



The GEIA-ACCENT Web Portal on Emissions

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The main goal of GEIA is to quantify the anthropogenic emissions and natural exchanges of trace gases and aerosols that drive earth system changes.



GEIA

Global Emissions Inventory Activity

Mission: quantify the anthropogenic emissions and natural exchanges of trace gases and aerosols that drive earth system changes

Emission inventories are essential tools for scientists, but they are presently dispersed across a multitude of institutions. GEIA will contribute to rationalising the compilation and ease of access to such data, thereby increasing their usefulness for research and training.

GEIA is part of the AIMES/IGBP program and GEIA activities are strongly linked with the activities of the ACCENT network

Website and forum: www.geiacenter.org

The IGBP Program



IGBP is an international scientific research programme on global change. Its objectives are:



- to describe and understand Earth System dynamics,
- focusing on the interactive biological, chemical and physical processes,
- the changes that are occurring in these dynamics,
- and the role of human activities in these changes.

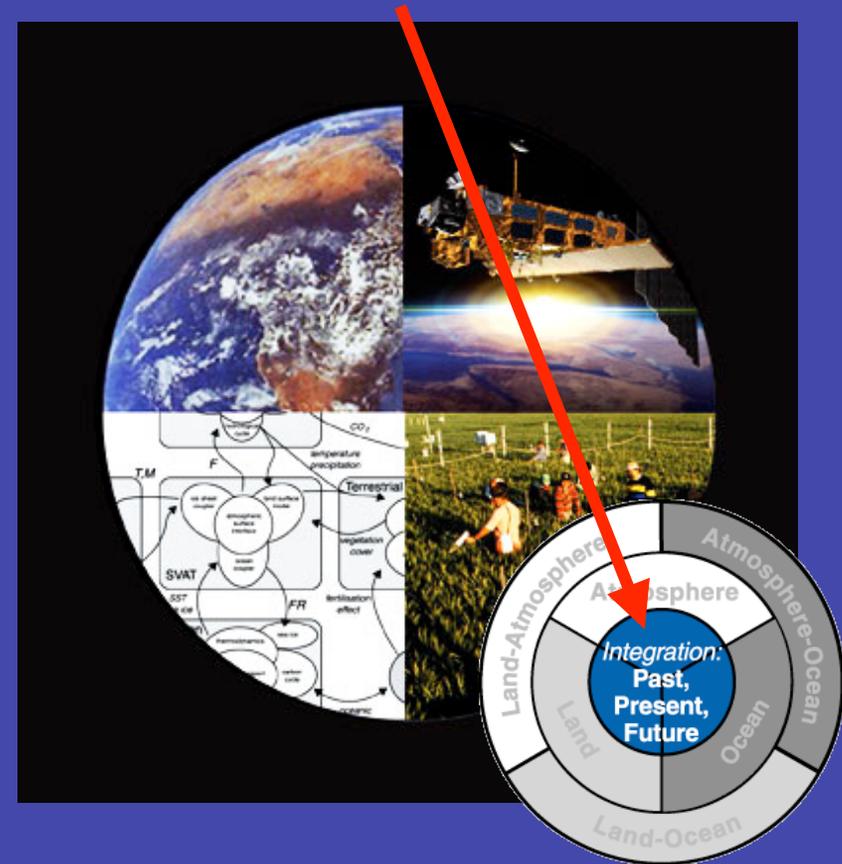
<http://www.igbp.net>



Analysis, Integration and Modelling of the Earth System: AIMES



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



<http://www.aimes.ucar.edu/>

GLOBAL
I G B P
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.

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

ACCENT:

- 44 European partners
- 130 associated partners from all continents
 - EU, Eastern Europe, Russia, Israel, Turkey
 - Mongolia, China, Japan, US, Canada, Chile
- US associated partners:
 - Carnegie Mellon Univ.
 - Colorado State Univ.
 - Columbia University
 - National Center for Atmospheric Research
 - Earth System Research Laboratory, NOAA
 - University of California, Irvine
 - University of California, Berkeley
 - University of California, Merced
 - University of Alaska, Fairbanks
 - University of Maryland

The GEIA web site and emissions portal

GEIA

Global Emissions Inventory Activity



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PRODUCTS

[GEIA Portal](#)

[GEIA v.1
\(Original Inventories\)](#)

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COORDINATION

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GEIA

-- an integrating project of
[AIMES/International Geosphere-Biosphere Program](#) --

*Brings together people, data and tools to create highest quality
information on global exchange processes.*

GEIA is managed by the GEIA [Steering Committee](#) and supported internationally.

IGAC Conference 2008

[Bridging the scales in Atmospheric Chemistry: Local to Global](#)

Summer School

ESF-ACCENT-CNRS-GEIA

Surface emissions and prediction of atmospheric composition changes

September, 11-20 2007

ile d'Oléron, France

[Final Report, Lectures, Participant Posters
and Updated Abstracts Now Available](#)

2006 Conference

[GEIA 2006 Open Conference](#)

Nov. 29 - Dec. 1 in Paris, France

[GEIA 2007 Priorities, Conference Findings, and Conference Presentations](#)

GEIA Portal

now available at

<http://www.aero.jussieu.fr/projet/ACCENT/database.php>

Please send your questions and suggestions to the [GEIA Forum](#).

<http://www.geiacenter.org>

A data portal to access emissions data

GEIA / ACCENT emission data portal web URL:

<http://www.aero.jussieu.fr/projet/ACCENT/Database.html>

The data portal is also accessible from the ACCENT web site and the GEIA web site :

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

<http://www.geiacenter.org>

What does it contain?

For each inventory, the data portal provides :

- Gridded emission datasets for download
- Total emission data
- Emission maps for all the species, and dates considered
- Metadata and documentation on the inventory

The data portal gives also links to other emissions inventories

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, CH₄, nitrogen oxides, non-methane hydrocarbons (NMHCs)), greenhouse gases (CO₂, CH₄, N₂O, CFCs, HCFCs and HFCs), organo-halogens, aerosols and their precursors (SO₂, 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 GEIA data portal can be accessed through
→ the GEIA web site
→ the ACCENT web site

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



GEIA/ACCENT Emissions

A cooperative effort



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GEIA/ACCENT Emission Data Portal

News on data availability

POET data are available for a large list of species, from 1990 to 2000. RETRO anthropogenic data are available for all species from 1960 to 2000 (biomass burning emissions data are coming soon).

The **GEIA /ACCENT** data portal provides gridded data, aggregated in several main categories (total anthropogenic, total biomass burning, biogenic, and oceans) at global or regional scales, from several inventories (POET, RETRO, GEIA version 1, and soon IIASA).

Search data through:

- the [LIST of INVENTORIES](#)
- the [LIST of SPECIES](#)

Important notice : When using any data from the GEIA/ACCENT web portal, we request that you acknowledge the authors of the datasets of each inventory (see each inventory's documentation), as well as the GEIA/ACCENT database activity (see Project description)

Links to other Emission Inventories / Databases

- [EMEP - Norwegian Meteorological Institute](#) -
- [EDGAR - RIVM](#) -
- [Aerocom - LSCE\(CNRS\) / MPI-Met](#) -
- [IIASA - International Institute for Applied Systems Analysis \(IIASA\)](#) -

Web site GEIA/ACCENT emissions Portal

● **Global Inventories**

Inventory	categories	spatial resolution	temporal resolution	years	Home site (for detailed data)
POET	anthropogenic biomass burning natural	1° x 1°	annual (anthro) monthly (biom. burn.) monthly (nat.)	1990 -2000 period	⇒
RETRO	anthropogenic biomass burning	0.5° x 0.5°	monthly	1960 -2000 period	⇒
EDGAR 3.2FT2000	anthropogenic biomass burning	1° x 1°	annual	2000	⇒
GFED v2	biomass burning	1° x 1°	monthly 8 day (available on GFED home site)	1997 - 2005	⇒
CO2 Andres et al.	anthropogenic	1° x 1°	annual	1751 - 2003	no
GEIA v.1	anthropogenic biomass burning natural	1° x 1°	annual + monthly for NOx, SO2, and nat.VOC	depends on the compound	⇒
AMAP -Mercury	anthropogenic	0.5° x 0.5°	annual	1995 and 2000	⇒

● **Regional Inventories**

Inventory	categories	spatial resolution	temporal resolution	years	Home site (for detailed data)
ABBI -Asia	biomass burning	1° x 1°	1 day	March to May 2000 - March to May 2001	-
REAS -Asia	anthropogenic	0.5° x 0.5°	1 year	1980-2020	⇒

RETRO inventory - Metadata

Go to [RETRO data](#)

DATASET DESCRIPTION	
Title of Dataset	RETRO emission inventory
Abstract	Within the RETRO project, global gridded data sets for anthropogenic and vegetation fire emissions of several trace gases were generated, covering the period from 1960 to 2000 with monthly time resolution. Anthropogenic emissions in the RETRO inventory are derived from the TNO database and the VERITAS inventory of international ship traffic emissions. Vegetation fire emissions were constructed from a large variety of sources with the objective to provide a reasonable estimate of emissions including their seasonal and interannual variability in the major burning regions of the world.
Reference (requested when used in any study)	Martin G. Schultz, Tinus Pulles, Roel Brand, Maarten van het Bolscher, and Stig B. Dalseren (2005), A global data set of anthropogenic CO, NO _x , 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.
Documentation	More documentation for the dataset can be found on the RETRO emissions web page
Keywords	emissions, ozone precursors, aerosols, anthropogenic, biomass burning
Language	English
Production Date	2005

Templates for the inventories have been standardized

RETRO inventory

Go to [RETRO data](#)

CONTACT DETAILS	
Authors name	Anthro. dataset : Tinus Pulles (1), Roel Brand (1), Maarten van het Bolscher (1), Jyvind 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)
Institutions	(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
Title of Dataset	
Abstract	<p>Emails</p> <p>Web link (for access to detailed data) http://retro.enes.org/emissions/</p> <p>SPATIAL AND TEMPORAL INFORMATION</p> <p>Geographical Coverage LONG : -180, : 180, LAT : -90, : 90,</p> <p>Spatial Resolution 0.5, x 0.5,</p> <p>Temporal Coverage of the Data Start : 01/1960 End : 12/2000</p> <p>Temporal Resolution 1 month</p>
Reference (requested when used in any study)	<p>OTHER INFORMATION</p> <p>Methodology Martin G. Schultz, Tinus Pulles, Roel Brand, Maarten van het Bolscher, and Stig B. Dals,ren (2005), A global data set of anthropogenic CO₂, NO_x, 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.</p>
Documentation	<p>Data source(s) 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</p>
Keywords	For biomass burning emissions : National statistics of burned areas, GBA2000 burnt areas (from Vegetation/SPOT), ATSR fire pixels
Language	Format NetCDF - 1 file per year and per specie
Production Date	File Size 1 NetCDF file (1 year, 1 specie) : 13.5 MB
	Remarks, questions Go to the GEIA forum

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Fires from

Templates for the inventories have been standardized

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- [Data manipulation tools](#)
- [Workshops & meetings](#)
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- Web links**
- [ACCENT web portal](#)
 - [GEIA project](#)
 - [Other Web links](#)

Search for [another compound](#) | [another database](#)

CO from RETRO inventory

You can also download these data directly from the ftp server : [ftp.aero.jussieu.fr/accent/Database/RETRO](ftp:aero.jussieu.fr/accent/Database/RETRO) (login as 'anonymous') if you need many data files.

- **Anthropogenic and/or biomass burning emissions**

1960 -2000

Please note that this portal provides now the Version 2 (V2) of RETRO fires and anthropogenic emission data.

	Anthropogenic	Biomass burning
1960	NetCDF	NetCDF
1961	NetCDF	NetCDF
1962	NetCDF	NetCDF
1963	NetCDF	NetCDF
1964	NetCDF	NetCDF
1965	NetCDF	NetCDF
1966	NetCDF	NetCDF
1967	NetCDF	NetCDF
1968	NetCDF	NetCDF
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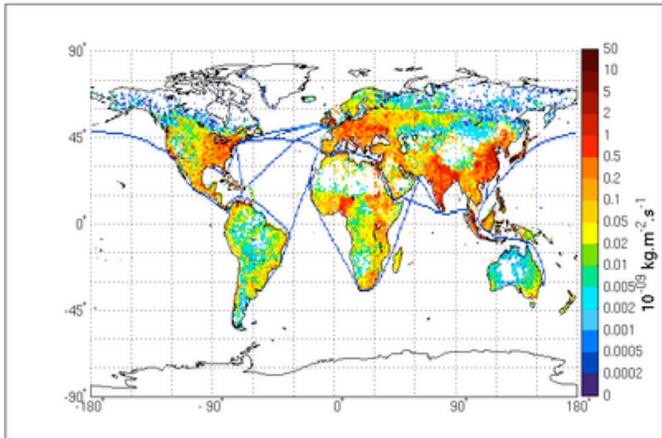
Emissions GEIA/ACCENT web portal: example of available dataset

ACCENT EMISSION PROJECT INTERFACE ----- developed/hosted by IPSL/LSCE

UPDATE - Synchron 4-Images links -> presently on dataipsl accent interface

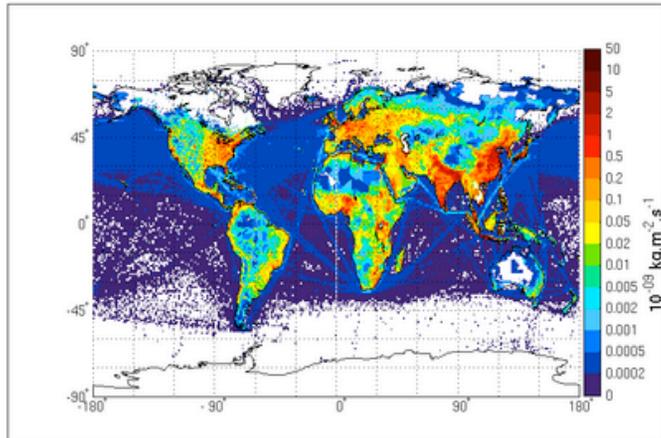
Graph Data source Species Parameter
 MAP EDGAR CO EMIanthro
 WORLD 2000 ALLYEAR

EDGAR - Total anthrop. co emission flux - year 2000, month 1



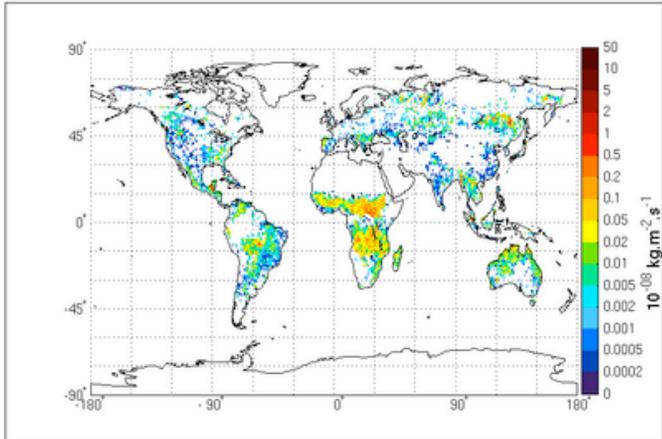
Graph Data source Species Parameter
 MAP RETRO CO EMIanthro
 WORLD 2000 ALLYEAR

RETRO - CO anthropogenic emission flux - year 2000



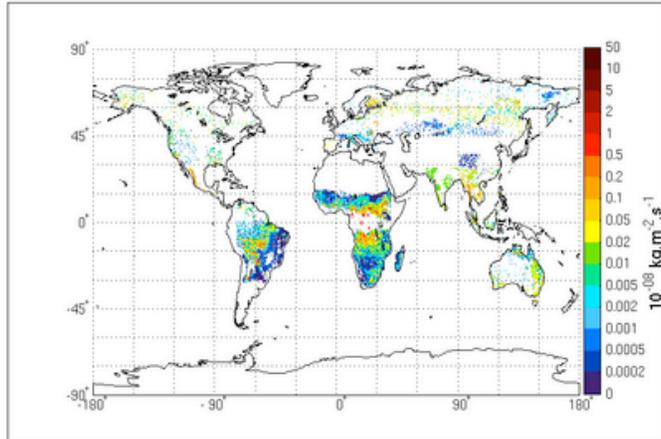
Graph Data source Species Parameter
 MAP GFED CO EMifires
 WORLD 2000 ALLYEAR

GFED - CO emissions from biomass burning, year 2000



Graph Data source Species Parameter
 MAP RETRO CO EMifires
 WORLD 2000 ALLYEAR

RETRO - CO emission flux from biomass burning - year 2000



CO anthropogenic emissions in 2000 from the EDGAR and RETRO inventories

CO emissions from biomass burning in 2000 from the GFED and RETRO inventories

Example of comparisons of CO emissions from anthropogenic activities and biomass burning for 2000

ACCENT EMISSION PROJECT INTERFACE ----- developed/hosted by IPSL/LSCE

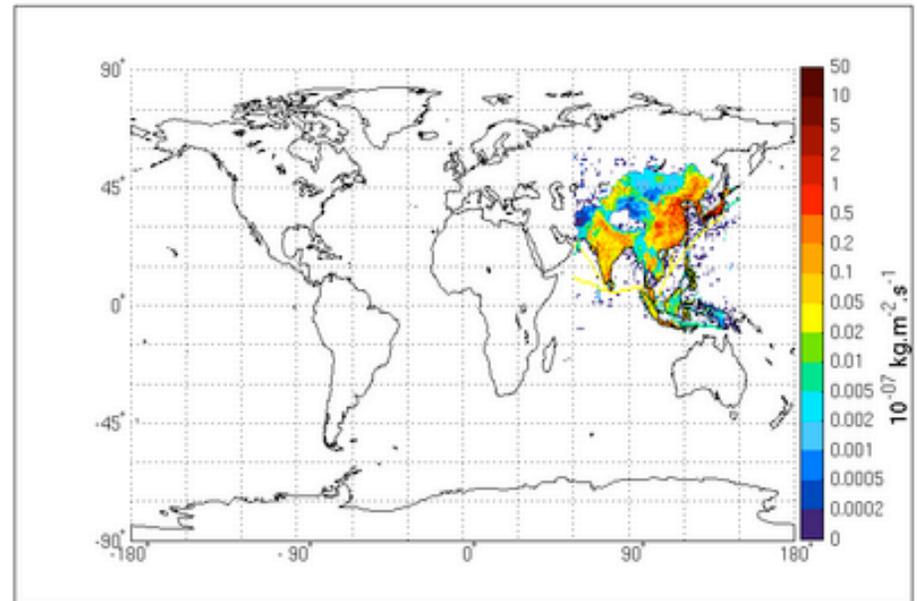
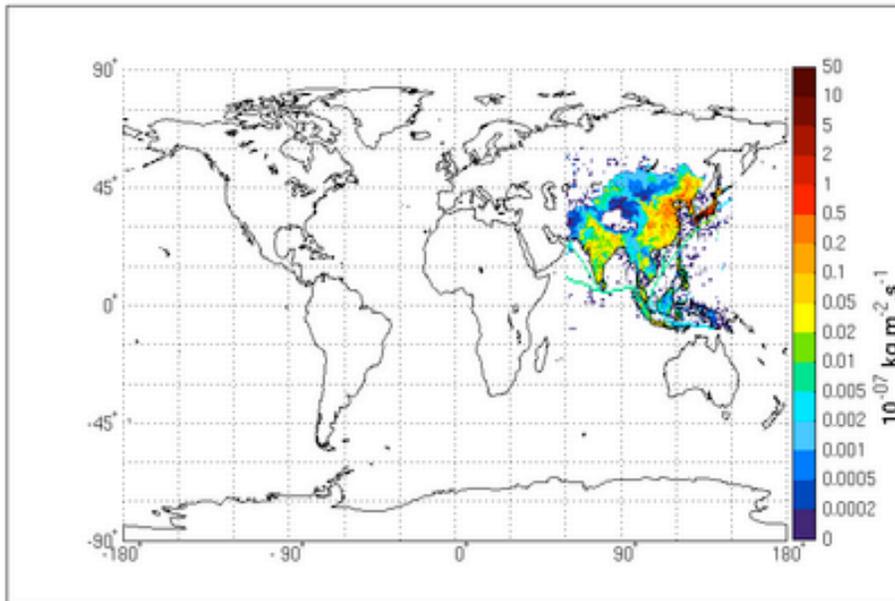
UPDATE - Synchron 4-Images links -> presently on dataipsl accent interface

Graph	Data source	Species	Parameter
MAP	REAS	CO2	EMlanthro
WORLD	1980	ALLYEAR	

REAS - Asia CO2 anthropogenic emissions - year 1980

Graph	Data source	Species	Parameter
MAP	REAS	CO2	EMlanthro
WORLD	2006	ALLYEAR	

REAS - Asia CO2 anthropogenic emissions - year 2006



Evolution of CO2 emissions in East Asia from 1986 to 2000 from the REAS inventory

Examples of inventories of surface emissions

- **Regional coverage:**
 - NAPAP, CORINAIR, **EMEP**, RAINS-ASIA, ACCESS, TRACE-P, **REAS**
 - UN-ECE, UNFCCC (no spatial information)
 - Official national inventories, sometimes time series
- **Global coverage:**
 - **GEIA version 1** (anthropogenic e.g. NO_x, SO₂, NMVOC; natural e.g. S-volcanoes, NMVOC-soil, vegetation) (1985-1990)
 - **EDGAR 3** (anthropogenic GG 1970-1995; other 90-95) + **POET** (1990-2000)
 - **RETRO** (1960-2000)
 - **EDGAR-HYDE 1.3** (all 1890-1990)
 - **Bond (1996) BC only**
 - **AEROCOM (2000) particles only**
 - Etc...
- **Other inventories**
 - In scientific literature (source-specific, e.g. biomass burning, or country-specific, or only global totals)
 - In scientific literature (new compounds, e.g. aerosols)
 - Other national inventories (e.g. GG in US-CSP)

Inventories available in GEIA: in orange

Soon available : in green

Summer School

ESF-ACCENT-CNRS-GEIA

Surface emissions and prediction of atmospheric composition changes

Summer School - [Flier](#) - [Program](#) - [Lectures](#) - [Photos](#)

**September, 11-20 2007
ile d'Oléron, France**

[Final Report of the School](#)

[Summer School Email Contacts](#)

Please contact school participants for more information on their presentations.

[Participant Posters and Updated Abstracts \(October 2007\)](#)

[Current Program and Poster Abstracts \(August 29, 2007\)](#)

[Reference Materials for School Participants](#)

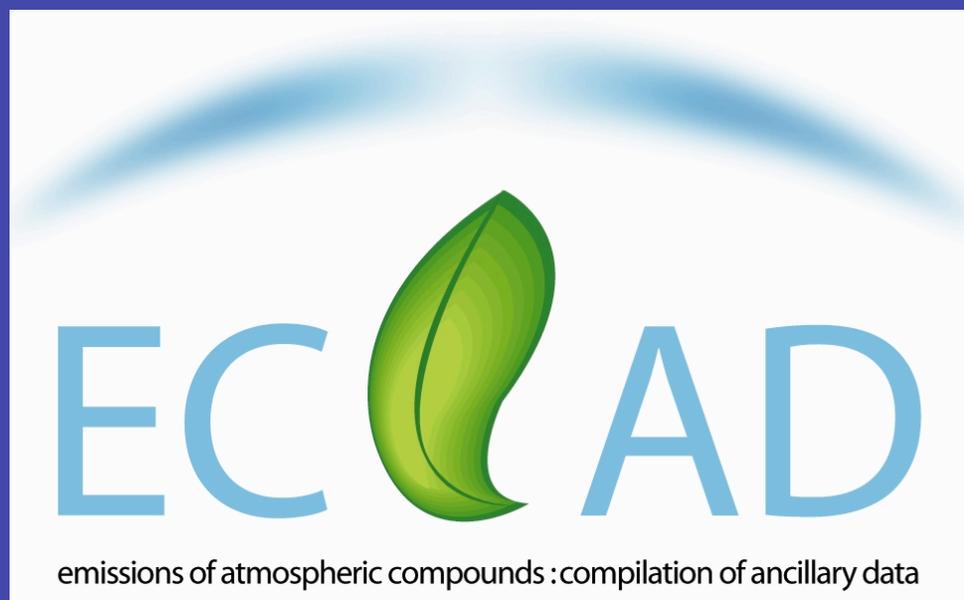
(last modified 12/10/07)

GEIA has organized conferences and a summer school in September 2007
All lectures and participants posters are available from the GEIA web site

The ECCAD project :

Emissions of atmospheric Compounds: Compilation of Ancillary Data

Claire Granier, Sabine Darras
Service d'Aéronomie , Paris



The ECCAD project

- **This project is funded by the French CNES (National Center for Space Science) within GEIA and ACCENT**

- **Goal of the project**

Development of a database of ancillary data required for the quantification of surface emissions of chemical compounds (gases and aerosols)

- **What are Ancillary data ?**

- data used to improve emission inventories
- data required to model emissions either using simple algorithms or detailed emission models

What does it contain?

Datasets included in the pilot project :

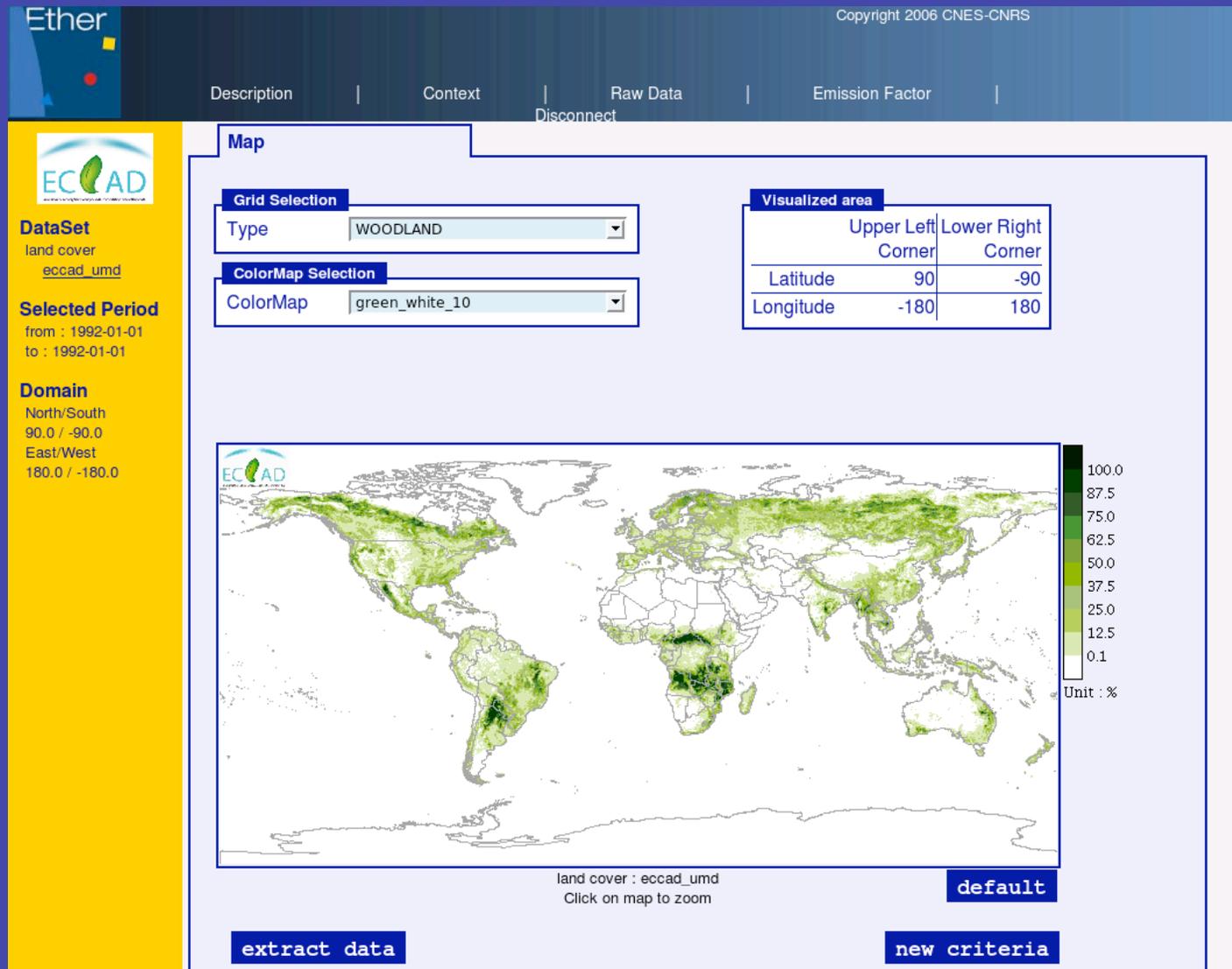
- Population (global + country level)
- Fire data (fire counts + burnt area)
- Vegetation maps

Development of tools :

- Data are available in 2 formats : ASCII and NetCDF
- Tools are being developed for :
format conversion; regridding; statistics/comparisons
interactive graphics

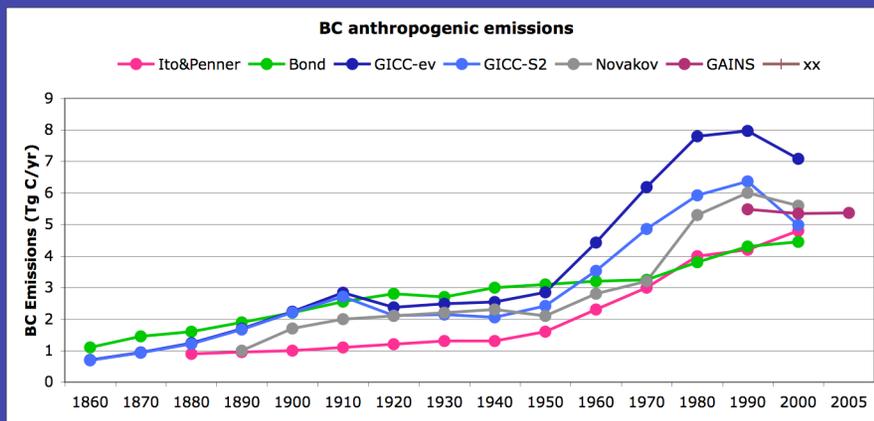
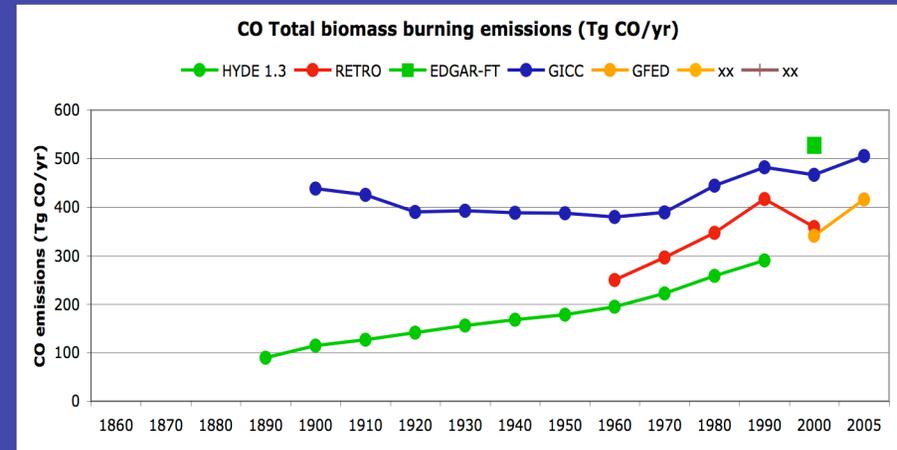
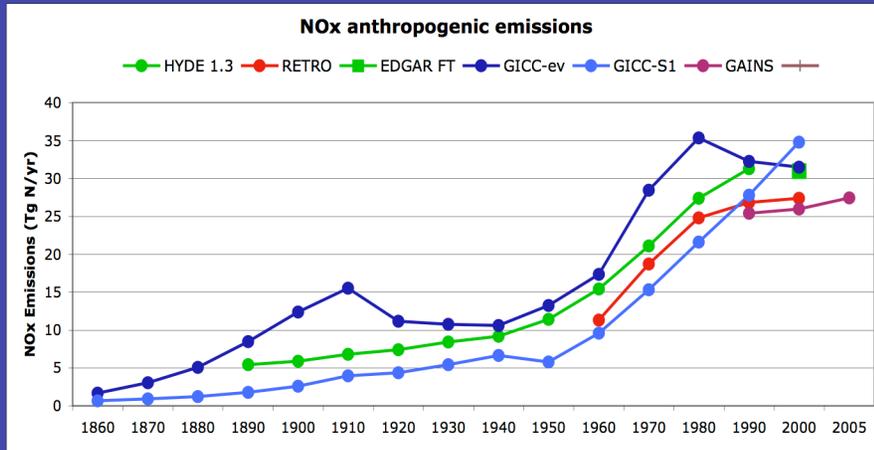
The ECCAD project

Example of plot for woodland areas :



A very new GEIA activity: participation to the definition of the surface emissions inventories to be used in the next IPCC report

- 1900-2000 period
- Intercomparison of emissions inventories
- Harmonization of emissions



Very preliminary results

Comparisons currently being done for

- different sectors
- different regions

Results will be published in the open science literature