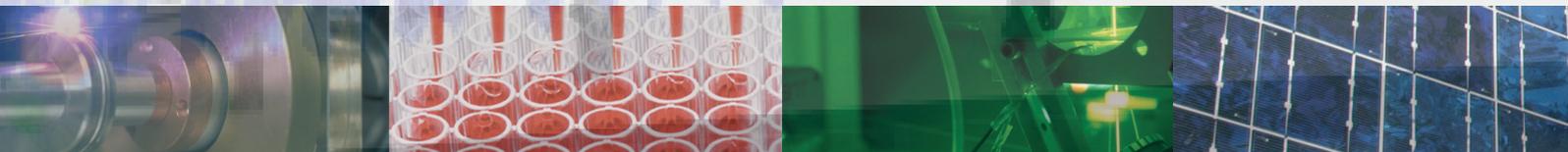




JRC Newsletter

EUROPEAN COMMISSION

May 2009



Editorial

Janez Potočnik, European Commissioner for Science and Research



For science and research to succeed; to advance our knowledge and understanding with the ultimate aim of making life better for all, few things are as important as the enthusiastic commitment and dedication of our researchers. They are the lifeblood of science, without which it grinds to a halt.

The spark of their passion for science and research – for the creation of new knowledge through study, investigation and experimentation – is ignited and nurtured in the classroom. Education is thus a key to success in this business of ours, like in so many others. It is for this reason that I took so much pleasure on Saturday, 16 May, in witnessing thousands of young people explore the world of science and research at the latest Open Day of the Joint Research Centre’s research site in Ispra, on the banks of the *Lago Maggiore* in Italy. Predictions of rain and an overcast morning did nothing to deter over 8,100 people of all ages from visiting this year’s event, which also marked the 50th birthday of the largest of the European Commission’s own research sites.

Over 70 of the JRC’s vast range of activities were showcased on the day, with tours of over 50 laboratories, topical seminars with the Commission’s scientific experts and wonderful demonstrations of experiments in the field. Whether the subject was renewable energies, electronic passports, flood and fire prediction systems or food safety tests, the participation of visitors of all ages was spirited and energetic. The expressions of curiosity and interest I witnessed on the faces of both children and adults demonstrated to me that this was a very successful way of communicating science.

I was delighted to be able to play a part on the day, presenting the winners of the JRC’s “Science and creativity in the classroom” competition for Italian schools with their prizes. Organised as part of the European Year of Creativity and Innovation, the competition attracted 214 entries from all over Italy and all school grades. Its goal was to attract Italian youth to science in and beyond the classroom, by engaging them in topical European research domains like food safety, climate change and renewable energies. The winners’ video brilliantly demonstrates a simple truth regarding energy efficiency: not to act now is an opportunity wasted.

While the declining interest of young people in science as a career has been highlighted as a problem in the EU’s Lisbon Strategy for Growth and Jobs, the originality of the scientific and creative ideas demonstrated in the competition’s entries is a positive sign.

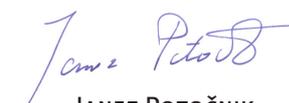
Continues...

Editorial	01
Policy support	02
EDGAR shows worldwide greenhouse gas emissions growing faster	02
Research policy:	
ERAWATCH publishes 27 country reports.	02
Melamine in food: JRC report shows tests are effective	03
Science and technology	04
Zebrafish embryo toxicity test: launch of the pre-validation study	04
Cows, sheep and global warming	04
JRC patent on new radar-imaging technique	05
Events	05
Other news	08

In these difficult times here in Europe and across the globe, perhaps now more than ever, we need the new ideas that come from the fresh minds of talented young students and scientists. And as we develop our knowledge-based society, scientific research and development will allow us to create new jobs, to ensure safer food and medicines, to provide better and more sustainable sources of energy. These are goals pursued through science by researchers today who face global challenges. The challenges are diverse and call for action and innovation in many areas. The development of the JRC's expertise reflects this, covering techno-economic studies; food safety; nuclear security; risk assessment for chemicals; reference materials; earth observation

techniques and much more. As the European Commission's role is to uphold and represent the interests of the EU as a whole, the JRC's ability to provide credible, independent scientific research and technical advice is its core strength, allowing European policy makers to base their decisions on solid scientific foundations.

Congratulations to the JRC's scientists and staff on a highly successful Open Day!

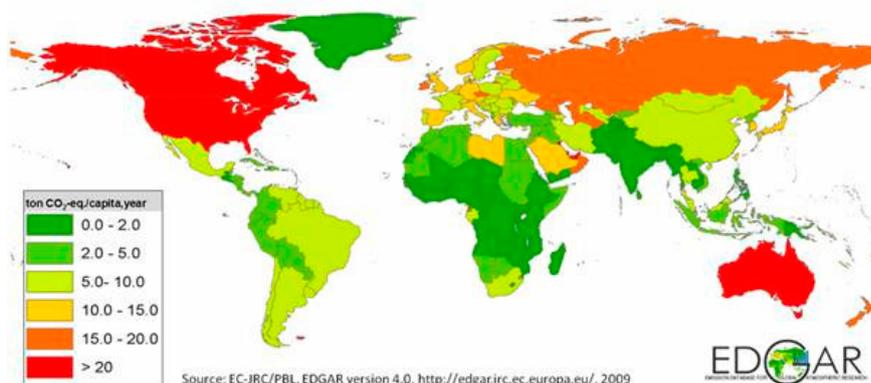

JANEZ POTOČNIK
 European Commissioner for Science and Research

POLICY SUPPORT

EDGAR shows worldwide greenhouse gas emissions growing faster

The latest results from a joint project of JRC and the Netherlands Environmental Assessment Agency (PBL), called the Emission Database for Global Atmospheric Research (EDGAR), show that global man-made greenhouse gas emissions increased 15% between 2000 and 2005, representing a sharp jump in the rate of emissions growth, which was 3% for the period 1990-1995 and 6% between 1995 and 2000. Global annual emissions of greenhouse gases increased from 24 billion tonnes of CO₂ equivalents in 1970 to 33 billion tonnes in 1990 and 41 billion in 2005. A total of 560 billion tonnes of greenhouse gases were released into the atmosphere between 1990 (the reference year of the Kyoto Protocol) and 2005.

The new dataset, named *EDGAR v4.0* and published on 25 May, shows that greenhouse gas emissions have been higher in developing countries than in industrialised countries since 2004, though developing countries emit



Annual per capita emissions of greenhouse gases

significantly lower levels of emissions *per capita* than developed countries (four versus approximately 15 tonnes).

The new data completes a unique, detailed overview of 35 years (1970-2005) of greenhouse gas emissions by country and emission sector. The EDGAR project uses the latest scientific information and data from international statistics on energy production and consumption, industrial manufacturing, agricultural production, waste treatment/disposal and the burning of biomass in order to model emissions for all countries of the world in a

comparable and consistent manner. EDGAR is unique in its provision of historical emission data for 20 years prior to 1990, the reference year for the Kyoto protocol.

Previous versions of EDGAR have been widely used for more than 15 years by the global scientific community and by policy makers worldwide. Detailed emissions country by country and graphically represented on a world map are available for download from the EDGAR project website.

<http://edgar.jrc.ec.europa.eu>

Research policy: ERAWATCH publishes 27 country reports

ERAWATCH, the European Commission's on-line information platform on research systems and policies in

Europe, published its 2008 Analytical Country Reports on research in individual EU Member States in May. The reports assess the performance of national research systems and enable the comparison of one

country with another. This is the first time all 27 Member States have been covered.

The analytical studies, carried out by the JRC's Institute for Prospective

Technological Studies (IPTS) and published online, are an important part of ERAWATCH support for the construction of the European Research Area (ERA). ERAWATCH does this by providing policy makers and analysts working in the field of science and research with concise and up-to-date information and insight into research systems and policy development across the EU and in a number of other countries. It contains information on recent policy initiatives, research programmes, funding

agencies, research performance and key indicators such as expenditure, publications and patents.

The system analysis developed by IPTS focuses on key processes significant for performance in four policy-relevant domains: resource mobilisation; knowledge demand; knowledge production and knowledge circulation.

The initiative aims to create a more coherent science and technology

environment across the EU by allowing for better coordination in the framework of the Lisbon Strategy for growth and jobs. Launched in 2006, ERAWATCH currently covers 43 countries in total.



<http://cordis.europa.eu/erawatch>

Melamine in food: JRC report shows tests are effective

A new international study published by JRC's Institute for Reference Materials and Measurements (IRMM) on 8 May suggests that the majority of laboratories around the world are capable of effectively testing for the presence of the chemical melamine in food. The study's results show that levels of the harmful substance in food samples can be accurately measured by the majority of laboratories tested, suggesting that the global response to the Chinese contaminated milk scare of 2008 has been effective.



Ensuring reliable and comparable testing methods - a task of JRC-IRMM

A total of 114 analytical laboratories from around the world volunteered to put their measurement competence to the test for the study, which was organised and carried out by the JRC at the request of the European Commission's Directorate-General for Health and Consumers. Carefully prepared samples of contaminated milk powder and baking mix were sent to the labo-

ratories for testing without revealing the known levels of melamine present. Participating laboratories from 31 countries measured the melamine content of these 'blind' samples to the best of their abilities and reported their results back to the JRC.

<http://irmm.jrc.ec.europa.eu/html/activities/melamine>

Guidance on sampling and monitoring of lead in drinking water

Together with the World Health Organization (WHO) and as part of the COST intergovernmental framework for European Cooperation in Science and Technology, the JRC Institute for Health and Consumer Protection (IHCP) has finalised guidelines on the assessment of lead in drinking water at national level.

As part of a work plan agreed by the Parties of the Protocol on Water and Health and implementation of the Millennium Development Goals, the guidelines, focus on helping governments to assess the nature of lead problems when little is known about its levels in water supplies at a national level.

<http://web.jrc.ec.europa.eu/pce/consumo8-dwater-main.html>

Survey of soils in the EU

At the request of the European Parliament, the EU's Statistical Office (EUROSTAT) in cooperation with the JRC and the European Commission's Directorate General for Agriculture, regularly carries out harmonised surveys of land cover and use across the EU. The surveys, called LUCAS (Land Use/Cover Area frame statistical Survey), collect information using estimates of areas occupied by different types of land cover and



Results from the latest study on soil are expected for 2010

assessing changes on the basis of observations taken at more than 250,000 sample points throughout the EU.

By repeating the survey every few years, changes in land use can be identified. During the 2009 survey which has just been launched, new soil samples will be collected

GM crops in the global regulatory pipeline

Following a workshop on the “Global commercial pipeline of new GM crops” organised by the JRC’s Institute for Prospective Technological Studies (IPTS) in Seville in November 2008, JRC-IPTS has published a global database of new

from more than 22,000 LUCAS point locations. These samples, weighing around 11 tonnes in total, will be sent to the JRC’s Institute for Environment and Sustainability (IES) and stored in the European Soil Archive Facility. The samples will then be analysed to assess key parameters (e.g. texture, organic matter content, pH, heavy

metals) in order to understand the state of soil across Europe. This is the first time that such an exercise has been attempted on such a scale. Initial results are expected in 2010.

<http://eusoils.jrc.ec.europa.eu/projects/Lucas/>

genetically modified (GM) crops to be commercialised in the short to medium term (before 2015) currently undergoing regulatory evaluation and/or approval.

The result of consultation with international experts, industry, various other European Commission services and stake-

holders involved in the development, regulation and commercialisation of GM crops worldwide, the database is part of a technical note that focuses on the issue of trade and unsynchronised authorisation of GM crops globally.

<http://ipts.jrc.ec.europa.eu/activities/agriculture/agriculture.cfm>

SCIENCE & TECHNOLOGY

Zebrafish embryo toxicity test: launch of pre-validation study

The zebrafish embryo test (ZFET) is a promising alternative to the acute fish toxicity test, currently required for the environmental safety assessment of chemicals and other products.

In 2008, the Organisation for Economic Co-operation and Development (OECD), which works together with its 30 Member States to develop and co-ordinate chemical and pesticide related activities, asked ECVAM, the European Centre for the Validation of Alternative Methods, part of the JRC’s Institute for Health and Consumer Protection (IHCP), to coordinate the pre-validation of ZFET. ECVAM has accordingly launched a study involving seven laboratories from four countries.

Results for the first six chemicals to be tested should be available in late 2009.

<http://ecvam.jrc.ec.europa.eu/>

Cows, sheep and global warming

The first phase of a study entitled “Evaluation of the livestock sector’s contribution to the EU greenhouse gas emissions”, begun in June 2008, has been completed by the JRC’s Institute for the Protection and Security of the Citizen (IPSC). The study assesses emissions from livestock following a food-chain approach at sub-national level across all 27 Member States of the EU.

This first phase of the study demonstrates the importance of livestock production per species throughout the EU, from an economic and land-use point of view. It estab-

lishes a preliminary livestock production system typology and zoning, highlights the negative and positive impact of livestock production on EU biodiversity and determines the emission levels of various greenhouse gases as induced by the production of various meat products constituting major EU animal product import flows. These vary strongly in emission intensity, showing Brazilian cattle to have the highest levels.

The study also involved preparative work for the core task of quantifying all EU livestock sector emissions.

<http://ipsc.jrc.ec.europa.eu/>



Brazilian cattle

JRC patent on new radar-imaging technique

The European Patent Office has positively assessed an application by the JRC in May 2008 for a patent on a new radar-imaging technique that uses a one- or two-dimensional radar array. The new technology was developed by scientists at the JRC Institute for the Protection and Security of the Citizen (IPSC) for application in the field of surveillance using ground-based radar stations. Exploiting the multiple input multiple output (MIMO) radar principle, the technique should allow imaging of equal performance to that of other, more costly and complex designs.

The patent application has now entered the subsequent phase of examination at International level under the Patent Cooperation Treaty (PCT).

In pursuing its mission to provide scientific and technical support to EU

policy makers, the JRC generates a number of patents and new software products every year. More information on these is available through the JRC technology portfolio:

www.jrc.ec.europa.eu/technology-portfolio

Testing transmutation in nuclear fuel

The HELIOS irradiation experiment for testing the transmutation of fuel at the High Flux nuclear Reactor (HFR) in Petten, the Netherlands, was begun on April 29, following several years of preparatory work at the JRC's Institute for Energy (IE). Transmutation is the conversion of one chemical element or isotope into another through nuclear reaction. In this manner, long-term radioactive waste can be turned either into stable elements or elements with significantly shorter half-life. The aim of the research

is to investigate fuel performance and helium release using different fuel microstructures and irradiation temperatures.

The HFR, owned by the European Commission and hosted by JRC-IE since 1961, is one of the most powerful multi-purpose research and test reactors in the world. Its operation has been entrusted since 1962 to the Netherlands Energy Research Foundation Nuclear Research and consultancy Group (NRG). Together with NRG's 'hot cells' facility at the Petten research site, it provides a full complement of irradiation and post-irradiation examination services for research and development and serves as an important research facility for the EU in the field of safe nuclear energy and related technologies, fission and fusion research and medical applications.

<http://ie.jrc.ec.europa.eu/>

EVENTS

JRC-Ispra Open Day Ispra, Italy, 16 May

In spite of an unfavourable weather forecast, over 8,100 people visited the JRC research site in Ispra for the 2009 Open Day. Over 70 of the JRC's wide range of activities were showcased at the event, with tours of over 50 laboratories as well as demonstrations 'in the field' and topical seminars with experts. Whether it was climate change or food safety and quality checks, there was something for everyone and for all age groups.

This year's Open Day also marked the 50th anniversary of the JRC-Ispra site. European Commissioner for Science and Research Janez Potočnik took time out of his weekend to participate in the various activities and present awards to the winners of the JRC's Italian schools competition, "Science and Creativity in the Classroom".

Visitors once again acclaimed the Open Day as a success that truly mirrors European innovation and creativity.

<http://ec.europa.eu/dgs/jrc/index.cfm?id=5490>



Commissioner for Science and Research Janez Potočnik participating at the JRC Open Day 2009

Research Connection 2009
Prague, Czech Republic, 7-8 May

The Research Connection 2009 conference, held in Prague from 7 to 8 May, provided an opportunity for scientists, industry and researchers to share first-hand information on priorities, objectives and rules for participation in the Community Framework Programme for Research and Technological Development (FP7).

In a special session entitled “Scientific Support to EU Policies”, the JRC presented its work of delivering robust, fit-for-purpose scientific and technological support based on in-house anticipatory functions, a strong research base and strategic dialogue with stakeholders. The session focused on the JRC’s work in the fields of climate change, energy, and food safety and quality.

<http://ec.europa.eu/research/conferences/2009/rtd-2009/>

International Symposium on Remote Sensing of Environment
Stresa, Italy, 4-8 May

Scientists, engineers, policy-makers and industry representatives from around the world gathered in Italy for the 33rd International Symposium on Remote Sensing of Environment (ISRSE). Jointly organised by the JRC and the International Center for Remote Sensing of Environment (Tucson, USA), the conference focused on the use of Earth Observation systems and airborne techniques for understanding and managing our environment and natural resources.

With more than 650 participants from 66 countries and exhibitions from global players in the global remote sensing and space community such as the US National Aeronautics and Space Administration (NASA), ISRSE33 was judged to have been a major success.

Satellites are an invaluable tool for European experts in their search



Dr Philemon Mjwara, Director General of South Africa’s Department of Science and Technology, at ISRSE-33

to build up a picture of the state of the global environment, monitoring changes such as deforestation. They also help generate timely information that can help prevent and/or manage disasters. Satellite-derived information is used at the JRC to support the management of the Common Agriculture Policy, monitor maritime activities and help protect citizens against natural hazards.

<http://isrse-33.jrc.ec.europa.eu/>

EU-US maritime security R&D workshop
Ispra, Italy, 27-28 April

Maritime affairs experts at the JRC’s Institute for the Protection and the Security of the Citizen (IPSC) hosted a workshop on research and development in the field of maritime security at the end of April. The workshop brought to light a number of common research interests including wide area maritime surveillance, data fusion and anomaly detection.

The event brought together around 50 participants from the EU and the US, including the US Department of Homeland Security (DHS), Department of Defence, Coast Guard and Navy. Delegates from the NATO Research Centre of La Spezia, several European Commission services as well as EU Agencies EMSA (European Maritime Safety Agency) and Frontex (European Agency for the Management of Operational



Coast Guard vessel Barend Biesheuvel

Cooperation at the External Borders of the Member States of the European Union) also attended the meeting. Representatives from industry involved in collaborative research projects also participated.

The JRC presented its work in the fields of maritime surveillance, container security and port security. Participants from the US gave an overview of the structures,

initiatives and activities related to maritime security science and technology.

The strengthening of EU-US R&D cooperation on maritime security through collaborative projects has been called for on both sides of the Atlantic and is foreseen for the near future.

<http://ipsc.jrc.ec.europa.eu/>

Scientific and technical co-operation with Egypt

On 10-11 May the JRC took part in an awareness-raising conference on intellectual property (IP) rights organised in Cairo on the occasion of both World Intellectual Property Day and Europe Day. The event was co-organised by the European Commission-funded Research Development and Innovation Programme (RDI) and the World Intellectual Property Organization (WIPO) with the Commission's Delegation in Egypt as one of the event partners.

The conference aimed to create a platform for discussion between national and international experts on recent developments and trends in the areas of innovation and intellectual property management. It was opened by EU Ambassador to Egypt Dr Klaus Ebermann, with the participation of Professor Hany Helal, Minister of Higher Education and State for Scientific Research, and Minister for Trade and Industry Rachid Mohamad Rachid. On behalf of the JRC, Geraldine Barry, head of the JRC's Intellectual Property & Scientific co-operation team, gave a presentation on the importance of IP clauses and management in joint research and scientific partnership.

Egypt is a partner in the EU's 7th Framework Programme for research and technological development and in European Neighbourhood Policy.

<http://www.eu-delegation.org.eg/>

UPCOMING

GSDI/INSPIRE Conference 2009 Rotterdam, The Netherlands, 15-19 June

The upcoming eleventh edition of the Global Spatial Data Infrastructures (GSDI) Conference – as part of which the 3rd INSPIRE (Infrastructure for Spatial Information in the European Community) Conference will take place – is being co-organised by the JRC's Institute for Environment and Sustainability (IES).

Global challenges in areas such as sustainable development, the environment and health will be addressed

at the conference, which will provide a platform for the European Commission to showcase results of important initiatives and programmes such as INSPIRE, Global Monitoring for Environment and Sustainability (GMES) and Framework Programmes for Research and Technological Development. Over 700 scientists, industry representatives and government officials have registered to attend.

<http://gsdi.org/gsdi11/>

ITU Summer School on Actinide Science Karlsruhe, Germany, 16-19 June

Every two years the JRC Institute for Transuranium Elements (ITU) organises a Summer School on Actinide Science at its laboratories in Germany. Young researchers from all over the world have participated in lectures, laboratory visits and demonstrations. The 5th Summer School will be held this June with co-sponsorship from the ACTINET Network of Excellence for Actinide Sciences.

The summer school will comprise fifteen lectures, featuring experts from international organisations and ITU, addressing the topics of basic actinide science, the nuclear fuel cycle, reactor fuel under irradiation and aspects of actinides in the environment. Some 80 participants from 20 different countries have pre-registered for the event.

<http://itu.jrc.ec.europa.eu/>

6th World Congress of Science Journalists London, UK, 28 June-3 July

The 2009 World Conference of Science Journalists (WCSJ2009) will bring together established and aspiring reporters, writers and science communicators from around the world to debate, network, develop their professional skills and report on the latest advances in science and technology.

The JRC will contribute to the event by organising a "green energy technologies workshop", hosting a

stand and facilitating the participation of one science journalist from each of the Member States. JRC Director General Roland Schenkel has also been invited to introduce the plenary session on: "Climate change: gearing up for Copenhagen" to be given jointly by former UK Chief Science Advisor Sir David King and Dr Rajendra Pachauri, Nobel Laureate and Chair of the Intergovernmental Panel on Climate Change (IPCC). To mark the 50th anniversary of the Ispra site, the JRC will also host a high-profile international dinner at the Royal Institution of Great Britain under the theme: "The role of the media in energy and climate change policy" with Andy Revkin of The New York Times and Dr Pachauri steering the debate.

<http://www.wcsj2009.org/>

European Biomass Conference and Exhibition in Hamburg Hamburg, Germany, 29 June-3 July

The 2009 European Biomass Conference and Exhibition will bring together scientists and representatives from industry for the 17th time at the end of June. The JRC Institute for Energy (IE) is coordinating the technical programme of the event, which will be chaired by the Institute's Director, Giovanni de Santi. More than 1,500 participants from over 70 countries are expected to attend in order to discuss the latest breakthroughs in the field.

Biofuels for transport and biomass for heat and electricity are increasingly used for fossil fuel replacement and prominent in the agenda of policy-makers.

<http://www.conference-biomass.com/index.htm>



Sunflowers are a potential biomass crop

Ireland's Chief Scientific Adviser visits JRC



Patrick Cunningham speaking at the JRC

Ireland's Chief Scientific Adviser, Professor Patrick Cunningham, made an extensive tour of over ten laboratories during a three-day visit to the JRC's Ispra site before chairing the African Session of the remote sensing conference in Stresa (Italy) at the beginning of May. During a guest lecture to staff he outlined his vision of the greatest challenges facing the planet today.

Linking population, energy, food and climate, the crux of Professor Cunningham's argument was

that: "Population growth in poor countries, combined with urbanisation and changing diets, is pushing food production systems to new limits. Food production in turn is increasingly energy dependent, and in competition with energy for transport and power. Increasing fossil energy use (largely coal and gas) in its turn is inexorably changing the climate with net negative impact on food production capacity".

<http://www.chiefscientificadviser.ie/>

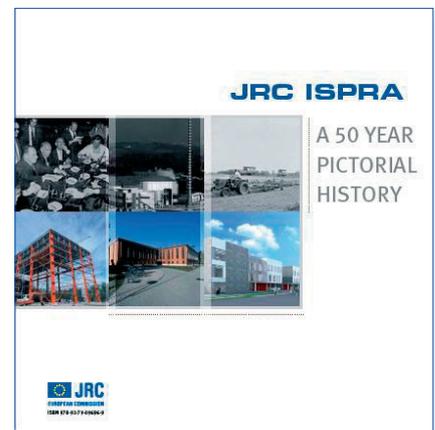
with the aim of improving the well-being of European citizens, through research in the areas of environment and sustainability, natural and man-made hazards, health and consumer protection issues and more. The brochure is available to download in electronic format from the JRC website with printed copies to be made available shortly.

<http://ec.europa.eu/dgs/jrc/index.cfm?id=2550&>

50 years of the Ispra site in pictures

In celebration of the 50th anniversary of the JRC Ispra site, a picture book on the site's evolution has been produced.

The illustrated brochure takes readers through the past five decades of the JRC's largest research site. Starting out as a purely nuclear-focus research centre, JRC-Ispra soon became a home to other scientific disciplines



The book is available in English and Italian

The JRC Newsletter is a monthly publication intended to provide JRC customers, stakeholders and other interested parties with an overview of recent highlights from the JRC's scientific achievements, policy support, contributions to events and other news.

To subscribe to the electronic version of this newsletter, please visit www.jrc.ec.europa.eu/newsletter

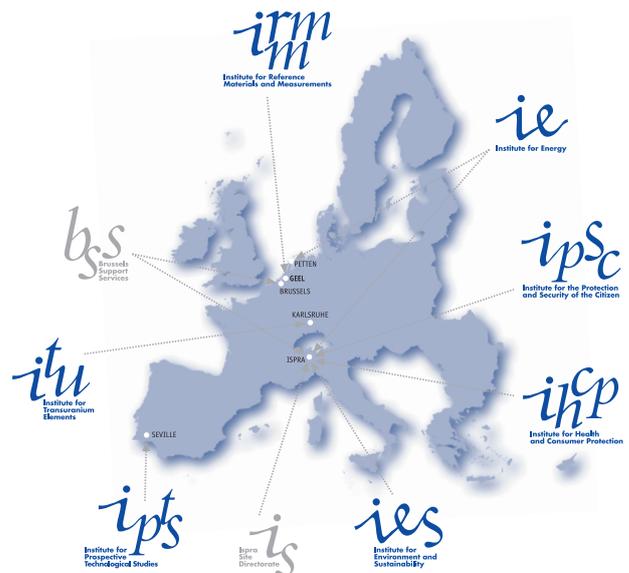
Editor in chief: Krzysztof Maruszewski
Production team: José-Joaquín Blasco, Boris Kandziora, Eamonn Prendergast, Sabine Schielke

www.jrc.ec.europa.eu — Contact: jrc-info@ec.europa.eu

Neither the European Commission nor any person acting on behalf of the Commission may be held responsible for the use to which information contained in this publication may be put, nor for any errors which may appear despite careful preparation and checking. This publication does not necessarily reflect the view or the position of the European Commission.

© European Communities, 2009

Picture credits
p. 3: Krzysztof Nikiforuk (Nature)
p. 4: Jesuino Souza
p. 6: EC Audiovisual Library (Maritime Safety)
p. 7: Everton Martins (Sunflower)



The mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union. Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.