



**IAI Summer Institute on Global Warming and Climate Changes:  
Causes, Mitigation Alternatives and International Actions**

**Piracicaba, Brazil, November 10-22, 2003**

**PROGRAM**

**First Week:** 10-14 November 2003- São Pedro. Hotel Fazenda Fonte Colina Verde

November 10 <sup>th</sup>	<p>Opening: Gustavo Necco (IAI) Promoting regional global change research networks in the Americas: the IAI (Inter-American Institute for Global Change Research)</p> <p><b>Module 1: Greenhouse effect.</b> Vincent Eschenbrenner (IRD - France) Electromagnetic radiation from Sun and Earth Atmosphere (structure; composition; role) Radiation / atmosphere interaction Radiation balance Radiative forcing Enhancement of greenhouse effect Global Warming Potential (GWP) of gases and aerosols CO<sub>2</sub> equivalent concept Historical increase in atmospheric concentrations</p>
November 11 <sup>th</sup>	<p><b>Module 2: Climate changes.</b> Vincent Eschenbrenner Energy transfer (Equator → poles) Causes of changes Climatic changes in geologic scale Mean temperatures Future Climates Uncertainties</p> <p><b>Module 3: Reservoirs, sources and sinks of GHGs and aerosols.</b> Vincent Eschenbrenner Fundamental mechanisms (Combustion; Photosynthesis; Breathing) Cycle, sources and sinks of carbon (CO<sub>2</sub>, CH<sub>4</sub>, CO, NMVOC, clathrates) Cycle, sources and sinks of nitrogen (N<sub>2</sub>O; NO<sub>x</sub>) Cycle, sources and sinks of ozone (O<sub>3</sub>) Other gases (ODS; SF<sub>6</sub>...) Water vapor Aerosols</p>
November 12 <sup>th</sup>	<p><b>Module 4: Potential impacts of global warming.</b> Martial Bernoux (IRD - Brazil) Scenarios 2100 Negative / positive Impacts Temperature Precipitation Sea level Consequences Agriculture Forests Health Biodiversity</p>

	<p>Fresh water Coasts</p> <p><b>Module 5: Mitigation Options.</b> Martial Bernoux Typology of options Diminish emissions Increase sequestration Examples in LULUCF (Land Use, Land Use Change, Forestry) sector Biofuels No-till cropping systems Reforestation Sugar Cane cutting without fires</p>
November 13 <sup>th</sup>	<p>Field trip. Soil-C and density sampling for C stocks calculations, CO<sub>2</sub> measurements and CH<sub>4</sub> and N<sub>2</sub>O sampling at Fazenda Santa Maria. Marisa Piccolo, Brigitte Feigl, Carlos Cerri (CENA-USP).</p> <p><b>Module 6: Efficiency of international treaties.</b> Carlos Cerri The ozone hole The Montreal Protocol - 1987 (Ozone) Evolution of CFCs, HCFCs and HCFs levels The UNFCCC (1992) The Kyoto Protocol (1997)</p> <p><b>Module 7: Post-Kyoto negotiations.</b> Carlos Cerri Pressing groups Economic and political aspects Global and <i>per capita</i> emissions Cumulative emissions by country The difficulties (COP 6 and 6 bis) The leaving of the USA Bonn-Marrakech Agreements (2001) The Johannesburg vacuum (2002) Present situation (2003)</p>
November 14 <sup>th</sup>	<p><b>Module 7 (cont.) Post-Kyoto negotiations.</b> Carlos Cerri</p> <p><b>Module 8: Implications of flexibility mechanisms for “non Annex I” countries.</b> Carlos Cerri CDM (Clean Development Mechanism) Designated National Authority Verification of “sustainable development” projects Eligibility criteria Sustainability indicators Limitations in the global volume of CDM projects Limitations in Kyoto Protocol Limitations in Annex I countries</p> <p>Invited talk - Structure and functioning of the CDM management: the Executive Board (CDM-EB). Eduardo Sanhueza (EB - UNFCCC -Chile)</p>

**Second week:** 17-22 November 2003 - Piracicaba. CENA-USP

November 17 <sup>th</sup>	<p><b>Module 9: The carbon market.</b> Carlos Eduardo Cerri (CENA-USP) Within Kyoto Protocol ET (Emission Trading) JI (Joint Implementation) CDM (Clean Development Mechanism) Outside Kyoto protocol PCF (Prototype Carbon Fund) BCF (BioCarbon Fund) CERUPT Clear Skies Initiative</p>
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	Laboratory: Measurements of C%, apparent density, calculations, measurements of CH <sub>4</sub> and N <sub>2</sub> O. Brigitte Feigl, Carlos Cerri
November 18 <sup>th</sup>	Invited talk: Implications of different LULUCF-related definitions on CDM. Thelma Krug (IAI)  Computer lab exercises. Exploration and analysis of public data 1. Vincent Eschenbrenner, Carlos Cerri, Martial Bernoux, Carlos Eduardo Cerri
November 19 <sup>th</sup>	Invited talk - Human Dimensions of global climate change. Eduardo Viola (UnB)  Invited talk - PCF Project case study. Plantar Project: Presentation and Discussion. Evandro Ribeiro Moura (Plantar)  Computer lab exercises. Exploration and analysis of public data 2. Vincent Eschenbrenner, Carlos Cerri, Martial Bernoux, Carlos Eduardo Cerri
November 20 <sup>th</sup>	Computer lab exercises. Exploration and analysis of public data 3. Vincent Eschenbrenner, Carlos Cerri, Martial Bernoux, Carlos Eduardo Cerri
November 21 <sup>th</sup>	Invited talk. José Domingos Miguez (MCT - Brazil). SI evaluation and closing session.

### **Module 10: Human Dimensions (Invited Conference)**

Problem-driven activities

#### **Exploration and analysis of public data**

For some "Annex I" countries (USA, Russia, Germany, England, France, Japan)

Evolution of GHGs emissions

Comparison by activity sector

Estimation of emissions 2008-2012

Estimation of necessary credits to meet the Protocol

#### **Establishment of a CDM project**

Reforestation of a grassland area

Practices

#### **Measurement of carbon stock in soil**

Field demonstration

Measurements of C% and apparent density in laboratory

#### **Measurement of GHGs fluxes**

Direct measurement of CO<sub>2</sub> in field

CH<sub>4</sub> and N<sub>2</sub>O Demonstration in field

Measurements of CH<sub>4</sub> and N<sub>2</sub>O in laboratory