

# CarboNordic

## Project Outline

11 August 2006

CarboNordic is an initiative that explores the feasibility of an international student exchange, in which students from secondary schools do project work in collaboration with scientific institutions both at home and abroad. Originated within the framework of CarboSchools ([www.carboschools.org](http://www.carboschools.org)), these scientific projects generally fall into the category of "Geosciences" or "Environmental Sciences" and are oriented mainly (but not exclusively) towards topics from the global change / CO<sub>2</sub> context. As such, they tend to be interdisciplinary, involving biology, chemistry, physics, mathematics and geography, as well as political and ethical aspects. Ideally, the student exchange is intended to be bilateral to foster scientific, language and social skills. To document this, at the end of an exchange a Europass Mobility will be awarded to participants.

The project outline presented here is based on the conclusions drawn from an extended discussion at a startup workshop on May 18 and 19, 2006 at IFM-GEOMAR, Kiel, Germany. It is intended as an initial frame of reference, and will be updated when new information is available.

## Participants

At the moment, CarboNordic is comprised of schools and institutions in 5 partner countries (for details see appendix):

Denmark: Greve Gymnasium, Greve, and Risø Laboratories, Roskilde;  
Finland: Koillis-Helsinki Upper Secondary School and University of Helsinki, Helsinki;  
Germany: Gymnasium Wellingdorf and Leibniz Institute of Marine Sciences (IFM-GEOMAR), Kiel;  
Norway: Bergen Katedralskole and Bjerknes Centre for Climate Research, Bergen;  
Sweden: Platengymnasiet, Motala, and Swedish University of Agricultural Sciences, Uppsala.

Each partner is represented by one or several teachers and scientists. Presently, coordination takes place through Kiel, but each country has one teacher as a local contact for students:

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Fi:	Sakari Kannisto,	<a href="mailto:Sakari.Kannisto@edu.hel.fi">Sakari.Kannisto@edu.hel.fi</a>
D:	Sabine Temming,	<a href="mailto:Sabine.Temming@t-online.de">Sabine.Temming@t-online.de</a>
N:	Bente Faerovik,	<a href="mailto:bentfa@online.no">bentfa@online.no</a>
S:	Lennart Wallstedt,	<a href="mailto:lennart.wallstedt@edu.motala.se">lennart.wallstedt@edu.motala.se</a>

## Goals

CarboNordic is trying to advocate partnerships between schools and research institutions at several locations in northern Europe, and to establish a scientific student exchange between participating countries. Since, by their very nature, geosciences work across national borders, it is important to encourage student mobility already at a pre-university level to foster a new generation of European scientists.

Particular emphasis is placed on:

- establishing local partnerships between schools and research institutions,
- starting science cooperations between schools and teachers in different countries,
- encouraging mobility in European students at a pre-university level,
- giving students insights into scientific methods, ways of thinking and international cooperation,
- allowing students to base their career decisions on first-hand experience,
- increasing and practicing language skills (both for students and teachers) in a context different from traditional language exchange programs,
- practicing social skills in a foreign environment,
- promoting new scientific cooperations between member countries via first contacts through students.

## Practical Aspects

Ideally, student projects eligible for CarboNordic should be science projects in environmental sciences that may take between 2 weeks and a complete school year. Wherever possible, they should involve two students at approximately the same age from two different countries, who each have a local tutor within a research institution to accompany their projects. The projects should be defined in such a way that in addition to their individual local work, a cooperation between the students in different countries is possible and involves a mutual visit with some period of joint practical work. While the complete projects may take considerably longer, the actual stay abroad should be from 1 to 2 weeks.

Although an actual exchange of students is preferred, projects of individual students in a partner country may also be part of CarboNordic, as is participation in courses or workshops offered at partner institutions.

The school context in which CarboNordic projects may take place varies between countries and schools. In some places the projects may be part of a syllabus or required coursework with subsequent grading, while in other schools they may be purely voluntary. Especially in cases where the projects are part of the syllabus, the exchange is likely to take place during the school year, for example during special project weeks. Even if the projects are a voluntary activity, exempting the students from class for a defined period of time should be considered. (Since the schools select the students for this exchange, generally it will be the academically stronger students who would not have problems catching up after one or two weeks.) Exchanges during or extensions into vacations should also be possible.

Students should be no less than 14 years old for an exchange between host families, 18 years for individual travel. (Note: nevertheless, explicit letters of consent by the parents and / or other legal and insurance procedures may be required. To be clarified...) Although housing in e.g. youth hostels should not be ruled out completely, the preferred *modus operandi* is through host schools and host families to allow the students to experience the living and learning environments in the host country. To facilitate a decision on participating, it may be advantageous to allow students to apply and travel in pairs; however, during their stay in the host country the students should live in different families.

The working language in CarboNordic will generally be English, unless the students speak the language of their host country.

Eventually, the program will encompass a teacher exchange or mutual visits to give the coordinators first-hand background knowledge on the host schools.

## Framework

CarboNordic projects can and should take place within the framework of one of several initiatives, all of which are suited to the proposed type of project work (see below). A link to a research project facilitates contributions by scientists, who may in their turn benefit from working with students: school projects may be defined such as to contribute directly to the scientist's work, e.g. by providing measurements or by analyzing data, or to fulfill the scientist's obligation for outreach activities required by funding agencies.

Examples for initiatives that qualify for CarboNordic projects:

**CarboSchools** ([www.carboschools.org](http://www.carboschools.org)): an association of partnerships between schools and research institutions in the context of global change and greenhouse warming, supported by the scientific projects CarboEurope and CarboOcean.

**BALTEX** ([dvsun3.gkss.de/baltex](http://dvsun3.gkss.de/baltex)): an international scientific project to study the hydrology and climate variability of the Baltic Sea region.

**Young Reporters for the Environment** ([www.youngreporters.org](http://www.youngreporters.org)): an international network of teachers and students who inform about environmental issues in articles and photos.

In addition, award of the **Europass Mobility** ([www.europass.cedefop.europa.eu](http://www.europass.cedefop.europa.eu)), a standardized report to document an exchange experience, is intended as a record of the students' stay and work in the host country.

## Pilot Phase

Initially, a pilot phase is envisaged which will mainly comprise the school year of 2006/07. In this time, the project will try to demonstrate the feasibility of the concept by exchanging a small number of students between the participating countries. The exact number depends on available resources in terms of eligible students, scientific and school tutors, and finances. A minimum of 2 students per country seems a reasonable goal for this time frame.

## Status

At the moment, the following projects are prepared for the pilot year:

(note: all of these outlines are tentative at the moment and will gradually be made more concrete)

**Denmark:** a "Carbo"-type project is envisaged in which students from other countries would be able to participate. This is likely to be an excursion of 2-3 days on themes relating to terrestrial CO<sub>2</sub> uptake.

**Finland:** local projects have been initiated. An excursion to Hyytiälä Station is suggested for May 2007 to study CO<sub>2</sub> uptake by forests for one or two weeks with a larger group of students. Places are likely to be offered for students from partner countries.

**Germany:** projects in the context of "NaT-Working" are continually taking place. Arrangements will be made to team up German participants with partners from other countries to work on common projects that include an exchange period.

**Norway:** a CarboSchools project has been initiated and options for exchange are being explored. At the moment, a project week (between 2 and 5 days) during March/April 2007 is planned where the inorganic carbon cycle in seawater and fresh water will be studied. Included in this week is one day on a research vessel.

**Sweden:** although no concrete activities have been started yet, the MarkInfo web data base on forest soils in Sweden ([www-markinfo.slu.se/eng/index.html](http://www-markinfo.slu.se/eng/index.html)) as well as the Soil Day held biannually will serve as a base for new activities.

## **Student Selection**

Students are eligible for an exchange upon application with and approval by their local contact teacher or by nomination through their school. Direct applications to the research institutions are not possible.

By its very nature, this scheme is particularly suited for gifted and specially interested students with strengths in the natural sciences and languages, and thus it may become part of special offers to gifted students in the respective countries.

## **Costs**

The expected costs for this exchange scheme are quite unclear during this pilot phase and will depend on the projects in which the students participate. In general, the students' families will be asked to contribute to the costs of travel and sojourn, similar to the standard procedure in language exchange schemes. However, a social component needs to be included to guarantee that students who are eligible but cannot afford the costs can be supported by the project. For this, specific funding will be required.

The material used for the scientific work that takes place at the research institutes should generally be contributed by the institutions themselves. However, this may depend on the nature of the specific projects.

## **Funding**

Sources for funding will need to be explored, both for the pilot phase but especially for long-term support. Potential programs are:

Comenius / Socrates: funding is offered for student conferences and teacher exchange, but not for individual science projects. Applications need to be by schools.

local (national) support: e.g. Schleswig-Holstein Ministry for Europe in Germany; various scholarship schemes or sponsoring by local companies could be options as well.

long term: beyond the pilot phase, an effort will have to be made to acquire funding for a continuation and expansion of the project. With a successful pilot phase, a solid proposal for EU funding should become possible.

## **Communication**

Communication between participants will initially mainly be by email. Eventually, a web-presence and further meetings may become necessary.

## **Output and Evaluation**

Output will be in terms of students' reports that should cover the scientific results of the projects but also include a personal statement on experiences from the project. While the scientific part may be required to be in the national language for grading purposes, at least an English abstract should be included. The personal part of the text should be in English. Reports will be made available on a common website.

Eventually, some scheme for an evaluation of the success of the cooperation has to be devised. This could be formal (through questionnaires) or informal (through the written reports with personal feedback by the students).

## **Appendix:**

### **Schools and Institutions**

#### **Denmark:**

Greve Gymnasium, Rådhusolmen 12, DK - 2670 Greve.  
[www.greve-gym.dk](http://www.greve-gym.dk)

Risoe National Laboratory, Biosystems Department, P.O. Box 49, DK - 4000 Roskilde.  
[www.risoe.dk](http://www.risoe.dk)

#### **Finland:**

Koillis-Helsinki Upper Secondary School, Moisiantie 3, 00730 Helsinki.  
[www.koillis-helsinki.fi](http://www.koillis-helsinki.fi)

University of Helsinki, Division of Atmospheric Sciences, P.O.Box 64, (Gustaf Hällströmin katu 2), 00014  
University of Helsinki.  
[www.atm.helsinki.fi/indexeng.php](http://www.atm.helsinki.fi/indexeng.php)

#### **Germany:**

Gymnasium Wellingdorf, Schönberger Straße 67, D - 24148 Kiel.  
[www.gymnasium-wellingdorf.de](http://www.gymnasium-wellingdorf.de)

IFM-GEOMAR, Leibniz-Institut f. Meereswissenschaften, Düsterbrooker Weg 20, D - 24105 Kiel.  
[www.ifm-geomar.de](http://www.ifm-geomar.de)

#### **Norway:**

Bergen Katedralskole, Postboks 414, N-5828 Bergen.  
<http://bks.hfk.no>

Bjerknes Centre for Climate Research, University of Bergen, Allegaten 70, N - 5007 Bergen.  
[www.bjerknes.uib.no](http://www.bjerknes.uib.no)

#### **Sweden:**

Platengymnasiet, Box 955, S - 591 29 Motala.  
[www.motala.se/templates/MotIntra\\_SimpleList\\_\\_\\_\\_1768.aspx](http://www.motala.se/templates/MotIntra_SimpleList____1768.aspx)

Swedish University of Agricultural Sciences, Department of Forest Soils, Box 7001, S - 750 07 Uppsala.  
[www.sml.slu.se](http://www.sml.slu.se)