

**Emissions databases  
within ACCENT**

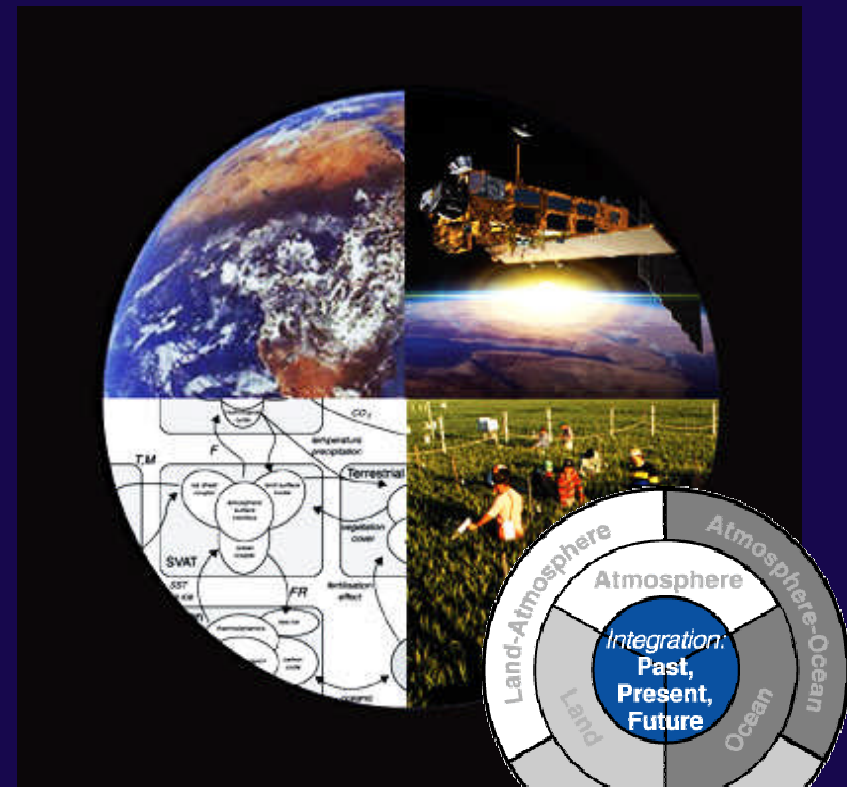
**and**

**the GEIA project of AIMES/IGBP**



# Analysis, Integration and Modelling of the Earth System

- Earth System modelling at various complexities
- Modular-declarative modelling and exchangeable code
- Formalisation of the human dimensions in the Earth System
- Global emission inventories and modeling (GEIA)
- Integrated Earth System scenarios
- Earth System Atlas
- Fast Track Initiatives (nitrogen, iron cycles; fires)



GLOBAL  
I G E F  
CHANGE

# ***ACCENT: Atmospheric Composition Change A European NeTwork***

**The overall goals of ACCENT are to promote a common European strategy for research on *atmospheric composition sustainability*, to develop and maintain durable means of communication and collaboration within the European scientific community, to facilitate this research and to optimise the interactions with policy-makers and the general public.**



# The structure of ACCENT

- vertical structure (subprojects)
- horizontal structure (tasks)
- reach-out structure (tasks)



# The activity on Emissions in ACCENT

- Emissions databases
- Tools for use of emissions for different studies
- Emissions for global and regional studies
- Development of a database of driving variables
- Past, current and future evaluation of emissions
- Coordination with national and international activities  
= strong link with GEIA

**Coordinator: C. Granier**

**Steering Committee: K. Butterbach, I. Isaksen,  
C. Liousse, J.F. Muller, C. Reeves, V. Vestreng**

**METADATABASE**

- Administration
- Advanced Search

**PROJECT DESCRIPTION**

- Project summary
- Project objectives
- Participant list
- Atmospheric pollutions
- Potential impact
- Project Archive
- Documentation

**JOINT RESEARCH PROGRAMME**

- Aerosols
- Biosphere-Atmosphere Exchange
- Transport and Transformation (T&TP)
- Atmospheric Sustainability

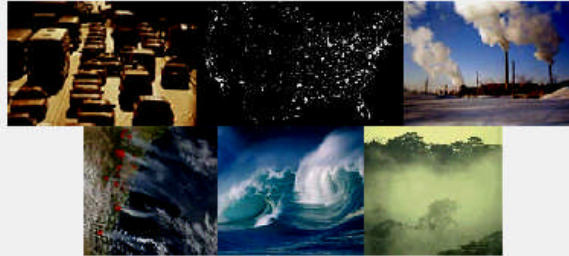
**OUTREACH TASKS**

- Public Information and Policy Support
- Training and Education

**INTEGRATION TASKS**

- Access to Infrastructures

**Access to Emissions**



The goal of the activity on emissions within ACCENT is to develop different and complementary approaches to establish and evaluate global and regional emission inventories, to provide easy access and detailed information on existing databases and to help develop parameterizations of emissions which can be used in chemistry-transport or climate models. Community tools for making an optimal use of the data for research and training will also be developed.

**The GEIA/ACCENT data portal** (click to go to the data portal)

The species that will be considered in the databases are the ozone precursors (CO, CH<sub>4</sub>, nitrogen oxides, non-methane hydrocarbons (NMHCs)), greenhouse gases (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, CFCs, HCFCs and HFCs), organo-halogenes, aerosols and their precursors (SO<sub>2</sub>, DMS and other sulphur gases, ammonia, dust, sea salt, black and organic carbon), and several heavy metals.

This activity will be developed in collaboration with the [GEIA](#) (Global Exchange and Interactions Activity) project, which is part of the [AIMES](#) (Analysis of the Integrated Modelling of the Earth system) project. [AIMES](#) is the new integration project of the [International Geosphere-Biosphere Program \(IGBP\)](#).

**ANNOUNCEMENTS**

- April 2005 workshop presentations available
- January 2005 workshop presentations
- June 2004 workshop presentations

**CONTACTS**

- Claire Granier
- Aude Mieville

**LINKS**

- Service d'Aéronomie/PSL/CNRS
- GEIA center
- GEIA/ACCENT data portal
- EDGAR emissions

The new GEIA data portal can be accessed through → the GEIA web site → the ACCENT web site

A paper will be written in the coming months for IGBP Newsletters presenting the data portal

<http://www.geiacenter.org>  
<http://www.accent-network.org>



# RETRO inventory

Go to [RETRO data](#)

## Title of Dataset

## Abstract

## Reference (requested when used in any study)

## Documentation

## Keywords

## Language

## Production Date

### CONTACT DETAILS

<b>Authors name</b>	Anthro. dataset : Tinus Pulles (1), Roel Brand (1), Maarten van het Bolscher (1), ,yvind Endresen (2), Eirik S,rg,rd (2), Jostein K. Sundet (3), Stig B. Dals,ren (3), Ivar S. A. Isaksen (3), Tore F. Berglen (3), Gjermund Gravir (2), Martin Schultz (4) Fires emission dataset: Martin Schultz (4), Judith Hoelzemann (4), Angelika Heil (4), Allan Spessa (5), Kirsten Thonicke (6), Johann Goldammer (7), Alexander Held (7), Jos, Miguel Pereira (8)
<b>Institutions</b>	(1) TNO-MEP, Apeldoorn, The Netherlands; (2) Det Norske Veritas, Veritasveien, H,vik, Norway; (3) Department of Geophysics, University of Oslo, Oslo, Norway; (4) MPI-Met, Hamburg, Germany; (5) MPI-BGC, Jena; (6) PIK, Potsdam; (7) Fire Ecology Research Group, Freiburg; (8) Instituto Superior de Agronomia, Lisbon
<b>Emails</b>	
<b>Web link (for access to detailed data)</b>	<a href="http://retro.enes.org/emissions/">http://retro.enes.org/emissions/</a>

### SPATIAL AND TEMPORAL INFORMATION

<b>Geographical Coverage</b>	LONG : -180, : 180, LAT : -90, : 90,
<b>Spatial Resolution</b>	0.5, x 0.5,
<b>Temporal Coverage of the Data</b>	Start : 01/1960 End : 12/2000
<b>Temporal Resolution</b>	1 month

### OTHER INFORMATION

<b>Methodology</b>	Martin G. Schultz, Tinus Pulles, Roel Brand, Maarten van het Bolscher, and Stig B. Dals,ren (2005), A global data set of anthropogenic CO, NOx, and NMVOC emissions for 1960-2000 (paper in preparation) Martin G. Schultz, Angelika Heil, Judith J. Hoelzemann, Allan Spessa, Kirsten Thonicke, Johann Goldammer, Alexander Held, and Jose M.C. Pereira, Global Emissions from Vegetation Fires from 1960 to 2000, 2005, Global Biogeochemical Cycles.
<b>Data source(s)</b>	Anthropogenic emissions in the RETRO inventory stem from two main sources of data: 1. The TNO data base 2. The VERITAS inventory of international ship traffic emissions For biomass burning emissions : National statistics of burned areas, GBA2000 burnt areas (from Vegetation/SPOT), ATSR fire pixels
<b>Format</b>	NetCDF - 1 file per year and per specie
<b>File Size</b>	1 NetCDF file (1 year, 1 specie) : 13.5 MB
<b>Remarks, questions</b>	Go to the <a href="#">GEIA forum</a>

**Documentation and templates for the RETRO inventory**

### Data Portal - List of species

Specie	POET	RETRO	GEIA v.1
CO	•	•	•
NOx	•	•	•
CO2		•	•
CH4 (methane)		•	•
C2H6 (ethane)	•	•	
C2H4 (ethene)	•	•	
C3H6 (propane)	•	•	
C3H8 (propene)	•	•	
Butane and higher	•	•	
Butene and higher	•		
Toluene	•	•	
CH3OH (methanol)	•	•	
C2H5OH (ethanol)	•	•	
CH2O (formaldehyde)	•	•	
CH3CHO (acetaldehyde)	•	•	
CH3COCH3 (acetone)	•	•	
CH3COCH2CH3 (Mek)	•		
C2H2 (ethyne)		•	
C6H6 (benzene)		•	
Xylene		•	
Isoprene (C4Hx)	•	•	
Monoterpenes	•	•	
H2 (hydrogen)		•	
N2O		•	•
NH3 (Ammonia)		•	•
CFC (cfc-11 & cfc-12)			•
Black Carbon ('BC')		•	•
Organic Carbon ('OC')		•	•
SO2			•
Lead (pb)			•
Mercury (hg)			•
Reactive chlorine			•
Pesticides			•
VOC			•

**List of current species  
included in the database**

**All these information need to  
be integrated into the  
ACCENT metadata system**



**Workshop on biomass burning**  
**in December in Toulouse**

Organized by

C.Liousse (Lab. Aerologie) and J.M. Gregoire (JRC)

Presentations available soon  
on the ACCENT-Emissions website

*Toulouse, December 14 and 15, 2005*

**Aim of the workshop :**

**How to access global and regional burnt biomass from satellite observations to derive gases and particle emission inventories?**

**Producers ↔ Users**

***Burnt Biomass***

***=> Burnt areas***

***=> fuel loads and burning efficiency***

*With the support of ACCENT/GEIA/JRC*

## A brief summary ....

*First maps created from statistical data : a factor of 2 or 3 for uncertainty*

- maps of active fires from AVHRR 1km (IGBP-DIS)
- coordinated effort continued with GOFC/GOLD program (=> workshops in 2001,2002)
- additional products : ATSR, VIRS, MODIS

« Active fire products : only a sample of the total fire activity »

- development of global maps of burnt areas :  
GBA2000 (Spot) and GLOBSCAR (ATSR) : big differences  
*GBA>GLOBSCAR>WFA (active fire ATSR) see Kasischke and Penner paper*

**Users of these burnt area products**

**: Michel, Liousse, Penner ...**

**Users of the active fire products**

**: Generoso, Mieville, Van der Werf, Ichoku, Chin...**

**Users of mixed products :**

**: Ito and Penner : GBA 2000 and WFA**

**: Hoelzemann et al. : ATSR and WFA ...**

## Specific objectives of the workshop

Examine current and on going fire products : burnt areas (BA), Active fires (AF), FRE products.

Present results of emission estimates

Recommend methodology for best estimates of burnt biomass  
*(multi product use : find a coherent method)*

Find modeling exercises with possible validations to evaluate the estimated emissions

Promote the dialogue between the users and producers to guide the development of products and their use.

Need for maps of fuel loads and burning efficiency

## Questions (issued from 2 days workshop)

1) Need to be completed for the letter-report of our workshop and also to be put in the ACCENT/GEIA web site

- Exhaustive description of fire products (BA and AF) global and regional : Jean-Marie, please could you circulate a table? And send me back the results.
- Exhaustive description of existing emissions by satellite/model (ex using ATSR) = needed to know assumptions of each group : Carsten, please could you circulate a table?
- To put priorities in the list of Jean-Marie (an important first message for providers: products need to be validated!)  
(to be added to the JM list = Duration of fires (Sergei model), request of Radiative energy) : Jean-Marie, please could you circulate the list in order that everybody put their priorities? And send me back the results.



## Questions (issued from 2 days workshop)

2) **intercomparison exercise** = Total Particulate matter and CO emission estimates for the year 2003 from different fire products  
A common vegetation and common EF will be chosen.

This action will help to understand huge differences existing between the current products (absolute budgets, spatial variation and temporal differences).  
By working together (both providers and users), regional recommendations are expected for users (by combining products for example).

- *Decide on experiment before Spring 2006 (vegetation, EF..)*
- *Use with burning products in spring-summer 2006*
- *Scheduled works using GBA, GLOBCARBON, MODIS, FRE, Serguei Venevsky model, Kraus and Goldammer statistics ...*
- *Link with HALO/GEMS*

Leadership: JRC group

Questions (issued from 2 days workshop)

3) can we propose a methodology to derive long time series of emissions (combining BA/fire counts?) with agreement between the producers and the users?

- *look at relative seasonal/interannual variations*
- *see with inverse modelers about the status of studies on seasonal variation (Guido?)*
- *provide recommendations*

4) Vertical distribution of emissions? (Sylvia Generoso and Michael Sofiev); can we organise a modeling exercise to test this parameter by select zones?