CLARIS
A Europe-South America Network for Climate Change Assessment and Impact Studies

A project within the EC 6th Framework Programme

1 July 2004 to 30 June 2007

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http://www.claris-eu.org

The CLARIS consortium

Partner Role*	Partner No.	Partner name	Partner short name	Country
CO	1	Centre National de la Recherche Scientifique	CNRS	France
CR	2	Centre de coopération Internationale en Recherche Agronomique pour le Développement	CIRAD	France
CR	3	Consejo Nacional de Investigaciones Cientificas y Técnicas	CONICET	Argentine
CR	4	Universidad de Buenos Aires	UBA	Argentine
CR	5	Instituto Nacional de Pesquisas Espacias	INPE	Brazil
CR	6	Universidade de São Paulo	USP	Brazil
CR	7	Istituto Nazionale di Geofisica e Vulcanologia	INGV	Italy
CR	8	Istituto Sperimentale Colture Industriali	ISCI	Italy
CR	9	Universidad de Castilla-La Mancha	UCLM	Spain
CR	10	Universidad de la Republica	UR	Uruguay
CR	11	Plant Research International	PRI	Holland
CR	12	Universidad de Chile	UCH	Chile
CR	13	Institut de Recherche pour le Développement	IRD	France
CR	14	Max-Planck Gesellschaft Institut	MPI	Germany

CENTRE NATIONAL
DE LA RECHERCHE
SCIENTIFIQUE

CIRAD

CONICET

UBA

INPE

USP

Agro-Industrial Research

UCLM

UNIVERSIDAD
DE LA REPUBLICA

PLANT RESEARCH INTERNATIONAL
WAGENINGEN UR

IRD
Institut de recherche
pour le développement

MAX-PLANCK-GESELLSCHAFT

The CLARIS project in numbers

- 36 Months
- 14 Partners
- 355 Person.months
- 40% Women-60% Men
- 3 Strategic objectives
- 4 Network Coordination Themes
- 7 Workpackages
- 4 Milestones
- 38 Deliverables

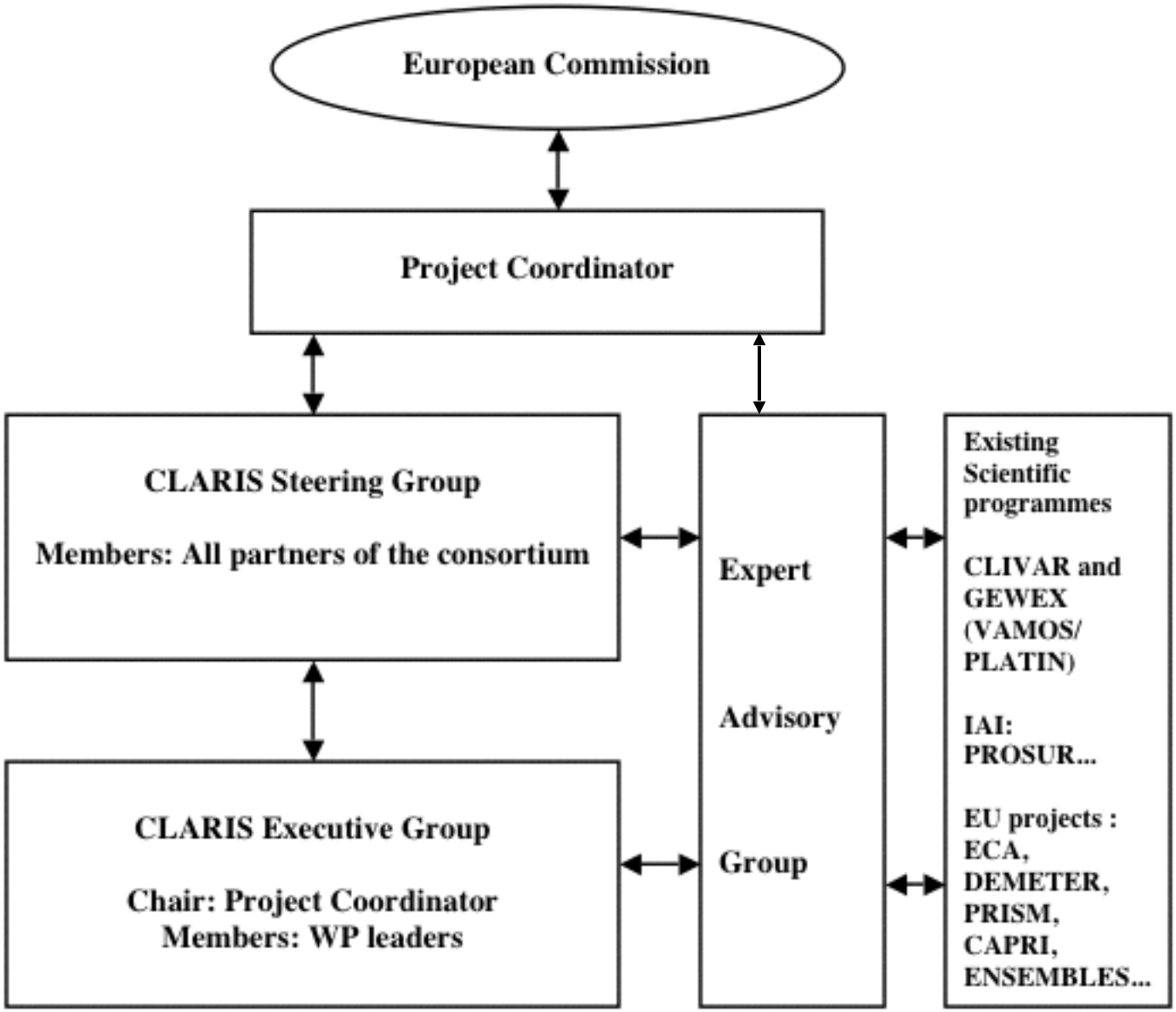
CLARIS strategic objectives

- **The first objective of CLARIS is to set up and favor the technical transfer and expertise in Earth System and Regional Climate Modeling between Europe and South America together with the providing of a list of climate data (observed and simulated) required for model validations.**

- **The second objective of CLARIS is to facilitate the exchange of observed and simulated climate data between the climate research groups and to create a South American high-quality climate database for studies in extreme events and long-term climate trends.**

- **The third objective of CLARIS is to strengthen the communication between climate researchers and stakeholders, and to demonstrate the feasibility of using climate information in the decision-making process.**

CLARIS Management Structure



CLARIS Steering Group

Composition:

- a representant of each partner
- a European Commission representative.

Tasks:

- supporting the CLARIS objectives in developing common research strategies leading to the submission of common **research projects to IAI**, EU and other relevant programme calls.

- evaluating the efficiency of the communication and knowledge dissemination inside and outside the project.

- suggesting improvements in the CLARIS management (each general meeting will be a project milestone when the project management will be evaluated and improved).

- identifying new priorities leading to a better integration of the different institutes involved in the project.

- promoting efficient relationships/partnerships with society (association, public/private companies and policy-makers) together with an Expert Advisory Group.

- promoting cooperation with other networks and international projects dealing with similar issues.

CLARIS Executive Group

Composition:

- WP leaders and co-leaders

  WP1.1: J-P Boulanger (CNRS)
  WP1.2: J-P Boulanger (CNRS) and Carlos Ereño (UBA)
  WP2.1: Rafael Terra (UR) and Andrea Carril (INGV)
  WP2.2: Hervé Le Treut (CNRS) and Roberto Mechoso (UR)
  WP3.1: Manuel Castro (UCLM) and Claudio Menendez (CONICET)
  WP3.2: Matilde Rusticucci (UBA)
  WP4.1: J-P Boulanger (CNRS) and Olga Penalba (UBA)
  WP4.2: Nicolas Degallier (IRD)
  WP4.3: Guy Brasseur (MPI) and Carlos Nobre (INPE)

Tasks:

- to ensure the day-to-day evolution of the project and to follow closely the execution of the project objectives (deliverables and milestones).

CLARIS Expert Advisory Group

Composition:

- CLARIS project members:
  - Carlos Roberto Mechoso (FI-UR)
  - Mario Nuñez (CONICET)
  - Carlos Ereño (UBA)
  - Hervé Le Treut (CNRS)

- External members
  - Albert Klein Tank (KNMI), coordinator of the European Climate Assessment Project (WP3.2)
  - Laurent Dubus, Expert in Seasonal Climate Prediction at EDF (Electricité de France)
  - Pablo Marcovecchio, División Riesgos Agrícolas, MAPFRE, Buenos Aires, Argentina
  - Caio Coehlo, Hadley Center, England.
  - Andrés Sipowicz, RADAR-INTA (Instituto Nacional de Tecnicas Agropecuarias)
  - Nidera (Agroproducts)

Tasks:

- To ensure the promotion of CLARIS to other international programmes as well as the integration of the CLARIS partners in future international activities related to climate change and climate impact issues in South America
- To assist the CLARIS groups in better identifying the climate information needs of stakeholders allowing to bridge climate research and applications.
- To suggest improvements to the CLARIS organization, priorities and objectives.

CLARIS
Network Coordination Themes and WorkPackages

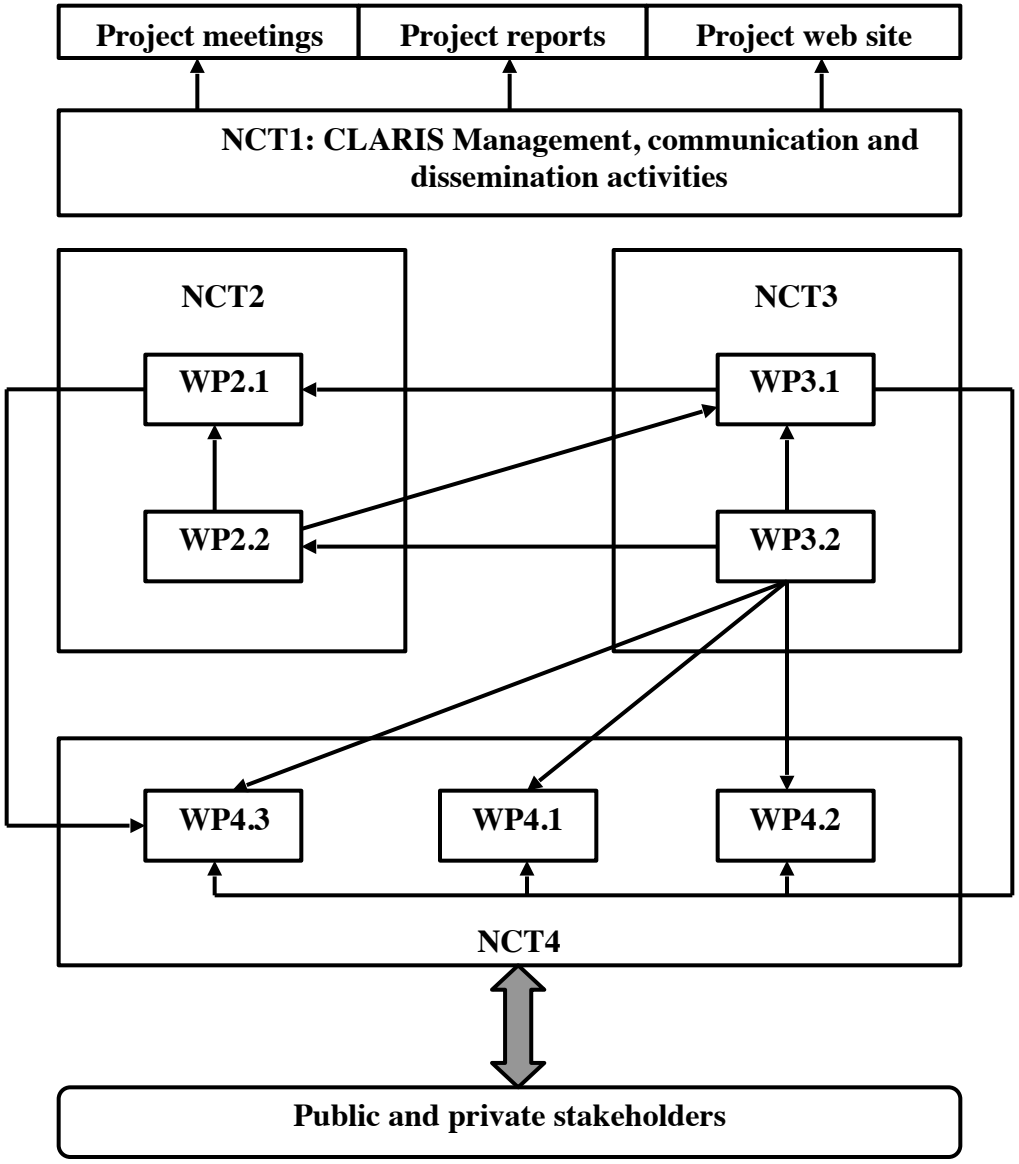
NCT1: Project coordination
- WP1.1: CLARIS and the European Commission **(J-P Boulanger, CNRS)**
- WP1.2: CLARIS communication and dissemination activities **(J.-P. Boulanger, CNRS, and Carlos Ereño, UBA)**

NCT2: Observing and modelling South American climate at continental scale
- WP2.1: Earth System Modelling **(Rafael Terra, UR, and Andrea Carril, INGV)**
- WP2.2: Climate observations and Earth System Simulations **(Hervé Le Treut, CNRS, and Roberto Mechoso, UR)**

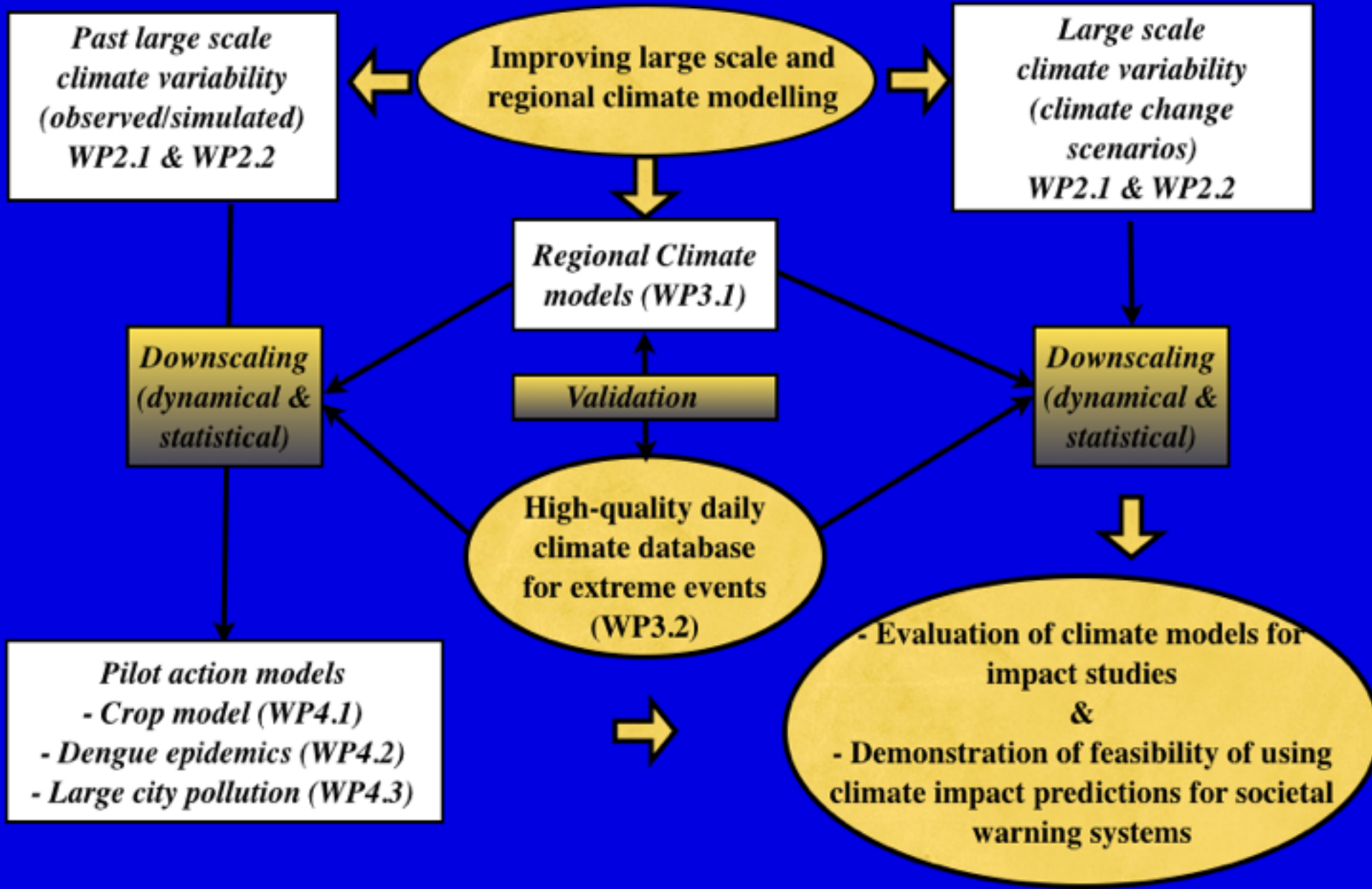
NCT3: From continental to regional and local scales
- WP3.1: Climate Change Downscaling in the sub-tropical and mid-latitude South America **(Manuel Castro, UCLM, and Claudio Menendez, CONICET)**
- WP3.2: High-quality regional daily data base for climate trends and extreme event studies **(Matilde Rusticucci, UBA)**

NCT4: From climate to impact studies
- WP4.1: Climate and agriculture: a Pilot Action in the Argentinean Pampa Humeda **(J.-P. Boulanger, CNRS, and Olga Penalba, UBA)**
- WP4.2: Climate and vector-borne epidemics: a Pilot Action on Dengue and Yellow Fever in Brazil **(Nicolas Degallier, IRD)**
- WP4.3: A Pilot Action on continental-scale air pollution produced by South American mega cities **(Guy Brasseur, MPI, and Carlos Nobre, INPE-CPTEC)**

CLARIS Graphical Representation



Graphical representation of the CLARIS project components



CLARIS Schedule of Work

Month	0 2 4 6 8 10 12	14 16 18 20 22 24	26 28 30 32 34 36
NCT1			
WP2.1			
WP2.1			
WP3.1			
WP3.2			
WP4.1			
WP4.2			
WP4.3			
Project Milestones	M1 M2	M3	M4
Deliverables	*D1.1* *D1.5* *D1.6* *D2.1* *D2.5* *D3.1* *D3.5* *D4.1* *D1.2* *D1.7* *D2.2* *D2.6* *D3.6/D3.7* *D4.2* *D4.7* *D4.10*	*D1.3* *D1.8* *D2.3* *D2.7* *D3.2* *D3.8* *D4.3* *D4.4/D4.5* *D4.8* *D4.11* *D4.12*	*D1.4* *D1.9* *D2.4* *D3.3* *D3.4* *D3.9* *D4.6* *D4.9* *D4.13*
Project reports	* *	*	*

CLARIS Kick-Off Meeting - Foz do Iguaçu - September 2004 (Photo by Carlos Eroño)

CLARIS NEWS

The Newsletter of the European Project of the 6th Framework programme

A Europe-South America Network for Climate Change Assessment and Impact Studies

Issue 1 - December 2004

The CLARIS Project is coordinated by

http://www.claris-eu.org/

Thank you

CLARIS NCT1
Management, coordination and dissemination activities

J-P Boulanger (CNRS) and Carlos Ereño (UBA)
(CNRS, CONICET, UBA, UR)

- To manage the project evolution and relation with the EC
- To organize CLARIS general meetings
- To make available to all the partners the advances reached in each work package
- To strengthen the work package interactions and collaborations via general meetings, workshops, trainings, a project web site and a regular newsletter.
- To promote the interaction and collaboration with stakeholders.

CLARIS NCT1 Tasks

Task 1 will be to organize four project meetings (kick-off, 1-year, 2-year and final) with two on each continent. The meetings will gather the project partners (including the Network Steering Group), experts from the Expert Advisory Group as well as external participants when they can bring external views and suggestions enriching the project strategy. A special attention will be put in opening the project meetings to stakeholders.

Task 2 will be to disseminate the project results (reports, development of research strategies,) through two web sites (one with a public access and the other one restricted to the partners) and a regular newsletter (6-month basis) gathering information related to the project as well as to national and international meetings, programme calls...

CLARIS NCT1 Deliverables

- **D1.1 (month 3)**: Kick-off meeting report
- **D1.2 (month 12)**: First annual report to the EC
- **D1.3 (month 24):** Second annual report to the EC
- **D1.4 (month 36):** Third and final report to the EC

- **D1.5 (month 1):** Creation of the CLARIS web site
- **D1.6 (month 2)**: Organization of the kick-off project meeting
- **D1.7 (month 12)**: Organization of the 1-year project meeting
- **D1.8 (month 24):** Organization of the 2-year project meeting
- **D1.9 (month 36):** Organization of the final project meeting

CLARIS WP2.1: Earth System Modelling

Rafael Terra (UR) and Andrea Carril (INGV)
(CNRS, CONICET, INPE, USP, INGV, UR, UCH, MPI)

- **Cooperation between South American and European scientists to:**
  - **Facilitate the transfer of technical and scientific know-how in the field of Earth System modelling to increase the modelling capability of the partners and enable them to address the specific complexities of the climate of subtropical South America**
  - **Promote the dissemination of models that will enable a multi-model approach to the study of the climate system. Set quality criteria for global models to be used in the region, in particular for downscaling purposes.**

- **Address those scientific issues that are least developed in South America, such as the interactions among climate subsystems: atmosphere-ocean coupling, land-atmosphere feedbacks, cloud-aerosols and chemistry-radiation interactions, fostering the development of local modelling expertise.**

CLARIS WP2.1 Tasks

- **Task 1**: Define a quality test for the simulations of the large scale regional climate.
- **Task 2**: Assess the capacity of the participating large scale models to meet the set of criteria defined in Task 1.
- **Task 3**: Structure the working group of new collaborations, report the state-of-the art in each subject area, identify partner needs in terms of data and modelling tools and define an implementation calendar.
- **Task 4**: Implement that calendar with training, modelling expertise transfer, modelling validation and inter-comparison activities.
- **Task 5**: Report the progress achieved in each area including the identification of further needs and advice on relevant follow-up activities.

CLARIS WP2.1 Deliverables

- **D2.1 (month 4):** Report of first workshop describing (i) quality criteria for global models performance in subtropical South America and (ii) calendar of activities for the working groups in each subject area (results from WP2.1 sessions held during the kick-off meeting to assist Task 1 in combination with WP3 and Task3 in combination with WP2.2, respectively).

- **D2.2 –2.3 (month 12, 24):** Report of second and third workshops (i) on with the evaluation of participating large scale models in view of the quality criteria set in D2.1 (together with WP3), and (ii) on installation of technical capabilities, transfer of specific expertise and advance of coordinated research activities in the subject areas.

- **D2.4 (month 36)**: Report of final meeting with results of cooperative research using updated/new models and prospective strategy to improve the model skill in representing climate change characteristics in South America

,ARIS WP2.2: Climate Observations and Earth System simulations

Hervé Le Treut (CNRS) and Roberto Mechoso (UR)
(CNRS, CONICET, INPE, USP, INGV, UR)

- **To structure the access of CLARIS partners to a common set of climate observations and Earth System simulation results. This will be achieved through the creation of a CLARIS metadata base:**

  - **The combined use of multidisciplinary data from different sources (in situ, satellite, reanalyses) for process studies**

  - **The validation of global models over the South American area**

  - **The determination of boundary and forcing conditions for regional models or downscaling approaches**

  - **The validation of regional models**

CLARIS WP2.2 Tasks

- **Task 1**: To set up a data exchange protocole agreeable by all partner.
- **Task 2**: To archive the reanalyses data, commonly available satellite data and available model climate scenarios necessary for the validation of global models, driving conditions for regional scale models, validation data for regional models or the process studies
- **Task 3:** To update the archival on a 6-month basis after consultation of the partners

CLARIS WP2.2 Deliverables

- **D2.5 (month 6):** Report on exchange protocol, preliminary list of necessary data
- **D2.6 (month 12):** Web access to the preliminary set of data
- **D2.7 (month 18):** Web access to updated list of data + first CLARIS modelling results (to be updated every 6 months)

CLARIS WP3.1: Climate Change Downscaling

Manuel Castro (UCLM) and Claudio Menendez (CONICET)
(CNRS, CONICET, UBA, INPE, USP, INGV, UCLM, UCH, MPI)

- To make-up a SA-EU expert group on dynamical and statistical downscaling techniques.
- To set up a research strategy on regional-scale climate change in SA.
- To assess the performance of RCMs to reproduce current regional climate in SA.
- To develop scenarios for the late 21st century using different downscaling methods.
- To analyse the changes in mean climate, weather regimes and extremes over different South American regions.
- To compare the suitability of the employed downscaling methods for regional climate change impact studies in SA.
- To develop standard RCM simulated data sets.

CLARIS WP3.1 Tasks

- **Task 1**: To assure a unified approach for all experiments in terms of model domain and resolution, time periods, model forcing and diagnostics studied through our SA-EU expert group on dynamical and statistical downscaling techniques.
- **Task 2**: To explore the capability of the RCMs, forced by reanalysis data, to simulate some case-studies (*synoptic time-scale*) of daily temperature and/or precipitation extreme events already described in the litterature (link with WP3.2).
- **Task 3**: To perform and analyze present-day RCMs simulations driven both by reanalysis data and by the available ESMs, focusing on their ability to simulate extremes of temperature and precipitation (link with NCT2 and WP3.2).
- **Task 4**: To evaluate the models´ skills in specific regions of South America, selected on the basis of the availability of data and the expertise of the partners (links with WP2.2, WP3.2 and NCT4).
- **Task 5**: To apply dynamical downscaling and statistical/statistical-dynamical downscaling methods to the same underlying ESMs of T3 for the end of the 21st century to provide regional scenarios of climate change (link with WP4.1).
- **Task 6**: To compare dynamical, statistical and statistical-dynamical downscaling approaches, for specific South American regions.
- **Task 7**: To evaluate the most probable regional characteristics for different climate change scenarios assessing the ESMs and RCMs major flaws (link with NCT2).
- **Task 8**: To use these scenarios to identify changes in weather regimes and extremes.
- **Task 9**: To ensure wide dissemination of the project results to stakeholders, the scientific community and the public through the project web site and the production of reports and scientific papers (link with NCT1).

CLARIS WP3.1 Deliverables

- **D3.1 (~month 4)**: Report of the 1st workshop giving a general outlook over ongoing work on South American regional climate modeling and downscaling

- **D3.2 (~month 14)**: Report of the 2nd workshop analysing the preliminary results about the capability of the RCMs (driven by reanalysis) to simulate extreme events and the present-day climatology of southern South America.

- **D3.3 (~month 26)**: Report of the 3rd workshop analysing the preliminary results about the climate change scenarios generated by dynamical downscaling.

- **D3.4 (month 36)**: Final report on climate change scenarios for southern South America, on accomplished progress, exchange of expertise, and on a prospective of pursued common research strategy.

CLARIS WP3.2: High-quality regional daily data base for climate trends and extreme event studies

Matilde Rusticucci (UBA)
(CNRS, CONICET, UBA, INPE, UR, UCH)

- To create a high-quality regional database (metadata) for daily temperature and precipitation which will be regularly updated (every six months).

- To develop impact-relevant indices of extremes and indices of extremes necessary for climate modelling (WP2.2), downscaling (WP3.1) and impact studies such as in NCT4.

- To promote the development of high-quality observational networks in order to stop the current decline in the coverage of in-situ networks and to ensure data continuity required for changes in extremes to be detected.

- To strengthen collaborations between the data and modeller communities to further develop common scientific projects on extreme events and climate change.

- To contribute to global assessments of observed climate variability and changes in extremes by extending our initiative to the South American continent.

CLARIS WP3.2 Tasks

- **Task 1**: To gather all currently available data in the region of study and collect archived historical data. In some cases, data will be digitalised. A regional database starting in 1960 will have a higher regional coverage. A database of some stations with long-term records will respond to low frequency climate variability and trends.

- **Task 2**: to apply processing tools (data quality control methods, homogenisation techniques,...) already developed by the European Climate Assessment (ECA) Project and disseminate these methods among the network partners.

- **Task 3**: to organize small-size meetings to promote the present initiative to the different regional and national institutes collecting meteorological data in the four countries of interest (Argentina, Brazil, Chile and Uruguay).

- **Task 4**: to detect climate trends and frequency changes in extreme events in southern South America.

CLARIS WP3.2 Deliverables

- **D3.5 (month 6)**: Transfer of quality-control methods and expertise developed by ECA to South American partners.

- **D3.6 (month 12)**: Creation of a metadata base for quality-controlled of daily temperature and precipitation appropriate to be used for studies of extreme events in Southern South America (a regular 6-month update of the database is scheduled).

- **D3.7 (month 12):** Report on the needs of WP2.1 (Earth System Models), WP3.1 (downscaling) and NCT4 (impacts) related to extremes.

- **D3.8 (month 24)**: Report on the estimation of regional extreme indices for the detection of climatic change over the region and the evaluation of probabilistic methods for extreme climate event risk assessments (e.g. agriculture, health, hydrology) in southern South America.

- **D3.9 (month 36)**: Report on climate trends and frequency changes in extreme events in southern South America.

CLARIS WP4.1: Climate and agriculture

J-P Boulanger (CNRS) and Olga Penalba (UBA)
(CNRS, CIRAD, UBA, ISCI, PRI)

- To state the needs of agricultural stakeholders in the CLARIS pilot region
- To identify the spatial and temporal scales bridging the stakeholder needs and the climate research state-of-the-art abilities in describing the climate system
- To set-up a climate-cropping model system to evaluate the climate impacts on agricultural production
- To assess the potential consequences of climate change scenarios on agricultural activities in the CLARIS pilot regions
- To suggest adaptation strategies to these potential changes

CLARIS WP4.1 Tasks

- **Task 1**: To create a common climate and agricultural database (accessed via the CLARIS partner web site) including high-quality detailed data at some selected sites for evaluating an integrated climate, cropping and economic modelling system.

- **Task 2** : To perform crop simulations to calibrate and validate the crop model

- **Task 3** : To test and select climate downscaling methods adapted to the agricultural needs

- **Task 4** : To downscale climate change scenarios in the CLARIS pilot region to characterize the potential impacts on agricultural activites, and generate management scenarios (crop species and maturity class choice, sowing time, irrigation, fertilization, etc.) to design cropping adaptation strategies taking into account the impact on the natural resource base (e.g. soil organic matter) and changes in cost and benefits for each agricultural system

CLARIS WP4.1 Deliverables

- **D4.1 (month 6):** Report on « Climate needs and expectations of agricultural stakeholders in the CLARIS pilot region »
- **D4.2 (month 12):** Crop model formatted meteorological and agricultural database in the selected Pampa Humeda regions.
- **D4.3 (month 21):** Report on crop modelled production and production probability distribution for current observed climate conditions
- **D4.4 (month 24):** Crop model training course in Argentina
- **D4.5 (month 24):** Report on state-of-the-art climate downscaling methods useful for agricultural impact studies.
- **D4.6 (month 36):** Climate change cost/benefit studies and scenarios of management options to alleviate climate change impact on current systems.

CLARIS WP4.2: Climate and vector-borne epidemics

Nicolas Degallier (IRD)
(CNRS, CONICET, INPE, USP, INGV, UR, UCH, MPI)

- **Create an epidemiological relational database including high-quality detailed data on Yellow Fever (YF) cases (human and monkeys) and Dengue human cases in Brazil freely accessed on the CLARIS public web site.**

- **Determine which climate parameters are key ones in explaining the spatial and temporal distribution of YF and Dengue cases.**

- **Generate epidemiological scenarios (Dengue transmission, level of immune status, vector densities and control activities), according to various climate change scenarios.**

CLARIS WP4.2 Tasks

- **Task 1**: To compare various existing *Aedes aegypti* - Dengue models.
- **Task 2**: to couple the chosen mosquito-Dengue model to a temporal-evolution epidemics model already developed and applied with success in simulating Dengue epidemics.
- **Task 3**: to diagnose the climate impact on simulated past epidemics and to suggest a potential evolution of the regions at risk for different climate change scenarios.
- **Task 4**: to propose to Brazilian Ministry of Health (FUNASA) a risk index for decision-making during vaccination campaigns based on seasonal climate predictions.

CLARIS WP4.2 Deliverables

- **D4.7 (month 12)**: Internet-based epidemiological database for YF and Dengue cases in Brazil.

- **D4.8 (month 24)**: Report on Dengue-mosquito model analysis and validation, and YF spatio-temporal analysis of cases.

- **D4.9 (month 36)**: Map of Dengue risk evolution for different climate change scenarios and risk assessment indices for YF vaccination decision-making and Dengue integrated control

CLARIS WP4.3: Continental-scale air pollution by South American mega cities

Guy Brasseur (MPI) and Carlos Nobre (INPE)
(CNRS, INPE, UCH, MPI)

- **Cooperation between South American and European scientists to assess:**

  - **Impact of mega cities on air quality at the sub-continental scale (ex: Sao Paulo and Santiago)**

  - **Impact of land-use changes on air quality at the local and regional scale**

  - **Relative effects of anthropogenic versus biogenic emissions on atmospheric oxidants and aerosol abundances at the continental scale**

  - **Regional climate forcing resulting from changes in aerosols and tropospheric ozone concentrations in the past and in the future**

CLARIS WP4.3 Tasks

- **Task 1**: Assemble an emission database for urbanized and industrialized regions at high spatial resolution. Assess emissions algorithms for biogenic processes.
- **Task 2**: Perform global model simulations of the atmospheric composition for present and future conditions (based on emission scenarios).
- **Task 3**: Downscaling at and regional modelling of the chemical composition of the atmosphere (aerosols and oxidants) for South America.
- **Task 4**: Analysis of simulation results: evaluate the effect of South American mega cities on regional air quality.
- **Task 5**: Analysis of observations (gaseous species and aerosols) provided by surface networks and comparison with results of simulations.
- **Task 6**: Integrated analysis of air quality evolution and assessment of the efficiency of environmental policies

CLARIS WP4.3 Deliverables

- **D4.10 (month 12):** Implementation of atmospheric chemistry/transport models in South American institutions ("trans-national technology transfer").

- **D4.11 (month 18):** Joint development (studies/analysis) of detailed emission inventories (natural and anthropogenic compounds) for South America (Exchanges of scientific visitors).

- **D4.12 (month 24):** Joint study/analysis focusing on the evaluation of model simulations and of the impact of environmental policies.

- **D4.13 (month 36)**: Training of South American scientists and students at European Institutions for the use of global and regional atmospheric chemical models