Imprint

Publisher and Copyright:
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September 2007

We thank all employees for the assistance and supply of information material, without this it would not have been possible to realize this project. The retrospect of the last 10 years is not complete, but it shows some important events and the development of the institute.

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MAX-PLANCK-GESELLSCHAFT

Retrospect 1997–2007

MPI-BGC Jena

Max Planck Institute for Biogeochemistry

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MPI-BGC Jena

Preface

The Max Planck Institute for Biogeochemistry (MPI) celebrated its tenth anniversary on September 1, 2007. I would like to take this opportunity to look to the past, as the idea for and the genesis of the institute began at least 20 years ago. Allow me to guide you through a short historical retrospective.

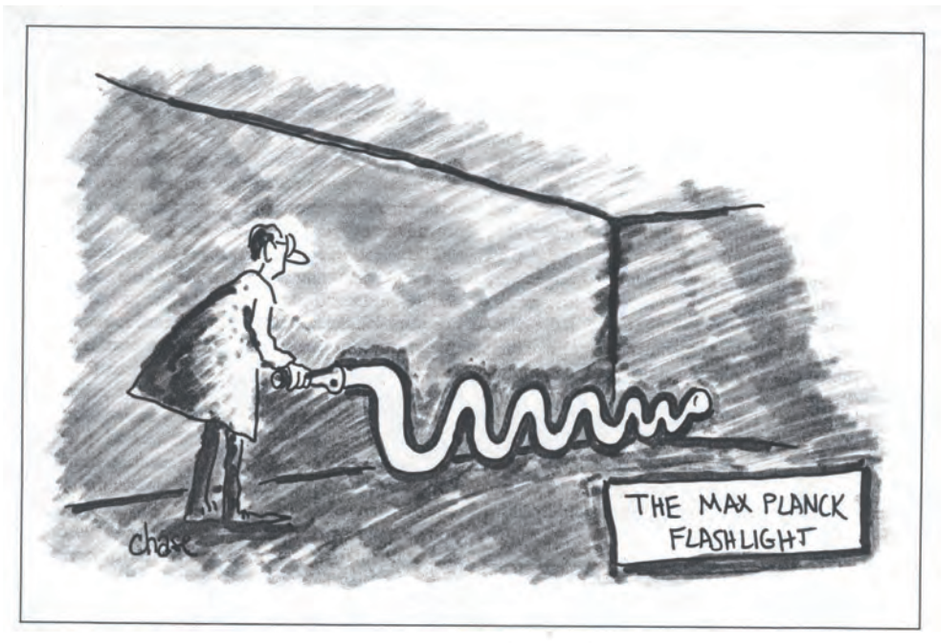
I was first in contact with the Max Planck Society (MPS) regarding the founding of a new institute on July 1, 1988, when the head of the Biology and Medicine Section called to ask me whether I wanted to participate in the foundation of an Institute for Ecology. At that time the third session of a commission had been discussing a proposal by Profs. Schell and Ziegler regarding if and how an Institute for Ecology should be organized. As far as I know, the establishment of this commission was initiated in 1983 by the senator of the Max Planck Society, former German Chancellor Helmut Schmidt, former Minister of Education Hans Leussing, Nobel Prize winner Manfred Eigen, and a manager of ESSO, Wolfgang Oehme. Helmut Schmidt was worried about the damage to forests that was described in the German government's report of the Research Board of Air Pollution and Forest Damage, of which I was a member. The initiative put forward by the Biology and Medicine Section was supported by the Chemistry, Physics and Technology Section, particularly by Prof. Crutzen.

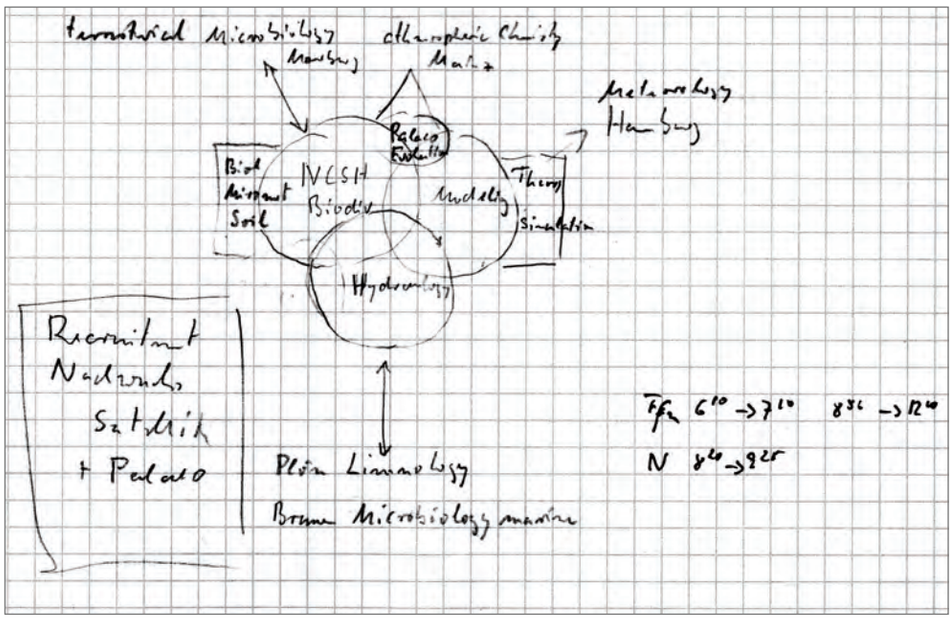
The Max Planck Society received three competing applications, ranging from community ecology via eco-physiology and ecosystem research to microbial ecology. The decision was made in favor of microbial ecology and as a result the MPI for Terrestrial Microbiology was founded in Marburg.

Prof. Dr. E.-D. Schulze
Director

During this process I corresponded with the head of the commission and sent him the picture below (from Science vol. 238, p. 9, 1988), with the comment that this caricature reminded me of the "ecology discussion". Looking at this drawing today, I can say with confidence that Max Planck's flashlight still sheds light.

This decision of the MPS suited me after all because I was busy at that time helping to establish the four ecosystem centers in Bayreuth, Kiel, Goettingen, and Freising, and setting up the Institute of Ecosystem Research of Bayreuth (BITÖK), which I



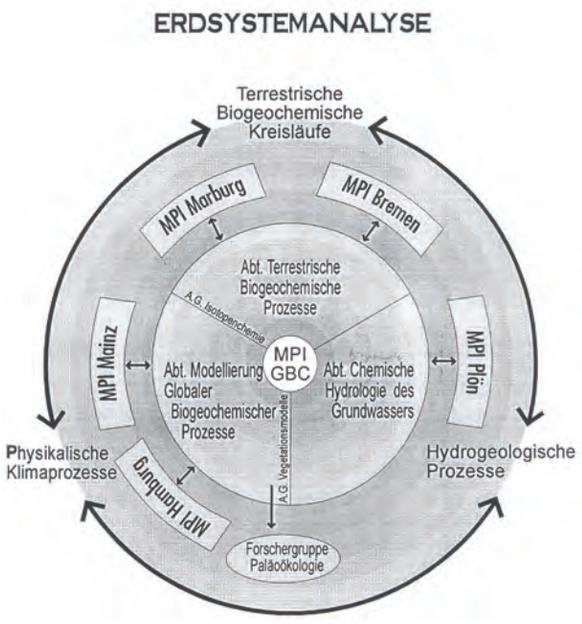


managed from 1989 to 1993. These projects were also based on the works of the Research Board of Air Pollution and Forest Damage. The foundation of BITÖK strengthened rather than reduced contact with the MPS because an overlap in work emerged.

At the same time the large research centers of the former German Democratic Republic were also assessed by the Science Council. I visited the ZIMET (Zentralinstitut für Mikrobiologie und experimentelle Therapie) in Jena together with members of the Ecology Commission, and in a general session, we drew up the current structure of the Beutenberg Science Campus. In 1992 Prof. Mooney and I received the Max Planck Research Award.

In 1993 Prof. Crutzen informed me that discussions had started again about founding another MPS institute in the newly formed German states. This one was intended to be one of the last of 18 new MPS institutes. On November 4, 1993, Prof. Crutzen presented a proposal for the foundation of a MPI for Atmospheric-Biospheric-Geochemical cycles (global system modeling) focused on the "adaptation of ecosystems and nutrient cycles" or "palaeohistoric studies". During 1994, discussions concentrated on the "adaptations". A commission was founded and the MPS gave the green light for an "International Symposium on Biogeochemical Cycles and Global Change". In a small discussion group I was asked to give a brief outline of my ideas about such an institute, and I made a sketch on a sheet of paper that reflected elements that still exist today (see figure above).

After the symposium, I was asked to elaborate on the concept for an "MPI for Global Material Cycles" by April 10, 1995, which included a modified rough outline (see figure on the right). Already at that time "hydro-biogeochemistry" was included, a department for which we planned the structural extension of the institute, but which has not yet been realized. A series of sessions and revisions of the concept followed. When I wrote this introduction, I thumbed through old letters with interest (of course I have saved them as hard copies) and I found the following sentence in a letter to Prof. Crutzen dated September 10, 1995: "We have to study soils and the interface between the terrestrial surface and the atmosphere in order to derive robust predictions of ecosystem carbon stocks". In the meantime, Prof. Bengtsson was elected head of the commission, and he was very active in pursuing the foundation of our institute. Without his effeorts it most certainly would not have been successfull. On May 4, 1996, L. Bengtsson wrote me the following: "I am pleased to inform you that the evaluation by the external experts for the proposal of a new MPI for Biogeochemical Cycles has been successfully completed", and the planning activities of the previous three years were crowned with success. My colleagues Prentice and Schimel were selected simul-



taneously with this evaluation process. On May 17, 1996, the work areas were outlined and the names of the three departments existing today were defined: "Biogeochemical Processes", "Biogeochemical Systems" and "Integration of Biogeochemical Cycles", and a revised concept was presented to the section.

Nonetheless, the future of the institute still hung by a thread until June 22, 1996, because the MPS had placed an order for the foundation of three institutes, but only two proposals at most could be financed. In a vote that took place on June 22, 1996, the section gave absolute priority to the foundation of the "Max Planck Institute for the Research of Global Biogeochemical Cycles", which was the official name. Our institute was founded in this session.

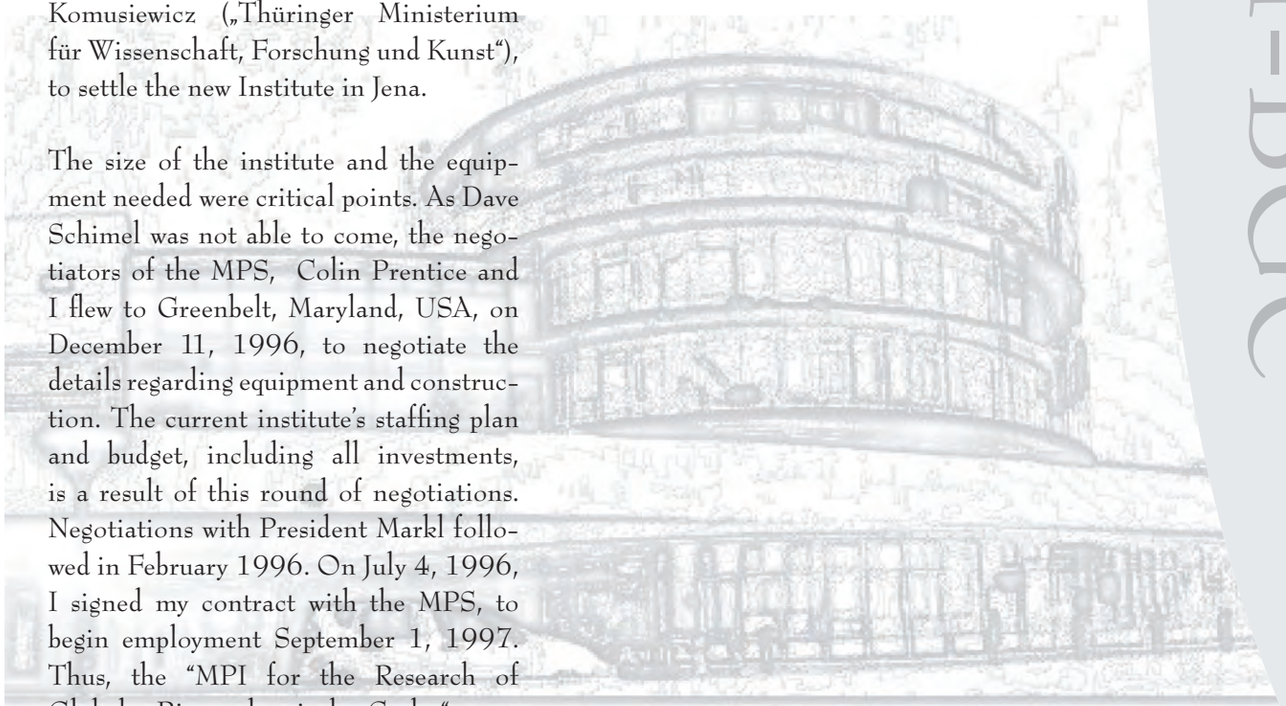
The next difficult decision was to choose the right location. The MPS put Dresden, Halle and Jena up for discussion. Together with representatives from the Chemical Ecology I visited Jena on October 10, 1996. The University had a reception and many efforts were taken by the „Thüringer Landesanstalt für Umwelt und Geologie" (TLUG), „Thüringer Forst" and Mr. Komusiewicz („Thüringer Ministerium für Wissenschaft, Forschung und Kunst"), to settle the new Institute in Jena.

The size of the institute and the equipment needed were critical points. As Dave Schimel was not able to come, the negotiators of the MPS, Colin Prentice and I flew to Greenbelt, Maryland, USA, on December 11, 1996, to negotiate the details regarding equipment and construction. The current institute's staffing plan and budget, including all investments, is a result of this round of negotiations. Negotiations with President Markl followed in February 1996. On July 4, 1996, I signed my contract with the MPS, to begin employment September 1, 1997. Thus, the "MPI for the Research of Global Biogeochemical Cycles" was opened on this day.

At first I held the offices of executive chairman, head of administration, engineer and scientist. I opened a personal account at the Deutsche Bank that I used to settle the business of the institute. The process of hiring the C3 professorships was then initiated, after which the positions for head of administration and in the central facilities were advertised.

In the section session of February 1998 I applied to change the name of the institute to "MPI for Biogeochemistry". The logo of the institute was discussed for quite some time. The logo of today was designed by my sister, Roswitha Asche, who was inspired by a church window in Siena, in northern Italy, that shows the moment in the Creation story when God separated the light from the darkness. On December 23, 1998, I terminated the personal account at the Deutsche Bank. The Max Planck Institute for Biogeochemistry was born.

Jena, August 3, 2007
Ernst-Detlef Schulze



Foundation of the institute

On September 1, 1997, the Max Planck Institute for the Research of Global Biogeochemical Cycles (later renamed MPI for Biogeochemistry) in Jena is founded. E.-D. Schulze (Bayreuth), D. Schimel (USA) and I. C. Prentice (Sweden) are the founding directors.

The name of the institute represents a relatively new field in the geo- and life sciences. The scientific objective is to research global material cycles (carbon, oxygen, hydrogen, nitrogen and sulphur) and the biological, chemical and physical conversions participating in these cycles. The three departments, Integration of Biogeochemical Cycles, Biogeochemical Systems and Biogeochemical Processes, start working together with the central facilities in 1997 and 1998. Long-term plans include the relocation to the Beutenberg Science Campus. Four months after its official inauguration the institute has 7 employees; they enjoy the atmosphere (including the creaking floorboards) of the old building rented on Sophienstrasse. A flat for newcomers is fixed up in the attic.

Translation of the OTZ article of August 30, 1997: Max Planck Institute no. 2 for Beutenberg Campus

Jena (OTZ/rq). At its recent session on Thursday evening the town development committee confirmed the construction of the second Max Planck Institute (MPI) on the Beutenberg Campus. In addition to the MPI for Chemical Ecology, the Max Planck Institute for Global Biochemical Cycles shall also be established there.

City View

Research group: Biogeochemical Processes

E.-D. Schulze and his group research the processes that control the ecosystems, the biogeochemical cycles. Field experiments and analysis of air and soil samples from all over the world provide data from which carbon balances can be estimated. Research activities include the investigation of the carbon, nitrogen and water cycles in ecosystems with different vegetation and land use. Moreover, the processes leading to the fixation of carbon are analyzed.
http://www.bgc-jena.mpg.de/bgc-processes/

Research group: Biogeochemical Systems

D. Schimel and his group develop methods to find out how knowledge gained at different locations can be scaled up to larger regions in order to quantify trace element balances on a continental level. Numerical models and remote sensing data are used and compared to sources and sinks determined from atmospheric measurements (bottom-up and top-down procedures). For this purpose, the team of M. Heimann starts to build up a measurement network for atmospheric trace gases. Another emphasis of the department is the investigation of the importance of the nitrogen cycle in carbon conversion processes within terrestrial vegetation and soils.

Research group: Integration of Biogeochemical Cycles

I. C. Prentice and his colleagues develop computer models of the terrestrial biosphere to calculate the influence of complex biological processes on the climate, using results obtained in the laboratory and through field research. New findings about the amounts of trace gases produced by plants or about external influences on water balance and plant growth, allow the researchers to improve the accuracy of their model predictions. These models are used to simulate the global carbon, nitrogen and water cycles, and to show how these cycles influence each other and affect the climate. The results of the model calculations are compared with observational data to examine their consistency and to ensure that the computer models are realistic.
http://www.bgc-jena.mpg.de/bgc-synthesis/

Central Field Instrumentation Facility

On November 1, 1997, the Central Field Instrumentation Facility is founded with one employee. Its mission includes the installation of measurement stations in the field, the construction and operation of measurement towers, and the preparation of expeditions and field experiments. As of 2007, five employees with permanent positions are supported by several temporary workers and assistant researchers. They have worked in several different countries, e.g. Germany, Russia, Botswana, Brazil, Italy, Sweden, Zambia and Slovakia. In the meantime, they have virtually rounded the earth 6.4 times with their all-terrain vehicle.

Entrance to the first offices

10 years MPI BGC 1997

Relocation to the Carl Zeiss building

As the office on Sophienstrasse is only a temporary solution for about 10 employees, intensive efforts have been made since the foundation of the institute to reconstruct areas of the Carl Zeiss Company building into laboratories and offices. In mid-1998, the employees move with the existing office furniture to these rooms. At the beginning, an unhinged door is used as a table till the furniture is delivered. The complete institute structure is conceived based on the planned relocation into the new building on the Beutenberg Campus. In the meantime the scientific work begins in this temporary shelter. The laboratory is completed, the first of a total of 12 mass spectrometers is set up, the first analyses are carried out, the IT service is installed, and more and more employees are hired. The institute expands as planned in these rented rooms.

Workshop on the occasion of the 1st anniversary of the institute

From September 22 to 27, 1998, an international workshop entitled "Global Biogeochemical Cycles" is conducted to mark the first anniversary of the institute. Scientists from around the world have been invited to discuss research results, objectives and perspectives. The numerous contributions are published in a book. (Ref.: Schulze E-D, Heimann M, Harrison S, Holland E, Lloyd J, Prentice C, Schimel D (2001) Global biogeochemical cycles in the climate system. Academic press, San Diego, 350 pp.)

Translation of the OTZ article of 24 September 1998
"Planck has its first anniversary"
Jena (OTZ). An international conference of experts entitled "Global Biogeochemical Cycles" will be organized on the occasion of the first anniversary of the Max Planck Institute for Biogeochemistry of Jena in the hotel "Schwarzer Baer" on Sunday. Yesterday evening, the official day of foundation was celebrated in the presence of the Minister of Science of Thuringia, Dr. Gerd Schuchardt. The Nobel Prize winner Dr. Paul Crutzen gave the main lecture on the „Influence of biospheric and anthropogenic processes on atmospheric chemistry and the possible consequences for the climate".

First measurement station in Russia

At a distance of 300 km from Moscow, in Fedorovskoe, the first measurement station of the institute with two measurement towers is set up. Here, the exchange fluxes of energy, water vapor, and carbon dioxide between a forest and the atmosphere are continuously monitored. The two towers of the station are rebuilt in 2007 after a lightning strike to ensure long term measurements into the future. In the course of 1998, two more towers are constructed close to Zotino, Siberia/Russia. Simultaneously, an observation program planned for several years is started in Russia and Siberia, based on airborne systems that measure trace gases in the lower atmosphere. More than one thousand air samples taken during these measurements are analyzed for biogeochemical trace gases and their isotopic composition (CO_2, CH_4, N_2O, CO) by the scientists in Jena or by their collaborators (Heidelberg, Paris, Melbourne, Groningen).

Buildings of the Carl-Zeiss Jena GmbH

Central Stable Isotope Facility at Beutenberg

Central Technical Services

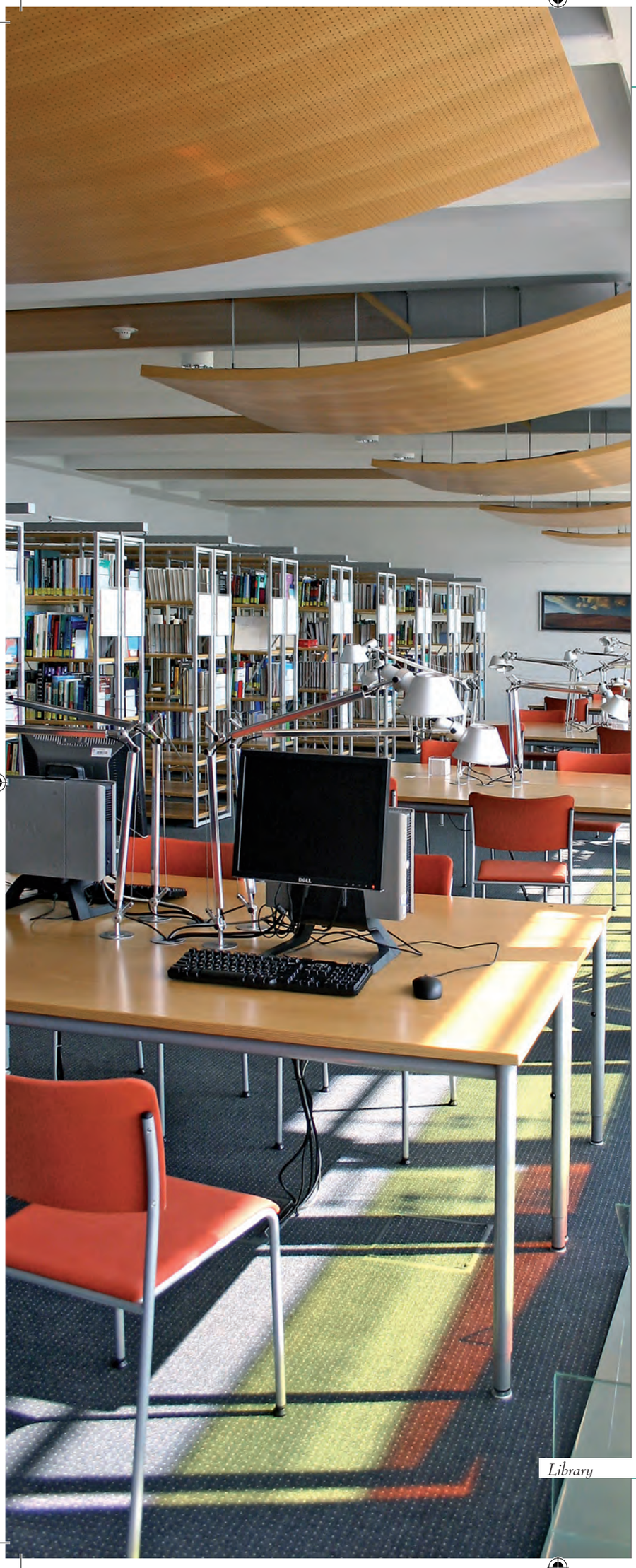
The first challenge facing the Central Technical Services, which starts their work with the employment of the head (H. Schmalwasser) on May 1, 1998, is providing electronic and mechanical components for measurement towers and the preparation of the new institute premises at Carl Zeiss. The next steps are equipping the electronics workshop and hiring additional staff. After relocating to the new building on the Beutenberg Campus in 2002, work is focused on maintenance and repair tasks as well as on the extension and adjustment of the infrastructure (motor vehicle pool, greenhouse, climate chambers, phone system). Central Technical Services provides support for scientists in new experimental stations and with new measurement towers (e.g. measurement tower Zotto, Siberia, Russia).
"On a lighter note"… the helium that has been consumed in the laboratories in the new building since 2002 could fill about 18,000,000 balloons! (Helium does not affect the climate.)

Central Stable Isotope Facility

Another central facility supporting research since 1998 is the Central Stable Isotope Facility. Already in the first year, dried and homogenized soil and plant samples are analyzed for their $\delta^{13}C$ and $\delta^{15}N$ values as a matter of routine. Beginning in 2001 the $\delta^{13}C$ values and the CO_2 content of the air are additionally analyzed with a newly developed acquisition instrument. This new method allows an accuracy of about 0.01 °/°° for $\delta^{13}C$ measurements, which is acknowledged worldwide. Moreover, a method for determining $\delta^{13}C$ values in solids is developed and used in routine work, for example, measuring annual tree rings. After several years of improving methods it also becomes possible in 2004 to measure oxygen concentrations in air samples with high precision, allowing a different view into the processes of the global carbon cycle. Since 2005, after the development of an innovative flux reversion technique, routine analyses of $\delta^{18}O$ in solid and liquid samples are also conducted by means of high-temperature pyrolysis, with about 40,000 samples analyzed annually. Collaboration with W. Weigand at Friedrich Schiller University in the investigation of ammoniac synthesis under natural conditions leads to the presentation of the Thuringian Research Award to, among others, Willi A. Brand (laboratory head).
http://www.bgc.mpg.de/service/iso_gas_lab/

Foci

- Organization of different workshops with international participants, for example, the international workshop "Global Biogeochemical Cycles" (September); BIOME 6000 final workshop (October); presentation of the institute at exhibitions in the Hainich National Park.



Library

Library

The library is planned as a common service facility of both the MPI for Biogeochemistry and the MPI for Chemical Ecology, and is located in the building of the MPI for Chemical Ecology. Whereas the MPI for Biogeochemistry concentrates on a conventionally organized library -- for example, it has subscriptions to about 130 print journals and even buys them backdated for 10 years -- the MPI for Chemical Ecology wants to use the library services for periodicals mostly in electronic form. Today (2007), about 10,000 volumes, 100 current printed journals and 800 maps are listed in the library's catalogue. However, the access to scientific periodicals is incomparably larger. Thanks to local and Max Planck-wide contracts with publishing companies, scientists have access to more than 23,600 electronic journals of all fields directly from their workstation. The library has a computer seminar room, a color copier, and a color scanner as well as 5 additional computer workstations for readers. A comfortable lounge with newspapers in German and in English and a coffee machine complete the services offered to scientists.

http://www.clib-jena.mpg.de/ext/

Smoke paralyzes the institute

On November 11, 1999, insulation catches fire during welding in an air-conditioning shaft in the main building of Carl Zeiss Jena and causes a local fire. Due to the heavy smoke and possible contamination, the building is cleared; fortunately, nobody is injured. The institute remains closed for several days awaiting results of air quality tests. During this time, I. C. Prentice informs employees of his department by regular telephone calls when work can be resumed.

Measuring tower in Botswana with gentle elefants

First institute retreat

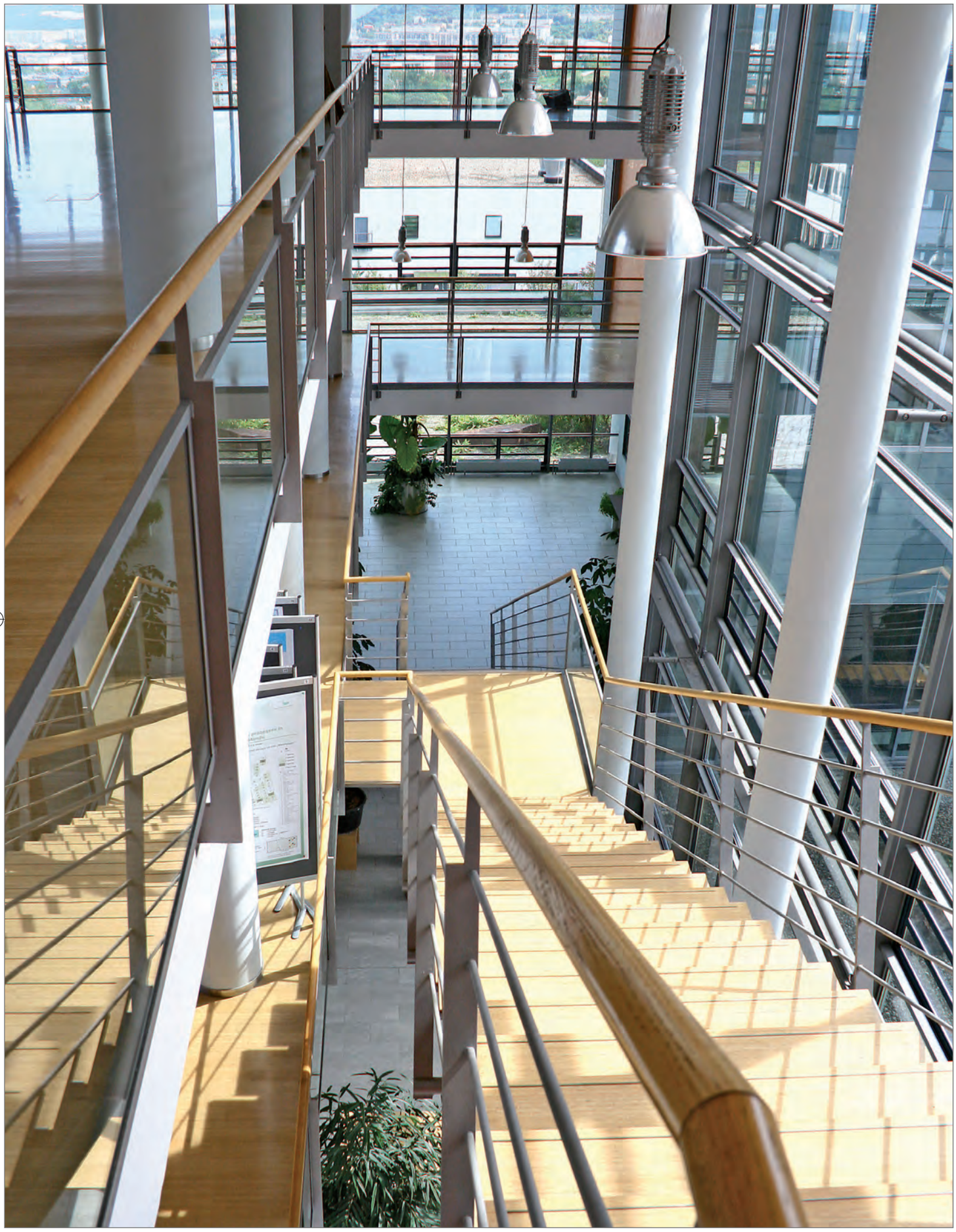
In October, all scientific employees of the institute meet each other in the Thurnau castle close to Bayreuth for a closed conference. The retreat is meant to enhance scientific exchange through the presentation of current work, and offers the opportunity for informal meetings.

Foci

- Construction of a measurement tower in Botswana, Africa, in cooperation with the Okavango Research Centre
- Construction of the first measurement tower in Thuringia (Hainich)
- Organization of several workshops with international participants, among others TRACES inaugural workshop (March); Review Meeting CarboEurope, Toulouse, France (April); Terrestrial Biosphere and Palaeo Carbon Cycle Modelling, Durby, Belgium (November)
- The institute is also becoming a training center: In autumn the first trainees in the administration (office administrator) and Central Technical Services (mechatronics engineers) are hired; three years later they successfully pass their examinations, as do all trainees in future years.

Global palaeo data for calculating climate changes

Climatologists not only look into the future by means of their computer models, but also far back into the past. Sandy Harrison and her staff simulate characteristic climate changes in the past by using computerized models of the Earth. They are particularly interested in processes within the biosphere. Among others, pollen fossils gained from peat and sea sediments deliver detailed information about climate changes during the last ice era. These palaeo data are combined with computer models of the Earth and significant climate changes of the last 20,000 years are calculated. The success of this analytical method depends on the grade of completeness of the global palaeo data. Therefore, the development of different databases is also coordinated, such as hydrologic data for almost 800 lakes all over the world over the last 30,000 years and the data about the mineral structure of dust from ice-drilling cores. Scientists can only be sure that climate models are correct when events of the past are calculated correctly.



Stairway in the new building at Beutenberg

„CarboEurope Cluster“

In the newly founded “CarboEurope Cluster”, European researchers start one of the largest initiatives worldwide within global carbon cycle research. 190 scientists of 69 institutes in 15 countries have joined forces to measure and model the behavior of forests and other ecosystems in a broad inter-disciplinary campaign. The coordination of this new association is taken over by the MPI for Biogeochemistry in Jena. The European Commission supports this association, which comprises eight European projects in its Fifth Framework Programme, with 21 million Euros over three years. The objective is to better understand and calculate the European terrestrial carbon balance. The United Nations Framework Convention on Climate and the Kyoto Protocol motivated the establishment of these projects.

Airborne systems for CO_2 measurements

Jonathan Lloyd’s team applies and develops aircraft-assisted measurement procedures. In addition to the CO_2 concentration, CO_2 isotopic ratios and the concentration of carbon monoxide, methane and nitrogen oxides are analyzed in long-term airborne measurement campaigns over natural forests and marshes in Siberia – ecosystems that have a big influence on the global climate. Further measurement campaigns are started over the Amazon in Brazil and the delta of the Okavango in Botswana. With this huge amount of data, the scientists expect to improve computer models in climate research.

Open House

On the Open House of the Carl Zeiss Jena GmbH, visitors have also the chance to get information about the work of the MPI for Biogeochemistry and about current research projects.

Office areas

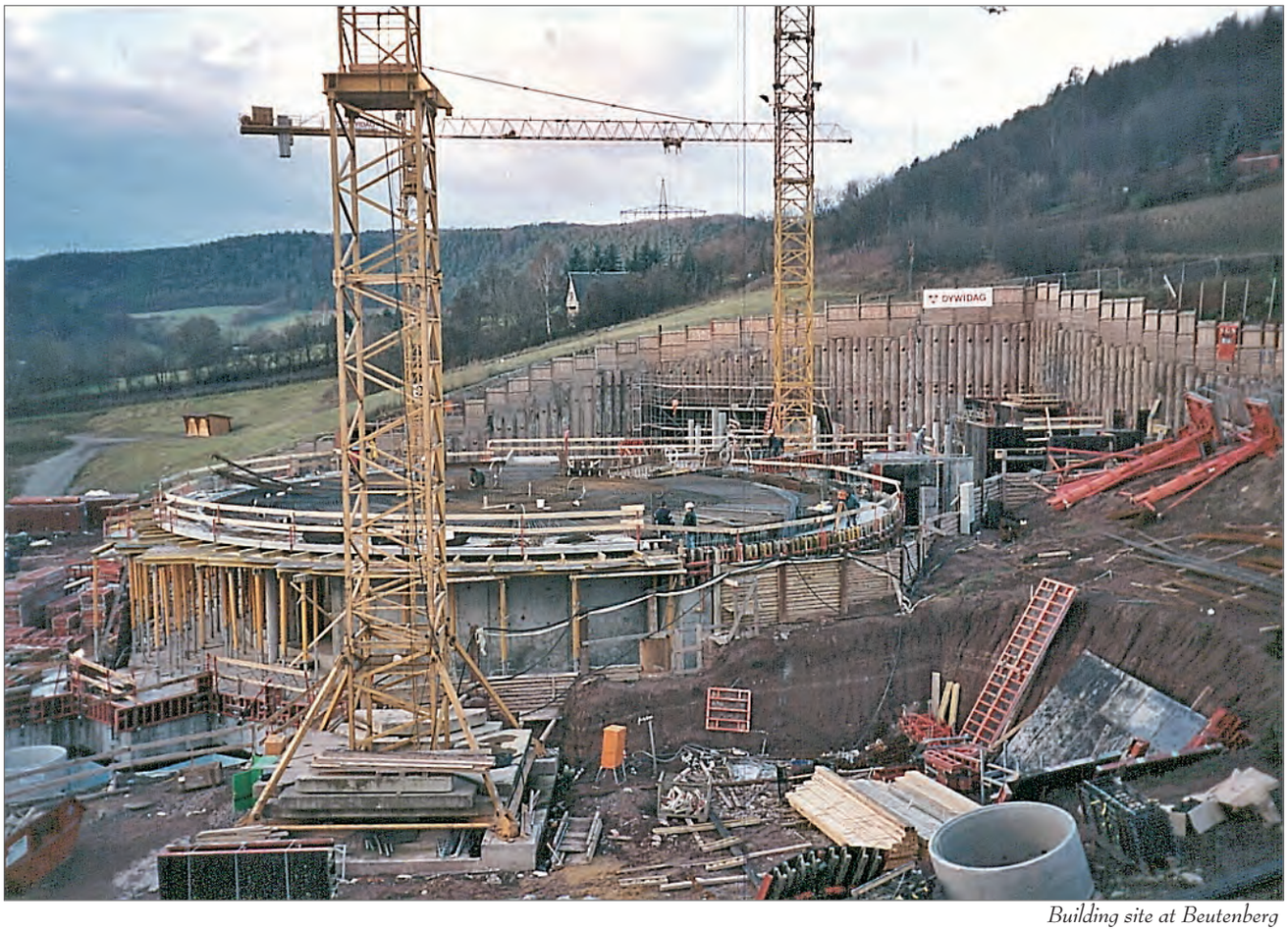
As the office area at Carl Zeiss soon becomes too small for the constantly increasing institute, several offices are relocated into the new MPI for Economics on Kahlaische Strasse. Among them are D. Schimel’s group and some employees of E.-D. Schulze.

Central Gas Analytics Facility

In this year, the Central Gas Analytics Facility is established under the leadership of A. Jordan to support the institute’s scientific activities. It specializes in the high-precision measurement of trace gases in air samples, e.g. of long-term measurement stations that are a part of the global measurement network. Apart from this, the institute produces its own standard gases that can be calibrated to a precision of 0.01 ppm by means of a LOFLO CO_2 analyzer. From 2005 on, the laboratory is responsible for inter-laboratory tests for quality checks of the European measurement network.
http://www.bgc.mpg.de/service/iso_gas_lab/

Foci

- Russia expedition at the East side of the Yenisei (construction of two measurement towers)
- Construction of the second measurement tower in Thuringia (Gebesee)
- Organization for example of the CarboEuope Conference in Torgiano, Italy (March), FORCAST opening workshop in Jena (April); CarboEurope steering committee meeting in Lisbon, Portugal (May).



Building site at Beutenberg

Translation of the OTZ article of 29 Dec. 2001

Wetzstein has a new research site

Lehesten (OTZ/vs). The Max Planck Institute for Biogeochemistry in Jena has completed its measurement areas in the Thuringian forests.

Apart from the deciduous forests near Leinefelde and in the Hainich National Park where samples have been collected for quite a while, a pine forest at Wetzstein close to Lehesten was recently equipped with measuring instruments. Prof. Schulze, Director at the MPI for Biogeochemistry said approvingly: "Thanks to the excellent help of the Regional Office of Forest Policy and Forest Resources Management we succeeded in finding a natural pine forest that is typical for further areas of the German minor mountain ranges". Thus, the measurement sites of the MPI teams of Jena cover now three quarters of the Thuringian forest types.

The objective of the research is to understand the role of the forests as a carbon stock. Forests remove carbon dioxide from the atmosphere and thus they contribute to the protection of climate, at least temporarily. The climate protection function of forests has been identified as a new important task of forestry management, but an actual carbon management requires first the exact knowledge of the processes and inter-relations of carbon storage in soil and biomass. Since September of this year, the micro-meteorological measurement tower at the Wetzstein close to Lehesten has been used to continuously record the exchange of carbon dioxide, water vapor and energy between the atmosphere and the forest stand. Currently, the reserves of carbon in the trees and in the soil are exactly determined in six forest age classes. The different growth stages help to assess and simulate the carbon dynamics over a total forest rotation time of 100 years".

Solarimeter with shadow ring

'Richtfest' (Topping-out ceremony) for the new building

Slope during the building phase

After the extensive redevelopment of the slope that had become necessary due to a landslide of the planned building site, the construction of the new institute started 50 m from the originally envisaged place. The start of construction is one year behind schedule and the topping-out ceremony for the new building on the Beutenberg Campus is celebrated on July 19, 2001. The hardening of the newly poured foundation, which is about 1.20 m thick, will take about 10 years.

IT Service facility

Due to the increasing size of the institute and the temporary relocation of some workplaces to the MPI of Economics, the IT group has to face constant challenges. At meetings, the procurement of HP machines (called "big iron" – which cost the price of a single family house at that time) is discussed; these are in demand by calculation-time-hungry modeling employees from the institute. Apart from their day-to-day service, the IT department is going full steam ahead with its plans for the new building on the Beutenberg Campus. A large machine room with an air-condition system and UPS system will satisfy all the needs of the coming years.
The development of the IT department progresses rapidly if you bear in mind that in 1997 the infrastructure consisted of only one computer that was used for everything from emails to file archiving. Only one fast network connection line of 2Mbit/s was available by this time. In the meantime, the reliability of the operation is enhanced by high-capacity backup.
http://www.bgc-jena.mpg.de/~bsmolny/ITS/ITS.html

Outstanding scientist

N. Buchmann receives a C3 Professorship within the special program for the promotion of outstanding woman scientists in the MPS; her research concentrates on "the interaction between biodiversity and ecosystem processes".

D. Schimel and E. Holland leave

After only two years, D. Schimel and E. Holland leave the institute and go back to the National Center for Atmospheric Research (NCAR) in the USA. D. Schimel is appointed external member of the MPS.

Foci

- Kaethe Tischer (personnel office) is the first retiring employee (December)
- Construction of the third and fourth measurement towers in Thuringia (Wetzstein, Leinefelde)
- Organization of the Eurosib Meeting, Jena (January); MAGIC workshop (February); LPJ (Lund-Potsdam-Jena) Model Developer Meeting, Durbuy, Belgium (April); Green Ocean Workshop, Villefranche, France (June); Palaeoclimate Modelling Intercomparison Project Workshop, Jena (August); FORCAST Workshop, Umea; Sweden (October)

Delivery of the Tandetron accelerator

Press conference on the Carbo-Europe project

In October, a large press conference is held with the representatives of all participating project partners of CarboEurope and the European Commission in Valencia, Spain. The project is presented very successfully in front of about 40 journalists from all European countries; 60 reports on the carbon balance and the role of the forests in Europe are subsequently published in newspapers, on the Internet and broadcast on TV and radio.

Tandetron accelerator

The delivery and construction of a Tandetron accelerator in the hall of the central ^{14}C department (leader: A. Steinhof) is an outstanding event. The tank of this system measures 7x5 meters, weighs about 6 tonnes and has a maximum operating voltage of 3 million Watts. This tank is a part of the accelerator mass spectrometer, which is used to determine minimal concentrations of radiocarbon (^{14}C, 10^{-12} to 10^{-14} parts) in a variety of samples.

Working group: Global Ecology

One focus of the Global Ecology group run by I. C. Prentice is the development of a global ecosystem model of the Earth. Under his leadership, a syndicate develops the so-called LPJ model – named after the locations of the three participating working groups (M. Sykes, University Lund; W. Cramer, PIK, Potsdam, and I. C. Prentice, MPI-BGC, Jena). The basic idea of this model is to integrate theoretical knowledge from different research fields, such as plant physiology and biophysics as well as terrestrial ecology and hydrology and to confront this knowledge to as many types of observations as possible.

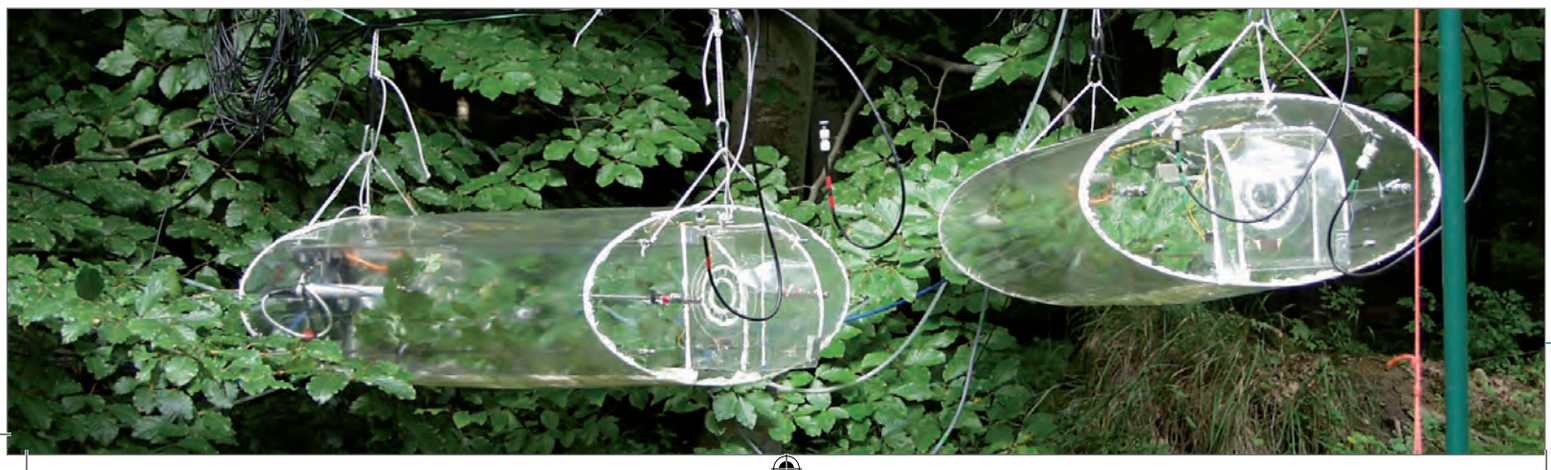
Research group on biodiversity – "The Jena Experiment"

The German Research Foundation (DFG) finances a research project to examine the importance of biodiversity for element cycling in ecosystems. W. Weisser (Friedrich Schiller University, Jena) and E.-D. Schulze (MPI-BGC, Jena) lead this project. On the basis of a pasture-model-ecosystem, ecosystem carbon balances will be measured and the turnover and losses of nutrients in the systems will be calculated as a function of their biodiversity. For this purpose, more than 500 grassland plots containing many plant species are seeded and investigated along the river Saale starting in May 2002. The project, sponsored by the DFG, is the largest European project on this topic and is planned for 10 years.
http://www.biotree.bgc-jena.mpg.de/

Foci

- Second institute retreat in Bad Sulza (April)
- Arrangement of comprehensive measurement systems on the biodiversity area in the floodplains along the river Saale
- Construction of a measurement tower in Cherskii, East Siberia
- Installation of the meteorological measurement systems at the Tall Tower Ochsenkopf (Fichtelgebirge)
- Airborne system measurements close to JiParana (Brazil)

Air chambers for CO_2 sampling



Circle of stones and a wooden wall

The wooden wall and the stone floor mosaic have been planned to illustrate the concept of "biogeochemistry". The interaction of flora and geological substrate is the process that initiates many of the trace gas fluxes, which can be observed in the atmosphere.
Thuringia is particularly rich in plant species, in part because of the diversity of geological parent rocks and climatic conditions. A wall exhibition of woods, which represent the trees of Thuringia, and an exhibition of the rocks of Thuringia and its close environment, which reflect the variety of the geology underground, characterize this interaction. A total of 45 tree species and 60 different kinds of rocks are on display in front of the institute's auditorium. Two book publications describe in detail the woods and rocks, their origin and use in the past and today: *Schulze E-D, Börner A, Weist S (2003) Die Hölzer Thüringens. Jena; Schulze E-D, Katzschmann L, Voigt T, Börner A, Huckriede H, Heuse T, Rohrmüller J, Sachse D, Radke J (2006): Die Geologie der Baugesteine Thüringens. Der Steinfußboden am MPI für Biogeochemie Jena. Weißdornverlag Jena, 184 pp.*

Relocation to the new building

After roughly two years of construction, the new building on the Beutenberg Campus is ready for occupancy. The total costs amount to approximately 30 million Euros. The modern offices and laboratories have a usable area of 5500 m^2. At Carl Zeiss, 2576 m^2 of laboratories, storage and office rooms are packed up. The things that have to be moved include 150 computers with peripherals, growth chambers, mass spectrometers, analytical instruments, laboratory and workshop equipment, plant samples, office furniture, files and much more. The geographic position of the new institute is 11.57°E (longitude E.) and 50.91°N (latitude N.) and 208 m above mean sea level (measured at the main entrance).

Stones of Thuringia in the entrance area of the lecture hall

Cafeteria

Opening ceremony for the new building

On May 21, 2003, the institute celebrates the official opening of the new building on the Beutenberg Campus in Jena. The President of the Max Planck Society, P. Gruss, and the director, E.-D. Schulze, welcome numerous guests from Germany and abroad. The ceremonial address on „Earth system analysis and Co-evolution" is made by H.-J. Schellnhuber.

I. C. Prentice leaves

In summer, one of the founding directors, I. C. Prentice, leaves the institute and returns to England. E.-D. Schulze takes over the management of the institute.

Hainich National Park

The core area of Hainich National Park has not been harvested for decades, and thanks to its primal character it is a much-needed reference for the commercial forests. Through a collaborative agreement, the national park turns into a main investigative area of the institute. In particular, E.-D. Schulze receives permission to establish a measurement tower with a height of 40 m. Basic preparations for all the scientific work in Hainich are organized. N. Buchmann and her group are responsible for the measurement tower in the forest and investigate the biological processes that contribute to the total balance of the local gas exchanges. Natural forests such as Hainich had been considered "neutral" with respect to their total carbon balance, i.e., they are neither considered a sink, where the carbon remains in the long term, nor a source. Therefore, until that time they had not been taken into consideration in the calculations for the Kyoto Protocol on Climate Protection. By contrast, the employees of Nina Buchmann's group find that the National Park represents a substantial carbon sink – a research result that has climatological and political consequences.

BIOTREE

The MPI for Biogeochemistry, the Thuringian Regional Office of Forest Policy, Hunting and Fishing and the Regional Office of the Thuringian Forest start a unique worldwide research project at three sites in Thuringia in the spring of 2003. On an 80 hectare wasteland, a forest grows that is expected to deliver new findings about the influence of biodiversity on ecosystem processes in the coming years. Researchers from all over the world participate in this project. *http://www.biotree.bgc-jena.mpg.de/*

Meteorological station

On the roof of the institute a small pole with a meteorological station is set up. This station delivers current data about air temperature, humidity, pressure, precipitation, wind speed, and wind direction. The pole is also used for performing rappelling-rescue exercises that may be necessary when working at tall measurement towers.

Foci

- Construction of the fifth measurement tower in Thuringia (Mehrstedt 1)
- Opening ceremony for measurement station Ochsenkopf in the Fichtelgebirge in Upper Franconia by the MPS President on the open house
- Election of the first 'works council' of the institute (spring)
- Change of the mailing address from Winzerlaer Str. 10 to Hans-Knöll-Str. 10
- "Architectours" – open house for guests interested in architecture
- Organization of Annual Meeting and Conference of CarboEurope Cluster; two German national IPCC workshops, "Present Greenhouse Gas Budget" and "Mitigation in the German Atmosphere"; TCOS Siberia Annual Meeting; AEROCARB EC Project Modelling Workshop; ICESHEET Workshop in Cambridge, UK; 3rd Dynamic Green Ocean Workshop, Villefranche-sur-Mer, France

10 years MPI BGC 2003

Example of different woods

„CarboEurope“

More than 100 European research institutions meet in January to pave the way for CarboEurope (following project of “CarboEurope Cluster”). The project, coordinated by E.-D. Schulze (MPI for Biogeochemistry), is supported by the EC with more than 16 million Euros from 2004 to 2008 and an additional 30 million Euros are spent from national budgets. The object is to calculate the carbon balance of the whole of Europe and to determine the regional distribution of carbon sources and sinks and time-related dynamics. More than one hundred continental measurement stations, distributed over all climate regions and ecosystems of Europe, will deliver data about their contribution to the carbon budget. Simultaneously, ground stations, measurement towers and aircrafts measure the concentration of greenhouse gases in the atmosphere. All measurement values are integrated into innovative computer models on high-performance computers to be able to predict the development of the terrestrial biosphere. CarboEurope is the first initiative of this kind in the world, putting Europe on the forefront of carbon cycle research.
http://www.carboeurope.org/

Biogeochemical Systems department

In autumn, M. Heimann accepts the appointment as second director and takes over the leadership of the Biogeochemical Systems department. The scientific orientation of this department aims to improve the so-called top-down method by which regional trace gas fluxes are determined using both high-precision concentration measurements at measurement stations distributed worldwide and numerical models of atmospheric transport. In the following years, the department contributes to this target by making continuous measurements with tall towers (150 m-300 m) at Ochsenkopf, in Bialystok in the eastern part of Poland, and in Zotino in the center of Siberia. The data gained at these stations are added to regular air samples of stations on the Shetland Islands and in Alert in the Canadian Arctic. An extension of the measurement network along the East Atlantic towards the south is in construction or planned (among others Cape Verde Islands, Sao Tome and Namibia). Apart from this, the department tries to improve the technique of trace gas measurements for use in aircrafts as well as to develop sensors for trace gas measurements from space in partnership with the DLR and ESA. Using a hierarchy of numeric atmospheric models, the measured data are integrated and the extensive sources and sinks of the trace gases and their time-related changes are determined by complex mathematical methods (such as inversion).
http://www.bgc-jena.mpg.de/bgc-systems/

Dynamic Green Ocean project

In this year, the Dynamic Green Ocean Workshop takes place in Villefranche-sur-Mer in France for the fourth time. This international project, coordinated by Corinne LeQuéré, was initiated in 2001. Its targets are the development and evaluation of a generic process model of sea ecosystems that - among other things - will help to better understand the feedback of the biological sea processes to the climate system.

Foci

- Construction of the sixth measurement tower in Thuringia (Mehrstedt 2)
- Organization e.g. of Beutenberg Campus Proteomics Workshop; FORCAST Workshop; CarboEurope-IP Kick-off Meeting; NORTH EC Project planning meeting; Workshop on Spatial NEE Patterns; DLR Project Meeting on Remote Sensing of CO_2 from Space
- Participation in the press event of the European Commission in Brussels “Communicating European Research – What’s in it for you?”

Demonstration of the CO_2-cycle during the „Long Night of Science"

Independent junior research groups

Three junior groups are founded; the first one starts almost immediately.

Independent junior research group: Organismic Biogeochemistry

This group, led by Ch. Wirth, starts in November and consists of five scientists and three scientific assistants. The overarching goal is to identify the signature of plant species identity and diversity in terrestrial biogeochemistry, and to explore the degree to which functional diversity needs to be resolved and represented in order to gain a predictive understanding of biogeochemical cycles under global change. The work of the group comprises the development of trait databases, modelling and field work.
http://www.bgc-jena.mpg.de/bgc-organisms/

Award for Junior Scientists and Researchers

M. Vetter is presented the Award for Junior Scientists and Researchers by CarboEurope for the best publication in the field of carbon research.
(*Vetter M, Wirth C, Böttcher H, Churkina G, Schulze E-D, Wutzler T, Weber G (2005) Partitioning direct and indirect human-induced effects on carbon sequestration of managed coniferous forests using model simulations and forest inventories. Global Change Biology, 11, 810-827.*)

TCOS Siberia

From 2002 to 2005, twelve international research teams are supported by EC financing in the TCOS Siberia Project (Terrestrial Carbon Observing System). Under the leadership of the Max Planck Institute for Biogeochemistry, the scientists want to better understand how the carbon stocks of Siberia will change if the temperature of the Earth's climate rises, the permafrost soils defrost and land use, such as slash and burn agriculture, changes. An important result is the finding that the boreal forests of Siberia represent a considerably smaller carbon sink than assumed so far.
http://www.bgc-jena.mpg.de/bgc-systems/projects/web_TCOS/

First Long Night of Sciences

In November 2005, all interested citizens of Jena have the opportunity to take a look at the Institute's research on the Earth system and the Climate. In lectures, experiments, guided tours, games, and a quiz, the scientists explain their research activities and answer questions.

Foci

- Third institute retreat in Oberhof (January)
- Construction of two measurement towers in the High Tatra (Windwurf)
- Travels to Russia for the construction of the Tall Tower near Zotino (ZOTTO)
- Organization of the Symposium on New Aspects on Terrestrial Biogeochemical Dynamics Derived from Integrating Observations, Theory and Models, Jena (March); TCOS-SIBERIA-II Final Symposium, Jena (June); Annual Meeting of the German Association for Stable Isotope Research (GASIR), Jena (October); 3rd Annual CarboEurope-IP Meeting, Lapland/Finland (November)

„Bialystok Tall Tower“ Station

The station starts as part of the CHIOTTO tall tower network in July and is operated now as part of the CarboEurope project. This new analysis system for continuous atmosphere observation is built and tested in Jena and then installed at the 300 m tower close to Bialystok, East Poland (Lat 53°14'N, Long 23°01'E, Alt 180m). The challenge is to build a reliable automatic system that can run continuously without assistance, and at the same time fulfills the high precision requirements for all the measured gases. Since July 2005 this system is more or less continuously measuring the atmospheric gases CO_2, CH_4, CO, N_2O, SF_6 and the O_2/N_2 ratio, as well as meteorological parameters (atmospheric pressure, temperature, humidity, wind speed and direction) from 5 heights on the tower ranging from 5 to 300 m. For quality assurance, comparison measurements are carried out with reference gas cylinders and bottles are filled for further analyses in Jena, e.g. isotopic analyses.

Measuring tower in Bialystok (Polen)

Measuring tower at Ochsenkopf (Bavaria)

Ochsenkopf Tall Tower

In winter 2005 the atmospheric observations start at Ochsenkopf – the TV tower at the summit of the Fichtelgebirge in Bavaria. Observations include the most important greenhouse gases: CO_2, CH_4, N_2O and SF_6. In addition, the O_2/N_2 ratio and CO are measured and the isotopic ratio is determined. The “fingerprints” of the different gases can be used to study the origin of the sampled air masses and the processes that influence their composition. Most importantly, Ochsenkopf observations along with those from other measurement stations contribute to the understanding of the carbon fluxes in Europe.

http://www.bgc-jena.mpg.de/bgc-systems/projects/ochsenkopf/

10 years MPI-BGC 2005

Institute excursion to the Hainich National Park

In July all interested members of the institute take part in a tour in the Hainich National Park in Thuringia. First on the program is a visit to the institute's measurement areas. The field site is situated in the core protection zone, "Weberstedter Holz", is one of the most important investigation area within the European research project CarboEurope-IP. By means of the so-called eddy covariance method, the tower measures the net carbon fluxes of the forest within a radius of about 1 km^2. Numerous soil-based measurements (e.g. the amount of litter, the trunk growth and the soil respiration) allow the carbon balance of the forest to be estimated independently from the tower measurements. Through a thick forest the group continues walking towards the public tree canopy path and returns to Jena after a nice break.

German Environmental Award 2006

After being recognized as a Highly Cited Researcher by ISI (Int. Science Index) in 2002 and after being awarded the Vernadsky Medal by the European Geophysical Union, E.-D. Schulze receives the German Environment Award (which includes a large monetary award) directly from the German Federal President Horst Koehler on October 29, 2006. He is honored for his scientific life's work in fundamental ecologic research. E.-D. Schulze is one of the top scientists in Germany in the field of terrestrial ecology.

Jena – Place of Ideas 2006

The initiative "Germany – Land of Ideas" under the patronage of the German Federal President, Horst Koehler, awards the Beutenberg Campus the name, 'Ort der Ideen' ("Place of Ideas"). The MPI for Biogeochemistry presents itself and its research projects together with 7 other scientific institutes and two foundation centers during a ceremony and has an open house for the interested public afterwards. A humorous lecture on "Chemistry and Alchemy" completes the program.

Foci

- Fourth institute retreat in the Nimbschen monastery close to Leipzig (March)
- Organization of a cross-department institute workshop on the "Role of Soil Processes in the Ecosystems and Earth System" (May); Earth System Science Research Partnership, Ringberg castle (June); CarboEurope Continental Integration Meeting, Bern, Switzerland (July); Symposium "Old-growth forests", Jena (September); Gap Filling Workshop, Jena (September); Meeting of the Technical Managers of the Max Planck Society, Jena (September); Open Science Conference on the GHG Cycle in the Northern Hemisphere, Sissi-Lassithi, Greece (November)

Excursion to the Hainich National Park

Replacement of the Reduction Tube, Elemental Analysis

Central Inorganic Chemistry Analysis Facility

In January the department is split into two service fields. One is the working group "Routine Measurements and Analysis" (head: I. Hilke). The work is concentrated on carbon and oxygen analyses in soil, plant and water samples. Up to 30,000 measurement values are delivered annually for the CarboEurope and Biotree projects. The analytic measurement procedures include ultimate, sum parameter and flux analyses as well as ion chromatography.
The other field is the "Laboratory for Spectroscopy and Speciation" (head: M. Raessler) that is committed to atom absorption spectroscopy and the respective chemical digestion techniques. In addition, the employees of this laboratory are working on developing new analytic methods in the field of natural material chemistry and element specification.
http://www.bgc-jena.mpg.de/service/chem_lab/

Independent junior research group: Biospheric Theory and Modeling

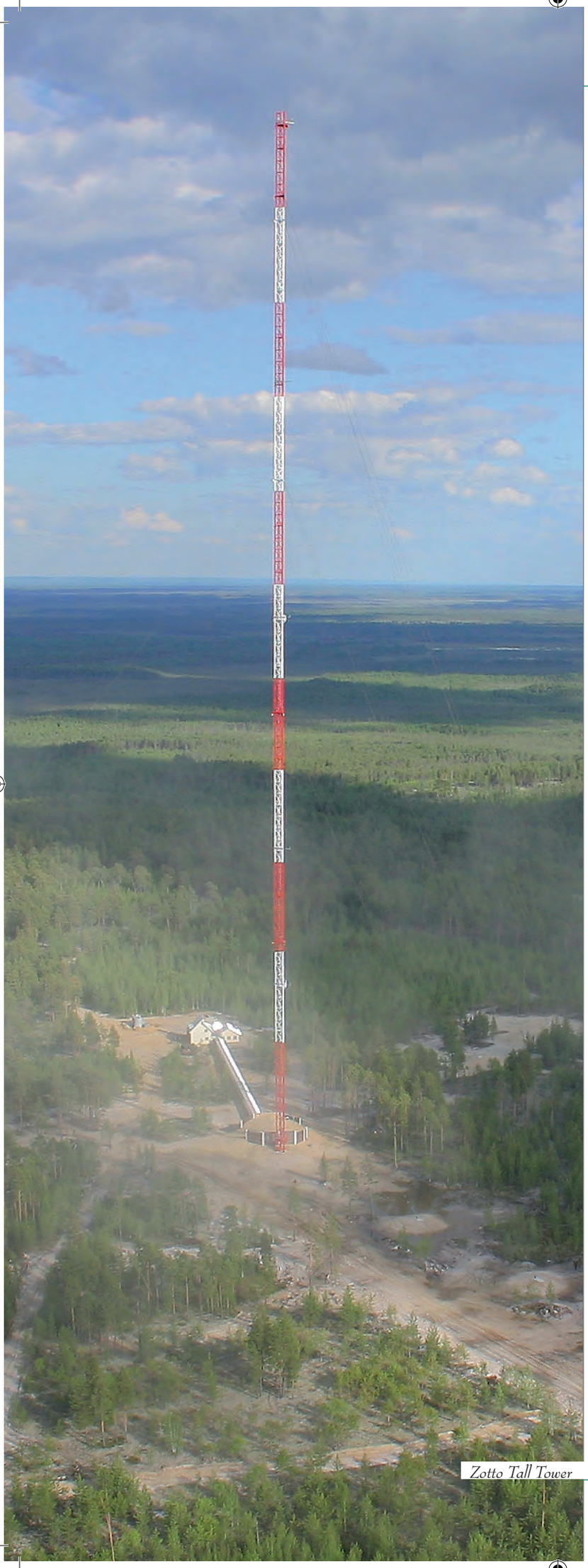
This working group, led by A. Kleidon, starts at the institute in June 2006. The young scientists of this group aim to identify the general organizing principles of the biosphere in order to better understand and predict its interaction with biogeochemical cycles and the climate system. For this purpose, they develop a series of simulation models that they use to reproduce and understand the observed structure and function of the biosphere.
http://www.bgc-jena.mpg.de/bgc-theory/

Independent junior research group: Biogeochemical Model-Data Integration

This working group is established in March 2006. It is dedicated to the development of methods and model systems that are used both to diagnose the current state of the ecosystems by means of monitoring and remote sensing (e.g. during extreme events such as the heat wave of 2003) and to deliver estimates about the reaction of the ecosystems to changed climatic conditions. Research focuses on carbon-water cycle interactions, on the coupling between ecosystems and the atmosphere, and on the development of new realistic models of soil carbon dynamics. Members of this group work on and with data from the worldwide network FLUXNET that include, among others, the carbon dioxide and water exchange between the biosphere and atmosphere. The group is led by M. Reichstein and currently consists of five doctoral candidates, three post-docs as well as programmers, database experts and literature assistants who work for all the three junior groups.
http://www.bgc-jena.mpg.de/bgc-mdi/

ZOTTO

In September 2006 the international climate research station ZOTTO (Zotino Tall Tower Observatory) is opened in the Siberian Taiga. There, the Institute's scientists, together with the Russian Sukachev Forest Institute in Krasnoyarsk and the MPI for Chemistry in Mainz, focus on how increasing temperatures on Earth and the greenhouse gases influence each other. A measurement tower of 300 m allows scientists to determine the greenhouse gas concentration both locally and over large areas.
http://www.bgc-jena.mpg.de/bgc-systems/projects/zotto/



Zotto Tall Tower

Official inauguration of the ZOTTO measurement station

In June 2007 the ZOTTO measurement station in the center of Siberia is officially inaugurated by scientists and representatives of various Russian and German scientific organizations. E.-D. Schulze guides the participants through the different forest ecosystems in the Taiga around the ZOTTO station. The MPS agreed to the financing of this project in 2001 and concluded a collaboration agreement with the Russian Academy of Sciences (Siberian branch). However, to build the tower another Russian institution, the ISTC (International Science and Technology Center) was involved; they were able to acquire the appropriate contracts and approvals for a project of that scale.

Working group: Airborne trace gas measurements and mesoscale modeling

In the year 2007, the working group for airborne measurements and mesoscale modeling, led by C. Gerbig, is making field measurements in the southwest of France within the "Carbo-Europe Regional Experiment" project. Using several research aircrafts, among them the Dimona of the MetAir AG, atmospheric concentrations of carbon dioxide and related tracers were measured within the lowest 3 km of the atmosphere. These data form the basis of estimates for regional Budgets of CO_2 exchange between surface and atmosphere, which are derived with high resolution models of atmospheric transport.
http://www.bgc-jena.mpg.de/bgc-systems/

„Girls´ Day"

For the first time the institute offers a lecture and laboratory program on the carbon cycle and biodiversity for young women in high-school. Moreover, an information stand at the employment office in Jena briefs interested girls on jobs in research and science.

Foci

- Fifth institute retreat in Oberhof/ Thuringian Forest (February)

Delivery of an airconditioned shipping container

Working group: Atmospheric Remote Sensing

The newly founded working group under the leadership of D. Feist in the Biogeochemical Systems department takes a new measuring device into operation in 2007: a Fourier transformation spectrometer constructed in Germany. This expensive, complex device allows scientists to measure all important greenhouse gases such as carbon dioxide or methane very precisely, from the soil up to the atmosphere. An air-conditioned shipping container is used as a mobile laboratory as well as for transport. The device can be shipped in this container and set up at almost any location in the world. In the long run, measurements are planned in the tropics because the processes in which greenhouse gases are set free or removed from the atmosphere are almost unknown in these regions.
http://www.bgc-jena.mpg.de/bgc-systems/

PhD students

The about 40 PhD students currently working at the institute are organized in the group of „Grads“ (abbreviation for graduate students) to exchange experiences and support newcomers in the starting phase of their work. In monthly meetings they discuss day-to-day issues and concerns and plan group activities such as the Reading Club, in which climate-relevant topics and recent publications are discussed in a relaxed atmosphere in the evenings. Soft-skill courses and seminars as well as the yearly summer party are also organized.

Working group: Humus Chemistry

Today, 12 members belong to the working group Humus Chemistry, led by G. Gleixner. They have one of the most modern laboratories at their disposal to measure substance-specific isotopic ratios in H_2O, CO_2 and N_2O and to determine a compound's substance-specific age; the carbon stocks of the soils usually considered as stable have been identified as a manipulable 'time bomb'. Hydrogen isotopes reconstruct the climate history of the Earth much more precisely than other procedures used previously. The isotope patterns of the plant metabolites report about the plants' well-being. Incidentally, G. Gleixner was the first scientist employed by the institute, in 1998.

The MetAir Dimona research aircraft

10 years MPI BGC 2007

Hall with exhibit of a charred pine from Siberia

Epilogue and future directions

It is only a recent discovery in Earth system sciences that biological processes can substantially influence the climate and environmental conditions of the Earth not only locally but also on a global scale. An essential contribution to this knowledge was the finding made in the early 1980's that the concentration of the important greenhouse gases carbon dioxide, methane and nitrous oxide varied synchronously with the temperature during the glacial cycles. Subsequently scientific interest focused on the vast number of biological, chemical, and geological processes that control the exchange of these gases between the oceans, the atmosphere, the terrestrial biosphere and the lithosphere. The serious consequences for the future climate due to the currently increasing concentrations of anthropogenic greenhouse gases underlined the necessity to base the field of global biogeochemistry on solid scientific grounds. As such, it was only logical that the Max Planck Society responded to this challenge by founding the Max Planck Institute for Biogeochemistry in 1997, even if – as described in the preface – a lot of difficult steps had to be taken to carry out this plan.

Ten years after the foundation of our institute we have to ask ourselves what we have achieved so far and what directions we shall now follow. In my opinion our research balance has two sides. On the one hand, we see exciting progress in our research; many of these have been made possible thanks to ingenious new methods as well as to technical progress. Here, our institute, together with national and international partners has shown cutting-edge research . I think for example about the eddy covariance method, which allows the local exchange fluxes of energy, water vapor and carbon dioxide between the terrestrial ecosystems and the atmosphere to be measured. These measurements make it possible to determine how ecosystems react to changed environmental conditions. I am also thinking about the development of inverse methods for determining sources and sinks of trace gases over large areas on the basis of the observations from the global atmospheric measurement network. The development of the first global models of the carbon cycle coupled with the physical climate systems constitute also a milestone in the recent history of global biogeochemistry. Additionally, many process studies now

show us in detail the fascinating interactions as well as the complexity of the processes operating in terrestrial ecosystems. Not the least these successes are also due in part to the technological advances developed by our institute, such as the high-precision isotope and gas analyses and other high-tech analysis methods, or the progress in computer support for scientific evaluations, or the technically and logistically challenging operations of complex high-tech scientific equipment in remote ecosystems of the world, such as Siberia, Africa, Tibet or the Amazon region.

On the other hand, soberingly, we have to realize that some of the central, hard problems have not yet been answered. For example: Which processes decisively control the terrestrial uptake of excess carbon dioxide? Why can we estimate regional trace gas emissions only with a high degree of uncertainty? To what extent do biogeochemical processes feed back on the climate system and thus dampen or enhance climate changes? Is biodiversity a stabilizing factor for the ecosystems in the Earth's system? In the same way, the big puzzle of the role of biogeochemical processes during the glacial cycles still awaits a satisfactory scientific explanation. Decisive, unanswered questions also exist about the direct and indirect consequences of human influence on the current state and future development, such as with regard to land use and management on continental and global scales.

From a science policy point of view, the context for our activities has changed. In the 1990s, the primary task was to establish the scientific evidence of climate change and of changes of our global environment followed by the identification and quantification of the relevant biogeochemical processes. We were asked to demonstrate to society that human beings' activities actually had begun to perturb the earth's natural systems in a significant way. Ten years later we can say that, by and large, we have completed this task successfully. Therefore, our research must be partially reoriented: society expects from us strategies that help to tackle the global climate problem.

Reliable strategies demand a sound scientific basis. It is the task of our research to provide this basis and therefore we must not lose sight of the core questions of our science. Certainly, new techniques such as remote sensing or other new analytical methods will change our scientific approach, but a characteristic feature of our core questions is the fact that their answer demands long-term research perspectives. For example, the response of an ecosystem to only one year of drought differs considerably from the long-term response – – the changes in composition and the physiological adjustments that would accompany a climatic trend toward drought. Basic knowledge about such long-term adjustment processes is absolutely necessary to predict reliable scenarios for the future.

Prof. Dr. M. Heimann
Director

We must be grateful to the Max Planck Society in providing us such a long-term research perspective. Only a small number of comparable institutes exist in the world. Apart from this, we must also be thankful for giving us the privilege to participate in this fascinating and intellectually challenging scientific undertaking. On this note, I am looking forward to see the development of our science in the next ten years.

Jena, 8 August 2007

Martin Heimann

Institute building

Large projects of the Institute (from 100.000,- € total financing)

EU supported

AEROCARB (Airborne European Regional Observations of the Carbon Balance)
2000 - 2003

ATEAM (Advanced Terrestrial Ecosystem Analysis and Modelling)
2001 - 2003

Biodepth (Biodiversity and Ecological Processes in Terrestrial Herbaceous Ecosystems: Experimental Manipulations of Plant Communities
1996 - 1999

CAMELS (Carbon Assimilation and Modelling of the European Land Surface)
2002 - 2005

Canif (Carbon and Nitrogen Cycling in Forest Ecosystems)
1996 - 1999

Carboafrica (Quantification, Understanding and Prediction of Carbon Cycle, and other GHJG Gases in Sub-Sahara)
2006 - 2009

CarboData (Carbon Balance Estimates and Resource Management-Support with Data from Project Networks Implemented at European Continental Scale
2000 - 2003

CarboEuroflux (AnInvestigation on Carbon and Energy Exchanges of Terrestrial Ecosystems in Europe
2000 - 2002

CarboEurope-IP (Assessment of the European Terrestrial Carbon Balance)
2004 - 2008

CHIOTTO (Continuous High-prescision Tall Tower Observations of Greenhouse Gases)
2002 - 2005

COCO (Measurements CO_2 from Space Exploiting Planned Mission)
2001 - 2005

CARBO-OCEAN (IP) (Marine Carbon Sources and Sinks Assessment) 2005 - 2009

DOBME (Developing Ocean Biogeochemical Modelling Expertise)
2000 - 2005

EUHY (European Network for Atmospheric Hydrogen Observations and Studies GOCE)
2006 - 2009

Euroflux (Long Term Carbon Dioxide and Water Vapour Fluxes of European Forests and Interactions with the Climate System)
1996 - 1999

GHGC (Concerted Action Synthesis of the European Greenhouse Gas Budget)
2002 - 2005

Eurosiberian Carbonflux (Eurosiberian-Carbonflux – a Feasibility Study to Quantify Fluxes of Biogeochemical Trace Gases on a Regional and Continental Scale
1998 – 2000

Greencycles (European Research and Training Network for the Study of Biogeochemistry and Climate Change)
2005 – 2008

Nitro-Europe (The Nitrogen Cycle and its Influence on the European Gas Balance)
2006 – 2011

NOCE (Nothern Ocean Atmosphere Carbon Exchange Study)
2002 – 2005

TACO (Terrestrial and Atmospheric Carbon Observing System Infrastructure)
2001 –

TCOS – Siberia (Terrestrial Carbon Observing System – Siberia)
2002 – 2005

UBAF (Kyoto-Protokoll: Weiterentwicklung der Regelungen im Bereich Landnutzung, Landnutzungsänderung und Forstwirtschaft)
2002 – 2005

Laboratory

DFG supported

Biodiversity Exploratories Exploraties for Large-Scale and Long-Term Functional Biodiversity Research
2006 –

BioTree (Biodiversity and Ecosystem Processes in Experimental Tree Stands)
2002 –

The Jena Experiment (The Role of Biodiversity for Element Cycling and Trophic Interactions – an Experimental Approach in a Grassland Community)
2000 –

BMBF supported

Entwicklung eines inversen, hochauflösenden globalen numerischen Simulationsmodells zur Überprüfung der Reduktion natinaler Emissionen von klimarelevanten Spurenstoffen
1998 – 2001

IPCC (Participation in the IPCC (Intergovernmental Panel on Climate Change) Third Assessment Report)
1999 – 2001

KLIMAVAR (Zusammenhänge und Rückkopplungen von Biospäre und Klima: Variationen auf Zeitskalen von Jahren bis Jahrhunderten und zukünftige Änderungen
2001 – 2006

Moor (Verbundvorhaben Klimaschutz: Moornutzungsstrategien)
2006 – 2009

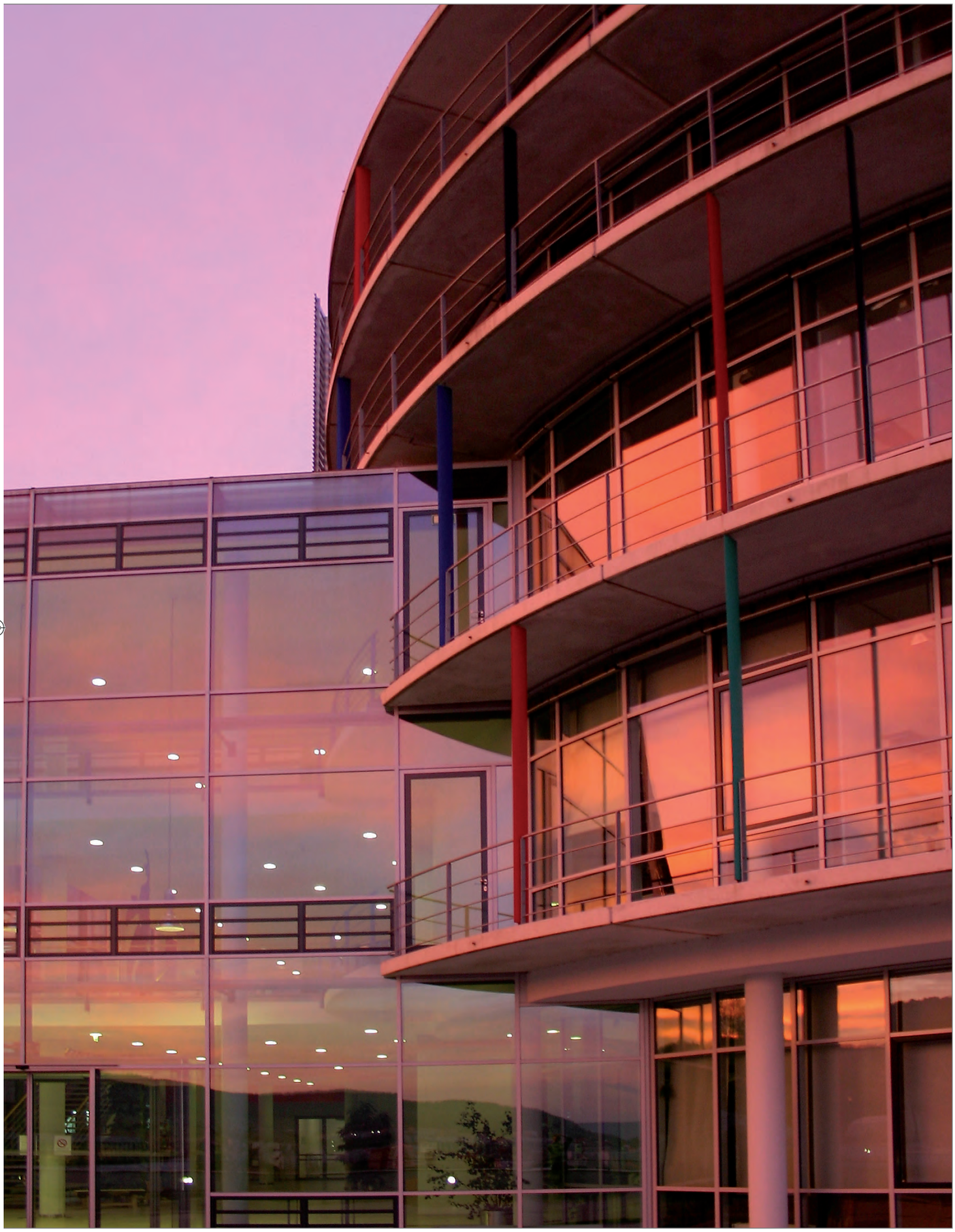
VW-Stiftung supported

ECOB (Economy-Biosphere Climate)
2002 – 2005

US National Science Foundation

MMIA (Methods and Models for Evaluating Vegetation Feedbacks on the Climatic Systems) 1999 – 2001

10 years MPI-BGC
Large Projects



Institute building

Directors

Prof. Dr. E.-D. Schulze
Prof. Dr. M. Heimann

Departments

- Biogeochemical Processes
  Prof. Dr. Ernst-Detlef Schulze
- Biogeochemical Systems
  Prof. Dr. Martin Heimann
- Integration of Biogeochemical Cycles
  N.N.

Independent Junior Research Groups

- Biogeochemical Model-Data Integration
  Dr. Markus Reichstein
- Biospheric Theory and Modeling
  Dr. Axel Kleidon
- Organismic Biogeochemistry
  Dr. Christian Wirth

Central Facilities

- Scientific Coordination
  Dr. Claudia Hillinger
- Inorganic Analysis
  - Laboratory for Spectroscopy and Speciation
    Dr. Michael Rässler
  - Routine Measurements and Analysis
    Ines Hilke
- ^{14}C-Analysis
  Dr. Axel Steinhof
- Stable Isotope/Gas analytics
  Dr. Willi Brand
- Central Field Instrumentation
  Olaf Kolle
- IT Service
  Bertram Smolny
- Library
  Linda Maack
- Central Technical Services
  Harald Schmalwasser

Former Directors

Prof. Dr. I. Colin Prentice
1997-2003
„Integration of Biogeochemical Cycles“

now at Department of Earth Sciences, University of Bristol, UK

Prof. Dr. Dave Schimel
1997-2001
„Biogeochemical Systems“

now at Terrestrial Sciences Section, National Center for Atmospheric Research, Boulder, USA

Former Senior-Researcher

Dr. Sandy P. Harrison
1997-2003
„Palaeoclimatology“

now at School of Geographical Sciences, Unisverity of Bristol, UK

Dr. Jonathon Lloyd
1997-2004
„Analysis of carbon exchange between biosphere and atmosphere on regional scale“

now at School of Geography, University of Leeds, West Yorkshire, UK

Dr. Nina Buchmann
2001-2003
„Understanding of the interactions between biodiversity and ecosystem-processes“

now at ETH Zürich, Institut f. Pflanzenwissenschaften, Zürich, Schweiz

Dr. Elisabeth A. Holland
1998-2001
„Bioatmospheric chemistry“

now at National Center for Atmospheric Research (NCAR), Atmospheric Chemistry Division (ACD) and The Institute for the Integrative & Multidiciplinary Earth Sciences (TIIMES), Boulder, USA

Some Facts (Status 07/2007)

Since Foundation of the Institute..

Publications: approx.1100

Diploma thesis: 26

PhD thesis: 22

Nationalities: 33

Employees, supported by Junior- or Third-Party-Funding : 181

Status quo ...

Employees: 168

Scientific Employees: 97

Female Employees: 79

Mandatories ...

Contact person for foreign employees:
Axel Kleidon

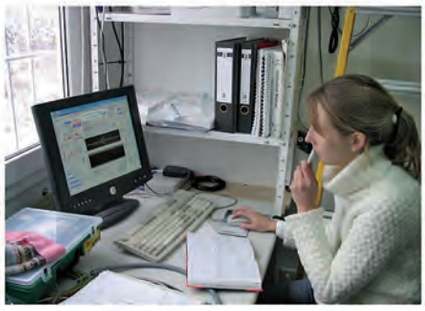
Contact for PhD-students:
Julia Steinbach

Appointee for Equal Opportunities:
Yvonne Hoffmann

Ombud person:
Willi Brand

10 years MPI-BGC Facts







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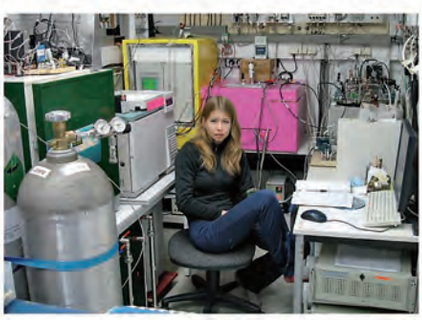

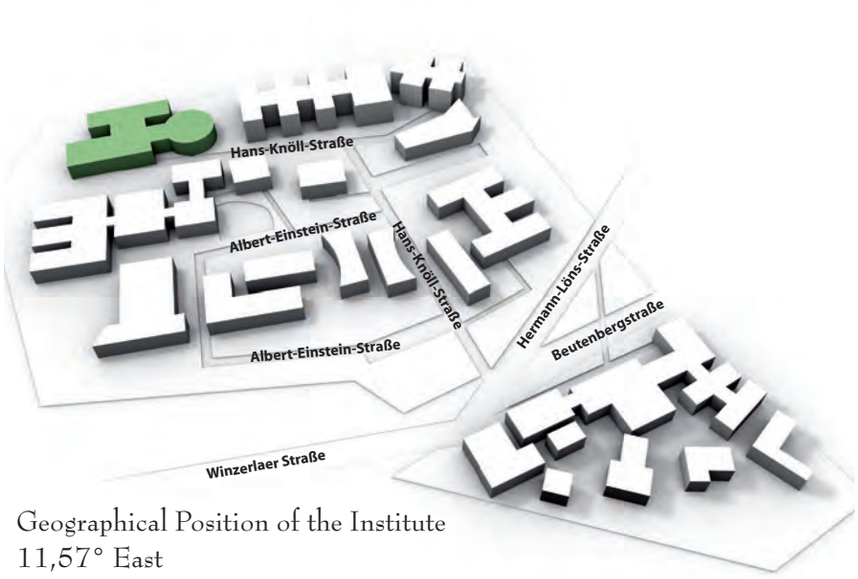

Geographical Position of the Institute
11,57° East
50,91° West

By plane

Erfurt is the closest airport but offers only irregular service. Visitors of the Institute usually arrive at Frankfurt/Main, Leipzig, Munich or Nuernberg airports. Frankfurt/Main airport has direct access to the Deutsche Bahn railway system. Trains go to Jena West train station via Weimar (about 3.5 hours). The Leipzig airport has an airport shuttle to Leipzig main train station (about 25 min). Trains from there to Jena Paradies train station run frequently (the intercity express train takes about 1 hour). The Jena bus lines 10, 13 or 40 stop at Beutenberg Campus.
Coming from Munich or Nurenberg, there is an hourly intercity express train to Jena Paradies train station.

By train

Coming from north (Berlin) or south (Munich): after arriving at the railway station Jena Paradiesbahnhof take the bus line no. 15 (direction Westbahnhof) and get off at the bus stop „Stadtzentrum“, change to the bus line 10 or 13 (direction Burgau) or 40 (direction Göschwitz) and get off at the bus stop Beutenberg-Campus.
Coming from east (Dresden) or west (Frankfurt/Main): arriving at the railway station Jena Westbahnhof follow the Westbahnhofstraße to the left, then take the underpass to your left, cross the road, several meters on the right side there is a bus stop. Take the bus line no. 10, 13 or 40 and get off at the bus stop Beutenberg-Campus. Continue as described above.

By car

Coming from north (Berlin) or south (Munich): Take the motorway A9 Berlin - Munich to the motorway intersection ermsdorfer Kreuz, follow the motorway A4 in direction to Erfurt and Frankfurt/Main, leave at exit Jena-Goeschwitz heading on the Rudolstaedter Straße towards Goeschwitz and Jena City Center. After about 5 km take the Winzerlaer Straße to the left. Follow this road till you reach Beutenberg-Campus.
Coming from east (Dresden) or west (Frankfurt/Main): Motorway A4 Frankfurt/Main - Dresden, exit Jena-Goeschwitz; further description see above.