

DesertNet International



DesertNet International Newsletter n. 1/2012

This quarterly electronic newsletter is intended to inform the scientific community about dryland-relevant research matters. The **deadline** for receipt of material for the next issue is **15.06.2012**. Please send your contributions (1000 characters max, including spaces) to czanolla@uniss.it

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1. Information relevant to DesertNet members

About the forthcoming DNI-elections and the General Assembly

DesertNet International will hold its second elections and its second General Assembly in summer 2012. The DNI Bureau is thus currently starting all organisational phases for the electronic elections of the DNI Steering Committee and DNI Advisory Board, which will be due on 4-6 June 2012, and for the organisation of the second General Assembly, to be held in Bari (Italy) on 5 July 2012.

An invitation to express candidature to the Steering Committee and Advisory Board was sent to all DNI members on 12 April, with a deadline of 30 April. We hope that numerous DNI members will express their interest. The DNI Bureau will be providing all members of DNI with a candidate list and a list of members of DNI, together with the roadmap of the electronic election process.

Information contributed by: DNI Bureau

DNI submission for 2012 Land For Life Award



In the framework of the Land for Life Award recently launched at the tenth session of the Conference of the Parties to the United Nations Convention to Combat Desertification (UNCCD), DNI submitted an application with the valuable contribution of the DNI members. Winners will be announced on the World Day to Combat Desertification, 17th June 2012.

Information contributed by: DNI Bureau

2. Researchers Updates

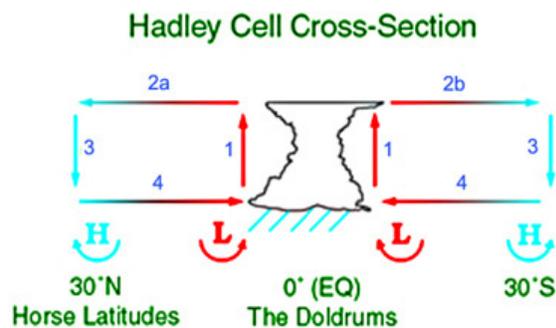
India and France launched the Megha-Tropiques advanced meteorological satellite...

Tropical desertification heavily depends upon the inter-annual and medium term fluctuations of the ITCZ and the so-called "Hadley cells". In these areas the monsoon (and hence the rain regime) inter annual dynamics play a key role. In the monsoon areas, very heavy rains can cause the erosion of soil weakened either during dry periods or already saturated with water. In the "buffer zones" between these areas and the high pressure areas causing permanent deserts, long dry episodes can cause food insecurity, famines and soil exhaustion. Whether this situation is a climate long trend or a pseudo-periodic oscillation and whether soils may recover after long dry periods is still an open question.

Better understanding scientifically the monsoon mechanisms in the Intertropical belt is a must. This requires innovative space systems to monitor continuously some poorly observed key parameters, such as the joint Indian-French Megha-Tropiques satellite, launched on October 12, 2011 and monitoring continuously the Intertropical belt.

Four instruments operate on the satellite:

- A **Microwave Analysis and Detection of Rain and Atmospheric Structures** (MADRAS),
- A **Sounder for Probing Vertical Profiles of Humidity** (SAPHIR), centred on the 183.31 GHz strong water vapour absorption frequency,
- A **Scanner for Radiation Budget** (ScaRaB),
- A **Radio Occultation Sensor for Vertical Profiling of Temperature and Humidity** (GPS-ROS)



Left: The **Hadley cells** mechanism piloted by ITCZ low pressures, strong and wet air masses ascension, and high pressures regions at about 30° latitude - **Right:** The **Megha-Tropiques** satellite.

More information at:

<http://www.cnes.fr/web/CNES-en/5503-megha-tropiques.php>

<http://www.isro.org/satellites/megha-tropiques.aspx>

<http://meghatropiques.ipsl.polytechnique.fr/mission-description.html>

http://cerea.enpc.fr/fich/support_cours/POLU1_2010-2011/CG.pdf

Information contributed by: Gerard Begni, CNES & CSFD, France (Head, Science/Policy WG)

... while End 2011, France successfully launched the **Pléiades Earth Observation satellite, a component of the Italian-French OEFEO constellation.**

On December 17, 2011, Cnes successfully launched Pleiades, the first French contribution to the joint French-Italian SAR and optical high resolution system ORFEO. The French component is made of two small satellites offering a spatial resolution at nadir of 0.7 m and a field of view of 20 km. Their great agility enables daily access all over the world, which is a critical need for present applications, and a coverage capacity allowing cartography at scales better than those accessible to SPOT family satellites. Pleiades/ORFEO can serve classical desertification monitoring methods based on low resolution permanent monitoring and “zooming” on specific areas.

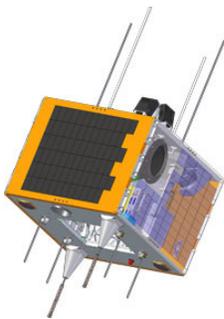


Pleiades image of San Francisco and its famous Golden Gate Bridge taken in December 2011. © CNES.

More information at: <http://smc.cnes.fr/PLEIADES/>; <http://www.astrium.eads.net/node.php?articleid=8153>.

Information contributed by: Gerard Begni, CNES & CSFD, France (Head, Science/Policy WG)

... and **TURKEY** launched its **RASAT Earth Observation Satellite.**



In August 2011, Turkey successfully launched the RASAT, the first remote sensing satellite developed and manufactured in Turkey by Turkish engineers. RASAT is expected to provide information for disaster management, cartography, environmental and urban planning and development. It will provide Turkey with several cooperation perspectives through advanced remote sensing offers, and will serve national capacity building in several domains – including desertification.

*Picture: An artist's view of the Turkish **RASAT** satellite. (C) TÜBİTAK UZAY*

More information at:

<http://www.uzay.tubitak.gov.tr/tubitakUzay/en/projects/spaceApplications.php>

Information contributed by: Gerard Begni, CNES & CSFD, France (Head, Science/Policy WG)

Greening of deserts by means of artificial roots - - Copying nature's capillaries and membranes -

Capillaries: annually millions of kilometres of „plastic“ fibres are produced by textile industry. A new in-line process makes these fibers, like cotton, hydrophilic, water-adhering. By aligning and densely packing these fibers in parallel the space between the fibers is converted into capillaries: the smaller the fibre's diameter the more efficient the capillary will be: 10 µm (= 0,01 mm) diameter is standard.

Membranes: mechanically stable and water-permeable tubing from cellulose or surface-modified silicone is commercially available in large scale.

Artificial Roots: are simply made by plugging a densely packed and thoroughly wetted fibre bundle into the membrane tubing.

Application: the lower end of this man-made root is planted into moist soil whereas the remaining parts are covered with dry soil ... seeds being on the top of the construct get a chance to germinate.

Information Contributed by: Dr. med. Rolf Siegel, -bionic surfaces-, Germany. rolf@bionicsurfaces.de.

Increasing agricultural productivity with salt-resistant crops



Global food requirements are expected to increase in the next decades. Soil salinity limits crop yields in degraded arid and semi-arid areas. Wheat (*Triticum spp.*) and rice (*Oryza sativa*) constitute the world's major staple food crops, but accumulation of high concentrations of foliar Na⁺ inhibits leaf function.

Scientists at the University of Adelaide, Australia have discovered the *TmHKT1;5-A* gene that confers the property of Na⁺ exclusion and the ability to increase grain yields in salty fields. It was obtained from an ancestor of modern wheat. This demonstrates the great potential for the genetic diversity inherent in non-domesticated germplasm for improving plant productivity and stress tolerance.

More information at: <http://www.nature.com/nbt/journal/vaop/ncurrent/full/nbt.2120.html>

Information contributed by: Maria José Marques Perez Univ. Autonoma de Madrid, Spain

Green Char Production



All types of biomass may be converted by pyrolysis into char. Char may be used for cooking purposes ("charcoal") or as a soil improver ("biochar"). Emphasis is laid on using charcoal for cooking purposes to replace charcoal made out of wood (first priority). Only if the local market will allow, additional charcoal may be produced and sold as finely ground biochar to improve soil fertility (second priority). Agricultural residues, weeds (e.g. water hyacinth) etc. are to be used.

ICPS (*IMPROVED CHARCOAL PRODUCTION SYSTEM ("ADAM-RETORT")*) is specially designed to better use heat generated during carbonization at optimal temperatures to obtain twice as much char from the input material, while

harmful gases are burnt during carbonization. It may be constructed with local labour and locally available construction materials and be run by locally trained staff. Please contact the Institute for Applied Biotechnology in the Tropics (IBT), Göttingen, Germany for more information (info@miprolab.com).

The creeping desertification and importance of indigenous genetic resources

Creeping desertification is a serious threat to global food security, especially for the drylands of the world. The genetic resources for food and agriculture (GRFA) of drylands are highly resistant to weathering calamities and can resist droughts and desertification. Unfortunately the true treasure of such GRFA is never documented properly, resulting in negligence among the policy makers is resulting in the speedy erosion of important GRFA in drylands. In the same way, international aid usually supports high-tech factory based breeds and varieties to get short-term results and ultimately erodes local/indigenous GRFA and reduces community resilience.

Information contributed by: Abdul Raziq Kakar, Society of Animal, Vet. and Environmental Scientists (SAVES), Pakistan

DESIRE Project

The DESIRE Project, Desertification mitigation and remediation of land – a global approach for local solutions, is coming to the end of 5 years of research. During this time we have assessed and mapped land degradation in 13 countries, developed desertification indicators, and used workshops with stakeholders to choose and trial new sustainable land management approaches and technologies in the 17 field sites. The results from the technology trials were analysed and evaluated, again with the stakeholders who included land users, NGOs, and policy makers. Modelling has allowed us to construct scenarios, with which to predict future possibilities. Summaries and full details of all this information are made available in formats to suit a range of audiences. See the DESIRE website <http://www.desire-project.eu/> and the information system <http://www.desire-his.eu/> especially Key Messages <http://www.desire-his.eu/en/key-messages>

Information contributed by: Nichola Geeson, DESIRE Dissemination

CASCADE Project

A start-up meeting in Aveiro, Portugal in February launched the new FP7 Project CASCADE on sudden and catastrophic regime shifts in dryland ecosystems. In drylands this means that if thresholds or tipping points are passed it can result in changed vegetation patterns and/or increased land degradation, and that is sometimes irreversible. The challenge is to understand these thresholds sufficiently to provide early warning of impending issues. In this way we can help to avoid further land degradation and sustain the position of all those who depend on the land for their livelihoods. The CASCADE Project will use a mixture of experiments at different spatial scales, from small plots to landscapes, with naturally occurring ecosystems as well as simulations. Advances in modelling will help to examine the ecosystems in the context of scenario analyses for sustainable land management strategies. To follow our progress on our website over the next 5 years, see: <http://www.cascade-project.eu/>

Information contributed by: Nichola Geeson, DESIRE Dissemination

KULUNDA Project

The KULUNDA project (How to prevent the next “Global Dust Bowl”.? – Ecological and Economic Strategies for Sustainable Land Management in the Russian Steppes: A Potential Solution to Climate Change, Russia, 2011-2016) is funded by the German Federal Ministry of Education and Research under the Research Programme “Sustainable Land Management”. The main goal of the interdisciplinary KULUNDA project is to mitigate degradation and desertification processes and to stabilize, and in the long run enhance, carbon sequestration in soils in the Russian steppes. An additional goal is to stabilize and increase crop yield by development and implementation of adequate sustainable land management practices for agricultural areas. Moreover, by doing so, KULUNDA wants to contribute to sustainable regional and rural development.

More information at: www.kulunda.eu or milada.kasarjyan@geo.uni-halle.de

Information contributed by: Dr. Milada Kasarjyan, Martin Luther University Halle Wittenberg, Germany

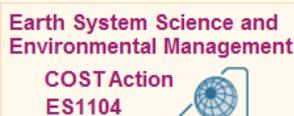
WADIS-MAR Project

WADIS-MAR (Water harvesting and Agricultural techniques in Dry lands: an Integrated and Sustainable model in MAghreb Regions) is a demonstration project funded by European Commission through

Sustainable Water Integrated Management (SWIM) Programme. Its action concerns the realization of an integrated water harvesting and aquifer recharge techniques in two watersheds in Maghreb Region, Oued Biskra in Algeria and Oum Zessar in Tunisia, characterized by water scarcity, overexploitation of groundwater resources and high vulnerability to climate change risk. Taking into account past local traditional experiences, WADIS-MAR will implement a sustainable water and agriculture management system based on participative and bottom-up approach and will achieve to enable local communities to manage groundwater resources, starting from a more efficient use of water harvesting techniques (WHT) and from a sustainable agricultural practices application. More information at: www.wadismar.eu

Information contributed by: Dr. Chiara Zanolla, Desertification Research Group – NRD, University of Sassari, Italy

ARID LANDS RESTORATION HUB Project



This four year COST Action aims to create an 'Arid Lands Restoration Hub' for dryland restoration and combat of desertification through a dynamic and productive international network of initially 29 participants from 15 COST countries and 2 partners from outside Europe. It is funded by COST through the 7th Framework Programme.

The main objective of this Action is to provide the science and practical guidance on the particular issue of arid lands restoration and combat of desertification through the establishment and management of vegetation. The aims of the Action focuses on networking of researchers and practitioners to create a hub for the collection and dissemination of data through 5 Working Groups:

WG1 – Understanding Land Degradation and Causality : The Bigger Picture and Focus on Europe;

WG2 – Traditional and Innovative Systems: Focus on Soils and Hydrology;

WG3 – Traditional and Innovative Systems: Focus on plants, ecology, plant physiology, mycorrhizal fungi etc;

WG4 – Focus on Land Management;

WG5 - Knowledge Transfer, Outreach and Training.

More information at: http://www.cost.eu/domains_actions/essem/Actions/ES1104

Information contributed by: Maria José Marques Perez Univ. Autonoma de Madrid, Spain

3. Important upcoming events

List of links to next meetings regarding desertification, water conservation and land degradation.

2012		
1-2 May	Water and Climate: Policy implementation challenges http://www.climatechange2012.org/index.asp?IntCatId=14	Canberra, Australia
12-16 May	Water Resources and Water Security in the Middle East and the Mediterranean Region. http://www.ewdr.org	Amman, Jordan
14-17 May	Second International Conference on Human Impacts on Soil Quality Attributes in Arid and Semiarid Regions. http://hisqa.iut.ac.ir/	Isfahan, Iran
21-24 May	Alternative Futures. http://www.alternativefutures.com.au/program.html	Newcastle, NSW Australia
22 – 23 May	Mobilities, Migrations, Development et Environnement. http://momiden-2012.info/	Pretoria, South Africa
28 May–2 Jun	International Conference on Water, Climate and Environment	Ohrid, Republic of

	http://balwois.com/2012/	Macedonia
29-31 May	Technologies for Sustainable Development: A Way to Reduce Poverty? http://cooperation.epfl.ch/2012Tech4Dev	Lausanne, Switzerland
17 Jun	2012 World Day to Combat Desertification. Healthy soil sustains your life: Let's go land-degradation neutral. http://www.unccd.int/publicinfo/june17/2012/menu.php	Rio de Janeiro, Brazil
18-19 Jun	4th Conference on Desertification and Land Degradation Contact: Muhammed Khlosi Muhammed.Khlosi@UGent.be	Ghent, Belgium
20-22 Jun	<u>Earthsummit 2012</u> http://www.earthsummit2012.org/	Rio de Janeiro, Brazil
27-29 Jun	XII International Symposium on Environmental Geotechnology, Energy and Global Sustainable Development. http://www.isegnet.org/2012/	Los Angeles, CA, USA
29-30 Jun	Research Workshop on Evaluating Policies, Programmes and Projects to Fight Desertification. http://www.global-mechanism.org/news--events/events/research-workshop-on-evaluating-policies-programmes-and-projects-to-fight-desertification/	Montpellier, France
1-5 Jul	6th Conference iEMSS. Managing Resources of a Limited Planet: Pathways and Visions under Uncertainty. http://www.iemss.org/sites/iemss2012/	Leipzig, Germany
2-6 Jul	4th International Congress Eurosoil 2012. Soil Science for the Benefit of Mankind and Environment. http://www.eurosoil2012.eu/	Toulouse, France
2-6 Jul	4th AMMA International Conference http://www.amma-international.org/spip.php?rubrique1	Bari, Italy
26-31 Aug	World Water Week. Water and Food Security http://www.worldwaterweek.org/	Stockholm, Sweden
29-31 Aug	3rd. International Sustainability Conference http://www.sustainabilityconference.ch/cms/index.php	Basel, Switzerland
4-5 Sep	Annual Meeting 2012: Soil Science and Food Security http://www.soils.org.uk/events/event-88/	Loughborough Leics, UK
12-14 Sep	Annual Conference of the remote Sensing and Photogrammetry Society http://www.rspoc2012.org/	London, UK
24-27 Sep	SPIE Remote Sensing. Technologies and Applications Research http://spie.org/x6262.xml	Edinburgh, UK
30 Sep- 5 Oct	EcoSummit 2012 – Ecological Sustainability. http://www.ecosummit2012.org/	Columbus, Ohio, USA
12-15 Nov	4th International Conference on Dryland, Deserts and Desertification http://in.bgu.ac.il/en/desertification/Pages/default.aspx	Sede Boqe, Israel

Information contributed by: Maria José Marques Perez Univ. Autonoma de Madrid, Spain

UNESCO Chair of Eremology – Fourth Conference on Desertification and Land Degradation

Each year around 17th of June - the World Day on Desertification- the UNESCO Chair on Eremology organizes its *Conference on Desertification and Land Degradation*. In 2012, this two-day event will be organized on Monday June 18 and Tuesday June 19. The objectives of the conference are to gather specialists, scientists, students and stakeholders involved in land degradation in the broadest sense, and share knowledge on desertification and land degradation problems and control at local, regional and global scales. To communicate your interest in participating to the conference, please send a message '**Intention to Participate**' to the conference secretariat (Muhammed.Khlosi@UGent.be).before April 27, 2012

Information contributed by: Donald Gabriels, Chairman UNESCO Chair on Eremology

4. Publications and Special Issues

1. Gonzalez, P., C. J. Tucker, et al. (2012). "Tree density and species decline in the African Sahel attributable to climate." *Journal of Arid Environments* 78: 55-64.
2. Kannan, A (2012): *Global Environmental Governance and Desertification : A Study of Gulf Cooperation Council Countries*. ISBN-10: 8180698483; ISBN-13: 9788180698484, 978-8180698484. Edition, Place & Publisher. 1st ed. New Delhi, Concept Publishing Company. See also: <http://www.kkagencies.com/index.php?p=sr&Uc=86593511011713164652>
3. Keskin, M. O., B. S. Akin, et al. (2012). "Pre-service teachers' attitudes towards some environmental problems." *Energy Education Science and Technology Part B-Social and Educational Studies* 4(1): 97-104.
4. Li, W., Y.-j. Liu, et al. (2012). "Preliminary strategic environmental assessment of the Great Western Development Strategy: safeguarding ecological security for a new western China." *Environmental management* 49(2): 483-501.
5. Martius, C.; Rudenko, I.; Lamers, J.P.A.; Vlek, P.L.G. (Eds., 2012): *Cotton, Water, Salts and Soums - Economic and Ecological Restructuring in Khorezm, Uzbekistan*. 419 pages. Springer, Berlin, etc. Hardcover, ISBN 978-94-007-1962-0, 160,45 €. See also: <http://www.springer.com/life+sciences/agriculture/book/978-94-007-1962-0>
6. Mager, D.M., Thomas, A.D., 2011. The role of extracellular polysaccharides from cyanobacterial soil crusts in dryland surface processes: A review. *Journal of Arid Environments*, 75, 91-97
7. Peters, D. P. C., J. Yao, et al. (2012). "Directional climate change and potential reversal of desertification in arid and semiarid ecosystems." *Global Change Biology* 18(1): 151-163.
8. Petropoulos, G. P., K. Arvanitis, et al. (2012). "Hyperion hyperspectral imagery analysis combined with machine learning classifiers for land use/cover mapping." *Expert Systems with Applications* 39(3): 3800-3809.
9. Ravi, S., D'Odorico, P., Breshears, D., Field, J.P., Goudie, A.S., Huxman, T.E., Li, J., Okin, G.S., Swap, R.J., Thomas, A.D., Van Pelt, S., Whicker, J.J., Zobeck, T.M., 2011. Aeolian processes and the biosphere. *Reviews of Geophysics*, 49, RG3001, doi:10.1029/2010RG000328
10. Salvati, L. and M. Zitti (2012). "Monitoring vegetation and land use quality along the rural-urban gradient in a Mediterranean region." *Applied Geography* 32(2): 896-903.
11. Sitters, J., M. Holmgren, et al. (2012). "Rainfall-Tuned Management Facilitates Dry Forest Recovery." *Restoration Ecology* 20(1): 33-42.
12. Stringer LC, Dougill AJ, Thomas AD, Spracklen DV, Chesterman S, Ifejika Speranza C, Rueff H, Riddell M, Williams M, Beedy T, Abson D, Klintonberg, P, Syampungani S, Powell P, Palmer AR, Seely MK, Mkwambisi DD, Falcao M, Siteo A, Ross S, Kopolo G (2012) "Challenges and opportunities in linking carbon sequestration, livelihoods and ecosystem service provision in drylands". *Environmental Science and Policy* (19-20) 121-135.
13. Stringer LC, Dougill AJ, Mkwambisi DD, Dyer JC, Kalaba F, Mngoli M (2012) "Challenges and opportunities for carbon management in Malawi and Zambia". *Carbon Management* 2 (3) 159-173.
14. Thomas, A.D., Hoon, S.R., Dougill, A.J., 2011. Soil respiration at five sites along the Kalahari Transect: Effects of temperature, precipitation pulses and biological soil crust cover. *Geoderma*, 167/168, 284-294

15. Whitfield, S. and M. S. Reed (2012). "Participatory environmental assessment in drylands: Introducing a new approach." *Journal of Arid Environments* 77: 1-10.
16. Yiran, G. A. B., J. M. Kusimi, et al. (2012). "A synthesis of remote sensing and local knowledge approaches in land degradation assessment in the Bawku East District, Ghana." *International Journal of Applied Earth Observation and Geoinformation* 14(1): 204-213.
17. Yitbarek TW, Belliethathan S, Stringer LC (2012) "The Onsite Cost of Gully Erosion and Cost-Benefit of Gully Rehabilitation: a case study in Ethiopia". *Land Degradation and Development* 23(2) 157-166
18. Zucca, C., R. Della Peruta, et al. (2012). "Towards a World Desertification Atlas. Relating and selecting indicators and data sets to represent complex issues." *Ecological Indicators* 15(1): 157-170.

The State of Land and Water Resources (SOLAW) is FAO's first flagship publication on the global status of land and water resources.

The State of the World's Land and Water Resources for Food and Agriculture. Managing Systems at Risk. FAO, 2011. Routledge, Taylor and Francis Group. ISBN: 978-1-84971-326-9. Hardcover, 294 pages. Price \$160.00. ISBN: 978-1-84971-327-6.

SOLAW focuses on these key dimensions of analysis: (i) quantity, quality of land and water resources; (ii) the rate of use and sustainable management of these resources in the context of relevant socio-economic driving factors and concerns, including food security and poverty, and climate change.

Information contributed by: Maria José Marques Perez Univ. Autonoma de Madrid, Spain

Changing Deserts: Integrating People and their Environment - edited by Lisa Mol and Troy Sternberg

The cultures, environments and histories of deserts, while fundamentally entangled, are rarely studied as part of a network. To bring different disciplines together, the 1st Oxford Interdisciplinary Deserts Conference in March 2010 brought together a wide range of researchers from backgrounds as varied as physics, history, archaeology anthropology, geology and geography. This volume draws on the diversity of papers presented to give an overview of current research in deserts and drylands. Readers are invited to explore the wide range of desert environments and peoples and the ever-evolving challenges they face.

More information at: <http://www.whpress.co.uk/DES.html>

Information contributed by: Sarah Johnson, The White Horse Press, Cambridge, U.K

5. Other Information

Online Financing Source directory for Sustainable Land Management



Lack of public finance and investments is often seen as a major problem for the implementation of the UNCCD and of programmes and initiatives promoting sustainable agriculture, forest and water management and rural development at large.

The Global Mechanism provides the **Finance Info Kit**, a comprehensive online financing sources directory that aims to provide insights into public institutions and funds as well as foundations and private sector initiatives investing in sustainable land management.

More information at: <http://www.global-mechanism.org/en/our-services/finance-info-kit>

Information contributed by: Maria José Marques Perez Univ. Autonoma de Madrid, Spain

Scientists issue “State of the Planet Declaration”

From 26 to 29 March 2012, nearly 3000 experts and decision-makers gathered in London, UK, at the *Planet under Pressure: New Knowledge Towards Solutions* conference. Scientists issued the “State of the Planet” declaration at this international conference, which gathered experts on global environment and social issues, shortly before the upcoming UN Summit Rio+20 in June 2012. The declaration is downloadable at: http://www.planetunderpressure2012.net/pdf/state_of_planet_declaration.pdf. The declaration is directed towards the scientific community and the decision-making arena and outlines the urgency to make science more accessible for policy making in a time, where earth-system processes are dominated by human activities. This new epoch was termed at the conference as the *Anthropocene*.

A series of policy briefs were presented at the conference in London. These were commissioned by the Nobel Laureate Prof. Elinor Ostrom and were developed by the academic community. The policy briefs will be supported by white papers, which should be available soon. The policy briefs target policy-makers in the Rio+20 process and address following topics, which are of importance to the Rio+20 conference:

1. Water security for a planet under pressure.
2. Food security for a planet under pressure.
3. Transforming governance and institutions for a planet under pressure.
4. Biodiversity and ecosystems for a planet under pressure.
5. Interconnected risks and solutions for a planet under pressure.
6. Human well-being for a planet under pressure.
7. A green economy for a planet under pressure.
8. An energy vision for a planet under pressure.
9. Global health for a planet under pressure.

All nine policy briefs are downloadable at: <http://www.planetunderpressure2012.net/policybriefs.asp>

Information contributed by: Mariam Akhtar-Schuster, DNI Chair

---- Editorial Board ----

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