



JRC Newsletter

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Editorial

Europe and the United States: A Crucial Moment for Science Cooperation



By Alan I. Leshner and Vaughan Turekian

In 1747, just as he had become fascinated by electricity, a young American polymath named Benjamin Franklin received a package from English scientist Peter Collinson: a simple glass tube that could be used to generate static electricity. It probably was not the first instance of transatlantic science cooperation, but it was a revolutionary early success, helping lead Franklin to discoveries about electricity that serve us to this day.

In the centuries since, researchers in Europe and the United States have built an abiding bond, and like the Franklin-Collinson collaboration, the relationship has paid immeasurable dividends in human prosperity and well-being throughout the world.

Today, however, a new moment of challenge and opportunity awaits the transatlantic alliance. Confronted by financial crisis, unstable energy supplies, an aging population and ominous climate change, a consensus has emerged in both Europe and the United States that we must answer these urgent challenges with substantially increased innovation. And the election of President Barack Obama, with his clear belief in the importance of science to virtually all

societal issues, is a clear signal that the United States is poised to bring renewed commitment to the global scientific enterprise.

“We will restore science to its rightful place, and wield technology’s wonders to raise health care’s quality and lower its cost,” Obama said in his inaugural address. “We will harness the sun and the winds and the soil to fuel our cars and run our factories. And we will transform our schools and colleges and universities to meet the demands of a new age. All this we can do. All this we will do.”

These are welcome words, and they are sure to galvanise new efforts on both sides of the Atlantic. This is, therefore, a crucial moment for the future of the European-U.S. science and engineering relationship.

By themselves, excitement and energy will not address key questions; to chart the way forward, there must be deliberations at high levels of our governments and our research institutions. That is precisely why the American Association for the Advancement of Science and the European Commission’s Joint Research Centre hosted a joint brainstorming at the recent AAAS Annual

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Meeting in Chicago (12-16 February). An immediate outcome planned for next October will be the signing of a Memorandum of Understanding and the hosting of a high-level AAAS-JRC science summit to mark the 50th anniversary of the Joint Research Centre's Ispra site in Italy.

Among the many questions for discussion will be how can Europe and the United States develop a shared approach to the policy-making challenges that confront us? How do we allow for both the benefits of creative and economic competition and cohesive, efficient cooperation? As we try to mobilise a large, complex system for action, what are the particular roles of individual scientists and engineers, their laboratories and universities, professional associations and foundations? What role should industry play? Ultimately these discussions between technical and policy experts will provide the connective tissue and critical steps for turning words into action.

Science has always been international, of course. Hundreds of years ago, Europe's rise was shaped by Persian and Arab understanding of mathematics, astronomy and medicine and by Chinese inventions such as printing, the compass and gunpowder. Scientific and technological progress in the early days of America would have been stunted without Europe's academic excellence and industrial techniques. During the Cold War, bilateral science and technology agreements were crucial in thawing tensions with the Soviet Union and China.

Throughout the 20th century, the transatlantic partnership has helped produce historic progress in fields ranging from medicine and genetics to physics, communication and space exploration. Today our students move freely between universities and labs in the United States and Europe; from telescopes high atop Mauna Kea in Hawaii to developing the Large Hadron Collider beneath the Franco-Swiss countryside, our scientists and engineers are working together on important projects. However, as we look to the future, with new technologies making collaboration easier and more productive, a more comprehensive approach to cooperation has become imperative.

The intertwined issues of energy and climate change are the most obvious challenge, and the most urgent. They also may be the most obvious examples where international cooperation is a must between various groups in the United States, the Joint Research Centre and other European and world actors. Patterns of energy consumption by industrialised nations are causing global geopolitical instability and profound damage to the Earth's climate. Finding and implementing solutions will require the involvement of scientists from many disciplines, as well as policymakers at every level of governments and in every nation.

Many people believe that the United States and Europe must be at the hub of action, if only because they historically have been the biggest sources of greenhouse gases. They must find "an agreed formula" on how to address climate change, Germany's ambassador to the United States, Klaus Scharioth, said during a recent meeting of European ambassadors at the University of California-Los Angeles. "If we don't do it, we have not the slightest chance of convincing the Chinese and the Indians and the Brazilians or anybody else."

Ambassador Scharioth's point applies as well to the way we must approach other global challenges: the health of our oceans and fisheries, the spread and control of infectious disease, improved food production, the development of clean water supplies, and efforts to control the proliferation of weapons of mass destruction.

While it may be correct that Europe and the United States need to lead these efforts, our research efforts must be opened up as much as possible to all interested nations. That is not just a diplomatic gesture; our researchers stand to gain new insights and research opportunities by working with colleagues in every nation. Nations that just a decade ago were considered 'Third World' are today making significant investments in scientific research, development and education, and are studying exactly the same problems facing more developed countries, even if the details of the problems facing them are different.

Individual scientists and their institutions, both in Europe and the United States, are already involved in a range of cooperative ventures with these nations. But if we make these efforts more systematic, the transatlantic nations can help anchor a global network of scientific knowledge.

There is an emerging effort in the United States to use the international character of science to help build trust and cooperation among nations, particularly among those whose governmental relationships have been strained. For example, scholars and scientists in the United States have put 'science diplomacy' into practice and recently met with counterparts from North Korea, Iran, and Cuba, among others. Similarly, we need to expand scientific engagement with Russia, China and nations of the Middle East, where cooperation will be crucial if we want to address issues such as climate change, energy and nuclear proliferation on a global scale.

Last fall, a group of U.S. elected officials, diplomats, and leaders from science, business and education met in Washington, D.C., to develop strategies for expanded science diplomacy. Like the European ambassadors who met at UCLA, many at that meeting

were hopeful that the new Obama Administration will see science diplomacy as a critical tool for solving problems and building global peace and prosperity.

These early efforts could begin to reverse the mistrust and hostility that have produced a global stalemate in recent years. As we prepare for the tests ahead, history reminds us that a strong commitment to the Euro-U.S. partnership will give us a foundation for work that

will help solve many of the world's most pressing problems and improve life for our children, our grandchildren, and billions of people on every continent.

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THE JRC AT AAAS 2009



ADVANCING SCIENCE. SERVING SOCIETY

This year's edition of the AAAS annual meeting took place in Chicago from 12-16 February 2009. The conference theme was "Our Planet and Its Life: Origins and Futures", in recognition of the 200th anniversary of Charles Darwin's birth and the 150th anniversary of the publication of his book, *On the Origin of Species by Means of Natural Selection*. The JRC contributed to the event with five sessions:

- *Keeping the lights on: the revival of nuclear energy for our future*
- *New approaches to the therapy of infectious diseases (topical lecture)*
- *Life beneath our feet: research challenges in soil biodiversity*
- *Preimplantation genetic diagnosis: beyond natural selection?*
- *Nanofood for Healthier Living?*

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

AAAS 2009: The revival of nuclear energy

On 14 February, JRC Director-General **Roland Schenkel** gave a presentation on Nuclear Energy as part of a JRC organised symposium entitled "Keeping the Lights on: The revival of Nuclear Energy".

Pitted against negative public opinion, few governments in recent



Securing our energy supply

years have openly extolled the virtues of nuclear energy. Yet countries that do not currently generate nuclear power are now manifesting their interest in building nuclear plants. Dr Schenkel's presentation and those of fellow panel members Professor **Mujid Kazimi** of the Massachusetts Institute of Technology (MIT) and Dr **Jacques Bouchard** of the French Atomic Energy Agency (CEA), explored how the situation has changed and what this means for the future.

<http://ec.europa.eu/dgs/jrc/index.cfm?id=5290>

AAAS 2009: European-American cooperation on new approaches to HIV treatment

Also on 14 February, **Ekaterina Dadachova** from the Albert Einstein College of Medicine in New York gave a topical lecture on "Novel approaches to the therapy of infectious diseases", detailing the results of a joint project with scientists at the JRC Institute for Transuranium Elements (ITU) on the use of alpha-immunotherapy as a

new option for the treatment of HIV infections.

The hypothesis that antibodies coupled or 'labelled' with a radioactive isotope (Bismuth 213) can be used to treat the HIV virus has been successfully tested in a joint project between scientists at JRC-ITU and the Albert Einstein College, with test results providing support for the first time that 'radio-labelled' antibodies can be used to selectively target and eliminate immunodeficiency virus-infected cells from a patient's body by delivering doses of ionising radiation directly to the infected cells¹.

Pre-clinical development testing the efficacy and safety of this novel 'nuclear medicine' therapeutic approach is being undertaken in preparation of a Phase I clinical trial in HIV infected patients.



Radio-labelled antibodies hold promise for the combat against HIV

<http://ec.europa.eu/dgs/jrc/index.cfm?id=5290>

1 Dadachova E., Patel M.C., Toussi S., Apostolidis C., Morgenstern A., Brechbiel M.W., et al.: "Targeted killing of virally infected cells by radiolabeled antibodies to viral proteins", *PLoS Medicine*, 2006, 3(11):2094-103.

AAAS 2009: Life beneath our feet

On Sunday, 15 February, the JRC organised a symposium at AAAS 2009 on soil biodiversity. The session presented an overview of current understanding in the field and attempted to explain the various pressures 'life in our soils' is currently under, together with an analysis of recent developments that have enhanced our understanding of this crucial, yet unknown ecosystem.



Soil is a medium that thrives with life

The symposium, moderated by Professor **Diana H. Wall** from Colorado State University, included a presentation by Professor **Karl Ritz** from Cranfield University (UK) on the role of soil biodiversity as the biological engine of the Earth. Professor **Volkmar Wolters** from the Institute for General and Special Zoology in Giessen, Germany, discussed the implications of land use and climate change on soil biodiversity and Professor **Ciro Gardi** from the JRC Institute for Environment and Sustainability (IES) discussed novel methods to assess the loss of soil biodiversity.

The most urgent goals of the research being done at IES are now to quantify real and probable threats to soil biodiversity, to provide support for environmental legislation in this field, and to come to a deeper understanding of these issues.

<http://ec.europa.eu/dgs/jrc/index.cfm?id=5290>

AAAS 2009: Tracking trends in Pre-implantation Genetic Diagnosis

On 16 February, the JRC organised a scientific symposium on pre-implantation genetic diagnosis (PGD), a service provided by in-vitro fertilisation (IVF) clinics to parents who want to avoid passing on genetic diseases to their children.

PGD entails carrying out genetic tests on embryos in a laboratory to identify those that have a healthy version of a given gene. These embryos can then be safely implanted in a mother's womb. Not to be confused with the more far-reaching and separate issue of actual genetic engineering with a view to creating 'designer babies', PGD enables fertilisation clinics to select embryos for implantation so that at-risk families can avoid passing on genetic disease to their children and to subsequent generations. Nevertheless, many questions continue to surround the technique.

The JRC symposium featured **Tarek El-Toukhy** from Guy's and St. Thomas' Hospital, London **Susannah Baruch** from Johns Hopkins University, Baltimore and the JRC's **Dolores Ibarreta** from the JRC Institute for Prospective Technological Studies (IPTS) in Seville.



PGD: Simultaneous first and second polar bodies removal

It was moderated by **Karen Sermon** from the Vrije Universiteit Brussel, Belgium. A lively debate with the audience followed the session.

EU legislation requires that the Community establish high quality and safety standards for the use of

blood, organs and other substances of human origin. A JRC report in late 2007 showed that guidelines were urgently needed on the counselling of patients that opt to screen their embryos created by in vitro fertilisation (IVF) for serious genetic disorders.

AAAS 2009: Nanofood for healthier living?

On Monday, 16 February the JRC held its final session of the AAAS 2009 meeting. The symposium "Nanofood for healthier living?" featured a presentation from **Qasim Chaudhry** of the Central Science Laboratory in York (UK), who spoke on the current status of nanotechnology for food applications, explaining that there are about 800 consumer products with nanoparticles currently available on the market.



Smart packaging is one of the many emerging applications of nanotech in the food sector

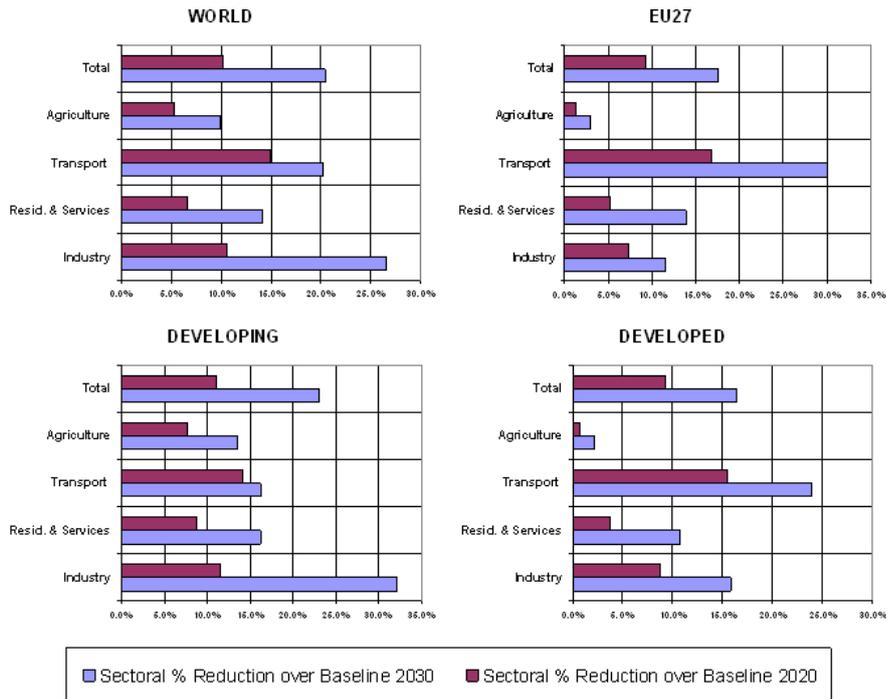
Thane S. Thurmond from the U.S. Food and Drug Administration looked at the regulatory framework for 'nanofood', asking whether it was adequate, and **Hermann Stamm** from the JRC Institute for Health and Consumer Protection (IHCP) gave a presentation prepared in collaboration with the European Food Safety Authority (EFSA) entitled "Nanofood: how to assess the risk of a nutritional miracle". The symposium was moderated by **Elke Anklam**, Director of IHCP.

<http://ec.europa.eu/dgs/jrc/index.cfm?id=5290>

JRC report estimates global cost of climate-change policies

The report “Economic assessment of post-2012 global climate policies”, published 13 February by the JRC’s Institute for Prospective Technological Studies (IPTS) presents in detail the economic estimations upon which the recently released Commission Communication “Towards a comprehensive climate change agreement in Copenhagen” is based.

The research gives an estimate of some €666 billion to the global cumulative cost of mitigation policies, which aim to reduce the effects of climate change by curbing greenhouse gas emissions, for the eight year period following the Kyoto protocol (2013-2020). By 2020, annual costs in the energy and industrial sectors will be €150 billion, with additional costs of about €25 billion that would be borne by land use-related sectors, amounting to a total cost of €175 billion. The JRC’s estimations mean that most countries would face costs



Sectoral Final Energy Savings compared to Baseline (POLES model, IPTS)

ranging from 0.4 to 1.2% of their respective Gross Domestic Product (GDP).

The report also highlights the strategic importance of technology deployment and flexible policy

instruments as contributors to emission-reduction targets.

The JRC report can be downloaded free of charge.

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

An EU strategy for preventing and dealing with disasters

On Monday, 23 February the European Commission adopted two Communications related to natural and man-made disasters: the first on an EU-level approach to reducing their impact and a second on an EU strategy for supporting disaster risk reduction in developing countries. The Communications represent a first attempt to establish a more strategic approach to European responses to disasters in the EU and beyond.

Recognising the importance of investing in research activities in the disasters management cycle, the Communications fix as a notable objective strengthening the coordination of EU-financed research activities. The JRC, through its



The frequency and severity of forest fires around the world is rising

Security of the Citizen (IPSC) and for Environment and Sustainability (IES) plays an important role in supporting the EU throughout the crisis management cycle, from prevention and risk mapping to immediate response, damage analysis and reconstruction. The Communication notes that the Commission will reinforce the link between existing early warning systems, whose reliability and accessibility is crucial for mitigating

disasters. These early warning systems include the JRC’s alert systems for forest fires (EFFIS) and floods (EFAS) as part of the Global Disaster Alert and Coordination System (GDACS), a joint initiative of the JRC and the United Nations Office for the Coordination of Humanitarian Affairs (OCHA).

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



Dresden railway station, Elbe flood August 2002

JRC to play key role in Fuel Cells and Hydrogen JTI

A cooperation agreement between the JRC and the European Fuel Cells and Hydrogen Joint Technology Initiative (JTI), a public-private venture aimed at delivering commercially viable hydrogen energy and fuel cell technologies, has been approved by the JTI Governing Board.

The JRC will contribute to the JTI work programme through pre-normative research aimed at assessing the performance of fuel cell and

hydrogen technologies in terms of their safety, reliability, efficiency and emissions. The JRC will also provide the services of reference laboratories, notably its hydrogen storage and fuel cell performance labs at the JRC Institute for Energy (IE), in Petten, the Netherlands.

At the same time, the JRC will seek to support the JTI's strategy formulation and implementation, helping to ensure that the European Commission plays a significant role in the research, development and demonstration of fuel cells and hydrogen projects in Europe.

JTIs are public-private partnerships and have been identified as a new strategy for the implementation of the Seventh Framework Programme for Research and Technological Development (FP7). They should serve to support large scale initiatives that could not be implemented efficiently using other R&D funding mechanisms, addressing market failures by focusing on a specific industrial area with a clearly defined objective, funded by a combination of private and public investment.

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

JRC intensifies desertification research

The JRC is intensifying and globalising its research activities relating to desertification, drought and 'dryland' science. In 2008, a new research team was set up at the Institute for Environment and Sustainability (IES), with a view to developing benchmarks and indicators for monitoring and assessing desertification processes across a range of geographic scales. The research team is already engaged in several regional and

2008, was edited by JRC scientists along with colleagues from the South African Council of Scientific and Industrial Research and Australia's Desert Knowledge Cooperative Research Centre (CRC). This edition also contains the conclusions of a *Global Change Research Workshop* organised by the JRC in Wengen, Switzerland, in 2007, to collate learning on desertification processes over the previous three decades and on best practice in monitoring and modelling of the phenomenon.

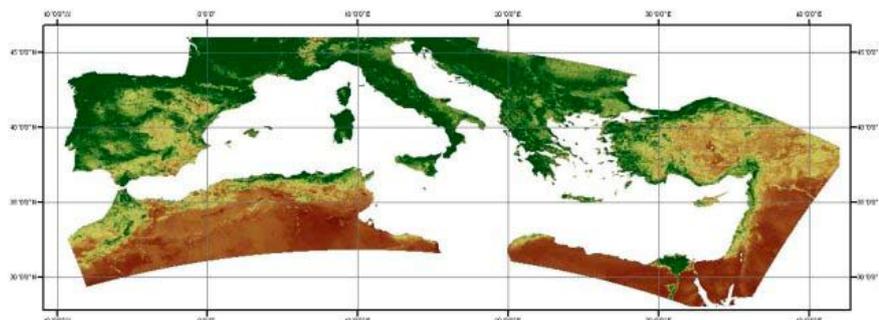
Desertification directly or indirectly

JRC report assesses soil degradation in Europe

On 14 February the JRC released a report entitled "Addressing soil degradation in EU agriculture: relevant processes, practices and policies". The study identifies opportunities for soil-friendly farming, paying particular attention to how so-called 'conservation agriculture practices' (the combined use of no-tillage or reduced tillage, soil cover and crop rotation) might minimise the risk of soil degradation.

The report is the result of work at the JRC Institutes for Prospective Technological Studies (IPTS) and for Environment and Sustainability (IES) as part of the 'SoCo' (Sustainable Agriculture and Soil Conservation) project.

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



Mean Green Vegetation Fraction (GVF) values over all years 1989 - 2005. IES Desert Action

global networks, providing key support to policy makers at a European level and beyond, and its activities are beginning to bear fruit.

A special feature on "Climate Change and Desertification"² in the journal *Global and Planetary Change*, published in December

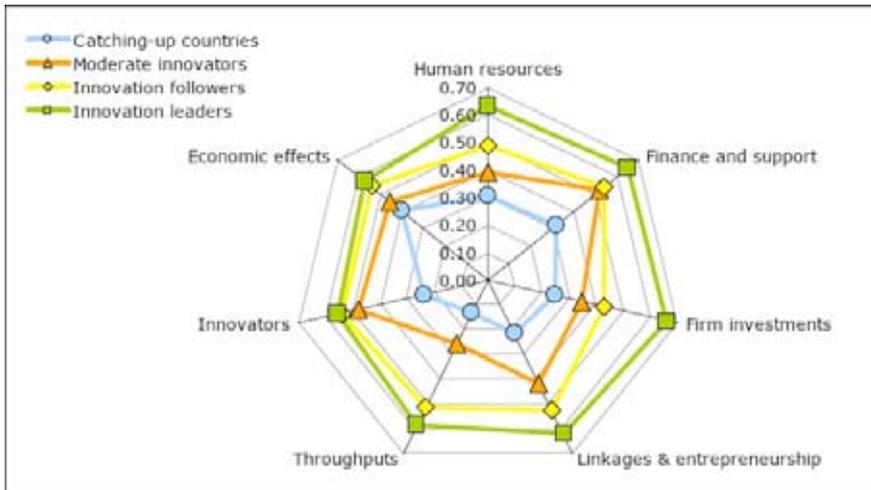
² *Global and Planetary Change*, vol. 64, issues 3-4, Dec. 2008.

affects a billion people and as much as one third of the planet's surface. Specialists worldwide have teamed up to tackle this major environmental issue from a scientific point of view, sharing their knowledge globally and rendering the trends much more visible with latest digital mapping techniques.

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

Substantial progress on innovation in Europe

The 2008 European Innovation Scoreboard (EIS) published on 22 January shows the EU making substantial progress in its innovation performance preceding the financial crisis. The 'innovation gap' between the EU and both the U.S. and Japan was reduced, thanks in particular to progress made by many new Member States including Romania and Bulgaria. Across the EU, particular



EIS 2008: country groups: innovation performance per dimension.

progress was made in human resources and the availability of finance for innovation. However, innovative investments by businesses are still relatively weak, especially when compared to the US and Japan. The 2008 Science, Technology and Competitiveness report, published the same day, provides a more in-depth analysis of trends in public and business R&D, technological performance and progress in implementing the European Research Area.

The JRC Institute for the Protection and Security of the Citizen (IPSC) has been providing statistical support to the authors of the Innovation Scoreboard for the methodology used to construct its composite indicators and in the preparation of thematic reports. The 2008 Scoreboard has benefited particularly from the IPSC's recent report "European Innovation Scoreboard: strategies to measure country progress over time", discussing a range of composite indicator growth

formulas to measure real progress over time.

<http://www.eis.eu/>

First global assessment of ozone impact on major crops

A first-ever global study assessing ozone impact on major crops by the year 2030 has been published the JRC's Institute for Environment and Sustainability (IES).

The study is an integrated assessment combining data and model results from various sources. It estimates the damage caused by ground-level ozone to four major crops (wheat, rice, soybean and maize), both at present day and for the year 2030 assuming current policies will be fully implemented.

It is the first study to make this assessment on a global scale,

showing that in particular India and China are facing significant impact of air pollution on their crop productivity if no further measures are being taken.

R. Van Dingenen, F.J. Dentener, F. Raes, M.C. Krol, L. Emberson, J. Cofala: "The Global Impact of Ozone on Agricultural Crop Yields under Current and Future Air Quality Legislation", *Atm. Env.*, 43, pp. 604-618 (2009).

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



Validation of new GMO detection method

A method for the quantification of the Genetically Modified cotton crop "MON 15985 x MON 1445" was validated in January by the Community Reference Laboratory for GM Food and Feed (CRL-GMFF) at the JRC's Institute for Health and Consumer Protection (IHCP).

The Community Reference Laboratory for GM Food and Feed (CRL-GMFF) was established by European Regulation (EC) No 1829/2003 on genetically modified (GM) food and feed, and started its operations on 18th April 2004. Its core task is the scientific assessment and validation of detection methods for GM Food and Feed, which is done in collaboration with the European Food Safety Authority (EFSA), as part of the European Commission authorisation procedure.

<http://ihcp.jrc.ec.europa.eu/facilities/crl-gmff.htm>

SCIENCE AND TECHNOLOGY

New organic contaminants in European rivers

A Europe-wide survey of rivers and streams that tested water samples for a range of polar organic molecules acting as pollutants in European water systems has been completed. The researcher groups involved were organised and led by

the JRC's Institute for Environment and Sustainability (IES).

The study's results, which have just been published, highlight the problems associated with the persistence of industrial pollutants and the monitoring of new pollutants. The continued entry of organic pollutants stemming from personal

care products, pharmaceuticals and industrial chemicals via wastewaters into rivers and streams is noted as a cause for concern, as little is known about the long-term, potentially toxic effects of these increasingly complex mixtures of pollutants. Water-soluble compounds can also contaminate ground and drinking waters.

The survey was conducted with 122 sampling points in over streams and rivers of all sizes throughout Europe in autumn 2007. 27 European Countries, mostly EU Member States, were covered.

Relatively speaking, the most frequently detected compounds at noteworthy concentrations were benzotriazole, tolytriazole (which are corrosion inhibitors), caffeine, carbamazepine (a drug used for the treatment of epilepsy) and nonylphenoxy-acetic acid, a degra-

tion product of industrial surfactants. These agents are suspected to disrupt the reproductive functions of both wildlife and humans. Significant contamination by perfluorinated acids (PFOA) was also detected in a number of major river basins in Europe. The study detected only low concentrations of pesticides, though sampling was conducted in autumn when few pesticides are used.

The results also show the need to anticipate environmental problems stemming from the

use of chemicals in Europe, for example via the European REACH Regulation (Registration, Evaluation, Authorisation and Restriction of Chemical substances).

R. Loos, B.M. Gawlik, G. Locoro, E. Rimaviciute, S. Contini, G. Bidoglio: "EU-wide survey of polar organic persistent pollutants in European river waters", *Environ. Poll.*, 157 (2009), pp. 561-568.

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

JRC pattern-recognition programme adopted in U.S.

A powerful pattern recognition programme developed by researchers at the JRC is being adopted by specialists in a number of U.S. federal agencies including the Environmental Protection Agency (EPA) and the U.S. Department for Agriculture's Forest Service. The latter is using the freeware in the context of a collaboration agreement with the JRC and the first results of its application are on display on the Eastern Forest Environmental Threat Assessment Center's web-site (<http://forestthreats.org/tools/landcover-maps/mspa>), detailing the state of American national forest patterns.

The computer programme, developed by Peter Vogt and Pierre Soille at the JRC Institute for Environment and Sustainability (IES), is based on a system known as Morphological Spatial Pattern Analysis (MSPA) and works by following a customised sequence of image processing steps. Its purpose is to detect, recognise and highlight different geometric features or geographical land-cover within a given image.

Image overlays for easy display in GoogleEarth®, depicting the latest JRC research results on forest patterns in Europe and globally can also be downloaded for free from the IES website. A user friendly MSPA software application called GUIDOS



Morphological Spatial Pattern Analysis in Google Earth ©

(Graphical User Interface for the Description of image Objects and their Shapes) is also available to download for free.

http://forest.jrc.ec.europa.eu/biodiversity/Pattern_maps/

Detecting phthalates in food

The JRC's Institute for Reference Materials and Measurements (IRMM) published a report in January summarising the analytical methods applied by European laboratories for the determination of phthalates in food. The study, requested by the European Commission's Directorate-General for Health and Consumers and conducted by Thomas Wenzl at IRMM, provides an overview of the methods applied in Europe and is a necessary first step in preparing legislation in the field of phthalates.

Phthalates are generally used as plasticisers, added to various

materials to increase their flexibility. They are chiefly used to soften *polyvinyl chloride*. Phthalates are currently being phased out of many products in the EU and US due to health concerns.

<http://irmm.jrc.ec.europa.eu/html/news/index.htm>

Detecting banned chemicals in consumer products: new reference materials

JRC-IRMM has released two new certified reference materials (CRMs) to help analytical laboratories better detect two classes

of flame retardants banned under EU legislation restricting the use of hazardous substances in electronics and electrical equipment (Directive 2002/95/EC). The two reference materials were custom made to contain all relevant flame retardants at levels close to the legal limit. Polybrominated flame retardants are used in a wide variety of products to prevent the spread of fire. However, these chemicals can accumulate in blood, breast milk or fat tissues and are reported to cause hormonal imbalances and impair the development of the nervous system.

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

**Alternative energies:
pre-treatment of biomass prior to
thermal conversion**

A paper published in January by scientists at the JRC Institute for Energy (IE) looks at methods for the pre-treatment of biomass prior to thermal conversion by combustion or gasification to produce either electrical energy or heat directly or an alternative fuel for storage.

The scientific basis of the work is aimed at establishing data for use in defining “preferred pathways” for biofuels and renewable heat/power production.

K.Svoboda, J.Martinec, M. Pohořelý, D.Baxter: “Integration of biomass drying with combustion/gasification tech-

nologies and minimization of emissions of organic compounds”, *Chemical Papers*, 63 (1) (2009), pp. 15-25.

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

**Industry to use JRC robotics for
keyhole surgery**

The JRC Institute for the Protection and Security of the Citizen (IPSC) signed a licence contract with SOFAR spa, a biopharmaceuticals and medical equipment company, in November. The agreement is for the use of JRC-patented robotics technologies for tele-operated minimally invasive surgery.

Laparoscopic or ‘keyhole’ surgery stands to become safer and more

efficient with the help of ALF-X, a JRC-developed surgical tele-robotics system with innovative tactile sensing capabilities. ALF-X, which stands for ‘Advanced Laparoscopy through Force refleCTion’, employs a range of innovative features covering tactile sensing capabilities, versatility, safety and ease of use for laparoscopic surgical procedures. It provides surgeons with better ‘tactile sensing’, the perception of forces exerted on patient tissues by robotic surgical instruments. This will help avoid breaking sutures (surgical stitching) and reduce any damage caused by the incision of *trocars* (tools used in keyhole operations) thus improving the quality of interventions.

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

EVENTS

**The role of technical experts in
the assessment of proliferation risk**
20-22 January, Ispra, Italy

A conference on the role of technical experts in the assessment of proliferation risk and ‘end-use end user analysis’ was co-organised by the JRC Institute for the Protection and Security of the Citizen (IPSC) and the U.S. Department of Energy National Nuclear Security Administration (US-DoE-NNSA) in the framework of informal collaboration begun in 2007 on export control issues. The seminar included lectures on the genesis and scope of the EU’s ‘Dual Use’ legislative regime and on export control issues in the US.

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

and in close collaboration with the International Atomic Energy Agency (IAEA), is hosting a workshop on impurity measurements in uranium samples on 16 and 17 March 2009 at the JRC Institute for Transuranium Elements (ITU) in Karlsruhe. The workshop’s aim will be to illustrate the relevance of impurity data for safeguards, non-proliferation, nuclear forensics and other applications.

Nuclear safeguards authorities, fuel manufacturers and analytical laboratories are invited to participate in the workshop to exchange views and experience in this area.

<http://esarda2.jrc.it/>

Nuclear security for the media
19 March, Karlsruhe, Germany

Nuclear scientists from the JRC’s Institute for Transuranium Elements (JRC-ITU) will meet with journalists at an exclusive press workshop and guided visit of JRC nuclear laboratories on 19 March 2009.

Demonstrations of nuclear forensics and safeguards verification will

be made and participating media will have the opportunity to pose questions to leading nuclear experts on, for example, the current state of play on nuclear security and non-proliferation or the legal basis behind ‘safeguards’ work.

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

**International use of satellite data
for air quality and health
management**

30 March, Prague, Czech Republic

The JRC’s Institute for Health and Consumer Protection (IHCP) is co-organising, alongside the Regional Environmental Centre for Central and Eastern Europe (<http://www.rec.org/>), an international workshop addressing challenges and opportunities in the transferability of satellite-based techniques to support the cost-effective management of air quality and health in the EU’s new Member States. Participation of a large number national authorities, industry and academics is expected.

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

UPCOMING

**ESARDA Workshop on impurities
in Uranium**
16-17 March, Karlsruhe, Germany

The European Safeguards Research and Development Association (ESARDA), through its Working Group on Standards and Techniques for Destructive Analysis (WG DA)

JRC visit ENEA

A delegation from the JRC, led by its Director-General Roland Schenkel, visited the principal research centre of the Italian National Agency for New Technologies, Energy and the Environment (ENEA) in Casaccia, near Rome on 30 January. The visit follows that of a large delegation from ENEA to the JRC in Ispra on 11 September 2008.

As its name suggests, ENEA shares a number of research interests with the JRC. The programme of the visit was thus focused on four thematic workshops in which groups of scientists from both organisations could interact, namely: environment, security, energies and nuclear waste management/decommissioning. The aim of these workshops was to facilitate the identification of areas in which collaboration could be stimulated in the future through



JRC Director-General Roland Schenkel and ENEA President Luigi Paganetto

joint projects, staff exchanges and further workshops, meetings and conferences.

The signature of a collaboration agreement between the JRC and ENEA is expected shortly to provide the necessary institutional framework for further cooperation between the two organisations.

<http://www.enea.it/com/ingl/default.htm>

Cooperation with CEA on security

On 20 January at the Centre d'Etudes Scientifiques et Techniques d'Aquitaine (CESTA) near Bordeaux, a delegation from the JRC met a French Commissariat à l'Énergie Atomique (CEA) delegation from its Direction des applications militaires (DAM) to sign a framework agreement for cooperation between the two organisations with a focus on the field of nuclear security.

While cooperation between the JRC and CEA is longstanding and several agreements have been signed between the two organisations in the past, this agreement is the first to emphasise nuclear security as a priority.

<http://www.cea.fr/>

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.

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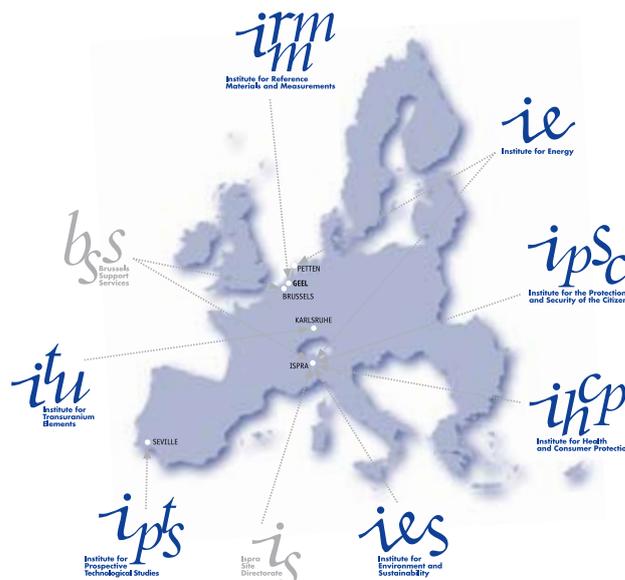
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p. 3: Nick Benjaminsz (energy), p. 4: V. Ivakhenko (polar bodies); p. 5: Uwe Hoehne (Elbe flood).



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