlas	The project has delivered a digital 'Coastal and Marine Resource Atlas' and a sustainable mechanism by which the atlas will be maintained and updated, ensuring that it remains accurate and fit for purpose Final Report (August 2006): http://www.ukshipregister.co.uk/research_report_517.pdf	Joint national funding by: MCA, Defra, SE, SNH, EI, JNCC, EA, EN, DTI, HCC, ECC, KCC	
"COMMODE" Communities of marine microorganisms for oil degradation	Oil degradation	Duration: 2002-2005 Coordinator: Institute for	Some marine micro organisms degrade oil and play a crucial role in reducing its pollution impact, but very little is known about them.		FP5: Co-funded/partially funded under the "Energy, Environment and	

		coastal marine Environment- (IAMC), ITALY	This project will try to fill this critical knowledge gap and elucidate the identity and functional roles of the most important degraders, through studying oil-degrading bacteria and the microbial communities in which they act		Sustainable Development" (EESD) thematic programme	
"CONTINMAR" Development of tools, response protocols and information system for the contingency planning design against spills in the sea (Source: General Directorate of Merchant Marine, Spain)	Monitoring operations, response operations, tracking, socioeconomic aspects, contingency plans and training	Duration: 2004-2006 Coordinator: CETMAR	Development of tools, response protocols and help systems for the decision makers. It will give assistance to competent institutions in the design and execution of the contingency planning.		National funding: Spanish Ministry of education and science Programme: Plan Nacional I+D Total budget: € 628.370	http://193.144.36.199/continmar/DesktopDefault.aspx http://otvm.uvigo.es/vertimar2005/comunicaciones/1059_VEM2003-20578-C08-01-INTER_chapela.doc
"DaGoB": Safe and reliable transport chains of dangerous goods in the Baltic Sea Region			DaGoB aims at improving the co-operations between public and private stakeholders related to dangerous goods (DG) transport in the Baltic Sea Region (BSR) by connecting the stakeholders on different levels, providing up-to-date information on cargo flows, supply chain efficiency and risks related to DG transport.	DaGoB provides a useful tool for both national Ministries responsible for Transport, their units of DG transport and for Central Administration in Maritime, Rail and Road sub sectors Publications: http://info.tse.fi/dagob/publications.asp	INTERREG III B: Baltic Sea Region INTERREG III B Neighbourhood Programme which is financed by the European Regional Development Fund (ERDF)	http://info.tse.fi/dagob/ A short presentation about the project (PPT / PDF).
"DECLIMS" Detection and classification of marine traffic from	Vessel detection through satellite monitoring	Duration: 2003-2006 Coordinator:	To establish and enhance the state-of-the-art in operational ship detection from space and to provide a focus for research into the use of satellite	Paper on the findings of the DECLIMS project: http://earth.esa.int/workshops/seasar2006/participa	FP5: Co-funded under the "Energy, Environment and	CORDIS FP5

space		Institute for the Protection and Security of the Citizen (IPSC), JRC, ITALY	imagery for maritime vessel detection, classification and identification.	nts/87/paper_SeasarDECLIMS12p3.pdf	Sustainable Development" (EESD) thematic programme Total budget: €1.105.339 EC funding: €608.803	
"DENIM" Detection de Nappes Imergees (Detection of sunken oil slicks)			During the last twenty years there have been several spills involving heavy fuel oil in the world. In many of these accidents, part of the heavy fuel has sunk and produced a threat to the environment that has been difficult to evaluate because of the lack of means of detection and monitoring. It is of paramount importance to detect and map these oil patches so as to plan an adequate response such as a recovery operation	Summary Report: http://ec.europa.eu/environment/civil/pdfdocs/denim.pdf	Co-funded under the DG ENV – Call for proposals 2001 of the Community framework for cooperation in the field of accidental or deliberate marine pollution Total budget: €297,618 EC funding: €148,808	Executive Summary: http://ec.europa.eu/environment/civil/pdfdocs/executive_sum_denim.pdf
Detection and Discrimination of Corrosion Attack on Ships (Crude Oil Tankers) with Acoustic Emission (AE)	Ship construction	Duration: 2002-2006 Coordinator: Technischer Ueberwachung-sverein (TUEV) AUSTRIA	To develop a method for detection and discrimination of corrosion damage to ships (crude oil tankers), which owing to its advantageous features (no need to empty and clean the tanks) will further contribute to the protection of the environment. More specifically: ▪ To perform the necessary basic		FP5: Co-funded under the "Energy, Environment and Sustainable Development" (EESD) thematic programme	http://www.ndt.net/article/apcndt2006/papers/07.pdf

			research, to develop two different types of AE testing equipment and ▪ To check the testing equipment together with the application rules on oil tankers for corrosion by means of AE			
Determination of the Limiting Oil Viscosity for Chemical Dispersion at Sea (UK MCA Research project Nr 516) (Source: Internet research – MCA webpage)	Marine pollution response, oil spill dispersants	Duration: 2004	Objective: To provide information on the limiting oil viscosity of chemical dispersion at sea	Final Report (July 2004): http://www.mcga.gov.uk/c4mca/research_report_516.pdf	National funding: UK Maritime and Coastguard Agency (MCA)l	
Development of a Protocol for the Treatment and Disposal of Oily waste in the UK (UK, MCA Research project Nr 549) (Source: Internet research – MCA webpage)	Oil pollution, oily waste disposal	Duration: 2006-2007	The overall project objective focuses on the management and infrastructure in place to deal with oily waste resulting from a marine spill in the UK The project was structured in four tasks, with the following main objectives: Task (1) - Local Authority Contingency Planning: To determine the existing level of contingency arrangements in place for all UK Maritime Local Authorities Task (2) - UK Capacity of Oil Waste Handling Facilities: To identify potential	Project final reports (March 2007): Task 1: http://www.ukshipregister.co.uk/final_report_rp549_march_2007_task_1.pdf Task 2: http://www.ukshipregister.co.uk/final_report_rp_549_march_2007_task_2.pdf Task 3: http://www.ukshipregister.co.uk/final_report_rp549_march_2007_task_3.pdf	National funding Project jointly funded by: UK Maritime and Coastguard Agency, Environment Agency, Energy Institute, and EROCIPS project partnership	

			locations within the UK, where companies could provide storage/recovery/disposal operations for oily waste and to assess the current level of UK capacity Task (3) - Specific Capacities from UK Companies (2006): Prepare a detailed UK-wide inventory of companies that may be able to provide services in the storage/recovery/disposal of oily waste Task (4) - Designing Infrastructure for the Handling of Large Quantities of Oily Waste – A guidance document for the UK: Preparation of a guidance document for general use by the Maritime Local Authorities and the private sector, that captures the latest techniques, tools and technologies associated with the management of oily waste following a maritime spill	Task 4: http://www.ukshipregister.co.uk/final_report_rp_549_march_2007_task_4-2.pdf		
Development of the national system for preparedness and response to accidental marine pollution in the Syrian Arab Republic	Oil pollution preparedness	Duration: 2000-2003 Coordinator: REMPEC	The project's overall objective was to establish an efficient and reliable national system for preparedness for and response to accidental marine oil pollution in the Syrian Arab Republic.	Key results: • The preparation of a National Contingency Plan. • The introduction of sensitivity mapping and oil spill modelling in the Ministry offices, including training. • The drafting of a proposal for setting up a national oil pollution Response Centre. • The organisation of specialised training courses and an exercise	Co-funded under the LIFE 99-ENV Programme (DG ENV) Total budget: € 382.000 EC funding: € 301.184	http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=home.createPage&s_ref=LIFE99%20TCY/INT/017&area=3&yr=1999&n_proj_id=1672&mode=print&menu=false

				(SYREX 2003)		
"DIFIS" Double inverted funnel for intervention on ship-wrecks (Source: European Commission, DG RTD)	Oil spill response technology and equipment innovation	Duration: 2005-2008 Coordinator: Maritime Research Institute (MARIN), The Netherlands	• To study, design and validate a European reference method for the prompt and cost-effective intervention and remediation of tanker wrecks. • DIFIS is aimed at developing a way to remove fuel oil from wrecks. The DIFIS system consists of a light, quickly deployable structure that should stay in place until all the tanks of a wreck are emptied and pollution threat is eliminated	• Developed and basin-tested the structure able to collect oil leaking from shipwrecks • Developed the logistics to install the structure	FP6: Funded under the thematic area "Sustainable Development" Total budget: € 3.182.900 EC funding: € 1.800.000	http://www.ifremer.fr/difis/ DIFIS Leaflet
"DIMAS" Database for the Management of Accidental Spills (Source: BELSPO – Belgian Science Policy Office)	Marine pollution	Duration : 2004-2006 Coordinator: EURAS (European Centre for Risk Assessment, Belgium)	The aim of this project is to develop a user-friendly and easily accessible database with reliable, easy to interpret and up-to-date information on marine specific issues for experts as well as for non-experts. The most important parts will be the direct and indirect effects on marine biota and the data quality assessment.		National funding Funded by the Belgian Federal Science Policy, in the framework of the program 'Global Change, Ecosystems and Biodiversity SPSD 2 Total budget: € 178.185	http://www.vliz.be/Projects/dimas/index.php and http://www.belspo.be/belspo/Northsea/program/phaseVI_en.stm
"DIPTY-Waste": Development of Innovative Processes for the Treatment of Hydrocarbon Wastes		Duration: 2002-2006	The objective is to develop efficient tools for the management of a specific waste stream: hydrocarbon sludges. The waste considered is a liquid effluent and its composition varies considerably according to it source: quantity of water, type of hydrocarbons and presence of solid matter. Its collection is performed by operators that		FP5	

			guarantee their safe collection, handling and disposal. The programme was divided in three phases: Characterization of the specific waste stream; Technical solutions; Pilot-scale study			
"DISMAR" Data integration system for marine pollution and water quality	Monitoring of marine environment	Duration: 2002-2005 Coordinator: Nansen Environmental and Remote Sensing Centre (NERSC), NORWAY	To develop an intelligent system for monitoring and forecasting of the marine environment to improve management of natural or man-induced pollution crises in coastal and ocean regions of Europe, supporting public administrations and emergency services responsible for prevention, mitigation and recovery of crisis such as oil spill pollution.		FP5: Co-funded/partially funded under the "User-friendly Information Society" (IST) thematic programme	http://www.nersc.no/main/index2.php?display=projectdetails&projectNo=366 CORDIS FP5
"ECODIS" Dynamic sensing of chemical pollution disasters and predictive modelling of their spread and ecological impact		Duration: 2005-2008 Coordinator: Wageningen University, The Netherlands	To develop technologies for monitoring the physicochemical reactivity and biological impact of pollutant species on the short and long term chemical and biological status of aquatic ecosystems following a pollution disaster. Specific goals of ECODIS include to arrive at a model that includes predicted pollutant species distributions, and ensuing biological risks, in all compartments of the aquatic ecosystem as a function of time and space and to formulate a set of guidelines for monitoring, data management, and interpretation of pollution disasters.	The ECODIS project has developed measurement approaches (chemical and biological sensing) coupled with dynamic modelling to predict the spread and eco-toxicological impact of pollutants in aquatic systems. ECODIS has developed a comprehensive computational tool for dynamic risk assessment at the river basin level that takes into account all sources and transfer resistances of aquatic pollutant species of relevance to pollution	FP6: Co-funded/partially funded under the thematic area "Sustainable Development" (sub-priority 6.3: Global change and ecosystems) EC funding: € 3.500.000	http://www.fenk.wau.nl/ecodis/startpagina.html Project summary: http://www.fenk.wau.nl/ecodis/summary.pdf

				disaster assessment and management.		
Ecosystem assessment following the sinking of Tanker ECE - Results from two sampling events at the wreck of the ECE (UK, MCA research project Nr 580) (Source: Internet research - MCA website)	Chemical marine pollution	Duration: 2006	The aim of the project was to sample the water column surrounding the wreck of the *ECE* and to determine the impact of the release of phosphoric acid. More specifically: ▪ To use Plymouth Marine Laboratory coupled physical/ecosystem models to predict dispersion of dissolved phosphate and to investigate possible effects on primary production; ▪ To sample the area surrounding the wreck to provide information on the concentration of phosphate following deliberate/accidental release of phosphoric acid; ▪ To provide better understanding of the impact of the release on the marine ecosystem	Results from two sampling events at the wreck of the ECE Final Report: http://www.ukshipregister.co.uk/rp580_final_report.pdf	National funding: UK Maritime and Coastguard Agency (MCA)	
Effectiveness of DEFRA approved surface cleaners for use in oil spill response (UK MCA Research project Nr 540) (Source: Internet research – MCA webpage)	Oil pollution response	Duration: 2007	Aims: ▪ To create a manual for responders and management to refer to when carrying out oil spill clean up operations on hard surfaces. ▪ To establish a protocol for the use of DEFRA approved surface cleaning agents. ▪ A series of trials were conducted to identify the most appropriate and effective techniques for varying hard surfaces and oil properties. The results from these trials have been used to construct	Final Trials Report (May 2007): http://www.ukshipregister.co.uk/microsoft_word_-_trials_report_final_17_05_07.pdf	National funding UK Maritime and Coastguard Agency	

			the guidance manual that accompanies the final report			
"ERAMAR" The European Maritime Research Area	Maritime research and development (R&D)	Coordinator: ALSTOM (Chantiers de l'Atlantique, France)	By using the principles and instruments of the European Research Area (ERA), to mobilise the maritime stakeholders towards a co-ordinated and continuous effort to define their R&D targets for the medium and long term in response to market and society needs & requirements.		FP5: Funded under the "Competitive and Sustainable Growth" (GROWTH) thematic programme	http://www.eramar.net/ CORDIS FP5
"EROCIPS" Emergency response to coastal oil, chemical and inert pollution from shipping	Response to coastal pollution from shipping accidents	Duration: 2004-2007 Coordinator: Devon County Council , UK	To enhance emergency response to oil, chemical and inert coastal pollution from shipping accidents, through developing a transferable methodology which communicates relevant information to the decision makers and responders involved in the shoreline counter pollution operations.	EROCIPS Project Results: http://www.erocips.org/reports_press_releases.htm	INTERREG IIIB: Atlantic Area Programme (2000-2006), which is financed by the European Regional Development Fund (ERDF) Department of Communities and Local Government (DCLG), INTERREG IIIB in the UK Total budget: € 6.000.000 EC funding: € 3.400.000	http://www.erocips.org/
"ESEOO" Establishment of a Spanish	Forecast models, decision support systems and	Duration: 2004-2007	Development of a operational oceanographic system for emergency events like accidental spills, shipwrecks,	ESEOO: Real-time short-term (72 hours) forecast system of currents and	Programme: Acción Estratégica sobre	http ://www.eseoo.org/

Operacional oceanographic system (Source: General Directorate of Merchant Marine, Spain)	software tools	Coordinator: Puertos del Estado SPAIN	lost of containers in the sea, etc	other oceanographic variables (such as temperature and salinity)	Actuaciones de I+D contra vertidos marinos accidentales National funding: Spanish Ministry of Education and Science	
"EU-MOP" Elimination units for marine oil pollution (Source: European Commission, DG RTD)	Oil spill response technologies and equipment innovation	Duration : 2005-2008 Coordinator: National Technical University of Athens (NTUA), GREECE	To design and validate the concept of autonomous Elimination Units for Marine Oil Pollution (EU-MOPs), capable of mitigating and eliminating the threat arising from oil spill incidents.	Development and testing of "small robots" that operate in a swarm and could clean up oil spills in open seas, shallow waters and ports	FP6: Co-funded under the thematic area "Sustainable Development" Total budget: € 2.900.689 EC funding: € 1.899.269	Project Fact Sheet: http://cordis.europa.eu/fetch?CALLER=FP6_PROJ&ACTION=D&RCN=74315&DOC=1&CAT=PROJ&QUERY=1146757915205
"EUROBALTIC" Project for regional cooperation in the field of Civil Protection in the Baltic Sea Region		EUROBALTIC I Duration: 2003-2006 EUROBALTIC II Duration: 2006-2007 Coordinator:	The aim of the EUROBALTIC Civil Protection Projects is to gather cross-sector and transnational competence and experience in civil protection. By improving abilities of individuals and organisations, many negative effects from disasters and emergencies, can be prevented and reduced. Thus, the focus of the project is on the sharing of information, experiences and lessons learned. Eurobaltic I: Thematic Focus • Risk Assessment and Mapping • Cooperation with Non-State Actors	Eurobaltic I: Outcomes • Common identification of risks and needs for actions in the BSR. • Joint understanding of priorities in addressing the shortcomings in the civil protection capabilities. • 9 reports	Project part-financed by the European Union (European Regional Development Fund) within the BSR INTERREG III B Programme	http://www.helsinki.fi/aleksanteri/english/projects/eurobaltic_%202_civil_protection.htm

			• Transnationality, Cross-Sectorality and Regionality • New Technologies: Decision Support Systems • Institution and Human Capacity Building Eurobaltic II: Goals • Advancing risk management and spatial development. • Building transnational capacity through exercises, training, education and research. • Promoting safety over sectors and borders.			
"FLUOSENSE" Laser fluorosensor for oil spots detection	Oil spill detection	Duration: 2001-2002 Coordinator: EKSPLA Ltd., LITHUANIA	To develop an inexpensive oil-on-water detection system working autonomously 24 hours a day in all weather conditions. The technique to be utilised is laser-induced fluorescence of hydrocarbons, currently used for research purposes.		FP5: Co-funded/partially funded under the "Energy, Environment and Sustainable Development" (EESD) thematic programme	CORDIS FP5
"HASREP" Response to harmful substances at sea	Chemical spills from ships	Duration: 2004-2005 Coordinator: AMRIE – Alliance of Maritime Regional Interests in Europe, BELGIUM	To undertake a pilot study into the nature of chemical substances transported by sea and to improve the knowledge on the response to chemical spills from ships.	Project final report zip~5Mb	Co-funded/partially funded under the DG ENV – Call for proposals 2004 of the Community framework for cooperation in the field of accidental or deliberate marine pollution	Project report zip~5Mb

High resolution airborne camera (Source : Swedish Coast Guard)	Aerial and satellite monitoring and surveillance systems	Duration: 2007-2008 Coordinator: Chalmers technical university and Swedish Coast Guard	Use of scientific camera for measuring volumes of oil slicks at sea	Several field tests performed. Report is expected (initial report is available in Swedish)	National funding Total budget: ~€ 50.000	
"IRIS" Ice ridging information for decision making in shipping operations	Monitoring & modelling of marine environment	Duration: 2003-2005 Coordinator: Helsinki University of Technology, Ship Laboratory FINLAND	• To develop ice modelling and SAR interpretation so that ridging parameters are obtained; • To include the parameters into systems of ice information delivery; • To relate the parameters to the trafficability of ships; • To apply the enhanced ice information in ship route selection.		FP5: Co-funded/partially funded under the "Energy, Environment and Sustainable Development" (EESD) thematic programme	http://www.tkk.fi/Units/Ship/Research/Iris/Public/ CORDIS FP5
"LOSTCONT" Response to the problems of overboard loss of containers from ships in the Bay of Biscay and its approaches (Source: Internet research)		Duration: 2006-2008 Coordinator: Regional Prefect of the Aquitaine (France)	The aim of the project is to: • Suggest solutions to the problems raised by the loss of containers at sea in terms of maritime safety in the Gulf of Gascony; • To improve awareness of the problem and to improve the response to maritime safety risks generated by the loss of containers at sea	Expected results: • To learn more about the accident processes, their frequency, the main causes and consequences; • Facilitate identification and monitoring of containers lost at sea; • Facilitate decision-making and interventions from land and sea safety services in accordance with the level of danger of the cargo; • Promote safe techniques for	EC funding**:** INTERREG III B programme, priority C (ERDF)	http://www.cedre.fr/project/lostcont/index.html and http://www.interreg-atlantique.org/IIIB/eng/projet/detail_projet.html?idr=46&id=135

				recovering containers at sea; • Facilitate the work of port services in storing and managing recovered containers, from a safety and responsibility angle.		
"LOSSEB" Local Oil Spill Models for South-East Baltic (Source: Maritime Institute in Gdansk, Poland)	Forecast models	Duration: 2006-2008 Coordinator: Centre of Marine Research, Klaipeda, Lithuania	Raise awareness within local/regional authorities as well as other organisations which take care of the coastal areas in Klaipeda and Pomeranian Regions about operational forecasting tools		Programme: Interreg IIIA Neighbourhood Programme – Lithuania, Poland and Kaliningrad Region of Russian Federation Total budget: € 314.932 EC funding: from the ERDF €236.199	http://gnejs.im.gda.pl/losseb/
"MAPO" Enhancing R&D projects to find solutions to struggle against various marine pollutions (Source: Internet search)	Contingency planning, training	Duration : 2005-2007 Coordinator : L'Association du Technopole Brest-Iroise (TBI), France	To strengthen European SMEs' (small and medium-sized enterprises) capacities for technology strategy development and to assist European SMEs in participating in European RTD projects regarding marine pollution.		FP6: Funded under the activity area: "Structuring the ERA-Research and Innovation" Total budget: € 1.009.482 EC funding: €752.297	www.marine-pollutions.org and CORDIS FP6

"MAPRES" Marine Pollution Monitoring and Mitigation by Remote Sensing (Source : European Commission, DG Environment, Dir. A)	Marine pollution monitoring and detection by aerial surveillance and satellite images	Duration : 2007-2008 Coordinator : Consorzio Nationale Interuniversitario per le Scienze del Mare, ITALY	To develop an operating manual on: • methods, techniques, sensors and procedures for oil spill detection using remote sensing; • hydrodynamic numerical simulations for spill propagation forecasting and mitigation procedures To hold an operational exercise on these procedures, including all the main actors (Coast Guard, aerial surveillance and satellite imagery evaluation personnel) The project uses data provided by oil slick remote sensing observation to feed hydrodynamic models applied to forecast threatened areas: well-timed mitigation and recovering measures in a disaster occurrence.	Final report: http://ec.europa.eu/environment/civil/marin/pdfdocs/mapres.pdf	Co-funded/partially funded under the DG ENV – Call for proposals 2006 of the Community framework for cooperation in the field of accidental or deliberate marine pollution Total budget: €300,000 EC funding: €150,000	http://www.mapres.eu/ MAPRES presentation
"MarCoast" Marine and Coastal Environmental Information Services (Source: Internet research)	Oil spills, marine pollution surveillance and monitoring		The MarCoast project aims to establish a durable network of marine and coastal information services. MarCoast delivers satellite-based services in the field of marine and coastal applications. Services integrate detection and monitoring technologies involved in water quality, oil spill and metereological information into a durable network.		MarCoast is a 3-year GMES (Global Monitoring for Environment and Security) project funded by the European Space Agency (ESA)	http://www.gmes-marcoast.com/

"MARINE" Maritime Incident Research and Innovation		Duration: 2007-2008 Coordinator: University of Porto, PORTUGAL	The MARINE project aims to create a Research and Innovation Network for Maritime Incidents in the Atlantic Area, capable of developing and transferring knowledge in this domain. The activities of the MARINE network will embrace the study of the necessary skills and capacities to face an incident during its several stages. The main goal of the MARINE network is to bring different organisations together with the aim of setting up and boosting a cooperation network capable of promoting the creation and transfer of knowledge and technologies to face issues linked to maritime incidents.		INTERREG B – Atlantic IDT/RTD Project cost: €733,800 EC funding: €351,250	http://www.fe.up.pt/si/PROJECTOS_GERAL.MOSTRA_PROJECTO?P_ID=1095
"MARIS" Maritime Accident Response Information System (Source : Finnish Environment Institute, SYKE)	Decision support systems and software tools	Duration: 2003-2005 Coordinator: Finnish Environment Institute, SYKE	To map the risks of marine oil spills in the Baltic Sea area and the capacity to combat them	The MARIS-system (map interface). MARIS can be used to view different datasets related to oil spill risk and response over a common background map and in different combinations. http://www.helcom.fi/GIS/maris/en_GB/main/	Financed regionally by the Nordic Council of Ministers	http://www.helcom.fi/GIS/maris/en_GB/main/
"MarNIS" "Maritime navigation and information services "	Maritime navigation & information	Duration: 2004-2008 Coordinator: Ministry of Transport, AVV Transport	i) To develop maritime navigation and information services on a pan–European basis, in order to improve maritime transport safety. ii) To turn the vision of "One Stop Shopping" into reality on a pan – European and global basis. The		FP6: Co-funded/partially funded under the thematic area: "Sustainable Development" (Priority 1.6.2:	http://www.marnis.org/home.asp CORDIS FP6

		Research Centre, NETHERLANDS	development of a mandatory systematic use of modern localisation and communication systems will be key elements in this process.		Sustainable Surface Transport) Project cost: € 27.17 million EC funding: € 12 million	
"MARSAIS" Marine SAR Analysis and Interpretation System (Source: European Commission, DG JRC)	Marine pollution monitoring	Duration: 2001-2003 (3 years) Coordinator: Nansen Environmental and Remote Sensing Centre (NERSC), Norway	To design and implement a prototype generic Marine SAR Analysis and Interpretation System (MARSAIS) with sufficient product accuracy and optimum resolution for specific application to the coastal zone.	MARSAIS is an integrated information system for processing and information extraction from different types of Earth Observation data. Its main components are: • The MARSAIS Database: a web enabled database of multi-source satellite data implemented in IDL on the Net (ION); • The MARSAIS Toolkit: a series of selected algorithms and models implemented in IDL. The toolkit demonstrates different geophysical parameters that can be derived from SAR data alone or from synergy with other EO data types, model and in situ data; • The MARSAIS User Interface: a web based interface providing access to various products, data sources,	FP5: Co-funded under the "Energy, Environment and Sustainable Development" (EESD) thematic programme	http://marsais.ucc.ie/ http://marsais.nersc.no/introduction.html MARSAIS brochure: http://marsais.ucc.ie/Marsais%20brochure/index.html MARSAIS Final User Requirement Document: http://marsais.ucc.ie/Marsais%20brochure/Final%20URD%20%20.pdf CORDIS FP5

				algorithms and models, validation information and other data		
"MATBIOPOL" Role of microbial mats in bioremediation of hydrocarbon polluted coastal zones	Bio-remediation of hydrocarbon polluted coastal zones	Duration: 2000-2003 Coordinator : Université de pau et des pays de l'adour (UPPA), France	To understand the role of microbial mats in the bioremediation of oil-polluted shallow coastal marine environments and to evaluate the potential of using microbial mats as a means of rehabilitating oil contaminated marine sites to their original state.		FP5: Co-funded/partially funded under the "Energy, Environment and Sustainable Development" (EESD) thematic programme	http://web.univ-pau.fr/RECHERCHE/MATBIOPOL
"MERMAID": Marine Environmental Response data Management and Acquisition using Internet Data Brokerage		Duration: 2000-2002 Coordinator : BMT Marine Information Systems, UK	Overall Objective: The development of a seamless, minimum intervention link (Data Broker) to allow end users working in the marine environmental emergency application domain to access and use large distributed datasets of environmental parameters. This will include the development of an Internet-based Data Broker capable of cataloguing, storing/referencing and accessing these datasets.	Final Report: http://www.marinedatabroker.com/docs/wp9/D12-4%20-%20final%20report.pdf The project successfully delivered a fully working prototype of an Internet-based Data Broker aimed at the marine emergency response domain.	Partly funded (50%) by the European Union under the Framework V Information Society Technologies (IST) Programme Total budget: €2.150.000 EC funding: €1.100.000	http://www.marinedatabroker.com/

"MERSEA" Marine Environment and Security for the European Area – Integrated Project (Source: European Commission, DG Enterprise and Industry, Dir. H)	Satellite monitoring and surveillance systems, oceanographic and environmental monitoring	Duration: 2004-2008 Coordinator: IFREMER	To develop an integrated European operational system for the global monitoring and forecasting of the ocean and a coordinated network of regional systems in European waters	MERSEA is the predecessor of the MyOcean project (see table above)	FP6-IP: Funded within the GMES (Global monitoring for the environment and security) area of the "Space" thematic priority Total budget: € 24.420.940 EC funding: € 14.048.000	http://www.mersea.eu.org and http://www.mersea.eu.org/3-project-overview.html
"MIDIV" Monitoring illicit discharges from vessels (Source: European Commission, DG JRC)	Monitoring & surveillance (illicit discharges)	Duration: 2003-2006 (4 years) Coordinator: Institute for the Protection and Security of the Citizen (IPSC), JRC, Italy	To achieve a full integration of space-borne radar observations in an operational system for sea-based oil pollution monitoring. Main objectives are: ▪ The mapping of oil discharges in European seas using space imagery; ▪ The development and maintenance of a database and GIS of oil spills; ▪ The development of the European Group of Experts on satellite monitoring of sea-based oil pollution (EGEMP); ▪ The support to the emergency management of accidental oil pollution.	▪ Delivery of oil spill maps of European seas (available on website) ▪ Implementation of a Database and GIS for oil spill observations in European seas ▪ Secretariat support to EGEMP	FP6: Funded under the "Cross-cutting Research activities / JRC activities"	http://serac.jrc.it/index.php?option=com_content&task=view&id=61&Itemid=169 http://serac.jrc.it/midiv CORDIS FP6
"MSUO" Maritime Safety Umbrella Operation		Duration: -2007	The MSUO is an INTERREG cross programme enhancement that assists Maritime Safety projects by:		INTERREG IIIB	http://www.maritime-safety.org/

			▪ Providing a European and International Network for co-operation on maritime safety ▪ Promoting project outcomes to establish Europe and partners at the forefront of maritime safety activity ▪ Increasing project competence in maritime safety by closing gaps in knowledge and encouraging co-operation ▪ Assisting programmes to become a collective driving force for maritime safety on the European and International agenda			
"NAUPLIOS" Galileo Pilot Project Navigation and perilous goods input and output system	Maritime surveillance & safety	Duration: 2002-2003 Coordinator: Centre National d'Etudes Spatiales (CNES), France	To demonstrate Galileo improvements for maritime navigation security and hazardous goods transportation and to evaluate new services made possible by the return link to be used for search and rescue (SAR), doing much more than a simple positioning system.		FP5: Co-funded/partially funded under the "Competitive and Sustainable Growth" (GROWTH) thematic programme	http://nauplios.cnes.fr/ CORDIS FP5 Project sheet
"NEBAJEX" Net Environmental Benefit Analysis Joint Exercise		Duration : 2 years Coordinator : MUMM, Belgium	The main goal of this pilot project was to organize an oil pollution exercise at sea in order to carry out an effective monitoring in real time, and to develop a common monitoring approach, in support of a Net Environmental Benefit Analysis (NEBA) for oil pollution response at sea	NEBAJEX Final Report: http://ec.europa.eu/environment/civil/marin/pdfdocs/nebajex.pdf	Co-funded/partially funded under the DG ENV – Call for proposals 2001 of the Community framework for cooperation in the field of accidental or deliberate	http://ec.europa.eu/environment/civil/marin/pdfdocs/nebajex.pdf

					marine pollution	
"OCEANIDES" Harmonised monitoring, reporting and assessment of illegal marine oil discharges (Source: European Commission, DG JRC)	Marine pollution monitoring & surveillance (illicit discharges)	Duration: 2003-2005 Coordinator: Joint Research Centre (JRC)	To identify and assemble the knowledge required to establish a more harmonised and effective monitoring of European waters of illicit marine oil pollution. Specific objectives include: ▪ comparing accuracy/efficiency of automatic & manual methods for oil-spill recognition in SAR images of satellite/aircraft sensor systems ▪ analysing historic image archives to determine severity of the problem & understanding how many images/aircraft flights are needed to establish statistically robust oil pollution information ▪ developing & applying a methodology for assessing the environmental effects of illegal marine oil-spills at sea basin scale ▪ evaluating potential support of satellite oil spill recognition to optimise airborne surveillance & combating activities		FP5: Funded under the "Energy, Environment and Sustainable Development" (EESD) thematic programme Total budget: €2.577.595 EC funding: €1.288.796	http://oceanides.jrc.it/ CORDIS FP5
"OILECO" Integrating ecological values in the decision making process on oil spill combating in the Gulf of Finland (Source: Finnish Environment Institute, SYKE)	Marine pollution, environmental monitoring	Duration: 2005-2007 Coordinator : University of Helsinki	In the framework of the OILECO project the ecological values of the Finnish and Estonian parts of the Gulf of Finland will be plotted, their significance evaluated and supportive information produced to facilitate operational decision making in order to protect the most valuable populations and habitats in case of an oil spill	Prioritization of the Gulf of Finland coastline for oil combating (Final Report: http://hykotka.helsinki.fi/oileco/oileco_loppuraportti.pdf)	Total budget: € 804.724 Funding: National funding, and funding from the European Regional Development Fund (ERDF).	http://hykotka.helsinki.fi/oileco/index.html

					It implements the Interreg IIIA Southern Finland and Estonia programme.	
"OILI" Oil Spill Detection in the Baltic region (Source: Finnish Environment Institute, SYKE)	Decision support systems and software tools	Duration: 2003-2006 Coordinator: Finnish Environment Institute, SYKE	▪ To develop an operative near real-time system for oil spill detection, forecast drifting and presenting the results in a map user interface ▪ To develop a GIS application that would be used in risk assessment and during pollution response operations ▪ To develop automatic algorithm to detect oil spills in SAR satellite pictures	The BORIS map interphase. BORIS (Baltic Oil Response Information System) is an operational system which processes the satellite images, interprets potential oil slicks, shows the results and all other valid GIS information in a web based geographical user interphase. The BORIS system has also direct link to a drifting model, whose two days prognose can also be shown in the user interphase. (See also project BORIS II, in the table of ongoing projects above)	National funding	http://www.environment.fi/default.asp?contentid=150106&lan=fi&clan=en
"OROMA" Operational radar and optical mapping in monitoring hydrodynamic, morphodynamic and environmental		Duration: 2003-2005 Coordinator: Institute for Coastal Research (GKSS), Germany	The main objective is to monitor and map the near coastal bathymetry and related environmental parameter values as base for the coastal management for a most actual assessment of the coastal status and the dynamical behaviour of the involved processes.	To develop operational mapping tools by scientific progress. It will integrate cost effective radar and optical mapping techniques for the bathymetric	FP5: Co-funded/partially funded under the "Energy, Environment and Sustainable Development" (EESD) thematic	http://www.brockmann-consult.de/oroma/

parameters for coastal management			The project will conduct experimental monitoring to increase the effectiveness of monitoring technologies by increasing the basic knowledge on the physics involved.	assessment.	programme Total budget: € 3.333.5	
"OSH" Oil Sea Harvester (Source: European Commission, DG RTD)	Oil spill response technology, ship design	Duration : 2004-2007 Coordinator : ALSTOM Marine Chantiers de l'Atlantique, France	To develop an innovative trimaran ship design for responding to oil spills in rough seas. The trimaran vessels would be adapted to oil sea harvesting and the oil recovery tools would be designed (brush type skimmer, oil separator) to be integrated in the vessel. Main deliverable of the project will be the definition of the complete integrated OSH concept (vessel, tools, systems), including its economical perspective.	Trimaran was designed	FP6: Co-funded under the thematic area "Sustainable Development" Total budget: € 3.547.500 EC funding: € 2.000.000	http://www.osh-project.org/ CORDIS FP6 CORDIS News OSH Leaflet
"OSIS" Sensor for identification of oil spills from offshore installations Identification System	Oil spill detection, remote sensing	Duration: 2002-2005 Coordinator: OSIS International, DENMARK	To demonstrate the viability of a permanently mounted sensor system for identifying oil discharges from offshore installations within North-Sea areas designated as "special areas" by the International Maritime Organisation (IMO).	The OSIS project has successfully developed an oil spill sensor providing 'round-the-clock' online surveillance, which has been tested and installed on fixed offshore installations, mainly oil rigs	Co-funded under the LIFE 02-ENV Programme (DG ENV) Total budget: € 3.359.448 EC funding: € 867.392	http://www.osis.biz/ss2.asp Summary report: http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=home.showFile&rep=laymanReport&fil=LIFE02_ENV_DK_000151_LAYMAN.pdf

"OSIS-Marine Transport" Oil Spill Identification System for Marine Transport	Remote sensing, oil pollution	Duration: 2004-2007 Coordinator: OSIS International, DENMARK	To develop further the technology for surveillance of oil spills from platforms (which has been successfully developed under the LIFE 02-ENV project OSIS-Oil Spill Identification System). The present project will use the existing experience to develop and test a sensor and transmission system suited to the special conditions related to ship transport. The project will address best ways of measuring in a three-dimensional environment from a moving vessel, and effective data-transmission from a ship constantly changing its geographic position.		Co-funded under the LIFE 04-ENV Programme (DG ENV) Total budget: € 3.977.750 EC funding: € 1.193.325	http://www.osis.biz/ss2.asp LIFE 04
"ÖTVA" Oil pollution preparedness on the open sea – Report by an expert group (Source: Finnish Environment Institute, SYKE)	Marine pollution, preparedness and response	Duration : 2007	To define the optimal level of national marine oil spill response resources and propose the development needed in order to achieve the defined level	Final Report: http://www.ymparisto.fi/download.asp?contentid=77247&lan=fi (Publication series and number: The Finnish Environment 41/2007)	National funding	
"PEARL" Port Environmental Information Collector (Source: European Commission, DG Enterprise and Industry, Dir. H)	Satellitle monitoring and surveillance systems, ports environmental monitoring, information services	Duration: 2006-2008 Coordinator : Atos Origin, SAE Spain	• To have a good understanding of environmental needs of ports authorities • Achieve the operational use of space data in the port sector • Provide the port environmental manager with a user friendly tool for accessing and interpreting relevant information		FP6-STREP Funded within the GMES (Global monitoring for the environment and security) area of the "Space" thematic priority	http://www.pearl-project.eu

					Total budget: € 1.717.700 EC funding: € 890.000	
"POP&C" Pollution prevention and control – Safe transportation of hazardous goods by tankers (Source: European Commission, DG-RTD)	Pollution prevention and control	Duration : 2004-2006 (36 months) Coordinator INTERTANKO Safety, Technical and Environmental Committee (ISTEC) NORWAY	To address the tanker accidents issue by focusing on prevention and mitigation in ship design and operation for existing and new vessels. Specific objectives include: i) To develop a risk-based methodology to measure the oil spill potential of tankers ii) To develop a risk-based passive pollution prevention methodology (design and operational lines of defence) iii) To develop a risk-based active post-accident pollution mitigation and control framework	• Database on tanker accidents • Methodology and software tool to assess environmental risk from tankers and other ships	FP6: Funded under the thematic area "Sustainable Development" Total budget: € 2.204.873 EC funding: € 1.549.953	http://ec.europa.eu/research/transport/news/article_953_en.html CORDIS FP6
"POST-PRESTIGE" Post-Prestige intervention programme (Source: Internet research – EurOcean)	Marine pollution preparedness and response	Duration: 2002-2004 Coordinator: Spain	The project has three main objectives: • To intervene after the Prestige disaster for combating pollution at sea and coastline; • To favour a joint reflection under the common heritage (sea and coastline) affected by the Prestige disaster, in particular in regard to the surveillance, prevention and recovery of the environment; • To proceed to an exchange of experiences about prevention techniques, collection, cleaning and waste disposal		INTERREG III B Total budget: € 7.166.667 EC funding: €4.300.000	http://www.interreg-sudoe.org/francais/proyectos/approved_proyecto_ficha.asp?ID_Proyecto=51

"PRAGMA" Input to European guidelines for monitoring oil and chemical spills at sea	Environmental Impact Assessment from oil and chemical spills	Duration: 2005-2007 Coordinator: International Research Institute of Stavanger (IRIS) NORWAY	• To address issues related to the evaluation of the long lasting environmental impact of spills, related to aging processes of substances from past accidents along the EU coastal zone. • To implement well-established methodologies based on biological marker measurements as decision-making criteria for the assessment of environmental impact of oil and chemical spill at sea and integrate them in existing EU guidelines. • To propose simple, cost-effective analytical tools based on biosensors as monitoring techniques		DG Environment, Civil Protection: Community framework for cooperation in the field of accidental or deliberate marine pollution Total budget: €293,091 EC funding: €133,789	http://www.iris.no/Internet/pragma.nsf/wvDocID/5C1DF063EF726BA1C125713A00378890 http://ec.europa.eu/environment/civil/marin/mp05_en_projects.htm
***"PRESTIGE* oil spill": 9 studies and projects nationally funded under the Urgent Special Actions (2003) programme. (For detailed information, please see annex 1)** (Source: General Directorate of Merchant Marine, Spain)	Please see annex 1	Duration: 2002-2003 Coordinators: Please see annex 1	Please see annex 1	Please see annex 1	National funding: Spanish Ministry of Education and Science Urgent Special Actions (2003) Programme Total budget: €1.194.000	Please see annex 1
***"PRESTIGE* oil spill": 79 studies and**	Please see annex 1	Duration: 2004-2007	Please see annex 1	Please see annex 1	National funding: Spanish Ministry of Education and	Please see annex 1

projects nationally funded under the VEM-2003 programme. (For detailed information, please see annex 1) (Source: General Directorate of Merchant Marine, Spain)		Coordinators: Please see annex 1			Science VEM-2003 Programme (Programa de Vertidos Marinos) Total budget: €10.000.000	
***"PRESTIGE* oil spill": 6 studies and projects nationally funded under the Complementary Actions (2004) programme. (For detailed information, please see annex 1)** (Source: General Directorate of Merchant Marine, Spain)	Please see annex 1	Duration: 2004-2005 Coordinators: Please see annex 1	Please see annex 1	Please see annex 1	National funding: Spanish Ministry of Education and Science Complementary Actions (2004) programme Total budget: €117.973	Please see annex 1
***"PRESTIGE* oil spill": 18 studies and projects nationally**	Please see annex 1	Duration: 2005-2008 Coordinators: Please see annex 1	Please see annex 1	Please see annex 1	National funding: Spanish Ministry of Education and Science	Please see annex 1

funded under the VEM-2004 programme. (For detailed information, please see annex 1) (Source: General Directorate of Merchant Marine, Spain)					VEM-2004 programme (Programa de Vertidos Marinos) Total budget: €1.653.240	
PRESTIGE Oil Spill: Oceanographic cruise in the Prestige wreck zone to monitor and assess the leaks from the sunken tanker (Source: General Directorate of Merchant Marine, Spain)	Oceanographic monitoring, marine pollution	Duration: 2006-2007 Coordinator: Instituto Español de Oceanografía, Vigo	To monitor and assess the leaks from the sunken tanker *Prestige*		Special Actions (2006-2007) programme Total budget: €55.585 National funding: Spanish Ministry of Education and Science	
"PREVER" Advances in modelling of Prevention and Response to spills in ports, coastal and transitional waters (Source: General Directorate of	Pollution prevention, preparedness and response	Duration: 2007 Coordinator: Instituto de Hidráulica Ambiental. Universidad de Cantabria	To improve numerical applications, atmospheric and oceanographical, (hydrodynamic and substance transport), at high resolution (tens of metres) in order to be applied in coastal and ports pollution prevention systems. To set out efficient mechanisms to fight against accidental spills effects.		Programme: TRA2007 National funding, Spanish Ministry of Education and Science.	

Merchant Marine, Spain						
Properties of Russian oils and the applicability of dispersants (Source: European Commission, DG Environment, Dir. A , Swedish Coast Guard and HELCOM)	Pollution preparedness, pollution response dispersant use	Duration: April 2007-October 2008 Coordinator: Swedish Coast Guard	▪ To increase knowledge of the use of dispersants on oil transported in the Baltic Sea ▪ To analyse the chemical and physical properties and weathering of both Russian crude and bunker oils. The results will increase the knowledge of how these oils will change after a spill as well as to determine how effective dispersants are when used in the response of an oil spill. ▪ To establish Guidelines for use of dispersants in case of an oil spill of Russian oil in the Baltic Sea Region.	Final Report in English http://ec.europa.eu/environment/civil/marin/pdfdocs/slutrapp_reviderad.pdf	50 % EC-funding and 50 % funding by partners: Co-funded under the DG Environment – Call for proposals 2006 of the 'Community framework for cooperation in the field of accidental or deliberate marine pollution' Total budget: €114,056 EC funding: €54,620	http://ec.europa.eu/environment/civil/marin/mp05_en_projects.htm
Pump test (Source: Swedish Coast Guard)	Marine pollution response	Duration: 2006-2007	Find out pump capacity for heavy oils	Report (in Scandinavian only): http://www.copenhagenagreement.org	Regional funding within the Copenhagen Agreement	http ://www.copenhagenagreement.org
"RAPSODI" Remote sensing anti-pollution system for geographical data integration	Monitoring & surveillance, remote sensing	Duration: 2000-2002 (3 years) Coordinator: THALES SYSTEMES AEROPORTES S.A.,	• To develop necessary knowledge and sensor specifications in order to address maritime oil-spill pollution monitoring; • To propose a concept of an airborne system for maritime pollution surveillance to complement space	Results include: • Development and implementation of Synthetic Aperture Radar (SAR) algorithms for an airborne SAR system	FP5: Co-funded under the "User-friendly Information Society" (IST) thematic programme	http://serac.jrc.it/pdf/rapsodi_31-03-03.pdf CORDIS FP5

(Source: European Commission, DG JRC)		France	borne imagery use; • To design a dedicated system against maritime pollution by developing detection, estimation and tracking functions.	• Development and implementation of algorithms for oil spill detection in airborne SAR images • Testing of developed algorithms in a real time at sea exercise	Total budget: €1.497.344 EC funding: €845.315	
"RESPIL" Response means to chemicals spilled at sea and environmental damage (Source : European Commission, DG Environment, Dir. A)	Chemical spills	Duration : 2007-2008 Coordinator: International Research Institute of Stavanger (IRIS) NORWAY	To propose a panel of well-established biological- and ecotoxicological methodologies for their use in the assessment of environmental damage and recovery following chemical pollution. The usefulness of the methodologies will be tested in laboratory controlled and in field conditions using a selection of representative chemicals and marine bivalves as sentinel organisms. conditions and in field (mesocosm). The outcome of this project should have valuable implication in the monitoring of chemical pollution through cooperation among Member states, implementation of evaluation methods in EU guidelines and other international working groups.	Final report : http://www.iris.no/Internet/respill.nsf/wvDocId/DE882147CF1321C1C1257292004ED9DA/$file/TechRep-ver2009.pdf	Co-funded/partially funded under the DG ENV – Call for proposals 2006 of the Community framework for cooperation in the field of accidental or deliberate marine pollution Total budget: €299,005 EC funding: €148,154	RESPIL Presentation DG ENV http://www.iris.no/respill
"RIOS": Reducing the Impact of Oil Spills		Duration: 2007-2008 Coordinator: Nordeconsult, Sweden	The main objective of the RIOS-project is to develop an action plan for the future research in the area of rehabilitation of oiled animals and to stimulate the contacts and future cooperation between scientists and other stakeholders in this area.	The European Action Plan for Future Research and Development on Oiled Wildlife Rehabilitation	FP6 EC funding: € 170.300	http://www.nordeconsult.com/RIOS/index.htm

"SAI" Scientific and technological development of a integrate system for the managing of risks and environmental protection and fight against pollution in real time and remote access in the maritime sphere (Source: General Directorate of Merchant Marine, Spain)	Monitoring operations, response operations, tracking, contingency plans and training	Duration: 1 year (2007) Coordinator: Universidad de las Palmas de Gran Canaria			Programme: PROFIT National funding: Spanish Ministry of education and science.	
"SAMM" Environmental alert and monitoring system (Source: General Directorate of Merchant Marine, Spain)	Monitoring operations, contingency planning, risk assessment, response operations, tracking.	Duration: 2007-2008 Coordinator: Universidad de Las Palmas de Gran Canaria (ULPGC)	Development of a alert and monitoring system, for the Canary Islands, to act as a decision support system to prevent or act in the event of an oil spill		National funding: Regional Canary Islands Government	
"SÖKÖ I" A joint development program for shoreline response to worst case oil spill. (Unofficial	Marine pollution prevention, preparedness and response, oil and chemical spills, spill response technologies	Duration: 2003-2007 Coordinator: Kymenlaakso University of Applied Sciences, (KyAMK), in Kotka, Finland	To develop a model that describes how to manage the transportation of oily wastes, the oil combating equipment and personnel by road and by sea. In addition, the methods for loading and discharging of oily wastes as well as transportation routes and equipment were examined.	The SÖKÖ-guidebook for the shoreline response of the Kymenlaakso region (eastern part of the Gulf of Finland). The SÖKÖ guidebook provides information for oil combating authorities on	Funding: National Total budget: € 400.000	(SÖKÖ info in English)

translation from Finnish: *"Coordination of a large oil pollution response operation in the coastal zone – procedure for the authorities responsible for coastal zone pollution response operations")* (Source: Finnish Environment Institute, SYKE)			Also, the suitable areas for temporary storing sites in mainland and archipelago were charted and construction specifications for intermediate storages were prepared.	how to create and finance an oil combating organisation in the case of a massive oil accident. (See also the project SÖKÖ II on the table above of ongoing projects)		
"SOS" Numerical and Experimental Optimization of a Seaway Independent Oil Skimming System (Source: Technical University Berlin, Division of Ocean Engineering, Germany)	Pollution response	Duration: 2004-2008 Coordinator: Technical University Berlin/Division of Ocean Engineering	Optimization of a sea state independent oil skimming system by means of numerical and experimental analyses	During numerical and experimental analyses, the optimized skimming system yields an efficiency up to 95% in calm waters and up to 70% in the chosen sea states	National funding by the BMWi (Federal Ministry of Economics and Technology)	
"SPREEX" Spill response experience (Source: European	Identification of research needs	Duration: 2005-2007 Coordinator: ENTE Publico Puertos del Estado	Overall aim: To assemble existing experience from oil spill response. More specifically: ▪ To identify research needs to	State-of-the-Art Reports were developed and RTD needs have been identified (http://spreex.net/outcomes.htm)	FP6: Funded under the thematic area "Sustainable Development"	http://spreex.net/ CORDIS FP6

Commission, DG RTD)		Spain	achieve a fast and effective response, ▪ To propose clusters of existing research projects included in different research programmes ▪ To generate synergies for building new projects and partnerships between authorities and regulators, end-users and researchers.		Total budget: € 900.000 EC funding: € 900.000	
"Super CEPCO Pilot Project and Exercise" (Source : European Commission, DG Environment, Dir. A)	Oil pollution monitoring and detection	Duration: 2006-2007 Coordinator: Management Unit of North Sea Mathematical Models (MUMM), Royal Belgian Institute of Natural Sciences (RBINS)	• To perform a continuous monitoring of ship-source marine pollution by oil or other harmful substances traceable on the sea surface • To evaluate the use of satellites for marine pollution detection and monitoring and develop guidelines for satellite surveillance • To catch polluters and develop rapid, effective follow-up procedures • To draft European Guidelines on oil pollution monitoring, detection and reporting procedures	Final technical report: http://www.mumm.ac.be/SuperCEPCO/finalreport.pdf Draft European guidelines on (oil) pollution detection and reporting procedures for use at national and at sub-regional level http://www.mumm.ac.be/SuperCEPCO/generaldrafteuropeanguidelines.pdf	Co-funded/partially funded under the DG ENV – Call for proposals 2006 of the Community framework for cooperation in the field of accidental or deliberate marine pollution Total budget: €497,034 EC funding: €267,056	http://www.mumm.ac.be/SuperCEPCO/ MUMM press release
"TESEO-MARPOL" Treaty Enforcement Services Using earth Observation – Marine Pollution (MARPOL Convention)	Oil spills, satellite surveillance	Duration 2001-2002 (extended to 2003) Coordinator: BMT Ltd	A feasibility study done under the Treaty Enforcement Services Using Earth Observation (TESEO) initiative with the objective to explore the potential of satellite imagery to support the implementation of the MARPOL 73/78 Convention. The study is divided into three phases:	Phase 1 - Report on the study of Marine Pollution: http://dup.esrin.esa.it/files/project/192-171-5-18_200442711153.pdf	Total budget: €~300.000 Funded by the European Space Agency (ESA). ESA has placed a number of	http://dup.esrin.esa.it/projects/summaryp53.asp

(Source: Internet research, ESA website)			▪ Determination of the relevant legislation, the relevant organisations and the resulting requirements for enforcement and description of the state of the art of EO in support of marine pollution monitoring and treaty enforcement. ▪ Examination of the potential contribution of EO, including possible new EO technologies, and the identification of EO based information products that can serve future needs. ▪ Demonstration of two prototype products, including assessment by end users. Recommendations for the use and further development of TESEO applications for marine pollution.		consultancy contracts to examine the role and potential of earth observation to support the enforcement of international treaties	
"THEMES" Thematic network on safety assessment of waterborne transport	Safety of waterborne transport	Duration: 2000-2003 Coordinator: Den Norske Veritas (DNV), NORWAY	To improve industrial safety and environmental protection in shipping, through support to and development of a pro-active safety culture, by establishing a common knowledge base and a comprehensive framework of safety assessment and safety management for waterborne transport.		FP5: Funded under the "Competitive and Sustainable Growth" (GROWTH) thematic programme	CORDIS FP5
Very Heavy Fuel Oil: UK Spill Risk Assessment (UK MCA Research project Nr 522) (Source: Internet research – MCA	Oil pollution, HFOs, Risk assessment	Duration: 2006	▪ To identify the quantities and routeings of Very Heavy Fuel Oils (VHFOs), both as cargoes and as bunkers, that are transported within and through the UK pollution control zone (UKPCZ); ▪ To assess the locations of environmental and economic resources vulnerable to	Final Report (January 2007): http://www.ukshipregister.co.uk/master_vhfo_2008-4.pdf	National funding UK Maritime and Coastguard Agency	

webpage)			pollution from VHFOs; ▪ To evaluate the existing capacity to respond to VHFO spills in UK waters and make recommendations for additional measures			
VERTIMAR 2005 & VERTIMAR 2007 Symposia to monitor the research projects related to the Prestige oil spill * VERTIMAR is not an R&D project as such, but provides useful R&D information			Symposiums held in 2005 and 2007 in Vigo, Spain, to monitor the research projects related to the Prestige oil spill, in particular those funded by the Strategic Action against Accidental Oil Spills, Spanish Ministry of Education and Science (Special Urgent Actions, VEM-2003 and VEM-2004 Projects, and Complementary Actions 2004).	It is a forum where researchers from different fields and related to accidental marine oil spills can meet, present, discuss and transfer their projects' results. The conclusions and outcomes of these symposia, can be found on the symposia websites		http://otvm.uvigo.es/vertimar2005/ http://otvm.uvigo.es/vertimar2007/
"TOPAZ" Towards an operational prediction system for the North Atlantic European coastal zones	Monitoring & forecasting of marine environment	Duration: 2000-2003 Coordinator: Nansen Environmental and Remote Sensing Centre (NERSC), NORWAY	To implement a preoperational monitoring and forecasting system for the North Atlantic, the Nordic Seas and the Arctic. The system will use a state of the art couples ocean circulation and marine ecosystem model and assimilate observations available on near real time from satellites and in situ observation programmes.		FP5: Funded under the "Energy, Environment and Sustainable Development" (EESD) thematic programme	http://topaz.nersc.no/index.html
"WIN" Wide Information Network for risk management (Source: European Commission, DG	Monitoring & surveillance; Risk management	Duration: 2004-2007 Coordinator: ALCATEL ALENIA SPACE, France	To integrate existing reference results and initiatives to contribute to the design, the development, and the validation of what could be referred to as a "European risk management information infrastructure".		FP6: Funded under the thematic area: "Information society technologies"	CORDIS FP6

JRC)			WIN will approach different types of risks. The Marine and Coastal Environment Information Services, mainly focusing on response to accidental and deliberate oil pollution will be the first real application for Win infrastructure.		Total budget: € 8.080.000 EC funding: € 4.400.000	

7. Annex 1 – 112 R&D Projects funded by Spain from 2002 to 2007 related to the *Prestige* oil spill

Information is presented per funding programme, as provided by the Spanish General Directorate of Merchant Marine

Funding programmes:

- Urgent Special Actions 2003 programme (9 projects)
- VEM-2003 programme (79 projects)
- Complementary Actions 2004 programme (6 projects)
- VEM-2004 programme (18 projects)

Project name, duration, webpage	Marine Pollution Related Field	Funding Instrument	Objectives	Results
9 Projects funded under the Urgent Special Actions 2003 programme (Acciones especiales urgentes)				
Name: **Fuel oil wreck retained evolution model and physical-chemical properties identification**. Acronym: - Duration: 2002-2003 Coordinator: CIEMAT Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas Webpage: http://otvm.uvigo.es/investigacion/aeus/aeu2/aeu.html	Fuel behaviour modelling	Programme: Acciones especiales urgentes Total budget: 55.000€ National funding: National, Ministry of Education and Science.	The main goal was to study the state of the fuel left in the sunken tanker and predict its dynamic evolution.	The fuel did not experience a sudden change into a solid state due to the cooling process. However, viscosity increased hindering the motion of the fuel with decreasing temperature. After 6 months fuel temperature is around 10ºC and shows bad conditions to be pumped or transfer. http://otvm.uvigo.es/investigacion/aeus/aeu2/produccion.html
Name: **Maintaining and improving geophysical and trajectories models and predictions in the**	Forecast and monitoring	Programme: Acciones especiales urgentes	The main goal of this project is to maintain and to improve	Assistance to the response actions (fuel recovery, coastal

***Prestige* spill affected areas**. Acronym: - Duration: 2002-2003 Coordinator: UNICAN- Universidad de Cantabria Webpage: http://otvm.uvigo.es/investigacion/aeus/aeu3/aeu.html	oceanographic models	Total budget: 155.000 € National funding: Ministry of Education and Science.	the existing oceanographic-meteorological operational system, based on existing national and international operational observation and numerical prediction systems to provide oceanographic and atmospheric forecasts and oil spill trajectories. This information is relevant for decision makers in the areas affected by the *Prestige* oil spill.	protection) was given by predicting currents and swell with a high temporal and spatial resolution. http://otvm.uvigo.es/investigacion/aeus/aeu3/produccion.html
Name: **Oceanographic survey during spring bloom in Galicia and in the Cantabrian Sea**. Acronym: - Duration: 2002-2003 Coordinator: Instituto Español de Oceanografía- IEO-Coruña Webpage: http://otvm.uvigo.es/investigacion/aeus/aeu5/aeu.html	Risk assessment, pollution detection	Programme: Acciones especiales urgentes Total budget: 55.000 € National funding: Ministry of Education and Science.	The objective is to determine the concentration of hydrocarbon in water, plankton and sediment in the Galician and Cantabrian shelf during spring to essentially evaluate the levels of hydrocarbons in the first trophic level.	The planktonic system has not suffered any long-term effect as a consequence of the *Prestige* oil spill.
Name: **Oceanographic survey in the sinking area and continental slope**. Acronym: - Duration: 2002-2003 Coordinator: J. Manuel Cabanas. Instituto Español de Oceanografía- IEO-Grupo_Norte	Oceanographic characterization of a wreck zone	Programme: : Acciones especiales urgentes Total budget: 58.000 € National funding: Ministry of Education	1. Termohaline characterization of the *Prestige* sinking area, to know the current conditions for the initialization of hydrodynamic and pollutants dispersion models. 2. Termohaline	The place where the sunken *Prestige* lies is a dynamic area influenced by a submerged plateau known as *Banco de Galicia.* Superficial layers are forced by the wind. The predominant tide is semidiurnal being responsible for the observed variability of

Webpage: http://otvm.uvigo.es/investigacion/aeus/aeu4/aeu.html		and Science.	characterization in the shelf and continental slope area to improve the knowledge of the oceanographic structures (fronts, coastal currents) relevant in the transport and distribution of particulate and dissolved material. 3. To improve the currents knowledge in the sinking area from the surface to the bottom.	the currents. Important temporal variability was also recorded. http://otvm.uvigo.es/investigacion/aeus/aeu4/produccion.html
Name: **Identification of potential geo-environmental risks and its valuation in the *Prestige* ship collapse zone**. Acronym: - Duration: 2002-2003 Coordinator: Instituto de Ciencias del Mar, Consejo Superior de Investigaciones Científicas: ICM-CSIC Webpage: http://otvm.uvigo.es/investigacion/aeus/aeu1/aeu.html	Geo-environmental risk in the wreck zone	Programme: : Acciones especiales urgentes Total budget: 260000 € National funding: Ministry of Education and Science.	It aims at identifying and evaluating the geo-environmental risks in the wreck area by carrying out a comprehensive study (morfology, estratigraphy, sedimentary layers, types of floor, tectonic structures, fluids migration, seismic nature, and physical, geochemical and geotechnical properties, which characterize the floor sediment; moreover, it also aims at evaluating the probability of the seabed pollution with fuel, and study the geochemical processes in that area, in order to assess the impact in the environment.	The geologic risks identified in the wreck area are related to the morfologic, sedimentologic, tectonic and seismic characteristics. The interaction of these factors results in a medium level of dangerousness and a high degree of exposure of the sunken tanker to the geologic actors. http://otvm.uvigo.es/investigacion/aeus/aeu1/produccion.html
Name: **Fuel-oil analysis and cartography in sea water, sediments and organisms and pollution levels.** Inventory of the preliminary results obtained in Galicia and in the Cantabrian Sea.	pollution detection, oceanographic and environmental monitoring,	Programme: : Acciones especiales urgentes	The present project aims at understanding the spatial and temporal evolution of these processes in the first 10-12	-Highest concentrations of hydrocarbons in water were recorded in Galician coast in December 2002, which

Acronym: - Duration: 2002-2003 Coordinator: CSIC Centro Superior de Investigaciones Científicas Webpage: http://otvm.uvigo.es/investigacion/aeus/aeu6/aeu.html	risk assessment	Total budget: 233000 € National funding: Ministry of Education and Science.	months after the spill. To this end, the levels of hydrocarbons in water, sediment and organism samples collected during a series of cruises (December 2002 and February, March, April and September 2003) along the Galician and Cantabrian coasts were determined.	decreased significantly the following 2 months. -In sediments, highest concentrations were found in coastal areas, specifically in Costa da Morte and Islas de Ons. -An increase in PAHs concentration in mussels was recorded, especially in samples from Costa da Morte in February 2003. In summer, concentration decreased reaching values similar to levels showed before the spill. Similar trend was recorded in the rest of the biota analysed, except from fishes, whose PAHs concentration was not affected by the spill. - Apart from oil from *Prestige*, other residues were found: 10% tank washings, 7% bilge water. - *Prestige* fuel weathering: evaporation 5% max, dissolution 1% max., biodegradation: 1% max. http://otvm.uvigo.es/investigacion/aeus/aeu6/produccion.html
Name: **Implementation of an analytic results intercalibration system** Acronym: - Duration: 2002-2003	Marine pollution, pollution detection oceanographic and environmental monitoring risk assessment	Programme: Acciones especiales urgentes Total budget: 7000 € National funding:	To run an intercalibration exercise to know the comparability of the results given by 16 laboratories involved in the *Prestige* crisis.	In general, the quality of the analysis must improve in order to allow trustful comparability among results, and reliability of conclusions derived. http://otvm.uvigo.es/investig

Coordinator: Instituto Español de Oceanografía IEO-Vigo Webpage: http://otvm.uvigo.es/investigacion/aeus/aeu7/aeu.html		Ministry of Education and Science.		acion/aeus/aeu7/produccion.html
Name: **Impact assessment in communities and species of commercial and ecological interest in coastal areas. Spring season**. Acronym: Duration: 2002-2003 Coordinator: Universidade de Santiago de Compostela Webpage: http://otvm.uvigo.es/investigacion/aeus/aeu8/aeu.html	Environmental monitoring, impact on biological systems	Programme: Acciones especiales urgentes Total budget: 243000€ National funding: Ministry of Education and Science.	It aims at assessing the impact of the *Prestige* oil spill addressing two approaches: initial assessment of the impact on coastal communities in spring time, and toxicological assessment through biomarkers analysis using sentinel species.	-Vascular plants: lost in diversity due mainly to cleaning activities. -Algae: decrease in biomass, length of dominant species, and percentage of filamentous species. -Rocky shores: decrease on substrate occupation. -Sea urchin: almost total extinction in affected areas. http://otvm.uvigo.es/investigacion/aeus/aeu8/produccion.html
Name: **Impact assessment of the *Prestige* spill in the shelf ecosystem and their fisheries resources. Spring season** Acronym: Duration: 2002-2003 Coordinator: Ignacio Olaso Toca (IEO-Santander) Webpage: http://otvm.uvigo.es/investigacion/aeus/aeu9/aeu.html	Risk assessment	Programme: : Acciones especiales urgentes Total budget: 128000 € National funding: Ministry of Education and Science	The main goal objective is to estimate the impact on the main communities inhabiting the neritic zone, both the pelagic and bottom ecosystems, carrying out a sampling programme in spring which is the season of a highest increase in the primary productivity and when the reproduction and growth process of the main commercial species usually takes place.	http://otvm.uvigo.es/investigacion/aeus/aeu9/produccion.html

79 Projects funded under the VEM- 2003 programme (Total budget:10.000.000€)				
Name: **Impact and biomonitoring of *Prestige* oil spill on the reproductive potential of common octopus (*Octopus vulgaris*) in the Galician coast**. Reference: VEM2003-20010 Duration: 2004-2007 Coordinator: Rocha Valdés, Francisco Javier. Instituto de Investigaciones Marinas (IIM) | Consejo Superior de Investigaciones Científicas Webpage: -	Marine pollution, risk assessment	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	This study evaluates the *Prestige* oil spill effect on the commercial population of the common octopus (Octopus vulgaris) by means of changes of its reproductive potential and pollutant levels in oocytes and tissues.	The results obtained during this research provided a database of information about the impact of oil spill pollution on a species of ecological and economic interest
Name: **Parallel robot for observation and measuring of oceanographic variables**. Reference: VEM2003-20017 Duration: 2004-2007 Coordinator: Aracil Santonja, Rafael. Escuela Técnica Superior de Ingenieros Industriales | Universidad Politécnica de Madrid Webpage: -	Surveillance systems	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	The main objective in this project is the investigation and development of a integrated robotic system that makes easy the observation of oceanographic variables in real time. That means that, the system will be useful for validating and developing the models for studying and analysing outstanding variables and some fluids in the sea water.	The proposed system allows to have a vehicle without helmet for the underwater exploration with all manoeuvrability, floatability, depth control and low weight advantages. Consequently, we will have an inexpensive system due to the low energy consumption for the sailing.
Name: **Impact of the oil spill from the *Prestige* on the planktonic microbial food web** Reference: VEM2003-20021	Impact assessment	Programme: VEM-2003 Total budget:	The general objective of quantifying the effect of oil spills upon the structure and function of the pelagic microbial food web. This aim	

Duration: 2004-2007 Coordinator: Francisco Gómez Figueiras. Instituto de Investigaciones Marinas (IIM) | Consejo Superior de Investigaciones Científicas Webpage: -		National funding: Ministry of Education and Science	will be assessed in the four most relevant periods of the seasonal cycle characteristic of the Rias Baixas: winter period, spring phytoplankton bloom, upwelling season and downwelling period.	
Name: **Search, identification and characterization of marine microorganisms tolerant to organic solvents, capable of degrade phenanthrene and anthracene**. Reference: VEM2003-20025 Duration: 2004-2007 Coordinator: Segura Carnicero, Ana. Estación Experimental del Zaidín (EEZ) | Consejo Superior de Investigaciones Científicas Granada Webpage: -	Risk assessment, weathering, biodegradation	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	The main objective of the project is the isolation and identification of marine microorganisms with high tolerance toward organic solvents, combine with the ability to biodegrade phenanthrene and its corresponding alkyl derivatives and anthracene	
Name: **Rheological characterization of heavy crude oil fractions at high pressure**. Reference: VEM2003-20034 Duration: 2004-2007 Coordinator: Martínez Boza, Francisco José. Facultad de Ciencias Experimentales | Universidad de Huelva Huelva Webpage: -	Fuel fluid-dynamic performance in shipwreck	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	The objective of this project is the establishment of an empirical procedure to determine rheological properties, viscosity and viscoelasticity, in a wide range of pressure and temperature for these materials. This study can be used for modelling the fluid dynamic behaviour as a function of these variables.	

Name: **Study on the models on prevention, management and evaluation of environmental disasters on coast**. Reference: VEM2003-20035 Duration: 2004-2007 Coordinator: Vanaclocha Bellver, Francisco J. Facultad de Ciencias Sociales y Jurídicas | Universidad Carlos III Madrid Webpage: -	Contingency plans	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	The objective of this project is multiple. On one side (a) it is envisaged as a theoretical approach from a systemic conception to the struggle against the oil spills, from other side (b) it is sought to be a comparative analysis that based on the above mentioned systemic conception against oil spills would analyse the different existing models in a wide variety of countries, finally (c) it is planned to foresee the way the models operate when the disasters and contingencies that justify their existence come to prove them.	By reaching these objectives the research team will be in a position to systemize the Spanish model as well as to propose measures towards its improvements in the three basic fields of these models: prevention, operations (or managerial) and evaluation.
Name: **Effects of polluting hydrocarbons on marine zooplanktonic communities**. Reference: VEM2003-20037 Duration: 2004-2007 Coordinator: Calbet Fabregat, Albert. Instituto de Ciencias del Mar (ICM) | Consejo Superior de Investigaciones Científicas Barcelona Webpage: -	Marine Pollution, risk assessment	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	The main objectives of the study are: 1. To determine the effects of polycyclic aromatic hydrocarbons (PAH), present in oil slicks, on the local species of marine planktonic copepods. 2. To study the transfer of contaminants (PAH) through the marine planktonic food web. 3. To evaluate the changes in structure and function in the natural planktonic communities produced by hydrocarbon contaminants.	

Name: **Development of a specific code for the numerical simulation of the thermal and fluid-dynamic behaviour of fuel-oil contained in sunk ships** Reference: (FUELSIM). VEM2003-20046 Duration: 2004-2007 Coordinator: Barcelona Pérez Segarra, Carlos David. Escuela Técnica Superior de Ingenieros Industriales. Terrassa | Universidad Politécnica de Cataluña Webpage: -	Fuel fluid-dynamic performance in shipwreck	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	The code will implement three-dimensional unsteady simulations, considering two-phase flows (water / fuel-oil). It will be possible to treat the fuel-oil as a non-Newtonian fluid. The turbulent flows will be treated using advanced methods (RANS, LES, DNS). The code will allow the evaluation of aspects such as the flow rate through crannies at the hull, estimation of the total mass of fuel-oil that will reach the surface depending on the number and size of crannies, effect of the introduction of solvents, etc.	The code will be used to: (i) carry out a study that, considering different ship sizes, properties of the fuel-oil, water temperature and density, etc will allow to determinate in which cases all the fuel-oil will reach the surface and in how much time; (ii) in case of future accidents, it will be possible to carry out specific simulations, considering the properties of each case and with a realistic treatment of the ship's geometry.
Name: **Estimation of the genetic impact of fuel spill in wild populations of marine species**. Reference: VEM2003-20047 Duration: 2004-2007 Coordinator: Caballero Rúa, Armando. Facultad de Ciencias | Universidade de Vigo Pontevedra Webpage: -	Risk assessment	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	This project aims to understand what kind of species and life histories suffer from the highest reduction in genetic variability due to the fuel spill, as well as to estimate the actual genetic impact observed in a few key species of the marine ecosystems.	
Name: **Modelization and simulation of the fluid dynamics of fuel within a sunken tanker and the subsequent oil slick**. Reference: VEM2003-20048 Duration: 2004-2007	Fuel fluid-dynamic performance in shipwreck	Programme: VEM-2003 Total budget: National funding: Ministry of Education	The accurate prediction of the flow and heat transfer processes of the oil in storage tanks and on the sea surface is required in the decision-making process oriented to the minimization of the effects	Improving the performance of existing codes through the modelization of the dispersion and fragmentation of nearly neutral buoyant oil spills and the specific modelization of the flow pattern in shallow

Coordinator: Grau Vidal, Francesc Xavier. Escuela Técnica Superior de Ingeniería Química | Universidad Rovira i Virgili Tarragona Webpage: -		and Science	of oil spills. This project covers the development of CFD codes for the simulation of both flow/heat transfer processes of the oil in a sunken tanker and the dispersion of oil spills.	waters.
Name: **Seabirds as temporal and spatial bioindicators of pollution from the *Prestige* oil spill along the Galician littoral zone**. Reference: VEM2003-20052 Duration: 2004-2007 Coordinator: Oro de Rivas, Daniel. Instituto Mediterráneo de Estudios Avanzados (IMEDEA) | Consejo Superior de Investigaciones Científicas Baleares Webpage: -	Risk assessment, Impact on biologic systems	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	This project aims the study of both the direct and indirect impacts of the *Prestige* oil spill upon the seabirds breeding along the Galician coast (NW Spain) at several time scales (short, medium and long run), as well as the use of two seabird species (yellow-legged gulls and shags) as bio-indicators of environmental health	
Name: **Effects of the exposure to polycyclic aromatic hydrocarbons on reproduction and its neuroendocrine control in teleost fish**. Reference: VEM2003-20062 Duration: 2004-2007 Coordinator: Soengas Fernández, José Luis. Facultad de Ciencias | Universidade de Vigo Pontevedra Webpage: -	Risk assessment	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	The present project aim to study in teleost fish the effects of PAH exposure on reproduction and the mechanisms involved in the response to stress, as well as to study the neuroendocrine regulation of both processes using rainbow trout (*Oncorhynchus mykiss*) and Atlantic salmon (*Salmo salar*) as experimental models.	
Name: **Medium and long term effects on**	Socio-economical	Programme:	The objective of this project is	

fisheries economics resulting from oil spills: the case of the *Prestige*. Reference: VEM2003-20063 Duration: 2004-2007 Coordinator: García Negro, Maria do Carme. Facultad de Administración y Dirección de Empresas | Universidade de Santiago de Compostela A Coruña Webpage: -	impact	VEM-2003 Total budget: National funding: Ministry of Education and Science	to study the medium and long term effects on fisheries economics resulting from oil spills. The methodological debates about economic damage assessment and the analysis of the main oil spills from an economic point of view were considered.	
Name: **Distribution, fate and effects of the fuel-oil in the coastal zone affected by the *Prestige* oil spill. Subproject 1**. Reference: VEM2003-20068-C05-01 Coordinator: Bayona Termens, Josep Maria. Centro de Investigación y Desarrollo (CID) | Consejo Superior de Investigaciones Científicas Barcelona **Name**: **Toxicological assessment of the *Prestige* oil, its components and weathered products on coastal species of commercial and ecological relevance. Field investigation and laboratory bioessays. Subproject 2** Reference: VEM2003-20068-C05-02 Duration: 2004-2007 Coordinator: Beiras García-Sabell, Ricardo. Facultad de Ciencias | Universidade de Vigo Pontevedra **Name**: **Distribution, fate and effects of the fuel-oil in the coastal zone affected by the *Prestige***	Risk assessment, Bioremediation, Fuel-oil distribution and dynamic in affected ecosystems, Pollution monitoring	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	Improved methodologies for the characterisation of the *Prestige* oil spill and for the analysis of hydrocarbons and their degradation products in the marine environment. Toxicological assessment of the *Prestige* oil, its components and weathered products on coastal species of commercial or ecological relevance. Study of the spatial and temporal distribution of hydrocarbons in sediments and organisms of the coastal area affected by the oil spill. Characterisation of the photochemical and biodegradation processes of the fuel-oil. Ecotoxicological and remediation implications.	Scientific papers: *Ecotoxicological evaluation of polycyclic aromatic hydrocarbons using marine invertebrate embryo-larval bioassays Bellas, J; Saco-Alvarez, L; Nieto, O; Beiras, R Marine Pollution Bulletin [Mar. Pollut. Bull.]. Vol. 57, no. 6-12, pp. 493-502. 2008. * Toxicity and phototoxicity of water-accommodated fraction obtained from *Prestige* fuel oil and Marine fuel oil evaluated by marine bioassays Science of The Total Environment, Volume 394, Issues 2-3, 15 May 2008, Pages 275-282 Liliana Saco-Álvarez, Juan Bellas, Óscar Nieto, Josep María Bayona, Joan Albaigés, Ricardo Beiras * Accumulation trends of petroleum hydrocarbons in

oil spill. An integrated study. Subproject 3. Reference: VEM2003-20068-C05-03 Duration: 2004-2007 Coordinator: Viñas Diéguez, Lucia. Centro Costero Oceanográfico. Vigo | Instituto Español de Oceanografía (IEO) Pontevedra **Name**: **Biodegradation processes of the *Prestige* fuel-oil. Bioremediation implications. Subproject 4**. Reference: VEM2003-20068-C05-04 Duration: 2004-2007 Coordinator: Solanas Canovas, Anna Maria. Facultad de Biología. Universidad de Barcelona. **Name**: **Improved methodologies for analysis of hydrocarbons and heavy metals in marine environment. Monitoring of the *Prestige* oil spill. Subproject 5.** Reference: VEM2003-20068-C05-05 Duration: 2004-2007 Coordinator: Muniategui Lorenzo, Soledad. Facultad de Ciencias. Universidade da Coruña A Coruña Webpage: -				commercial shellfish from the Galician coast (NW Spain) affected by the *Prestige* oil spill Vinas, L; Franco, MA; Soriano, JA; Gonzalez, JJ; Ortiz, L; Bayona, JM; Albaiges, J
Name: **Simulation and modelization of the fluid-dynamic of shipwrecks' fuel using supercomputing advanced techniques.**	Fuel fluid-dynamic performance in shipwreck	Programme: VEM-2003	In this Project three Spanish Universities are going to join their efforts in order to	

Subproject 1. Reference: VEM2003-20069-C03-01 Duration: 2004-2007 Coordinator: Hauke Bernardos, Guillermo. Centro Politécnico Superior de Ingenieros | Universidad de Zaragoza Zaragoza Webpage: - **Name**: **Finite element methods joined with the characteristics methods for simulation of heat transport by natural convection. Subproject 2.** Reference: VEM2003-20069-C03-02 Duration: 2004-2007 Coordinator: Bermúdez de Castro López-Varela, Alfredo. Facultad de matemáticas, Universidade de Santiago de Compostela A Coruña. Webpage: - **Name**: **Prediction of the fuel-oil heat transport by natural convection within shipwrecks. Hydrodynamic modelization and simulation. Subproject 3.** Reference: VEM2003-20069-C03-03 Duration: 2004-2007 Coordinator: Codina Rovira, Ramón. Centro Internacional de Métodos Numéricos en Ingeniería | Centro Internacional de Métodos Numéricos en Ingeniería Barcelona		Total budget: National funding: Ministry of Education and Science	develop independent reliable simulation tools, which will be able to predict the heat transport problem of harmful substances, such us fuel-oil, within the shipwrecks, with the greatest accuracy and in the shortest time possible. Sub-project N. 1 will concentrate on the development of multi -scale finite element 3 methods, including error estimation and control, with automatic mesh adaptability. This part of the project also contemplates the parallelization of the computational codes and the development of a new high-performance workstation (based on Beowulf clustering) which will be assembled for this purpose. In Sub-project number 2, from the numerical point of view, a similar strategy to Sub-project number 1 will be followed. In particular, stabilized numerical methods will be used that will be compared with those of Sub -project number 1. Likewise, wit the objective of reproducing exactly the temporal evolution of the flow variables, high order time integration techniques will be developed, which will be used in combination with fractional	

Webpage: -			steps strategies to obtain better computational efficiency. A remarkable aspect of this formulation is its implementation, which will be carried out through a nodal based scheme with computational efficiency. From the point of view of the physical model, two particular phenomena will be studied, namely the non-linear rheology of the fluid, and the use of high order buoyancy models, since high temperature gradients are expected. The numerical model developed will be included in the pre and postprocessor GiD which will simplify the tasks of mesh generation and imposition of boundary conditions and the visualization of the results. The goals of Sub-project number 3 are centred in the numerical solution of the momentum and energy conservation equations by using the finite element method joined with the characteristics method of order two. It seeks to obtain methods of order two in time and in space, and therefore, the possibility of increasing the time step in the non-steady problems. The next problem to solve is due to the	

			coupling between the models. A second problem is the analytic study of the stability of the Rayleigh fluxes. For the validation of the simulation programs it will be employed the benchmark describing the steady convection between two horizontal plates maintained at given temperatures, whose solution has been obtained by Pellew and Southwell. Finally, results will be compared with those obtained in the other sub - projects.	
Name: **Effects of accidental oil spills on coastal ecosystems. Study of the transfer, fractionation and bioaccumulation processes through the food webs. Subproject 1.** Reference: VEM2003-20070-C04-01 Duration: 2004-2007 Coordinator: Freire Botana, Juan Manuel. Facultad de Ciencias | Universidade da Coruña A Coruña Webpage: - **Name**: **Effects of accidental oil spills on reproduction and recruitment of marine benthic invertebrates.** Reference: VEM2003-20070-C04-02 Duration: 2004-2007	Marine pollution, pollution detection, risk assessment, Fuel-oil toxicological assessment	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	Subproject 1.-Development of models of The coastal food webs using stable isotopes of carbon and nitrogen. Complimentarily, the use of stable isotopes as markers of the spill in the rocky intertidal will be assessed. Analysis of the incorporation of contaminants from the *Prestige* oil spill to the organisms of coastal ecosystems and study of the transfer, fractionation and bioaccumulation processes through the food webs. This study will evaluate the potential toxic sublethal effects (organic levels of polycyclic aromatic hydrocarbons) and their variability related to habitat,	

Coordinator: Vázquez Otero, Maria Elsa. Facultad de Ciencias | Universidade de Vigo Pontevedra Webpage: - **Name**: **Effects of accidental oil spills on development of benthic invertebrates. Morphological response as analysis tool for studying environmental stress.** Reference: VEM2003-20070-C04-03 Duration: 2004-2007 Coordinator: A Coruña Cobo Gradín, Fernando. Facultad de Biología | Universidade de Santiago de Compostela Webpage: - **Name**: **Effects of accidental oil spills on rocky intertidal and sublitoral communities of coastal habitats. Environmental monitoring of the substrate recolonization and succession.** Reference: VEM2003-20070-C04-04 Duration: 2004-2007 Coordinator: Urgorri Carrasco, Victoriano. Facultad de Biología | Universidade de Santiago de Compostela A Coruña Webpage: -			life history and trophic level in the coastal system. Subproject 2.- Study using a combination of observations and experiments of the effects of oil after the *Prestige* spill on reproduction and recruitment of *Hediste diversicolor*, *Mytilus edulis*, *Pollicipes pollicipes*, *Chthamalus montagui*, and *Paracentrotus lividus* in three localities of the Galician Coast with three different impact levels: Caldebarcos (Costa da Morte), Aguiño (Ría de Arousa) and O Segaño (Golfo Artabro). Subproject 3.- Use of the abnormal growth of benthic foraminifer's carapaces as indicator of the toxic effects of the spill. Analysis of the fluctuating asymmetry of various species of arthropods of ecological and commercial interest in coastal ecosystems selected due to their wide and diverse distribution and tolerance to high contaminant levels. Subproject 4.-A spatial and temporal assessment of the ecological impact of the oil spill on the coastal marine biota will be carried out studying the plant and animal communities living in rocky intertidal and sublittoral habitats. The composition and	

			evolution of the benthic communities will be used in four Galician coastal localities with a different degree of impact and the monitoring of the substrate recolonization and succession.	
Name: **Research on the technical feasibility of the injection of gases in the supercritical state as a method for plugging leaks.** Reference: VEM2003-20072-C02-01 Duration: 2004-2007 Coordinator: Santa-Maria Blanco, José Guillermo. Instituto de Fermentaciones Industriales (IFI) | Consejo Superior de Investigaciones Científicas Madrid Webpage: - **Name**: **Determination of diluted heavy hydrocarbons properties with CO2/CH4 mixtures in the supercritical state.** Reference: VEM2003-20072-C02-02 Duration: 2004-2007 Coordinator: Rodríguez Somolinos, Francisco. Facultad de Ciencias Químicas. Universidad Complutense de Madrid. Webpage: -	Fuel fluid-dynamic performance in shipwreck	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	The main purpose of this project is the technical feasibility study of the hydrocarbon waste remediation after shipwrecks such as the "*Prestige*" case by CO2 and CO2/CH4 mixtures in the supercritical state. Two possible solutions are proposed to solve the problem: leaks plugging and fuel oil pumping by supercritical fluid techniques. Thus the proposed research has been structured in two subprojects. The first subproject will deal with the supercritical fluid extraction of light hydrocarbons from the fuel oil. The injection of a gas in the supercritical state in the fuel oil will induce heavy hydrocarbon deposits that plug hull cracks and thus reduce fuel oil leaks. The extent of the heavy hydrocarbon deposition will be determined. It will depend largely on fuel oil composition, solvation power of injection	

			gas, and fuel oil temperature and pressure. In this second subproject the feasibility of the gas-diluted fuel oil pumping by gas lifting will be studied. To do this, advanced process simulation software will be used. Dissolution of a gas in the supercritical state in the fuel oil will cause a reduction on its density, viscosity and interfacial tension and thus its fluid-dynamic properties with pumping purposes will be enhanced. Therefore to simulate the pumping process, diffusion coefficients of the supercritical fluids in the fuel oil and density, viscosity and interfacial tension of the gas-diluted fuel oil at the shipwreck temperature and pressure will be determined.	
Name: **Anaerobic biodegradation of petroleum residues by sulphate reducer bacteria and biodiversity on microbial crude oil removal in marine sediments. Subproject 1.** Reference: VEM2003-20075-C02-01 Duration: 2004-2007 Coordinator: Marques Martín, Silvia. Estación Experimental del Zaidín (EEZ) | Consejo Superior de Investigaciones Científicas Granada	Bioremediation	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	We intend to analyse and compare the bacterial diversity present in sediments subjected or not to crude oil pollution, and to take advantage of this information to isolate Fe (III) reducer and sulphate reducer strains able to degrade aromatic compounds present in crude oil. The degradation pathway of the selected strains and the genes involved will be	

Webpage: - **Name**: **Isolation and molecular characterisation of reducer Fe (III) bacteria able to biodegrade aromatic compounds present in oil polluted sediments. Subproject 2.** Reference: VEM2003-20075-C02-02 Duration: 2004-2007 Coordinator: Carmona Pérez, Manuel. Centro de Investigaciones Biológicas (CIB) | Consejo Superior de Investigaciones Científicas Madrid.			characterised, in order to design molecular probes to easily and unequivocally detect these activities in situ. The limiting factors for optimal growth and degradation yield will be analysed. Finally, a technology based on the natural isotopic discrimination ability of living organisms will be set up for the rapid and sensitive detection in situ of anaerobic degradation of aromatic compounds	
Name: **Maritime security and environment: juridical and public repercussions on the "*Prestige* case". Subproject 1.** Reference: VEM2003-20076-C02-01 Coordinator: Sobrino Heredia, José Manuel. Instituto Universitario Estudios Europeos Salvador Madariaga. Universidade da Coruña A Coruña **Name**: **From the ecological catastrophe to political crisis: public opinion and published one about *Prestige* case. Subproject 2.** Reference: VEM2003-20076-C02-02 Coordinator: Ruano Gómez, Juan de Dios. Facultad de Sociología. Universidade da Coruña, A Coruña. Webpage: - Duration: 2004-2007	Contingency plans	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	As main objective of this project, we raise the need of selecting and value in their strategic importance, all the discourses and theories that contribute to a better understanding of issues related to information about collective risks and social communication in crisis situations. Once we get to know the significant lines of social and political analyses, the aim is to analyse operatively the suitable elements of risk information that have hinder an acceptable communication with regard to that risk management. The practical interest of this first aim lies in the understanding of the different dimensions involved	

			with management and communication, on the part of the Public Institutions, in a crisis situation caused by environmental and collective risk information. Our second aim is related to the application of a methodology of social investigation design for the empirical verification of learning obtained from our first objective. So, our second aim consists of making a monitoring in detail of the keys and analytical variables that have been present in the "*Prestige*" case, with the purpose of understanding the social alarm generated and the potential development of the informative treatment towards a social and political destabilisation. Our second objective has then, as its foundation, to provide precise analytical keys about the improvement of the informative management in a crisis situation by means of the knowledge of social communication lines that have been articulated in the case of the information related to the sinking of the oil tanker "*Prestige*", not only from the perspective of public opinion but also from the perspective	

			of the published one.	
Name: **Impact assessment of the *Prestige*'s oil spill on continental shelf ecosystems and its fishing resources. Galicia and Cantabrian Sea. Subproject 1**. Reference: VEM2003-20081-C02-01. Coordinator: Sánchez Delgado, Francisco. Instituto Español de Oceanografía (IEO) | Instituto Español de Oceanografía (IEO) Santander Webpage: - **Name**: **Impact assessment of the *Prestige*'s oil spill on continental shelf ecosystems and its fishing resources. Biology of resources. Subproject 2.** Reference: VEM2003-20081-C02-02. Coordinator: Saborido Rey, Juan Francisco. Instituto de Investigaciones Marinas (IIM) | Consejo Superior de Investigaciones Científicas. Pontevedra. Duration: 2004-2007	Marine pollution. Pullution detection, risk assessment.	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	The *Prestige* oil spill has affected the Galician and Cantabrian sea shelf communities through direct effects (mortality, sublethal effects), changes in the trophic structure (bottom–up and top-down effects) and indirect effects (mainly due to the close of the fisheries in the area). This project addresses the assessment of the impact on the fishing resources from an ecological viewpoint and with a cross-disciplinary approach. The main aspects studied are: the oil persistence on the substratum and how it affects the sediments and their dynamics; the assessment of the impact on supra-, epi- and endobenthic ecosystems and on the upper trophic levels through the trophic web; the impact on the species biology and the fishing resources, paying special attention to the effect on growth and reproduction of commercial species, and finally the results of all these factors on the fisheries. All this information will be integrated in a trophodynamic model to understand the oil spill impact on the shelf ecosystems	

			dynamics, structure and quality.	
Name: **Integrated assessment of the impact of the *Prestige*'s oil spill in Galicia and in the Gulf of Biscay: toxicological, ecological, productive and socio-economical aspects (1)** Reference: VEM2003-20082-C06-01 Duration: 2004-2007 Coordinator: Cajaraville Bereziartua, Miren Pilare. Facultad de Ciencias | Universidad del País Vasco / Euskal Herriko Unibertsitatea Vizcaya. Webpage: http://www.ehu.es/ImpactoBiologicoPrestige/ **Name**: **Integrated assessment of the impact of the *Prestige*'s oil spill in Galicia and in the Gulf of Biscay: toxicological, ecological, productive and socio-economical aspects (2).** Reference: VEM2003-20082-C06-02 Coordinator: Tarazona Lafarga, José Vicente. Subdirección General de Investigación y Tecnología | Instituto Nac. de Inv. y Tec. Agraria y Alimentaria (INIA) Madrid. **Name**: **Integrated assessment of the impact of the *Prestige*'s oil spill in Galicia and in the Gulf of Biscay: toxicological, ecological, productive and socio-economical aspects (3).** Reference: VEM2003-20082-C06-03 Coordinator: Gorostiaga Garai, José Maria. Facultad	Fuel-oil distribution and dynamic in affected ecosystems. Impact on biological systems.	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	The main objective of this coordinated project is to perform an integrated assessment of the effects of the "*Prestige*"´s oil spill comprising toxicological, ecological, productive and socioeconomical aspects (PREStige, Toxicological, Ecological, Productive and SocioEconomical aspects, acronym PRESTEPSE). Therefore, we intend to carry out a multidisciplinary project with especial emphasis on the integration of results obtained in the different fields. For this purpose 6 research groups participate in the project, each of them with previous demonstrable experience in the field of the assessment of the biological effects of pollution on marine and estuarine ecosystems and on fisheries resources. The group UPV-BCTA is in charge of the coordination of the project as a whole and will be involved in the toxicological assessment of the impact of the fuel oil on littoral sentinel species (mussels and limpets) and on two fish species constituting important fisheries resources	

de Ciencias | Universidad del País Vasco / Euskal Herriko Unibertsitatea Vizcaya. **Name**: **Integrated assessment of the impact of the *Prestige*'s oil spill in Galicia and in the Gulf of Biscay: toxicological, ecological, productive and socio-economical aspects (4).** Reference: VEM2003-20082-C06-04 Coordinator: Etxebarria Loizate, Nestor. Facultad de Ciencias. Universidad del País Vasco / Euskal Herriko Unibertsitatea Vizcaya. **Name**: **Integrated assessment of the impact of the *Prestige*'s oil spill in Galicia and in the Gulf of Biscay: toxicological, ecological, productive and socio-economical aspects (5).** Reference: VEM2003-20082-C06-05 Coordinator: Díez Díez, Guzmán. Fundación AZTI - AZTI Fundazioa. | Fundación AZTI - AZTI Fundazioa Vizcaya.			such as the anchovy (pelagic) and the hake (demersal) using early warning biomarkers of exposure and effects of the fuel oil, and powerful tools such as genomics and proteomics. The group at INIA will perform the toxicological evaluation of the impact of the fuel oil using bioassays of sublethal toxicity and of mutagenicity with water samples collected at the same locations than those used for collection of littoral sentinel species. They will also be involved in modelling of relationships between pollutant concentrations and toxicity, in collaboration with participants of UPV-BCTA, and will develop predictive bioaccumulation models to be compared with the field results obtained by the UPV-QAA group.	
Name: **Multisensor hyperspectral system for the detection, tracking and cartographic representation of marine spills: instrumentation, classification systems, real time detection.** Reference: VEM2003-20088-C04-01 Coordinator: Duro Fernández, Richard. Escuela Politécnica Superior | Universidade da Coruña. **Name**: **Development of a multisensor**	Fuel-oil distribution and dynamic in affected ecosystems	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	The objective of this proposal is to develop a complete, automatic, flexible, reliable, fast and precise real time detection and cartographic representation system for marine spills. The system will be based on the fusion of hyperspectral techniques and other complementary sensors. The objectives of the system that will determine its	

hyperspectral system for the detection, tracking and cartographic representation of marine spills: acquisition, control and communications. Reference: VEM2003-20088-C04-02 Coordinator: González Castaño, Francisco Javier. Escuela Técnica Superior de Ingenieros de Telecomunicación. Universidade de Vigo Pontevedra. **Name**: **Development of a hyperspectral sensor and complementary optical techniques for teledetection and analysis of marine spills**. Reference: VEM2003-20088-C04-03. Coordinator: Liñares Beiras, Jesús. Escuela Universitaria de Óptica y Optometría. Universidade de Santiago de Compostela A Coruña. **Name**: **Computational methods for spill detection from hyperspectral remote sensors and others**. Reference: VEM2003-20088-C04-04 Coordinator: Graña Romay, Manuel. Facultad de Informática. Universidad del Pa¡s Vasco / Euskal Herriko Unibertsitatea Guipúzcoa. Duration: 2004-2007			characteristics are: 1. Real time tracking of spills in marine environments. 2. Determination and mapping of the affected areas in coast and inlets. a) Coastal areas (dry ground) that are visible. b) Inlets and shallow water areas with layers of contamination in the bottom. c) Sandy areas where the spill is covered by layers of sand. 3. Study of the possibility of remotely tracking certain parameters in the ecosystems in order to monitor their recovery.	
Name: **Bioremediation of fuel polluted marine shorelines, seawater and sediments.** Reference: VEM2003-20089-C02-01	Bioremediation	Programme: VEM-2003 Total budget:	The present project aims the development of a technology for remediation of marine shorelines, water and sediments polluted with oil-	

Duration: 2004-2007 Coordinator: Feijoo Costa, Gumersindo. Facultad de Ciencias. Lugo | Universidade de Santiago de Compostela Lugo. Webpage: -		National funding: Ministry of Education and Science	derived compounds (specially the fuel) based on biodegradation processes with bacteria and/or fungi. Not only collection-type microorganisms but also autochthonous microbial flora from the polluted coastal areas will be applied. The application of treatment systems in solid phase (in situ) and in suspension or "slurry" (ex site) will be considered. The extent of biodegradation of each fraction of the fuel (saturated, aromatic, resinic and asphaltenic) will be evaluated. A special attention will be paid to the aromatic fraction (which represents an average percentage of 50% of the fuel). Among the different compounds that constitute this fraction, the polycyclic aromatic hydrocarbons (PAH) present a recalcitrant nature. For the objective of monitoring the main degradation products, HPLC, GC-MS and NMR analysis as well as the performance of experiments with exogenous addition of 13C-pyrene and 13C-phenanthrene will be considered. Finally, the scale-up of the process in laboratory pilot scale equipments corresponding to	

			each of the most efficient treatment systems and strategies will be developed.	
Name: **Geo-environmental risk assessment in the *Prestige* sinking area (ERGAP): study of sedimentology, geotectonic and physical properties**. Reference: VEM2003-20093-C03-01 Coordinator: Ercilla Zárraga, Gemma. Instituto de Ciencias del Mar (ICM) | Consejo Superior de Investigaciones Científicas Barcelona. **Name**: **Geo-environmental risk assessment in the *Prestige* sinking area (ERGAP): underwater continental slopes' instability, neotectonic and bottom currents erosion**. Reference: VEM2003-20093-C03-02 Coordinator: Somoza Losada, Luis. Dirección de Geología y Geofísica | Instituto Geológico y Minero de España Madrid. **Name**: **Geo-environmental risk assessment in the *Prestige* sinking area (ERGAP): study of lithoseismic facies, geochemical facies and structures of fluids' presence.** Reference: VEM2003-20093-C03-03 Coordinator: García Gil, Soledad. Facultad de Ciencias. Universidade de Vigo Pontevedra. Duration: 2004-2007 Webpage: -	Geological and geophysical characterisation in the sinking area.	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	The project plans out the tectonic and sedimentary risk assessment in the area of the *Prestige* sinking through the integrated morphology, sedimentary stratigraphy and facies, seafloor characterization, tectonic structures, fluid dynamics, geochemistry and geotechnics studies of the seafloor and subbottom sediments. Likewise, this project aims to determine the possible contamination of the seafloor and subbottom sediments by oil and the geochemical processes and its products in order to evaluate the environmental impact. The study area comprises the *Prestige* sinking zone in the Galicia bank and surrounding area of the continental slope and rise, and Iberian and Vizcaya Abyssal Plains. This project is a co-ordinated project comprising three sub-projects: sub-project 1, integrated by the Instituto Ciencias del Mar, CSIC, in Barcelona; subproject 2, integrated by the Instituto Geológico y Minero de España, IGME, in Madrid, joined to the	

			University of Cadiz, in Cadiz; and the subproject 3, integrated by the University of Vigo, in Vigo. Expected results would have short-term implications for the Government, Industry, Civil Defence and Insurance Companies, and they help to establish the technical conditions to increase the security of the persons and engineering works which can be affected by the oil spill event. Likewise, the results will have a great interest for those institutions dedicated to study the problems posed by the *Prestige* vessel (point 1) and the social and economic impacts (point 5) included as priority in the current announcement.	
Name: **Bioaccumulation and evaluation of the *Prestige* oil spill effects on mussel culture (BIOPMEX)** Reference: VEM2003-20096-C02-01 Coordinator: Labarta Fernández, Uxío. Instituto de Investigaciones Marinas (IIM). Consejo Superior de Investigaciones Científicas Pontevedra **Name**: **Bioaccumulation and evaluation of the *Prestige* oil spill effects on mussel culture (BIOPMEX).** Reference: VEM2003-20096-C02-02	Impact on biological systems. Pollution detection.	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	The present project proposes an evaluation of growth parameters and energetic physiology of mussel seed from different geographical locations, within north-south gradient of Galician Coast, which in turn is characterised by different degree of hydrocarbon contamination derived from *Prestige* catastrophe and maintained under raft culture in different areas of Galician Rias as well as studying the evolution of	

Coordinator: Pérez Camacho, Alejandro. Centro Costero Oceanográfico. A Coruña | Instituto Español de Oceanografía (IEO) A Coruña. Duration: 2004-2007 Webpage: -			their biochemical composition: proteins, carbohydrates, glycogen and with especial emphasis in the lipidic fraction. Moreover, it is proposed the control of gametogenic development in these mussel see as well and the combined use of biomarkers that permit to determine levels of exposition to aromatic hydrocarbons and their oxidised metabolites from *Prestige* oil spill as well as their toxic effects (lipids peroxidation) and probable interferences with reproduction (enzymatic inactivations or inhibitions that may reflect hormonal balance changes and gametogenesis inhibition). Beside the latter in situ monitoring of the catastrophe and its incidence either on growth or reproductive cycle, the present project aims to study in vitro the contamination of petroleum spill during gametogenic development of the mussel, evaluating its possible effect on the reproductive cycle, accumulation of biochemical reserves and to study biomarkers (molecular or cellular level changes of exposed organisms) as	

			parameters that would permit to evaluate and perform monitoring of the impact of fuel oil on reproduction processes.	
Name: **Characterization of the environmental quality in littoral ecosystems affected by oil spills. Comparison between accidental spills (acute impact) against continuous spills (chronic impact).** Reference: VEM2003-20563 Duration: 2004-2007 Coordinator: del Valls Casillas, Tomás Ángel. Instituto de Ciencias Marinas de Andalucía (ICMAN) | Consejo Superior de Investigaciones Científicas Cádiz Webpage: -	Impact on biologic systems	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science Collaborated international institutions: IPIMAR (INIAP) - Instituto de Investigaçao das Pescas e do Mar (Instituto de Investigaciones Agrarias y Pesquera) [Portugal] Consultora canadiense-EVS Environmental Consultants [Canadá]	An integrative assessment to determine the environmental quality of three different coastal areas in Spain (Bay of Cádiz, Bay of Algeciras and and Ría of Corme-Laxe) is proposed. These areas have suffered different levels of hydrocarbon spill that produced contamination by hydrocarbons and other associated contaminants. Thus, Ría of Corme-Laxe has been acutely impacted by the oil spill produced by the sunk of the tanker '*Prestige*', Bay of Algeciras has suffered diverse oil spills during the last decades of the past century and in the years of the XXI century, finally the Bay of Cádiz shows a low or inexistence rate of oil spills. The method compromises the measurement of contamination levels, toxic effects under laboratory conditions, adverse effects under field conditions and the bioaccumulation in the benthic ecosystem, both sediment and organisms living in it, to	

			determine the pollution. The study will be carried out in three phases in the three areas: 1) screening survey to determine the contamination; 2) the method will be applied in the 'full mode' and in a synoptic way: contamination, toxicity, 'in situ' effects and bioaccumulation; and 3) Determination of the environmental quality indexes and the derivation of sediment quality values related to the hydrocarbons and its associated contaminants provoking the biological effects (SQVs) for each area. The integration of the bioaccumulation data in the method will permit to assess the potential impact on the human population.	
Name: **Characterization of the indigenous microbial communities degrading the fuel of the *Prestige* and their bioremediation potential.** Reference: VEM2003-20565 Duration: 2004-2007 Coordinator: Lalucat Jo, Jorge. nstituto Mediterráneo de Estudios Avanzados (IMEDEA) | Universidad de Las Islas Baleares Baleares. Webpage: -	Fuel-oil distribution and dynamic in affected ecosystems.	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science Collaborated international institutions: Universidad de Essex [Reino Unido]	Bacteria play a predominant role in the degradation and mineralization of hydrocarbon spills in marine ecosystems. The indigenous microbiota responds to an oil spill by increasing its biodegradation capacity and favouring the development of those populations able to metabolise hydrocarbons. The composition of microbial communities varies with relation to the hydrocarbon characteristics and the	This project will allow us to determine which are the microorganisms present in polluted marine environments, which of them are involved in biodegradation, which metabolic genes are implicated are implicated and which biodegradation strategy might be the most appropriate for these environments.

			physico-chemical conditions of the environment. The succession of bacterial populations involved in hydrocarbon degradation is not well known due to methodological problems. Currently, the use of molecular techniques allows for the precise characterisation of the relevant microbial communities in marine ecosystems, as well as to characterise the genetic and metabolic potential of the populations degrading hydrocarbons in the recovery of contaminated areas. The main objectives of the proposed project are: 1. Analysis using cultivation and molecular methods of the bacterial communities in contaminated and non contaminated zones in an area affected by the *Prestige* oil spill at the Galician coast: tidal zone, sediment and surface water. Identification of those populations which actively degrade hydrocarbons by using stable isotope probing (SIP). 2. Study of the diversity of the key genes in the degradation of the crude oil	

			constituents, both from the isolated microorganisms and directly from environmental samples after generation of metagenomic libraries. 3. Bioremediation studies in micro- and macrocosms by stimulation of the indigenous microorganisms identified.	
Name: **Expert system for the monitoring and control of oil spills**. Reference: VEM2003-20567 Duration: 2004-2007 Coordinator: Pérez Marrero, Javier. Instituto Canario de Ciencias Marinas | Gobierno Canarias Las Palmas Webpage: -	Operational oceanography implementation on hydrocarbons spills. Collaborated international institutions: NOAA-National Oceanic and Admospheric Administration [USA] Universidad de Açores [Portugal]	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science	This project deals with the setup of an Expert System based in remote sensing data that will help in the generation of prevention and mitigation strategies against oil spills. The proposed model involves: optimal detection; taking advantage of the synergies amongst a number of satellite sensors, completed with advection diffusion models that will allow predicting the short term evolution of the spill or leakage. As main tool for spill detection Synthetic Aperture Radars (ERS, ENVISAT, RADARSAT) will be used, these are flown on board Earth observing satellites, that operate even under cloudy conditions. To qualify SAR observations in order to include them into an Operational System, wind scaterometer (QUIKSCAT) and	

			other radiometric data will be used (AVHRR, SeaWIFS, MERIS y MODIS). Remotely sensed data will be used to run and validate circulation models (PREVIMAR), and a Lagrangian model for contaminant dispersion. The goal is to generate short term predictive synthetic images of the spill evolution that will be updated as soon as new data became available. System validation will be performed through 3 case studies, from which large amounts of information are available, being the knowledge exchange amongst them one of the main issues of the project. In situ Information from spills and leakages near harbours will be sampled using ICCM research vessel 'Taliarte'	
Name: **Study of the *Prestige* spill impact on the zooplankton and ichthyoplankton**. Reference: VEM2003-20573-C02-01 Duration: 2004-2007 Coordinator: Irigoyen Larrazabal, Xabier. Fundación AZTI - AZTI Fundazioa. Gipuzkoa | Fundación AZTI - AZTI Fundazioa Guipúzcoa	Impact on biologic systems	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science Collaborated	The objective of this project is to investigate the effect of the *Prestige* spill on the zooplanktonic community in general and fish eggs in particular, both in the Atlantic façade and the Cantabrian Sea. To achieve this objective we intend to establish a coherent database with	

Webpage: - **Name**: **Study of the *Prestige* spill impact on the zooplankton and ichthyoplankton.** Reference: VEM2003-20573-C02-02 Duration: 2004-2007 Coordinator: López-Urrutia Lorente, Ángel. Instituto Español de Oceanografía (IEO) Centro Oceanográfico. Gijón, Asturias. Webpage: -		international institutions: SAHFOS-Sir Alistair Hardy Foundation for Ocean Science - [Reino Unido]	information on the abundance and composition of the zooplankton community through the analysis of samples that have been collected since the 1950s in the area that has been affected by the *Prestige* oil spill. This temporal coverage obtained mainly from samples collected by the Sir Alister Hardy Foundation for Ocean Science (SAHFOS) with the continuous plankton recorder (CPR) and the IEO sampling stations in the Cantabrian Sea will be complemented on an spatial scale by samples collected during anchovy and mackerel stock biomass surveys. Samples from different years will be partially reanalysed to obtain homogeneous information from both sources (zooplankton to be analysed in the fish egg samples and fish eggs to be identified in the CPR samples). We will use those data combined with statistical modelling techniques (general additive models, GAMs) to establish predictive maps. Predictive maps will be used as a baseline to establish the impact of the *Prestige* spill at different temporal scales: immediate, productive period	

			(spring) following the spill and consecutive years, and will also be useful in the future to determine the impact of any other accident.	
Name: **Computational simulation and instrumental analysis of undercooled hydrocarbons**. Reference: VEM2003-20574-C03-01 Coordinator: Lago Aranda, Santiago. Facultad de Ciencias Experimentales. Universidad Pablo de Olavide Sevilla. **Name**: **Computational theory and simulation of fuel like overcooled liquid.** Reference: VEM2003-20574-C03-02 Coordinator: Rull Fernández, Luis Felipe. Facultad de Física | Universidad de Sevilla Sevilla 1. **Name**: **Experimental study of undercooled fluids dynamic.** Reference: VEM2003-20574-C03-03 Coordinator: González Rubio, Ramón. Facultad de Química | Universidad Complutense de Madrid Madrid. Duration: 2004-2007 Webpage: -	Fuel fluid-dynamic performance in shipwreck.	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science Collaborated international institutions: Universidad de Princeton, NJ [USA] Universidad de Amsterdam [Holanda]	The basic hypothesis is the consideration of fuel marine spills as undercooled liquids, namely as systems remaining liquids well below of their freezing point. This fact is mainly dues to their huge relaxation times. The determination of the properties of these undercooled liquids in the conditions of a sunken boat will be get either by the use of different experimental techniques in the lab, notably relaxation dielectric spectroscopy, or by different computer simulation methods. Required transport coefficients to estimate spill fluxes out of the sunken boat will be estimated in the project. The project will also study the spill emulsion and aggregation phenomena in the marine water from the kinetic and thermodynamic aspects. Influence of pressure, temperature and salt concentration on the aggregation conditions will be intensively studied.	

			Finally, the project will focus on the aggregation conditions in confined systems which can give us some account about how the aggregation process is initially launched in a microscopic way in beaches and coasts.	
Name: **Spanish Operational Oceanography System: modelling, teledetection and exploitation**. Reference: VEM2003-20577-C14-01 Coordinator: Álvarez Fanjul, Enrique. Puertos del Estado. Puertos del Estado, Madrid. **Name**: **Spanish Operational Oceanography System: data, exploitation and modelling**. Reference: VEM2003-20577-C14-02 Coordinator: Parrilla Barrera, Gregorio. Instituto Español de Oceanografía (IEO) | Instituto Español de Oceanografía (IEO) Madrid **Name**: **Cantabria University contribution to Spanish Operational Oceanography System**. Reference:VEM2003-20577-C14-03 Coordinator: Losada Rodríguez, Iñigo Javier. Escuela Técnica Superior de Ing. Caminos, Canales y Puertos | Universidad de Cantabria Santander. **Name**: **Spanish Operational Oceanography System: modelling of rias (estuaries) and Galician continental slope.**	Operational oceanography implementation on hydrocarbons spills	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science Collaborated international institutions: MFSTEP (INGV)-Mediterranean Forecasting System Toward Environmental Predictions (National Institute for Geophysiscs and Volcanology) [Italia] NRL (Naval Research Laboratory) [USA] POL (Proudman Oceanographic Laboratory) [Reino Unido] ECMWF (European Centre for Medium Range Weather	The main objective of the present project is the development and implementation of a Spanish Operational Oceanography system able to be used in emergency situations at sea, such us oil spill accidents or tracking of drifting objects. The system will consist in several applications based on numerical modelling and analysis of oceanographic data, both historical and real time. The applications based on numerical models will provide forecast of several Physical parameters, such us winds, currents, sea surface temperature, waves and sea level. The models will be operational at three different scales: a) global, generating boundary conditions, b) regional, providing a single high resolution solution for all the Spanish waters and c) local, where the different institutes will create very high resolution applications for	

Reference: VEM2003-20577-C14-04 Coordinator: Varela Benvenuto, Ramiro. Facultad de Ciencias | Universidade de Vigo Pontevedra **Name**: **Spanish Operational Oceanography System: oil spills modelling and oceanographic modelling**. Reference: VEM2003-20577-C14-05 Coordinator: Sánchez-Arcilla Conejo, Agustín. Escuela Técnica Superior de Ing. Caminos, Canales y Puertos. Universidad Politécnica de Cataluña Barcelona. **Name**: **Spanish Operational Oceanography System: circulation and oil spills in Canary Islands.** Reference: VEM2003-20577-C14-06 Coordinator: Grisola Santos, Diana. Facultad de Ciencias del Mar | Universidad de Las Palmas de Gran Canaria Las Palmas. **Name**: **Spanish Operational Oceanography System: Andalusian coast area**. Reference: VEM2003-20577-C14-07 Coordinator: Izquierdo González, Alfredo. Facultad de Ciencias del Mar. Universidad de Cádiz Cádiz. **Name**: **Oceanic Prediction System with assimilation of real-time data.** Reference: VEM2003-20577-C14-08		Forecasting) [Reino Unido]	different coastal areas. These local models will be able to cover the whole Spanish coastline, either using permanent implementations or by means of relocatable models. Local scale applications will be nested on regional scale ones, and regional on global models. Basic research will be required for the development of the systems, especially on the areas related to data assimilation and model nesting. The applications based on data analysis will provide immediate access to processed information that will be used for decision making during emergency situations. In order to prepare these applications, new developments will be required in the field of oceanographic data analysis. The results of this project will not be limited to emergency cases, but will boost the knowledge of Spanish coastal waters and the related scientific tools available.	

Coordinator: Tintoré Subirana, Joaquín. Instituto Mediterráneo de Estudios Avanzados (IMEDEA) | Consejo Superior de Investigaciones Científicas Baleares. **Name**: **Spanish Operational Oceanography System of eastern Cantabrian Sea: observation, monitoring and prediction.** Reference: Uriarte Villalba, Adolfo. VEM2003-20577-C14-09 Fundación AZTI - AZTI Fundazioa. Gipuzkoa | Fundación AZTI - AZTI Fundazioa Guipúzcoa. **Name**: **Spanish Operational Oceanography System: models validation and intercomparison**. Reference: VEM2003-20577-C14-10 Coordinator: García Ladona, Emilio. Instituto de Ciencias del Mar (ICM) | Consejo Superior de Investigaciones Científicas Barcelona. **Name**: **Spanish Operational Oceanography System: data, exploitation and modelling**. Reference: VEM2003-20577-C14-11 Coordinator: Pérez Zabaleta, Amelia. Facultad de Ciencias Económicas y Empresariales. Universidad Nacional de Educación a Distancia. Madrid. **Name**: **Spanish Oceanography System: meteorological modelling and high-resolution Oceanography**. Reference: VEM2003-20577-C14-12				

Coordinator: Pérez Muñuzuri, Vicente. Facultad de Física | Universidade de Santiago de Compostela A Coruña. **Name**: **Spanish Operational Oceanography System (meteorological modelling).** Reference: VEM2003-20577-C14-13 Coordinator: Couchoud Gregori, Milagros. Dirección General del Instituto Nacional de Meteorología. Dirección General del Instituto Nacional de Meteorología Madrid. **Name**: **Forecast system of oceanographic variables in Galician Rias (estuaries).** Acronym: VEM2003-20577-C14-14 Coordinator: Acinas García Juan, Román. Escuela Técnica Superior de Ing. Caminos, Canales y Puertos. Universidade da Coruña A Coruña. Duration: 2004-2007 Webpage: -				
Name: **Development of elements, tools, response protocols and an information system for the design of contingency plans for accidental oil spills. Coordination, advice, validation and spreading of elements and helping systems for contingency plans design.** Reference: VEM2003-20578-C08-01 Coordinator: Chapela Pérez, Mª Rosa. Fundación Cetmar - Centro Tecnológico del Mar. Vigo.	Contingency plans design related to marine spills.	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science Collaborated	Oil spills are one of the most important sources of accidental marine pollution. The intensive maritime transport of oil taking place near the Galician coasts makes this area become a potential scenario of maritime accidents with serious consequences for the ecosystems and the economy	

Pontevedra. **Name**: **Checking of contingency plans, setting of behaviour actions on ships in danger, and research and study of systems and mechanical equipment for hydrocarbon retaining and removal**. Acronym: VEM2003-20578-C08-02 Coordinator: Núñez Basáñez, José Fernando. Escuela Técnica Superior de Ingenieros Navales | Universidad Politécnica de Madrid Madrid. **Name**: **Hydrocarbon spills detection, monitoring and prediction in oceanic waters, using teledetection and artificial intelligence systems**. Acronym: VEM2003-20578-C08-03 Coordinator: Torres Palenzuela, Jesús Manuel. Facultad de Ciencias | Universidade de Vigo Pontevedra. **Name**: **Bioremediation and chemical methods on oil spillage.** Reference: VEM2003-20578-C08-04 Coordinator: Mirón López, Jesús. Facultad de Ciencias. Universidade de Vigo Pontevedra. **Name**: **Information system for definition and carry out of a contingency plan against accidental marine spills.** Reference: VEM2003-20578-C08-05 Coordinator: Vázquez Núñez, Fernando Antonio.		international institutions: CEDRE-Centre de documentation de recherche et d'expérimentations sur les pollutions accidentelles des eaux [Francia]	of coastal communities. This project aims to develop elements, tools, protocols and information systems for the decision-making and for the organisation of actions and responses to accidental marine oil spills. Such systems might be used by administrations, bodies or organisms legally qualified for the design and implementation of a contingency plan. Due to the multidisciplinary nature of the actions to be developed against marine pollution, the project has been structured as a coordinated project, constituted by several sub-projects that comprises a multidisciplinary and inter-institutional group of highly experienced researchers in the subjects purposed on the project as well as some public experts qualified for the elaboration and implementation of contingency plans. Moreover, the project counts on the additional participation of a research group from CEDRE, French organism in charge of giving advice and support to the competent authorities on the area accidental marine pollution.	

Escuela Técnica Superior de Ingenieros Industriales | Universidade de Vigo Pontevedra. **Name**: **Processing, reutilization and disposal of fuel leakage waste**. Reference: VEM2003-20578-C08-06 Coordinator: Guitián Rivera, Francisco. Instituto de Cerámica | Universidade de Santiago de Compostela A Coruña. **Name**: **Cost-profit analysis of different contingency plans with environmental impacts**. Reference: VEM2003-20578-C08-07 Coordinator: López Iglesias, Edelmiro. Instituto Universitario Estudios e Desenvolvemento de Galicia. Universidade de Santiago de Compostela A Coruña. **Name**: **Preparation of an action guide for marine pollution monitoring caused by a hydrocarbon spill and its effects on resources.** Reference: VEM2003-20578-C08-08 Coordinator: González-Garcés Santiso, Alberto. Centro Costero Oceanográfico. Vigo | Instituto Español de Oceanografía (IEO) Pontevedra. Duration: 2004-2007 Webpage: -			The project covers the identification, compilation and assessment of guidelines, actions, means and material, scientific and human resources existing at regional, national and international level for prevention and fight against oil spill including, when appropriate, localisation, cataloguing and costs/benefit studies, as well as the way and criteria of implementation or action. The information collected and analysed will include moreover the nature and characteristics of the contaminants and the environment where the spills occurs, contention equipment and systems, oil cleaning, waste management and transport, weather and oceanographic information, observation and prediction systems and models and a map of sensitivity of Galician coasts with remarkable information regarding resources protection. By using all the scientific and technical information collected by experts as well as the criteria for decision-making during the different situations and/or scenarios (ships in danger, oil spills in open sea or on the coast, etc.) databases with	

			geographical references, manuals and protocols for action will be elaborated. Furthermore, an information system to be used as a tool for the definition and implementation of a contingency plan and to manage the logistics derived from such plan will be designed. With the aim to count on a better approach to reality a computer prototype will be created to serve as a reference for its mighty implementation by the competent administrations. Additionally, those means, data or resources necessary for the design and execution of a contingency plan which are not available at present, will be identified. Finally, and taking into account that every contingency plan must contain prevention measures to reduce the accident risks to the minimum, proposals of training programs for crews and for ships and ports inspectors will be carried out and also for the different levels of operators, technicians and managers intervening in management and relieve of oil spills	

			incidents.	
Name: **Biogeochemical and oceanographical implications of the dispersion in the water column of the oil spilled from the *Prestige* wreck (FATEFUEL).** Reference: VEM2003-20583 Duration: 2004-2007 Coordinator: Rosell Mele, Antoni. Facultad de Ciencias. Universidad Autónoma de Barcelona Barcelona 3 Webpage: -	Fuel fate	Programme: VEM-2003 Total budget: National funding: Ministry of Education and Science Collaborated international institutions: Dept. Ingeniería Civil y Ambiental-Clarkson University, Postdam, New York [USA] AWI-Alfred Wegener Institute for Polar and Marine Research, Bremerhaven [Alemania] Marine Environmental Laboratory of IAEA (International Atomic Energy Agency) [Monaco]	The aim of the Project is to answer to the following questions: where is the fuel leaving the wreck going?, is it going to disaggregate and degrade at sea?, is it turning up at the surface, being transported by the ocean currents over great distances?, can it end up in the Iberian or European coasts?. The main objective of the Project is to find out the fate of the fuel, its residues or derivates, from the *Prestige* wreck in the different water masses of the accident region. The starting hypothesis is that the deep sea, intermediate and surface currents are actively dispersing the oil in the water column, so that there are chemical traces of fuel at a distance from the wreck equivalent to the average velocity of different water masses. It is proposed to undertake: i) Laboratory work to fully characterise the fuel and identify organic and inorganic tracers from it in the ocean, as well as to investigate potential changes in fuel composition in the water column during its rising	

			towards the surface. ii) Two oceanographic cruises to investigate the role of the water masses around the wreck to transport laterally the fuel oil coming out of the wreck, and the rile of the suspended particulate matter to sediment fuel remains in the ocean bottom. iii) Mathematical modelling to simulate the plume of the fuel oil leaving the wreck, that will be validated and tuned using the data from the proposed oceanographic cruises. The proposed study will be also a contribution towards a better understanding of the synamism of the water masses in the area of the sinking of the *Prestige*, and of the transforming and transporting processes of organic matter at sea.	
6 Projects funded under the "Complementary actions" programme (Acciones complementarias)				
Name: **2º Ejercicio de intercalibración de HAPs en relación con el estudio del impacto del *Prestige*** (Second PAHs' intercalibration exercise, related to the *Prestige* oil spill impacts) Coordinator: Lucía Viñas Diéguez (Instituto Español de Oceanografía - Vigo)	Pollution detection	Programme: Acciones complementarias. Budget: 14.000,00 € National, funding: Ministry of Education		

Duration: 2004-2005 Webpage: -		and Science		
Name: **Seguimiento temporal del impacto del *Prestige* en el bentos submareal**. (Monitoring of the impact evolution of the *Prestige* impact on the subtidal benthos) Coordinator: Jesús Souza Troncoso (Universidade de Vigo)	Pollution monitoring	Programme: Acciones complementarias. Budget: 14.780,00€ National funding: Ministry of Education and Science		
Name: **Evaluación del impacto del fuel en las comunidades de sustrato rocoso intermareal en el tercer período primaveral: horizonte mesolitoral superior de Chthamalus spp.** (Impact assessment of fuel on rocky substrate intertidal communities, at the third spring period: Chthamalus spp.) Coordinator: Celia Besteiro Rodríguez (Universidade de Santiago de Compostela) Duration: 2004-2005	Risk assessment, pollution detection	Programme: Acciones complementarias. Budget: 13.901,52€ National, funding: Ministry of Education and Science		
Name: **Evaluación del impacto del vertido del buque *Prestige* sobre las especies de interés comercial asociadas a sustratos rocosos del litoral gallego. Período primaveral del año 2005.** (Impact assessment of the *Prestige* oil spill on the economic relevant species on rocky substrates of the Galician shores. 2005 spring.) Coordinator: Eugenio Fernández Pulpeiro (Universidade de Santiago de Compostela)	Risk assessment, pollution detection	Programme: Acciones complementarias. Budget: 11.000,00€ National, funding: Ministry of Education and Science		

Duration: 2004-2005				
Name: **Reconocimiento oceanográfico en la época de proliferación primaveral en una ría de la Costa da Morte (Galicia) y su plataforma continental adyacente**. (Oceanographic study during the spring proliferation in a ría located in Costa da Morte (Galicia) and its continental platform.) Coordinator:Manuel Varela Rodríguez (IEO-A Coruña) Duration: 2004-2005	Oceanographic monitoring	Programme: Acciones complementarias. Budget: 25.050,00 € + 10.800,00 € (BIO-Lura) National, funding: Ministry of Education and Science		
Name: **Bases para el desarrollo de un modelo de enterramiento del fuel y su evolución en la columna sedimentaria de la zona intermareal de playas.** (Basis for the development of a fuel burial model and its evolution in the sedimentary column of a intertidal beach area.) Coordinator: Ana M. Bernabeu Tello (Universidade de Vigo). Duration: 2004-2005	Fuel fate	Programme: Acciones complementarias. Budget: 28.441,81 € National, funding: Ministry of Education and Science		
18 projects funded under the VEM-2004 prgramme (Funds provided: 1,653,240.00€)				
Name: **Seabirds as indicators of ecological changes in the coastal marine ecosystem affected by the "*Prestige*" oil spill: stable isotopes as biomarkers**. Reference: VEM2004-08524	Pollution assessment and detection.	Programme: VEM-2004 Total budget: National funding: Ministry of Education	This project aims to evaluate the changes in the use of trophic resources by seabird species in the Atlantic coast from Galicia occurred after the oil spill caused by the '*Prestige*'. Species considered	

Duration: 2005-2008 Coordinator: Sanpera Trigueros, Carolina. | Facultad de Biología | Universidad de Barcelona Barcelona Webpage: -		and Science	are the yellow-legged seagull (Larus cachinnans) and the shag (Phalacrocorax aristotelis), both nesting in the area. They represent two different feeding strategies, generalist vs. specialist, and thus have the potential to provide complementary views on changes in food availability and feeding resources being used. To evaluate the status of the coastal ecosystem, biomarkers such as stable isotopes of nitrogen (15N/14N), carbon (13C/12C) and sulphur (34S/32S) will be measured in feathers taken during the bird's breeding season; this will provide a qualitative estimate of diet. Two are the main objectives of this project. First of all, to estimate the changes in stable isotope signatures by comparing the values in feathers developed before the oil-spill (in 2002) with those of feathers formed afterwards. Secondly, to track the trends of isotopic signatures in five consecutive breeding seasons, to evaluate the degree of recovering of the ecosystem. This represents an innovative way to look at the effects of oil spill on coastal ecosystems, since the	

			biomarkers considered here constitute powerful tools for the study of seabird trophic ecology and also, because the indicator species used are top predators, and thus provide an integrated answer, both in space and time, to the problem posed by changes in the prey's communities, as well as in the ecosystem as a whole, which have been caused by an unexpected event such as the wreck of the *Prestige*.	
Name: **Design of antennas and other subsystems of ground penetrating radars used for detection of buried oil spill layers**. Reference: VEM2004-08541 Duration: 2005-2008 Coordinator: Manuel García Sánchez. Escuela Técnica Superior de Ingenieros de Telecomunicación | Universidad de Vigo Pontevedra Webpage: -	Pollution detection.	Programme: VEM-2004 Total budget: National funding: Ministry of Education and Science	The proposed project is concerned with the application of Ground Penetrating Radars (GPR) to the detection of oil spill layers buried under the sand at seaside beaches. The final goal is building a GPR prototype optimized for this specific problem. The project will start with the experimental characterization of the electromagnetic properties of the oil spill remains altogether with other elements present in the environment where the oil spill lay. The research team has previously developed techniques to get these characteristics as a function of the frequency, and now they will be applied to these	

			substances. Measurement results will complete one of the electromagnetic models that the team has already developed. It will be used to obtain, by simulation, the optimal frequency response, the radiation pattern and the polarization of the antennas that will be used in the sounder. Once the design has been done, several antenna prototypes will be built and its performance will be tested in an anechoic chamber. It is also intended to use the information from the electromagnetic characterization to improve other elements from the sounder, such as the spectral characteristics of the transmitted signal and the algorithms used for measurement processing. With the optimised parts of the sounder a prototype will be built. Antenna and sounder prototypes will be used to validate research results and to facilitate the transfer of technology to the industry.	
Name: **Macrofaunal and suprabenthic study of**	Risk assessment,	Programme:	The project proposed studies	

the Galician sandy beaches after the *Prestige* oil spill. Reference: VEM2004-08544 3 Duration: 2005-2008 Coordinator: Juan Maria Junoy Pintos. Dpto. Biología Animal | Universidad de Alcalá Madrid Webpage: -	pollution detection.	VEM-2004 Total budget: National funding: Ministry of Education and Science	the macroinfauna and suprabenthic invertebrates' communities inhabiting sandy beaches of the Galician region following the oil spillage from the tanker "*Prestige*". The environmental impact which this major oil spillage has on the faunal invertebrates requires full evaluation. Previous studies carried out on Galician beaches during 2003 and 2004 will provide the baseline data for the proposed comparative investigations. The proposed sampling strategy will comprise: 1) monthly sampling of three beaches in years 2005 and 2006 (beaches at Corrubedo, A Frouxeira and Altar) ; 2) yearly sampling in years 2005 and 2006 of 15 other beaches located along the Galician coastline (América, A Lanzada, Xuño, Louro, Carnota, Rostro, Area Longa, Traba, Seiruga, Baldaio, Barrañán, Doniños, San Román, Esteiro and Llas). During each sampling occasion the macrofauna, both infaunal and suprabenthonic, will be collected and environmental data recorded at different tidal levels. Analyses of the spatial and	

			temporal data matrices will provide information about the effects of the oil spillage on the recolonization processes. In particular, studies on the dynamics of three common species of sandy shore crustaceans, the isopod Eurydice, the amphipod Pontocrates arenarius and the mysidacean Schistomysis parkeri will provide valuable information on the impact of oil pollution on their populations.	
Name: **Microbial bioavailability and metabolism of polycyclic aromatic hydrocarbons present in marine oil spills. Implications for their natural attenuation and bioremediation**. Reference: VEM2004-08556 Duration: 2005-2008 Coordinator: José Julio Ortega Calvo. Instituto de Recursos Naturales Y Agrobiología (IRNASE) | Consejo Superior de Investigaciones Científicas Sevilla Webpage: -	Bioremediation	Programme: VEM-2004 Total budget: National funding: Ministry of Education and Science	The objective of this study of basic research is to examine the microbial bioavailability and metabolism of polycyclic aromatic hydrocarbons (PAHs) in different scenarios relevant to marine oil spills: from the fuel freely suspended in the water column, subject to treatment with dispersants, to contaminants present in the shoreline, treated by bioremediation, and also those ones incorporated into sediments, where monitored natural attenuation may be the only way of treatment. We propose a progressive approach consisting in a previous study of representative, marine microorganisms on relevant aspects of bioavailability and	

			metabolism of PAHs. The target compounds will be naphthalene, phenanthrene, fluorene, anthracene, pyrene and fluoranthene, all of them present in the fuel from *Prestige*, which will be used as a model. Then, the physicochemical (partitioning and sorption-desorption) and biological (biosurfactant production, chemotaxis, adhesion) factors involved in microbial bioavailability will be evaluated by using model experimental systems. Also, the effect on these factors of additives to be used in the treatment of spills (dispersants, oleophilic and slow-release fertilizers) will be studied. Finally, microcosm studies will be performed, consisting, on the one hand, in the assessment of bioavailable fractions of native PAHs present in sediments from two coasts (Corrubedo in Galicia and Algeciras in Andalusia) that have suffered oil spills. On the other hand, the biodegradation process will be simulated in solid-phase microcosms, where a new methodology will be developed for the follow-up of biodegradation through the detection of metabolites. The final objective of the study is	

			to generate a wide basis of knowledge that allows the understanding of the physicochemical and biological processes involved in the microbial degradation of PAHs present in marine oil spills. This will be useful not only for the improvement of immediate reactions to the spills, but also to predict the long-term behaviour of these pollutants in their geochemical context.	
Name: **Economic valuation of passive use value damages caused to the Spanish society by accidental marine spills: empirical and methodological aspects**. Reference: VEM2004-08558 Duration: 2005-2008 Coordinator: Carmelo Javier León González. Dpto. Economía Aplicada | Universidad de Las Palmas de Gran Canaria Las Palmas Webpage: -	Spill socio-economical impact	Programme: VEM-2004 Total budget: National funding: Ministry of Education and Science	This Project aims at investigating the some methodological aspects of the empirical measurement, in economic terms, of the passive use losses caused by accidental marine spills. Stated preference techniques will be analyzed by means of laboratory experiments, with the objective of studying the sensitivity to some of the elements which should contain a constructed market for the evaluation of the economic impacts of passive use values, such as i) the ex ante or ex post evaluation, ii) willingness to pay versus willingness to accept compensation, iii) the amount and type of information provided, iv) substitution and complementary relationships	

			between alternative policies, v) the amount of attributes that can be valued, vi) the degree of complexity acceptable, vii) the economic incentives for a truthful valuation, viii) the risk perception and xi) the temporal dimension of the impacts. Finally, from the study of the design aspects of constructed markets for the evaluation of the damages to passive use values, it will follow the parameters which will be put in practice through a survey to the Spanish population. The techniques of transfer method will be also applied based upon the techniques developed, allowing for a comparison of the relative efficiency of the methods developed.	
Name: **Enzymatic bioremediation of polycyclic aromatic hydrocarbons (PAHs) in sea spills**. Reference: VEM2004-08559 Duration: 2005-2008 Coordinator: Miguel Alcalde Galeote. Instituto de Catálisis Y Petroleoquímica (ICP) | Consejo Superior de Investigaciones Científicas Madrid Webpage: -	Bioremediation	Programme: VEM-2004 Total budget: National funding: Ministry of Education and Science	This proposal deals with the use of laccases in PAHs detoxification (both high and low molecular weight PAHs) from sea spills and waste waters. The dependence of redox mediators and the instability of laccases are the main hurdles for a practical application of this system. The study of laccases in PAHs detoxification will be tackled by:	

			1.- Biocatalyst engineering by directed molecular evolution (random mutagenesis, recombination and screening) to improve the enzyme stability against organic solvents. The main bottleneck in bioremediation issues is the xenobiotic bioavailability. The presence of organic solvents would enhance the PAHs solubility decreasing the mass transfer problems. 2.- The enhancing the redox potential of lacccases will mean the increasing in the PAHs oxidation (turnover rates) and therefore the enzyme will become less mediator dependent. The construction of combinatorial libraries by saturated mutagenesis will be performed to enhance the laccase ionization potential. 3.- The biocatalyst will be immobilized on acrylic supports and used in a fixed-bed bioreactor to be tested with waste-waters contaminated with PAHs and fuel donated by REPSOL-YPF Petrochemistry Company - which supports the current proposal-.	
Name: **Biosensors for "in situ" evaluation of pollutants from oil spillages based on genetic systems coupled to microchips**.	Pollution detection	Programme: VEM-2004	Pseudomonas putida DOT-T1E is a solvent-tolerant bacterium which is also able	

Reference: VEM2004-08560 Duration: 2005-2008 Coordinator: Juan Luis Ramos Martín. Estación Experimental del Zaidín (EEZ) | Consejo Superior de Investigaciones Científicas Granada. Webpage: -		Total budget: National funding: Ministry of Education and Science	to degrade toluene through the toluene dioxygenase pathway (TOD). This strain expresses a series of proteins at the cell surface level which confer the strain a great capacity to adhere to inorganic surfaces. The toluene degradation pathway is induced by one-ring aromatic hydrocarbons in a process mediated by the two component TodS/TodT system, in which TodS is the sensor protein of the kind of the histidinekinases, and TodT is the transcriptional regulator which once it has been phosphorylated stimulates transcription from the PtodX promoter that leads to the expression of the tod operon. Taking into consideration the robustness of the strain, its capacity to adhere to inorganic surfaces, and the number of available genetic techniques to alter the features of substrates recognized by TodS, we propose the development of a multiple format biosensor to detect aromatic hydrocarbons present in oil spillages, including 2-, 3- and 4-ring aromatic compounds. The todS gene will be successively mutagenized by PCR and mutants that recognize new	

			effectors will be selected in an heterologous system based on Acinetobacter. The TodS variants will be coupled to TodT as well as to the PtodX system fused to the lux reporter genes. The biosensor will be placed on a multi-well plate system or arranged on a microchip provided with fotodiodes so that each variant will be adequately positioned. This organized system will allow the detection of different substrates simultaneously and it will be calibrated to determine the concentration of pollutants.	
Name: **Removal of heavy oils from polluted waters by adsorption and photochemical degradation**. Reference: VEM2004-08576 Duration: 2005-2008 Coordinator: Juan Manuel Diez Tascón. Instituto Nacional del Carbón (INCAR) | Consejo Superior de Investigaciones Científicas Asturias. Webpage: -	Spill response technologies	Programme: VEM-2004 Total budget: National funding: Ministry of Education and Science	The aim of this project is to contribute to develop new adsorbents and catalysts for the retention and further degradation of heavy oils coming from accidental oil spills into sea water. To this end, several carbon materials derived from exfoliated graphite will be used as adsorbents.	
Name: **Marine spill detection by orbiting radiometers: complementary tools to synthetic aperture radars**.	Oil spill detection	Programme: VEM-2004 Total budget:	The new generation of orbiting radiometers (MODIS and MERIS) is proposed as complementary tools to Synthetic Aperture Radars	

Reference: VEM2004-08579 Duration: 2005-2008 Coordinator: Javier Ruiz Segura. Instituto de Ciencias Marinas de Andalucía (ICMAN) | Consejo Superior de Investigaciones Científicas Cádiz. Webpage: -		National funding: Ministry of Education and Science	(SAR) for the remote sensing of marine spills. SAR has the high spatial resolution and the adequate sensitivity for the detection of oil spills. However, SAR images are expensive and have low temporal resolution. New orbiting radiometers do not have those handicaps since their images are provided for free by the space agencies generating them with a daily frequency. The high spatial resolution these new radiometers have for certain spectral bands allows them to detect oil spills at areas of high maritime traffic like Venezuela (Hu et al., 2003). The proposal will apply this new but already validated approach to another area of very intense traffic and very close to the Spanish coasts: the Strait of Gibraltar. It will implement the experience developed within the research group for the automatic analysis of ocean colour images and will benefit of the contacts held with the research group of Frank Muller-Karger y Chuanmin Hu, pioneer for oil slick detection with radiometers, with the aim of generating tools for the detection and surveillance of these spills through cheap and	

			operative structures.	
Name: **Genotoxic risks associated to *Prestige* spillage.** Reference: VEM2004-08597 Duration: 2005-2008 Coordinator: Ricardo Marcos Dauder. Dpto. Genética i Microbiologia | Universidad Autónoma de Barcelona Barcelona. Webpage: -	Toxicity evaluation	Programme: VEM-2004 Total budget: National funding: Ministry of Education and Science	The present project plan to carry out a complete and systematic study on the genotoxicity of a large number of compounds widely presented in the *Prestige* spillage. This study will be carried out by using human cells which will give high relevance to the obtained data. The assays we propose to use cover all the range of genetic damage: chromosome aberrations and aneuploidy (Micronuclei), single and double DNA strand breaks and its repair (Comet) and point mutations and its mutational spectrum (point mutation in the TK locus). Taking into account the relevance of the information we plan to obtain, the results will be very useful in those studies interested in carry out genetic risk assessment for this kind of disasters.	
Name: **Altimetric remote sensing and Poleward Current in the region of influence of the *Prestige* oil spill**. Reference: VEM2004-08613 Duration: 2005-2008 Coordinator: Carlos García Soto. Centro	Oceanographic monitoring	Programme: VEM-2004 Total budget: National funding: Ministry of Education and Science	The Project analyses the surface geostrophic circulation (climatological values and seasonal and interannual variability) in the *Prestige* sinking region (Galicia Bank) using a long-term data base of altimeter data over the period 1992-2004 (12y;	

Oceanográfico de Santander | Instituto Español de Oceanografía (IEO) Santander Webpage: -			OBJECTIVE 1). The altimeter-derived values of geostrophic velocity are compared with "in situ" values of geostrophic current derived from hydrographic data during the HidroPrestige 0303 Cruise (OBJECTIVE 2). The comparison allows to check the geostrophic assumption of the remote sensing method and to extend in time the observations of the survey (a component part of the Special Urgent Task 3 "Oceanographic surveillance in the *Prestige* sinking region and continental slope). The "in situ" observations in the study region are increased in the Project by analyzing historical current-meter data from currentmeters deployed in the vicinity of Galicia Bank and in the Iberian continental slope (OBJECTIVE 3). During the winter period (September-April), when the Poleward Current takes place seasonally or strengthens, the analysis of altimeter data is extended from the sinking region to the Cantabrian region or region of influence of the *Prestige* oil spill (OBJECTIVE 4a). For the years when the Poleward Current is particularly strong (years 1996, 1998 and 2003 since 1992), the study	

			investigates with altimetry the Poleward Current structure along its full extent (from the Subtropical Front to the SubPolar Front; ?35-65ºN) and try to analyse the relationships described between the Poleward Current intensity (SST) and the North Atlantic Oscillation Index (OBJECTIVE 4b).	
Name: **Study on the non public agents and connectivity of models of prevention, management and evaluation of environmental disasters**. Reference: VEM2004-08624 Duration: 2005-2008 Coordinator: José Ignacio Cases Méndez. Dpto. Ciencia Política Y Sociología. Universidad Carlos III, Madrid. Webpage: -	Prevention, Management and Evaluation of Environmental Disasters	Programme: VEM-2004 Total budget: National funding: Ministry of Education and Science	This department knows the outstanding of two items in order to reach a global sight of the mechanisms of Prevention, Management and Evaluation of Environmental Disasters. The new focus is around the next items: (a) Study the roll inside the systems against oil spills in 10 countries taking into account the non public elements (companies, associations, volunteers, non profit organizations, etc.) (b) a deep Study of the interrelations and relationships in the field of connectivity between the system, other systems and other public policies (transport, industrial, coast regulation). This new investigation project needs a new team, but managed by the same department, that it will continue working in parallel the other group.	

			By reaching these objectives the research team will be in a position to systemize the Spanish model as well as to propose measures towards its improvements in the three basic fields of these models: prevention, operations (or managerial) and evaluation in terms of public items, also this project will develop a non Public items and inside the system its relationships with other systems and with other public policies.	
Name: **Development of hydrocarbons biodegradation "in situ" techniques by the use of microorganisms immobilized in adhesive hydrogels**. Reference: VEM2004-08637-C03-01 Coordinator: José Ramón Ochoa Gómez. Fundación Leia Centro de desarrollo Tecnológico | Fundación Leia Centro de Desarrollo Tecnológico Álava. **Name**: **Synthesis and characterization of adhesive and biodegradable polymeric supports**. Acronym: VEM2004-08637-C03-02 Coordinator: Issa Katime Amashta. Dpto. Química Física | Universidad del País Vasco / Euskal Herriko Unibertsitatea Vizcaya. **Name**: **Immobilization of hydrocarbon-degrading microorganisms in adhesive and**	Response technologies	Programme: VEM-2004 Total budget: National funding: Ministry of Education and Science	The main objective of this project is the development of an adhesive product for the treatment of fuel spillage in rocky or difficult access zones, by the use of hydrocarbons degrading microorganisms immobilized in suitable polymeric supports with specific characteristics of adhesivity, biodegradability, swelling and mechanical resistance, compatible with the cellular viability, that improve the efficacy of the bioremediation processes. Besides the spillage treatment in marine environment, this type of products is of great interest for other type of industrial applications as: the cleaning of tanks or accidental	

biodegradable polymeric supports. Reference: VEM2004-08637-C03-03 Coordinator: Maria Jesús Llama Fontal. Dpto. Bioquímica y Biología Molecular | Universidad del País Vasco / Euskal Herriko Unibertsitatea Vizcaya. Duration: 2005-2008 Webpage: -			spillage, the bioremediation of polluted soils, the recovering of exhausted oil well and so on.	
Name: **Decision support system for risk assessment and management of sea pollution due to accidental spills. 1**. Reference: VEM2004-08641-C03-01 Coordinator: Eugenio Oñate Ibáñez de Navarra. Centro Internacional de Métodos Numéricos en Ingeniería: Centro Internacional de Métodos Numéricos en Ingeniería Barcelona. **Name**: **Decision support system for risk assessment and management of sea pollution due to accidental spills. 2.** Reference: VEM2004-08641-C03-02 Coordinator: Alfonso García Ascaso. Escuela Politécnica Superior. Universidad de A Coruña A Coruña. **Name**: **Decision support system for risk assessment and management of sea pollution due to accidental spills. 3.** Reference: VEM2004-08641-C03-03	Decision support systems	Programme: VEM-2004 Total budget: National funding: Ministry of Education and Science	The objective of the project is to develop a decision support system (DSS) for risk assessment and management of sea pollution due to accidental spills. This topic is of high interest for public administrations and emergency services for preventions and management of sea pollution in real time. The DSS will integrate information of sea currents and pollution level in the region of interest obtained via satellite or by in situ measurements and computer simulation codes of contaminant transport. These codes will be used to train an artificial intelligent module based on artificial neural networks (ANN) to be used to determine in quasi-real time the risk of pollution in a	

Coordinator: Alfonso García Ascaso. Facultad de Náutica | Universidad Politécnica de Cataluña Barcelona Julio García Espinosa. Duration: 2005-2008 Webpage: -			certain area under different assumptions in the case of an accidental spill. The training of the ANN will make use of advanced Monte Carlo methods and distributed (grid) computing techniques. The risk criteria will be based on the study of historic information of real experience of ship wrecking situations leading to pollution spills. The DSS will have enough flexibility to evolve in terms of the new information available during the project and in its exploitation life. The users will have access to the information of the DSS via a user-friendly integrated Internet-based working environment. This will allow preventing and evaluating via Internet the risk of pollution and transport in different zones of the geographic area under study. In addition, the DSS can be used as a fast simulation tool in order to design the necessary risk management actuations within the area. The DSS will be completed with Internet-based communication tools allowing the interaction with other users and access to a data base with complementary socio-	

			economic information to help in the decision making process.	

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