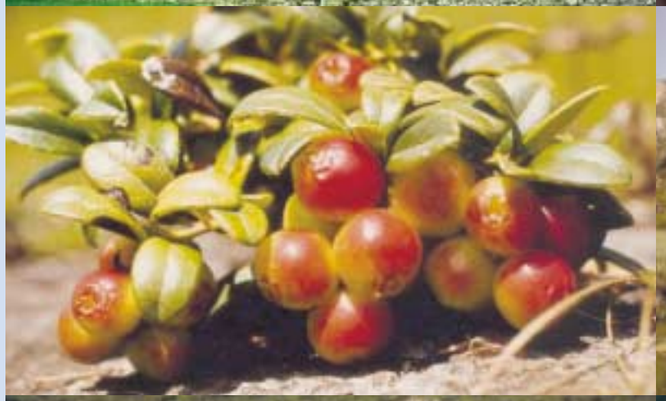
ATEAM **partners**

Wageningen University (WU), Wageningen, The Netherlands – Rik Leemans (co-coordinator), Frits Mohren
Centre d'Ecologie Fonctionnelle & Evolutive (CEFE), Montpellier, France – Sandra Lavorel
Eidgenössische Technische Hochschule Zürich (ETH), Zürich, Switzerland – Harald Bugmann
Max Planck Institute for Biogeochemistry (MPI-BGC), Jena, Germany – I. Colin Prentice
Lund University (LU), Lund, Sweden – Martin Sykes
Université Catholique de Louvain (UCL), Louvain-la-Neuve, Belgium – Mark Rounsevell
Centre de Recerca Ecològica i Aplicacions Forestals (CREAF), Barcelona, Spain – Santi Sabaté
Institute of Arable Crops Research (RES), Rothamsted, United Kingdom – Pete Smith (now at University of Aberdeen)
University of Southampton (SOTON), Southampton, United Kingdom – Nigel W. Arnell
Universidad de Castilla-La Mancha (UCLM), Toledo, Spain – José Manuel Moreno
European Forest Institute (EFI), Joensuu, Finland – Timo Karjalainen

ATEAM subcontractors:
Finnish Environment Institute (SYKE), Helsinki, Finland – Timothy Carter
Laboratoire des Sciences du Climat et de l'Environnement (LSCE), Paris, France – Pierre Friedlingstein
Silsoe Research Institute (SRI), Bedford, United Kingdom – Eric Audsley
Tyndall Centre for Climate Change Research, University of East Anglia (UEA), Norwich, United Kingdom – Mike Hulme
University of Sheffield (US), Sheffield, United Kingdom – F. Ian Woodward
University of Georgia (UGA), Athens, Georgia, USA – Bruce Beck



ATEAM

Advanced Terrestrial Ecosystem Analysis and Modelling

For more information contact: Dagmar Schröter, tel. +49 331 288 2639, Dagmar.Schroeter@pik-potsdam.de
Visit our ATEAM website at www.pik-potsdam.de/ateam/

A project funded by the EU and led by the Potsdam Institute for Climate Impact Research. Project No. EVK2-2000-00075, 5th Framework Programme of the European Commission, 2001–2003.

Coordinating Institute

Potsdam Institute for Climate Impact Research, Potsdam, Germany
Wolfgang Cramer (project leader)
Dagmar Schröter (scientific co-ordinator)

The founding of PIK in 1992 arose out of the growing need of decision-makers for scientific information on the consequences of global change. PIK promotes management strategies for sustainable development by studying the complex interactions between earth-system components and society.
PIK contributes actively to programmes such as the International Geosphere-Biosphere Programme (IGBP), the Millennium Ecosystem Assessment (MA) and the Intergovernmental Panel on Climate Change (IPCC).

www.pik-potsdam.de/ateam/

Global change – Global change includes changes in climate, atmospheric composition (e. g. CO_2 concentration), in deposition of nitrogen (and other substances), biodiversity and land use.

The ATEAM **project**

Ecosystems provide a number of vital services for European people and society. Global environmental changes such as climate change, land use change and atmospheric pollution can have large effects on these ecosystem services. For example, the capacity of European ecosystems to provide fresh water, agricultural products, biodiversity and recreational opportunities is likely to be affected by global change.

Many people and organisations in Europe have a direct interest in the successful functioning and well-being of ecosystems. The ATEAM project is concerned with the risks that global change poses to the interests of these stakeholders. By assessing the vulnerability of ecosystem services to global change ATEAM will support stakeholders in their decision-making and will promote the sustainable use of ecosystem services.

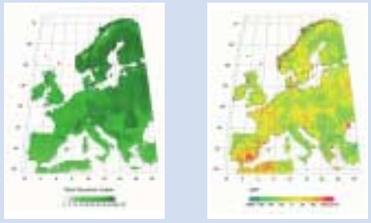
The vulnerability assessment itself is based on comprehensive state-of-the-art databases and the application of numerical simulation models. Future conditions are explored using a range of scenarios which are generated with the aim of testing several policy options.

The ATEAM **stakeholder dialogue**

ATEAM initiates a dialogue that crosses the boundaries between economic, social and scientific spheres. This dialogue brings together decision-makers and scientists to identify the most important ecosystem services in Europe in a process of mutual learning. ATEAM involves managers and decision-makers from the agricultural, forestry, energy, water, nature conservation, recreation and tourism sectors, as well as scientists whose work focuses on modelling the effects of global change on these sectors. A long-term collaboration will help scientists to deliver more meaningful information to stakeholders. The partnership between stakeholders and scientists reflects a new era of sustainable environmental management.

Stakeholders – people and organisations who have an interest in information on ecosystem services and their vulnerability to global change. Stakeholders for ATEAM include natural resource managers, planners and decision-makers, both within the private and the public sector.

www.pik-potsdam.de/ateam/



The map on the left depicts the total terrestrial carbon pools in Europe (1980, kg C m^{-2}). The map on the right shows carbon emission and uptake (g C m^{-2}) between the years 1980–1989 (by LPJ-DGVM). ATEAM will produce maps for future scenarios up to the year 2100. These maps can serve as direct input into decision-making on greenhouse-gas reduction strategies. Red shades: carbon emission; green shades: carbon uptake.

ATEAM **products**

ATEAM will produce Europe-wide maps of vulnerability of those ecosystem services that are relevant to stakeholders. A comprehensive ecosystem modelling framework will be applied to produce plausible future scenarios based on various possible socio-economic developments. These maps will be fundamental for 'if-then-analyses'.

For example, under certain climatic and socio-economic scenarios Southern European ecosystems might turn into an important carbon source (see maps above, for illustration only). Such information is important regarding European commitments under the Kyoto Protocol. Similar maps will be developed for timber production, water resources and other ecosystem services.

In workshops and by means of a continuous dialogue, stakeholders and scientists will generate and review such maps to ensure and improve their value to managers and decision-makers. ATEAM's target is both to promote sustainable environmental management and to assess business opportunities.

Examples of *ecosystem services* are…

…agricultural products,

…biodiversity (shown here: *Vanessa atalanta*),

…recreational opportunities.

Ecosystem services – Ecosystem services are the conditions and processes through which ecosystems, and the organisms that make them up, sustain and fulfil human life.

Vulnerability – Vulnerability is the degree to which an ecosystem service is sensitive to global change combined with the degree to which the sector that relies on this service is unable to cope with the changes.

A fossil-fuel driven power plant contributes to climate change by producing CO_2.

Ecosystems may absorb and store CO_2 for some time, and they may provide substitutes for fossil fuels in energy production.

The frequency and intensity of floods may increase as a result of climate and land use change – ecosystems may be managed to alleviate the effects.

The red grouse (*Lagopus lagopus scoticus*) acts as a symbol for intact wildlife and is therefore suitable for marketing hunting holidays and whiskies.