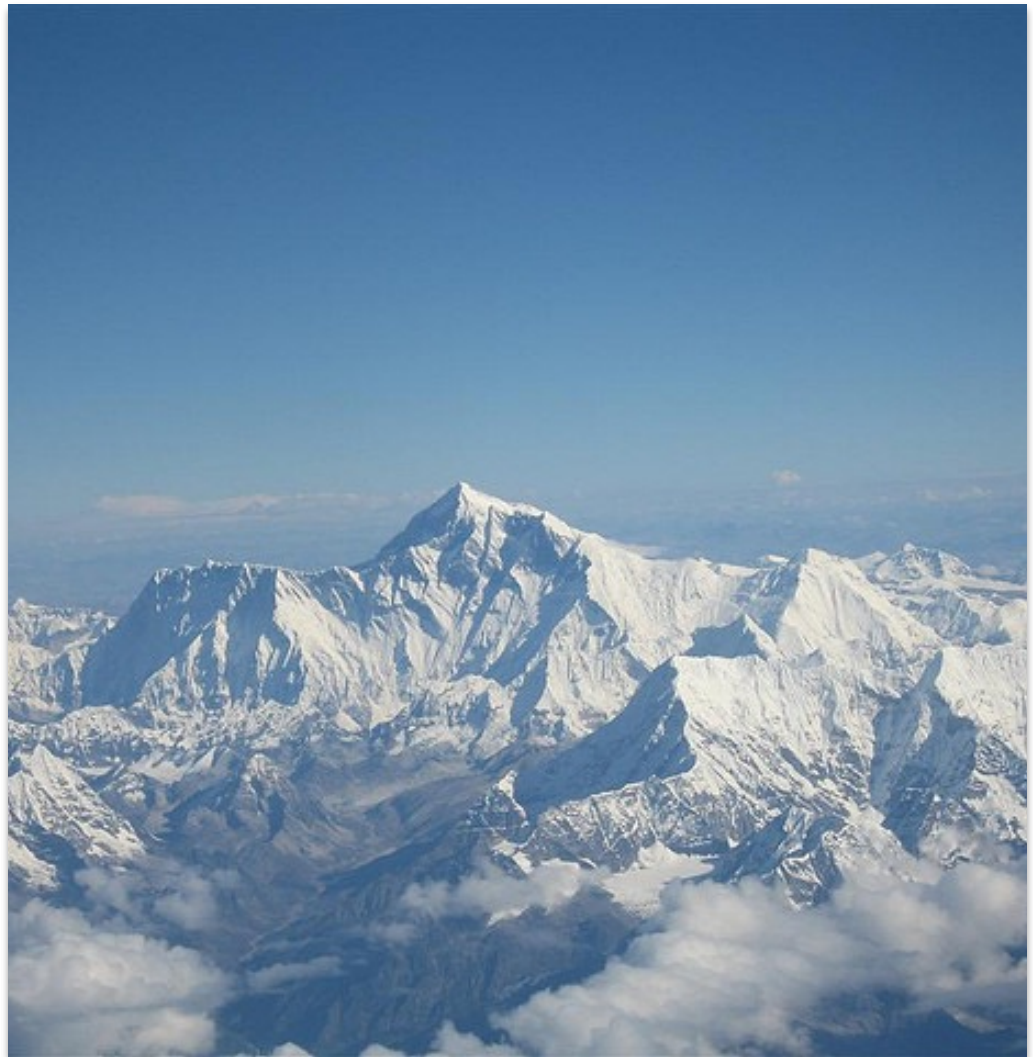


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**The Climate Services Partnership (CSP)** is a platform for knowledge sharing and collaboration to advance climate service capabilities worldwide. CSP members are climate information users, providers, donors, and researchers; though they represent diverse interests, all are actively engaged with climate services through their own programmes and activities. Partners collaborate to develop and improve climate services; they also learn from each other by sharing resources and experiences. The CSP creates a venue to generate new knowledge, establish best practices, and promote a resilient, sustainable, and climate-smart future. More information is also available on our website: [www.climate-services.org](http://www.climate-services.org).

The CSP newsletter is a quarterly publication meant to keep all informed of the latest updates of the partnership community. We rely on you for news of your activities, upcoming events, and recent publications.

**Editorial board:** April Humble, Daniela Jacob, María Máñez Costa, Irene Fischer-Bruns (all GERICS)

# A new year & the beginning of a great new climate chapter

## letter from the CSP Secretariat

2015 proved itself to be a momentous year, one hailed as "a historic turning point" in human history. On the 12<sup>th</sup> December in Paris world leaders decided on a legally binding agreement to keep global warming to below 2°C, and "pursue efforts" to limit mean temperature increases to 1.5°C. This agreement, signed by almost 200 world leaders, is one that many believed would not be possible a year ago.

After two decades of climate talks, the Paris Agreement has also been ground breaking for global cooperation and leadership. We would like to congratulate all those working in the climate science and beyond that have been involved in creating the necessary science to inform strong policy making, and all those who have been involved in advocating for a more sustainable planet. Together, we have taken the first steps to make an incredible and absolutely crucial aspiration a reality.

2015 was also momentous for other reasons as well. It was the first year to pass 1°C warming comparable to pre-industrial times, in addition to being the first year when annual CO<sub>2</sub> concentration exceeded the symbolic 400 ppm threshold. The climate challenge will be tough. The next few years will be telling for how our leaders as well as nations and businesses actualise efforts to stick to the goal of under 2°C. The reality remains of course that the climate is already warming, climate impacts are already occurring worldwide and the world is also already locked into a certain degree of further temperature rise even if we stopped all green house gas emissions tomorrow.

So, what would the world look like at the 2°C limit agreed on in Paris? To have an insight into this, we only need to look to the recently concluded IMPACT2C project, which quantified the impacts of 2°C global warming in Europe and other key vulnerable hotspots: Bangladesh, Africa (Nile and Niger basins), and the Maldives. This project was concluded at the end of November, and reached some striking results of what a 2°C world might bring.

Regional variations exist when considering global mean temperature. Results from IMPACT2C show that Europe as well as West and East Africa, would warm more than the 2°C mean global warming. Impacts of 2°C in Europe were found to include extreme events becoming more frequent: Heat waves are projected to double, while extreme precipitation events would become more intense, such as the storms and extreme precipitation that wrecked havoc across the UK throughout December. It was also found that if we manage to cap global warming at 2 degrees, in Europe, the highest flood costs would be to countries around the North Sea. Low-lying nations in other vulnerable regions will face even greater threats from sea-level rise, such as the Maldives where their highest island peaks at 2.4 meters and Bangladesh, which is at great risk of subsidence.

Climate change is here, and will continue, but to what degree remains unknown. What we do know however is that world leaders have made the incredible step of legally and jointly committing to keep climate change to 'safe levels'. It is now our duty to support them in every way we possibly can to honour these duties.

With that, I wish you all the best for 2016 and I am raising a glass to the climate deal, to our role in climate services, and to the planet! We all have a lot of work to do!

*Daniela Jacob*

Director of Climate Service Center Germany  
(GERICS)

**Ottmar Edenhofer, Director of the Mercator Research Institute on Global Commons and Climate Change**

*"The Paris agreement is a breakthrough. Earth's fate now depends on how fast and how strong we implement policy instruments to actually reach the great target of strictly limiting global temperature increase and the resulting climate risks."*

"The Paris agreement explicitly acknowledges that the current emission reduction pledges, the so-called INDCs, will lead to increasing global emissions by 2030. Nevertheless, the aspirational goal of staying below 2°C of the Paris Agreement is not consistent with the pledges unless deep emission cuts at rates of about 6 percent per year between 2030 and 2050 are pursued. We need short-term entry points for climate policies that allow emissions to peak well before 2030. However, the institutional mechanisms in the Paris Agreement for emission reduction rates are vague: The monitoring and review process has to be clearly defined. The Paris Agreement mentions short-term entry points: carbon pricing and carbon markets. The G-20 should elaborate next steps to implement carbon prices. Financing and transfers provide the means to harmonise these carbon prices. Whoever is building more coal power plants, however, is shutting the door to reaching the two-degree-target. We now more than ever need to avoid a global renaissance of coal - so we can transform the treaty into reality, and ultimately a better future for all."

**Christoph Bals, Policy Director at Germanwatch**

"Our experience in Germany has shown that renewable energy can be scaled up rapidly with significant economic benefit. The decarbonisation signal from the Paris Agreement will increase and accelerate these benefits, but Germany still needs to up its game. Chancellor Merkel needs to commit to a plan to phase out the use of coal within the next two decades. The Paris outcome requires developed countries to come back next year with a credible plan for reaching their 2020 targets - that just is not going to be possible without a coal phase-out."

**Kanta Kumari Rigaud, Lead Environment Specialist, World Bank-PPCR Focal Point**

"The Paris outcome coupled with the INDC submissions by countries provides a great impetus for stepping up action on low carbon climate resilient strategies and mainstreaming these into the development agendas of the World Bank's client countries. Recognizing that enhanced adaptation would benefit from decision support through the provision of climate service among other needs is a step in the right direction. Climate services are a critical part of managing climate risks. Increasingly we must go beyond the win-win and low regrets measures to design and embed customized, timely and quality climate services into projects and programs. This will allow countries to not only better manage extreme events through early warning systems, but provide for improved flood management, urban drainage, and advisory services for farmers, among others. Through the Pilot Program for Climate Resilience (PPCR) the World Bank is already working with Nepal, Zambia, Jamaica and Haiti to pioneer this integrated approach on climate services. Countries are increasingly understanding the need for systematic and sustained investment in hydromet and climate information to support informed decision making under a changing climate. As the PPCR expands to 10 new countries globally, including 6 in Africa, climate services will likely be a central feature of each country's strategic programming."

**Guy Brasseur, Senior Scientist, National Center for Atmospheric Research**

*"COP21 is an extraordinary diplomatic success achieved under the leadership of Foreign Minister Fabius."*

"The agreement by all national delegations that the warming of the Earth should remain below 2 degrees Celsius and, if possible, be as low as 1.5 degrees is a real "tour de force". The real challenge today is to see how these ambitious goals will be met. We know that the committed warming today is already close to 1.5 degrees and that the current voluntary contributions of the nations are not sufficient to meet the 2 degrees target. However, a new political dynamics has been initiated and further discussions and agreements will be required to decide on further actions towards the decarbonization of our energy system. A major challenge for the scientific community and for climate services is to provide objective guidance to optimize the financial investments of large initiatives towards a sustainable future."

# the Niger Basin under 2°C

## a conversation with Frank van Weert, Wetlands International

### Impact2C

The international ambition to limit global warming to 2°C relative to pre-industrial levels was confirmed and put in the COP21 agreement. The IMPACT2C project provides information on the potential impacts of 2°C of global warming for Europe, Bangladesh, the Maldives, Upper Blue Nile and, as addressed here, for the Niger Basin.

### Projections of future change in the Niger Basin under 2°C

The Impact2C study shows a stronger warming signal in the Southern Sahara than the global mean, with the 2°C threshold being exceeded before 2050 under a stabilisation scenario (of RCP4.5 for the non-European cases), and in the next 25-30 years under the high emission scenario. There is a projected small increase in annual precipitation with increasing rain intensity and a decreasing number of rain days. In many regions, there are also indications of changes in the onset and cessation of rainy seasons.

Large parts of the Niger Basin contain flood-pulse dependent ecosystems, on which livelihoods depend. However, the Niger Basin has also experienced extensive hazardous flooding over the past two decades with millions of people affected. While there are some regional differences in magnitude, for most parts of the Niger Basin, the analysis found that hazardous floods are expected to increase, though the uncertainty range is large.



Niger river map. Licensed under CC BY-SA 3.0 via Commons – [https://commons.wikimedia.org/wiki/File:Niger\\_river\\_map.PNG#/media/File:Niger\\_river\\_map.PNG](https://commons.wikimedia.org/wiki/File:Niger_river_map.PNG#/media/File:Niger_river_map.PNG)

Similar analysis was undertaken for droughts. The potential impact of such events is high, as the national economies in these countries are largely agricultural based and production is mainly rain-fed (and flood recession-fed) and thus highly climate sensitive. The hydrological cycle also affects other natural resources – in the Inner Niger Delta in Mali, for example, fish yields are directly related to the delta's inundation

extent, which is determined by flood levels. Results indicated a much greater variation in outcomes, depending on the projection and location. For some areas in the Niger Basin, notably the central Benue valley, the southern Bani basin and parts of the Guinea highlands, there were consistent trends of longer periods of low flows and more severe hydrological droughts.

Importantly, many of the projected changes will increase existing risks. A key priority is to build adaptation to better cope with climate variability – now and for the future. However, a strong finding is that this adaptation needs to take place in an integrated manner, considering disaster risk reduction, poverty eradication and economic growth and development simultaneously.



### Mainstream and integrate

This can be best advanced by mainstreaming climate change adaptation into existing

development policies and planning as also recently expressed by the African Union Commission, United Nations Economic Commission for Africa and the World Bank. Stakeholders in the basin stressed the need for reliable weather forecasts and projections, early warning systems and supporting structures and networks. A key component of mainstreaming is the need to fully implement and conduct integrated water resources management (IWRM) in order to balance water resources demands across multiple end-users, including biodiversity and ecosystem services, and to help address water-induced disasters and shocks.

Linked to this, there is the potential for climate-proof water infrastructure to help address water variability, as long as this is implemented alongside climate-smart agriculture, community and ecosystem resilience within an IWRM framework. The Investment Plan for building the resilience of the Niger Basin Climate Resilience Investment Plan (CRIP), presented by the Niger Basin Authority at the COP21 in Paris is based on these integrated principles and explicitly addresses avoidance of maladaptation which may result from an infrastructural and engineering-based development bias.

Reference to additional information can be found in the IMPACT2C policy brief found here: [http://cordis.europa.eu/project/rcn/99957\\_en.html](http://cordis.europa.eu/project/rcn/99957_en.html)

EU Grant reference: 282746

# agriculture in the climate talks

a conversation with James Hansen, CGIAR Research Program on Climate Change, Agriculture and Food Security

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) seeks to overcome the threats to agriculture and food security in a changing climate, exploring new ways of helping vulnerable rural communities adjust to global changes in climate. CCAFS worked with a range of countries and organisations in preparation for COP21 in regard to agriculture and climate change, and will continue to work to bring agriculture into global climate policy.

In the COP meetings, CCAFS participated in several events on adaptation and mitigation within agriculture, including:

- Agriculture Action Day under the Lima-Paris Action Agenda (1 Dec);
- Partnering to scale-up climate-smart agriculture in Africa: from policy to tangible impact (2 Dec);
- Scaling up innovative approaches to climate-smart agriculture in Africa (4 Dec);
- Taking forward the implementation of national climate-smart agriculture programmes in East Africa (4 Dec);
- Radical Adaptation - far-reaching and far-sighted (5 Dec);
- Climate-Smart Food Systems for Enhanced Nutrition (5 Dec);
- Global Landscapes Forum (5-6 Dec);
- Strategic climate change partnerships: opportunities and actions in developing countries (7 Dec);
- Scaling up climate-smart agriculture in the context of climate change (7 Dec); and
- Climate change adaptation: Lessons and needs (8 Dec).



Although the landmark Paris Agreement does not mention agriculture by name, food security, food production, human rights, gender, ecosystems and biodiversity are explicit in the Agreement – opening the door for more efforts toward adaptation and mitigation in the agriculture sector. For more on what the resulting Paris Agreement means for Agriculture and Food Security, see:

<https://ccaafs.cgiar.org/research-highlight/paris-climate-agreement-unlocks-opportunities-food-and-farming#.VnagQTYfd6C>

For more on CCAFS at COP21, see:

<https://ccaafs.cgiar.org/ccaafs-un-climate-change-conference-cop21#.VnagCzYfd6C>.

### The Status of Climate Observations in Africa

#### Global Climate Observing System (GCOS)

During the UNFCCC COP21 meeting in Paris the UN-led GCOS held a side event in the Africa Pavilion. The status of climate observations in Africa and some of the work being carried out by the GCOS to support African monitoring was presented. Observations are vital for a range of issues including advancing scientific knowledge on climate change and advising and informing policymaking on adaptation, early warning and emergency response preparedness. Adaptation to climate change and variability is important for reducing a range of risks, including risks to water availability, agricultural systems, food availability, and health and economic security. The GCOS 2015 Status Report of the Global Climate Observing System has just been published. This report reviews the global monitoring of all the GCOS Essential Climate Variables (ECVs) and outlines significant improvements in global monitoring. However, there are still gaps and the system needs to develop to meet new adaptation needs. The GCOS Cooperation Mechanism has been providing support and assistance to fill some of these gaps, most recently in Madagascar, Zimbabwe and Zambia. Youba Sokona, Special Advisor on Sustainable Development at the South Centre and vice president of the Intergovernmental Panel on Climate Change (IPCC) noted that most national systems are deteriorating as governments are not convinced of the need to invest. Other participants also noted the need for greater understanding of the need and use of climate observations. For more information or to download the report go to [gcos.wmo.int](http://gcos.wmo.int).

### Addressing adaptation in Africa

#### Global Framework for Climate Services Adaptation

The Global Framework for Climate Services Adaptation is a multi agency programme focusing on increasing the resilience of people most vulnerable to the impacts of weather and climate-related hazards in Tanzania and Malawi. Partner agencies represent natural and social sciences as well as on-the-ground development and humanitarian agencies. This programme is a model of how agencies can work together under the GFCS umbrella, and the programme includes a strong communications component to enable partners to reach different target audiences with key lessons learned and success stories. It is hoped that this programme will lead to similar partnerships advancing climate services.

The main achievements to date include the establishment of Steering Mechanisms for Climate Services, awareness raising of stakeholders especially in the health sector and capacity building of the Meteorological Services in the production of climate information to meet user needs identified through extensive surveys and studies. For instance, the seasonal forecast for the GFCS programme districts have been

downscaled for the 2015/2016 season in Malawi, and for the October – December season in Tanzania as the baselines identified a request for more local climate information. Intermediaries, such as agricultural extension workers and Red Cross volunteers have been trained in Participatory Integrated Climate Services for Agriculture (PICSA). These intermediaries in turn are providing training and support for farmer groups. Climate services access is very low among women, and the programme has made efforts to take into account the different needs of men and women in the design and delivery of climate services.



**Climate Focus Paper**

**Climate Service Center Germany (GERICS)**

The German Climate Service Center (GERICS), in collaboration with the German development Bank KfW, have recently released the new *Climate Focus Paper: Regional Sea Level Rise South Asia*. Changes in mean sea-level are the result of the complex interplay of a range of factors, both climatic and non-climatic. When developing projects and considering investment decisions that may be sensitive to changes in mean sea-level, it is important that adequate consideration of all relevant factors has been taken, and the implications this may have for projects well understood. This Focus Paper highlights the challenge of understanding changes in mean sea-level, and the associated impacts, for a region in South Asia, focused on the Bay of Bengal. The purpose of the paper is thus to provide KfW project managers with help and guidance when considering the potential impacts of sea-level rise on projects and investment decisions. The paper is available as a free pdf download here: [http://www.climate-service-center.de/060787/index\\_0060787.html.en](http://www.climate-service-center.de/060787/index_0060787.html.en)

**Update from Fifth Session of the ASEAN Climate Outlook Forum**

**Meteorological Service Singapore**

The Fifth ASEAN Climate Outlook Forum (ASEANCOF-5) was organised in Singapore from 18-19 November 2015 by the Meteorological Service Singapore (MSS), as host of the ASEAN Specialised Meteorological Centre (ASMC). This event was supported and co-sponsored by the World Meteorological Organization (WMO) and the US Agency for International Development (USAID). ASEANCOF-5 was attended by the National Meteorological Services (NMSs) of all 10 ASEAN Member countries: Brunei, Cambodia, Indonesia, Lao, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. Other experts from meteorology, hazard warning, disaster-risk management, hydrologic systems, environmental protection and humanitarian assistance also attending from across the Pacific region and beyond.

The aim of the forum is to provide collaboratively developed and consensus-based seasonal climate outlooks and related information on a regional scale. The forum outlook and its activities contribute significantly to one of the key roles of the ASEAN Specialised Meteorological Centre (ASMC), which is to conduct climate and seasonal prediction for ASEAN region through pooling the expertise of ASEAN National Meteorological Services. In light of the developing El Niño, the theme of this year's forum focused on the application of seasonal and subseasonal predictions to drought.

**Outlooks included:**

The 2015-16 El Niño event was at a strong and mature level by the Northern Hemisphere late autumn/early winter season. Most of the international climate outlook models indicated that this El Niño event would strengthen slightly before the end of 2015. The strength of this El Niño was comparable to the stronger El Niño events in the past (e.g. 1982-83 and 1997-98). Typically, the impact of the El Niño on the region during the DJF season is on the north-eastern part of the Maritime Continent. Hence, there is an enhanced likelihood for that sub-region to experience drier-than-normal conditions for DJF 2015-16.

The Indian Ocean Dipole (IOD) was in a positive state towards the end of 2015 but models that were assessed predicted that the IOD would start to weaken gradually from the beginning of 2016. Positive IOD can potentially reinforce the impact of El Niño on the region, especially in the south-western sub-region, however the sea-surface temperature gradient and conditions in the Indian Ocean and the seas around this region were observed not to be as significant as that of the 1997-98 El Niño and IOD co-occurrence.

Results on the present status of the climate conditions affecting Southeast Asia, and the forecasts were also discussed.

A full overview on the outcomes of the Forum can be found here: <https://www.wmo.int/media/sites/default/files/ASEANCOF-5%20Outlook%20Bulletin%20for%20DJF%202015-16%20FINAL.pdf>



## New EU project kicks off in De Bilt IMPRES

To advance the state-of-the-art in operational hydro-meteorological forecasting, a newly funded project called IMPRES has recently been launched.

IMPRES stands for: IMproving PREdictions and management of hydrological EXtremes. The project, awarded €7.9 million over 4 years by the European Commission, aims to improve society's ability to anticipate and respond to future hydrological extreme events in Europe.

IMPRES works across time-scales by focusing on both the quality of short-to-medium term predictions as well as the reliability of future climate projections. It does this by improving the representation of key processes in the current state-of-the-art forecasting systems. The application-oriented approach of the project hopes to improve the uptake of climate information in strategic economic sectors and contribute to risk management strategies across Europe. As a key outreach product, a periodic hydrological risk outlook for Europe will be produced.

IMPRES is built upon a strong team of experts from public and private sectors as well as universities and research institutes with complementary skills and experiences. The direct involvement of a broad range of users from key economic sectors will ensure the relevance of the project outputs.

The project kicked off at the premises of the coordinating organisation, the Royal Netherlands Meteorological Institute (KNMI), in De Bilt, Netherlands on 30 November 2015. The 3 day kick-off meeting allowed representatives from the 23 consortium members to build a strong team spirit and set the foundations for the work ahead.

You can stay informed on the latest project developments through twitter @impres\_eu and on [www.impres.eu](http://www.impres.eu)

IMPRES received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 641811.



EU project IMPRES kicked off to improve predictions and management of hydrological extreme events

## Web-Atlas launched

### IMPACT2C

At the end of 2015, the IMPACT2C project launched the interactive web-atlas. IMPACT2C is a very recently concluded 4 year project which quantifies projected impacts under a global 2°C warming for Europe. As mentioned in the last newsletter, the web-atlas is an interactive online tool which allows users to surf between different 'stories' from the IMPACT2C project. These stories refer to the different themes and regions of research from the project, and cover a range of sectors and topics that will be affected by climate changes at 2°C within Europe. It also branches out to analyse other vulnerable regional hotspots, including: Bangladesh, the Maldives, West Africa and East Africa, and also assesses a world at 3°C for these regions. Within the web-atlas there are eight storylines, that cover topics such as energy, water and coastal themes, which are then broken down into further localised/sector relevant topics. The results in each are presented through bullet points and short texts and are illustrated with maps. The web-atlas ultimately serves as an interactive and highly accessible dissemination tool making the results easily digestible for society, scientists and decision makers alike.

To visit the web-atlas, please visit here:

<https://www.atlas.impact2c.eu/en/>



impres

Learn from today to anticipate tomorrow



## News from Red Cross Red Crescent

### Red Cross Red Crescent (IFRC)

- In June the Climate Centre provided technical input at an IFRC workshop in Togo on climate and weather information in early warning, preparedness and response.

Staff from 12 French-speaking National Societies came together for the first climate-related IFRC-Climate Centre training workshop of its kind in West Africa, after the success of a similar event in East Africa.



- From satellite images to crowdsourcing, disaster managers have many analytical tools to help them understand and address risk. But their ability to use geoinformation is generally outpaced by the rate of the changes happening around them; it's no longer enough to train new people on old methods. A new paper by Climate Centre authors published in September asked how we can accelerate learning and dialogue on geoinformation to help disaster managers navigate new methods and approaches. Rethinking Engagement: Innovations in How Humanitarians Explore Geoinformation looked at the question by linking geoinformation with educational games.

Among the Climate Centre's top stories this year will undoubtedly be the first humanitarian action triggered by a scientific forecast of flood risk: the Uganda Red Cross (URC) distributed just under 5,000 preparedness items to flood-prone communities in Kapelebyong, 300 km north-east of the capital, Kampala.

The [action](#) was based on a forecast of rising water-levels in the Teso area – and the non-food items were procured under [forecast-based financing](#) with the support of the German government through the [German Red Cross](#).

The URC mobilised the supplies as soon as a predetermined threshold of forecast risk was crossed. It was the first full humanitarian use of forecast-based financing, which had only been piloted.

- At the COP 21 in Paris, the Netherlands Minister for Foreign Trade and Development Cooperation, [Lilianne Ploumen](#), signed an agreement for a new five-year partnership with five Dutch agencies, including the Climate Centre, working to build community resilience in disaster-prone developing countries.

The country's Prime Minister Mark Rutte said the agreement contributed to “strengthening the resilience and livelihoods of many vulnerable communities, connects this to government priorities and investments, and supports economic growth...”

- Also at the historic UN climate talks in Paris, the Climate Centre and its partners jointly organised the 13th Development and Climate Days, centred on the theme of Zero Poverty, Zero Emissions: Tough talk on poverty and climate and heralding two days of innovative and incisive dialogue.

It was officially opened by Andrew Norton, Director of the UK International Institute for Environment and Development, and Dominique Charron, Acting Director of Agriculture and Environment at Canada's International Development Research Centre. Calling for an end to business as usual on climate, Mr Norton said climate justice was “a fundamental part of the history of D&C Days”.

## Climate Focus-Paper “Cities and Climate Change”

### GERICS

Cities are main drivers of global climate change and at the same time being affected by climate change. Additionally, cities are confronted by other challenges in relation to growing urbanisation, natural hazards, and their interactions. This Climate Focus-Paper was developed together with the KfW



and highlights the need to reduce greenhouse gas (GHG) emissions through climate mitigation policies, as well as the need for adaptation action to combat existing and potential climate impacts. Moreover, the paper underlines the challenges in finding synergies between adaptation and mitigation measures, suggests possible adaptation responses to inevitable climate change, and points out the financial barriers.

The main focus lies on rapidly growing cities in developing countries and emerging economies. Given the complexity and unique characteristics of individual cities, it is not possible to provide an in-depth analysis of existing and projected climate risks, and possible mitigation and adaptation policies, for one particular city. Rather, this Focus-Paper provides a brief overview of various aspects, topics, and sectors of relevance to cities in general.

The Climate Focus-Paper “Cities and Climate Change” is available on the GERICS homepage: [http://www.climate-service-center.de/060692/index\\_0060692.html.de](http://www.climate-service-center.de/060692/index_0060692.html.de)

## El Niño knowledge to user communities

### DFID

One of the issues discussed at the recent [international conference](#) on El Niño, was the need to improve the links between the climate science community and user communities. It was noted this can be challenging – even across different parts of the same organisation.

Since the first advisories on the current El Niño were issued, a small group from different parts of [DFID](#) have been working to ensure that colleagues in Africa and Asia have the information they need to respond proactively. This group includes those responsible for humanitarian responses (operational response), research and evidence (provision of science) and the communications team.

Research was commissioned on the expected impacts of this El Niño based on the previous events and this was cascaded at the start of August 2015. The report was released at least two months in advance of any El Niño impacts across DFID country footprint. In response to suggestions from users, monthly iterations of the report were commissioned from November 2015 to include future forecasts based upon the output from modelling centres (including the UK Met Office, ECMRWF and IRI). Information has been prepared at a range of levels for different audiences; including a headline summary, a narrative summary and monthly maps and charts.

Translating the forecasts into operational terms for Senior Management and Ministers has so far been successful. One measure of this is the approval of an additional £90 million to both prepare for and respond in Africa. However, there are still challenges in managing expectations from colleagues looking for greater certainty or granularity. A review of lessons learned is already underway to help inform areas of further research and also operational lessons. This is consistent with the UK’s commitment to improve the quality of [early warning systems](#) and act more effectively on [‘Evidence-informed humanitarian action’](#).

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### Understanding Risk Boulder: ECEP pitches Urban-CAT at URBoulder Technology Challenge

#### Engineering for Climate Extreme Partnership

In late October 2015, URBoulder – Understanding Risk Boulder – brought together those interested in building long-term risk resilience to extreme events and climate change. With participants from the Boulder community and beyond, the event also featured an innovation challenge that provided \$20,000 in funding to support technology focused on improving resilience in the city. This challenge ideally suited the Urban-CAT (Climate Adaptation Tool), an app that will soon become part of GRRIT.

ECEP Project Lead, Mari Tye, and Operations Manager, Rachel Hauser pitched Urban-CAT as a tool that the City of Boulder could use to improve the City's resiliency to costly urban flooding and storm water management for a range of future climate, urban growth, and infrastructure scenarios. Oak Ridge National Laboratory, an ECEP partner, originally developed Urban-CAT in partnership with Knoxville, TN. This web-based tool will help city managers and staff in Knoxville and Boulder understand how climate change could impact urban infrastructure vulnerability and explore the priority and benefits of different adaptation options. While the ECEP team did not win the competition, the Challenge initiated conversations with the City of Boulder's Watershed Sustainability and Climate Sustainability groups. The ECEP team will continue to work with ORNL, leaders within the City of Boulder, and others to evolve the Urban-CAT prototype into a robust software app that facilitates even broader hazard planning and climate adaptation capabilities in urban areas around the world. City of Boulder managers hope that Urban-CAT will help with assessing and responding to emerging environmental problems, as well as provide guidance for planning judicious urban development.

#### Apps for Resilience

Partners are working to advance the apps that will be included in the Global Risk, Resilience, and Impacts Toolbox. The first of these are scheduled to roll out in early 2016. Initial focus has been placed on three apps – one to provide an assessment of force majeure events (events that could shut down a construction site for a number of days), another focused on urban climate adaptation, and the third to provide information on cyclone damage potential. Created on behalf of and in collaboration with ECEP Partners, these apps are the first of many anticipated GRRIT tools and capabilities.

#### Force Majeure App:

Spearheaded by ECEP Industry Advisor, Willy Accame, the NCAR-based science team is meeting regularly with experts in the construction and real estate industries to understand industry needs around

wind, temperature, precipitation, and future climate. Using this information, the team will develop a GRRIT app that provides probabilistic future extreme events to enable construction companies and others plan contingencies. As in most industries, down time and schedule slip can be costly; the soon-to-be developed force majeure app will enhance understanding about the likelihood of such events.

#### Urban Climate Adaptation Tool (Urban-CAT) App:

Scientists at Oak Ridge National Laboratory, an ECEP partner, developed the Urban Climate Adaptation Tool or Urban-CAT for the city of Knoxville to help decision makers with green-infrastructure decisions in the face of current and future stressors. The tool can be expanded to include optimising other infrastructure (energy, water, transportation, etc.). A web-based tool, Urban-CAT will allow Knoxville decision makers to evaluate how different green infrastructure deployments (e.g., retention basins, porous



Image courtesy of KROMKRATHOG at FreeDigitalPhotos.net

pavements, etc.) improve resilience to extreme events. Urban-CAT can significantly increase a city's ability to engage its citizens by being able to explore the benefits and costs of different climate adaptation and other options.

#### Cyclone Damage Potential (CDP) App:

Cyclones are potentially disastrous, risking human lives, and damaging to property and industries. Costs associated from downtime and evacuations from oil and gas platforms run into billions of dollars and can have a ripple affect through the economy. With this in mind, the ECEP team has developed the Cyclone Damage Potential (CDP) index working in collaboration with Willis Re. CDP assigns a value (1-10) to cyclones denoting their potential to cause damage. Unlike the Saffir-Simpson hurricane wind scale, which groups hurricanes/cyclones into five categories distinguished by the intensities of their sustained winds (1-5), the CDP scale also takes into account the size of the cyclone and the speed at which it is moving. This is because the bigger the cyclone and the slower it moves, the more damage it will cause. Research has shown that the CDP index explains more than 70% of damages. Using the CDP index, the ECEP team will develop a GRRIT app that provides industry and first responders with a damage potential for real-time cyclones and an outlook on likely changes in future damage potential, and the ability to compare global damage potential. For more information see here: [https://www.ecep.ucar.edu/sites/default/files/ecep\\_news\\_final.pdf](https://www.ecep.ucar.edu/sites/default/files/ecep_news_final.pdf)

## Do CMIP5 models hint at a warmer and wetter India in the twenty-first century?

**Author(s):** Maity, R., Aggrawal, A., & Chanda, K.

**Summary:** This study diagnoses the spatio-temporal variation of three major hydroclimatic variables (temperature, precipitation and evaporation) estimated from four general circulation models participating in Fifth Phase of the Coupled Model Intercomparison Project (CMIP5). Changes in climate regime are analysed across India for the historical scenario (1850–2005) and for the RCP8.5 Scenario (2006–2100). The study provides a relative assessment of projected changes in climatic pattern over different zones in India, broadly divided as southern, Eastern, Western, Central, North-Eastern and Himalayan regions. Monthly data for both the scenarios was obtained and all the data are re-gridded to a common resolution. All the models show a stronger warming in the future as compared to the historical period. The North-Eastern, Northern and Himalayan Regions are likely to be severely affected. Though inconsistencies have been observed among the models, the majority of them predict an increase in precipitation in future with major increment in southern cities. The Himalayan belt is expected to receive heavy rainfall in the summer season with little change in the winter season. Most of the regions are not expected to experience change in evaporation in pre-monsoonal months, but substantial change is expected in some regions during monsoonal and post-monsoonal months.

**Link:** <http://jwcc.iwaponline.com/content/early/2015/11/11/wcc.2015.126>

## Dynamical versus statistical downscaling for the generation of regional climate change scenarios at a Western Mediterranean basin: the Jucar river district

**Author(s):** Chirivella, V., Capilla, J., E., & Pérez-Martín, M., A.

**Summary:** Current climate change (CC) predictions for the Western Mediterranean show a significant increase of temperature, and decrease of precipitations, with great variability depending on General Circulation Models (GCM) and downscaling approaches. This paper analyses how dynamic downscaling improves statistically based CC scenarios. The study area is the Jucar River Basin (JB), with results from ECHAM5 GCM, and a close time frame 2010–2040 appropriated for decision-making. The dynamic downscaling is performed with the regional climate model (RCM) RegCM3. It is applied to a coarse grid over the Iberian Peninsula, and then to a finer grid over the JB. The RCM is customised to reproduce Western Mediterranean climatic conditions using the convective precipitation scheme of Grell; the non-convective scheme is customised changing the default RHmin and Cptt parameters to reproduce precipitations originated by larger-scale atmospheric circulations. The RCM results, compared to current official Spanish AEMET scenarios—statistically based—reproduce much better historical data (used to verify scenarios generation). They foresee a 21.0% precipitation decrease for 2010–2040, compared to previous ECHAM4 predictions with statistical downscaling (–6.64%). The most significant

reductions are in February, September and October. Average estimated temperature increase is 0.75 °C, with high increments in July (+3.05 °C) and August (+1.89 °C).

**Link:** <http://jwcc.iwaponline.com/content/early/2015/11/25/wcc.2015.207>

## Tropical cyclones and climate change

**Author(s):** Walsh, K. J. E., McBride, J. L et al.

**Summary:** Recent research has strengthened the understanding of the links between climate and tropical cyclones (TCs) on various timescales. Geological records of past climates have shown century-long variations in TC numbers. While no significant trends have been identified in the Atlantic since the late 19th century, significant observed trends in TC numbers and intensities have occurred in this basin over the past few decades, and trends in other basins are increasingly being identified. However, understanding of the causes of these trends is incomplete, and confidence in these trends continues to be hampered by a lack of consistent observations in some basins. A theoretical basis for maximum TC intensity appears now to be well established, but a climate theory of TC formation remains elusive. Climate models mostly continue to predict future decreases in global TC numbers, projected increases in the intensities of the strongest storms and increased rainfall rates. Sea-level rise will likely contribute toward increased storm surge risk. Against the background of global climate change and sea-level rise, it is important to carry out quantitative assessments on the potential risk of TC-induced storm surge and flooding to densely populated cities and river deltas. Several climate models are now able to generate a good distribution of both TC numbers and intensities in the current climate. Inconsistent TC projection results emerge from modeling studies due to different downscaling methodologies and warming scenarios, inconsistencies in projected changes of large-scale conditions, and differences in model physics and tracking algorithms.

**Link:** <http://onlinelibrary.wiley.com/doi/10.1002/wcc.371/abstract>

## Paris, Potlatch and Pareto: What would render COP21 a success?

**Author(s):** Rockström, J. & Schellnhuber, H. J.

**Summary:** So here we go again, for the 21st time: 2015 will end like all other years over the last two decades, i.e., with a multilateral attempt to negotiate away dangerous climate change. However, why should the outcome be better this winter, and what could be considered a good result in the first place? Paper written by Earth League members Johan Rockström, Director for Stockholm Resilience Centre, and Hans Joachim Schellnhuber, Director for Potsdam Institute for Climate Impact Research, explores the potential outcomes at Paris and why a 'perfect' deal is not essential.

**Link:** <http://www.the-earth-league.org/paris-potlatch-and-pareto.html>

**The impact of the variability and periodicity of rainfall on surface water supply systems in Scotland****Author(s):** Afzal, M., Gagnon, A. S., & Mansell, M. G.

**Summary:** This paper analyses the impact of the variability and periodicity of rainfall on the reliability of water supply systems in Scotland. A conceptual rainfall-runoff model was used to simulate catchment runoff and the reliability of 29 notional and six actual reservoirs was calculated using a simple storage model. The relationship between water supply reliability and the variability of rainfall was then investigated using different measures of variability. A strong correlation was found between reservoir reliability and measures representing the distribution of rainfall between the winter and summer seasons, as well as the cumulative sum (CUSUM) of annual precipitation, quantifying the variability of rainfall between years. In contrast, mainly the intra-annual CUSUM range and the variance of monthly precipitation influenced the reliability of river-intake schemes. The presence of periodic patterns in rainfall anomalies was found to be more prevalent in West Scotland where reservoir reliability is on average lower than in the East. In addition, a sensitivity analysis revealed the small influence of evapotranspiration on reservoir reliability in comparison to rainfall variability. This study reveals the measures of variability most affecting the reliability of surface water supplies in Scotland and could therefore help with their management in the context of future climate change.

**Link:** <http://jwcc.iwaponline.com/content/early/2015/11/11/wcc.2015.136>

**Water resource management in a variable and changing climate: hypothetical case study to explore decision making under uncertainty****Author(s):** Kiem, A. S., Austin, E. K. & Verdon-Kidd, D. C.

**Summary:** This paper investigates what information water resource managers think they need to make decisions on climate change adaptation. This is achieved through a hypothetical case study where participants, all actual water resource managers or in research, practitioner or administration roles linked to Australian water resources management, were given theoretical future climate scenarios and asked to make decisions based on the available information. The case study provided useful insights into why there is little evidence of effective climate change adaptation being implemented despite significant advances in climate impacts and adaptation science over the last decade. It was found that in order to bridge the gap between climate change adaptation recommendations and successful implementation at practitioner level there is a demand for: improved translation, communication and packaging of existing climate science information into sector and location specific impacts (e.g. hydrological interpretation of climate model rainfall projections and the associated uncertainties); attribution of historical and future hydroclimatic changes (e.g. not just what has happened or is going to happen but why and the confidence and likelihoods surrounding that); quantification of costs and benefits of any decision; and understanding of the social, political, and environmental contexts and level of acceptance associated with any decision.

**Link:** <http://jwcc.iwaponline.com/content/early/2015/11/11/wcc.2015.040>

**Free-riders to forerunners****Author(s):** Hasselmann, K., Cremades, R., et al.

**Summary:** So far, climate change mitigation policies and their modeling exercises paid little or no attention to co-beneficial aspects beyond Gross Domestic Product accounts, which derive from a very limited perspective of societal welfare. In this article published recently in Nature Geoscience the authors outline an opportunity for policy makers to link job creation policies with mitigation policies, which would promote European economy and strengthen the ties amongst European countries.

Roger Cremades from GERICS, who co-authored the article, states that "this kind of models can guide us in the societal transformations needed to make the best of the opportunity appeared in Paris".

You can find a figure sketch of the model open to all readers in page 10, [here](#).

**Link:** [http://www.nature.com/ngeo/journal/v8/n12/full/ngeo2593.html?utm\\_source=hootsuite](http://www.nature.com/ngeo/journal/v8/n12/full/ngeo2593.html?utm_source=hootsuite)

**The impact of climate change on photovoltaic power generation in Europe****Author(s):** Jerez, S., Tobin, I., et al

**Summary:** Ambitious climate change mitigation plans call for a significant increase in the use of renewables, which could, however, make the supply system more vulnerable to climate variability and changes. Here we evaluate climate change impacts on solar photovoltaic (PV) power in Europe using the recent EURO-CORDEX ensemble of high-resolution climate projections together with a PV power production model and assuming a well-developed European PV power fleet. Results indicate that the alteration of solar PV supply by the end of this century compared with the estimations made under current climate conditions should be in the range (-14%;+2%), with the largest decreases in Northern countries. Temporal stability of power generation does not appear as strongly affected in future climate scenarios either, even showing a slight positive trend in Southern countries. Therefore, despite small decreases in production expected in some parts of Europe, climate change is unlikely to threaten the European PV sector.

**Link:** <http://www.nature.com/ncomms/2015/151211/ncomms10014/metrics>

**Social learning for adaptation to climate change in developing countries: insights from Vietnam****Author(s):** Clemens, M., Rijke, J., et al.

**Summary:** Social learning concepts of developed countries are often recommended for implementing strategies for climate change adaptation in developing countries. The effectiveness of these replications is questionable, because it is necessary to align the set-up of learning processes with the social, economic and environmental conditions of the local context. In this paper, we compare the theory of social learning in Learning Alliances with a Working Group for climate change adaptation in Can Tho City in Vietnam to see how far it is possible to extrapolate current social learning concepts from developed countries to developing countries. The Working Group facilitates participation processes among stakeholders to use and produce knowledge, to work together on problems and to further develop solutions. This is mostly similar to the social learning form of a Learning Alliance. However, the interactions among stakeholders in the Working Group evolve in a much more formal way, which leads to several problems caused by the relative inflexibility of the top-down stipulation of stakeholders' participation, planning procedures and solution approaches. To overcome this challenge, we recommend introducing elements of Learning Alliances to the Working Group, in order to stimulate an open dialogue with incentives and an extension of an action practice approach.

**Link:** <http://iwcc.iwaponline.com/content/early/2015/11/25/iwcc.2015.004> Exploring the ability of current climate information to facilitate local climate services for the water sector

**Exploring the ability of current climate information to facilitate local climate services for the water sector****Author(s):** Koutroulis, A. G, Grillakis, M. G. et al.

**Summary:** Local climate services become increasingly necessary in making adaptation to our changing climate more understandable and manageable. The ability of current climate information to develop and support local climate services for water resources management in close collaboration with local users of the water sector from the island of Crete is being explored. Climate modeling output ranging from event scale to decadal and centennial experiments, at hourly to monthly temporal scales and at high resolution (2 Km) to GCM spatial scales (100–250 km), are used to assess climate change impacts on water resources availability and extremes. A robust signal of temperature increase and precipitation decrease is projected for all future periods, in parallel to an increase in magnitude of extreme precipitation. Several messages could be extracted from the provider – user interaction such as the communication of basic concepts and uncertainties, user skepticism and feedback. The frequent personal contact, the communication in layman's terms of the limitations of the climate impact modeling and the corresponding uncertainties, is the key to successful provisions of suitable information.

**Link:** <http://www.earth-perspectives.com/content/2/1/6/abstract>

**Climate knowledge cultures: Stakeholder perspectives on change and adaptation in Nusa Tenggara Barat, Indonesia****Author(s):** Bohensky, E.L., Kirono, D.G.C., et al.

**Summary:** Effective climate adaptation requires engagement (awareness, motivation, and capacity to act) at relevant scales, from individuals to global institutions. In many parts of the world, research attention has focused on the engagement of the general public. We suggest that studies also need to focus on key stakeholders in the government and non-governmental sectors who participate in adaptation planning processes, so that a better understanding may be achieved of the distinct knowledge cultures that influence their engagement with climate change. Indonesia is a key actor in climate adaptation because of the potentially dire consequences for its population's livelihoods and well-being. In this paper we consider whether 'climate knowledge cultures' exist amongst stakeholders at multiple organisational levels in Nusa Tenggara Barat (NTB) Province, Eastern Indonesia. Surveys were conducted with 124 stakeholders from differing levels at the beginning of four multi-stakeholder climate adaptation workshops. Across all levels, climate change ranked highest as the first challenge participants identified, followed by food security, but well-being ranked highest when the top three challenges were combined.

**Link:** <http://www.sciencedirect.com/science/article/pii/S2212096315000388>

**Status Report of the Global Climate Observing System (GCOS-195)****Authors:** GCOS

**Summary:** The results of the global observing system have proved invaluable and have underpinned the IPCC fifth assessment report. However, as the IPCC identifies, there are gaps in the global observing system particularly with regional information. It is important for climate observations to improve understanding and prediction of climate change not just globally but also regionally. The needs of climate services, such as adapting to climate change and variability on regional and local scales, are adding additional requirements on the observing system. The report reviews the overall status of each Essential Climate Variable (ECV), assesses progress against the latest Implementation plan, and identifies gaps. The report does not provide actions or plans to address gaps, deficiencies or additional requirements that have been identified: this is the role of the new GCOS Implementation Plan being developed for release and submission to the UNFCCC in 2016. The Status Report has been submitted to the UNFCCC in December in Paris.

**Link:** <http://www.wmo.int/pages/prog/gcos/>

## upcoming events in the climate services community

### 2016 Legislators Forum

**Dates:** 15 January 2016

**Location:** Abu Dhabi, UAE

**Lead organisation(s):** International Renewable Energy Agency (IRENA)

**About:** IRENA will host its first one-day Legislators Forum in Abu Dhabi (UAE), ahead of the sixth session of its annual Assembly. As the agreement at COP21 in Paris clearly shows, renewable energy is an integral part of addressing the challenges of climate change. Over the past years, the business case for renewable energy has been strengthened, and as levels of investment in the field rise and technology deployment costs decline, industry structures are witnessing a dramatic transformation, especially with the changes in policy frameworks that continue to stimulate the deployment of renewables. Mindful of these developments, the Legislators Forum will be an opportunity to highlight and debate the critical facets of the energy transformation taking place in countries around the world.

Through presentations and peer-to-peer discussions, members of parliament from various parts of the world will have the opportunity to share their perspectives on the current energy transformation, and the renewable energy solutions that will enable countries to meet their domestic and regional energy needs. The creation of effective policy instruments and frameworks will be a central component of the agenda. The Legislators Forum will also be an opportunity to inform legislators about the agency's flagship initiatives that are of relevance to them. These initiatives aim to increase the deployment of renewables, reinforce the decarbonisation agenda and effect real change at the global, regional and national levels.

The meeting will allow participants to exchange best practices and experiences, and it will serve to assess how the agency can best support legislators in their work. The meeting will be a unique opportunity for legislators to discuss the transformation taking place in the global energy system. Legislators will be invited to examine and discuss current renewable energy topics and trends that are of specific relevance to them.

**Web link:** <http://www.irena.org/menu/index.aspx?mnu=cat&PriMenuID=30&CatID=142>

### Canada in the Post-2015 World: Outcomes of the Paris Climate Change Conference and the SDGs

**Date:** 25 January 2016

**Location:** Ottawa, Ontario, Canada

**Lead organisation(s):** International Institute for Sustainable Development (IISD)

**About:** The International Institute for Sustainable Development (IISD) is hosting a half-day panel to discuss the implications of the Paris Climate Change Conference and the SDGs for Canada and the international community. The Paris Agreement marks a historic breakthrough: all governments agreed to tackle climate change through mitigation and adaptation. The Sustainable Development Goals (SDGs) similarly mark a historic breakthrough, as countries agreed in

September 2015 to advance coherent and universal sustainable development goals and targets. This panel discussion will consider what are in these agreements, what the key challenges in implementation are, and what it means for Canada at home and abroad.

**Web link:** <http://climate-1.iisd.org/events/canada-in-the-post-2015-world-outcomes-of-the-paris-climate-change-conference-and-the-sdgs/>

### 3rd Carbon from Space Workshop

**Dates:** 26-28 January 2016

**Location:** Exeter, United Kingdom

**Lead organisation(s):** European Space Agency, Committee on Earth Observation Satellites and Global Carbon Project  
**About:** Over the last 10 years significant efforts have been made to establish an Integrated Global Carbon Observing System (IGCO) to provide insight into the behaviour of the carbon cycle and its interaction with climate, the water cycle and nutrient cycles. Following the 2nd Carbon from Space workshop in Oxford and the publication of the Group on Earth Observations (GEO) Carbon Strategy (Ciais et al., 2010, 2014), the space agencies, coordinated by the Committee on Earth Observation Satellites (CEOS), have published a response setting out the high level requirements needed to contribute observations from Space to the Integrated Global Carbon Observing System (CEOS, 2014).

To explore mechanisms for implementation of the CEOS and GEO recommendations, in collaboration with the Global Carbon Project, the European Space Agency (ESA) is convening the 3rd Carbon from Space workshop bringing together the EO, climate and Earth system science communities addressing the carbon cycle to define a concrete work plan of research and development activities to guide ESA and other space agencies and institutions to respond to the requirements for observations and their exploitation in the time frame 2017-2021.

**Web link:** <http://www.carbonfromspace.info>

### UNISDR Science and Technology Conference on the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030

**Dates:** 27-29 January 2016

**Location:** Geneva, Switzerland

**Lead organisation(s):** United Nations Office for Disaster Risk Reduction (UNISDR); Scientific and Technical Advisory Group (STAG)

**About:** The aim of the conference is to promote and support the availability and application of science and technology to decision-making in Disaster Risk Reduction. It will bring together the full diversity of the science and technology community, policy makers, practitioners and researchers from all geographical regions, at local, national, regional and international levels to discuss how the science and technology community will best support the implementation of

the Sendai Framework for Disaster Risk Reduction 2015-2030. The outcomes of the conference are to:

- Launch the UNISDR Science and Technology Partnership for the implementation of the Sendai Framework, and
- Discuss and endorse the UNISDR Science and Technology road map to 2030 to define the expected outcomes of the science and technology work under each of the four Sendai Framework priorities for actions and the ways to monitor progress and review emerging needs

**Web link:** <http://www.unisdr.org/we/inform/events/45270>

#### **Future Earth Workshop: Extreme Events and Environments from Climate to Society (E3S)**

**Dates:** 14-16 February 2016

**Location:** Berlin, Germany

**Lead organisation(s):** Future Earth

**Summary:** This cross-community/co-design workshop aims to identify and elaborate the scientific questions and associated research agendas which are scientifically challenging and of high societal relevance, in line with the goals of Future Earth. Six workshop sessions have been selected. They will discuss, among others, new narratives of climate extreme that are impact-relevant, adaptive capacity of socio-ecological systems, governance for sustainable development, impacts of extremes on ecosystems and infrastructure and adaptation.

**Web Link:** <http://www.e3s-future-earth.eu/index.php/ConferencesEvents/ConferencesAmpEvents>

#### **ASLO-AGU-TOS Ocean Sciences 2016 Conference**

**Dates:** 21-26 February 2016

**Location:** New Orleans, USA

**Lead organisation(s):** AGU, ASLO & TOS

**About:** The 2016 Ocean Sciences Meeting will be held 21-26 February 2016 at the Ernest N. Morial Convention Center, located at 900 Convention Center Blvd., New Orleans, LA 70130. Cosponsored by AGU, ASLO, and TOS, the Ocean Sciences Meeting will consist of a diverse programme covering topics in all areas of the ocean sciences discipline. The event is cosponsored by American Geophysical Union, Associated for the sciences of Limnology and Oceanography and The Oceanography Society.

The full scientific programme can be found here:  
<https://agu.confex.com/agu/os16/meetingapp.cgi>

**Web link:** <http://osm.agu.org/2016/>

#### **Global Climate Observation: the Road to the Future**

**Dates:** 2-4 March 2016

**Location:** Royal Academy of Arts and Sciences, Amsterdam, the Netherlands

**Lead organisation(s)** GCOS

**About:** GCOS will hold a conference on 2-4 March 2016 at the Royal Academy of Arts and Sciences, Amsterdam. The conference Global Climate Observation: the Road to the Future will allow producers and users of climate observations and other stakeholders the opportunity to discuss the current monitoring of ECVs and to highlight possible new areas for ECVs. These discussions will provide a key input into the new GCOS Implementation Plan that is now being prepared for the UNFCCC in 2016.

**Web link:** [www.gcos-science.org](http://www.gcos-science.org)