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Ocean Acidification Strategic Workshop  
 28-30 January, 2008

## European Climate Change Research




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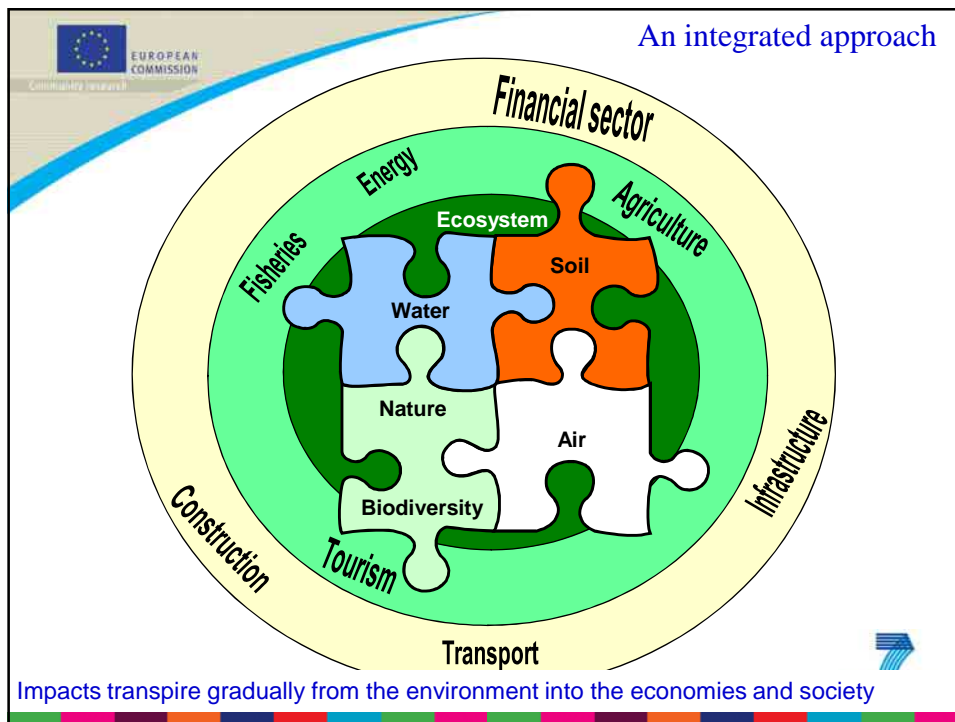

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## EU research: the story so far




- 1952:** ECSC treaty; first projects started March 1955
- 1957:** EURATOM treaty; Joint Research Centre set up
- 1983:** ESPRIT programme
- 1984:** First Framework Programme (1984-1987)
- 1987:** 'European Single Act' – science becomes a Community responsibility;  
Second Framework Programme (1987-1991)
- 1990:** Third Framework Programme (1990-1994)
- 1993:** Treaty on European Union;  
role of RTD in the enlarged EU
- 1994:** Fourth Framework Programme (1994-1998)
- 1998:** Fifth Framework Programme (1998-2002)
- 2000:** European Research Area
- 2002:** Sixth Framework Programme (2002-2006)
- 2007:** Seventh Framework Programme (2007-2013)






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- ## International Policy context
- Science: The IPCC's 4th Assessment Report
  - Kyoto Protocol: Important but only a first step
  - United Nations Convention on Climate Change
  - 'Bali Roadmap', negotiation on agreement for the period after 2012
- 7  
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## European Policy context

- EU's Greenhouse Gas Emissions trading system (ETS)
- EU target-global T increase will not exceed 2°C over pre-industrial times- Communication 'Climate change & energy package' (2007)
- Green Paper on Adaptation to Climate Change (2007)  
– 3rd pillar expanding the knowledge base




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## European Research

- Contribution to understand Earth system functioning, the origin and impacts of climate change and to predict its future evolution
- Guidance and support to EU's international commitments and EU policies
- Basis for effective mitigation and adaptation measures



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## International Cooperation

- Climate change: Global dimension with strong effort on international cooperation
- International cooperation on research can have many benefits: exchange and share of knowledge, assist in building effective policies, effective response
- A number of current EU-funded projects focus on important climate change issues in developing countries
- FP open to international partners



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## Sixth Framework Programme

(2002-2006)



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**Sixth Framework Programme  
(2002-2006)**

Areas and list of ongoing projects funded under FP6  
- Global change and ecosystems

- **Carbon and Nitrogen Cycles: Sources and Sinks**  
**CARBOOCEAN – Marine carbon sources and sinks assessment**  
Consortium of 44 partners: Belgium, Denmark, France, Germany, Iceland, Morocco, the Netherlands, Norway, Poland, Spain, Sweden, Switzerland, United Kingdom, and the USA  
  
Budget 14.5 million €, 5 years, coordinated by the University of Bergen & and the Bjerknes Centre for Climate Research


- **Understanding and prediction of the marine carbon sources and sinks with special emphasis on the Atlantic and Southern Oceans on a time scale -200 to +200 years from now**
- **Determine the ocean's quantitative role for uptake of atmospheric carbon dioxide**
- **Create scientific knowledge which is essential to a quantitative risk-uncertainty judgement on the expected consequences of rising atmospheric CO<sub>2</sub> concentrations**

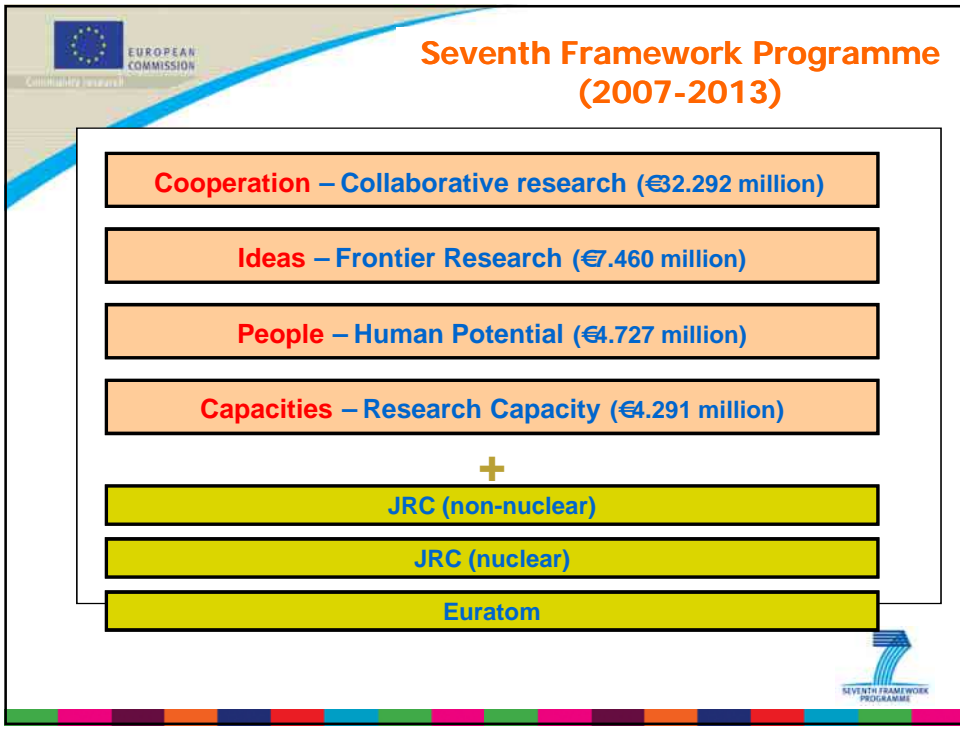



**Atmospheric Pollutants and their Regional Impacts**  
**MAP – Marine Aerosol Production from Natural Resources**  
(Specific Targeted Project, Budget: 2.5 mil €, 16 partners)

MAP focuses on the aerosol formation mechanisms involving iodine oxides, on the secondary aerosol production, and aerosols produced by plankton and transferred to the atmosphere.

- **Climate dynamics and variability**
- **Stratospheric ozone and climate interactions**
- **Prediction of climatic change and its impacts**
- **Adaptation and mitigation strategies**









## International Cooperation

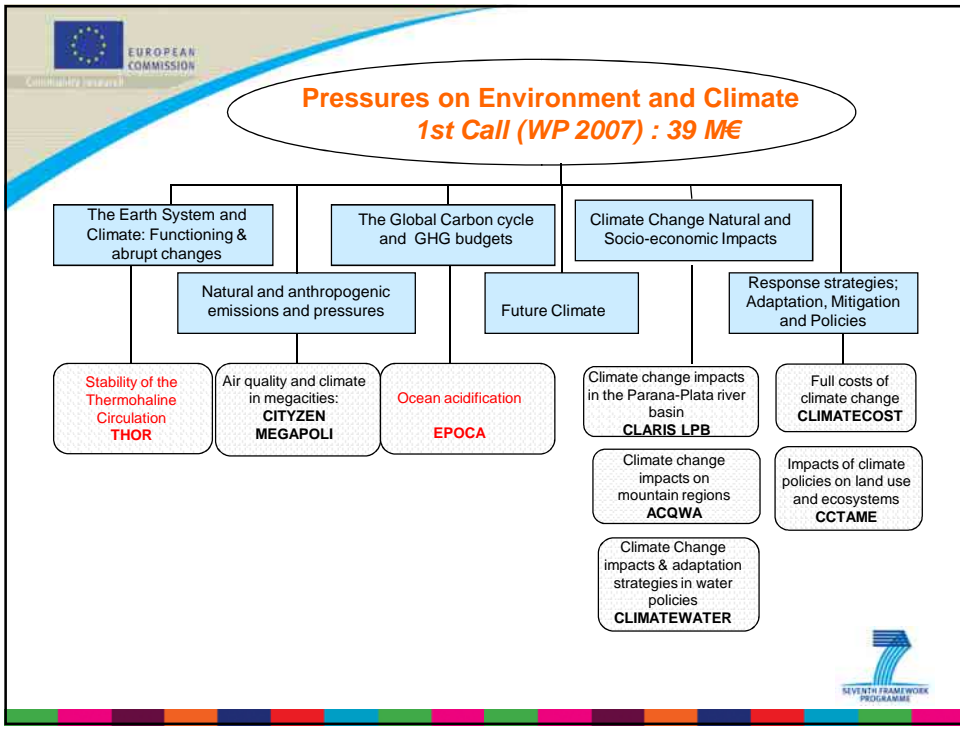
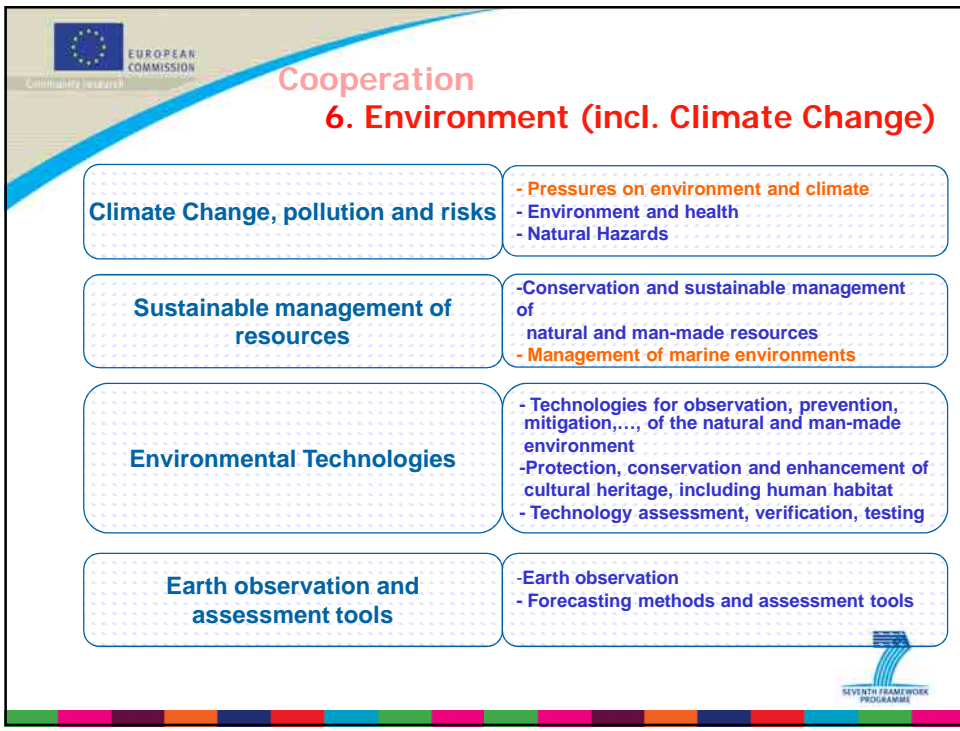
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I. Cooperation	Budget (€million, current prices)
1. Health	5 984
2. Food, agriculture and biotechnology	1 935
3. Information and communication technologies	9 110
4. Nanotechnologies, materials and production	3 467
5. Energy	2 265
6. Environment including Climate change	1 886
7. Transport	4 180
8. Socio-economic research	607
9. Security and space	2 858
<b>Total</b>	<b>32 292*</b>


\* Not including non - nuclear activities of the Joint Research Centre: €1 751 million











**ENV.2007.1.1.1.1. Stability of the ThermoHaline Circulation**  
 Integrated observation and process studies in key regions (e.g. the Arctic and sub-Arctic), modelling and palaeo-studies *to assess the risk of the breakdown* or sudden reduction of the thermohaline circulation. Feedback with stability of ice-sheets in polar regions, changes and variability in atmospheric circulation and the hydrological cycle should be included. This topic is also a contribution to the International Polar Year. (...)


**Funding scheme: collaborative projects (large-scale integrating projects)**


**ENV.2007.1.1.3.1. Ocean acidification and its consequences**  
*Temporal and spatial changes of ocean acidification* due to increasing CO<sub>2</sub> uptake. *Quantification of the impacts of the acidification* on marine biota and their physiology, and marine ecosystems. Process and experimental studies and field work should be integrated in biogeochemical, ocean sediment, circulation and climate models.




**Funding scheme: collaborative projects (large-scale integrating projects)**




**EPOCA (European Project on Ocean Acidification)**  
 27 partners, 48 months, EC contribution: 6.549.000 €

- To investigate the changes in ocean chemistry and biogeography across space and time
- To determine the sensitivity of marine organisms, communities and ecosystems to ocean acidification
- Results on the chemical, biological and biogeochemical impacts of ocean acidification will be integrated in biogeochemical, sediment and coupled ocean-climate models to better understand and predict the responses of the Earth system to ocean acidification
- To assess uncertainties, risks and thresholds ("tipping points") related to ocean acidification at scales ranging from sub-cellular, to ecosystem and from local to global.



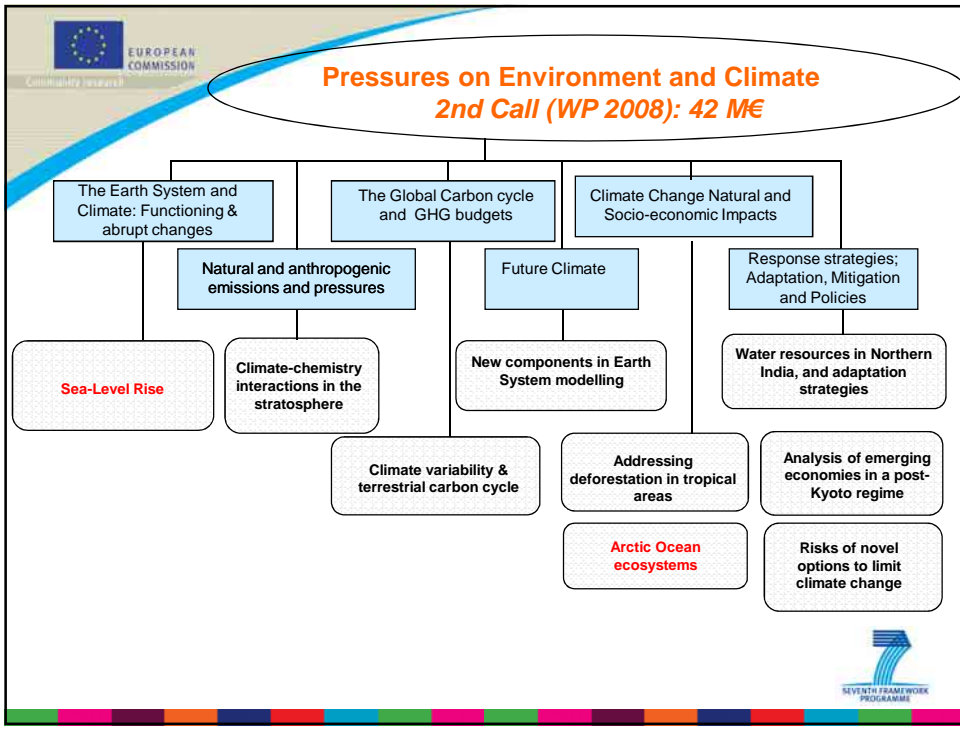




**Activity 6.2. SUSTAINABLE MANAGEMENT OF RESOURCES**  
**Sub-activity 6.2.2. Management of marine environments**

**ENV.2007.2.2.1.4. Dynamic of marine ecosystem in a changing environment**

Investigate *how marine ecosystems respond to and evolve with a changing environment*. The scenarios to be considered should address in an integrated manner the main driving factors, essentially changes in climate patterns, ocean circulation, pollution, invasive alien species and ocean acidification (a particularly important process), as well as the impact of fisheries. The project will investigate the *response of marine ecosystems to the combined effects of the many changing parameters and anthropogenic action e.g. acidification, eutrophication, temperature, light and nutrients, overfishing, invasive alien species*. The focus should be on the consequences for marine organisms and population dynamics, the likely impacts on resource management, products and services.


Funding scheme: collaborative projects (large-scale integrating projects)



**ENV.2008.1.1.1.1. Sea-Level Rise - Trends in contributions from continental ice, processes and links to climate change**


Under this topic research should include field studies of key processes (e.g. ice flow dynamics), observations, data gathering and analysis, and modelling *to refine predictions of the behaviour of glaciers (globally), ice caps, and ice sheets, links to climate change* and associated changes of sea level over the next decades and centuries.



**Funding scheme: collaborative projects (large-scale integrating projects)**

**ENV.2008.1.1.5.2. Climate change impacts and Thresholds on Arctic Ocean ecosystems**

The research should identify the *elements of ecosystem which are the most sensitive to climate change* and will develop trajectories of climate change impacts under different climate change scenarios and assess if the Arctic marine ecosystems are close to critical thresholds ("tipping points"). **Funding scheme: collaborative projects (large-scale integrating projects)**




**Activity 6.2. SUSTAINABLE MANAGEMENT OF RESOURCES**  
**Sub-activity 6.2.2. Management of marine environments**

**ENV 2008.2.2.1.3. Ecosystem approach to marine environment and resources**

Research under this topic will require a *trans-disciplinary and integrative ecosystem approach*, combining an improved understanding of the functioning of Europe's marginal seas and the direct and indirect impacts from their uses (e.g. by aquaculture, fisheries, extraction of minerals, etc.), on the water quality and ecology, in order to *contribute to the development of sustainable use patterns through an ecosystem-based management*. Research should address the following elements:

- Socio-economic valuation of coastal and shelf seas in view of their goods and services, evaluation of the costs of non-action, costs of improved assessment and monitoring programmes in support of the implementation of the EU Marine Strategy;
- Assessment of the combined impacts from aquaculture, fisheries within the EEZ (Exclusive Economic Zone) (EEZ) of the Member States, extractions of minerals, oil and gas, eutrophication, shipping, release of land-based pollutants into the coastal zone, tourism, etc. on the marine ecosystems. **(Policy relevant topic)**

**Funding scheme: collaborative project (large-scale integrating project)**





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## Policy issues

### Blue Paper for a European Maritime Policy


- Maximising the sustainable use of the oceans and seas
  - \*Action for the Protection of the High Seas
  - \*Action on Mitigation and Adaptation to Climate Change
  - \*Implementation of the Eco-System Approach in European Fisheries
  - \*Maritime Transport ...
- Building a knowledge and innovation base for the maritime policy
  - \* European Maritime Research ...

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Coordinated call within directorates of DG RTD (Environment, Energy, Science Economy and Society, International ...) and within DG's (TREN, RTD, ENTR ..)




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## Preparation of the Roadmap for 2009 – 2011 +




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## FP- Preparation of the Work Programme

- Annual process
- Following consultation and expert advice:
  - Advisory Group
  - Open consultations
  - Symposia, Workshops, expert meetings..
  1. Climate Change Research Challenges Symposium, February 06
  2. 'Climate change impact on water resources', September 2006
  3. 'Time to adapt: Climate change and the European water dimension
  4. Polar Environment and Climate Symposium, March 07
  5. EU-India S&T Workshop, February 07
  6. EU- Japan meeting
  7. [IPCC 4th Assessment Report & EC Integrated Climate Research \(symposium\)](#)
  - Consultation with other Commission Directorate Generals
- Subject to opinion by Programme Committees (Member State representatives)




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## Information

- EU research:  
<http://ec.europa.eu/research>
- Seventh Framework Programme:  
<http://ec.europa.eu/research/fp7>
- RTD *info* magazine:  
<http://ec.europa.eu/research/rtdinfo/>
- Information on research programmes and projects:  
<http://cordis.europa.eu/>
- Information requests:  
<http://ec.europa.eu/research/enquiries/>






*Thank you*

