Met Office
Hadley Centre

Climate modelling, downscaling and scenarios for assessing climate (change) threats and opportunities and planning adaptation

NWP technical workshop on Collaboration among Regional Centres and Networks, Apia, Samoa 2-5 March 2010

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- Climate scenarios
- Derivation of regional climate information
- Sources and application of climate scenarios
- Improving access to and application of regional climate information

Context: assessing climate change impacts and planning adaptations

Clear messages are emerging on how many aspects of large-scale average climate will change

Climate models are central to the understanding and prediction of climate change

More work is required to determine reliable predictions of detailed climate change (both spatially and for extremes)

Comprehensive scenarios for risk assessment require temporal and spatial detail

Applying detailed climate scenarios can provide policy-relevant information on vulnerability and adaptation

AR4 South Asian monsoon changes

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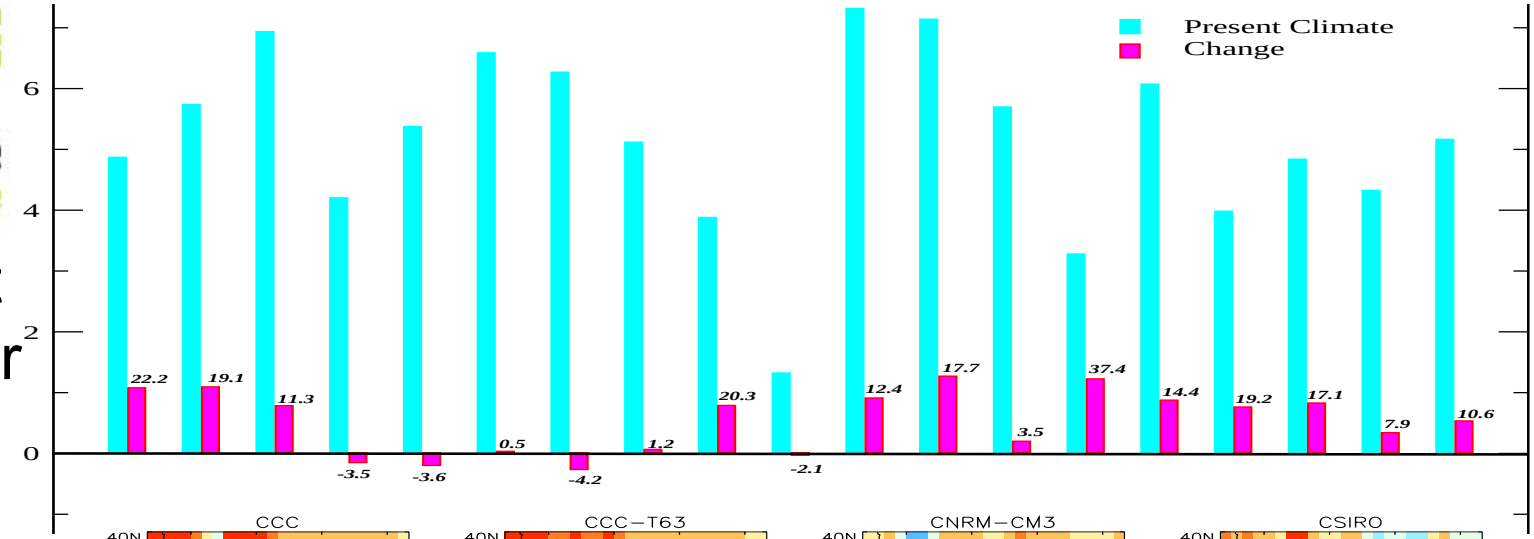
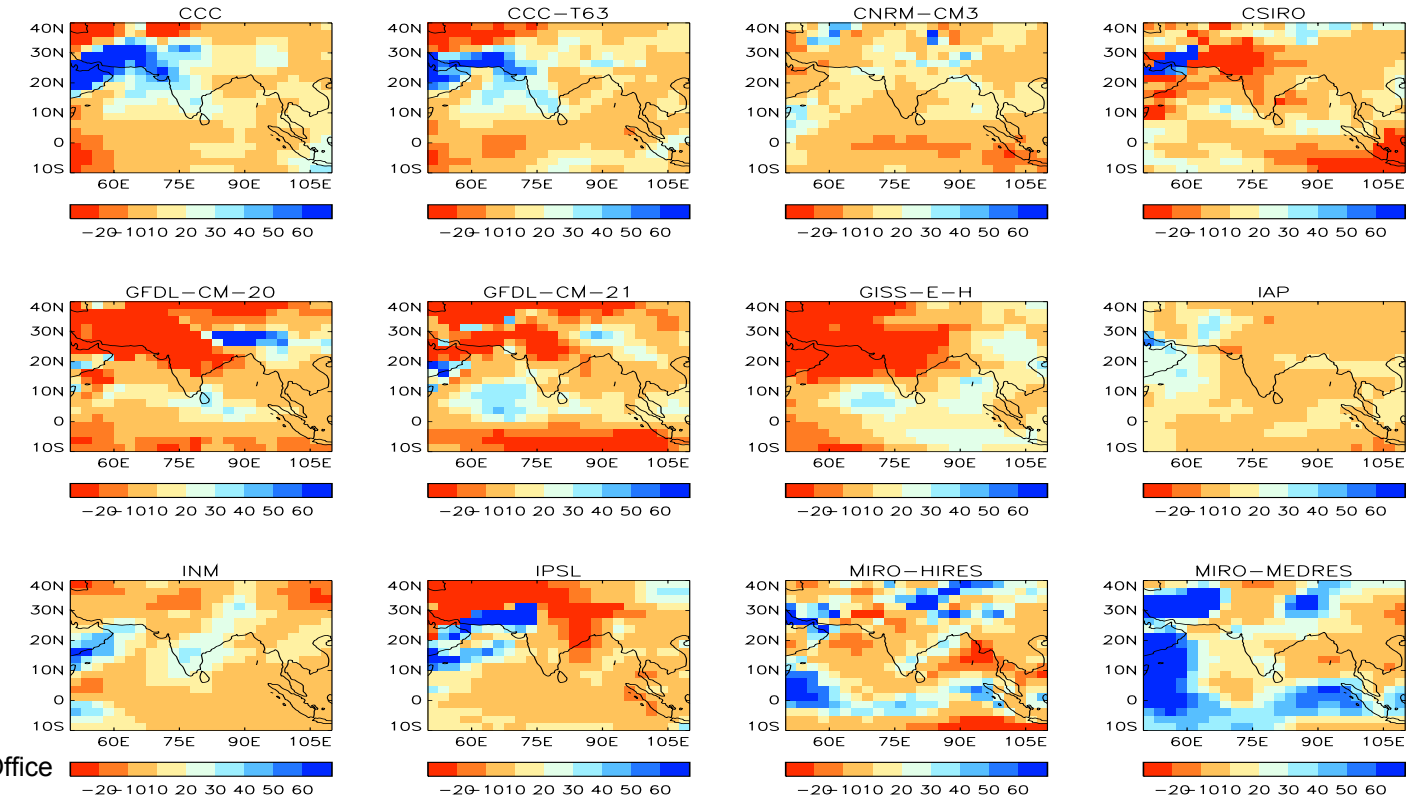
Consistent picture for regional average change - models and theory

Must allow for pattern difference in regional scenarios





Climate scenarios – some definitions

- Climate projection: Long-term response of the climate system to a scenario of greenhouse gas and aerosol emissions, as simulated by a climate model
- Climate change scenario: The difference between some plausible future climate and the current or control climate
- Climate scenario: Plausible future climate constructed to investigate the consequences of anthropogenic climate change

Types of climate scenarios

- Incremental scenarios (for sensitivity studies)
- Analogue scenarios
- Scenarios based on climate model outputs, either directly or with some downscaling
- Other types of scenarios
  - Weather generators
  - Expert judgement

Latest downscaling developments

- Some regions have coordinated downscaling (AMMA-WAMME, ENSEMBLES, NARCCAP, RMIP, CREAS)
- Some significant individual multi-model activities, Brazil, India, China, SE Asia
- Some specific statistical downscaling activities, Africa
- WCRP CORDEX has set up a framework for CMIP5 downscaling for all land areas, initially doing Africa
- Most importantly, no coordinated data distribution except ENSEMBLES/NARCCAP – but CORDEX will do this, for Africa at least (but still on good-will basis)

Sources of information and technical guidance

- NCSP guidance on regional climate scenarios and applying climate information for adaptation
- TGICA guidance on scenarios from global models and dynamical and statistical downscaling
- UK Climate Impacts Programme (UKCIP) – background information and worked examples
- Scientific literature and summaries (e.g. IPCC report)
- Nothing comprehensive, especially for climate scenario construction for national/regional risk assessments or cost/benefit analyses

Role of regional centres and networks

- Central location for data dissemination (currently these are modelling centres without a wider remit)
- Collection/distribution of scenario/expertise requirements
- (Links to) guidance on and quality measures of scenarios
- Repository for examples on applications
- Repository for regional meeting outputs, e.g. CCAA learning forum in Nairobi next week
- Need assessment/coordination (!) of these to ensure consistent standards

Opportunities for collaboration between centres/networks

- Assess and propagate best practice
- Define strengths, assess overlaps and identify gaps – which would improve confidence of potential funders
- Coordinate data distribution to enable and provide results from exploitation of CMIP5 downscaling potential
- Engage in quality assurance activities
- Set-up scenario development to risk assessment programme(s) involving bottom-up and top-down practitioners/suppliers – and hopefully learn a lot!