



*Second announcement - February 2010*

CarboSchools open conference - Jena (Germany) 14-16 April 2010  
**Teacher-scientist partnerships for climate change education:  
Results & perspectives**

The Max Planck Institute for Biogeochemistry and the CarboSchools consortium invite educators, scientists & anyone interested in climate change science education to come to Jena for two and a half days of presentations, meetings and discussion with project participants from all over Europe.

This conference aims at

- showing the achievements from educational projects developed since January 2008 by nine leading EU carbon research laboratories in partnership between scientists and secondary school teachers around Barcelona (Spain), Bergen (Norway), Firenze and Benevento (Italy), Groningen (Netherlands), Norwich (UK), Paris and Bordeaux (France), Jena and Kiel (Germany).
- discussing the educational impact of these projects based on in-depth evaluations carried on participating students
- giving new inspiration, tools and resources for climate change education to the broader educational community in Europe and beyond, and to research institutes willing to develop their education & outreach activities.

The conference will run in parallel with the CarboSchools Spring School gathering 45 students (16-19 years old) and 15 teachers from these 9 regional projects and an associated project in Cluj (Romania).

Registration is open **until 15th March 2010** at [www.carboschools.org/registration](http://www.carboschools.org/registration). All participants are expected to cover their travel & accommodation costs + a conference fee of 100€ covering coffee breaks, lunches on 14, 15 & 16 April and social dinner on 15 April. This conference fee can be waived upon written request to Susanne Hermsmeier <[sherms@bgc-jena.mpg.de](mailto:sherms@bgc-jena.mpg.de)> by 15th March for participants from outside the CarboSchools consortium.

**We invite all conference participants to make our meeting carbon neutral.** For this we encourage you to travel by train to Jena. For advance booking Deutsche Bahn offers very low fares inside Germany and from all bordering countries (check European offers on [www.bahn.de](http://www.bahn.de), available in 9 languages). When you come from too far away to travel by train, we invite you to compensate your airline CO<sub>2</sub> emissions in an innovative way:

- 1) calculate your CO<sub>2</sub> emissions and give them a voluntary price based on the carbon offset market (i.e. companies which collect money to finance projects who reduce emissions for you elsewhere when you can't reduce your own) - the price varies a lot between companies, generally ranging from 10 to 100 euro per ton.
- 2) bring this money in cash to Jena where we will put it in a common pot
- 3) all CarboSchools student groups are challenged to design local mitigation projects in their own schools and present their ideas in Jena. The group who will demonstrate the highest potential for emissions reduction will receive the money from everyone as a symbolic award to help implementing it.

## Wednesday 14 April: Achievements from regional projects

### 9h00 Welcome

*Martin Heimann, Director Max Planck Institute for Biochemistry*

### 9h10 Introduction & practical information

*Susanne Hermsmeier, Barbara Michel & Philippe Saugier*

### 9h20-11h50 Practices from the field: diversity of partnerships & projects

*session chairs Stephanie Hayes & Sally Soria-Dengg*

(including coffee break & discussions)

The general idea behind CarboSchools (CS) is to form *partnerships* between scientists and teachers and develop collaborations in the frame of a *school project*. This general idea is implemented in many different ways in CS regional projects. In this session the different types of partnerships and projects realised in CS will be introduced. Examples of achievements illustrating this diversity of projects and partnerships will be highlighted and benefits and limitations (for teachers, scientists & pupils) of each type will be discussed.

### 11h50-12h00 Introduction to parallel sessions

### 12h00-13h00 Lunch

### 13h00-14h30 Parallel workshop sessions

**Topic 1 - Integration to school curricula:** some CS activities have strong interaction with many subjects within the school curricula (especially in biology) where they have the potential to be integrated. This session will look at opportunities and obstacles for curriculum integration and interdisciplinarity: how best can teachers from diverse disciplines (such as math, physics, informatics, foreign language) be involved, what are the limits and the benefits? (*Facilitator Francesca Ugolini*)

**Topic 2 - Science education in a perspective of sustainable development:** this session will explore how some projects managed to articulate science education activities with activities developing action competences for sustainable development (eg. reducing CO<sub>2</sub> emissions in schools); why they were not carried out in some projects; what activities were carried out; the public reached; how successful they were; the skills developed by the pupils when carrying out such activities; other benefits, limitations and organisational issues when trying to incorporate this element into a science education project. (*Facilitator Stéphanie Hayes*)

**Topic 3 - How to start a project between a school and a research institution?** Bridging the gap between research and schools is one of the concerns of a number European educational initiatives. One question often encountered by CS scientists or teachers from colleagues is how can I start a collaboration with a school or a research institution, respectively. What are the difficulties? How do I profit from this collaboration? Is it expensive? Will it cause me a lot of extra work? How do I get support from my superiors? These and more related questions will be discussed with CS teachers and researchers. (*Facilitator Joachim Dengg*)

### 14h30-15h00 Wrap-up in plenary

### 16h00-18h00 In the streets of Jena, public event with CarboSchools students

## Thursday 15 April: Global Change Science Festival

The Science festival will be an open day taking place in the main hall of the MPI building in Jena where CarboSchools participants: students, teachers, scientists & regional coordinators will present experiments, games, posters, videos etc. developed within the project - and invite everyone to try & take part. The festival will gather the 45 pupils and 15 teachers attending the CarboSchools Spring School since Saturday 10 April, and will also be open to schools from Jena, families & the general public. *The Spring Schools' session topics are given for information at the end of this programme.*

**9h00-10h30 Set-up of the festival** + for those available, visit of MPI-BGC, stable isotope laboratory & 14C accelerator.

**10h30-11h00 Coffee break**

**11h00-12h30 Poster session**

Students & teachers present their local CarboSchools activities by means of posters, practical demonstrations, movies, etc.

**12h30-13h30 Lunch**

**13h30-16h00 The Market place**

Parallel presentations in booths/workshop/activity rooms in the institute's hall, seminar rooms & outdoor, where experiments will be demonstrated as a result of the Spring School workshops and Regional projects activities throughout the year + games, exhibits, movies etc. realized during the Spring School group work sessions.

**16h00-16h15 Market place closing time** & short preparations for presentations

**16h15-18h30 Plenary presentations**

Short presentations (max. 5') of outcomes from Spring school group works (max. 5') by pupils + additional topics by teachers, CS members etc.

Invited talks (20' each) from two other science education projects focused on climate change:

- *Jana Albrechtova*, the Globe Carbon Project
- *Jenny Schluempmann*, German coordinator of "La main à la pâte": the project "Climate, my planet... and me !"

Discussion

**18h30 Closing of the festival with the award of the Sustainability prize** to the school demonstrating the highest potential for local CO<sub>2</sub> emissions reductions, which will receive the symbolic funding collected from everyone's travel emissions.

*We very much welcome presentations from non-CarboSchools participants at the Festival. If you are interested please send an abstract to [philippe@carboschools.org](mailto:philippe@carboschools.org) by 15th March 2010.*

## **Friday 16 April: Evaluation & the way forward**

### **9h00-10h30 Evaluation**

Two years of evaluating CarboSchools projects using self-evaluation questionnaires, pre & post attitude questionnaires and interviews: what did we learn about the impact of CarboSchools activities on pupils' perception of science, scientists and school science? (presentations & discussion) *Elma Djiskra and Martin Goedhart*

### **10h30-11h00 Coffee break**

### **11h00-11h45 CarboSchools final products**

Publication of CarboSchools resources & results on-line and as a book devoted to integrating climate change science education in school curricula: how the broader educational community can use this experience? *Joachim Dengg, Stéphanie Hayes and Philippe Saugier*

### **11h45-12h45 General discussion: how to best disseminate CarboSchools results?**

### **12h45-13h00 The Snowball project - perspectives for beyond 2010 - *Joachim Dengg***

# Thematic Workshops & Group-work topics at the CarboSchools Spring School

(leading to the Global Change Science Festival, Jena 15 April)

## Thematic Workshops (3 mornings)

All students will be spread in 4 thematic workshops (10-12 participants per workshop). In parallel, teachers will work together on ideas for future cooperation activities between their schools.

## Group-work topics (3 afternoons)

Small groups (5-8 students mixed from different countries, size depending on groups & wishes) focused on producing joint outputs illustrating an aspect of the carbon issue to be presented at the science festival - can be a video, game, poster, newspaper, webpage, new experiment etc. All groups will also be invited to address the question: "How can we reduce CO<sub>2</sub> emissions in our school and local community?". Students are expected to work autonomously, the main role of the facilitator being to get them started and give them support as they progress. Outputs will be presented during the science festival.

## Thematic Workshops

### Workshop 1 - Atmosphere

Carbon dioxide is a very well-known greenhouse gas. The latest rises in global temperatures are explained by an increase in concentration of atmospheric CO<sub>2</sub> as a result of human activities. In this workshop, you will explore how atmospheric CO<sub>2</sub> is regulated by thinking up and carrying out experiments: Where does it come from? Where and how is it absorbed?

CO<sub>2</sub> sensors will be provided so that you can measure and learn all about CO<sub>2</sub> concentrations in different environments. For the purposes of experimentation, you will also be provided with plants, seawater, little greenhouses and other materials (if you have any particular needs, please inform us before the meeting). By carrying out these experiments, you will learn about the carbon cycle and how it is regulated, a key factor to anticipating the climate of the next century.

*Conveners:*

*Dr Marc Jamous, LSCE-IPSL Paris, France - Dr Roger Curcoll, LRC-PCB Barcelona Spain*

### Workshop 2 - The Role of the Oceans in the Carbon Cycle

The oceans are one of the largest „natural“ sinks of carbon on earth, taking up a major proportion of the man-made CO<sub>2</sub> emissions. How do the oceans do this? Through lectures and experiments, the participants will get to know the physical, chemical and biological processes involved. They will also discuss the technical and moral aspects of strategies of „geo-engineering“, i.e. the storage of additional CO<sub>2</sub> in the oceans by artificial means.

*Conveners:*

<i>Dr Sally Soria-Dengg, Leibniz Institute for Marine Research, IFM-GEOMAR</i>	<i>Kiel, Germany</i>
<i>Dr Ingunn Skjelvan (tbc), Bjerkness Center for Climate Research</i>	<i>Bergen, Norway</i>
<i>Dr Eva Falck (tbc), Geophysical Institute, University of Bergen</i>	<i>Bergen, Norway</i>
<i>Dr Joachim Dengg, Leibniz Institute for Marine Research, IFM-GEOMAR</i>	<i>Kiel, Germany</i>

### Workshop 3 - Soils

Ecosystems turn-over large amounts of carbon through processes like photosynthesis and respiration. Soils play an important role in such processes since they sequester large amounts of carbon in the form of soil organic matter (humus). If only a small fraction of that carbon was emitted

to the atmosphere by means of carbon dioxide (CO<sub>2</sub>), we would have to expect unpredictable consequences for our climate.

In this workshop students will have the possibility to focus on the controversial role of soils as sink or source of CO<sub>2</sub>. They will explore physio-biological characteristics of various soils during a field campaign, measure CO<sub>2</sub>-emission rates and take soil samples which will then be elaborated and analysed by chemical testing (e.g. nutrient status, carbonate test, etc.).

*Conveners:*

*Barbara Michel, MPI-BGC, Jena, Germany*

*Francesca Ugolini, CNR-IBIMET, Firenze, Italy*

#### **Workshop 4 - Forests**

Forest ecosystems play a decisive role in the global and regional climate change debate. On the one hand, forest ecosystems are the biggest terrestrial carbon sink, storing the carbon for long periods of time in woody biomass and soil. These effects become even more pronounced as use of sustainable timber, rather than other energy intensive materials or fossil fuels, can lead to a significant reduction in greenhouse gas emissions. On the other hand, forests are directly and indirectly affected by climate change, via abiotic and biotic disturbances. Adaptation strategies and measurements to mitigate potential risks have to be developed with a long term vision.

The forest workshop is to convey information about forestry and its relationship to climate change, basic forest principles and inventory techniques to assess growth potential and climate sensitivity depending on soil and climate information. Through field experiments the students will learn how to use typical tools of a forester.

*Convener:*

*Ingolf Profft, Thüringen Forst, Gotha, Germany (+colleagues)*

### **Group-work topics**

***NB - only the 8-10 most popular groups will be kept out of this initial list of topics***

#### **Group 1 - Flash Mob Organisation**

*Facilitator: Stéphanie Hayes, Bordeaux*

We want to tell the people of Jena all about CarboSchools and the Spring School. What a better way than a flash mob event in the streets of Jena? All participants of the Spring School will participate in this event, **but we need a small team of organisers**.

But wait, you're not sure what a flash mob is? Have a look at these then...

- <http://www.guardian.co.uk/environment/video/2009/oct/13/climate-change-flash-dance-london>
- <http://www.youtube.com/watch?v=tQzM0x9z85A&feature=related>
- [http://www.youtube.com/watch?v=0UE3CNU\\_rtY&feature=fvsv](http://www.youtube.com/watch?v=0UE3CNU_rtY&feature=fvsv)
- <http://www.youtube.com/watch?v=jwMj3PJDxuo>
- <http://www.youtube.com/watch?v=WnY59mDJ1gg&feature=SeriesPlaylist&p=9C5623622606791F>

So you're inspired? Then you're the person we're looking for in order to help prepare this exciting event! You will define the message to be conveyed to the public; decide on the most appropriate, doable and sensational action to be carried out by about a hundred people; prepare any props or materials and give a debriefing session to all participants before the event.

#### **Group 2 - Spring School Sustainability Watch**

*Facilitator: Stéphanie Hayes, Bordeaux*

We've all come to Jena to talk about climate change, the reduction of greenhouse gases and being better citizens. We've come to Jena to celebrate and share our achievements in CarboSchools.

**But don't forget!** Our participation in the Spring School will contribute to global warming and to

the detriment of the environment! How many of us travelled by plane? What about those plastic cups and bottles? All that paper we will use? Not to mention other resources to carry out our work shops and group work? And the food? And the packaging? And the electricity? And the transport?...

This is typical of any conference or event. So will we be different? Will we make a conscious effort to reduce our waste and energy use? At the end of the five days, what will have been our impact on the climate and the environment? **Join this groupwork if you want to find out the answers to these questions, and if you want to help us reduce our impact.** You will be appointed as the Spring School Climate Guardians and you will be responsible for monitoring and assessing the sustainability of our practices and actions during the Spring School. You will also be given the difficult task to choose the local school mitigation project that will receive the money collected from everyone's travel CO<sub>2</sub> emissions. You will then present your results during the Science Festival.

### **Group 3 - create a game for the Science Festival**

*Facilitator: Mauricette Mesguich, Libourne. This game was a great success during last year's awareness-raising event at the Max Linder School and it involves learning and eating!*

This is the idea behind the game: visitors to the festival are given questions which they need to answer correctly by reading posters or visiting stands etc, then for each correct answer, they can win a token, "carboration", which they exchange for a snack at a refreshments stand. Here the food will be organic and will have been bought locally and in season.

Via this game, visitors not only "refresh" their stomachs and actively learn about climate change etc, but they also refresh their knowledge and attitudes towards the food that they buy and eat every day, and how it impacts CO<sub>2</sub> emissions. In addition, it provides a refreshing notion of money, whereby it is replaced by a different exchange system.

The group work would involve planning the questions, finding out where to buy the food/ingredients, preparing the snacks and also producing a poster or flyers informing the public about the importance of buying locally and in season etc.

### **Group 4 - a moment of silence**

*Facilitator: Rixt Kok, Groningen*

Challenge the visitors of the Science Festival to observe a Moment of Silence for global warming. Think of several ways of how the people can express their feelings towards global warming during this silence. Create materials for this purpose (symbols, text balloons, banners, clothing etc.). immortalize the moment by taking a picture. Think of ways to create a 'silence spot' at the Festival.

### **Group 5 - Climate-neutral art**

*Facilitator: Rixt Kok, Groningen*

The idea is to create climate-neutral (or sustainable) art together with the public during the Science Festival. This can be a 2- or 3-dimensional object, one large object or several smaller ones. In this group work you can use all your creativity. What kind of CO<sub>2</sub>-related object(s) to create together with the Science Festival visitors? What climate-neutral material to use: natural materials, rubbish, discarded materials of Jena citizens, et cetera? How and where to collect the materials? Decorate yourself with the materials and show the public the fun of creating art worthless materials.

### **Group 6 - Eco-Cluedo (game)**

*Facilitator: Francesca Ugolini & Italian teachers*

The Italian students would like to involve foreign students in organizing and developing the game-activity "ECO-CLUEDO": an eco-killer has committed an eco-crime and will be traced by means of many eco-evidences. The game will be then performed during the events' day.

### **Group 7 - Dante e Virgilio in the circle of polluters (theatral performance)**

*Facilitator: Francesca Ugolini & Italian teachers*

Dante e Virgilio, passing across the Hell meet some characters whose sin is to have been responsible for CO<sub>2</sub> emissions during their terrain life and that now are placed in the circle of polluters, by the way the hot of the Hell is due to the extreme greenhouse effect they are responsible for. Virgilio introduces Dante some characters:

- One entrepreneur that does not respect the legislation on its factory's smoke emissions.

- A driver owner of an old not revised car with a driving style not ecologically respectful.
- One local authority that doesn't care of the emissions' problem
- The president of a big nation who doesn't want to sign any agreement addressed to the CO2 emission reduction

Each character will introduce its sin and its punishment.

5-6 students are enough even if other characters could be invented.

### **Group 8 - The ecological game of the goose (game)**

*Facilitator: Francesca Ugolini & Italian teachers*

On the base of the well known childhood game, The Game of the Goose, students will create (possibly in two languages, English and German) a super size (1,5\*2 m or more) game's board consisting of 68 cells with questions or sentences about excellent and bad attitudes upon the environment and the CO2 emissions. The board will be drawn and questions, thought and written by the students, will be associated to a score. The game will need the use of a dice and, according the negative or positive score of each cell, will make move the players ahead or back. The first player arriving to the 68<sup>th</sup> cell will receive an award for having demonstrated the best attitude.

### **Group 9 - We think, we write, we survey (questionnaire & surveys)**

*Facilitator: Francesca Ugolini & Italian teachers*

A questionnaire about the human contribution to the increasing of the CO2 production and also about the attitudes to save electrical and water energy was designed by us, a group of student from 3Ds, High School in Prato and submitted to 3 targets: young people, adults and elder people. This is because we'd like to know how much this problem is known among people and to find out what the people do everyday to help the environment. We could take it as a starting point to write other questionnaires or questions in Jena and to submit it to the people in that town.

### **Group 10 - Make a documentary about the Spring School**

*Facilitator: Marc Jamous, Paris*

Write a scenario, take pictures and add sound (music and comments) to produce a very lively souvenir of the meeting. You will have to organise your team to follow all sessions and keep best moments. You have not to produce a movie but a photo-movie, which could be technically easier to produce but needs strong reflexions.

### **Group 11 - Produce a video message for the adult community**

*Facilitator: Marc Jamous, Paris*

Take pictures of young participants of the meeting and add sound (music and comments, interviews) to produce a message for adults. Ask for other pupils to explain in a few words why we have to decrease CO2 emissions and with the help of an ingenious editing, produce your message for an international audience.

### **Group 12 - How well informed are the Jena citizens about climate change?**

*Facilitator: Sally Soria-Dengg, Kiel*

Have you ever dreamed of becoming a reporter? of exposing the truth to the public? Now here's your chance to make your dreams come true! In this group work you will find out how well informed about climate change the citizens of Jena are. With your own questions, you will roam the streets of Jena with a camera team and interview the people on the streets, young and old, rich and poor, girls and boys and learn the truth about their climate literacy!

### **Group 13 - Street Art**

*Facilitator: Sally Soria-Dengg, Kiel*

Is there a Goya in you? a Picasso maybe? or a Michaelangelo? Join this group work and find out! You will create landscapes and sceneries, still lifes and probably portraits depicting any aspect of climate change... a snowy desert, a misshapen shell, a snowboarder in bikinis, a beautiful woman with melting make-up! Equipped with pavement chalks, you will transfer your drawings on the pavement of the "Fußgängerzone" of Jena or anywhere where we can attract a lot of attention (also on walls) - thus presenting your Masterpieces in an open-air Art Exhibit with a guaranteed high number of visitors!



### **Group 14 - "Monster PET"**

*Facilitator: Doru Chifor, Cluj*

This activity derives from a very successful and very funny activity in our school in Cluj. All the pupils will collect PET (plastic) bottles and build robots and monsters. At the science festival we will organise a contest and the visitors will be asked to find the funniest name for each monster PET.

### **Group 15 - social web**

*Facilitator: Elisabeth Engum, Bergen*

How to use social web to get the knowledge out, and also get tips and ideas from others? In this session every student will be taught a little bit about how to publish their results on a wikipage made for the workshop. They will also be able to make their own wiki later. The main goal is to get all of them connected via social web to see how they can benefit from other students around the world, or locally at their own school.

The students need some basic background in text editing on a computer. Suitable for students 14-20 years old. The students should bring the results from their different local studies (this could be text, tables, photos, videos - anything that can be shared on the web - remember issues connecting copyright)

*NB- as we publish this list of topics it is uncertain whether we will have enough computers & internet access for the needs of this group, which might therefore be cancelled.*

### **Group 16 - What's the politics behind climate change?**

*Facilitator: Michael Hüttner, Jena*

Take the opportunity and learn about the politics behind climate change and get first-hand experience from a participant of the World Climate Conferences (COPs). Find out about the UNFCCC process, the Kyoto-Protocol and the long way to reach international agreement on climate protection and negotiate your climate targets in a Climate conference role play.

Before coming to Jena we would like to ask you to collect information on your country's climate politics (emission reduction targets, policies concerning greenhouse gas emissions, etc.). We will discuss the different approaches, viewpoints and positions during the group work sessions in Jena.

### **Group 17 - Sustainability tour through Jena**

*Facilitator: Ulrike Müller, Jena*

This activity will take you on a city ralley to find out about the sustainability of products and services provided for consumers in Jena. Where does the caocao in your chocolate come from? What is the Carbon footprint of apples form New Zealand which travel all the way to Europe to be eaten by us? Should we only think of saving energy when using eco light bulbs?

Let's take the challenge and go on a shopping tour to prepare only sustainably produced foods which we will offer to visitors of Carbon Science Festival.