



PRECIS: Facilitating capacity building and technology transfer to enable climate change mitigation and adaptation activities worldwide

Joseph Intsiful, UNFCCC NWP Meeting, Mexico City 4 -7 March 2008

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What is PRECIS and what can it do?

Content:

- Why regional climate modelling and PRECIS?
- Capacity building and collaborations
- Climate research and climate scenario development
- Awareness raising and impacts research
- Future potential

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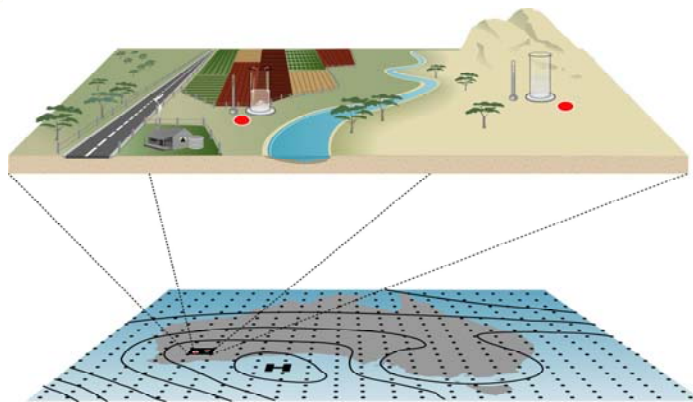


Why regional climate modelling and PRECIS?

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From global to local climate ...



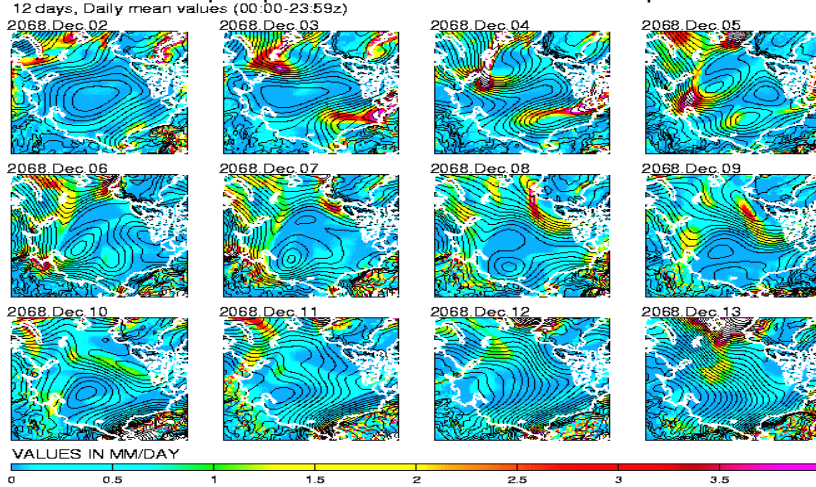
... from a global climate model (GCM) grid to the point of interest.

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Regional climate models (RCMs) simulate high resolution weather

Total precipitation rate with Pressure contour plot

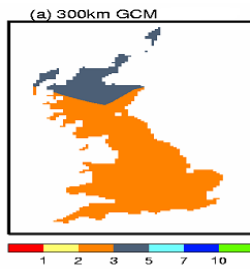


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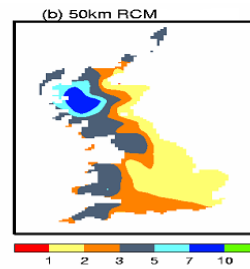


Winter precipitation over Britain

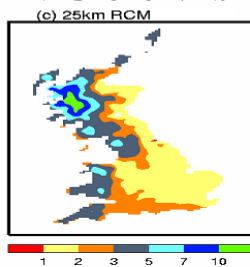
300km
Global
Model



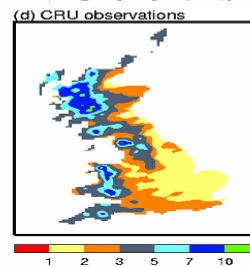
50km
Regional
Model



25km
Regional
Model



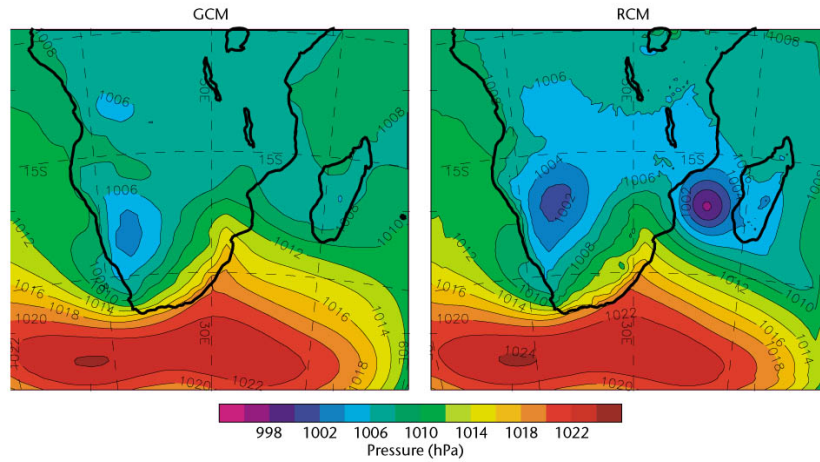
Observed
10km



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RCMs simulate extreme events e.g. tropical cyclones



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The PRECIS Programme

- PC version of latest Hadley Centre RCM
- User interface to set up RCM experiments
- Data processing and display software
- Boundary conditions
- Workshops and training materials
- Support



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Outputs from the PRECIS modelling system

- PRECIS can provide:
 - climate scenarios for any region
 - an estimate of uncertainty due to different emissions
 - an estimate of uncertainty due to different GCMs
 - an estimate of uncertainty due to climate variability
- Data available from PRECIS
 - comprehensive for atmosphere and land-surface
 - grid-scale box average quantities
 - maximum time resolution one hour

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Current outputs from the PRECIS Programme

- Detailed climate scenarios using the UKCIP02 methodology for the main developing country regions
- Detailed simulation of the recent climate (last 50 years) for many developing country regions
- Basic capacity building and technology transfer enabling mitigation and adaptation activities via:
 - scientific and technical support for applying PRECIS to scenario development and climate research
 - ad hoc advice on using scenarios in impacts assessments, developing collaborations and research proposals

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Capacity building and collaborations

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Activities are initiated via PRECIS workshops

- PRECIS workshops focus on:
 - Background science including uncertainties
 - Interpretation of PRECIS results by regional experts
 - Construction of regional climate change scenarios
 - Building capacity in countries/regions using PRECIS
- PRECIS is supplied with:
 - A handbook covering the background science, system description and the uses and limitations of PRECIS
 - A technical manual explaining technical details about the system and how install and to use it





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Current user/network/project status

- Over 200 trained users from over 60 countries from workshops in S Africa, UK (x5), Cuba (Belize), Bhutan (India), Brazil (Argentina), Turkey, Ghana, Malaysia, Kenya
- Developing country regional networks across the globe
- Projects and focal points: Belize/Cuba – CCCCC/INSMEN, India – IITM, China – CAAS, Brazil/Argentina – CPTEC/CIMA, S. Africa/Kenya – U Cape Town/ICPAC, SE Asia – MMD/START
- Links with international agencies (UNFCCC, UNDP-NCSP)Future potential
- Strengthened scientific capacities in developing countries for participation in international projects (AMMA, WAMME)

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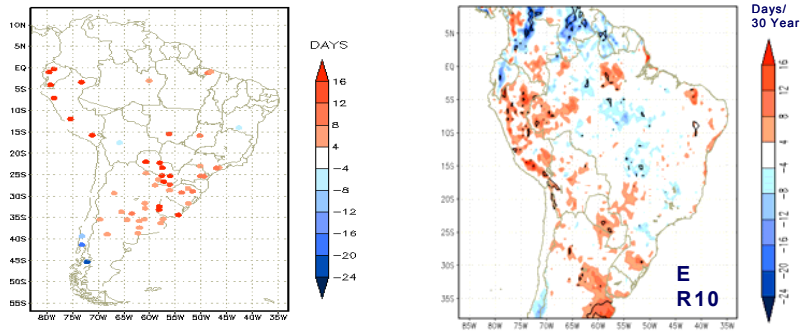
Climate research and climate scenario development

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Observed and modelled trends in heavy precipitation over South America

Stations observations and modelled significant trends in R10
(R10=number of days in a year with precipitation above 10 mm)



Future change of temperature and precipitation extremes in South America as derived from the PRECIS regional climate modeling system

J. A. Marengo*, R. Jones**, L. M. Alves*, M. C. Valverde*

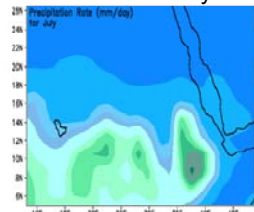
*CPTEC/INPE, **Met Office Hadley Centre (Reading Unit)

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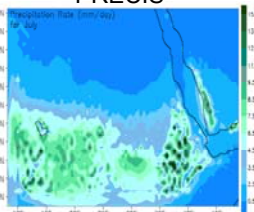


Precipitation estimates over Eastern Africa

NCEP-Reanalysis



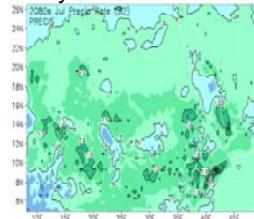
PRECIS



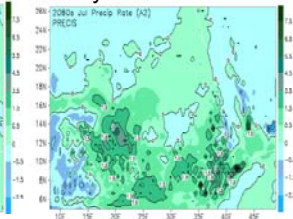
Current climate (1961-1990)

Captures the regional rainfall pattern along the East African steep topography and Red Sea area

July rainfall 2080 -B2



July rainfall 2080 -A2

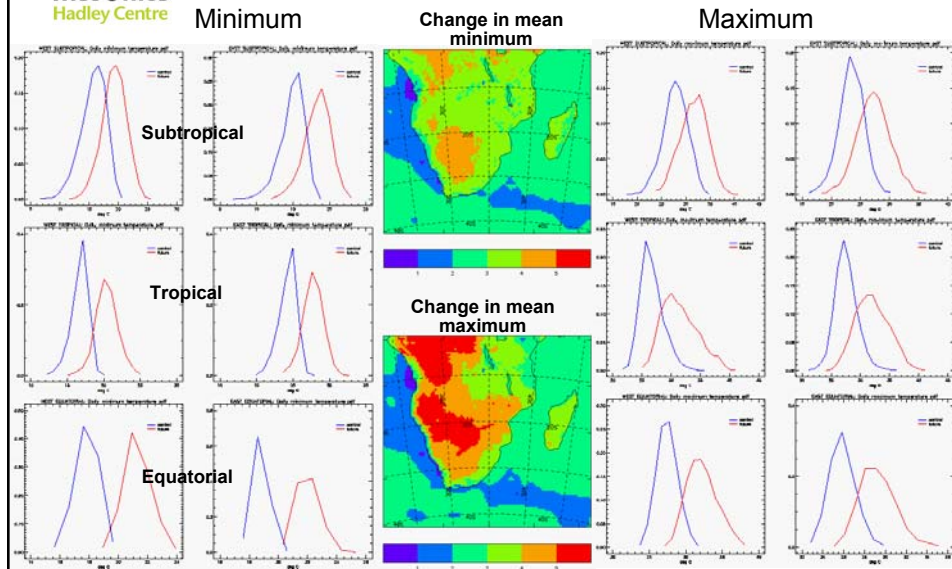


Future projections: 2080s

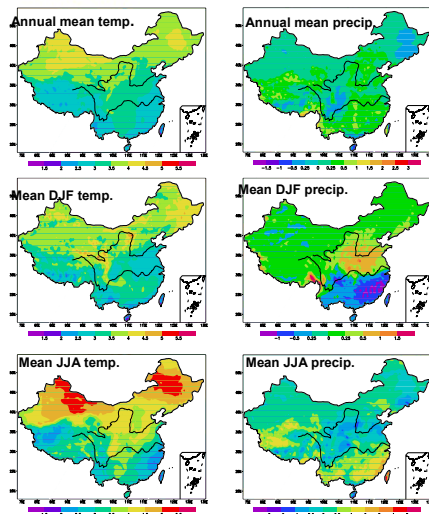
Increased rainfall (1.5mm/day) over the domain for both A2 & B2
More areas in A2 would experience higher rainfall increases

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Summer daily temperature changes from PRECIS: 2080s



Projected changes in future climates for 2080 under B2 scenario over China



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Over all temperature increase with a south-north gradient (up to 5°C).
 Increasing JJA precip. Amounts within Yangtze Basin would increase frequency of flooding. Precipitation would increase over most areas of China (mid. of south, north and Tibetan plateau) and decrease over the northeast.
 Decreasing precip. in Yellow Basin and the north, coupled with increasing temp. would enhance drought in these areas.



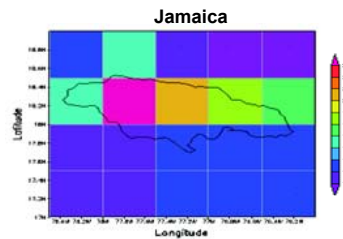
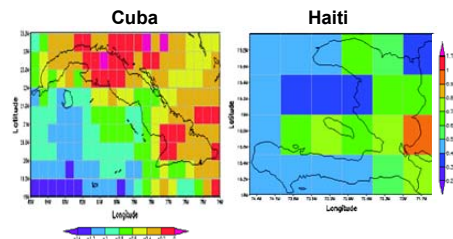
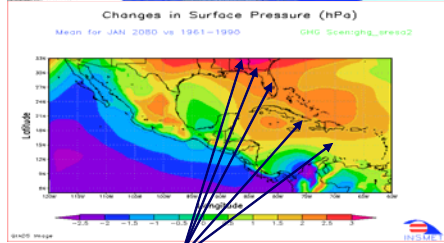
Awareness raising and impacts research

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Data provision and analysis system for Caribbean/Central American

Web interface for the PRECIS online access system



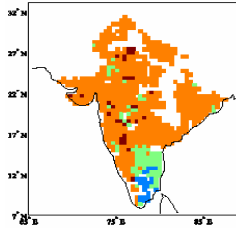
Tracking of pressure systems. Tool for investigating storms & extreme events.

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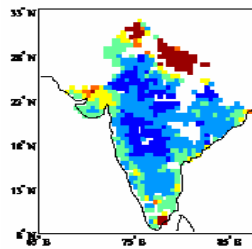
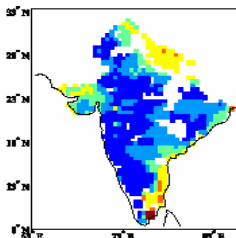
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Change in ground-nut yields over India



Ratio of simulated to observed mean (left) of yield for the baseline simulation with $T_{opt}=28^{\circ}\text{C}$.

Percentage change in mean yield for 2071-2100 relative to baseline: TOL-28 (bottom left) & TOL-36 (bottom right).



Over 70% reduction in some areas.

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Questions and answers

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