

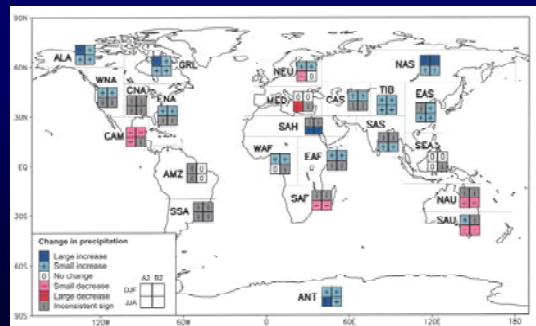
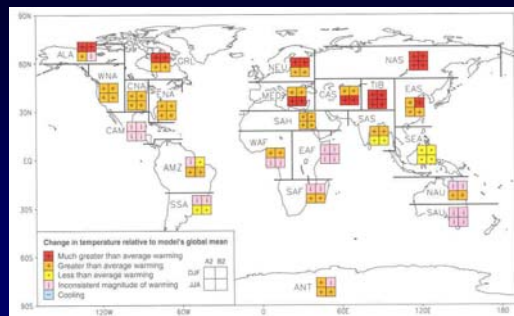
Report on an ongoing discussion on a coordinated RCM effort to enhance the input into the AR5 and to the impact community

Filippo Giorgi

Abdus Salam ICTP, Trieste, Italy

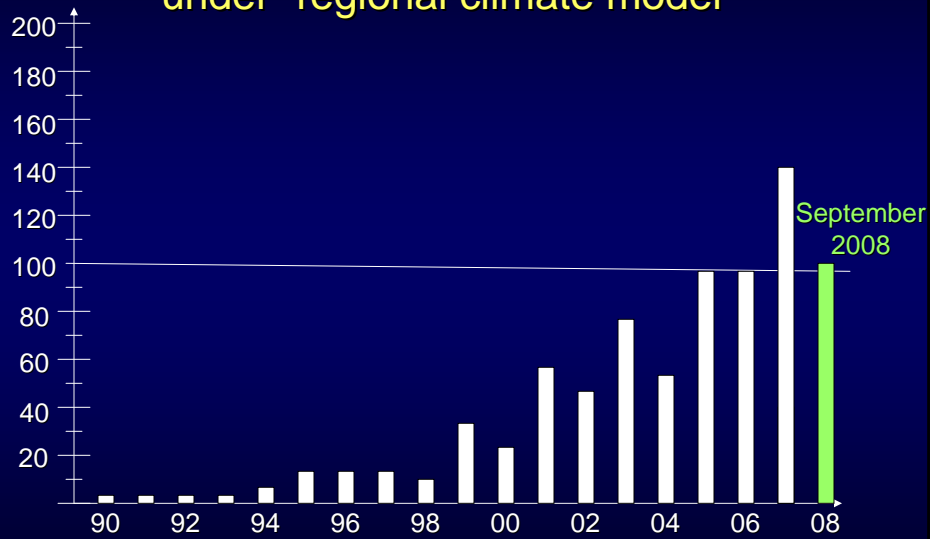
WGCM Meeting, Paris, 22-24 September, 2008

The regional climate change information in Chapter 10 of the TAR was essentially based on AOGCM simulations

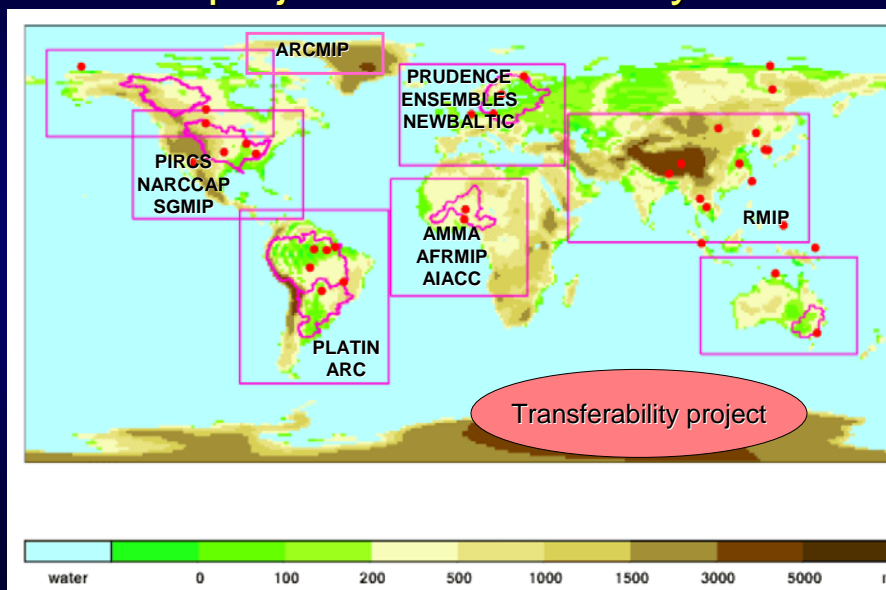


10 out of 18 figures in Chapter 10 were based mostly on methodological issues

Number of papers in the ISI under "regional climate model"

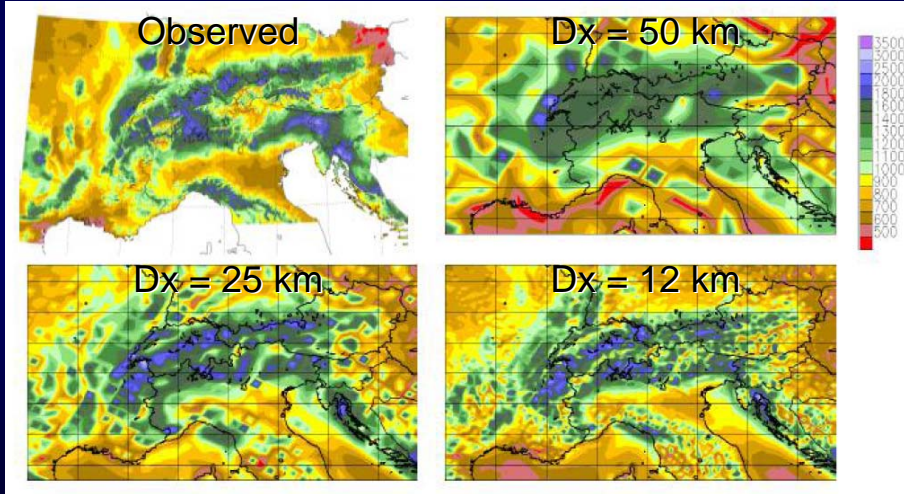


A number of regional intercomparison projects are under way



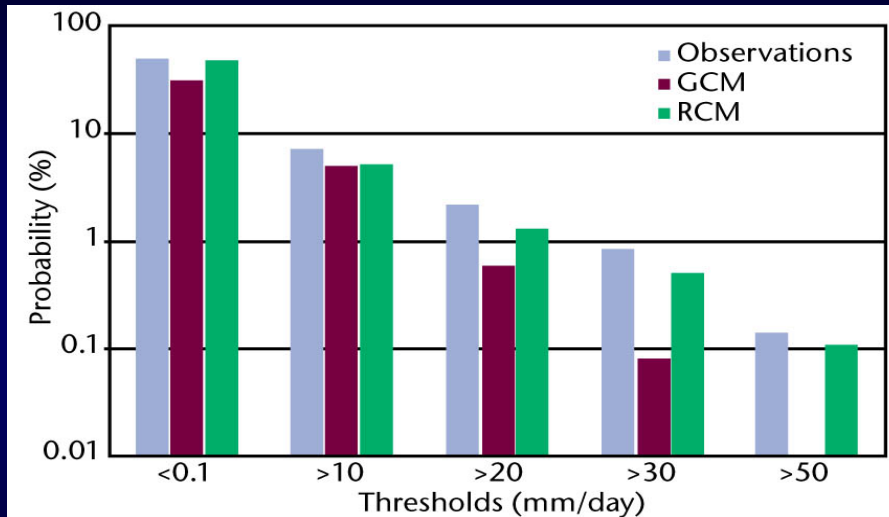
RCM simulation of precipitation at different resolutions over the Alps

Mean annual precipitation (mm/day)



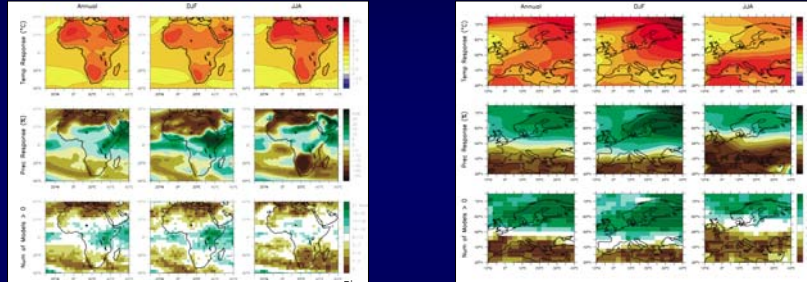
From Christensen et al. 2005

WINTER DAILY RAINFALL OVER THE ALPS

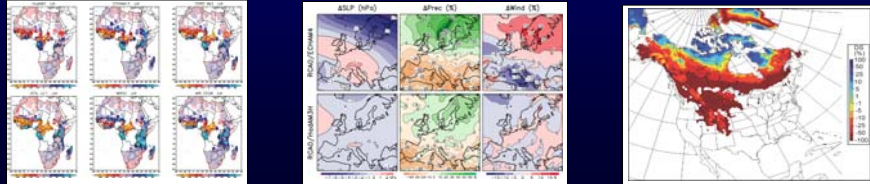


Resolution yields a much better description of extremes

Was this development reflected in the AR4? Most regional climate change information in the AR4 was still derived from AOGCMs



Only 3 figures in Chapter 11 from RCMs or SD (out of 30)



Why is RCM information under-utilized in the generation of climate change scenarios for impact/adaptation work?

RCM studies have not
been coherent and
comprehensive enough
to sufficiently characterize
uncertainties in climate
change projections

Exceptions are Europe
(PRUDENCE, ENSEMBLES)
and (maybe) US (NARCCAP)

The RCM community feels the need for a global coordinated program (analogous to a CMIPn) to produce a next generation set of scenarios

for use in the AR5 process

- Multiple Scenarios or RCP
- Multiple GCMs
 - Single or multiple realizations
- Multiple RCMs (or RCDs)
 - Single or multiple model configuration
- Multiple regions
- Multiple time slices
 - 1980-2040 – near future or “Adaptation” time slice
 - 2081-2100, 2181-2200, 2281-2300 – far future or “Stabilization/mitigation” time slices

Key ingredients for success emerging from the ongoing discussion

- Strong formal endorsement from WCRP
- Formation of a formal ad-hoc task force (or WG?) to oversee the process under the WCRP auspices
- Involvement of a wide model development, use, and analysis community
- Strong involvement of the end-user community (impact, adaptation, mitigation)
- Strong (formal?) commitment of global modeling groups to provide a suitable set of 6-hourly fields for RCM nesting
- Fast-tracked procedure for transfer of GCM fields to RCM users
- Creation of a databank for storage of global “driving” fields and RCM output.

WCRP/JSC discussion on RCM activities in support of the AR5

- Design a framework for improving coordination across RCM (and possibly SD) groups to enhance RCM/SD input into the AR5
 - Better evaluation of models and techniques
 - More coordinated sets of RCM/SD simulations to assess uncertainties

Model evaluation

- Define a standard set of analysis-driven (perfect LBC) benchmark cases to assess the model performance (analogous to AMIP)
 - ERA-Interim (1989-2007) ?
- Define a set of benchmark metrics
 - Region dependent?
 - Application dependent?
- Assess the model performance when driven by GCM historical runs (using same metrics?)
- Coordination with the Transferability framework?

Regional projections

- Multiple regions
- Target resolution: 25 km.
- Top priority runs for which global LBC fields will be needed
 - Tier 1: RCP4.5 (ideally 1950-2100)
 - Tier 2: RCP8.5 (ideally 1950-2100)
 - Tier 2: DHFG (2005-2035)
- Possible (wishful thinking) additional runs
 - Emission driven coupled carbon runs
 - Additional DHFG hindcast run
 - Far future RCP4.5 stabilization time slices (2170-2200, 2270-2300)
- Possible sensitivity experiments to assess the importance of regional forcings (aerosol and landuse)

How to go about it

- Formal endorsement by WCRP
 - Set up a formal X-MIP-X
- Formation of a task force (or WG) to design a plan, write a white paper and oversee the process after consultation with the broad community
- Involve a wide RCM (or RCD) community in a coordinated way
- Involve end-users (impact/adaptation)
- Involve (representatives of) the GCM community
- Formal commitment by GCM groups to provide 6-hourly fields for LBCs in a fast track way
- Creation of data-banks for LBC global fields as well as RCM output
 - Global center?
 - Network of regional centers?

A possible time schedule

- **September 2008 – December 2008**
 - Formation of the “task force”
 - Identification of potential participating modeling groups
 - First draft of “white paper”, distribution for comments
- **February 2009 – WCRP Workshop in Toulouse (still needs to be announced)**
 - First discussion meeting on technical issues of the program plan
 - Revision of white paper for further comments-distribution
- **May 2009 – Lund workshop**
 - Finalization of plan and white paper
 - Identification of contributions by different groups
- **September/October 2009**
 - Report to WGCM meeting
- **June 2009 – December 2009 (or June 2010)**
 - Completion and analysis of first set of validation runs driven by analyses of observations over the different domains
- **January (or June?) 2010**
 - Begin scenario runs