PIK

Potsdam Institute for Climate Impact Research

# ANNUAL REPORT 2012

Leibniz Association

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# PREFACE

## Preface

2012 was both a special and a very successful year for the Potsdam Institute for Climate Impact Research (PIK). It was special because this year marked the 20th anniversary of the institute's foundation, and we can justly look back with pleasure and gratitude on two decades of interesting and successful research in which PIK has become one of the central players – on a national and indeed an international level – in the area of climate impact research. During the same period, the Potsdam Institute has accompanied and actively supported the Leibniz Association in its process of development into one of the main pillars of the German research landscape.

The year 2012, however, represents not only twenty years of research at PIK on the causes and impacts of climate change and on possible solutions. By laying the foundation stone for the first new building in the history of PIK, this year marks a key milestone in the dynamic development of the institute. The new building is a wonderful symbol for the fact that here on Telegraph Hill, on a historic scientific site, we are investing in the issues of the future. We would especially like to thank the Ministry of Science, Research and Culture (MWFK) of the State of Brandenburg and the Federal Ministry of Education and Research (BMBF), without whose support we could not have reached this concrete milestone. Their support in financing this new building is both recognises the institute's past achievements and is a gesture of their confidence in the future relevance of its research, and represents for us both a responsibility and motivation. Not without reason did we select the foundation stone ceremony for the new building as the central occasion of our anniversary year and we were greatly delighted to be able to welcome Federal Minister Annette Schavan to this event.

As mentioned before, 2012 was not only a special but also very successful year. The acquisition of third-party funds und the international recognition of the institute have, for instance, reached record levels. The latter is expressed in the continuing increase in the number of citations of PIK's scientific publications in the international research landscape, the figures on its resonance in international media, the presence of the institute at the 18th UN World Climate Summit (COP) in Doha, Qatar, as well as the great number of high-level political and scientific visitors.

This very positive resonance is primarily founded on the scientific excellence of the institute, the motivation of its staff members and the societal relevance of the topics and research questions dealt with. By way of example, we would like to point to the following results:

- **Heat extremes are likely to increase significantly:** In a study in the journal Climatic Change, scientists from Research Domain I showed that record heat months occur today on average five times more often than would be expected without global warming. The number of monthly heat records has in some regions even increased tenfold. If global warming continues, the number of new monthly records will be twelve times higher in 30 years than without climate change.

- **Impacts of climate change for Germany:** Research Domain II, together with the State of Brandenburg and Humboldt University Berlin, organised a national conference for stakeholders and decision-makers from the worlds of politics, business and administration. The conference served to present the latest results of impact research to relevant players and to present the new internet platform "Climate Impacts Online", through which climate projections and sectoral climate impacts have been made available.

- **New concepts for global climate protection:** Up to now, socio-economic development has been closely connected to an increase of emissions. In a new publication, Research Domain III showed that a new growth path is possible. This makes clear that the concept of green growth alone is not sufficient; instead, it has to be supplemented by a political framework of binding emission reductions. Global trade in emission rights accompanied by public support for the transfer of technology to developing countries, payments for the reduction of emissions from deforestation as well as financial support for adaptation measures in the least developed countries are here the central elements.

- **Coupling of climate data with the rise and fall of the Mayan civilization:** Due to new statistical evaluation methods, scientists from Research

Domain IV were again this year able to shed light on a historical mystery. Climate data from stalagmites was used to show that the culture of the Mayan population first blossomed and later collapsed in dependence on climatic conditions.

The web portal Climate Impacts Online is a good example of the fact that the institute is continuously responding to new challenges. The portal represents a totally new approach towards making PIK's research results available to a broader public. But PIK also benefits from this approach. Since the portal has met with great interest from many different stakeholders, the institute has received valuable feedback from these user groups which can be exploited to optimise the tool and is of value for the estimation of future information needs and research questions.

2012 is for PIK a year to look back on and, with its new building, also to look to the future. The unchanged relevance of climate change and its impacts as an object of scientific research as well as the high international demand for the research results of the institute represent a great responsibility for the future work of PIK. Thanks to the new and modern infrastructure which the new building offers PIK, the institute is well prepared in future to face this responsibility and to continue its success story.

Hans Joachim Schellnhuber
Director

# 01
# HIGHLIGHTS

*Motorcycle squad on the occasion of the visit of Grand Duke Henri of Luxembourg in April 2012*
*Photo: PIK*


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# 20 years of PIK

*Federal Minister Annette Schavan, Hans Joachim Schellnhuber and State Secretary Martin Gorholt during the ceremonial laying of the foundation stone for the new building of PIK. Photo: PIK*

## Foundation stone ceremony

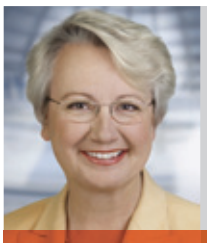
The ceremonial laying of the foundation stone for the first new building in the institute's history took place on 20th June 2012. The new building will set new standards both visually and in terms of its energy efficiency: the modern wooden façade and the building's cloverleaf-shaped ground plan should help ensure that it fits elegantly into its surrounding environment. Innovative technology will be found inside the building. It is, for instance, planned to efficiently exploit the waste heat generated by the mainframe computer used in climate simulations. This construction project is accompanied by scientists from the Technical University Dresden.

Seventeen million euros are being provided for the new building by the State of Brandenburg and the Federal Government.

In her speech, Federal Minister Schavan congratulated the institute on its incredible success and offered best wishes to all employees in their old and new working environments.

## Congratulatory messages on PIK's anniversary

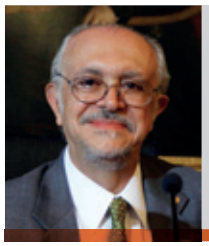
At the same time as laying the foundation stone for its exceptional new research building, PIK celebrated its 20th anniversary. As the congratulatory messages on the anniversary sent by top scientists and political figures emphasised (see below), since its foundation in 1992 the institute has become one of the world's leading climate research centres.



**Annette Schavan**

**Federal Minister for Education and Research:**

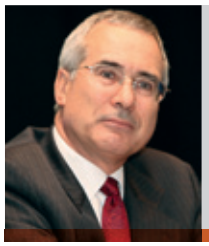
*»The work of the scientists at PIK is an important basis for the future development of humankind and nature. With their excellent research, the scientists of PIK create a solid knowledge base for decisions in politics and economy. I hope for PIK that it will be able to further strengthen its exceptional position.«*



**Mario Molina**

**Awarded the Nobel Prize for Chemistry for his work on the ozone hole, Professor at the University of California in San Diego:**

*»My heartiest congratulations on twenty years Potsdam Institute for Climate Impact Research. The research contributions of the institute are truly impressive and of great importance – both for climate science and climate policy. One of the most recent examples is the development of the 'budget approach' for international climate negotiations and the study which provides the connection between extreme weather events and climate change produced by humankind.«*



**Nicholas Stern**

**I.G. Patel Professor for Economics and Politics and Chair of the Grantham Research Institute for Climate Change and the Environment at the London School of Economics (LSE):**

*»Under the path-breaking management of Hans Joachim Schellnhuber, the Potsdam Institute for Climate Impact Research has become one of the world-wide leading institutions in the field of climate change. Among its many strengths is that it brings together world-class scientists from many different disciplines to tackle one of the decisive topics for this century: climate change. I would like to especially emphasize its research on the modelling of the possible reaction of global temperatures on different possible emission scenarios for greenhouse gases in the future. This helped humans and governments around the world to better understand the necessity of strong and collective action.«*

**Matthias Platzeck**

**Prime Minister of the State of Brandenburg:**

*»Climate and weather – what is the difference? As the Swiss journalist Ernst Reinhardt said, 'we cannot influence the weather, but unfortunately we can influence climate.' We are becoming more and more aware of how right he is. The Potsdam Institute for Climate Impact Research plays an essential part in sharpening peoples' social conscience on how the consequences of our actions influence our world's climate and in appealing to our sense of responsibility. The institute is an essential part of the international science community that has committed itself to explore the consequences of human action on climate. PIK plays an indispensable role not only in Brandenburg's but also in the international research landscape.«*

**Michael Otto**

**Head of the Supervisory Board of the Enterprise Otto Group:**

*»Through its research and the engagement of its scientists, PIK has been an alerter and admonisher of high societal relevance for twenty years in issues concerning climate impact research. The research results of PIK underscore how important it is to comply with the 2°C goal in order to preserve our basic living conditions and also offer important guidance to companies, enabling them to make their contribution to effective climate protection. I hope that PIK will continue to powerfully fulfil this role and to actively accompany the discussion on the protection of our climate.«*

# Research highlights

Photo: Maria Martin

## Risks of the Antarctic:

### A young scientist at the ice's edge

It was a very special moment for Ricarda Winkelmann when the mighty blue-white shimmering edge of the Antarctic ice sheet rose up – up till then, the young researcher only knew this ice sheet from her computer. There it consists of figures and equations, tens of thousands of program lines, familiarly abstract. As a member of an expedition on the German research vessel "Polarstern", Winkelmann had the chance to participate personally in taking drillings and samples in the Antarctic. The mathematician, only 27 years old, who wrote her thesis in physics at PIK, in 2012 published a ground-breaking study about snowfall in the Antarctic as lead author together with a group of colleagues in the journal Science. According to a common assumption, snowfall will increase if temperatures increase, and this additional snowfall binds water on the southern continent – climate change would so to speak mitigate the rise in sea level. This is, however, not the case, as Winkelmann was able to demonstrate with the ice layer model developed at PIK. The snow load causes movement in the ice, causing more ice mass to be lost at the edge of the ice sheet – as she could observe from the water. The Antarctic will not save humankind from a rise in sea level. Thanks to Winkelmann and her colleagues this is now clear.

*Screenshot Portal KlimafolgenOnline.com*

*It is worthwhile in the long run to stimulate investment in clean instead of fossil energy. Photo: Thinkstock*

## Research for foresters: Climate Impacts Online

Droughts will cause trees to suffer on the sandy soils of Brandenburg; however, on average, an increase in the growth of wood can be expected for Germany – information like this is very valuable for foresters. Forest management always involves a kind of deal with the future, since trees grow slowly. But up to now foresters and other practitioners – from water management authorities to famers – have not been able to see at a glance how climate change, if it continues as before, will affect the very different landscapes of Germany. For these user groups, a team around Friedrich-Wilhelm Gerstengarbe, co-chair of the Research Domain Climate Impacts and Vulnerabilities, developed a first internet platform in 2012 that provides information across sectors and regions. And that at a scale down to ten times ten kilometres for almost every local district. Instead of simply throwing data at the users from above, the scientists will further develop the contents and handling of the platform in co-laboration with the users.

When the German platform was presented on the occasion of the world climate summit, a number of states already showed definite interest – since once developed, the application can also be fed with data from other world regions, as has already been tested for South Africa.

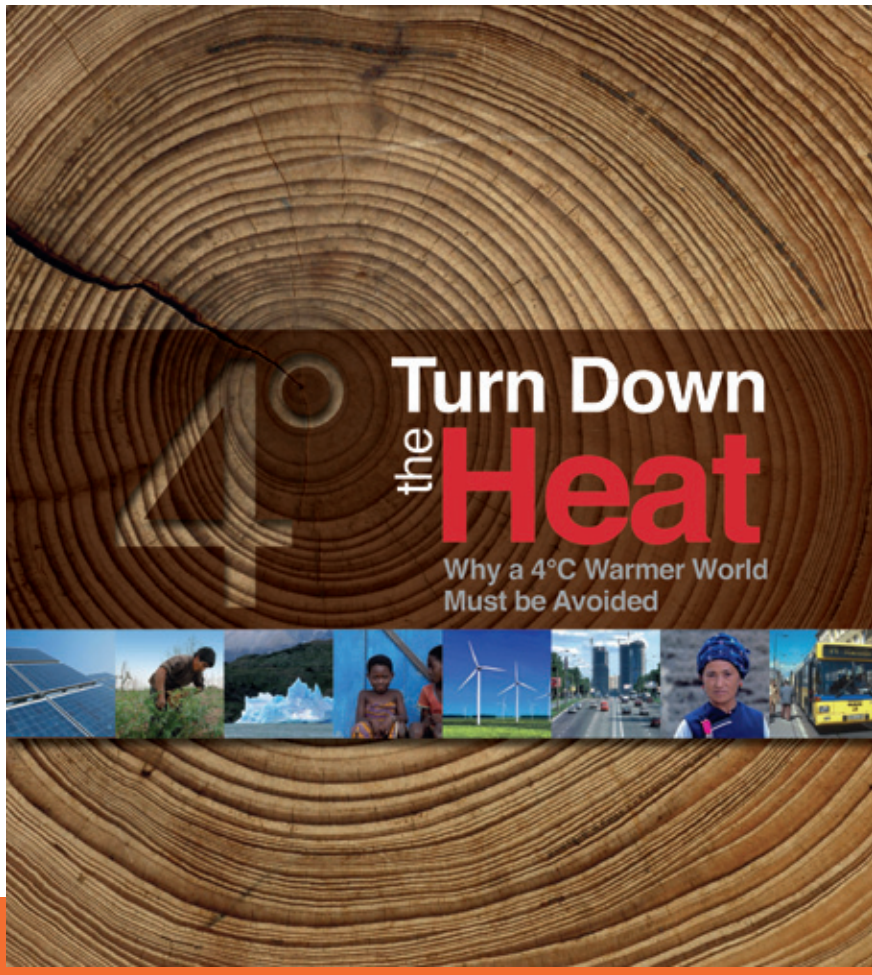
## Second-best worlds: The advantages of the leading role

Economic studies mostly proceed from so-called perfect worlds, i. e. worlds with perfect markets and perfectly informed actors. What if these assumptions are not true? In a study, a team of scientists around Ottmar Edenhofer, chief economist at PIK, have been dealing with the question of the impacts of imperfect worlds. Scenarios about the efficiency of a decarbonisation have so far often been developed on the basis of unrealistic assumptions: in a perfect world, the countries of the world agree on the fact that global warming needs to be reduced to a maximum of two degrees and immediately reduce their carbon dioxide emissions; all relevant technologies are available for them.

Since reality however does not always look so perfect, the researchers specially focused on second-best worlds in a comprehensive model comparison within the framework of the RECIPE project (Report on Energy and Climate Policy in Europe). And in a couple of studies, they found out that with a global goal of emission reduction, industrial countries can profit from early measures to limit climate change even though the rest of the world delays reducing greenhouse gases. For Europe, it is therefore worthwhile to take on a leading role. The findings of the studies will not only be included in the 5th Assessment Report of the IPCC. For the journal Climatic Change, the results were worth publishing in a special issue on the “Economy of Decarbonisation in an Imperfect World”.

# The 4-degree briefing for the world: from the World Bank to the World Climate Summit

The World Bank approached PIK. What are the consequences of unabated climate change especially for developing countries, the head of the World Bank, Jim Yong Kim, recently appointed by the US president, wanted to know in 2012: What is the state of knowledge? When the team under the leadership of PIK's director Hans Joachim Schellnhuber presented the results, Kim decided to drag this into the public: "Shock us into action". The world's media reported widely on the story, provoking a very great response to the report. Some of the original quotations are given below.




*» A 4 °C world can, and must, be avoided.«*

*» It is my hope that this report shocks us into action.«*

**(Dr. Jim Yong Kim, President, World Bank Group)**

At the World Climate Summit COP18 in Doha, Qatar, some weeks later, the report was again and again a central topic. Schellnhuber was the only scientist who gave a speech at the gala dinner on the occasion of the opening of the ministerial segment of the negotiations. Beforehand, PIK was the only research institution that was portrayed in the opening film of the summit. With both UN General Secretary Ban Ki Moon and UNFCCC Executive Secretary Christiana Figueres at his side on the podium, Schellnhuber signed a letter of intent with the Qatar Foundation about the joint foundation of a climate impact research institute in Doha – probably the first of its kind in an OPEC country whose wealth is founded on the exploitation of fossil resources. The contacts with Qatar extend further back than the World Bank report but both are based on the same fact: Namely that PIK with Schellnhuber at its head has gained a reputation that makes it much in demand for expert advice – on the highest international level.

*The signing of the memorandum for the foundation of an institute to explore climate change. Faisal Al Suwaidi and I. H. Sheikha Moza bint Nasser, both from the Qatar Foundation, UN General Secretary Ban Ki-moon, UNFCC Executive Secretary Christiana Figueres and PIK Director Hans Joachim Schellnhuber.*
*Photo: A. Vlad*

*» This new report from the World Bank reminds us that climate change is happening – now. The evidence is clear. No country is immune. If we mobilize today, we can make a difference for tomorrow. «*

**Ban Ki-moon, General Secretary of the United Nations**

# Visits to PIK

*From left to right: Hans Joachim Schellnhuber, Peter Altmeier, Ottmar Edenhofer, Stefan Rahmstorf Photo: PIK*

## Many high-ranking visitors found their way to PIK in 2012

Regarding the development of the German energy transformation "on site", Professor Schellnhuber welcomed Federal Environment Minister Altmaier to PIK for discussions in mid-August. Discussions focused on the state of climate impact research, in particular against the background of current negative records for the Arctic ice, as well as the German energy transformation and the policy options involved on the national, European and international level.

*Hans Joachim Schellnhuber together with Günther Oettinger on the balcony of the Michelson building. Photo: PIK*

In June, Günther Oettinger, EU Commissioner for Energy, visited the Potsdam Institute to discuss current research results on German and European energy policy together with our scientists.

In July, a meeting took place at PIK on request of Markus Dröge, Bishop of the Protestant Church Berlin-Brandenburg, Silesian-Oberlausitz. In an open discussion with other church leaders, the ethical challenges of climate change and how these might be handled were considered.

Also in July, PIK was host to a high-ranking delegation from the Emirate of Qatar led by Fahad bin Mohammed Al-Attiya, the Executive Chairman of Qatar National Food Security Programme (QNFSP) and accompanied by Vice Chairman Sheikh Hamad as well as His Excellency Ambassador Khalid Al-Khater, a key figure of the climate conference in Doha in December 2012. Concrete cooperations such as the development of a climate research institute in Doha were discussed.

*Grand Duke Henri of Luxembourg during his visit at PIK, others from left to right: Hans Joachim Schellnhuber, Prime Minister of Brandenburg Matthias Platzeck Photo: State Chancellery Brandenburg*

# Opening of the MCC

# »A new kind of dialogue at the interface between science and politics«

Following its ceremonial opening on November 16, 2012, the newly founded Mercator Research Institute on Global Commons and Climate Change (MCC) officially started its work.

With a staff of 13 scientists already and 17 more to be employed during the next months, MCC, based in Berlin, wants to become a new factor in the sustainability research scene.

Global commons, the insitute's thematic focus, are for example oceans and forests, but also especially the atmosphere, that is currently used as free waste disposal for $CO_2$. It will be the goal of MCC's work to provide scientific assessments for knowledge-based policy in the fields of climate and economy.

The institute was jointly founded by PIK and Mercator Foundation. Mercator Foundation provided the core budget of 17 million Euros for eight years.

In his speech, Ottmar Edenhofer, deputy director of PIK, particularly thanked the Foundation's President Bernhard Lorentz for the unique opportunities made possible by the financial support.

*The Director of MCC, Ottmar Edenhofer, together with Bernhard Lorentz, President of the Mercator Foundation*
*Photo: MCC*

# Honours and awards

*Ceremonial hall during the award ceremony, photo: Technical University of Berlin. Press office / Ruta*

*Hans Joachim Schellnhuber (centre) together with the president of the Technical University of Berlin, Prof. Steinbach (right) and Johann Köppel during the ceremony, photo: Technical University of Berlin. Press office / Ruta*

## Honours to the director

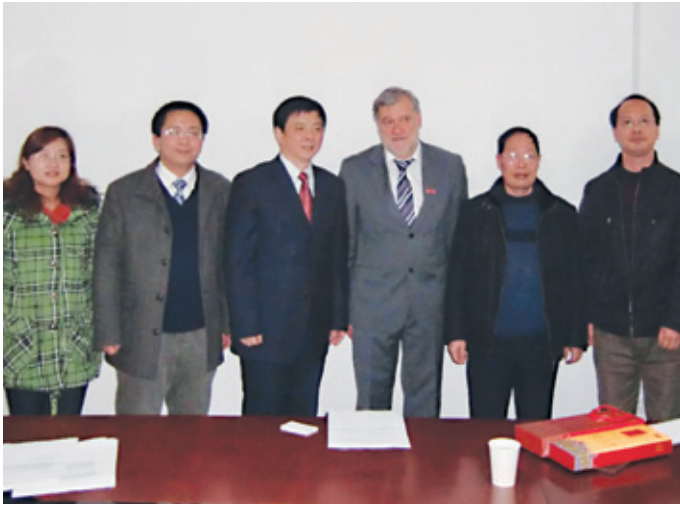
Another special honour was awarded to Prof. Schellnhuber by the Technical University of Berlin. For his work in climate impact research and scientific policy consulting, he was awarded an honorary doctorate of the university during a ceremonial act in June 2012.

As a recognition of his outstanding scientific work, Hans Joachim Schellnhuber was in November 2012 elected as a member of the Academia Europaea. 2400 excellent scientists of many different disciplines and European regions are organised in the Academia Europaea which was founded in 1988.

*Source: Academia Europaea*

## Guest professorship in China

The Southeast University in the Chinese metropolis Nanjing awarded a guest professorship to Jürgen Kurths, Co-chair of Research Domain IV "Transdisciplinary Concepts & Methods". This honour is similar to an honorary professorship in Europe and is only rarely be awarded in Nanjing. His research colleagues honoured Kurths' internationally outstanding accomplishments in the science of complex systems and the mathematical analysis of nonlinear data that can be applied across different disciplines – from climate research to medicine. The centre in China has an internationally highly regarded research group on complex systems.



*Jürgen Kurths with officials of the Southeast University in Nanjing during the award ceremony*
*Photo: PIK*

# Acknowledgements beyond science

*Jürgen Kropp (2nd from the left), Deputy Head of RDII, accepting the prize for the Climate Media Factory. The laudation was held by actress Christiane Pauli (1st from the right). Photo: Green Tech Media Award.*

*Right: Stefan Rahmstorf and his children's book "Clouds, Wind and Weather". Photo: PIK*

## Clean Tech Media Award

The Climate Media Factory, an initiative of PIK together with the University of Film and Television "Konrad Wolf" (HFF) was honoured with the environmental prize "Clean Tech Media Award" in the category communication in September. The prize was awarded to the cooperation project for the "unique constellation of climate researchers and media professionals".


## Clouds, Wind and Weather

For the "most sustainable effect on the environmental awareness in Germany", the children's book "Clouds, Wind and Weather" of PIK scientist Stefan Rahmstorf was honoured as environmental book of the year 2012 in June. The prize is awarded by the Deutsche Umweltstiftung (German Environment Foundation) in cooperation with the editors of Yearbook Ecology. The book was illustrated by Klaus Ensikat. It explains in an easy-to-understand way why the weather is getting warmer, how thunderstorms and storms develop, or whether the wind rests – always with respect to climate research.


A list of all awards of PIK scientists in 2012 can be found in the appendix.

# Outstanding events

*Participants of the Global Sustainability Summer School 2012*
*Photo: Christine Bounama*

## Global Sustainability Summer School 2012, Potsdam

**PIK organised the first "Global Sustainability Summer School" from 8th to 21st July 2012 in collaboration with IASS and the Santa Fe Institute.**

The theme of the two-week intensive workshop was "Risk, uncertainty and extreme events – characteristics of human-environment interactions". The 35 participants came from more than 20 nations world-wide.

The programme placed scientific excellence in the foreground and offered the summer students top-class speakers as a basis for assimilating the current state of knowledge and deriving joint solutions in the groupwork. Bill Clark spoke about the great challenges of sustainability science; Hans Joachim Schellnhuber gave an introduction to the problems of climate change; Ottmar Edenhofer's lecture dealt with the global commons; Doyne Farmer gave an introduction to the theory of complex systems, thematically continued by Holger Kantz and Jürgen Kurths; the Executive Director of the European Environmental Agency Jacqueline McGlade reported about the political challenges, Martin Frick about climate science and diplomacy. The social science perspective was elucidated by Elke Weber and Harald Welzer.

Beyond these topics, the participants had the chance to approach the topic of climate change by artistic means in a theatre workshop. In parallel, a workshop on the agent-based model Netlogo was offered.

The programme was complemented by a visit to the CCS pilot plant Ketzin, a public panel discussion on the controversially discussed topic geoengineering and a reception with the Mayor of the city of Potsdam, Jann Jakobs.

*In his studio: Author Lars Gustafsson.*
*Photo: DAAD*

## The PIK Artist Programme 2012

**In 2012, PIK was able to welcome two more artists as part of its Artist in Residence Programme.**

During his four-week stay in November, the internationally known author and Swedish intellectual Lars Gustafsson took the opportunity to meet scientists from PIK.

Earlier in the year, the British installation artist Nick Laessing was guest in the building of the former photo refractor. Laessing already had solo exhibitions in Paris, London, Turin and Geneva. Laessing's sculptures and installations often explore themes connected with energy, machines, and historical inventions.

In total, four artists have so far participated in the Artist in Residence Programme. The artists are nominated by the German Academic Exchange Service (DAAD); financing is provided by the project Art of Living of the German Federal Cultural Foundation.

Also in 2012, PIK organized joint events with its guest artists. Both on-site (lectures and presentations in the small photo refractor) and, together with the Berlin Artist Programme of DAAD and Deutschlandradio Kultur, in The Deutsches Theater in Berlin.

# 02
# BASIC INFORMATION

*Construction site of PIK's new building on Telegrafenberg*
*Photo: Lothar Lindenhan*

## [ 2.1 ] Staff development

Compared to previous years, the institute increased its staff only moderately, with a slight increase in the number of scientists employed. In total, 338 persons, including support functions like IT service, administration, executive board and Climate-KIC, were employed at PIK and/or affiliated with PIK through a scholarship. 213 scientists (almost two thirds of all employees) were supported by 66 persons working in support functions, 7 of these are members of the Climate-KIC co-location centre in Berlin. About 37 % of the staff currently employed at PIK are female.

The institute additionally hosted around 130 short-term or longer term guest scientists during 2012 (around 30 % more than in 2011).

**Staff development**
2008 – 2012

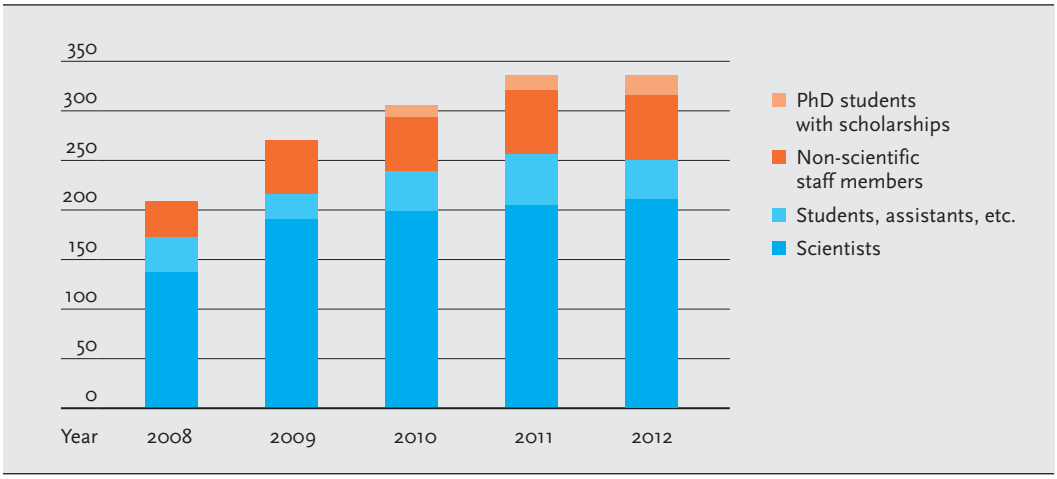



Fig. 1

* PhD students with scholarships have been included in the statistics only since 2010

## [ 2.2 ] Scientific development

The positive trend in the absolute number of publications continues. In 2012, PIK scientists published almost 350 publications. On a per capita basis, this means a total of 1.5 publications and 0.9 ISI publications per scientist. Taking senior scientists only into account, the rates are 3.1 publications in total and 1.9 ISI publications per scientist.[1]

The fact that many of these publications were published in very renowned journals such as Nature (2), Nature Climate Chance (6), PNAS (2) or Science (1) is very encouraging.

1) An overview about the publication activities of PIK scientists can be found in the appendix.

**Publications**
2008 – 2012

| Type of Publication | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| ISI publications | 103 | 140 | 149 | 208 | 197 |
| Non-ISI publications | 63 | 36 | 31 | 29 | 25 |
| Book chapters | 39 | 62 | 82 | 53 | 85 |
| Monographs (author & editor) | 10 | 6 | 13 | 15 | 12 |
| Reports (incl. PIK report) | 17 | 39 | 27 | 22 | 28 |
| Contributions to reports | 10 | 19 | 6 | 16 | 2 |
| **Total** | **243** | **302** | **311** | **343** | **349** |

Tab. 1

**Publications**
2008–2012

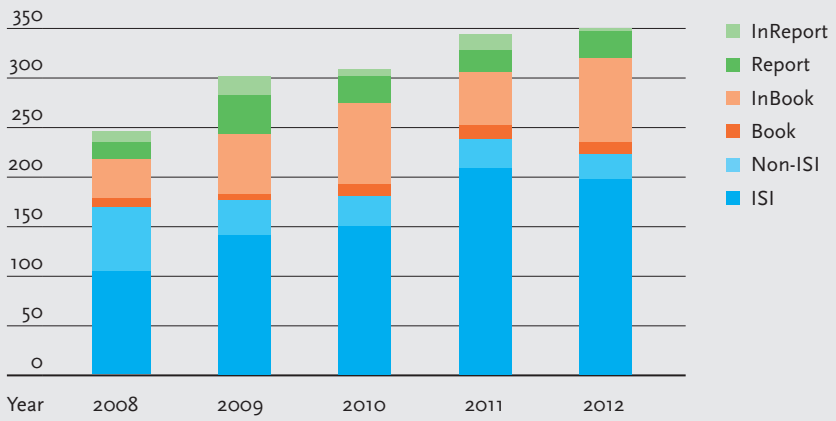



Fig. 2

**Distribution of PIK publications according to publication categories**
2012

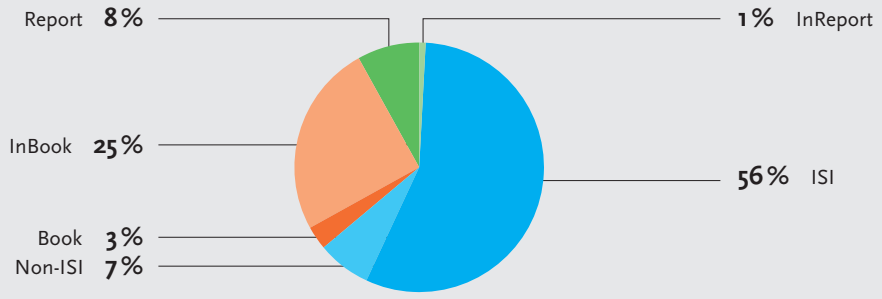



Fig. 3

## Scientific conferences and workshops

Scientific conferences and workshops are an essential element of scientific collaboration and networking. Also in 2012, PIK hosted a number of such events. PIK scientists organised 85 events of this kind – at PIK as well as Germany-wide and worldwide – thus exceeding the high levels of recent years:

**Lectures**
2008 – 2012

Tab. 2

| | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Organisation of conferences etc. | 54 | 69 | 73 | 73 | 85 |

## Lectures at scientific events

The number (402) of lectures in the context of scientific events like conferences, workshops and at universities was again increased compared to the year before.

**Meetings**
2008 – 2012

Tab. 3

| | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Lectures at scientific events | 322 | 457 | 390 | 393 | 402 |

Among the group of specialist lectures, 257 *keynote speeches* or special invitations to PIK scientists are documented. Here, some contributions in the course of the year:

- PIK scientists presented their results in the context of the *"Planet under Pressure"* conference in March 2012 in London.
- Helga Weisz was panel member of the opening session of the *"European Roundtable for Sustainable Consumption and Production"* in Bregenz and gave a lecture at the Caritas Symposium "Zukunft ohne Hunger" (Future without Hunger) in June in Vienna.
- Hans Joachim Schellnhuber played a key role in the organization of the Rio + 20 High-level Dialogue on Global Sustainability and gave a keynote speech in June 2012.
- Stefan Rahmstorf gave the opening speech at the international climate congress 'The Climate Challenge' in the Ministry for the Environment of Baden-Wuerttemberg in October.
- Ottmar Edenhofer gave the 2012 Climate Lecture of the Technical University Berlin together with Professor Tim Jackson from the University of Surrey in December 2012, on the theme *"Growth, Degrowth, or Green Growth? In Search of a Better Paradigm."*
- Hans Joachim Schellnhuber gave a lecture on *"Climate Protection: What the World Should Do, What Everyone Can Do"* at the Climate Conference of the United Nations, COP 18, in Doha.
- Hans Joachim Schellnhuber, Ottmar Edenhofer, Stefan Rahmstorf and Anders Levermann participated in several meetings of the National Academy of Sciences Leopoldina in the course of the year.

## Lectures for other target groups

Besides the classical scientific lectures, the scientists of PIK are very active in the dissemination of the institute's research results to specific target groups. Some additional 250 lectures were held in the framework of policy consulting, dialogue with business / industry, or education. In addition, there were 577 media contributions – interviews by PIK scientists, articles in which they were mentioned, or guest contributions. Especially the high number of interview requests is a good indicator of how strongly the institute is seen as a valuable source of information and discussion partner. An overview of the type of lectures by categories is shown in Figure 4.

**Target groups for lectures and presentations**
2012

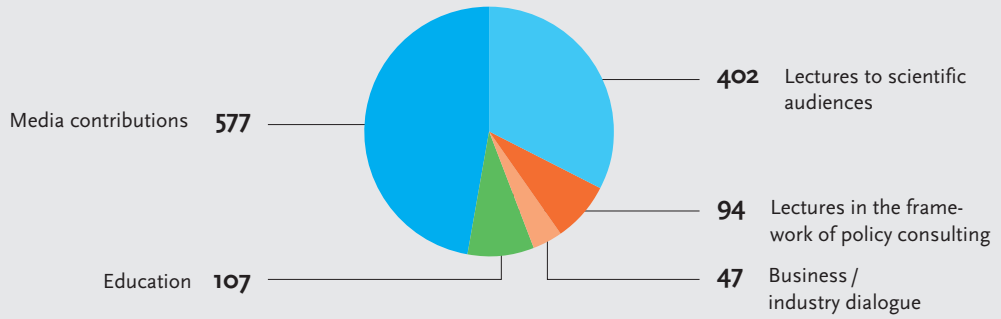



Fig. 4

## Teaching

Cooperation with regional universities finds its expression in the organisation of regular courses, seminars and other forms of knowledge transfer by scientists of PIK. A clear signal of this good cooperation und integration in the regional research landscape were the 61 university courses given by PIK scientists in 2012, especially at the University of Potsdam and Humboldt University as well as Technical University of Berlin and University of Applied Sciences Eberswalde. In this connection, the lecture series "The changing climate" of Jürgen Kurths, Kirsten Thonicke and Friedrich-Wilhelm Gerstengarbe at the Humboldt University is worth mentioning. This teaching portfolio is directed towards students of the DFG IRTG Graduate School 'Dynamical Phenomena in Complex Networks: Fundamentals and Applications', a joint project of PIK, Humboldt University and the Brazilian partners Instituto Nacional de Pesquisas Espaciais and University of São Paulo.

**Courses**
2008 – 2012

| | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Courses* | 39 | 45 | 55 | 55 | 61 |

Tab. 4

* This refers only to teaching activities of PIK members. The courses given by guest scientists are not considered. For each year, courses of the winter semester and the following summer semester are counted.

In addition to the activities at local universities, PIK scientists also accepted guest professorships abroad in 2012: Helga Weisz at the Institute of Social Ecology in Vienna and Jürgen Kurths at the Southeast University, Nanjing. Other scientists gave lectures within the framework of different summer schools.

## Academic degrees

Also in 2012, many students were able to complete their bachelor, master or diploma studies with the support of PIK. The following diagram shows the number of completed studies, broken down by research domain, of the last five years. It is worth mentioning that more than half of those successfully completing examinations in 2012 (53 %) are female, a positive figure especially with regard to the natural science focus of the institute.

**Master and diploma degrees**
2008 – 2012

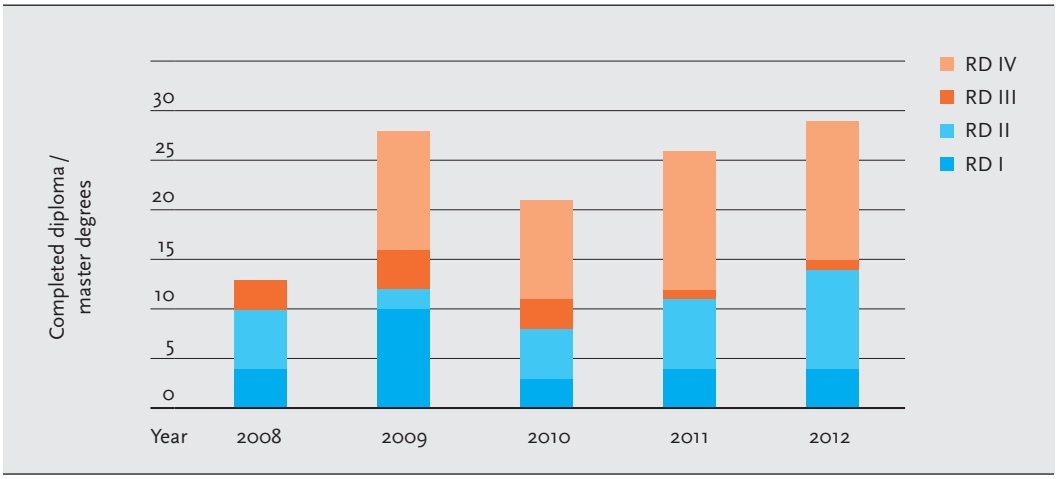



Fig. 5

The record number of completed theses in 2012 reflects the growth of the institute in recent years that has been accompanied by a strong increase in the number of Ph.D. students at PIK. A record number of Ph.D. qualifications were achieved and the Ph.D. students also contributed substantially to the research of PIK. This can be proven by the excellent results in completing the studies: 10 dissertations were rated “summa cum laude”. Eight of the 22 doctorates (36 %) were awarded to female scientists.

**Theses at PIK**
2008 – 2012

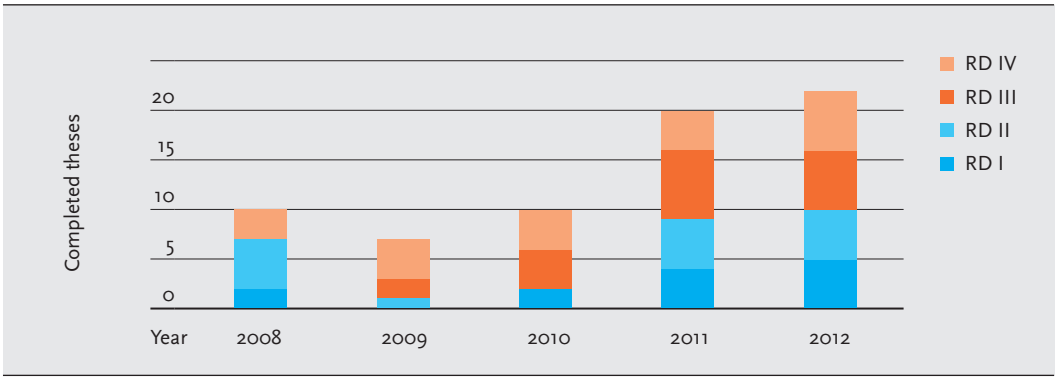



Fig. 6

### Internships

In 2012, 221 students or school students applied for a period of practical training at PIK, many of them from European or other foreign countries. This is roughly the same number of applicants as in 2011 and indicates how attractive the institute is for students from Germany and abroad. Around 25 young people were given the chance to learn about the research work of the institute and gain first work experience in the course of an internship at PIK.

### Awards and nominations

A number of PIK scientists were honoured in 2012 for their achievements and / or were appointed to new positions. Here is a selection (see also Chapter 1):

- Hans Joachim Schellnhuber was awarded an honorary doctorate by the Technical University of Berlin. Moreover, he was elected as a member of Academia Europaea.
- Jürgen Kurths was awarded an honorary doctorate by the Chernishevsky University Saratov, Russia. He received a guest professorship from the Southeast University Nanjing, China.
- Helga Weisz was offered a W3 professorship in Ecological Energy and Material Flow Management by Freiburg University.

The following Ph.D. students and postdocs were also honoured:

- Nishant Malik, who completed his doctorate under Jürgen Kurths' supervision with a Summa cum Laude in 2012 and has since moved to a postdoctoral position at the University of North Carolina, was awarded the Carl Ramsauer Prize 2012 of the Physikalische Gesellschaft zu Berlin.
- Kira Rehfeld, another Ph.D. student of Jürgen Kurths, received the Best Presentation Award at the OCHAMP-2012 Conference die Balso (Opportunities and Challenges in Monsoon Prediction in a Changing Climate) in Pune, India.
- Till Sterzel received the Best Paper Presentation at the Tyndall Centre Conference on 'Knowledge Gaps in Climate Change Research' in April 2012.
- Dominik Reusser, postdoc in Research Domain II, was member of the International Social Science Council (ISSC) delegation at the Rio+20 conference.

In the wider field of outreach, Stefan Rahmstorf received several distinctions for his children's book "Clouds, Wind and Weather," and the Climate Media Factory won a number of awards, as mentioned at the beginning of the report.

## [ 2.3 ] Developments in scientific policy consulting

Also in 2012, PIK was greatly in demand as a source of scientific policy advice. The contributions of PIK to scientific policy consulting can primarily be assigned to four categories:

**I) Publication of policy papers. Examples for this are**

- The already mentioned report for the World Bank on climate impacts in a four-degree warmer world.
- The WBGU policy paper "Financing the Global Energy Transformation".
- A position paper of acatech "Affordably Shaping the Energy Transformation" in which Ottmar Edenhofer and Brigitte Knopf were involved.
- A report for the Umweltbundesamt (The Federal Environment Agency) on the costs of the development of renewable energies.
- The first order draft of the 5th Assessment Report (AR5) was completed in July 2012 by Ottmar Edenhofer and the Technical Support Unit of Working Group 3.
- Ottmar Edenhofer and the Technical Support Unit of WG3 were co-editors of a report of the IPCC WG2 on "Economic Analysis, Costing Methods, and Ethics" and a report on geoengineering and on scenarios.

**II) Consultations with top-level politicians and political visitors' groups such as, e. g.,**

- EU Commissioner for Energy Günther Oettinger in June 2012.
- Federal Minister of the Environment Peter Altmaier in August 2012.
- The speech of Ottmar Edenhofer during an internal hearing of the Commission of Inquiry "Growth, Prosperity, Quality of Life" of the German Bundestag.

- Lecture of Ottmar Edenhofer at the BDEW Congress on European Emission Trade.

**III) Integration of PIK scientists in political events such as, e. g.,**

- In the climate summit Rio+20 in June 2012,
- In COP18 in Doha in December 2012.

**IV) Continuing cooperation of leading PIK actors in policy-consulting committees. Here a selection of the manifold activities:**

- WBGU (Prof. Dr. Hans Joachim Schellnhuber, since spring 2009 again chairman; Prof. Dr. Stefan Rahmstorf),
- IPCC (Prof. Dr. Ottmar Edenhofer, Co-Chair WG III and many other PIK scientists such as e. g. B. Hare, A. Ganopolski, A. Levermann, E. Kriegler as lead authors of AR 5),
- Sustainability Committee of the European Academies (Prof. Dr. Hans Joachim Schellnhuber),
- Working Group Climate-Energy of the National Academy of Sciences Leopoldina (Prof. Dr. Schellnhuber as chairman, Prof. Dr. Edenhofer),
- Research Union Economy-Science (Prof. Dr. Edenhofer, Dr. Bräuer),
- Environment Advisory Group of the 7th EU Research Framework Programme (Prof. Dr. Cramer, Prof. Dr. Schellnhuber, Prof. Dr. Kundzewicz),
- Sustainability Committee of the State of Brandenburg (Prof. Dr. Manfred Stock, chairman),
- Climate platform Brandenburg (Prof. Dr. Manfred Stock, chairman).

In all, 94 lectures in the framework of domestic and foreign scientific policy consulting are documented at PIK for 2012.

## [ 2.4 ] Financial developments

There was a significant increase in total funding amount in 2012 of more than 15 %. An increase in the institutional funding, mainly due to PIK's new building, together with further increase of the third-party funding volume, raises the total amount of funding to more than 25 million Euros (cf. Table 5).

At the end of 2012, the budget of the institute is composed as follows:

- 55 % institutional funding,
- 45 % third-party funding.

**Total funding in €**
2008 – 2012

| | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| Third-party funding, total | 4,789,759 | 7,412,833 | 8,089,379 | 10,245,209 | 11,137,961 |
| Institutional funding | 8,154,600 | 8,611,093 | 9,410,000 | 10,855,394 | 14,343,000 |
| EU-ERDF, Stimulus Package I+II | 1,019,720 | 2,130,896 | 1,523,126 | 225,500 | – |
| **Total funding** | **13,964,079** | **18,154,822** | **19,022,505** | **21,126,103** | **25,480,961** |

Tab. 5

## Institutional funding

The institutional funding of the institute increased in 2012 by 3.5 million Euros to 14.3 million Euros. Due to this strong increase, the ratio of third-party vs. institutional funding slightly decreased although in absolute terms more third-party funds were acquired than in the year before.

In 2012, PIK was again successful in the competitive procedure of the Leibniz Association (Pact for Research). Dr. Frieler, Deputy Chair of Research Domain II, was able to acquire a junior research group under the funding line "Women in leading scientific positions".

**Development of funding**
2008–2012

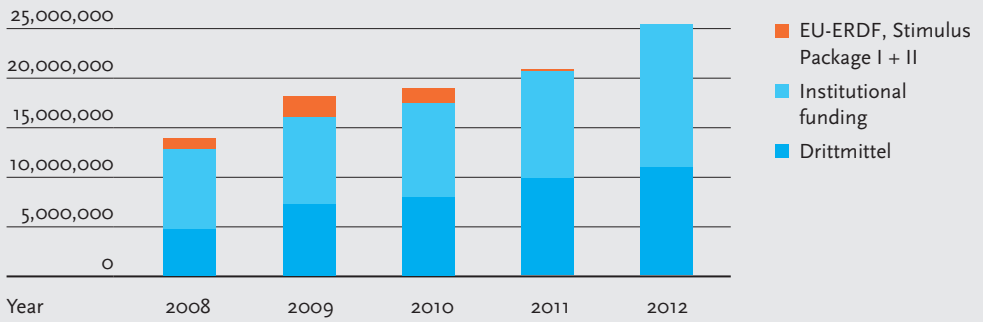



Fig. 7

## Third-party funding

In 2012, a total of 147 projects were financed through third-party funding. Third-party funding amounted to approximately 11.1 million Euros in total – compared to 2011 again a strong increase. Thus, the institute is still at a record level – the institute has never before been able to acquire third-party funds to this extent. The main funders in the area of third-party funding are as in the years before the Federal Government and the European Union. Fig. 8 shows a detailed breakdown of the different funding instruments.

**Development of third-party funds in Euros**
2008–2012

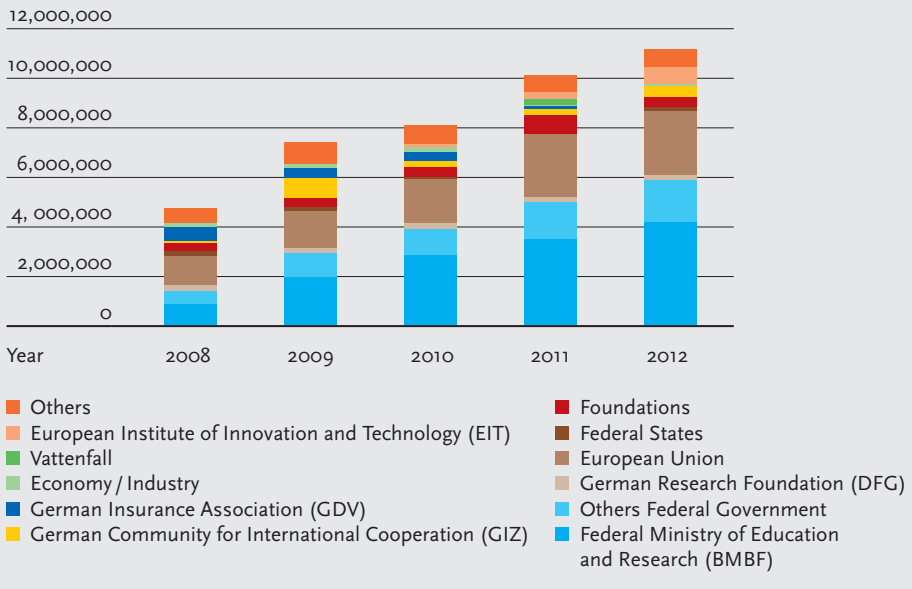



Fig. 8

In terms of percentage, Fig. 9 gives a picture for 2012:

**Distribution third-party funds**
2012

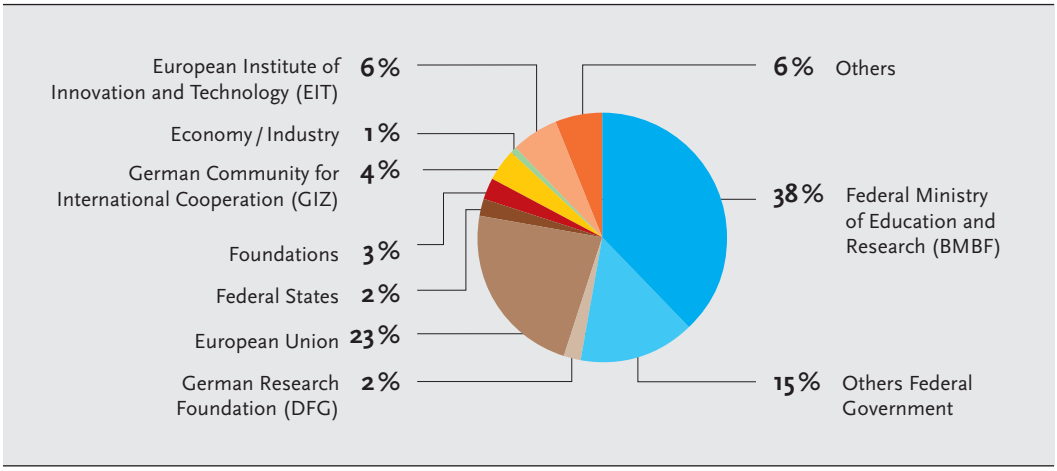



Fig. 9

The share of funding from the Federal Ministry of Education and Research (BMBF) dominates the federal funding. The 16 BMBF projects account for 38 % of the third-party funding of PIK. The funding from the European Union – now 23 % of the total volume – has continuously increased in recent years.

In 2012, projects with a total volume of more than 6 million Euros could be acquired. The following new acquisitions can be mentioned here:

- **ISI-MIP:** *Inter-Sectoral Impact Model Intercomparison* – an international cross-sectoral model comparison of 18 impact models coordinated by PIK and IIASA and funded by BMBF within the Joint Programming Initiative (JPI-Climate).
- **INNOVATE:** Sustainable use of water reservoirs via innovative coupling of aquatic and terrestrial ecosystem function, funded by BMBF.
- **Efficent Projections:** *Where to stop? – Efficient projections of correlated impacts at different levels of global warming.* In the framework of the project financed by the Pact for Research of the Leibniz Association, we try to show how the impacts of climate change with different expected mean temperature increases will change in the field of agriculture.

In addition, PIK was able to acquire four EU projects, of which PIK is the coordinator of two.

- **ENTRACTE:** *Economic instruments to achieve climate targets in Europe.* The goal of this EU project is to investigate feasible policy options for the transformation of energy supply to facilitate the compliance of the EU reduction goals to reduce $CO_2$ emissions.
- **POLFREE:** *Policy Options for a Resource-Efficient Economy.* This EU project considers the question which new concepts and paradigms are necessary to increase the resource efficiency of the European economy significantly.
- **ADVANCE:** *Advanced Model Development and Validation for Improved Analysis of Costs and Impacts of Mitigation Policies.* The project deals with the development of a new generation of integrated assessment models and is coordinated by RDIII.
- **RAMSES:** *Reconciling Adaption, Mitigation and Sustainable Development for Cities.* This project which is also coordinated by PIK (FBII) deals with the identification and quantification of climate impacts in cities as well as with the estimation of the costs and benefits of different adaptation measures.

# 03 RESEARCH DOMAINS

*Greenland ice sheet*
*Photo: Thinkstock*

*>> We evaluated world-wide weather data. Already today, the number of monthly heat records is five times higher than under a stable climate. This is one of the results of our new research focus on extreme events. <<*

**(Stefan Rahmstorf)**

*Photo: F. Batier*

*>> We combined our computer model of the global biosphere with the results of climate modelling. Now we can venture the next big step – to develop a novel model of the entire Earth system. <<*

**(Wolfgang Lucht)**

*Photo: F. Batier*

# [ 3.1 ] Research Domain I – Earth System Analysis

*Chairs: Stefan Rahmstorf & Wolfgang Lucht*
*Deputy Chairs: Kirsten Thonicke & Georg Feulner*

**It is the goal of the research domain to investigate the coupled dynamics of the geosphere, biosphere and anthroposphere with regard to natural and human-made changes. The results should help to assess the likely effects of global change for the Earth system as a whole.**

## Structure of the research domain

The research domain is structured in six flagship projects with three research foci ("Understanding the past", "Towards a comprehensive view of the Earth system", and "Stability and transitions") in which both the biological and physical aspects of the Earth system are investigated.

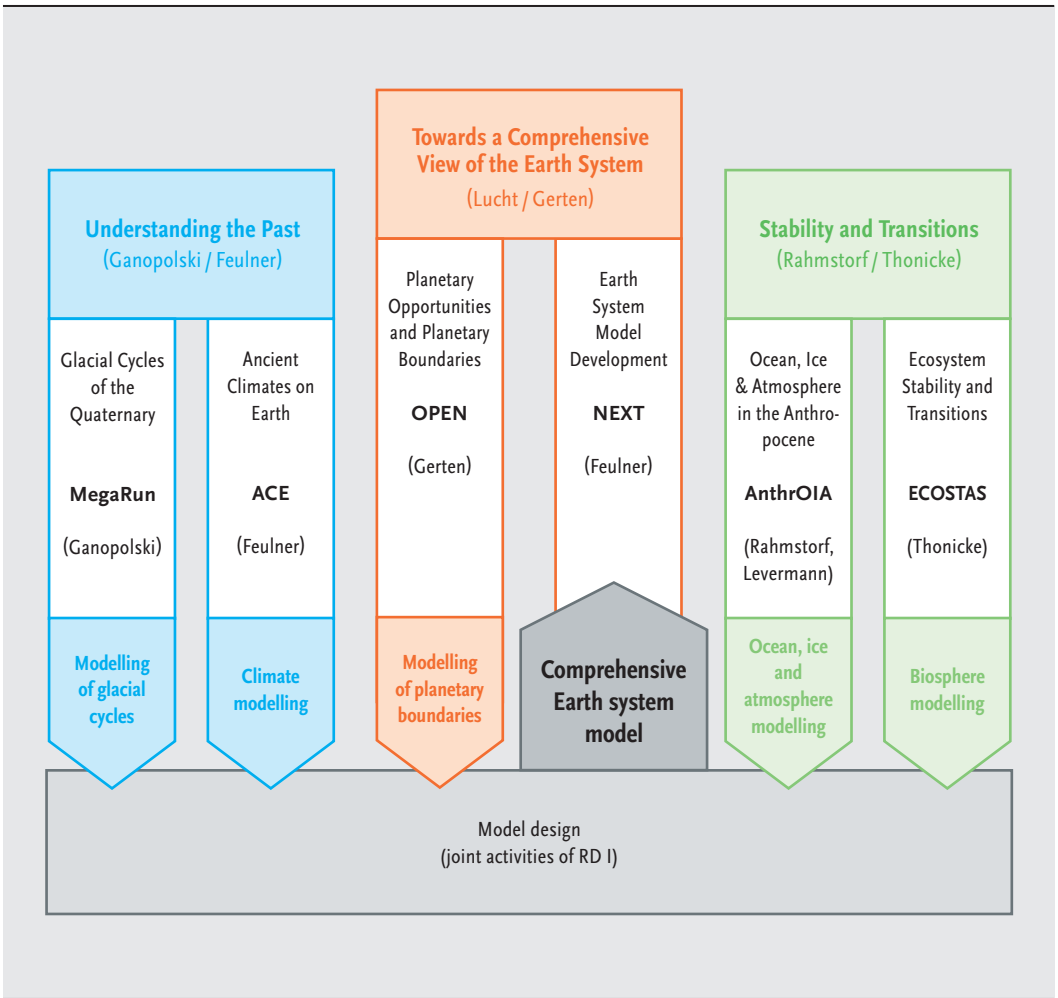



Fig. 10

**Understanding the past**

- **Glacial Cycles of the Quaternary (MegaRun):** Investigation of the processes that can explain the dimension and temporal progression of past ice ages.
- **Ancient Climates on Earth (ACE)** Investigation of interesting palaeo climate effects in earlier eras of Earth's history

**Stability and Transitions**

- **Ocean, Ice and Atmosphere in the Anthropocene(AnthrOIA):** Investigation of climate development in the recent past and future paying particular attention to the effects on society with focus on extreme events, sea level rise and potential tipping points in the Earth system.
- **Ecosystem Stability and Transitions (ECOSTAB):** Investigation of the stability and dynamics of ecosystems under conditions of climate and land-use change.

**Towards a Comprehensive View of the Earth System**

- **Earth System Model Development (NEXT):** Development of the Earth system model CLIMBER-4 and expansion and integration of the dynamic land-biosphere model LPJmL.
- **Planetary Opportunities and Planetary Boundaries (OPEN):** Systematic model-based quantification of the scope to use natural resources (biomass, water) by future societies constrained by limited available land surface.

## Research programme and products

Our programme consists of the above-mentioned three foci with six projects that are oriented towards the following topics:

- Analysis of climate changes of the past in order to understand above all those processes which intensify or dampen such changes and thus trigger gradual or rapid system changes.
- Analysis of data and scenarios of current and future climate change and its Earth system impacts.
- Analysis of the effects of human activities on the environment, especially on climate, oceans, ecosystems and the spatial structure of the land surface.
- Analysis of the role of humankind as driving force of global climate and environmental change.

## Selected results

**MegaRun:** The main goal of this project has been reached: a successful glacial cycle simulation driven only by orbital forcing. It shows that in agreement with Milankovitch theory (i) quaternary glacial cycles represent a strongly nonlinear response of the climate-cryosphere system to the astronomical forcing, (ii) aeolean dust, $CO_2$ and other GHGs provide positive feedbacks which amplify glacial cycles, and (iii) the removal by the ice sheets of the terrestrial sediments can explain the transition from from "short" (41,000 years) to "long" (100,000 years) glacial cycles around 1 million years ago.

**ACE:** Research activities have so far been focused on the climate on early Earth: A review paper on the faint young Sun problem has been published. Furthermore, the first coupled three-dimensional simulations of the Archean climate have been carried out, showing that significantly higher amounts of greenhouse gases are required to allow for liquid surface water than previously thought.

**AnthrOIA:**

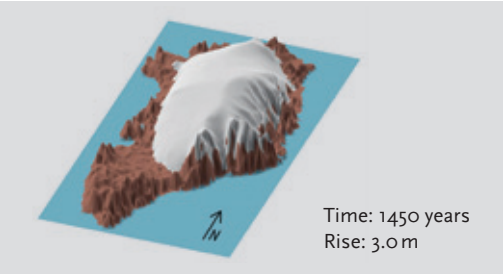



Fig. 11

*The Greenland ice sheet in the model of PIK, here a snapshot from a warming experiment after almost half of it has melted (equal to 3 metres sea level rise). Several simulations about the glacial cycles of the past hundreds of thousands of years were carried out with this model and adjusted using palaeo data to calibrate the model parameters. Robinson et al., Nature Climate Change 2012.*

Significant results were published on data analysis of global temperature and sea-level (as compared to IPCC projections), on semi-empirical sea-level projections and on extreme events in a warming climate. A model analysis of marine chlorophyll under global warming was performed. The effect of snowfall on ice discharge in Antarctica was imple-

mented in our ice sheet model and the critical threshold of Greenland ice sheet melting was determined. The increased risk of monsoon failure was analysed in an ensemble simulation with the COSMOS Earth system model.

**ECOSTAB:** Research activities concentrated on the analysis of extreme events and their impacts on terrestrial ecosystems. A data analysis showed that seasonal freezing and thawing of permafrost soils as well as low precipitation in late summer and autumn can reduce soil moisture in the following spring and can thus lead to extreme fire events as e. g. in Siberia in 2003 and 2008. A vulnerability index which quantifies the climatic driving forces from an ecosystem perspective was developed and applied to model projections with LPJmL. The index shows changes of the carbon balance and quantifies how many droughts or heat waves brought a particular European ecosystem to a critical condition.

**NEXT:** In the framework of the development of CLIMBER-4, extensive tests were carried out with the new atmosphere model Aeolus 1.0. A new three-layer cloud model was developed. Work on the coupling of ocean, atmosphere and the dynamic vegetation model LPJmL has made considerable progress, with full coupling expected shortly.

**OPEN:** 152 climate scenarios were generated to systematically analyse the climate impacts for different global warming levels. LPJmL simulations showed that the permafrost region becomes a (considerably varying) carbon source under all warming levels – initially still delayed by feedbacks from vegetation, then constant over centuries. Another study showed that climate change will significantly increase the water demand for irrigation in some regions, which will need to be partially met by non-renewable sources. Further climate impact studies for ecosystems and water supply as well as for the quantification of policy options for the future global food security are close to completion.

## Selected publications


**Coumou, D., Rahmstorf, S. (2012):** A decade of weather extremes. – Nature Climate Change, 2, 7, 491-496

**Feulner, G.** (2012): The faint young Sun problem. – Reviews of Geophysics, 50, RG2006

**Kienert, H., Feulner, G., Petoukhov, V.** (2012): Faint young Sun problem more severe due to ice-albedo feedback and higher rotation rate of the early Earth. – Geophysical Research Letters, 39, 4 . L23710

**Levermann, A., Albrecht, T., Winkelmann, R., Martin, M. A.,** Haseloff, M., Joughin, I. (2012): Kinematic first-order calving law implies potential for abrupt ice-shelf retreat. – The Cryosphere, 6, 273-286

Robinson, A., **Calov, R., Ganopolski, A.** (2012): Multistability and critical thresholds of the Greenland ice sheet. – Nature Climate Change, 2, 6, 429-432

Schaeffer, M., Hare, W., **Rahmstorf, S.,** Vermeer, M. (2012): Long-term sea-level rise implied by 1.5 °C and 2 °C warming levels. – Nature Climate Change, 2, 12, 867-870

**Winkelmann, R., Levermann, A., Martin, M. A.,** Frieler, K. (2012): Increased future ice discharge from Antarctica owing to higher snowfall. – Nature, 492, 7428, 239-242

Forkel, M., **Thonicke, K.,** Beer, C., Cramer, W., Bartalev, S., Schmullius, C. (2012): Extreme fire events are related to previous-year surface moisture conditions in permafrost-underlain larch forests of Siberia. – Environmental Research Letters, 7, 044021

**Heinke, J., Ostberg, S., Schaphoff, S.,** Frieler, K., Müller, C., **Gerten, D.,** Meinshausen, M., **Lucht, W.** (2012): A new dataset for systematic assessments of climate change impacts as a function of global warming. – Geosci. Model Dev. Discuss., 5, 3533-3572

Rohling, E. J., Sluijs, A., Dijkstra, H. A., Köhler, P., van de Wal, R.,S. W., von der Heydt, A. S., Beerling, D. J., Berger, A., Bijl, P. K., Crucifix, M., DeConto, R., Drijfhout, S. S., Fedorov, A., Foster, G. L., **Ganopolski, A.,** Hansen, J., Hönisch, B., Hooghiemstra, H., Huber, M., Huybers, P., Knutti, R., Lea, D. W., Lourens, L. J., Lunt, D., Masson-Demotte, V., Medina-Elizalde, M., Otto-Bliesner, B., Pagan, M., Pälike, H., Renssen, H., Royer, D. L., Siddall, M., Valdes, P., Zachos, J. C., and Zeebe, R. E. (2012) Making sense of palaeoclimate sensitivity. – Nature, 491, 683–691

*» With our internet portal "Klimafolgen-online.com", we are for the first time able to show practitioners the impacts of climate change in the coming decades in Germany as a whole – right down to a local level. «*

**(Friedrich-Wilhelm Gerstengarbe)**

*Photo: K. Karkow*

*» There are a lot of computer simulations on climate impacts. What we still lack is a systematic comparison of their very different results – from agriculture to health issues. That is exactly what we want to provide with ISI-MIP, an international model comparison. «*

**(Hermann Lotze-Campen)**

*Photo: K. Karkow*

## [ 3.2 ] Research Domain II –
Climate Impacts and Vulnerabilities

*Chairs: Hermann Lotze-Campen & Friedrich-Wilhelm Gerstengarbe*
*Deputy Chairs: Katja Frieler & Jürgen Kropp*

**The objective of Research Domain II research is to assess multi-sector climate impacts and adaptation options, including socio-economic costs, at 2 °C global warming and beyond. Cross-scale interactions between global modelling approaches and comparative regional case studies are taken into account through a well-structured project portfolio.**

### Structure of the Research Domain

Since 2012, Research Domain II is divided into three research areas with a total of six flagship projects (Fig. 12). Three cross-cutting activities establish cooperation between RDII flagships as well as the other PIK Research Domains.

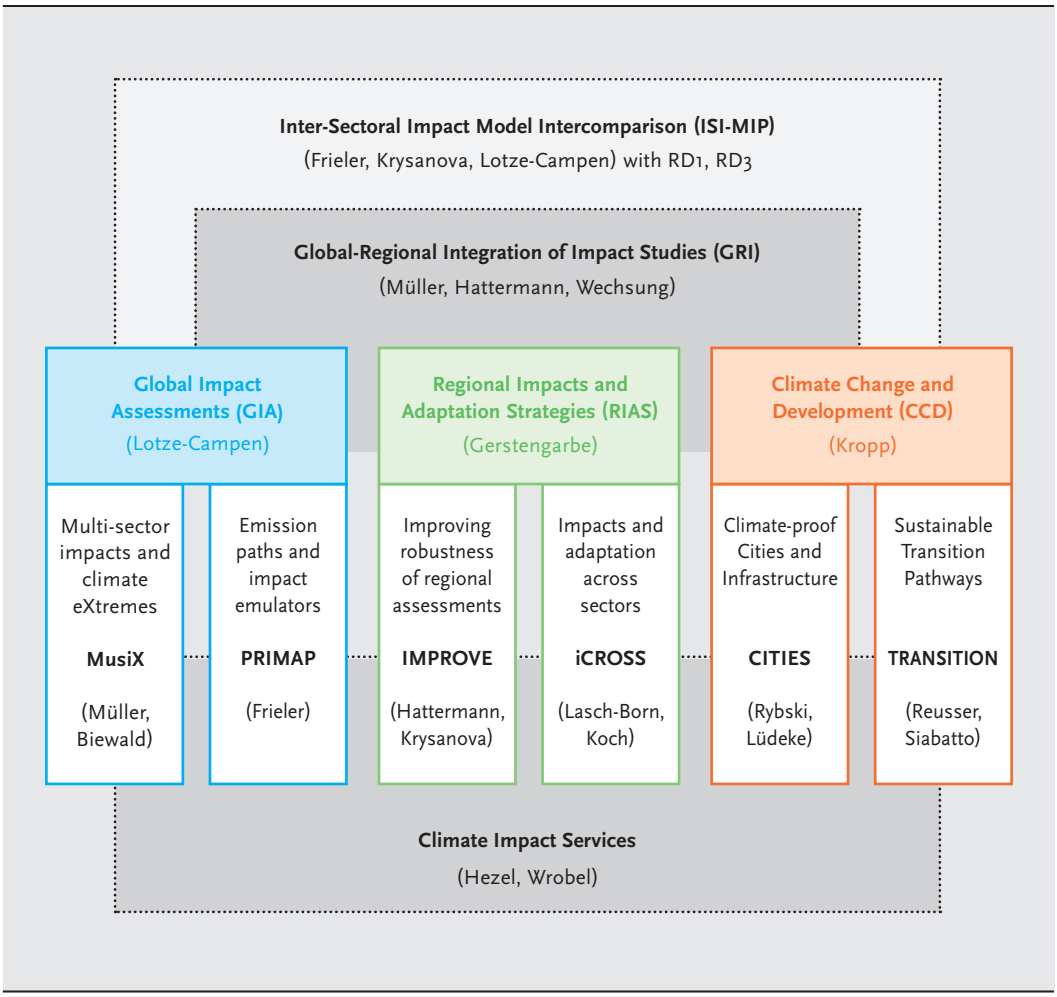



Fig. 12

RDII is the biggest research domain at PIK with 125 staff members including 40 postdoc scientists and 39 Ph.D. students. In 2012, 48 third-party projects dealt with the research foci.

At the beginning of the year, a new steering group was created in RDII to which besides the RD chairs a total of 13 scientists belong. In addition, discussion of current results and research-specific aspects takes place in a regular seminar series. Besides this, Ph.D. students and young postdocs regularly present their work in the "Young Scientist Seminar".

## Research programme and products

The future research in RD II is oriented towards three main goals:

1) Cross-sectoral integration and synthesis of climate impacts and damages
2) Improvement of the cross-sectoral interaction of different model approaches
3) More robust effect analyses by systematic model comparisons

The following 6 flagship projects contribute to it in different ways:

**Multi-sector impacts and climate extremes (MusiX):** Systematic model comparisons on climate impacts for the sectors agriculture, water and forestry will be continued. An economic model approach will be developed to transform sector-specific climate impacts into macro-economic costs. The analysis of extreme events caused by climate conditions shall especially be improved for the sectors agriculture and water.

**Emission paths and impact emulators (PRIMAP):** The spectrum of future emission paths, temperature changes and related climate effects is reproduced with simplified effect emulators. Based on the detailed results of the ISI-MIP process, this will allow for an improved assessment of scenario uncertainties.

**Improving robustness of regional assessments (IMPROVE):** The internet portal "www.klimafolgenonline.com" will be extended by additional scenarios in different sectors so that a larger user group can be addressed. A foundation in the form of a service company and with the participation of EIT Climate KIC is planned. During the second phase of ISI-MIP, a regional model comparison in three regions world-wide for three sectors (water, agriculture, forestry) with at least three models will take place. The Impacts World 2013 conference in May 2013 serves as a preamble for it.

**Impacts and adaptation across sectors (iCROSS):** The effects of land use changes and climate change on material and water flow are investigated across sectors for Germany. Moreover, cross-sectoral analysis of the effects of land use and climate changes in river basins in Brazil, China and Africa takes place, including evaluation of possible synergies between adaptation and emission avoidance on the regional scale.

**Climate-proof cities and infrastructure (CITIES):** The already existing method for a "Rapid Urban Impact Appraisal" is used for different climate effect chains in several cities in developing countries. This is mainly done by using remote sensing data. Furthermore, a theoretical model approach for urban development is used for the assessment of socio-economic costs of the sea level rise.

**Sustainable Transition Pathways (TRANSITION):** This flagship project analyses the interactions among economic growth, country-specific development paths and climate protection. Different transformation paths towards a sustainable development are investigated in the framework of an international research network.

## Selected results

**Multi-sector impacts and climate extremes (MusiX):** In the framework of the Agricultural Model Intercomparison and Improvement Project (AgMIP), it was demonstrated that climate changes trigger probably greater pressure on global food prices than the increased use of bio energy (Lotze-Campen et al., submitted).

Schmitz et al. (2012) showed that an expansion of agricultural trade can decrease the costs of food production but at the same time could lead to an extension of land use in tropical forests especially in Latin America. Waha et al. (2013) investigated adaptation options through different agricultural production systems in the Sub-Saharan region by means of the agriculture-hydrology model LPJmL.

**Emission paths and impact emulators (PRIMAP):** Frieler et al. (2012) and Perette et al. (2012) showed how probabilistic projections for the occurrence of coral death and regional sea level rise, based on the global temperature increase, can be generated. Even an increase of global mean temperature of only 1.5 °C compared to the preindustrial age would threaten the existence of a large share of the coral reefs around the world, as shown in Fig. 13.

**ISI-MIP:** The first Inter-Sectoral Impact Model Intercomparison Project started in December 2011. More than 30 international modelling groups from the fields of hydrology, ecosystems, agriculture, health and infrastructure participated in the first phase. The results will be published in a special issue of the high-ranking journal PNAS. Piontek et al. described in an overview article which sections of the world population and land surface will be simultaneously affected by several climate impacts. As part of ISI-MIP, the conference "Impacts World 2013" will be held in Potsdam in May 2013, where it is planned to develop a new vision for climate impacts research by laying the foundations for regular, community-driven syntheses of climate change impact analyses.

**Improving robustness of regional assessments (IMPROVE):** Analysis of the climatic impacts of flooding and low-water events in Germany was extended by a greater number of scenarios (Huang et al. 2012, Hattermann et al. 2012). Further hydrological analyses of regional climate impacts were made available for the internet portal „klimafolgenonline". For the Tarim river basin in northeast China, it could be shown how increased glacial runoff influences high-water levels.

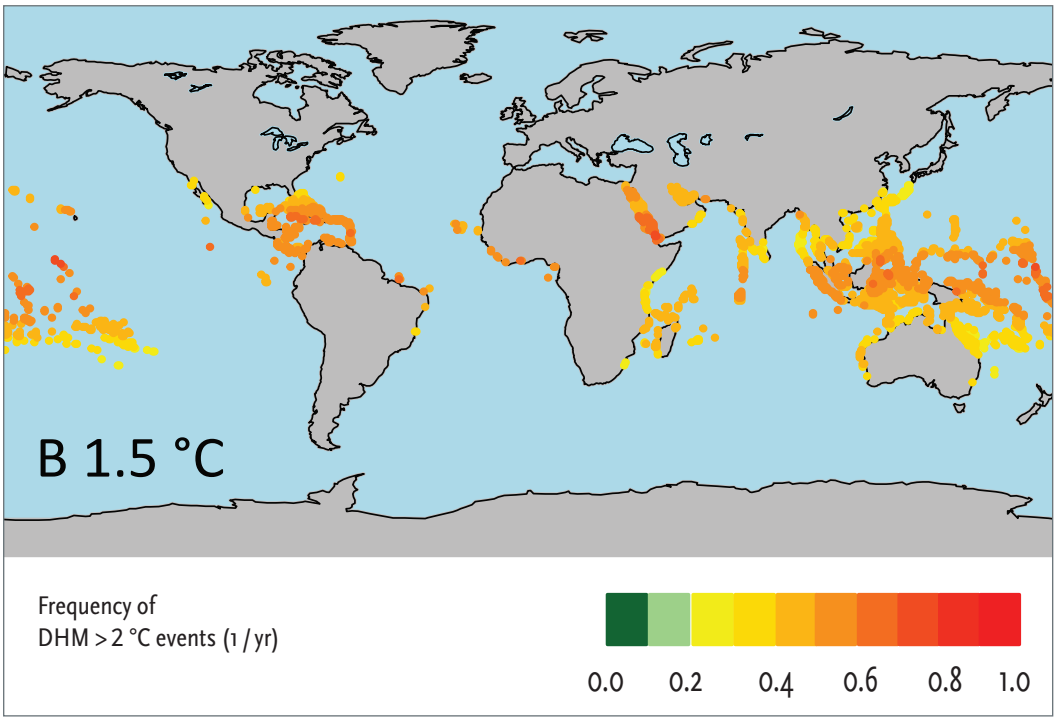



Fig. 13

*Threatened corals reefs at 1.5°C global warming (the colour scale shows the probability of the occurrence of bleaching events per year.)*

**Impacts and adaptation across sectors (iCROSS):** Koch et al. (2012) investigated stratified climate scenarios (0, 1, 2, 3 °C warming) for power generation in Germany. Heating power stations and hydroelectric power stations are slightly negatively influenced while wind power stations have to expect rather positive effects. At the conference "Klimafolgen für Deutschland" (Climate Impacts for Germany), the internet portal "Klimafolgenonline" was presented to potential users from different sectors (agriculture, hydrology, forestry, energy). A first English version "ClimateImpactsOnline" was presented at the climate negotiations of COP18 in Doha.

**Climate-proof cities and infrastructure (CITIES):** Due to a newly developed remote sensing-based model for the assessment of climate impacts in cities, analyses can now be carried out for cities where data is scarce, as is often the case for large cities in developing countries. The new model was tested for several cities in Southeast Asia.

Moreover, adaptation options to the increasingly higher temperatures in inner cities ("urban heat island effect") were investigated with the special city climate simulation model CCLM-DCEP (Schubert et al. 2012). Especially the influence of vegetation and roof albedo (Fig. 14 right side) using the example of Berlin was analysed.

An improved version of the internet platform CI:grasp (Climate Impact: Global and Regional Adaptation Support Platform) for developing and threshold countries was activated. Results from the ISI-MIP project are increasingly used here.

**Sustainable Transition Pathways (TRANSITION):** A simplified model for the transformation dynamics of societies was developed. It could be shown that certain characteristics of the development dynamics of different countries are influenced by their history. Moreover, a "livelihood index" was developed that is suitable for the cross-sectoral aggregation of climate impacts in addition to economic criteria. This index has great potential for the prioritisation of development and adaptation measures.

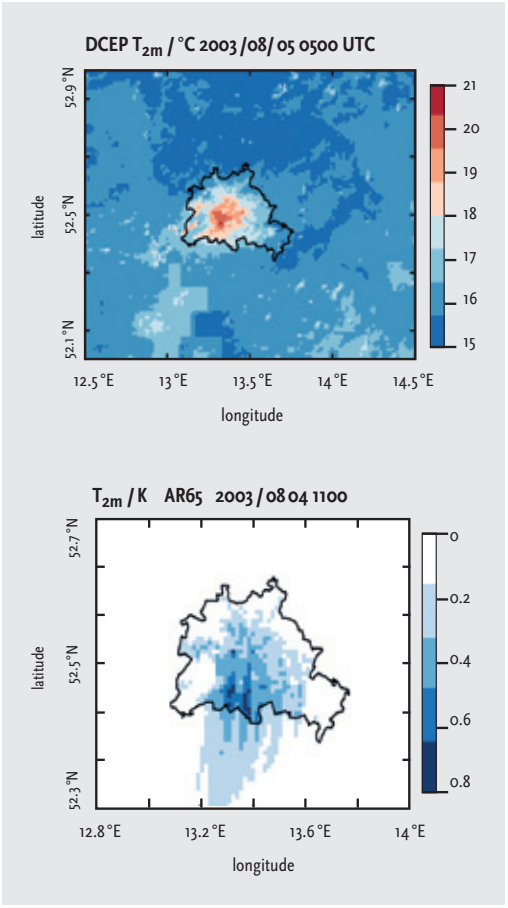



Fig. 14

*Simulation of the air temperature distribution near to the surface (top) in Berlin and it surroundings during the heat weave of 2003 with CCLM-DCEP. The temperatures higher than up to 5 K in the centre of Berlin are well reproduced in the model. The bottom figure shows the temperature change that could be expected during the heat wave of 2003 if all roofs in Berlin were covered with a strongly reflecting coating (albedo of 0.65).*

## Selected publications

**Frieler, K., Meinshausen, M.,** Golly, A., Mengel, M., Lebek, K., Donner, S. D., Hoegh-Guldberg, O. (2012 (Online first)): Limiting global warming to 2 °C is unlikely to save most coral reefs. – Nature Climate Change.

**Prahl BF, Rybski D, Kropp JP,** Burghoff O, Held H (2012): Applying Stochastic Small-Scale Damage Functions to German Winter Storms. Geophysical Research Letters 39, L06806.

**Huang, S., Hattermann, F., Krysanova, V., and Bronstert, A.,** (2012): Projections of impact of climate change on river flood conditions in Germany by combining three different RCMs with a regional hydrological mode. Climatic Change, 116, 631-663

**Schmitz, C., Biewald, A., Lotze-Campen, H.,** Popp, A., Dietrich, J. P., **Bodirsky, B., Krause, M., Weindl, I.** (2012): Trading more food: implications for land use, greenhouse gas emissions, and the food system. – Global Environmental Change 22(1): 189-209.

**Waha, K.; Müller, C.;** Bondeau, A.; Dietrich, J. P.; Kurukulasuriya, P.; Heinke, J.; **Lotze-Campen, H.** (2013) Adaptation to climate change through the choice of cropping system and sowing date in sub-Saharan Africa. Global Environmental Change 23(1): 130-143.

**Lissner, T., Holsten, A., Walther, C., Kropp JP** (2012): Towards sectoral and standardised vulnerability assessments: the example of heatwave impacts on human health. Climatic Change, 112, 3-4, 687-708

**Kit, O., Lüdeke, M. K. B., Reckien, D.** (2012): Texture-based identification of urban slums in Hyderabad, India using remote sensing data. Applied Geography 32, 660-667

**Koch, H.,** Vögele, S., **Kaltofen, M.,** Grünewald, U. (2012). Trends in water demand and water availability for power plants - scenario analyses for the German capital Berlin. Climatic Change, 110, 879–899.

**Reyer, C.,** Bachinger, J., Bloch, R., **Hattermann, F.,** Ibisch, P., Kreft, S., Lasch, P., Lucht, W., Nowicki, C., Spathelf, P., **Stock, M.,** Welp, M. (2012): Climate change adaptation and sustainable regional development: a case study for the Federal State of Brandenburg, Germany. Regional Environmental Change 12(3), 523-542.

**Bodirsky, B. L.,** Popp, A., **Weindl, I.,** Dietrich, J. P., **Rolinski, S., Scheiffele, L., Schmitz, C., Lotze-Campen, H.** (2012): N2O emissions from the global agricultural nitrogen cycle – current state and future scenarios. – Biogeosciences, 9, 4169-4197.

**Schubert, S., Grossman-Clarke, S.,** Martilli, A (2012): A Double-Canyon Radiation Scheme for Multi-Layer Urban Canopy Models Boundary-Layer Meteorology, 145, 439-468.

*» The German Energy Transformation raises questions about an electricity market of the future, for an affordable and secure supply which enables us at the same time to reduce emissions in Europe. We show options for answers on this national and European challenge. «*

**(Ottmar Edenhofer)**

*Photo: F. Batier*

*» The globalised networks of supply currents and infrastructure are complex, and are therefore vulnerable to climate extremes. We investigate how stable these networks are – and develop global adaptation strategies. «*

**(Anders Levermann)**

*Photo: K. Karkow*

## [ 3.3 ] Research Domain III – Sustainable Solutions

*Chairs: Ottmar Edenhofer & Anders Levermann*
*Deputy Chairs: Brigitte Knopf & Elmar Kriegler*

**Research Doman III "Sustainable Solutions" of PIK deals with strategies to mitigate climate change and to adapt to the unavoidable impacts of climate change. The research on the mitigation of climate change is managed by Ottmar Edenhofer. The research focus on global strategies to adapt to climate change has been built up under the leadership of Anders Levermann since March 2012.**

### Structure of the Research Domain

Organisationally, RDIII is divided into three research areas. These deal with

- the analysis of policy instruments on a German, European and global level (led by Ottmar Edenhofer),
- the modelling of global scenarios to avoid greenhouse gas emissions in the energy and land use system (led by Elmar Kriegler) and
- the global analysis of adaptation to climate change (led by Anders Levermann).

The seven flagship projects *"International Climate Policy", "Energy Strategies for Europe and Germany", "Global Energy Systems", "Energy Resources and Technologies", "Land Use Management", „Growth and Development" and „Adaptation Strategies for the Global Supply Network"* contribute to work in these research areas (see Fig. 15).

Since the very complex models REMIND and MagPIE are run in RDIII, the cross-sectional group Model Operations was established at the end of 2011 to specifically improve the software development and to contribute to a better performance of these models.

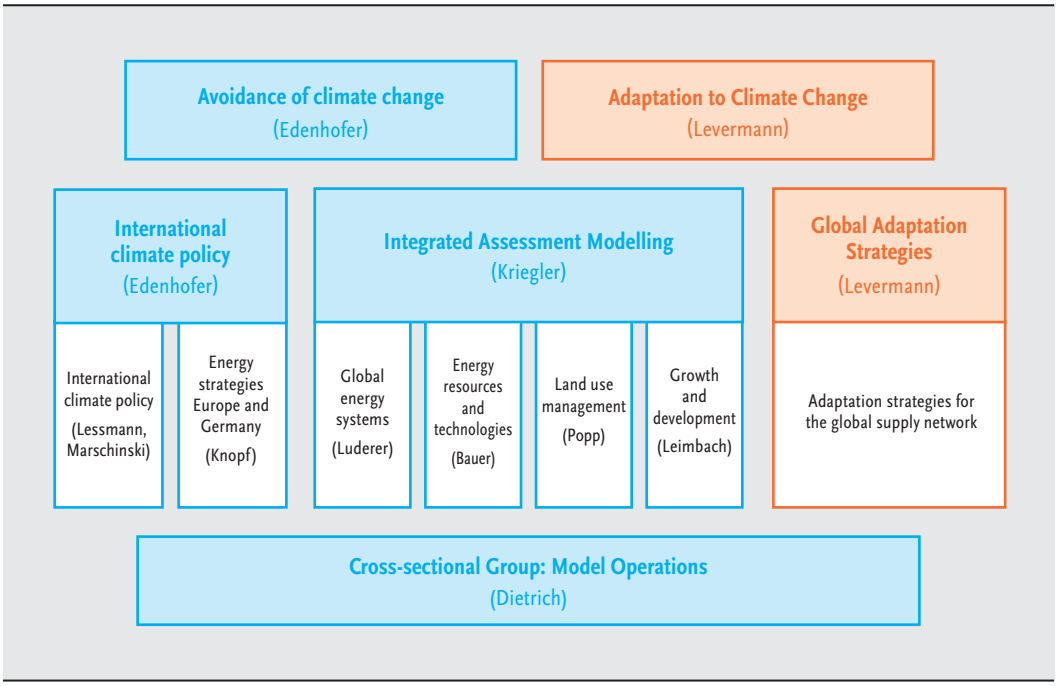



Fig. 15

## Research programme and products

RDIII can look back on an almost ten-year tradition (since 2004) of very successful international model comparison projects (e.g. IMCP, ADAM, RECIPE). This tradition is currently continued in six international model comparison projects, for instance the Stanford Energy Modeling Forum EMF27, which investigates the role of technologies to avoid climate change, and in the EU FP7 projects AMPERE and LIMITS in which among other things the effects of time delays of international measurements to avoid emissions are investigated as well as transformation paths on how the stabilisation of global warming at 2 °C can be reached. The results of these studies fundamentally contribute to the Fifth Assessment Report of Working Group III of the IPCC.

- Starting in 2013, RDIII moreover coordinates the European project ADVANCE in which the model development of integrated assessment models is a special focus. Special attention is paid to the transparency of the models and their assumptions as well as to the validation of the model results.

- Research on policy instruments relies on different decision and government levels. RDIII has carried out studies on the German energy transformation, the German energy market design and the European energy roadmap 2050, among others. But also global questions on international trade, the international shift of emissions (carbon leakage) and global strategic incentives and transfers have been addressed.

- In the area adaptation, three Ph.D. students are currently working on a model to assess the costs of global damage resulting from climate change (acclimate). Among other things, the representation of dynamic reactions and various time scales within the model shall be improved. Further improvements regarding decision strategies and the distribution of products will also be included in the model. These developments serve as a basis for implementing adaptation strategies.

## Selected results

**Global analysis of policy instruments:**

- In a recently published book, Edenhofer et al. show that the concept of green growth alone is not sufficient. It rather needs to be embedded in a global political framework for emissions reduction that offers long-term incentives for investments. The implementation of such a global agreement will need new institutional organisations.

- In a publication in Nature Climate Change, it was shown that even if production of goods were shifted from developed countries to countries like China, interventions in world trade, for instance by $CO_2$ tariffs, would reduce global emissions only to a limited extent. The emissions would probably even increase in these countries due to these trade restrictions since western countries have often specialised on energy-intensive goods. Energy is produced with comparatively low $CO_2$ emissions. If China has to produce more energy-intensive goods itself with its high-emission coal power stations instead, emission will increase.


*Indirect emissions induced by trade, i. e. emissions that are produced in the production land for the production of a certain product that is supposed to be exported.*

Fig. 16

**Energy strategies Europe and Germany:**

- In a study on the pricing of carbon and the effects of market power on investments and the choice of the technology form to produce energy, Pahle et al. show that a high $CO_2$ price reduces the technological market power and leads to an increased dismantling of old $CO_2$-intensive coal power stations. Strong investment in natural gas would increase the competitiveness of German markets as a whole.

- RDIII moreover carried out studies on the energy transformation. Up to now, there is no consistent model comparison of German models on the power market and energy system. This is critical since the results of these models will partially be used for political decisions. In a meta analysis of studies on the German energy market, Knopf et al. showed that the assumptions on the future development of gas prices will have a much greater influence on the energy price than a phasing out of nuclear energy.

- RD III participated in the assessment of the Brandenburg Energy Strategy 2030 that was developed by the Ministry for Economic and European Affairs.

**Integrated Assessment Modelling:**

- The global transformation of the energy system which is necessary to reach a stabilisation of greenhouse gases ($CO_2$ equivalent) in the atmosphere at 450 or 550 ppm was investigated in the EMF27 project. In all except for one of the 18 participating IAMs it could be shown that the 450 ppm goal can be reached at costs below 3 % of the global social product. We succeeded in proving a robust pattern in all models. These are for instance the high global importance of bioenergy in connection with CCS with which negative emissions can be produced and a long-term trend towards renewable energies.

- The study of Bauer et al. published in the renowned journal PNAS shows that a world-wide phasing out of nuclear energy will increase the costs of climate protection only marginally.

- Global scenarios on land use dynamics are generated with the MAgPIE model in RDIII. These scenarios are now used as higher-level orientation and context for the other regional projects of the BMBF funding priority "Sustainable Land Management".

**Adaptation to climate change:**

- The model acclimate shall in the medium-term be used to quantify global damages caused by climate change. Production, storage and transport have already been implemented.

## Selected publications

**Pahle, M., Lessmann, K., Edenhofer, O., Bauer, N.** (2013 (Accepted)): Investments in electricity markets with imperfect competition: Technology choice and optimal carbon pricing. – The Energy Journal.

**Bauer, N., Brecha, R. J., Luderer, G.** (2012): Economics of nuclear power and climate change mitigation policies. – Proceedings of the National Academy of Sciences of the United States of America (PNAS), 109, 42, 16805-16810.

**Creutzig, F., Popp, A.,** Plevin, R., **Luderer, G., Minx, J., Edenhofer, O.** (2012): Reconciling top-down and bottom-up modelling on future bioenergy deployment. – Nature Climate Change, 2, 5, 320-327.

**Edenhofer, O.,** Carraro, C., Hourcade, J.-C. (Eds.) (2012): On the Economics of Decarbonization in an Imperfect World Berlin: Springer, 168 p. Climatic Change ; 114, 1 Special Issue.

**Jakob, M., Marschinski, R.** (2013): Interpreting trade-related $CO_2$ emission transfers. – Nature Climate Change, 3, 1, 19-23.

**Kriegler, E.,** O'Neill, B. C., Hallegatte, S., Kram, T., Lempert, R. J., Moss, R. H., Wilbanks, T. (2012): The need for and use of socio-economic scenarios for climate change analysis: a new approach based on shared socio-economic pathways. – Global Environmental Change, 22, 807-822.

**Luderer, G.,** Bosetti, V., **Jakob, M., Leimbach, M., Steckel, J. C.,** Waisman, H., **Edenhofer, O.** (2012): The economics of decarbonizing the energy system – results and insights from the RECIPE model intercomparison. – Climatic Change, 114, 1, 9-37.

**Luderer, G., Pietzcker, R. C., Kriegler, E., Haller, M., Bauer, N.** (2012): Asia's role in mitigating climate change: A technology and sector specific analysis with ReMIND-R. – Energy Economics, 34, Suppl. 3, S378-S390.

**Policy-relevant book publications and contributions to national debates:**

**Edenhofer, O.;** Wallacher, J.; Lotze-Campen, H.; Reder, M.; **Knopf, B.;** Müller, J. (Eds.): Climate Change, Justice and Sustainability – Linking Climate and Development Policy. Springer, June 2012.

**Knopf, B., Pahle, M., Edenhofer, O.** (2012): Die Energiewende hängt vom Strompreis ab – aber noch fehlt eine robuste Energiestrategie. – Energiewirtschaftliche Tagesfragen, 62, 6, 37-40.

*» The world offers a lot of miracles behind which there is mostly mathematics. We further develop the abstract methods of non-linearity and make them applicable for highly concrete problems such as climate change a million years ago, the stability of the Amazon forest today or the stability of electricity grids. «*

**(Jürgen Kurths)**

*Photo: K. Karkow*

*» To understand the metabolism of modern societies – all the flows of energy, commodities, and waste – we use the theory of complex networks. Ultimately, the aim is to extend the art of self-observation to the physical boundary conditions of future options for society. «*

**(Helga Weisz)**

*Photo: F. Batier*

## [ 3.4 ] Research Domain IV –
Transdisciplinary Concepts and Methods

*Chairs: Helga Weisz & Jürgen Kurths*
*Deputy Chairs: Norbert Marwan & Fritz Reusswig*

**Research Domain IV "Transdisciplinary Concepts & Methods" develops climate impact and sustainability research for areas in which the existing concepts and methods are not sufficient. The Research Domain tries to develop scientific questions from stakeholder dialogues the results of which will then be included in these dialogues. The methodology of complex systems is here used as a tool to cope with the conceptional and methodological challenges.**

### Structure of the Research Domain

After Carlo Jaeger's retirement in April 2012, Helga Weisz became co-chair of Research Domain IV. The structure of the Research Domain has partially changed under the new leadership. New research foci are the analysis of the societal metabolism, i. e. the energy and material flows in a society and the combination of these investigations with complex network analysis. As a whole, the Research Domain is divided in the two fields Complex Systems and Social Metabolism. Besides the three flagship projects Complex Networks of Networks, Time Series Analysis and Adaptive Social-Metabolic Networks, there are also specific case studies as well as an overall cross-sectoral project to specifically support model development.

The co-chairs initiated a RD-internal research colloquium in 2012 that serves to promote the internal communication between scientists and Ph.D. students.

Currently, 48 people are working in Research Domain IV, 39 of them are scientists.

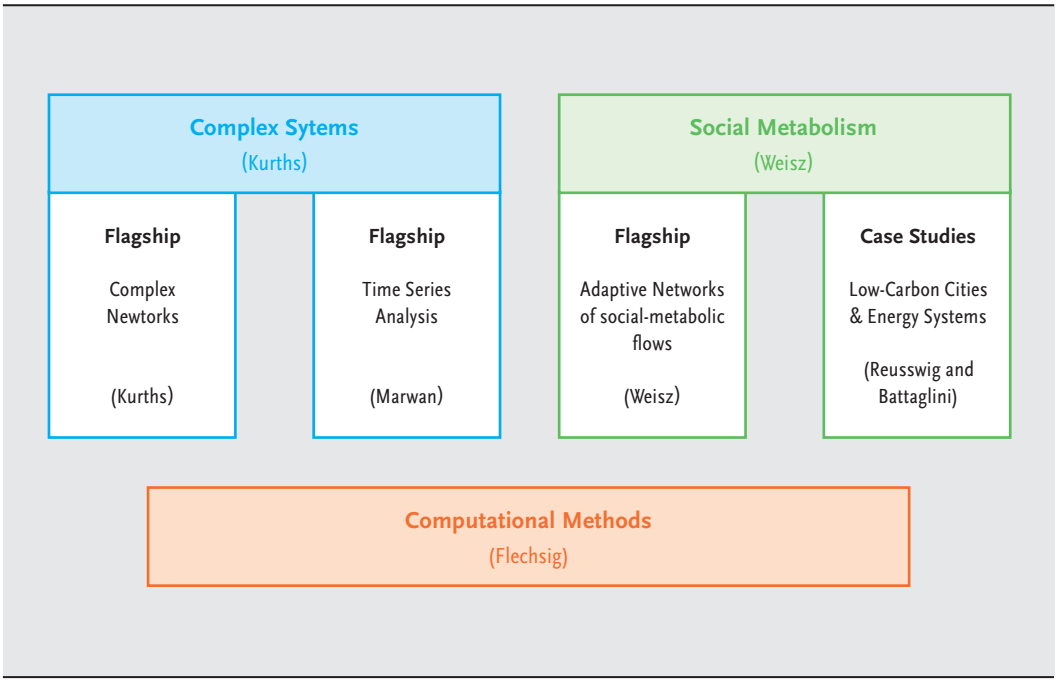



Fig.17

## Research programme and products

### Flagship projects

#### Complex Networks of Networks

Since the world today with increasing technological progress is more networked than ever, networks that combine the different levels of human activity with the technical infrastructure and the environment increasingly depend on each other and are thus also more susceptible to interferences. On the one hand, extreme weather events can for instance lead to massive failures of part of the infrastructure and can restrict social life considerably; on the other hand, humans change the environment due to their economic activities. The investigation of such complex interactions and feedbacks is of great importance for society but also represents an especially challenging task. We investigate these interactions by means of networks of networks that include many complex combinations of structural different networks. Each network has a function of its own, its functionality however strongly depends on others which leads to a new level of complexity.

With the development of new instruments for the reconstruction, characterisation and control of networks of networks, we break new ground in the investigation of complex systems. Our vision is:

- to describe the climate system of our Earth, the disequilibrium of socio-economic systems and their interactions within the "Whole Earth System Models".
- the development of new concepts for global stability (based on the Ma- Basin stability) since the traditional local stability paradigms applied to the system Earth are often not sufficient and can lead to wrong conclusions.

#### Time Series Analysis

The flagship project serves to develop and test new methods to prove causal relationships, coupling directions and indirect couplings between complex systems. This topic is among other things of great importance for the reconstruction of complex networks from measured multivariate data. Moreover, we will promote the development of methods to investigate extreme events and regime transitions with particular regard to insecurities on the time axis as well as in the observation objective / in the measurement itself as well as with missing information and irregular temporal samples.

#### Adaptive Social-Metabolic Networks

The goal of this new flagship project is a cross-sectoral view of the energy and material flows (society's metabolism) used for the preservation of societies from cites up to the global scale. The methodological focus is put on the novel combination of material and energy flow analysis with complex network analysis as well as agent-based modelling. The methods are up to now only rarely applied in the field of social-metabolic research, they are however particularly suitable to formally investigate fundamental and relevant aspects like structure, evolution and vulnerability of physical supply chains in today's socio-metabolic systems. The methods of complex network analysis and agent-based modelling also offer promising starting points to approach the hitherto scarcely examined question of the exact relations between the physical dimension of the social metabolism and socio-economic dynamics.

### Other important research projects beyond the flagship projects

The above-mentioned flagship projects are supplemented by a comprehensive cross-sectoral project as well as by case studies:

#### Cross-Sectoral Project: COMET – Computational Methods

The goal of the cross-sectoral project is the development of concepts and the implementation of methods for data analysis and for the use of computer models and the securing of relevant quality standards. An integrative approach is offered here by visualisation methods to explore large multidimensional / multivariate data sets. The simulation environment SimEnv for the analysis of model insecurities and sensitivities over parameter spaces is supplemented by methods for model calibration and is applied to the forest model 4C. Besides probabilistic and deterministic approaches, Bayesian approaches will thus also be available.

#### Case study: Low-Carbon Cities

Low-Carbon Cities (LCC) aims at developing transdisciplinary generic analysis methods and recommendations for action based on them for a social and political design of the transition from the "fossil" to the "post-fossil" city of the future. For this purpose, cities of different sizes and in completely heterogeneous socio-technical as well as cultural and political contexts are investigated. On behalf of the Joint Berlin-Brandenburg Planning Department,

we prepared a report in 2012 in which we were concerned with the land use effects of the energy strategy 2030 of the State of Brandenburg and the energy concept 2020 of the State of Berlin (cf. http://gl.berlin-brandenburg.de/imperia/md/content/bb-gl/energie/grk/grk_bbb_final_2.pdf). After a consortium led by PIK had developed an integrated climate protection concept for the State capital of Potsdam within the framework of LCC in 2011, we actively accompanied its political implementation this year. At the end of 2012, a consortium led by PIK could prevail in a fierce competition for the feasibility study Climate neutral Berlin 2050 that should be available in 2013 on behalf of the Senate Administration for Urban Development.

### Case Studies Energy Supply

#### SuperSmart Grid

The SuperSmart Grid project focuses on imports of renewable electricity from Northern Africa to Europe as part of a completely renewable power supply. The project especially aims at answering two very broad and interrelating questions:

a) if renewable imports of electricity are desirable or too much fraught with risk and

b) how Europe can accomplish a complete supply with renewable electricity, possibly in cooperation with Northern Africa.

New methods for energy security analyses, especially for imports of electricity, were developed and applied here.

#### CLIM-RUN – Climate Local Information in the Mediterranean region – Responding to User Needs

The aim of the CLIM-RUN project is to improve the quality of user-specific climate information on the regional and local scale. Furthermore, contributions to develop a climate information network shall be made.

*Mayan temples tower above rainforest*
*Photo: Thinkstock*

## Selected results

**The role of climate change in the decline of the Maya**

The role of climate change in the development of the classical Mayan civilisation from 300 to 1000 AD has been a controversial issue for decades since there is a lack of well-dated climatic and archaeological data. In a study published in Science, we present highly resolved regional climate data for the last 2,000 years and we were able to show for the first time how the political systems of the Maya first developed and then declined in relation to climate change. Together with colleagues from the Pennsylvania State University, ETH Zurich and the University of New Mexico, we reconstructed a climate record with high temporal resolution by means of isotope measurements on a stalactite from a cave in the tropical Mayan lowlands in the south of Belize. Based on the radioactive decay of uranium to thorium, the temporal reference of the isotope variations was established and hence a detailed record of precipitation in the region reconstructed. These data were compared with detailed records on the political development which can be found on stone monuments in Mayan cities in the region. Precipitation-conditioned changes of agricultural productivity considerably contribute to political integration or disintegration. While unusually high amounts of precipitation favoured increased food production, which caused a population explosion between 450 and 660 AD, a persistent drought trend from 700 AD onward caused increasing political conflicts which finally resulted in population decline. The final decline of the Maya civilisation can be associated with an extended drought period between 1020 and 1100AD.

**New methods for integrated vulnerability assessment**

The normalisation of different climate impacts to central state variables of social function beyond the gross domestic product (GDP) is still an unsolved problem in vulnerability research. The vulnerability of Germany's current energetic metabolism was assessed for electricity production and the energetic potential from forestry. Simulations with different temperature increase (1,2,3 K) in high spatial and technological resolution showed linear temperature-dependent decreases of up to 18 % of the annual production capacity of the currently water-based power plants and non-linear increases of up to 40 % of the energetic potential from forestry (assuming a maximum $CO_2$ effect). The increase of primary production is connected with a simultaneous linear decrease of the percolation rates of up to 30 %. These investigations were carried out in cooperation with Research Domain II.

**Global social-metabolic networks**

The industrial metabolism is based on complex global supply networks of commodities. We developed a new algorithm which allows for a generation of consistent bilateral data sets of international commodity trade in technical and monetary units and in annual time series. With this database, we created the first weighted and directed formal representation of the global physical trade network and developed a new complex network indicator for country-specific vulnerabilities that result from the embedding into the world trade system.

**Global stability - Novel stability concept**

We could show that the traditionally local approach for stability analysis (of complex systems) is not sufficient to quantify the stability of many important natural systems, including the so-called tipping points in climate. In addition to the generally used linear stability paradigm, we therefore developed a global concept, „basin stability", which can universally be applied. This basin stability enabled us to solve a long-time problem in network science regarding the structure of synchronised networks. We will use it in future to investigate new design principles for energy supply networks.

**Palaeo climate-networks**

With the palaeo climate network approach, we opened a new field of application for climate networks that is adjusted to the specific challenges in palaeo climate data. The new approach includes modern technologies for the estimation of similarities and correlations between time series with different and irregular temporal sampling rates and additional insecurities in dating. In a first application, we found differences in the magnitude of the Indian summer monsoon influence on the East Asian summer monsoon during the Medieval Warm Period, the Little Ice Age and the recent warm period (Rehfeld et al., 2012).

**Possible structure of climate compensation funds**

We developed the structure for the compensation of climate impacts beyond natural climate fluctuations. Certain institutional design options are pre-

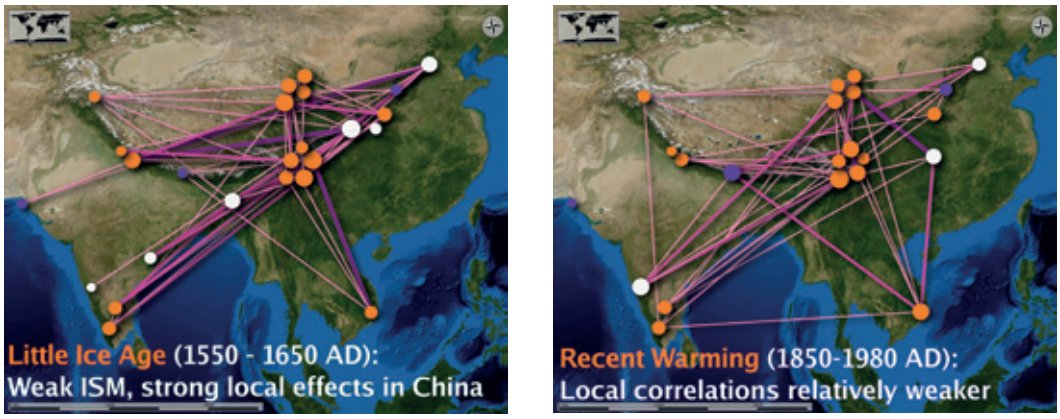



Fig. 18

*The spatiotemporal investigation of palaeo climate data can be carried out with complex networks. Time series of tree ring data (white and orange dots) and stalactite data (violet dots) exhibit similarities and correlations. This method enables statements to be made about the area of influence, e. g. of the Indian summer monsoon in Asia. During the Little Ice Age, the influence of the Indian summer monsoon in East China was significantly smaller than today.*

determined in our proposal, e. g. rules for the preparation and issuing of compensation funds.

**Political determinants of per-capita carbon dioxide emissions**
In an econometric analysis, we demonstrated that democracies considerably reduce the effects of raising incomes, especially of low and medium incomes. The results are stable in production and consumption-based CO2 emission values.

**Transboundary expansion of electricity grids**
We use new approaches (e. g. the Institutional Analysis Development Framework) to improve the understanding of non-technological influence factors and obstacles for a transboundary expansion of electricity grids. We hope to gain new knowledge about how to increase the acceptance of additional capacities for connecting cables which are necessary to support the cost-efficient expansion of renewable energies.

## Selected publications

D. J. Kennett, S. F. M. Breitenbach, V. V. Aquino, Y. Asmerom, J. Awe, J. U. L. Baldini, P. Bartlein, B. J. Culleton, C. Ebert, C. Jazwa, M. J. Macri, **N. Marwan,** V. Polyak, K. M. Prufer, H. E. Ridley, H. Sodemann, B. Winterhalder, G. H. Haug: Development and Disintegration of Maya Political Systems in Response to Climate Change, Science, 338(6108), 788–791 (2012).

**J. Runge, J. Heitzig, V.** Petoukhov, J. Kurths: Escaping the curse of dimensionality in estimating multivariate transfer entropy, Physical Review Letters, 108, 258701 (2012).

S. F. M. Breitenbach, **K. Rehfeld, B. Goswami,** J. U. L. Baldini, H. E. Ridley, D. Kennett, K. Prufer, V. V. Aquino, Y. Asmerom, V. J. Polyak, H. Cheng, **J. Kurths, N. Marwan**: COnstructing Proxy-Record Age models (COPRA), Climate of the Past, 8, 1765–1779, (2012).

**K. Rehfeld, N. Marwan, S. F. M. Breitenbach, J. Kurths**: Late Holocene Asian summer monsoon dynamics from small but complex networks of paleoclimate data, Climate Dynamics, online first (2012). DOI:10.1007/s00382-012-1448-3.

Grubler, X. Bai, Th. Buettner, S. Dhakal, D. J. Fisk, T. Ichinose, J. Keirstead, G. Sammer, D. Satterthwaite, N. B. Schulz, N. Shah, J. Steinberger and **H. Weisz**: Urban Energy Systems, Global Energy Assessment: Toward a Sustainable Future. IIASA, Laxenburg, Austria and Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1307–1400 (2012).

**Battaglini, A.,** Komendantova, N., Brtnik, P., Patt, A.: Perception of barriers for expansion of electricity grids in the European Union. – Energy Policy, 47, 254-259 (2012).

**Goswami, B.,** Ambika, G., **Marwan, N., Kurths, J.**: On interrelations of recurrences and connectivity trends between stock indices. – Physica A: Statistical Mechanics and its Applications, 391, 18, 4364–4376, (2012).

**Malik, N., Zou, Y., Marwan, N., Kurths, J.**: Dynamical regimes and transitions in Plio-Pleistocene Asian monsoon. – Europhysics Letters (epl), 97, 40009, (2012).

**Rheinwalt, A., Marwan, N., Kurths, J.,** Werner, P., Gerstengarbe, F.-W.: Boundary effects in network measures of spatially embedded networks. – Europhysics Letters (epl), 100, 28002, (2012).

Feldhoff, J. H., **Donner, R. V., Donges, J. F., Marwan, N., Kurths, J.** (2012): Geometric detection of coupling directions by means of inter-system recurrence networks. – Physics Letters A, 376, 46, 3504-3513, (2012).

# 04
# OTHER ORGANISATIONAL UNITS AND ACTIVITIES

- Executive Staff
  - Director's Office
  - Science Coordination
  - Press and Public Relations
- Information Technology Service
- Administration
- Technical Support Unit (TSU) of Working Group III of the Intergovernmental Panel on Climate Change (IPCC)


*High performance computer of PIK, Photo: F. Batier*

## [ 4.1 ] Executive Staff

**It is the core task of the executive staff to support the institute's management in its content-related, strategic and organisational work. Besides the traditional committee work and the fulfillment of reporting duties, this includes maintaining the institute's relations with politics and business as well as science coordination and press relations.**

### [ 4.1.1 ] Director's Office

*Head: Daniel Klingenfeld*

The Director's Office supports the head of the institute, Professor Schellnhuber, in his daily tasks. These are among others support in his scientific work, lectures or committee work. The latter also includes the content-related preparation and supervision of external duties such as the chair of the German Advisory Council on Global Change (WBGU) as well as the chairmanship of the Supervisory Board of Climate-KIC, the climate network of the European Institute for Innovation and Technology (EIT). The representation of PIK as core partner in the Climate-KIC, especially among the partners of the German knot, also belongs to the portfolio of tasks. Moreover, the Director' Office ensures that the equal opportunities officer is involved in the work and decisions of the Board of Directors.

#### Activities in 2012

In 2012, the Director's Office was involved in the conceptual and logistic preparation and realization of 27 external lectures given by Professor Schellnhuber. Moreover, visits to the institute by a number of high-ranking visitors from politics and society were prepared and accompanied in close coordination with the Press and Public Relations Office. Worth mentioning are here for instance the visits with ensuing discussions of EU Commissioner for Energy Günther Oettinger, Federal Environment Minister Peter Altmaier, Federal Minister for Education and Research Annette Schavan as well as Markus Dröge, Bishop of the Protestant Church Berlin-Brandenburg, Silesian-Oberlausitz.

The Director's Office was also involved in numerous operative but also strategic activities of the institute management on an international level. Examples include here the preparation and accompanying of the emerging cooperation in research questions with the Emirate of Qatar, the support of Professor Schellnhuber within the framework of the climate conference in Doha as well as numerous activities associated with Climate-KIC. As chair of the Supervisory Board of Climate-KIC, the director occupies a prominent position that comes along with responsibilities like regularly chairing meetings of the Supervisory Board and the General Meeting. Prior to and at the meetings, Daniel Klingenfeld is personally responsible for their content-related support.

*Professor Schellnhuber welcomes the participants of the European Climate-KIC meeting on 2 May 2013 in the great cupola of PIK. Photo: PIK*

## [ 4.1.2 ] Science Coordination

*Head: Ingo Bräuer*

Science Coordination at PIK brings together the activities of four research domains and takes on the function as an interface between research areas, board of directors, administration and committees.

The tasks of Science Coordination include:

- Support of the Scientific Advisory Board
- Support in assisting the Board of Trustees
- Documentation and representation of scientific achievements of the institute for the respective reporting duties of the institute
- Support in acquiring external funding and initiation of cooperation projects
- Planning of joint appointments
- Promotion of young researchers / Ph.D. programme
- Cooperation with the equal opportunities officer
- Organisation of outstanding events
- Contact with the Leibniz Association, German Climate Consortium (DKK) and other organisations and networks

### Activities in 2012

**Support of young researchers**

The in-house Ph.D. programme established last year has become an inherent part of the promotion of young researchers. The internal series of events called "Science and Pretzels" organised by Science Coordination with lectures by top scientists at PIK is well attended by the staff of PIK. The same is true for the various seminar programmes.

After focusing on doctoral training in recent years, the institute's focus in 2012 is now on the promotion of its postdocs. The support of postdocs is also part of the activities of Science Coordination.

The following first steps to promote postdocs have been taken:

- Creation of a special homepage with current and relevant information
- Creation of an email list for postdocs to enhance in-house communication
- Conclusion of a cooperation agreement with the Potsdam Graduate School (PoGS) which enables the postdocs of PIK to participate in training programmes for this target group
- Regular in-house surveys of needs; a first survey showed that project management and media training are seen as being especially relevant
- Promotion of the use of instruments for career planning like employee-superior-discussions and transfer of managerial responsibility, for instance as deputy RD chair

**Documentation**

The definition of scientific evaluation criteria, the documentation and representation of scientific achievements are central tasks of Science Coordination. The work is documented with regard to the annual assessment report, the meetings of the Board of Trustees and the Scientific Advisory Board. Moreover, information needs to be provided for various queries on the institute's activities and portfolios from the Leibniz Association, the State and Federal Government and the European Union. To optimise the reporting duties and to better provide information to the staff of PIK, a new project database has been started and put online. The figures of current third-party projects and already completed projects of PIK of recent years are fed into the database. Connection with the internet enables not only staff members but also external persons to easily and comprehensively inform themselves about the research activities of the institute.

*Ph.D. students in group work during the PIK-internal Ph.D. days in May 2012.*
*Photo: PIK*

**Equal Opportunities**

The equal opportunities concept was completed in close cooperation with the Director's Office and afterwards approved by the Board of Directors. Based on an institute-specific situation analysis, the concept includes working goals for equal opportunity as a strategic task for reconciling work and family life, promoting the careers of women at PIK, organising recruitment processes, collecting and monitoring data as well as agreeing on target rates. The implementation of the goals is described and a quality management to examine the activities is presented. The equal opportunities concept is accessible to all staff members on the intranet of PIK.

Also last year, the equal opportunities officer of PIK took part in many interviews or was comprehensively informed about the process.

One of PIK's female postdocs successfully participated in the mentoring programme for young scientists that started in September 2011.

**Events**

Members of the Science Coordination team were responsible for planning the content, the organisation, realisation and the financial implementation of the Global Sustainability Summer School in 2012. The summer school was very successful so that other events of this kind are planned.

# [ 4.1.3 ] Press and Public Relations

*Jonas Viering, Mareike Schodder & Sarah Messina*

**Climate research needs communication to reach the general public on the one hand and national and international decision-makers on the other hand. It is self-evident for PIK that research also includes explaining its results. Not only since the public largely finances its scientific work via tax money. But also since the results of climate research are often of great importance for the welfare of all our children's children.**

## A new communication strategy for more effectiveness – in an efficient way

The scientific output of PIK is continuously increasing. Therefore, the institute expanded its press team in 2012 – a PR volunteer was employed for the first time – and a new communication strategy to increase efficiency was developed. The new communication strategy consists of four pillars:

1. **Primary target group are opinion leaders who are reached via key media** – instead of striving for citations in any media. Numerous media enquiries of regional media are of course answered in everyday work but the media appearances initiated by the press office of PIK take place in the key media. One exception is the media of Brandenburg. Since PIK is located here, regional media gets more access.

2. **The world-wide public visibility of PIK research shall be increased.** Although PIK is regularly present in the international media, the press office will systematically contact non-German media in the future, above all in those countries which are of decisive importance for the global interest in the climate problem and its possible solutions: China, India and the United States. In 2012, we started to use Eurekalert to increase the distribution of press releases in the United States and to scientific journalists.

3. **Use of new communication channels.** Since 2012, Twitter is used in the institute and videos are also used on the PIK website. Twitter is an option to directly communicate with a limited but interested public with low wastage and little effort. Video on the other hand serves another form of attention of internet users. When introducing such instruments, PIK is very careful since it wants to avoid an excessive simplification of the presentation of climate research. The institute, however, wants to meet the challenges of changed media use to find ways on how to directly communicate with the public.

4. **Development of communication skills of PIK scientists.** It is the declared objective of PIK to support promising scientists in becoming publically effective intellectuals. The press office started in 2012 to offer media training for scientists of the institute. Media training for Ph.D. students has among others been offered since 2012 that is integral part of the structured doctoral programme and shall in the future also be offered to postdocs.

   Moreover, the press office continuously prepares scientists for confirmed interviews, supports them in authorising quotations and gives them afterwards feedback on their performance: thus a kind of everyday media training is created.

## Media interest is growing: Some figures

With regard to media resonance, 2012 was very successful. Almost 7,600 articles in German-language print media reported about the work of our institute. A trend is continued here with 7,200 in 2011 and 6,500 in 2010. The PR services of PIK are reflected in a cumulated article edition of 129 million in the German media – 22 million of which in key media like Süddeutsche Zeitung (international data regarding print media are not available). PIK scientists were on television almost every week, even more often on the radio.

In addition, PIK was often present on the websites of news media such as Spiegel Online or Huffington Post. In 2012, the internet observation service "Meltwater" counted 8,000 articles world-wide in which PIK was mentioned. This means a potential readership of 48 million. Some restraint is called for when interpreting such figures but they are certainly a good first indicator. More than half of the citations of PIK in the online media could be found in international sources, 20 million alone in the United States. The effect in so-called social media such as Twitter is not recorded here. But, to mention only one example, the 4-degrees report of PIK alone had a readership of 30 million according to the World Bank.

**Development of media reporting with reference to PIK**
Three-month periods 1 / 2006 – 4 / 2012

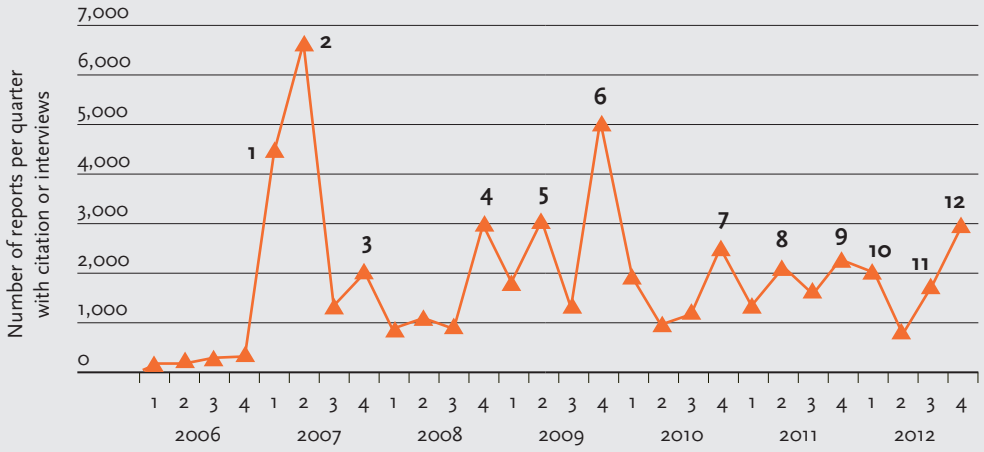



Fig. 19

1) Warm winter / hurricane 'Kyrill' / thawing polar caps; publication of IPCC report 1; media leak IPCC-Report 2+3
2) Publication of IPCC reports 2+3
3) Interdisciplinary Nobel Laureate Symposium for Global Sustainability in Potsdam; German Environment Prize for Hans Joachim Schellnhuber; DUH Media Prize for Stefan Rahmstorf; UN Climate Conference in Bali
4) Press conference of the BMU on the latest findings of climate research with the participation of Hans Joachim Schellnhuber; Potsdam Climate Conference 2008; UN Climate Conference in Poznan
5) Visit of Prince Charles to PIK; Ottmar Edenhofer; Meinshausen study in 'Nature' on $CO_2$ residual budget of humankind for the 2-degree goal
6) UN Climate Conference in Copenhagen
7) UN Climate Conference in Cancun; PIK study: "A link between reduced Barents-Kara sea ice and cold winter extremes over Northern continents" (J. Geophys. Res.)
8) PIK Study: "Entering the phase-out" (FES); SRREN report; PIK study: "Climate related sea-level variations over the past two millennia" (PNAS)
9) UN Climate Conference in Durban, PIK study: "Increase of extreme events in warming world" (PNAS)
10) Vahrenholt book and editor; Greenland ice is melting (Robinson / Ganopolski); weather records and climate change (Coumou / Rahmstorf)
11) Hot summers, coral reefs in danger (Frieler / Meinshausen), world trade and $CO_2$ taxes (Jakob / Marschinski)
12) Projections for the sea-level could be underestimated (Rahmstorf), World Bank four-degrees report, Qatar and PIK want to found climate research institute, COP18 Doha

## What works: From World Bank factor to press releases

The 4-degrees dossier of the World Bank is a decisive factor for the media coverage of PIK in 2012, especially on the international level. Media from the British Financial Times to Xinhua / China Daily, from Washington Post to the Indian newspaper The Hindu, from Le Monde in France to Sydney Morning Herald reported on it.

A second factor, despite the low expectations of the public, was the World Climate Summit. The meeting that took place in Doha / Qatar in 2012 triggered many reports in which PIK and its research results were referred to. One highlight was of course the announcement that PIK and the Qatar Foundation will collaborate in founding the presumably first Arabic climate research institute – Gulf Times and the British Guardian (online) wrote about this.

In connection with COP18, PIK's Director Hans Joachim Schellnhuber gave a number of important interviews, for instance with Süddeutsche Zeitung and Frankfurter Allgemeine, for ARD Tagesthemen and ZDF-heute journal, for the Chinese news agency Xinhua and the South China Morning Post. Deputy Director Ottmar Edenhofer spoke among others with Wirtschaftswoche and Bloomberg news, Handelsbatt and vdi-Nachrichten. Many of these interviews were initiated by PIK.

Another well established PR format of PIK is the all-day background workshop for journalists which in 2012 was organised for the third time before the annual world climate summit. Once again PIK succeeded in bringing together 25 journalists from important German media to Potsdam for intensive discussions with PIK scientists.

The classical press releases were in 2012 responsible for more than one third of the presence of PIK in the print media. Of the 19 press releases sent in the course of the year, the following texts received the best print figures:

- *"Greenland ice masses could melt completely at a global warming of 1.6 degrees"*, based on a study of Robinson et al (found its resonance in print media with a total circulation of 9,106,038)
- *"Four-degrees-dossier for the World Bank: Risks of a future without climate protection"*, based on a report of Schellnhuber et al. (8,364,979)


— *"Projections for a sea-level rise could have been underestimated"*, based on a study of Rahmstorf et al. (5,513,408)

On the other hand, guest articles and question and answer interviews are very important to call the public's attention to certain topics. In 2012, PIK scientists published 41 guest articles and 147 question and answer interviews that could be found again in a printed total circulation of almost 10 million.

## New analysis tool shows that many PIK scientists are present in the media

The database for media resonance analysis that was developed in 2012 thanks to the support of the IT department allows for the first time an exact overview of the PR balance of the institute. It shows that – despite most of the media resonance being devoted to Hans Joachim Schellnhuber and Ottmar Edenhofer – a great number of PIK scientists are mentioned in the media. In all, as many as 75 PIK scientists were mentioned in the media. This reflects PIK's efforts to support the public appearance of the researchers.

The media rely on the research of our institute and see its importance – in more than 30 percent of the articles as regards the total circulation, PIK is the greatest or even only source.


## Face-to-face communication: Large number of visitors' groups

Visitor groups and stakeholder lectures are very often requested from PIK. These are in many cases coordinated by the press office as part of the research transfer. According to studies, the face-to-face communication, in spite of the low number of recipients compared to communication via media, can produce of high degree of credibility. The group "Green Talents", in cooperation with the Ministry of Education and Research, and guests from the American Council on Germany were among the many guests in 2012.

To promote the public understanding of science, PIK participates in several cross-institutional events. The Long Night of Science brought almost twice as many visitors to Telegraph Hill than in the year before (about 10,000). The PIK press office coordinated here the assignment of 120 volunteers from our institute. At the Girls' Day 2012, the world of climate science was introduced to the students at PIK.

*Hans Joachim Schellnhuber in discussion with media representatives*
*Photo: PIK*

# [ 4.2 ] Information Technology Services (IT)

*Head: Karsten Kramer*

**The IT Services group plans, develops and maintains the entire information technology infrastructure of the institute. It consults and supports the staff members of the institute on how to efficiently and safely use computerised services which roughly outlined include the following spectrum:**

**_ High-performance computing**
**_ Data storage / database management**
**_ Data networks / internet services**
**_ Personal computer / helpdesk**
**_ Server & software repositories**
**_ Video conferences**

## Activities 2012

Focus in 2012 was put on the introduction of a ITIL1 conform ticket system, the implementation of the W7 domain administration, the integration of the administration IT and the assumption of responsibility for the PIK web service.

Moreover, the IT group took on numerous special tasks associated with the computer centre and network planning of PIK's new building.

## High-performance computing

The production capacity of the high-performance computer could in 2012 be guaranteed without any limitations. As in the year before, more than a total of 11 million CPU-hours2 were retrieved by scientific projects.

Further foci of the work in this area were the user-specific consultation of scientific users including the organisation of seminars and – together with the administration of PIK – arrangements for the purchase of a new high-performance computer which is a prerequisite to implement the research programme of PIK in the years 2014-2018.

The still high demand for persistent storage space for project data in parallel data systems – in particular driven by the activities of ISI-MIP – could be met as far as possible. The capacity utilisation of >80 % at the end of 2012, however, reached a figure that showed the need for reorganising the parallel file systems in 2013.

At the end of 2012, two petabyte scientific data were stored in 210 million files in the automated tape library of the institute, about 50 % of which in the form of long-term storages3. The storage capacity of the system that was bought in 1994 and progressively developed was thus completely filled by the end of the year. Since an extension was no longer feasible, options for a replacement purchase were considered in the fourth quarter of 2012 and a submission for a new tape library was prepared.
In the course of the year, about 70 orders of users to restore accidentally deleted or destroyed data were processed. The software used to manage back-up and archive data was elaborately converted into a new main version.

## Further activities

The following activities represent a cross section of the work of the members of the group that was performed besides safeguarding production and helpdesk in the reporting period 2012.

**Data networks / internet:**
Via the internet connection of the institute which is currently laid out redundantly with a capacity of 2 x 350 Mbit / s, a total of 138 TByte were transmitted in

1) IT infrastructure library – international de-facto-standard for IT service management. In this set of rules and definitions, all processes, the organisational structure and tools necessary to run an IT infrastructure are uniformly described.

2) Standardisation: Intel XEON E5472 - Harpertown - 3GHz.

3) Gross capacities, i. e. incl. the backup files necessary for archives.

**Proportional use of CPU of the top 10 projects on the high-performance cluster**

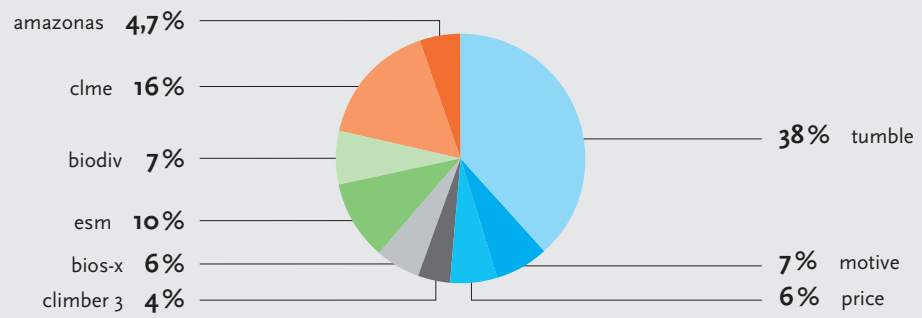



Fig. 20

**Hard disk capacity of the top 10 high-performance cluster projects 2012**

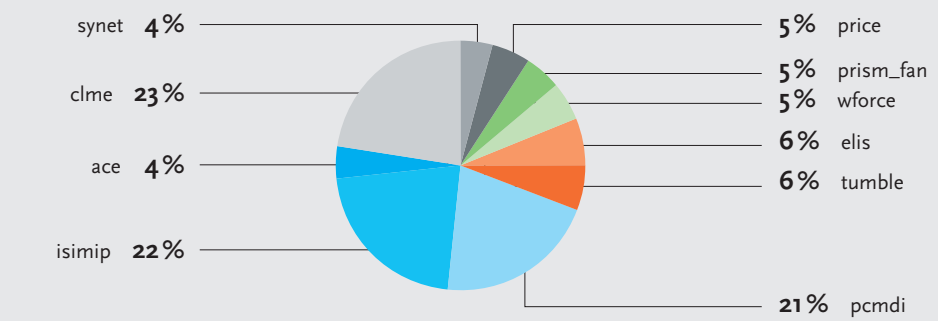



Fig. 21

**Development of filing stock tape library**

1999 – 2012

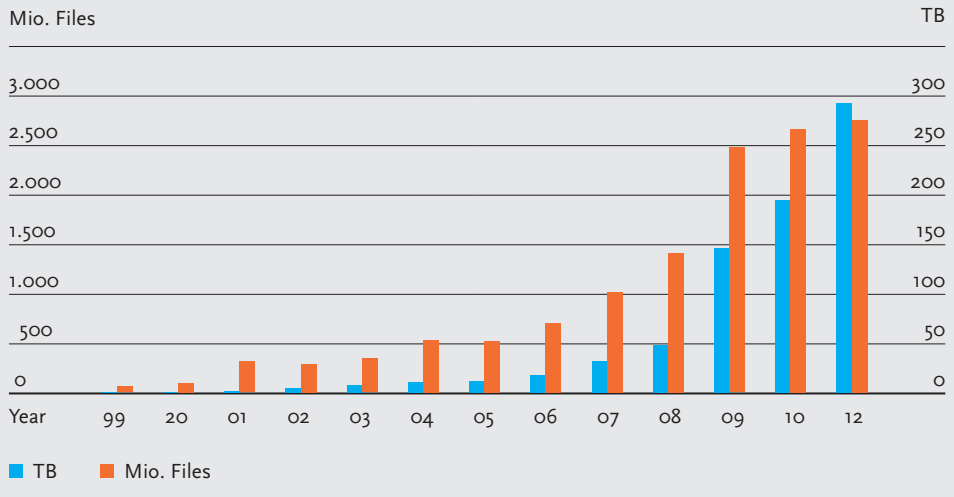



Fig. 22

**PIK Internet Data Movement**
2006 – 2012

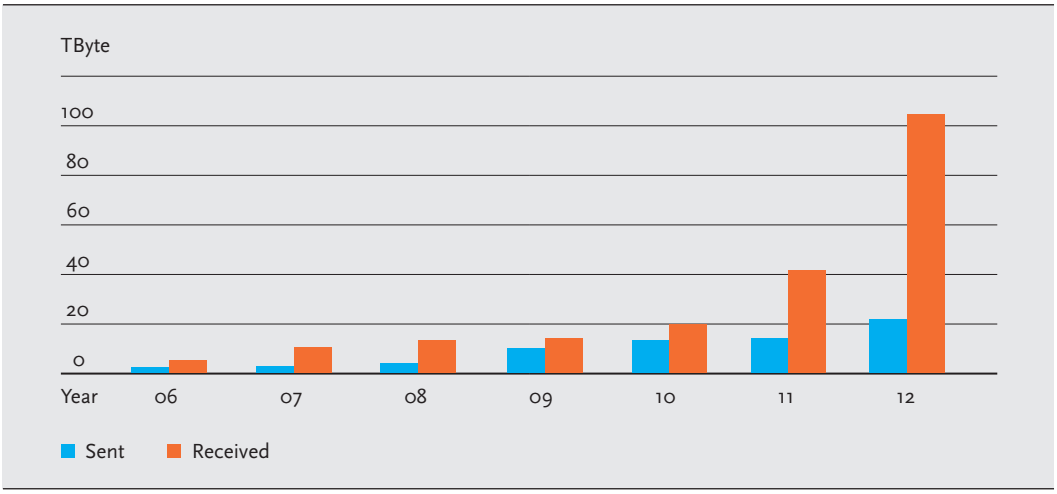



Fig. 23

the reporting period – this corresponds to a tripling of the data volume compared to the previous year which is primarily due to the work done within the ISI-MIP project.
The email service provided by the group without any failure time was very intensively used as was the case in the past years. In the course of the year, about 1.2 million messages were received and sent. Two million messages were classified as unwanted advertising and automatically rejected.

Besides the exchange of scientific data and email communication, the internet was also used for video and web conferences. About 25 video conferences were centrally arranged by the group. At this point, the extensive consultancy services that were rendered in preparation of the rearrangement of the media technology in the main cupola of building A31 need to be especially mentioned.

**Databases / data storage:**
In 2012, new web-based databases – one of which is used to record the media presence of PIK – were designed and implemented. Some already existing database applications, for instance project management, were functionally revised and extended in a significant way.

The replacement of a central file server for user and project data purchased in 2006 was the greatest investment of the IT service in 2012. The installation work, including the concept of connecting the existing data backup, were successfully completed in the beginning of January 2013 despite some initial problems that were due to the new software. The transfer of the existing data which cannot be realised without service interruptions was planned for the second quarter of 2013.

**Personal computer / helpdesk:**
In 2012, 197 new user accounts were created and about 50 personal computers were newly purchased. The number of new PC orders could considerably be reduced as to the previous year due to an intelligent inventory management that includes a complex recycling of old devices.

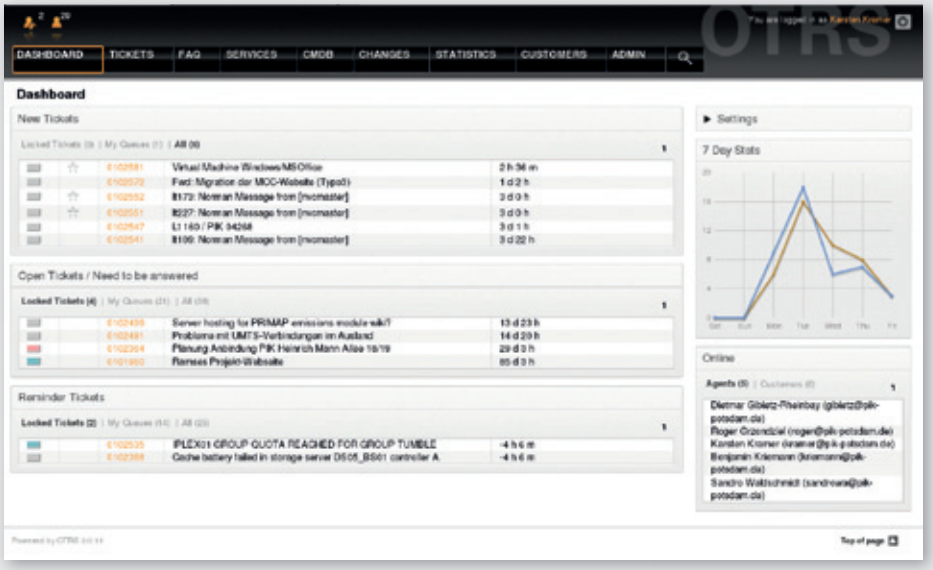
Another focus of the group's work consisted of the transfer of the device stock of the administration IT. Management and helpdesk functions that had so far been done by external service providers are now done by the IT service group. This work is an essential prerequisite for the introduction of new administration software.

After introducing a database-supported ticket system in the first quarter of 2012, it is for the first time possible to control the ITIL-compliant provision and settlement of IT services. The system is today used to manage all user requests and system failures. All requests / failures can be directly connected to the device stock. In the period Q2 / 2012 until the end of 2012, about 1,200 helpdesk requests were processed, documented and successfully completed. The significant increase in consultancy activities for the use of PIK internet services, for instance email via private mobile terminals, should be mentioned here.

**Print service:**
In close cooperation with the administration, the exchange of all working group printers of the institute was planned and accomplished. The approximately 30 device types used so far were replaced by thirteen standard multifunctional devices which are centrally maintained. The devices work on the basis of environmentally friendly consumables and can be used for printouts, copies, faxes or document scans. After the exchange, the print control of all personal computers had to be manually adjusted by the IT services team.

**Web service:**
The position "webmaster" was formally re-assigned to the IT service in the course of the year 2012. Through this restructuring, the strategic orientation of the service will be improved in the medium term and at the same time the development and operationality of the PIK web portal be secured in the long term.


*Screen shot web portal of PIK*




*Screen shot ticket systems*

## [ 4.3 ] Administration

*Head: Sven Oliver Arndt*
*Deputy Head: Frauke Haneberg*

**It is the task of PIK's administration to ensure that all personal, financial, spatial and technical means for a proper operation to fulfil the tasks listed in the statutes can be made available to the scientists. The administration has to make sure that the existing legal rules, the requirements of the funding agencies and committees as well as the instructions from the head of the institute are fulfilled.**

The administration supports the institute's directors and the whole institute in fulfilling its goals and aims at minimising the administrative loads for the head of the institute, the scientific staff of the research domains as well as for the staff member of other service units with a low deployment of personnel.

**Restructuring of the administration**

Less than 5 % of PIK's employees work in the administration. PIK's administration is therefore quite lean. The pleasing continued growth of PIK involves noticeable challenges from the administrative side that have to be mastered. This can only be achieved thanks to the great commitment and team spirit in the institute. Know-how, a good workplace organisation and communication within and outside the administration play a decisive role in securing smooth and proper administrative activities.

In order to deal with the growth of the institute in the long run, the administration decided to change its working processes radically. The processes shall be converted from mostly self-designed and non-coordinated "individual structures" to a broad software-supporting work. Existing workflows are designed more efficiently, duplication of effort will largely be avoided and the status of processing shall be made more transparent for the institute. The preparatory work for this goes far beyond the completion of tender documentations alone. Internal coordination with the employees' council, the equal opportunities officer, the data protection officer as well as units affected like the IT unit, the Board of Directors or the research domain coordinators will ensure internal support for this large-scale project.

A special position for coordinating the processes, preparing the tender as well as accompanying the introduction phase was created within the administration. This decision has already proved to be effective, demonstrating how necessary this measure – financed with annex funds – was and still is.

The software development was conceptually subdivided in a three-step model. In a first step, standard tools of software companies on the market are used to enable the access to the digital processes. A broad market observation and evaluation of more than 30 producers and users including an intensive exchange of experience with various Leibniz institutes ensures sufficient market knowledge and an estimation of the feasibility of the catalogue of requirements for those participating in the preparation of the project. In the first step, financial tools for the accounting department and the financial funds in the administration of third-party funds as well as small parts of the electronic personnel administration are first of all developed and / or used, master data are developed and existing data are transferred from the system ProFiskal whose software is no longer maintained. Once the first step is running reliably, further extensions on project management, awarding and travel costs will take place in a second step of the process that as can be expected to take several years. The third step, for which software still needs to be developed, will take care of the individual confectioning aiming at having a tailored system for PIK including its manifold reporting and communication tasks.

**New building of PIK**

One of the greatest and most attractive challenges for PIK's administration is the new research building.

The progress made regarding the new building is quite obvious. While only cranes rose above the forest when the foundation stone was laid in June 2012, now the outline of the building outlines is clearly visible. After completing the basement in early winter, the construction company began to fill the six-metre deep ditch around the building. The girders on the west side could finally be installed. Now, the first cores and external walls on the ground floor as well as parts of the first floor are already finished – two other floors will follow.

In parallel, service installation work started in October. Since the beginning of December, this work had to be interrupted several times due to longer frost periods. Service installation work includes the laying of drinking water and sewage pipes, cables for medium voltage supply and the connection of the emergency power system as well as the laying of empty pipes for data transfer and telephone cables later on.

Since the new research building is closely linked with the high-performance computer which is financed by the European Regional Development Fund (ERDF) and will cost some 4 million Euros, the timely availability of the high-performance computer is of great importance for the overall project. The high-performance computer is in two respects indispensable for research at PIK. Modelling work at PIK is simply not conceivable without a new computer. At the same time, as planned, the computer will provide heating for the building itself and other buildings in the science park. Regarding the financial funds, there has not yet been a positive decision from the ERDF committee at the time of reporting.

**Vocational training at PIK**

In addition to the two vocational training positions as IT specialist for system integration, which PIK has provided for a number of years, since 2012 the institute was able for the first time to successfully fill the vacancy of a volunteer trainee in the press and public relations office and two vocational training positions for the three-year apprenticeship as office communication assistant. Like many other Leibniz institutes, PIK has thus strengthened its commitment to social responsibility.

**PIK and Leibniz**

PIK again increased its engagement in the Leibniz Association last year. The institutional representative of the Board of Directors as well as the head of administration actively participate in the strategy development process of Leibniz and the head of administration is engaged in the committees of the working groups finance, personnel and law as well as in the expert group for dual training.

*Visualisation of PIK's new building Photo: Architectural office BHBVT*

# [ 4.4 ] Technical Support Unit (TSU) of Working Group III of the UN Intergovernmental Panel on Climate Change IPCC

*Head: Jan Minx*

**The TSU support the chairs of Working Group III of the IPCC Ottmar Edenhofer, Ramón Pichs-Madruga and Youba Sokono scientifically and organisationally in preparing the IPCC reports.**

## Activities of the TSU in 2012

Currently, the TSU together with its chair are organising the preparation of the contribution of Working Group III to the Fifth Assessment Report (AR5) of the IPCC. More than 230 scientists from 57 countries are participating as authors and meet on a regular basis within the framework of lead author meetings. Moreover, other scientists, experts and government representatives are participating as reviewers in the reporting process. In addition, there are expert meetings on certain topics, the results of which are considered by the authors. In 2012, the second and third of four lead author meetings in total took place. The report is expected to be adopted by government representatives at a plenary meeting of Working Group III of the IPCC in 2014.

Besides, the Special Report of Working Group III on Renewable Energy Sources and Climate Change Mitigation (SRREN) adopted in May 2011 was presented at different events in 2012.

### Work on the Fifth Assessment Report of the IPCC

The writing process for the contribution of Working Group III to the Fifth Assessment Report began in July 2011. At the beginning of 2012, an informal evaluation of the first draft (zero order draft) by the authors and selected experts took place. After compiling the received comments by the TSU, the authors started their work on the first official draft (first order draft) of the report. This draft was examined by experts from July to September 2012 who had previously registered for it. The more than 16,000 comments received were included and compiled by the TSU and forwarded to the authors whereupon they began to work on the second official draft (second order draft), supported by the TSU.

### Second lead author meeting

The second of four lead author meetings for the Fifth Assessment Report of the IPCC with more than 200 participants took place in Wellington, New Zealand on 19 – 23 March. An overall goal of the meeting was the introduction of the work on the first official draft of the report after considering the comments received during the informal evaluation. The work on chapter-overlapping topics was continued, in order to have them treated consistently in the final report.

**Third lead author meeting**
The third lead author meeting took place in Vigo, Spain, 5 – 9 November. Here, the comments received during the evaluation of the first official draft were discussed and the preparation of the second official draft initiated. Besides the lead authors, the official evaluators of the individual chapters, who play an important role in preparing the report, were also invited for the first time.

**Organisation of expert meetings**
In 2012, the following experts meetings also took place, the results from which will flow directly into AR5:

- 17 – 18 March (Wellington, New Zealand): Consistency in AR5 by chapter-overlapping use of socio-economic scenarios and their connection with sectoral knowledge (third of four meetings)
- 6 – 8 August (Washington, D.C., USA): Expert evaluation meeting
- 3 – 4 November (Vigo, Spain): Consistency in AR5 by chapter-overlapping use of socio-economic scenarios and their connection with sectoral knowledge (third of four meetings)

**SRREN outreach**
Moreover, the following events at which the special report of Working Group III (SREEN) was presented took place in 2012:

- 21 – 23 May (Ny-Ålesund, Spitsbergen, Norway): SRREN presentation at the Ny-Ålesund symposium 2012
- 4 September (Arusha, Tanzania): SRREN presentation at the 38th meeting of the Southern African Power Pool (SAPP)
- 18 October (Addis Ababa, Ethiopia): SRREN outreach workshop at the United Nations Economic Commission for Africa, African Climate Policy Centre
- 28 November (Doha, Qatar): SRREN presentation as side event of COP 18

*Plenary meeting of Working Group III during the third lead author meeting in Vigo, Spain.*
*Photo: Benjamin Kriemann*

# 05
# APPENDIX

## [ 5.1 ] Organisational Structure of PIK

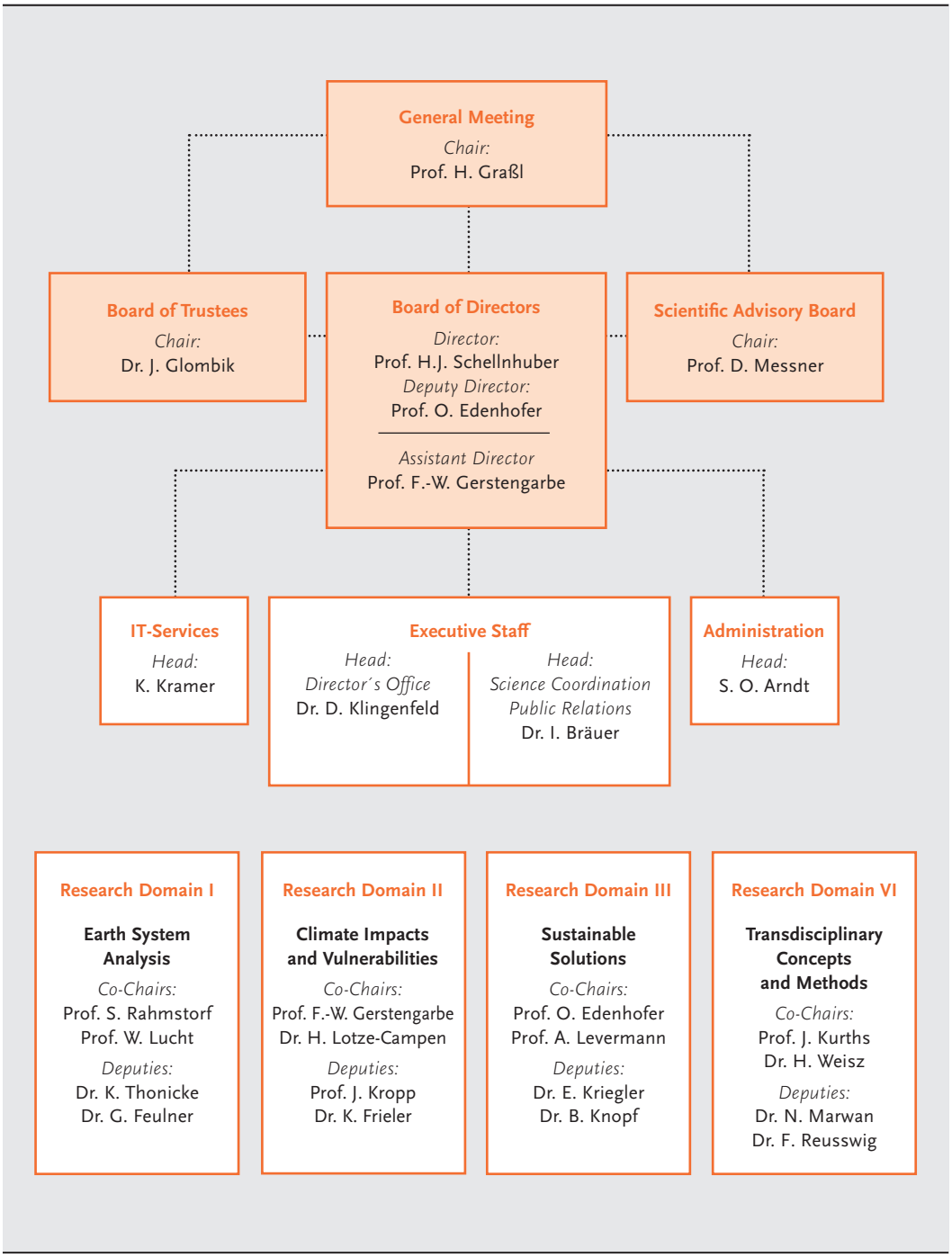



Fig. 24

# [ 5.2 ] Scientific Advisory Board and Board of Trustees

**Scientific Advisory Board**

| Name | Institution | Term in Office |
|---|---|---|
| *Chairperson:* Professor Dr. Dirk Messner | Deutsches Institut für Entwicklungspolitik, Bonn | 01.01.2009 – 31.12.2016 |
| *Deputy Chairperson:* Professor Johan Rockström | Stockholm Environment Institute, Stockholm | 01.01.2005 – 31.12.2012 |
| Professor Henry Abarbanel | Institute for Nonlinear Science, University of California, San Diego | 01.01.2009 – 31.12.2016 |
| Professor Dr.-Ing. Martin Faulstich | Technische Universität München, Sträubing | 01.01.2010 – 31.12.2013 |
| Professor Sir Brian Hoskins | Grantham Institute for Climate Change, Imperial College London | 01.01.2008 – 31.12.2015 |
| Professor Dr. Helga Kromp-Kolb | Institut für Meteorologie, Universität für Bodenkultur, Wien | 01.01.2008 – 31.12.2015 |
| Jennifer Morgan | World Resources Institute, Washington | 01.01.2010 – 31.12.2013 |
| Professor Lord Nicholas Stern | The London School of Economics and Political Science | 01.01.2009 – 31.12.2012 |
| Professor Dr. Georg Teutsch | Helmholtz-Zentrum für Umweltforschung – UFZ, Leipzig | 01.01.2010 – 31.12.2013 |
| Dr. Carol Turley | Plymouth Marine Laboratory | 01.01.2009 – 31.12.2012 |
| Professor Dr. Heinz Wanner | Oeschger Centre for Climate Change Research, University of Bern | 01.01.2010 – 31.12.2013 |
| Professor Dr. Georg Weizsäcker | Deutsches Institut für Wirtschaftsforschung, Berlin | 01.01.2012 – 31.12.2015 |

**Board of Trustees**

| Name | Institution | Term in Office |
|---|---|---|
| *Chairperson:* Dr. Josef Glombik | Ministerium für Wissenschaft, Forschung und Kultur des Landes Brandenburgs | Since 01.01.2003 |
| *Deputy Chairperson:* Dr. Gisela Helbig | Bundesministerium für Bildung und Forschung | Since 14.09.2007 |
| Professor Dr. Hartmut Graßl | Max-Planck-Institut für Meteorologie, Hamburg | Since 01.01.2001 |
| Professor Dr. Peter Lemke | Alfred-Wegener-Institut für Meeresforschung, Bremerhaven | Since 01.01.2002 |
| Professor Dr. Dirk Messner | Deutsches Institut für Entwicklungspolitik, Bonn | Since 22.02.2010 |
| Klaus Milke | Germanwatch e.V., Bonn | From 01.01.2011 to 31.12.2014 |
| Hildegard Müller | BDEW Bundesverband der Energie- und Wasserwirtschaft e.V. | From 09.11.2012 to 31.12.2015 |
| Professor Dr. Brigitta Schütt | Freie Universität Berlin | Since 01.08.2010 |
| Professor Dr. Robert Seckler | Universität Potsdam | Since 09.11.2012 |

*Except for the members selected according to article 7 paragraph 2 letters h and i (currently Ms. Hildegard Müller and Mr. Klaus Milke), the term in office of the members of the Board of Trustees is unlimited*

## [ 5.3 ] Staff Members

**Board of Directors**

*Director: Prof. Hans Joachim Schellnhuber*
*Deputy Director: Prof. Ottmar Edenhofer*
*Assistant Director: Prof. Friedrich-Wilhelm Gerstengarbe*

### Executive Staff

*Head of Director's Office: Dr. Daniel Klingenfeld*
*Head of Science Coordination: Dr. Ingo Bräuer*

Dr. Christine Bounama
Margret Boysen
Dr. Ingo Bräuer
Sabrina Dahlemann
Dr. Veronika Huber
Dr. Daniel Klingenfeld
Claudia Köhler
Sarah Messina
Uta Pohlmann
Eva Rahner
Alison Schlums
Mareike Schodder
Olivia Serdeczny
Ulrike Sylla
Jonas Viering
Christiane Walter
Martin Wodinski

**Climate-KIC**

Cornelia Altenbeck
Aaron Best
Izabella Kurkowska
Andreas Mögelin
Sarah Teller

### Earth System Analysis – Research Domain I

*Chairs:*
Prof. Dr. Stefan Rahmstorf, Prof. Dr. Wolfgang Lucht
*Deputy Chairs:*
Dr. Georg Feulner, Dr. Kirsten Thonicke

Torsten Albrecht
Tim Beringer
Klaus Bittermann
Dr. Alice Boit
Dr. Christine Bounama
Dr. Reinhard Calov
Dr. Dingemann Coumou
Paulo Da Silva Costa De Oliveira
Dr. Marinella Fader
Dr. Georg Feulner
Dr. Andrey Ganopolski
Dr. Dieter Gerten
Gerrit Hansen
Jens Heinke
Holger Hoff
Dr. Matthias Hofmann
Jonas Jägermeyr
Yvonne Jans
Silvia Kodeih
Markus Konzmann
Dr. Mario Krapp
Brigitta Krukenberg
Dr. Fanny Langerwisch
Prof. Dr. Wolfgang Lucht
Dr. Maria Martin
Matthias Mengel
Sebastian Ostberg
Lena Österle
Dr. Stefan Petri
Prof. Dr. Stefan Rahmstorf
Dr. Anja Rammig
Johann Georg Rastgooy Damavvandi
Boris Sakschewski
Sibyll Schaphoff
Dr. Thomas Schneider von Deimling
Dr. Kirsten Thonicke
Guillaumme Vilain
Dr. Werner von Bloh
Marco Wiedermann
Matteo Willeit
Dr. Ricarda Winkelmann

### Climate Impacts and Vulnerabilities – Research Domain II

*Chairs:*
Prof. Dr. Friedrich-Wilhelm Gerstengarbe,
Dr. Hermann Lotze-Campen
*Deputy Chairs:*
Dr. Katja Frieler, Prof. Dr. Jürgen Kropp

Valentin Aich
Martin Batta-Lochau
Ines Blumenthal
Benjamin Bodirsky
Markus Böttle
Matthias Büchner

Tobias Conradt
Luis Costa
Sabrina Dahlemann
Samuel Fournet
Dr. Katja Frieler
Dr. Anselmo Garcia Cantu Ros
Prof. Dr. Friedrich-Wilhelm Gerstengarbe
Dr. Pia Gottschalk
Peggy Gräfe
Susanne Grossman-Clarke
Martin Gutsch
Dr. Johannes Gütschow
Dr. Fred Hattermann
Detlev Hauffe
Dr. Sabrina Hempel
Cornelia Hesse
Dr. Bernd Hezel
Dr. Peter Hoffmann
Anne Holsten
Dr. Shaochun Huang
Dr. Thomas Kartschall
Oleksandr Kit
Dr. Hagen Koch
Prof. Dr. Jürgen Kropp
Dr. Valentina Krysanova
Prof. Dr. Zbigniew Kundzweicz
Cornelius Laaser
Petra Lasch
Jascha Lehmann
Dr. Friedemann Lembcke
Stefan Liersch
Tabea Lissner
Dr. Hermann Lotze-Campen
Dr. Matthias Lüdeke
Dr. Andrea Lüttger
Julia Lutz
Dr. Malte Meinshausen
Christopher Menz
Jacob Möhring
Dr. Christoph Müller
Mady Olonschek
Dr. Ilona Otto
Christian Pape
Mahé Perette
Prajal Pradhan
Boris Prahl
Claus Rachimow
Julia Reinhardt
Dr. Dominik Reusser
Christopher Reyer
Michael Roers
Dr. Susanne Rolinski
Dr. Diego Rybski
Dr. Christoph Schmitz
Sebastian Schubert
Flavio Augusto Siabatto Pinto
Judith Stagl
Anastassi Stefanova
Till Sterzel
Prof. Dr. Manfred Stock
Bastian Stößel
Dr. Felicitas Suckow
Julia Tecklenburg
Dr. Jan Volkholz
Katharina Waha
Christiane Walter
Dr. Lila Warszawski
Dr. Frank Wechsung
Isabelle Weindl
Jana Werg
Ursula Werner
Dr. Peter Werner
Michel Wortmann
Markus Wrobel
Bin Zhou

## Climate Impacts and Vulnerabilities – Research Domain II

*Chairs:*
Prof. Dr. Ottmar Edenhofer, Dr. Anders Levermann
*Deputy Chairs:*
Dr. Brigitte Knopf, Dr. Elmar Kriegler

Dr. Tino Aboumahboub
Anna Adler
Taberé Arroyo Curras
Wibke Avenhaus
Dr. Nicolas Bauer
Dr. Lavinia Baumstark
Cristoph Bertram
Robert Bierkandt
Markus Bonsch
Steffen Brunner
Siri-Lena Chrobog
Dr. Jan-Philipp Dietrich
Prof. Dr. Ottmar Edenhofer
Patrick Eickemeier
Dr. Elham Farahani
Robert Franks
Christian Gambardella
Anastasios Giannousakis
Nico Grasselt
Godefroy Grosjean
Johann Grüneweg
Sascha Heller
Jérome Hilaire
Florian Humpenöder

Tobias Ide
Dorothe Ilskens
Dr. Michael Jakob
Fabian Joas
Dr. Susanne Kadner
Felix Kaup
Alexander Kegeles
David Klein
David Klenert
Anne Klinnert
Dr. Brigitte Knopf
Ulrike Kornek
Dr. Elmar Kriegler
Benjamin Kriemann
Annegret Kuhnigk
Dr. Marian Leimbach
Dr. Kai Leßmann
Prof. Dr. Anders Levermann
Dr. Gunnar Luderer
Dr. Robert Marschinski
Dr. Jan Minx
Dr. Ionna Mouratiadou
Paul Nahmacher
Kristiyana Neumann
Dr. Michael Pahle
Michaja Pehl
Nils Petermann
Robert Pietzcker
Thiago Pinto Barbosa
Dr. Franziska Piontek
Dr. Alexander Popp
Nicole Reinhardt
Niklas Roming
Jussi Savolainen
Dr. Jacob Schewe
Steffen Schlömer
Eva Schmid
Anselm Schultes
Dr. Jana Schwanitz
Dr. Gregor Schwerhoff
Dr. Kirsten Selbmann
Kristin Seyboth
Iris Staub-Kaminski
Dr. Jan Steckel
Fee Stehle
Miodrag Stevanovic
Jessica Streffler
Susanne Stundner
Falko Ueckerdt
Sandra Venghaus
Christoph von Stechow
Nora Wegener
Leonie Wenz
Sebastian Wiesendahl
Katrin Wlucka
Anne Zimmer
Dr. Timm Zwickel

## Transdisciplinary Concepts and Methods – Research Domain IV

*Chairs:*
Prof. Dr. Jürgen Kurths, Dr. Helga Weisz
*Deputy Chairs:*
Dr. Norbert Marwan, Dr. Fritz Reusswig

Antonella Battaglini
Dr. Nicola Botta
Dr. Sentilkumar Dhamapuri Vujayan
Dr. Jonathan Donges
Dr. Reik Donner
Saskia Ellenbeck
Michael Flechsig
Badartha Goswami
Dr. Carsten Grabow
Dr. Arnim Haas
Dr. Jobst Heitzig
Magnus Heitzler
Till Hollmann
Dr. Cezar Ionescu
Prof. Dr. Jürgen Kurths
Hannes Kutza
Wiebke Lass
Johan Lilliestam
Dr. Daniel Lincke
Manuela Lubinsky
Dr. Norbert Marwan
Peter Menck
Lutz Meyer-Ohlendorf
Arghya Mondal
Dr. Eulalie Ngamga Ketchamen
Dr. Thomas Nocke
Vera Peters
Dr. Peter-Paul Pichler
Gabriele Pilz
Heike Prietzel
Kira Rehfeld
Dr. Fritz Reußwig
Aljoscha Rheinwald
Jakob Runge
Peter Schmidt
Prof. Dr. Detlef Sprinz
Veronika Stolbova
Jonas Teitge
Liubov Tupikina
Oliver Walkenhorst
Dr. Helga Weisz
Ye Wu

## IT

*Head:* Karsten Kramer

Dietmar Gibietz-Rheinbay
Joachim Glauer
Roger Grzondziel
Maximilian Kasmale
Karsten Kramer
Benjamin Kriemann
Ciaron Lindstead
Saskia Lubrich
Helmut Miethke
Marco Viertel
Sandro Waldschmidt

## Administration

*Head:* Sven Oliver Arndt
*Deputy Head:* Frauke Haneberg

Sven Oliver Arndt
Annemarie Dengler
Kerstin Duckstein
Vera Großmann
Frauke Haneberg
David Hauke
Julia Höfner
Monika Kramer
Andrea Kügler
Dr. Christine Kühnel
Lothar Lindenhan
Annett Lindow
Jürg Meyerholz
Hardy Seemann
Fanny Stahlberg
Ingmar Tübbecke
Sylvi Werner
Susanne Ziche

## Staff members who left the institute in 2012 /2013

State: 31 March 2013

Tabaré Arroyo Currás
Christina Bechini von Lazan
Olaf Bochmann
Jennifer Brenke
Ephraim Broschkowski
Patricia Brtnik
Claudine Chen
Marianela Fader
Franziska Faul
Dr. Christian Flachsland
Simone Fischer
Sonja Förster
Dr. Naoya Fujiwara
Steffen Fürst
Catrin Gellhorn
Markus Haller
Sascha Heller
Sabrina Hempel
Elke Henning
Moritz Hütten
Prof. Carlo Jaeger
Alexander Kegeles
Silvia Kodeih
Tina Kollaske
Athanasios Kostopoulos
Nadine Kuhla-von-Bergmann
Annegret Kuhnigk
Teresa Lenz
Dr. Daniel Lincke
Sylvie Ludig
Kathleen Markmann
Jakob Müller
Dr. Hermann Österle
Dr. Jörg Pietsch
Doreen Siegert
Uta Pohlmann-Steinhauser
Lena Reuster
Maria del Rocio Rivas Lopez
Olivia Roithmeier
Sebastian Scholz
Volker Schimming
Jonas Teitge
Xiaoxi Wang
Arianne Walz
Oliver Walkenhorst
Tobias Weiß
Sarah Wernicke-Allers
Dr. Ye Wu
Nadine Zacharias

## Guest scientists 2012

| Name | RD | Institution | Country |
|---|---|---|---|
| Bastian Abicht | II | Justus-Liebig-Universität Gießen | Germany |
| Dr. Lilibeth Acosta-Michlik | II | | Germany |
| Michael Aklin | IV | New York University | USA |
| Altenburg, Corina | IV | Universität Potsdam | Germany |
| Xylar Asay-Davis | III | Los Alamos National Laboratory | USA |
| Dr. Jörg Aßmus | I | University of Bergen | Norway |
| Dr. Santo Banarjee | IV | Politecnico di Torino | India |
| Susana Barbosa | IV | University of Lisbon | Portugal |
| Dr. Eva Bauer | I | Institute for Advanced Sustainability Studies | Germany |
| Albert Baur | III | Technische Universität Berlin | Germany |
| Hamed Beheshti | TSU | Freie Universität Berlin | Germany |
| Sophie Benard | III | Ecole Central Paris / TU Berlin | Germany |
| Virgilio Bento | IV | University of Lisbon | Portugal |
| Isabell Bergmann | II | Universität Dresden | Germany |
| Robert Bierkandt | III | Universität Potsdam | Germany |
| Dr. Tamas Bodai | IV | Max-Planck-Institut Dresden | Germany |
| Christopher Brandt | I | Freie Universität Berlin | Germany |
| Prof. Robert Brecha | III | University of Dayton | USA |
| Lars Brückner | IV | Universität Bremen | Germany |
| Prof. Ken Caldeira | Gast des Direktors | Stanford University | USA |
| Levke Ceaser | I | Universität Potsdam | Germany |
| Elias Döhne | IV | Freie Universität Berlin | Germany |
| Dana Ehlert | I | Universtiät Potsdam | Germany |
| Joshua W. Elliott | II | Computation Institute, Chicago | USA |
| Johannes Feldmann | I | Universität Potsdam | Germany |
| Dr. Manoel Ferreira Cardoso | I | Instituto Nacional de Pesquisas Espaciais | Brazil |
| Dr. Aideen Foley | I | University of Cambridge | UK |
| Dr. Andrew Friend | I | University of Cambridge | UK |
| Daniel Fürstenwerth | IV | Renewables Grid Initiative | Germany |
| Saurabh Gandhi | IV | Department of Physics, IIT-Bombay | India |
| Oxana Glushkovskaya | IV | State University Saratov | Russia |
| Aimee Gotway Bailey | IV | American Association for the Advancement of Science / U.S. Department of Energy | USA |
| Benjamin Grosse | III | FH Flensburg und Al Akhawayn University in Ifrane, Marokko | Germany |
| Prof. Thomas Guhr | IV | University of Duisburg-Essen | Germany |
| David Hansmann | IV | | Germany |
| Prof. Sharon Harlan | II | Arizona State University | USA |
| Thibau Henin | IV | | Belgium |
| Prof. Yoshito Hirata | IV | Aihara Laboratory, University of Tokyo | Japan |
| Lion Hirth | III | Vattenfall | Germany |
| Prof. Daniel Ho | IV | City University of Hong Kong | China |
| Kathrin Högner | II | Universität Oldenburg | Germany |
| Kathrin Hohmann | IV | Martin-Luther-Universität Halle-Wittenberg | Germany |

| | | | |
|---|---|---|---|
| Ingram Jeccard | III | Simon Fraser University | Canada |
| Mathieu Jonard | II | Université catholique de Louvain | Belgium |
| Sheril Kirshenbaum | III | University of Texas, Austin, and American Fellow 2012 at Marshall Memorial Fellowship | USA |
| Klaus Keller | III | | Germany |
| Daniel RichaKlein | II | Linköping University | Sweden |
| Katharina Kohl | IV | | Germany |
| Jens Kolbe | IV | | Germany |
| Martin Köppel | IV | | Germany |
| Dr. Aneta Koseska | IV | Humboldt Universität zu Berlin | Macedonia |
| Michael Krause | I | Humboldt Universität zu Berlin | Germany |
| Dr. Tobias Kümmerle | I | Humboldt Universität zu Berlin | Germany |
| Sven Kunze | III | Biofuels-Gruppe | Germany |
| Esther Laabs | III | Humboldt Universität zu Berlin | Germany |
| Xavier Labandeira | III | University of Vigo | Spain |
| Prof. Muthusamy Lakshmanan | IV | Centre for Nonlinear Dynamics, Bharathidasan University | India |
| Nils Lange | II | | Germany |
| Lixiang Li | IV | Beijing University of Posts and Telecommunications | China |
| Lulu Li | IV | City University of Hong Kong | China |
| Xiucang Li | II | Nanjing University of Information Science and Technology | China |
| Junguo Liu | I | School of Nature Conservation, Beijing Forestry University | China |
| Zonghua Liu | IV | East China Normal University | China |
| Prof. Jianyan Lu | IV | Southeast University, Nanjing | China |
| Thang Luong | II | University of Arizona | USA |
| Alberto Salazar Martínez | II | Catholic University of Leuven | Belgium |
| Cecilia Matasci | II | École polytechnique fédérale de Lausanne | Switzerland |
| Sabine Mathesius | I | Technische Universität Braunschweig | Germany |
| Jose Matos | IV | University of Porto | Portugal |
| Linus Mattauch | III | Technische Universität Berlin | Germany |
| Dr. Aissatou Mboussi | IV | University of Yaoundel | Cameroon |
| Aarathy Menon | I | Universität Potsdam | India |
| Ted Moldenhawer | I | Universität Potsdam | Germany |
| Dominik Moritz | Vorbe. | Hasso-Plattner-Institut | Germany |
| Reiner Mühlhof | III | Technische Universität Berlin | Germany |
| Heike Munderloh | II | Climate Media Factory | Germany |
| Manju Shrii Mururgesan | IV | | India |
| Mutz, Sabrina | III | Humboldt Universität zu Berlin | Germany |
| Jana Ollmann | IV | Universität Konstanz | Germany |
| Dirk Olonschek | I | Universität Potsdam | Germany |
| Paige Martin | IV | Harvard University | USA |
| Alexey Pavlov | IV | State University Saratov | Russia |
| Thomas Peron | IV | | Brazil |
| Dr. Awadhesh Prasad | IV | University of Delhi | India |
| Philippe Quirion | III | Centre International de Recherche sur l'Environnement et le Développement (CIRED) | France |
| Alexander Radebach | IV | | Germany |
| Dr. Avila Ramirez | IV | Universidad Mayor de San Andrés | Bolivia |

| | | | |
|---|---|---|---|
| Johann Rastgooy | II | | Germany |
| Andreia Ribeiro | IV | University of Lisbon | Portugal |
| Prof. Jorge Rijas | II | Universidade de Conception Víctor Lamas | Chile |
| Maria del Rocio Rivas Lopez | II | BTU Cottbus | Spain |
| Dr. Alexander Robinson | I | Universidad Complutense de Madrid | Spain |
| Sabrina Roy | IV | Albert-Ludwigs-Universität Freiburg | Germany |
| Dr. Alberto Salazar | II | Catholic University of Leuven | Belgium |
| Diana Saturnino | IV | University of Lisbon | Portugal |
| Dr. Rudi Schaefer | IV | Universität Duisburg-Essen | Germany |
| Johannes Schielein | I | Universität Potsdam | Germany |
| Anna Schürkmann | II | Universität Potsdam | Germany |
| Pallavi Sharma | II | TERI University, New Delhi | India |
| Gustavo Silva Santos | III | Biofuels-Gruppe | Brazil |
| Prof. Sudeshna Sinha | IV | IISER, Mohali | India |
| Cornelia Strube | IV | Universität Bayreuth | Germany |
| Prof. Natalia Stankevich | IV | Technical University Saratov | Russia |
| Dejan Stojanovic | II | Institute for Lowland Forestry and Environment, Novi Sad | Serbia |
| Prof. Elena Surovyatkina | IV | Space Research Institute of Russian Academy of Sciences | Russia |
| Dr. Anastasia Svirejeva-Hopkins | IV | | Germany |
| Dr. Yang Tang | IV | Hong Kong Polytechnic University | China |
| Vera Tekken | II | Universität Greifswald | Germany |
| Dzulia Terzijska | I | Universität Potsdam | Germany |
| Miron Thylmann | I | Humboldt Universität zu Berlin | Germany |
| Silvana Tiedemann | IV | | Germany |
| Ingmar Tübbecke | Verw. | | Germany |
| Luis Gustavo Tudeschini | III | Universidade de São Paulo | Brazil |
| Karl-Heinrich v.Bothmer | II | Beirat für Nachhaltige Entwicklung Brandenburg | Germany |
| Saskia Versteeg | I | University of Texas | USA |
| Tobias Vetter | II | Universität Potsdam | Germany |
| Steffen von Bünau | IV | International Finance Cooperation (World Bank Group), Moscow | Russia |
| Marek Wallenfels | III | 2° – Deutsche Unternehmer für Klimaschutz, MCC | Germany |
| Xiaoxi Wang | II | Humboldt Universität zu Berlin | China |
| Li Xiucang | II | Nanjing University of Information Science & Technology | China |
| Prof. Yoshiki Yamagata | IV | Center for Global Environmental Research, National Institute for Environmental Studies | Japan |
| Mitsusune Yamaguchi | III | University of Tokyo | Japan |
| Pengtao Yu | II | Chinese Academy of Forestry, Beijing | China |
| Wenwu Yu | IV | RMIT University | Australia |
| Dr. Shuwei Zhang | III | State Grid Energy Research Institute, Beijing | China |
| Jun Zhong | II | Nanjing University of Information Science and Technology | China |
| Fatemeh Ziaeyanbahri | I | | Iran |
| Prof. Dr. Liu Zonghua | IV | | China |
| Dr. Wie Zou | IV | Chinese Academy of Sciences, Wuhan | China |
| Dr. Yong Zou | IV | The Hong Kong Polytechnic University | China |

## PhD Scholarship Holders in 2012

| Name | RD | Grant | Country |
|---|---|---|---|
| Torsten Albrecht | I | Studienstiftung des deutschen Volkes | Germany |
| Robert Bierkandt | III | Heinrich-Böll-Stiftung | Germany |
| Niklas Boers | IV | DFG IRTG 1740 | Germany |
| Ana Cano Crespo | I | DFG IRTG 1740 | Spain |
| Pavlok Dass | I | IMPRS-ESM | India |
| Jan Feldhoff | II | Humboldt-Universität Berlin | Germany |
| Ramana Venkata Gudipudi | II | Potsdam Graduate School, DAAD | India |
| Peng Ji | IV | CSC | China |
| Fabian Joas | III | Stiftung der Deutschen Wirtschaft | Germany |
| Hendrik Kienert | I | Evangelisches Studienwerk Villigst e.V. | Germany |
| Simon Kiertscher | IV | Uni Potsdam, PhD student RD4 | Germany |
| Stefan Lange | II | Humboldt-Universität Berlin | Germany |
| Peter Menck | IV | Konrad-Adenauer-Stiftung | Germany |
| Matthias Mengel | I | Deutsche Bundesstiftung Umwelt | Germany |
| Nora Molkethin | IV | DFG-Kolleg 1539 | Germany |
| Kevin Oluoch | IV | DFG-Kolleg 1364 | Kenya |
| Jakob Runge | IV | Studienstiftung des deutschen Volkes | Germany |
| Carl-Friedrich Schleussner | I | Deutsche Bundesstiftung Umwelt | Germany |
| Falko Ueckerdt | III | Heinrich-Böll-Stiftung | Germany |
| Anna Zakharova | IV | GeoForSys (Uni Potsdam) | Russia |
| Delphine Zemp | I | DFG IRTG 1740 | France |

## Awards 2012

| Name | Award / Prize |
|---|---|
| Robert Bierkandt | Doctoral scholarship of the Heinrich Böll Foundation |
| Luis Costa | Participation in the programme "Junior Teaching Professionals" of the University Potsdam |
| Climate Media Factory: Bernd Hezel and Jürgen Kropp (PIK), E. Broschkowski and K.D. Müller (HFF) | Climate Media Factory: Bernd Hezel and Jürgen Kropp (PIK), E. Broschkowski and K. D. Müller (HFF) Deauville Film Festival Green Award 2012 (Silver Award, Category Climate Change) for the movie clip "We know enough about climate change" |
| Jürgen Kropp and K.D. Müller (HFF) | Environmental Prize "Clean Tech Media Award" in the category communication for the cooperation project "Climate Media Factory" of PIK and the University for Film and Television "Konrad Wolf" (HFF) |
| Jürgen Kurths | Honorary doctorate of the Chernishevsky State University, Saratov, Russia |
| Jürgen Kurths | Guest professorship, Southeast University Nanjing, China |
| Jürgen Kurths | Foreign Member of the Macedonian Academy for Science and Arts |
| Johan Lilliestam | Award for Advanced Doctoral Students 2012 / 2013, Central European University, Budapest, Hungary |
| Nishant Malik | Carl Ramsauer Prize 2012 of the Physical Society of Berlin |
| Stefan Rahmstorf | Children's book "Clouds, Wind and Weather" elected by the German Environment Foundation as environmental book of the year 2012 |
| Kira Rehfeld | Best Presentation Award, OCHAMP-2012 Conference (Opportunities and Challenges in Monsoon Prediction in a Changing Climate), Pune, India |
| Dominik E. Reusser | Fellow of the International Social Science Council (ISSC) delegation at the Rio+20 conference |
| Diego Rybski | Participation in the programme "Senior Teaching Professionals" of the University Potsdam |
| Hans Joachim Schellnhuber | Honorary doctorate of the Technical University Berlin |
| Detlef F. Sprinz | E.ON Ruhrgas Scholar of the Research Council of Norway |
| Detlef F. Sprinz | Chairman, Scientific Committee, European Environment Agency |
| Till Sterzel | Best Paper Presentation at the Tyndall Centre Conference on 'Knowledge Gaps In Climate Change Research', April 2012 |
| Helga Weisz | Offer of W3 professorship in Ecological Energy and Material Flow Management of the University Freiburg |
| Helga Weisz | Guest professorship, Institute for Social Ecology, IFF-Vienna, Alpen-Adria University |

# [ 5.4 ] Examinations and Appointments

## Completed examinations

### Bachelor theses 2012

| Name | RD | University | Topic of thesis |
|---|---|---|---|
| Ted Moldenhawer | I | Universität Potsdam | Bestimmung der dynamischen Habitabilität von bekannten extrasolaren Planetensystemen |
| Felix Bostel | II | Universität Freiburg | Kalibrierung und Validierung von Remote-Sensing basierten Temperatur- und Siedlungsstrukturdaten für die urbane Agglomeration Hyderabad / Indien |
| Vivienne Feske | II | Hochschule für nachhaltige Entwicklung Eberswalde | Anpassung, Vulnerabilität und Auswirkungen des Klimawandels auf die Wälder in Mecklenburg-Vorpommern |
| Hübner, Mirko | II | Hochschule für nachhaltige Entwicklung Eberswalde | Anpassung, Vulnerabilität und Auswirkungen des Klimawandels auf die Wälder in Mecklenburg-Vorpommern |
| Annika Nockert | II | Humboldt-Universität zu Berlin | Quantative Bewertung der vertikalen Darstellungsgenauigkeit frei verfügbarer digitaler Höhenmodelle und deren Eignung für eine effektive Flutmodellierung |
| Katja Vogt | II | Freie Universität Berlin | „Weiche“ Faktoren der Kapazität zur Anpassung an den Klimawandel: Möglichkeiten und Grenzen eines global anwendbaren Indexes |
| Eva Hauber | IV | Humboldt-Universität zu Berlin | Changes of extreme events and dynamical complexity of rainfall in Germany under the impact of climate change |
| Ronja Hubert | IV | Technische Universität Dresden | Bewertung von Biokraftstoffen unter ökonomischen und ökologischen Nachhaltigkeitsgesichtspunkten |
| Christian Klöden | IV | Technische Universität Dresden | Integraler Taktfahrplan für Sachsen - Zukunft für den öffentlichen Personenverkehr auf Schiene und Straße |
| Finn Müller-Hansen | IV | Freie Universität Berlin | Modeling Electricity Storage in Energy Systems with High Shares of Variable Renewables |
| Michael Otto | IV | Technische Universität Dresden | Optimierung des Schienennah- und -regionalverkehrs in der Metropolregion Berlin-Brandenburg durch hierarchische Linienplanung |
| Jasmin Thurau | IV | Technische Universität Dresden | Performance und Effizienz der Schienenverkehrssysteme in Deutschland und der Schweiz |
| Silvana Tiedemann | IV | Freie Universität Berlin | Analysing the Indian Summer Monsoon's Dependency on the El Nino-Southern Oscillation Using Complex Network Theory |
| Peter Wislaug & Gregor Worpus | IV | Technische Universität Dresden | City-Maut-Systeme: Eine Perspektive für deutsche Innenstädte |

### Diploma and master theses 2012

| Name | RD | University | Topic of thesis |
|---|---|---|---|
| Johannes Feldmann | I | Universität Potsdam | Modelling of Pine Island Glacier with the Potsdam Parallel Ice Sheet Model |
| Nils Marten Lange | I | Hochschule für nachhaltige Entwicklung Eberswalde | GIS based analysis of Ukrainian land availability for sustainable bioenergy production |
| Stefanie Schäfter | I | Freie Universität Berlin | Gender issues in the watershed management in India. A case study of Kadavakurichi, Tamil Nadu |
| Laura Tydecks | I | Universität Karlsruhe | Impacts of extreme climatic events on European ecosystems |
| Bin Zhou | II | Universität Freiburg | Urban Heat Islands: A study based on a vast number of urban agglomerations |

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|---|---|---|---|
| Mohamed Moustafa Fawzy | II | Universität Potsdam | Transitioning to Green Growth Economy How to ensure the 'green economy' models of development are sustainable for growth Green Growth Strategies and Economic Policies in the EU and the OECD Countries |
| Jing Jing He | II | Universität Potsdam | Mainstreaming climate change adaptation into poverty reduction planning in China |
| Franziska Kaiser | II | Universität Potsdam | Über die Phasenstatistik phänologischer Daten und den Einfluss des Klimawandels |
| Daniel R. Klein | II | Linköpings Universitet | The electricity system vulnerability of selected European countries to climate change: A comparative analysis |
| Steffen Kriewald | II | Universität Potsdam | A dyanamical coupled model for a sustainable urban-bio-region |
| Julia Marusczyk | II | Hochschule für nachhaltige Entwicklung Eberswalde | Climate Change Adaptation as a Process: Cost Implications for India's Agriculture |
| Tada Sawako | II | Universität Potsdam | The Role of Science in Risk Policy Making |
| Christine Scholl | II | Rheinische Friedrich-Wilhelms-Universität Bonn | A systematic approach to assess the impact of climate change on European protected areas – A case study in Triglav National Park, Slovenia |
| Scott Thacker | II | Brandenburgische Technische Universität Cottbus | Climate Change, Water, and the Possible Impacts on Riverine Habitats: A Case Study for the Zala Catchment (Hungary) |
| Jens Hoffmann | III | Universität Oldenburg | Die sozialen Auswirkungen von Energie aus Biomasse – Der Einfluss von Bioenergie auf die Lebensqualität der Regionalbevölkerung Brandenburgs |
| Susann Albrecht | IV | Technische Universität Dresden | Möglichkeiten zur Einbeziehung des Verkehrssektors in den Emissionshandel |
| Anja Barth | IV | Technische Universität Dresden | Nationale Fernbusverkehre – Ökonometrische Bewertung der Chancen und Risiken |
| Kerstin Bässe | IV | Technische Universität Dresden | Strategien von Schienenverkehrsunternehmen bei Betriebsstörungen - Empirische Analyse und Bewertung |
| Anja Brumme | IV | Technische Universtät Chemnitz | Critical materials for wind power: The relevance of rare earth elements for wind turbines. |
| Claudia Fritz | IV | Technische Universität Dresden | Netzwerkstruktur, Leistungsfähigkeit und Performance öffentlicher Verkehrsträger |
| Kristian Götze | IV | Technische Universität Dresden | Prognose des Passagieraufkommens im Luftverkehr |
| Thomas Kreher | IV | Technische Universität Dresden | Konzeptionelle Modellierung emergenter Distributionsnetze |
| Hannes Kutza | IV | Humboldt-Universität zu Berlin | Pattern recognition in complex networks, based on spatially embedded time series |
| Franziska Müller | IV | Technische Universität Dresden | Integration von schienengebundenen Nah- und Regionalverkehrsangeboten: Eine Strategie für den Großraum Berlin |
| Dwi Resti Pratiwi | IV | Universität Potsdam | Assessing Energy Efficiency in Asia Megacities: Jakarta and Mumbai |
| Susann Röhr | IV | Technische Universität Dresden | Automatische Kennzeichenerfassung - ein mögliches System für eine Pkw-Maut in Deutschland? |
| Kristin Rusche | IV | Technische Universität Dresden | Effizienz von Straßenbenutzungsgebühren im europäischen Kontext |
| Romy Schneider | IV | Technische Universität Dresden | Modellierung dynamischer Prozesse in industriellen Zuliefernetzwerken |
| Jork Schreiter | IV | Technische Universität Dresden | Erweiterungspotentiale von Straßenbahnnetzen am Beispiel Gera – Förderung des ÖPNV durch Ausbau der Stadtbahn |

## Doctoral theses 2012

| Name | RD | University | Topic of thesis |
|---|---|---|---|
| Alice Boit | I | Universität Potsdam | Mechanistic theory and modeling of complex ecological networks |
| Fanny Langerwisch | I | Universität Potsdam | The Role of Climate and Land Use Change on the Riverine Carbon Fluxes in Amazonia |
| Maria Martin | I | Universität Potsdam | Numerical Simulation of the Antarctic Ice Sheet and its response to external perturbations |
| Jacob Schewe | I | Universität Potsdam | Basic physical mechanisms for monsoon failure in past and future climate |
| Ricarda Winkelmann | I | Universität Potsdam | The future sea-level contribution from Antarctica: Projections of solid ice discharge |
| Pia Gottschalk | II | University of Aberdeen | Modelling soil organic carbon dynamics under land use and climate change |
| Johannes Gütschow | II | Leibniz Universität Hannover | Quantum Information Processing with Clifford Quantum Cellular Automata |
| Shaochun Huang | II | Universität Potsdam | Modelling of environmental change impacts on water resources and hydrological extremes in Germany |
| Friedemann Lembcke | II | Technische Universität Berlin | Kalkül versus Katastrophe: Die Kommunikation des Klimawandels |
| Christoph Schmitz | II | Humboldt-Universität zu Berlin | The future of food supply in a constraining environment - modelling the impact of trade, intensification, and cropland expansion on agricultural and environmental systems |
| Markus Haller | III | Technische Universität Berlin | $CO_2$ Mitigation and Power System Integration of Fluctuating Renewable Energy Sources: A Multi-Scale Modeling Approach |
| Matthias Kalkuhl | III | Technische Universität Berlin | The Calculus of Climate Policy: Carbon Pricing and Technology Policies for Climate Change Mitigation |
| Daniel Klingenfeld | III | Technische Universität Berlin | On strategies for avoiding dangerous climate change: Elements of a global carbon market |
| Martin Kowarsch | III | Hochschule für Philosophie München | "Refreshing Democracy." Economic Assessments for Climate Policy in the Light of Pragmatist Philosophy |
| Alexander Lorenz | III | Technische Universität Berlin | Uncertainty and learning in global climate analysis |
| Jan Steckel | III | Technische Universität Berlin | Developing Countries in the Context of Climate Change Mitigation and Energy System Transformation |
| Jonathan F. Donges | IV | Humboldt-Universität zu Berlin | Functional network macroscopes for probing past and present Earth system dynamics: Complex hierarchical interactions, tipping points, and beyond |
| Sabrina Hempel | IV | Humboldt-Universität zu Berlin | Deciphering Gene Regulation from Time Series Data |
| Martin Koeppel | IV | Eberhard Karls Universität Tübingen | Explaining the Effectiveness of Binding and Non-binding Agreements: Lessons from Trans-boundary Water Quality in Europe's River Basins |
| Daniel Lincke | IV | Technische Universität Hamburg-Harburg | A transformational approach to generic software development based on higher-order, typed functional signatures |
| Nishant Malik | IV | Universität Potsdam | Extremes in events and dynamics: a nonlinear data analysis perspective into the past and present of the dynamics of the Indian summer monsoon |
| Anna Zakharova | IV | Universität Potsdam | Bifurcations in deterministic and stochastic systems and applications to biology |

## Appointments 2012

| Name | RD | University | Professorship |
|---|---|---|---|
| Prof. Dr. Ariane Walz | I | Potsdam University | W1 professorship for landscape management, Institute of Earth und Environmental Science |

## [ 5.5 ] Events

| Date | Event, venue | Organisation<br>*Organisers who are not PIK members* |
|---|---|---|
| 19. – 20.01.2012 | Workshop: 'Image Politics – Pictur(e)ing Climate', Potsdam | Thomas Nocke |
| 26.01.2012 | CREW Project Kick-off Workshop | Robert Marschinski |
| 01.02.2012 | Beiratssitzung, Projekt "Biofuel as Social Fuel", Potsdam | Kirsten Selbmann, Sandra Venghaus, Felix Kaup, Wibke Avenhaus , *Co-organiser: Sabrine Mutz, HU Berlin* |
| 06. – 07.02.2012 | ISI-MIP Kick-off Workshop, PIK, Potsdam | Katja Frieler, Veronika Huber, Franziska Piontek, Jacob Schewe, Lila Warszawski (ISI-MIP coordination team), Sabrina Dahlemann |
| 07.02.2012 | Workshop & Expert Briefing on Social Acceptance of Energy Technologies and Smart Grids | Peter Schmidt, *Co-organiser: Stiftung Neue Veratwortung* |
| 08. – 09.02.2012 | Workshop on Modelling Climate Coalitions | Kai Lessmann |
| 12.02.2012 | Panel discussion "Greening the Film Industry", Berlinale Talent Campus 2012 | Bernd Hezel, *Co-organiser: Florian Krauss, HFF* |
| 28. – 29.02.2012 | Crop modeling workshop, Part I: Hydrology and Nutrients | Katharina Waha, *Co-organiser: Stefan Olin, Lund University* |
| 28.02.2012 | Workshop with Japanese delegation on nuclear-phase out and renewables depleyoment in Germany | Michael Pahle |
| 05.03.2012 | 2nd CIPSEM Advanced Training Course for the Alexander von Humboldt Foundation International Climate Protection Fellows | Gunnar Luderer |
| 07.03.2012 | Guanting Handlungsoptionen-Workshop, PIK, Potsdam | Christiane Walter |
| 09.03.2012 | Chinese-German workshop in the framework of the SuMaRiO project: Sustainable Management of River Oases along the Tarim River in China, Potsdam | Valentina Krysanova, *Co-organiser: Jiang Tong, NCC China* |
| 17. – 18.03.2012 | 2nd Meeting on Scenarios as an Integrating Element (SIE-2) in the Working Group III (WG III) Contribution to the IPCC Fifth Assessment Report (AR5), 17-18 March 2012, Wellington, New Zealand | Technical Support Unit, IPCC WG III, *Co-organiser: Victoria University of Wellington* |
| 19. – 23.03.2012 | 2nd Lead Author Meeting (LAM 2) for the Working Group III (WG III) Contribution to the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC), 19-23 March 2012, Wellington, New Zealand | Technical Support Unit, IPCC WG III, *Co-organiser: Victoria University of Wellington* |
| 04.04.2012 | AgMIP agricultural economic model intercomparison, Paris | Hermann Lotze-Campen |
| 18.04.2012 | INKA BB Klimaworkshop, TP2, PIK, Potsdam | Christiane Walter, *Co-organiser: ZALF, Müncheberg* |
| 19.04.2012 | EntDekEn Stakeholder Workshop | Michael Jakob, Jan Steckel |
| 20.04.2012 | EntDekEn Project Meeting | Michael Jakob |
| 20.04.2012 | Projekt Workshop "Klimaschutzpotenzial von erneuerbarem Gas" mit DVGW | Gunnar Luderer |
| 21.04.2012 | Aufgeheizt – Workshop 1<br>(climate change film project) | Dim Coumou, Thomas Schneider |
| 24.04.2012 | Aufgeheizt – Workshop 2 | Dim Coumou, Thomas Schneider |
| 22. – 27.04.2012 | EGU General Assembly 2012, Session NP2.6 "Complex networks: Theory and methods applied to geophysical systems" | Reik Donner, Jürgen Kurths, *Co-organiser: T. Heckmann , W. Schwanghart , R.G. Budich , P. Nyberg, K. Steinhaeuser* |

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| 22. – 27.04.2012 | EGU General Assembly 2012, Session NP4.1 "Time Series Analysis in the Geosciences – Concepts, Methods & Applications" | Reik Donner, *Co-organiser: S.M. Barbosa* |
| 22. – 27.04.2012 | EGU General Assembly 2012, Session SC2 / NP1.6 "Short Course: Nonlinear Time Series Analysis" | Reik Donner, Jonathan F. Donges |
| 22. – 27.04.2012 | EGU General Assembly 2012, Session ERE1.1 "Food security, growth and spatial organization of urban areas." | A. Garcia Cantu, S. Kriewald, D. Rybski, J P Kropp |
| 27.04.2012 | EGU General Assembly 2012, Session on Sustainability transitions of the socio-ecologic system | D. Reusser, D. Rybski, J. Kropp, *Co-organiser: A. Cerdà, A. Ferreira* |
| 27.04.2012 | Workshop on Green Producing at the International Film Festival sehsüchte, Potsdam | Bernd Hezel, *Co-organiser: Florian Krauss, Michael Geidel, beide HFF* |
| 01. – 03.05.2012 | EIT Climate-KIC Strategic Retreat, Potsdam | Daniel Klingenfeld, H.J. Schellnhuber |
| 03.05.2012 | Workshop: The dual Challenge for Global Material Supply Chains, ERSCP 2012, Bregenz, Austria | Helga Weisz |
| 05.05.2012 | Aufgeheizt - Workshop 3 | Dim Coumou, Thomas Schneider |
| 09.05.2012 | Project Workshop "Assessment of the Green Paradox" | Nico Bauer |
| 14. – 16.05.2012 | Retreat of Climate Change and Development Group at PIK, including invited external guest | Jürgen Kropp, Diego Rybski |
| 18.05.2012 | Side event at UNFCCC meetings, Bonn: "New scenarios – Can 2 °C still be reached starting from 2020 pledges?" | Gunnar Luderer, *Co-organiser: ECOFYS, Niklas Höhne* |
| 20. – 21.05.2012 | First Workshop on the Parallel Ice Sheet Model (PISM), Hamburg, Germany | Anders Levermann |
| 21. – 23.05.2012 | GUANTING Workshop, Seddin | Christiane Walter |
| 21. – 24.05.2012 | Workshop on Sustainable pathways for urban and peri-urban agriculture at Fudan University, Shanghai, and Nanjing Agriculture University, China | Anselmo Garcia Cantu Ros |
| 30.05.2012 | Optionen zur Unterstützung der UN-Klimaverhandlungen - Polyzentrische Initiativen für eine neue Dynamik in der Klimapolitik. | Christian Flachsland, Ottmar Edenhofer, *Co-organiser: SWP* |
| 31.05.2012 | Moderation of Climate-KIC Screening Workshop on Cities | Jürgen Kropp, *Co-organiser: Climate-KIC* |
| 04. – 05.06.2012 | Crop modeling workshop, Part II | Katharina Waha, *Co-organiser: Almut Arneth, IMK-IFU; Stefan Olin, Lund University* |
| 06. – 08.06.2012 | LIMITS Project Workshop | Elmar Kriegler, Lena Reuster |
| 06.06.2012 | RoSE Project Workshop | Ioanna Mouratiadou |
| 07.06.2012 | Chinese-German working meeting in the framework of the SuMaRiO project: Sustainable Management of River Oases along the Tarim River in China, Potsdam | Valentina Krysanova, *Co-organiser: Jiang Tong, NCC China* |
| 18.06.2012 | Host and Co-Editor, "International Relations and Global Climate Change" (second edition), Authors Conference. Georg Sverdrups Hus, The University of Oslo, Oslo, Norway. | Detlef Sprinz, *Co-organiser: The University of Oslo* |
| 20. – 21.06.2012 | Potential Impacts and Uncertainties of Climate Change (MOTIVE WP2 workshop on Deliverable 2.5) | Petra Lasch, Christopher Reyer, Felicitas Suckow, *Co-organiser: Markus Lindner, EFI* |
| 27.06.2012 | Feierliche Verleihung der Würde des Ehrendoktors der Naturwissenschaften (Dr. rer. nat.) an Herrn Prof. Dr. H. J. Schellnhuber | Ottmar Edenhofer |
| 29.06. – 05.07.2012 | "Tell Your Kiez" Workshop for Authors on transmedia climate storytelling at the BMW Guggenheim Lab | Bernd Hezel, *Co-organiser: The University of Oslo* |
| 03.07.2012 | Besuch einer GIZ-Delegation | Marian Leimbach |
| 04. – 05.07.2012 | Session "Data sets and model components for an integrative assessment of climate strategies" at the iEMSs 2012 (International Congress on Environmental Modelling and Software), Leipzig | Dominik Reusser *Co-organiser: Alexandrov, Bellocchi, Borsuk, Gillet* |

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| 03.07.2012 | Session "The role of models in governing transition processes towards sustainable resource management" at the iEMSs 2012 (International Congress on Environmental Modelling and Software), Leipzig | Dominik Reusser<br>*Co-organiser: Halbe, Pahl-Wostl, Sendzimir* |
| 03. – 04.07.2012 | Session "Interaction design for environmental information systems" in Stream A (Environmental Information-, Decision Support-, and Software Systems) at International Environmental Modelling and Software Society (iEMSs) - 2012 International Congress on Environmental Modelling and Software: Managing Resources of a Limited Planet, Sixth Biennial Meeting, Leipzig | Markus Wrobel,<br>*Co-organiser: Daryl Hepting, University of Regina, CAN, and Steven Frysinger, James Madison University, USA* |
| 03.07.2012 | Workshop "Defining interaction design for environmental information systems" at International Environmental Modelling and Software Society (iEMSs) - 2012 International Congress on Environmental Modelling and Software: Managing Resources of a Limited Planet, Sixth Biennial Meeting, Leipzig | Markus Wrobel,<br>*Co-organiser: Daryl Hepting, University of Regina, CAN, and Steven Frysinger, James Madison University, USA* |
| 05.07.2012 | Buchpräsentation "Klima und Gerechtigkeit", Potsdam | Ottmar Edenhofer, Hermann Lotze-Campen |
| 08. – 21.07.2012 | Global Sustainability Summer School, PIK and IASS, Potsdam | Ulrike Sylla, Christine Bounama,<br>*Co-organiser: IASS* |
| 17.07.2012 | Gemeinsame Sitzung der AG Smart Grids mit der BDI Arbeitsgruppe "Internet der Energie" (Leitung der Session: Soziale Akzeptanz von Smart Grids), Berlin, Stiftung Neue Verantwortung. | Peter Schmidt, *Co-organiser: Stiftung Neue Verantwortung* |
| 19.07.2012 | Workshop on Transitions (International Project with GIZ) | Dominik Reusser, J Kropp, T Lissner, M Wrobel, C Walther<br>*Co-organiser: GIZ, Künkel* |
| 24.07.2012 | Seminar with Jan-Christoph Goldschmit (FhG ISE) on technological potential of solar pv. | Michael Pahle |
| 06. – 08.08.2012 | Expert Review Meeting for the Working Group III (WG III) Contribution to the IPCC Fifth Assessment Report (AR5), 6-8 August 2012, Washington D.C., USA | Technical Support Unit, IPCC WG III,<br>*Co-organiser: Institute for Sustainability* |
| 16. – 23.08.2012 | Workshop on "Climate Change Research in India - New Achievements of the Indo-German Research Project Sustainable Hyderabad" at the Center for Research on Environmental Decisions, CRED, Columbia University | Matthias Luedeke, Oles Kit and Lutz Meyer-Ohlendorf,<br>*Co-organiser: Center for Research on Environmental Decisions, CRED, Columbia University* |
| 20. – 21.08.2012 | Materials criticality. Joint PIK-Yale workshop, Yale University, New Haven, CT, USA. | Helga Weisz,<br>*Co-organiser: Yale University* |
| 28.08.2012 | Session at the 32nd International Geographic Congress 2012 in Cologne on "Capturing imagined invisibility: How to analyze social representations of climate change?" | Lutz Meyer-Ohlendorf,<br>*Co-organiser: Center for Research on Environmental Decisions* |
| 28.08.2012 | Workshop on Inward Investment in Water, Stockholm Water Week, Sweden | Holger Hoff,<br>*Co-organiser: Kings College London* |
| 29.08.2012 | Workshop on Implementing the Water, Energy, Food Security Nexus, Stockholm Water Week, Sweden | Holger Hoff,<br>*Co-organiser: Stockholm Environment Institute, BMU, BMZ* |
| 30.08.2012 | Workshop on Water for bioenergy: Assessments and policies to support improved governance, Stockholm Water Week, Sweden | Holger Hoff, Co-organiser: Stockholm Environment Institute, Gothenburg University |
| 03. – 06.09.2012 | ISI-MIP Analysis Workshop, Walker Institute at the University of Reading, GB | Katja Frieler, Veronika Huber, Franziska Piontek, Jacob Schewe, Olivia Serdeczny, Lila Warszawski (ISI-MIP Coordination team) & Sabrina Dahlemann,<br>*Co-organiser: Walker Institute at the University of Reading* |
| 03. – 15.09.2012 | Sino-German Summer School 'Integrated Water Resources Management' | Frank Wechsung, *Co-organiser: National Climate Center China* |
| 13. – 14.09.2012 | RoSE Project Workshop | Ioanna Mouratiadou,<br>*Co-organiser: CMCC* |

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| 24. – 27.09.2012 | International Interdisciplinary Conference on Predictions for Hydrology, Ecology and Water Resources Management, Water Resources and Changing Global Enviroment, Vienna, Austria | Z.W. Kundzewicz |
| 24. – 27.09.2012 | Konferenz zu Klimafolgen für Deutschland, Berlin, Humboldt Universität | F.-W. Gerstengarbe, *Co-organiser: HU Berlin* |
| 25. – 27.09.2012 | Second Annual Meeting and Workshop, Enhancing Robustness and Model Integration for The Assessment of Global Environmental Change | Marian Leimbach, Nora Wegener |
| 03. – 05.10.2012 | MOCAP Workshop on Modelling Carbon Prices - Interacting agent networks & Strategies under risk, Potsdam | Jobst Heitzig |
| 04.10.2012 | Final Workshop of the Climate Media Factory at Potsdam Film University | Lutz Meyer-Ohlendorf, *Co-organiser: Center for Research on Environmental Decisions* |
| 04.10.2012 | Workshop on "The Greening of Indian Lifestyles – Between Myth and Reality" in Hyderabad | Fritz Reusswig, Lutz Meyer-Ohlendorf, *Co-organiser: Humboldt University* |
| 08. – 10.10.2012 | 3rd International Conference on Data Analysis and Modeling in Earth Sciences (DAMES 2012), Potsdam | Reik Donner, Jürgen Kurths |
| 16. – 19.10.2012 | GREENCYCLESII Training Workshop TW5 "Earth-System Models of Intermediate Complexity", PIK, Potsdam | Georg Feulner, Andrey Ganopolski, Matteo Willeit |
| 22. – 23.10.2012 | GREENCYCLESII Mini-Conference MC4 "Biosphere-mediated human impacts on the Earth System", PIK, Potsdam | Guillaume Villain, Georg Feulner |
| 17. – 18.10.2012 | Conference on Climate Change Challenges for Water Management in Northern China, Sino-German Center, Beijing | Christiane Walter, *Co-organiser: Tian Jinghong, DHI China* |
| 23.10.2012 | Special Session "Networks of Networks and their Applications" at the NOLTA Conference in Palma de Mallorca | Norbert Marwan, Jürgen Kurths |
| 26.10.2012 | Abschlusskonferenz Climate Media Factory, Potsdam | Jürgen Kropp, *Co-organiser: K.D. Müller, HFF* |
| 03. – 04.11.2012 | 3rd Meeting on Scenarios as an Integrating Element (SIE-3) in the Working Group III (WG III) Contribution to the IPCC Fifth Assessment Report (AR5), 3-4 November 2012, Vigo, Spain | Technical Support Unit, IPCC WG III, *Co-organiser: University of Vigo* |
| 05. – 09.11.2012 | 3rd Lead Author Meeting (LAM 3) for the Working Group III (WG III) Contribution to the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC), 5-9 November 2012, Vigo, Spain | Technical Support Unit, IPCC WG III, *Co-organiser: University of Vigo* |
| 14. – 16.11.2012 | Kick-off Workshop: EU FP7 Project RAMSES: Reconciling Adaptation, Mitigation and Sustainable Development for Cities | Jürgen Kropp |
| 20.11.2012 | Workshop UBA / PIK: Synergies of Climate Protection Policies between countries of different development levels | Jürgen Kropp |
| 03.12.2012 | Climate Lecture 2012 der Technischen Universität Berlin mit Gastredner Professor Tim Jackson | Ottmar Edenhofer |
| 09. – 12.12.2012 | Winter Simulation Conference, Berlin | Jan Volkholz *Co-organiser: Adelinde Uhrmacher (Uni Rostock), Jochen Wittmann (HTW Berlin-Schöneweide)* |

| Acronym | Name of project | Ref. No. | RD | Funding agency | Funding | Duration | Head of project |
|---|---|---|---|---|---|---|---|
| Neubau EnOp | Optimierung des PIK-Neubaus sowie Variantananalyse zum Campus-Energiekonzept | 9435 | Adm | Bundesministerium für Wirtschaft und Technologie / Forschungszentrum Jülich | 1,999,786.00 € | 01.06.2011 – 31.05.2015 | Sven Arndt |
| Anpassungsstrategien | Entwicklung von Anpassungsstrategien seitens des Naturschutzes zum Erhalt hochgradig durch den Klimawandel gefährdeter Lebensgemeinschaften | 9209 | I | Deutsche Bundesstiftung Umwelt | 7,500.00 € | 03.03.2008 – 31.01.2012 | Katrin Vohland |
| Biomasse | Hydrothermale Karbonisierung von Biomasse – Potenzial, Entwurf, Versuchsanlage | 9173 | I | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 394,741.00 € | 01.04.2009 – 31.03.2012 | Hermann Lotze-Campen |
| CARBO-Extreme | The terrestrial Carbon cycle under Climate Variability and Extremes - a Pan-European synthesis | 9669 | I | Europäische Union | 185,000.00 € | 01.06.2009 – 31.05.2013 | Kirsten Thonicke |
| CLA AR5 | Qualitätssicherung von IPCC-AR5: Assistenz für koordinierenden Leitautor Arbeitsgruppe II, Kapitel 18 (Erkennung und Zuordnungen von beobachteten Auswirkungen) | 9181 | I | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 213,408.00 € | 01.01.2011 – 30.04.2014 | Wolfgang Cramer |
| GHG Europe | Greenhouse gas management in European land use systems | 9673 | I | Europäische Union | 50,000.00 € | 01.01.2010 – 30.06.2013 | Kirsten Thonicke |
| GREENCYCLES II | Anticipating climate change and biospheric feedbacks within the earth system to 2200 | 9672 | I | Europäische Union | 444,362.55 € | 01.01.2010 – 31.12.2013 | Georg Feulner |
| Greenland ice sheet | Modelling the Greenland ice sheet response to climate change on different timescales | 9750 | I | Deutsche Forschungsgemeinschaft | 162,650.00 € | 01.05.2012 – 30.04.2015 | Andrey Ganopolski |
| ICRAF | Pressures on agriculture from increased bioenergy demand | 9436 | I | The World Agroforestry Centre | 103,200.00 € | 15.12.2011 – 14.12.2012 | Hermann Lotze-Campen |
| Klimadialog | From a dialogue on extremes, to extreme dialogues | 9214 | I | VW-Stiftung | 62,800.00 € | 01.09.2011 – 31.08.2012 | Dim Coumou |
| Kulunda | Process-based Modelling of the Carbon Cycle and the Impact of Land Use Changes on the Regional Carbon Balance of the Kulunda Steppe | 9189 | I | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 115,530.00 € | 01.01.2012 – 30.09.2016 | Hermann Lotze-Campen |
| LEGATO | Landnutzungsintensitäten und ökologische Massnahmen-Werkzeuge zur Bewertung von Risiken und Möglichkeiten in Ackerbausystemen | 9182 | I | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 335,864.00 € | 01.03.2011 – 29.02.2016 | Kirsten Thonicke |

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| Meeresspiegel | Zukünftiger Meeresspiegelbeitrag der Antarktis – Erwartung und Risiko | 9193 | I | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 326,729.00 € | 01.11.2011 – 30.06.2013 | Anders Levermann |
| Modellerweiterung | Erweiterung des Land Use Allocation Models LUCALP | 95113 | I | Institut für Schnee- und Lawinenforschung, Davos, Schweiz | 2,500.00 € | 25.08.2011 – 29.02.2012 | Arianne Walz |
| NOAA | Advanced regional and decadal predicitions of coastal inundation for the U.S. atlantic coast | 9438 | I | University of Pennsylvenia | 42,023.00 € | 01.09.2011 – 31.08.2012 | Stefan Rahmstorf |
| Permafrostböden | Folgen auftauender Permafrostböden für das Klimasystem | 95125 | I | Umweltbundesamt | 70,623.40 € | 01.12.2012 – 30.11.2013 | Thomas Schneider von Daimling |
| POLFREE | Policy Options for a Resource-Efficient Economy | 9698 | I | Europäische Union | 220,306.00 € | 01.10.2012-31.03.2016 | Wolfgang Lucht |
| ROBIN | Role Of Biodiversity In climate change mitigatioN | 9694 | I | Europäische Union | 465,581.00 € | 01.11.2011-30.10.2015 | Kirsten Thonicke |
| SURVIVE | Science and policy to assist and support SIDS and LDCs to negotiate a strong international climate regime enabling low carbon development and supporting adaptation needs | 9187 | I | Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit | 3,988,304.00 € | 01.09.2011-31.08.2014 | Katja Frieler |
| AFROMAISON | Africa at a meso-scale: Adaptive and integrated tools and strategies for natural ressources management | 9686 | II | Europäische Union | 295,595.00 € | 01.03.2011-28.02.2014 | Fred Hattermann |
| AsianCitiesAdapt | Stadtentwicklung in Asien: Entwicklung klimasensitiver Anpassungspläne | 95103 | II | ICLEI European Secretariat GmbH | 289,619.72 € | 15.02.2010-14.08.2013 | Jürgen Kropp |
| BaltCICA | Baltic Sea Region | 9664 | II | European Regional Development Fund | 397,650.00 € | 25.01.2009-24.01.2012 | Jürgen Kropp |
| Berechnung Klimaentwicklung | Berechnung der Klimaentwicklung für das RCP-Szenarium 8.5 des IPCC für Thüringen auf der Bais des aus 22 GCM-Läufen abgeleitetetn maximal Temperaturtrends zwischen 2011 und 2100 | 95126 | II | Freistaat Thüringen - Thüringer Landesanstalt für Umwelt und Geologie | 8,910.00 € | 09.11.2012-10.12.2012 | Friedrich-Wilhelm Gerstengarbe |
| BTU | Modellweiterentwicklung und Modellkopplung im Rahmen des INKA BB Teilprojektes 21: Instrumentarien für die nachhaltige regionale wasserwirtschaftliche Planung und Entwicklung - Beispiel Lausitz | 95107 | II | Brandenburgische Technische Universität Cottbus | 20,545.17 € | 01.01.2011-31.12.2012 | Frank Wechsung |
| CarpathCC | Carpathian Region Consortium | 9442 | II | The Regional Environmental Center for Central and Eastern Europe | 75,000.00 € | 27.12.2011-27.06.2013 | Fred Hattermann |

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| CC-LandStraD | Flächendeckende Analysen der Konsequenzen von Landnutzungsänderungen in Deutschland für den Wasser- und Stoffhaushalt | 9180 | II | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 386,249.00 € | 01.11.2010-31.10.2015 | Frank Wechsung |
| CGSS 2012 | Chin.-Deutsche Sommerschule "Integrated Water Resources Management" 3.-15.09.2012 Urumqi | 9079 | II | Chinesisch-Deutsches Zentrum für Wissenschafts-förderung, China | 510,360.00 € | 03.09.2012-15.09.2012 | Frank Wechsung |
| CIES | Climate Impact Expert System | 9909b | II | EIT | 500,000.00 € | 01.11.2010-31.12.2013 | Friedrich-Wilhelm Gerstengarbe |
| CLIMAFRICA | Climate change predicitions in Sub-Saharan Africa: impacts and adaptations | 9680 | II | Europäische Union | 217,560.00 € | 01.10.2010-30.09.2014 | Fred Hattermann / Holger Hoff |
| DEWFORA | Improved drought early warning and forecasting to strengthen preparedness and adaptation to droughts in Africa | 9683 | II | Europäische Union | 168,618.00 € | 01.01.2011-31.12.2013 | Fred Hattermann |
| ESPON Climate | Climate change and territorial effects on regions and local economies | 9666 | II | European Regional Develop-ment Fund | 98,365.00 € | 08.12.2008-23.01.2012 | Jürgen Kropp |
| Ethiopia | Climate Change and Adaptation in Ethiopia | 9440 | II | Auswärtiges Amt | 60,045.00 € | 01.03.2012-31.12.2012 | Stefan Liersch |
| Gefahrenquellen | Vorkehrungen und Maßnahmen aufgrund der Gefahrenquellen Wind und Schnee unter Berücksichti-gung des Klimawandels | 95115 | II | Krätzig & Partner Ing.ges. Bautechnik mbH | 15,000.00 € | 01.09.2011-01.03.2013 | Manfred Stock |
| GLUES | Globale Abschätzung der Auswirkungen von Landnut-zungsänderungen auf Treibhausgasemissionen und Ökosystemare Dienstleistungen - Klima- und Landnut-zungsszenarien | 9170 | II | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 765,405.00 € | 01.01.2010-31.12.2014 | Wolfgang Lucht |
| Guanting | Nachhaltige Wasser- und Landnutzung im Guanting Einzugsgebiet unter begrenzten Wasserressourcen | 9167 | II | Bundesministerium für Bildung und Forschung / Forschungszentrum Jülich | 762,067.00 € | 01.06.2009-31.05.2012 | Frank Wechsung |
| HABIT-CHANGE | Adaptive management of climate-induced changes of habitat diversity in protected areas | 9677 | II | European Regional Develop-ment Fund | 136,320.00 € | 01.03.2010-28.02.2013 | Fred Hattermann |
| HGF-Allianz | Combining remote sensing with process-based vegetation modeling | 9443 | II | Helmholtz-Gemeinschaft / Deutsches Luft- und Raumfahrtszentrum | 234,375.90 € | 01.07.2012-30.06.2017 | Anja Rammig |
| IEA | Climate data for each of the model regions of the IEA's World Energy Model | 95122 | II | International Energy Agency | 4,201.68 € | 2012 | Katja Frieler |

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| ImmoRisk | Risikoabschätzung der zukünftigen Klimafolgen in der Immobilien- und Wohnungswirtschft | 95121 | II | Universität Regensburg, Institut für Immobilienwirtschaft | 7,000.00€ | 01.06.2012-30.06.2012 | Friedrich-Wilhelm Gerstengarbe |
| IMPACT2C | Quantifying projected impacts under 2 °C warming | 9693 | II | Europäische Union | 211,990.00€ | 01.10.2011-30.09.2015 | Fred Hattermann |
| INKA-BB | Innovationsnetzwerk Klimaanpassung Region Brandenburg Berlin | 9166 | II | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 526,093.00€ | 01.05.2009-30.04.2014 | Frank Wechsung |
| INNOVATE | Nachhaltige Nutzung von Stauseen durch innovative Kopplung von aquatischen und terrestrischen Ökosystemfunktionen | 9194 | II | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 552,957.00€ | 01.01.2012-31.12.2016 | Fred Hattermann |
| ISI-MIP | Sektorenüberrgreifender Klimafolgen-Modellvergleich (Inter-Sectoral Impact Model Intercomparison Project, ISI-MIP) | 9195 | II | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 1,419,571.00€ | 01.04.2012-31.08.2013 | Katja Frieler |
| ISI-MIP | Sektorenüberrgreifender Klimafolgen-Modellvergleich (Inter-Sectoral Impact Model Intercomparison Project, ISI-MIP) | 9195c | II | Ministerie van Infrastructuur en Milieu, Niederlande | 100,000.00€ | 01.04.2012-31.08.2014 | Katja Frieler |
| IVA | Integrative Analyse und Bewertung von Klimaänderungen und Klimafolgen als Grundlage integrierter Anpassungsmaßnahmen | 95100 | II | Umweltbundesamt | 168,122.69€ | 01.04.2010-30.05.2012 | Helga Weisz |
| IVA II | Anwendung von Konzepten, Werkzeugen und Methoden der integrierten Risikobewertung - Entscheidungshilfen für Anpassung an den Klimawandel | 95108 | II | Umweltbundesamt | 325,343.70€ | 01.02.2011-30.04.2014 | Helga Weisz |
| KIBEX | Kritische Infrastruktur, Bevölkerung und Bevölkerungsschutz im Kontext klimawandelbeeinflusster Extremereignisse | 9429 | II | Bundesamt für Bevölkerungsschutz und Katastrophenhilfe: United Nations University, Institute for Environment and Human Security | 85,000.00€ | 01.10.2009-30.09.2012 | Jürgen Kropp |
| Klimacheck | Klimacheck der Maßnahmenplanung in der Elbe zur EU-WRRL mit der Elbe-Expert-Toolbox | 9192 | II | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 58,644.00€ | 01.11.2011-31.10.2014 | Frank Wechsung |
| Konzept FGG | Konzept für ein überregionales Wassermengenmanagement in der Flussgebietsgemeinschaft Elbe | 95114 | II | Flussgebietsgemeinschaft Elbe | 12,605.04€ | 29.08.2011-01.10.2012 | Hagen Koch |

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| LAGOONS | Integrated water resources and coastal zone management in Europeans lagoons in the context of climate change | 9692 | II | Europäische Union | 334,388.50 € | 01.10.2011-30.09.2014 | Valentina Krysanova |
| MACSUR | Die europäische Landschaft mit dem Klimawandel in Bezug auf Ernährungssicherheit modellieren | 9196 | II | Bundesministerium für Bildung und Forschung / Forschungszentrum Jülich | 330,978.00 € | 01.07.2012-30.06.2015 | Hermann Lotze-Campen |
| MEDIATION | Methodology for Effective Decision-making on Impacts and AdaptaTION | 9675 | II | Europäische Union | 304,575.00 € | 01.01.2010-30.06.2013 | Jürgen Kropp |
| MOTIVE | Models for adaptive forest management | 9670 | II | Europäische Union | 251,849.00 € | 01.05.2009-30.04.2013 | Petra Lasch |
| NaLaMa | Nachhaltiges Landmanagement im Norddeutschen Tiefland unter sich ändernden ökologischen, ökonomischen und gesellschaftlichen Rahmenbedingungen - TP Klimaszenarien | 9174 | II | Bundesministerium für Bildung und Forschung / Forschungszentrum Jülich | 236,768.00 € | 01.09.2010-31.08.2015 | Friedrich-Wilhelm Gerstengarbe |
| PROGRESS | Potsdamer Forschungs- und Technologieverbund zu Naturgefahren, Klimawandel und Nachhaltigkeit | 9177 | II | Bundesministerium für Bildung und Forschung / Forschungszentrum Jülich | 1,327,210.00 € | 01.11.2009-31.10.2014 | Jürgen Kropp |
| PSI-connect | Policy Science Interactions: connecting science and policy through innovative knowledge brokering | 9668 | II | Europäische Union | 162,221.00 € | 01.05.2009-30.04.2012 | Valentina Krysanova |
| RAMSES | Reconciling Adaption, Mitigation and Sustainable Development for Cities | 96100 | II | Europäische Union | 691,860.32 € | 01.10.2012-30.09.2017 | Jürgen Kropp |
| Staßenbetrieb | Analyse der Auswirkungen des Klimawandels auf den Straßenbetriebsdienst | 95120 | II | Hochschule Biberach | 40,766.10 € | 01.06.2012-31.05.2013 | Friedrich-Wilhelm Gerstengarbe |
| SuMaRio | Nachhaltige Bewirtschaftung von Flussoasen entlang des Tarim Flusses in China | 9183 | II | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 510,069.00 € | 01.03.2011-29.02.2016 | Zbigniew Kundzewicz |
| Synergien | Synergien von Maßnahmen des Klimaschutzes und der Anpassung an den Klimawandel zwischen Ländern in unterschiedlichen Entwicklungsphasen | 95118 | II | Umweltbundesamt | 185,722.90 € | 15.11.2011-15.07.2014 | Jürgen Kropp |
| Transition | Methodeninventar zur Klimaanpassung | 95112 | II | Deutsche Gesellschaft für Internationale Zusammenarbeit | 686,900.00 € | 01.06.2011-31.05.2013 | Jürgen Kropp |
| UBA-costs | Optionen für Anpassung im internationalen Klimaschutzregime: Unterstützung bei der Ausgestaltung der Kopenhagen Vereinbarung und der Verhandlung eines Post-2012-Abkommens | 95109 | II | Umweltbundesamt | 103,410.69 € | 01.05.2011-31.10.2012 | Jürgen Kropp |

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| UCaHS | Stadtklima und Hitzestress in Städten der Mittelbreiten in Anbetracht des Klimawandels | 9752 | II | Deutsche Forschungsgemeinschaft | 264,581.00 € | 01.06.2012-31.05.2015 | Friedrich-Wilhelm Gerstengarbe |
| WASSERMed | Water Availability and Security in Southern EuRope and the Mediterranean | 9674 | II | Europäische Union | 262,801.50 | 01.12.2009-31.11.2012 | Fred Hattermann / Holger Hoff |
| WET Haihe | Water Expert Toolbox für das Haihe Einzugsgebiet | 9184 | II | Deutsches Zentrum für Luft- und Raumfahrt / Internationales Büro des BMBF | 16,540.00 | 01.08.2011-31.12.2012 | Ilona Otto |
| WeTwin | Enhancing integrated water management on twinned wetlands from Europe, Africa and South America in support of EU water initiatives | 9662 | II | Europäische Union | 277,205.00 | 01.11.2008-30.10.2011 | Fred Hattermann |
| CAT | Climate action tracker | 9917 | II | Ecofys Deutschland | 110,000.00 | 01.01.2012-31.12.2012 | Katja Frieler |
| ADVANCE | Advanced Model Development and Validation for Improved Analysis of Costs and Impacts of Mitigation Policies | 96101 | III | Europäische Union | 1,053,635.83 | 01.01.2013-31.12.2016 | Ottmar Edenhofer |
| AMAZALERT | Raising the alert about critical feedbacks between climate and long-term land use change in the Amazon | 9690 | III | Europäische Union | 213,114.00 | 01.09.2011-31.08.2014 | Kirsten Thonicke |
| AMPERE | Assessment of Climate Change Mitigation Pathways and Evaluation of the Robustness of Mitigation Cost Estimates | 9688 | III | Europäische Union | 574,282.34 | 01.02.2011-31.01.2014 | Elmar Kriegler |
| Biofuel | Biofuel as social fuel: Biokraftstoffe als sozialer Treibstoff einer nachhaltigen Entwicklung | 9175 | III | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 1,413,086.00 | 01.09.2009-31.08.2013 | Kirsten Selbmann |
| CliPoN | Climate Policy and the Growth Pattern of Nations | 9185 | III | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 318,799.00 | 01.09.2011-31.08.2014 | Ottmar Edenhofer |
| CReW | Klimapolitik in einer zögerlichen Welt - von zweitbesten Ansätzen zu globaler Kooperation | 9186 | III | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 434,259.00 | 01.09.2011-31.08.2014 | Ottmar Edenhofer |
| Emissionsminderungsszenarien | Szenarien zur Darstellung der Machbarkeit von 2 Grad-Emissionsminderungsszenarien - Technologien, Kosten, Petenziale - international / regional | 95106 | III | Umweltbundesamt | 157,388.25 | 03.01.2011-31.03.2013 | Elmar Kriegler |

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| ENCI-LowCarb | European Network engaging Civil society in Low Carbon scenarios | 9667 | III | Europäische Union | 110,852.00 | 01.04.2009-30.03.2012 | Ottmar Edenhofer |
| Energieeffizienz | Promotionsvorhaben: Die Rolle nachfrageseitiger Energieeffizienz im Kontext kostenoptimaler Klimaschutzstrategien | 9212b | III | Kurt Lange Stiftung | 85,000.00 | 01.04.2011-31.03.2014 | Elmar Kriegler |
| EntDekEn | Klimaschutz, Entwicklung und Gerechtigkeit: Dekarbonisierung in Entwicklungs- und Schwellenländern | 9179 | III | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 480,578.00€ | 01.08.2010-31.07.2013 | Brigitte Knopf |
| ENTRACTE | Economics instruments to achieve climate targets in Europe | 9699 | III | Europäische Union | 344,661.50€ | 01.09.2012-31.08.2015 | Robert Marschinski |
| EuropeAid | Climate Policy Outreach | 95101 | III | Centro Euro-Mediterraneo per i Cambiamenti Climatici S.c.a r.l. (CMCC) | 70,500.00€ | 01.01.2010-22.12.2012 | Ottmar Edenhofer |
| Global-IQ | Impact quantification of global changes | 9689 | III | Europäische Union | 397,380.00€ | 01.08.2011-31.07.2014 | Alexander Popp |
| Green Paradox | Das grüne Paradoxon - Wirkungsmechanismen und quantitative Bedeutung Assessing the Green Paradox - Quantitative Assessment of the Green Paradox | 9188 | III | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 249,818.00€ | 01.10.2011-30.09.2014 | Ottmar Edenhofer |
| Klimapolitik | Promotionsvorhaben: Kooperative Klimapolitik nach Kopenhagen | 9212a | III | Kurt Lange Stiftung | 85,000.00€ | 01.06.2011-31.05.2014 | Elmar Kriegler |
| Klimaschutz-potential | Analyse des Klimaschutzpotentials der Nutzung von erneuerbaren Wasserstoff und Methan | 9437 | III | Deutscher Verein des Gas- und Wasserfaches e.V. | 96,576.00€ | 01.12.2011-30.11.2012 | Gunnar Luderer |
| Kosten Ausbau | Kosten des Ausbaus erneuerbare Energien | 95119 | III | Umweltbundesamt | 37,200.00€ | 27.01.2012-31.05.2012 | Ottmar Edenhofer |
| LIMITS | Low climate impact scenarios and the implications of required tight emission control strategies | 9691 | III | Europäische Union | 573,234.00€ | 01.10.2011-30.09.2014 | Elmar Kriegler |
| RoSE | Roadmaps towards Sustainability Energy Futures: A Model-Based Assessment of Scenarios for decarbonising the energy system in 21st century | 9211 | III | Stiftung Mercator | 1,170,000.00€ | 01.01.2010-31.12.2013 | Elmar Kriegler |
| Strommarktdesign | Gutachten: Strommarktdesign der Energiewende | 95124 | III | Thüringer Ministerium für Wirtschaft, Arbeit und Technologie | 166,392.00€ | 05.11.2012-30.04.2013 | Michael Pahle |

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| TSU | Technical Support Unit (TSU) für den Co-Vorsitzenden der Arbeitsgruppe III des Weltklimarates IPCC | 9172 | III | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 5,985,440.00 € | 15.09.2008-30.09.2015 | Ottmar Edenhofer |
| BETTER | Bringing Europe and Third countries closer together through renewable Energies | 9697 | IV | Executive Agency for Competitiveness and Innovation | 119,850.00 € | 01.07.2012-31.12.2014 | Peter Schmidt |
| Bifurkationen | Dynamische Bifurkationen zur Vorhersage von Kipppunkten im Klimawandel – Gastaufenthalt Surovyatkina | 9754 | IV | Deutsche Forschungsgemeinschaft | 6,950.00 € | 06.12.2012-05.03.2013 | Jürgen Kurths |
| C3Grid-INAD | Towards on infrastructure for General Access to climate data | 9178 | IV | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 179,148.00 € | 01.10.2010-30.09.2013 | Michael Flechsig |
| CLIM-RUN | Climate Local Information in the Mediterranean region: Responding to User Needs | 9685 | IV | Europäische Union | 224,603.00 € | 01.03.2011-28.02.2014 | Antonella Battaglini |
| COMPASS | Comparative Assessment of Coastal Vulnerability to Sea-Level Rise at Continental Scale | 9671 | IV | Europäische Union | 41,040.00 € | 15.02.2009-14.02.2013 | Jochen Hinkel |
| Complex networks | Dynamical Phenomena in Complex Networks | 9751 | IV | Humboldt-Universität zu Berlin | 21,600.00 € | 01.01.2012-31.12.2012 | Jürgen Kurths |
| CRISIS | Complexity Research Initiative for Systemic InstabilitieS | 9695 | IV | Europäische Union | 286,363.00 € | 01.11.2011-30.06.2012 | Farmer / Kurths |
| Energy security | Energy security in scenarios for Europe' future electricity supply | 9433 | IV | Smart Energy for Europe Platform GmbH | 54,700.00 € | 01.03.2011-28.02.2013 | Antonella Battaglini |
| Extreme Events | Reccurent extreme events in spatially extended excitable systems: Mechanism of their generation and terminati-on | 9213 | IV | VW-Stiftung | 162,000.00 € | 01.04.2011-31.03.2014 | Jürgen Kurths |
| GRK | Gemeinsames Raumordnungskonzept Energie und Klima für Berlin und Brandenburg (GRK) - Teil 2 | 95116 | IV | Gemeinsame Landespla-nungsabteilung | 51,740.00 € | 24.10.2011-31.03.2012 | Fritz Reusswig |
| GSDP | Global systems dynamics and policy | 9679 | IV | Europäische Union | 90,000.00 € | 01.10.2010-30.09.2013 | Jürgen Kurths |
| HIMPAC | Analyse der Dynamik von Paläo- und modernen Klimadaten unter besonderer Berücksichtigung von Datierungsfehlern zur Untersuchung von Klimaüberr-gängen und Beziehungen zwischen Telekonnektionen und regionalem Klima | 9747 | IV | Deutsche Forschungsgemeinschaft | 127,200.00 € | 01.10.2010-30.09.2013 | Jürgen Kurths |

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| HyTrust | HyTrust - Auf dem Weg in die Wasserstoffgesellschaft | 9514 | IV | Unabhängiges Institut für Umweltfragen e.V. | 20,000.00 € | 01.09.2009-31.08.2013 | Carlo Jaeger |
| Investigation | Investigation of past and present climate dynamics and impact of climate tipping elements by means of a spatio-temporal analysis of climate data using complex networks | 9749 | IV | Deutsche Forschungsgemeinschaft | 122,250.00 € | 01.07.2011-30.06.2013 | Jürgen Kurths |
| Klimaneutrales Berlin | Machbarkeitsstudie: Klimaneutrales Berlin 2050 | 95127 | IV | Senatsverwaltung für Stadtentwicklung und Umwelt Berlin | 231,508.66 € | 10.12.2012-31.01.2014 | Fritz Reusswig |
| LINC | Learning about Interacting Networks in Climate | 9696 | IV | Europäische Union | 509,224.99 € | 01.12.2011-30.11.2015 | Jürgen Kurths |
| PHOCUS | Towards a photonic liquid state machine based on delay-coupled systems | 9676 | IV | Europäische Union | 215,073.00 € | 01.01.2010-31.12.2012 | Jürgen Kurths |
| PP Portugal | Projektbezogener Personenaustausch mit Portugal: Langzeitvariabilität regionaler Meeresspiegelschwankungen | 9346 | IV | Deutscher Austauschdienst | 8,078.00 € | 01.01.2011-31.12.2012 | Jürgen Kurths |
| PPP Indien | Intaracting networks to model and control dynamics of complex systems | 9347 | IV | Deutscher Austauschdienst | 6,750.00 € | 01.09.2012-31.05.2014 | Bedartha Goswami |
| SUMO | Supermodeling by combining imperfect models | 9681 | IV | Europäische Union | 219,891.00 € | 01.10.2010-30.09.2013 | Jürgen Kurths |
| EIT | Betrieb Co-Location Center Climate-KIC | 9909 | VB | EIT | 500,000.00 € | 01.01.2012-31.12.2012 | Daniel Klingenfeld |
| Klimaplattform 2012 | Betrieb der Koordinierungsstelle des Vereins Klimaplattform | 95123 | VB | Verein Klimaplattform | 5,110.61 € | 09.12.12 | Manfred Stock |
| Nachhaltig-keits-beirat | Geschäftsstelle des Beirats für Nachhaltige Entwicklung beim MUGV | 95110 | VB | MUGV Brandenburg | 168,416.69 € | 01.06.2011-31.12.2014 | Manfred Stock |
| Nobel Symposium 2011 / 2013 / 2015 | Nobel Laureate Symposium on Global Sustainability | 9074 | VB | Volkswagenstiftung | 100,000.00 € | 2011-2013 | Ulrike Sylla |
| Nobel Symposium 2011 / 2013 / 2015 | Nobel Laureate Symposium on Global Sustainability | 9074 | VB | Stiftung Mercator | 175,000.00 € | 01.04.2011-31.03.2016 | Ulrike Sylla |
| Sommerakademie | Internationale Sommerakademie "Globale Nachhaltigkeit komplex gedacht" | 9077 | VB | Robert Bosch Stiftung / IASS | 174,505.00 € | 01.05.2012-31.08.2012 | Veronika Huber |
| WS Energie | Workshop: Energie im Wirtschaftsraum Berlin-Brandenburg | 9080 | VB | Investitionsbank des Landes Brandenburg | 9,750.00 € | 01.06.2012-31.12.2012 | Izabela Kurkowska |

**Gemeinsame Projekte**

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|---|---|---|---|---|---|---|---|
| FUME | Forest fires under climate, social and economic changes in Europe, the Mediterranean and other fire-affected areas of the world | 9678 | I / II | Europäische Union | 333,443.00 € | 01.01.2010-31.12.2013 | Kirsten Thonicke |
| NaWaMa | Nachhaltiges Wassermanagement in einer globalisierten Welt | 9176 | I / II | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 573,288.00 € | 01.04.2010-31.03.2013 | Hermann Lotze-Campen |
| VOLANTE | Visions of land use transitions in europe | 9682 | I / III | Europäische Union | 386,132.00 € | 01.11.2010-30.04.2015 | Hermann Lotze-Campen |
| ERMITAGE | Enhancing Robustness and Model Integration for The Assessment of Global Environmental Change | 9684 | II / III | Europäische Union | 617,275.75 € | 01.12.2010-30.11.2013 | Marian Leimbach |
| Hyderabad | Klima und Energie in einem komplexen Transformationsprozess zur Nachhaltigkeit in Hyderabad: Nachhaltige Anpassung an und Mitigation des Klimawandels mit Blick auf Lebensstile und Konsummuster | 9171 | II / IV | Bundesministerium für Bildung und Forschung / Deutsches Luft- und Raumfahrtszentrum | 754,133.00 € | 01.07.2008-30.06.2013 | Matthias Lüdeke |

## [ 5.7 ] Publications

### Journals (ISI journals)

Adrian, R., **Gerten, D., Huber, V.,** Wagner, C., Schmidt, S. R. (2012): Windows of change: temporal scale of analysis is decisive to detect ecosystem responses to climate change. – Marine Biology, 159, 11, 2533-2542

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