

Agenda

Walter Vergara	Opening remarks and introduction of the Amazon dieback risk analysis	15 min
Peter Cox	Probability density function for future rainfall in the Amazon basin	15 min
Akio Kitoh & Shoji Kusunoki	The use of the Earth Simulator in climate projections over Amazon	15 min
Anja Ramming & Ursula Heyder	LPJ model for future biome shifts in the Amazon - visualization of results	15 min
Lincoln Alves	Overview of climate change simulations using the global 20km mesh Atmospheric Model	10 min
José Marengo	Is there an Amazon Die back in the Earth Simulator AOGCM?	10 min
Q&A and discussion		40 min

Risk Analysis of Amazon Dieback

Science Program at the World Bank Latin
America Region

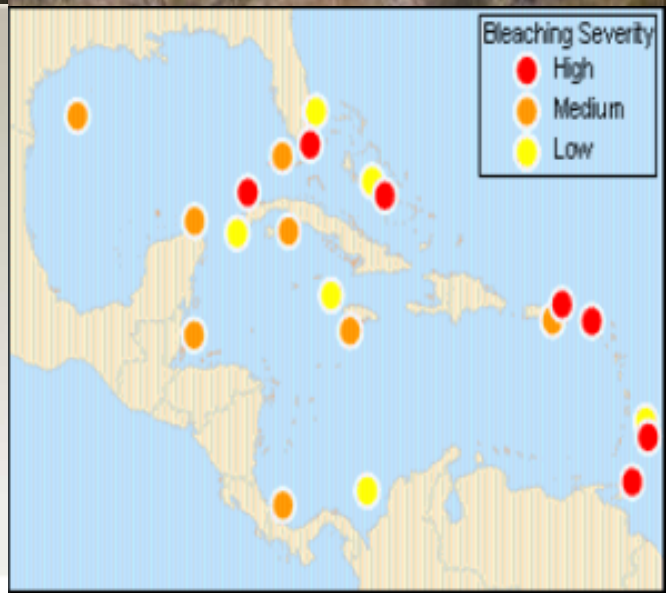
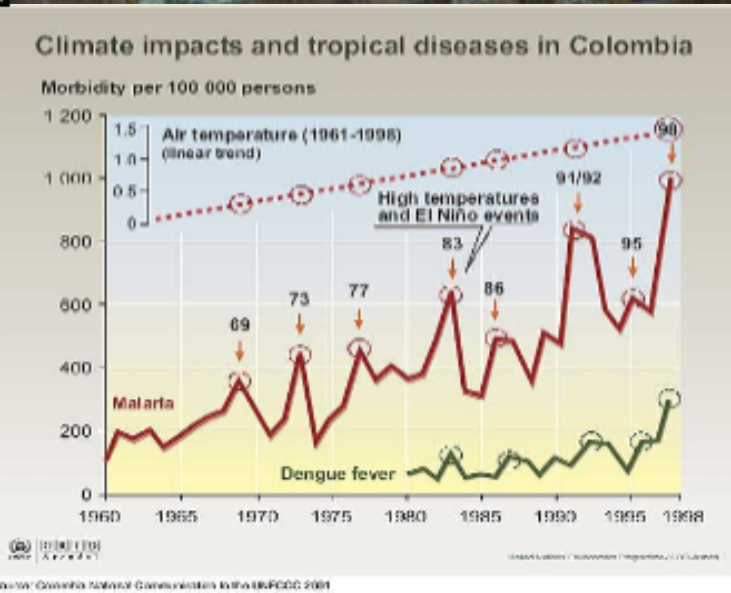
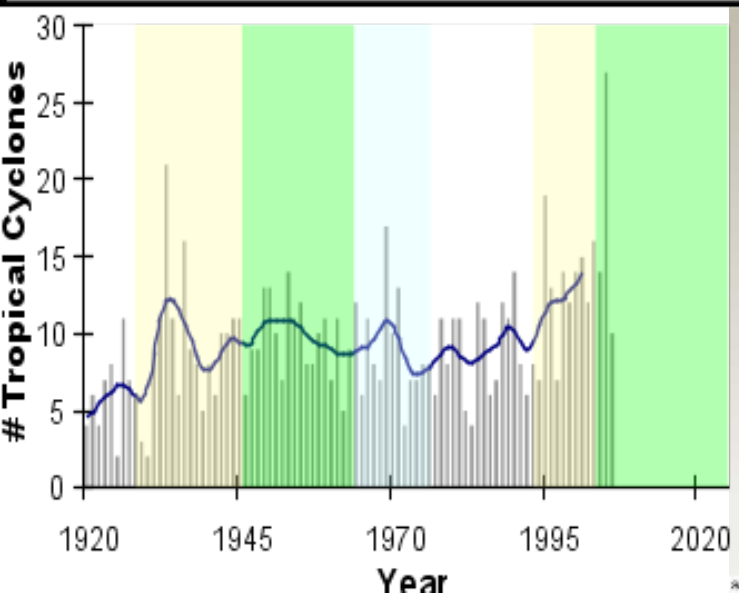
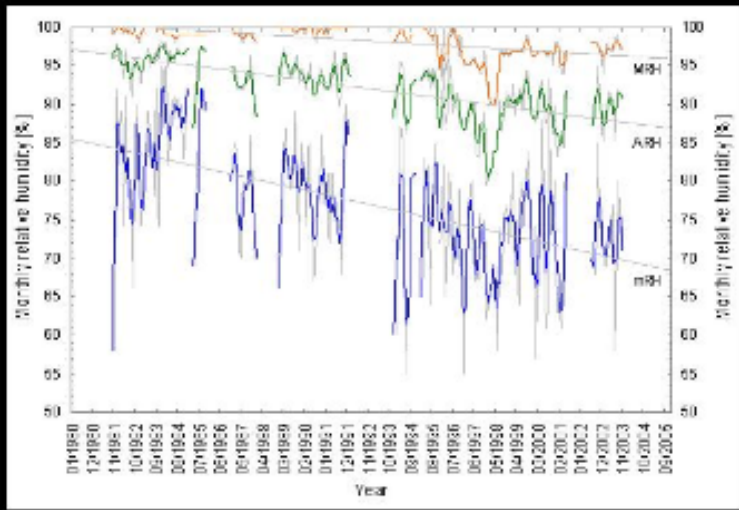
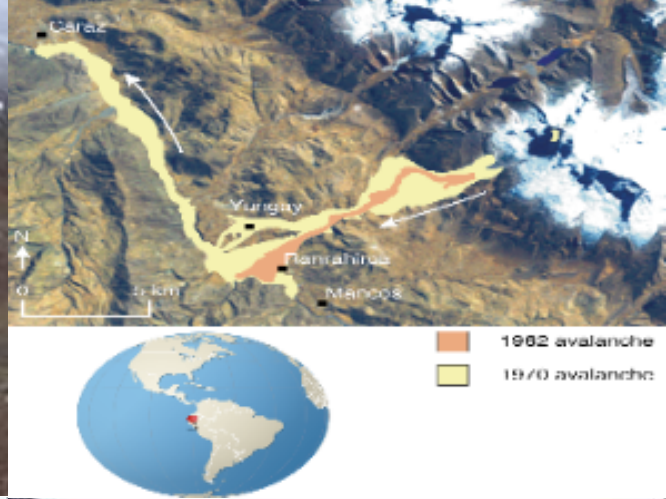
Wvergara@worldbank.org

June 3rd, 2008



Emissions of CO2 in 2004

<i>Country</i>	<i>Annual CO2 emissions (2004 MMt)</i>	<i>Carbon intensity (kg/PPP US\$, 2000)</i>	<i>Per capita Emissions (Mt/year)</i>	<i>Carbon path (% increase 1990- 2004)</i>
United States	5.99	0.6	20.0	16.8
China	5.01	0.6	3.8	108.7
Germany	0.89	0.4	10.7	(15.8)
Japan	1.28	0.4	10.1	12.4
Brazil	0.33	0.2	1.8	58.2
Mexico	0.44	0.5	4.2	5.9
Colombia	0.05	0.2	1.2	(7.7)



Climate hotspots

<i>Hotspot</i>	<i>Magnitude of Impact</i>	<i>Immediacy</i>	<i>Irreversibility</i>	<i>Economic Consequences</i>
Collapse of the coral biome in the Caribbean	Very High, region wide	Now	Complete	Large
Tropical Glacier retreat	Very High, region wide	Now	Complete	Large
Subsidence of coastal wetlands in the Gulf of Mexico	Very High, region wide	This century	Complete	Large
Amazon dieback	Very High, region wide	This century	Complete	Large

Climate change strategy in Latin America and the Caribbean

- a) To support low carbon growth, in particular in the energy and transport sectors, which represent the bulk of emissions in the region and to reduce emissions from deforestation and forest degradation;
- b) To support the process of adaptation, focused on key vulnerabilities (hotspots); and
- c) To support the linkages between knowledge, science and decision making.

The World Bank is supporting a large adaptation portfolio In Latin America

Portfolio of adaptation activities under execution or preparation

Project

Regional: Mainstreaming Adaptation to Climate Change Impacts

Colombia: Integrated National Adaptation Program

Regional Implementation of Adaptation Measures in Coastal Zones in the West Indies
Regional Adaptation to Impacts of Rapid Glacier Retreat in the Tropical Andes

Mexico: Adaptation to Climate Impacts in the Gulf of Mexico Wetlands

Regional: Implementation of Adaptation Measures in Coastal Ecosystems of Global Biological Importance

Guyana: Conservancy Adaptation (*)

Total



Latin America and Caribbean Region

Sustainable Development Working Paper 25

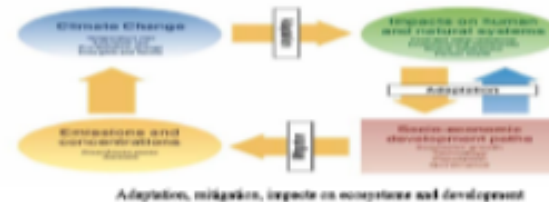
Adapting to Climate Change

Lessons Learned, Work in Progress, and Proposed Next Steps for the World Bank in Latin America



Rapid regression of the Quel Katu glacier in Peru's Andes

Monitoring network for sea level rise in the Caribbean



October 2006

By:

Walter Vergara

The World Bank

Latin America and Caribbean Region

*Environmentally and Socially Sustainable Development Department
(LCSES)*

The Bank supports efforts to link science and knowledge with policy making

- Provide a bridge between science and development ensuring access to data, tools for observation, modeling and planning
- Support the observation and modeling of climate in the region
- Support R&D and international cooperation to quantify impacts and consequences and develop and transfer low carbon and adaptation technologies

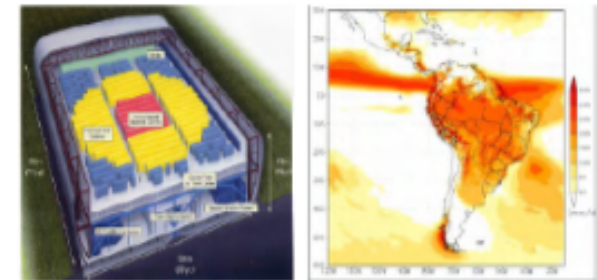
Support for modeling of future climate and impacts

- Application of Earth Simulator (MRI) results (Training, data compilation and interpretation)
 - Glaciarized Basins; Coastal Wetlands, Coral Reefs, Amazon basin
- Use of ensemble results from regional models
- Development and application of new tools for simulation of future impacts



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Visualizing Future Climate in Latin America: Results from the application of the Earth Simulator



November 2007

By:

World Bank: Walter Vergara

Japan Agency for Marine-Earth Science and Technology: Hiroki Kondo

INE (Mexico): Edgar Pérez Pérez, Juan Matías Méndez Pérez and Víctor Magaña Rueda

IDEAM (Colombia): María Constanza Martínez Arango and José Franklin Ruiz Murcia

SENAMHI (Peru): Grisia Jesús Avendaño Roldán

ECAMHI (Ecuador): Enrique Palacios

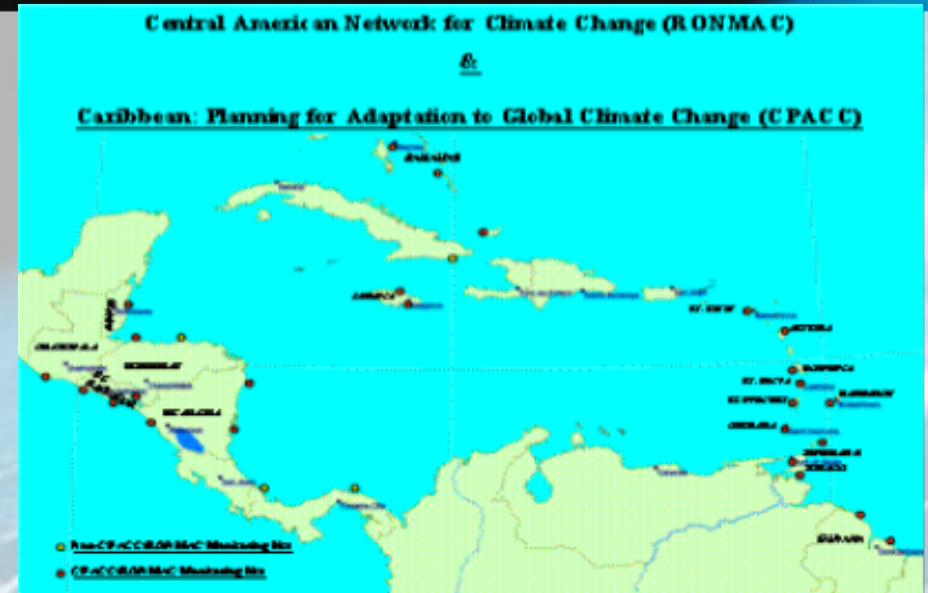
The World Bank

Latin America and the Caribbean Region

Sustainable Development Department (LCSSD)

Support for long-term climate observation systems.

- Network of stations for SST and SL in the Caribbean
- Network of stations in glacialized basins of immediate economic relevance.
- Remote sensing (ALOS) of six basins in the Andes (Bolivia, Colombia, Ecuador, Peru)
- Coral bleaching observation (Jamaica)
- Paramo observation



Partnership Latin America-Japan-World Bank

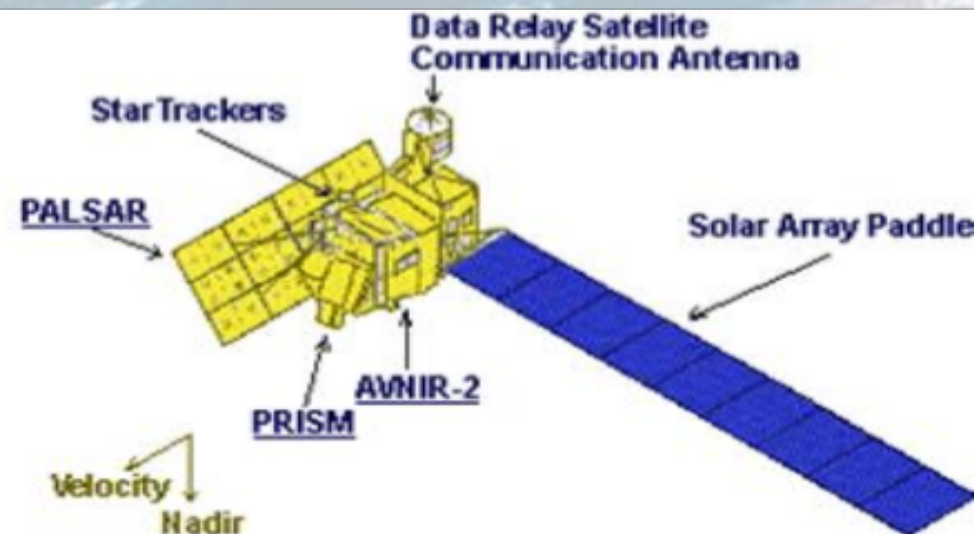


- **Scope of Cooperation with JAXA/RESTEC.**

Monitoring of
--glacier region
--coral reefs
--coastal wetlands
--amazon region

- **Scope of Cooperation with MRI**

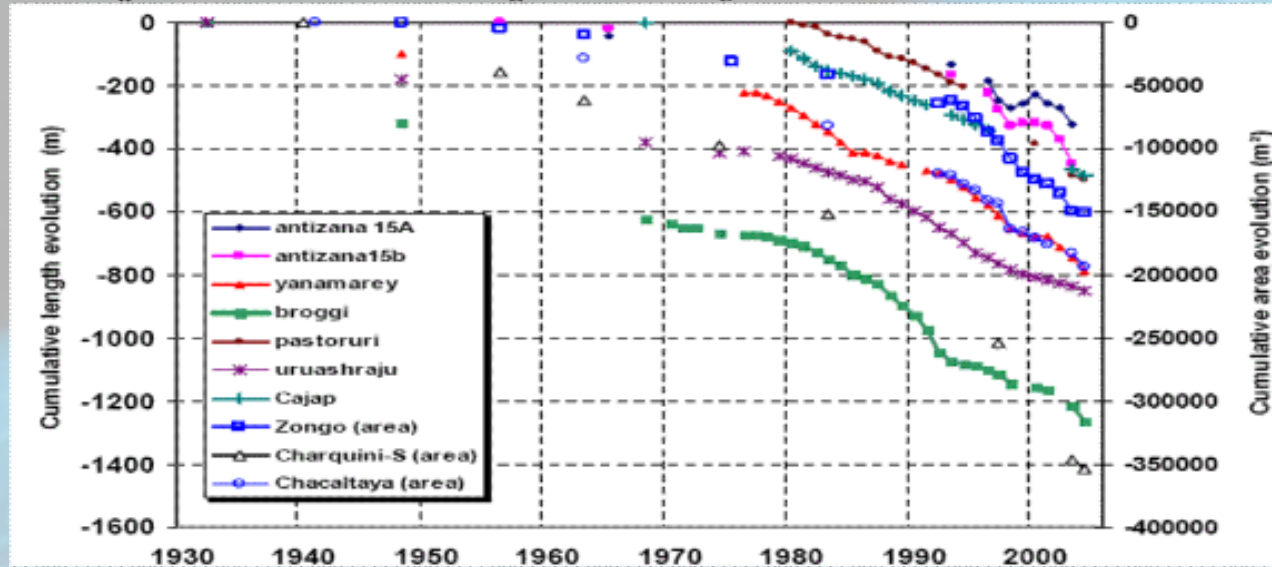
- training in Japan to enable efficient use of ES data
- technical assistance to interpret results
- scientific exchange
- cooperation for dissemination of results in scientific literature
- data storage
- feedback to ES for better future simulation at regional level



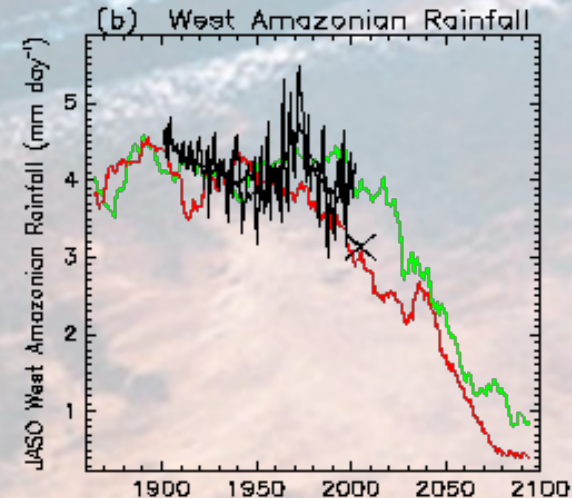
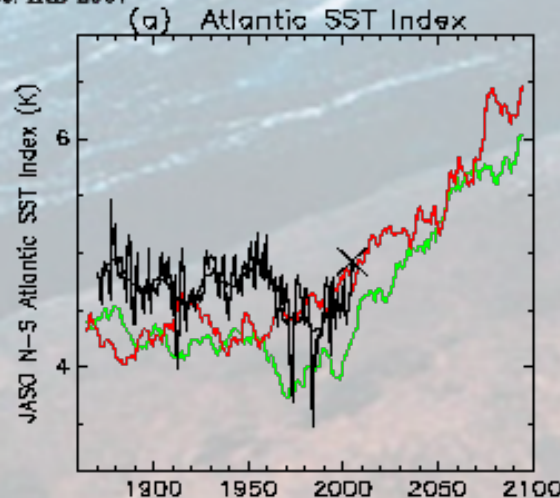
Science and technical work

- Assessment of the climate impacts on net surface hydrology in Peru
- Risk analysis of Amazon dieback
- Economics of adaptation
- Barrier analysis for renewables

Figure 3. Cumulative loss in length for selected glaciers in the Andes since 1870



Source: IRD 2007

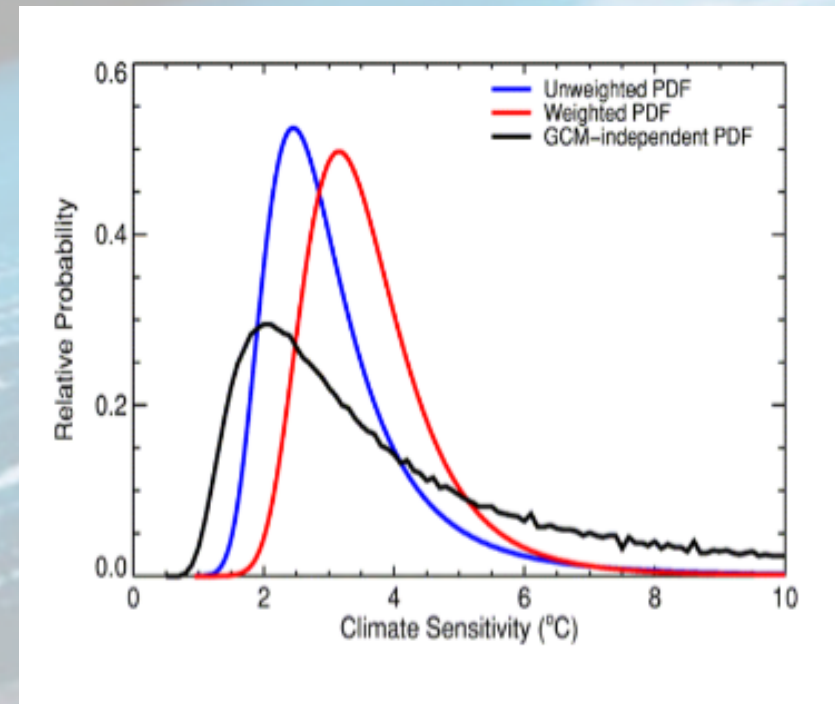


Objective of Amazon Dieback Risk Analysis

- Assist in understanding the risk, process and dynamics of Amazon dieback and its implications.
- Support the analysis of long-term options that would be required to maintain the integrity of the basin.
- Delivery date June 2009

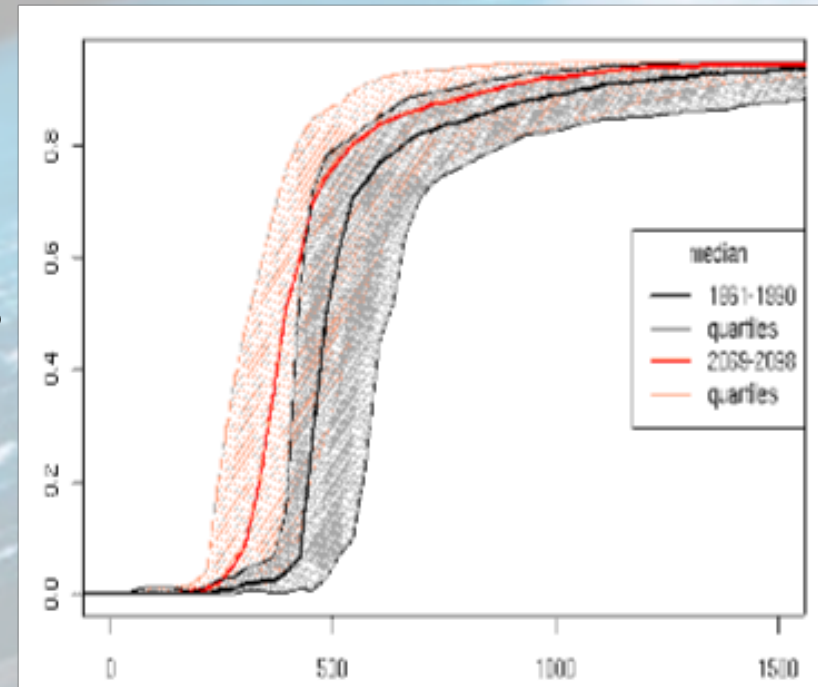
Tasks

- Download of Earth Simulator data at a 20 by 20 km resolution for end of century scenario A1B.
- Risk analysis of Amazon dieback or development of a probability density function (PDF) for future Amazon rainfall as a function of the level of greenhouse gases in the atmosphere.

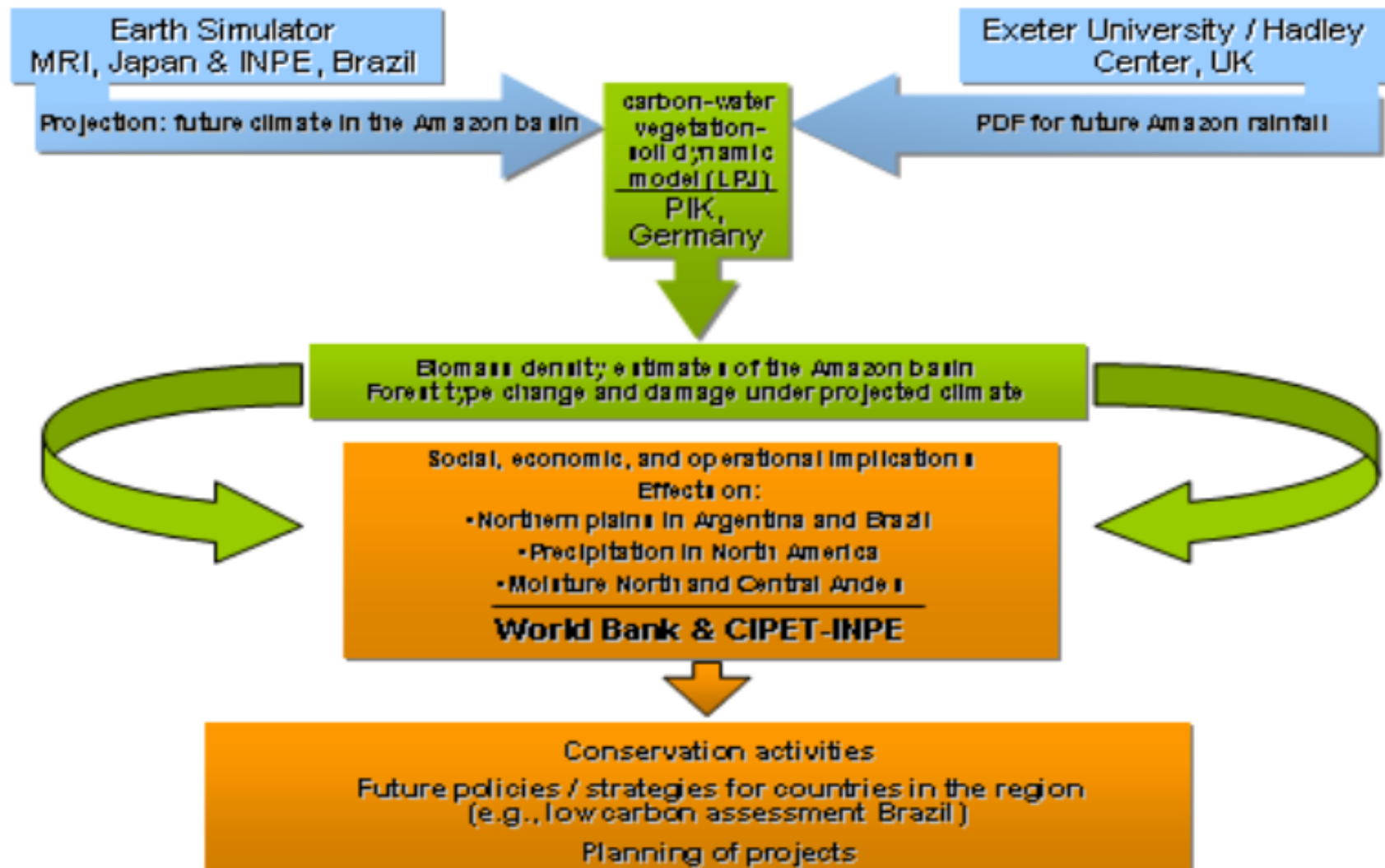


Tasks

- Apply LPJ (carbon-water vegetation-soil dynamic model) vegetation model specifically for the Amazonian region,
- Assess the consequences and regional and trans-boundary impacts of Amazon dieback
- Incorporate the feedback of ecosystem response to climate change in global atmospheric circulation models.



Schematic of proposed activities, responsibilities and information flows



External review panel

- Thomas E. Lovejoy (Chair), President, Heinz Center for Science,
- Lawrence E. Buja, Project Manager, NCAR
- David Lawrence, Project Scientist, NCAR
- Daniel C. Nepstad, Senior Scientist, Woods Hole Research Center
- Earl Saxon, REDD Coordinator, CAN
- Ben Braga, Director, National Water Agency of Brazil - ANA