

Improving Delivery of Climate Model Results & Capacity Building

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Mission & Objectives



World Climate Research Programme supports climate-related decision making and adaptation planning by

- (1) supporting research for improved climate predictions, and understanding of human influence on climate;
- (2) creating scientific knowledge to assess the impacts of climate change and variability.

Knowledge Generation



WCRP develops the scientific knowledge to help

- mitigate and manage climate-related risk
- develop adaptation strategies



WCRP works with partners to transfer this knowledge to the users and build capacity

Science is Needed Urgently for



Mitigation

- What level of mitigation? What stabilisation scenarios?
- Can we detect and attribute regional impacts?
- What is dangerous? - short-term, long-term, irreversible (scale)
- How are emission reductions verified?



Science is Needed Urgently for



Adaptation: even with successful mitigation, adaptation will be essential.

- Regional and local scales
- What do we need to adapt to? How fast? Where?
- Detecting and attributing regional impacts
- Extreme events
- Adaptation in the near- and long-term
- Urban environments

Science is Needed Urgently for



Risk Management

- Improve climate predictions
 - intra-seasonal,
 - seasonal,
 - multi-year,
 - decadal,
 - centennial prediction
- Improve prediction of changes in extreme events (tropical cyclone, storm intensity, drought, etc.)



Support to the UNFCCC process

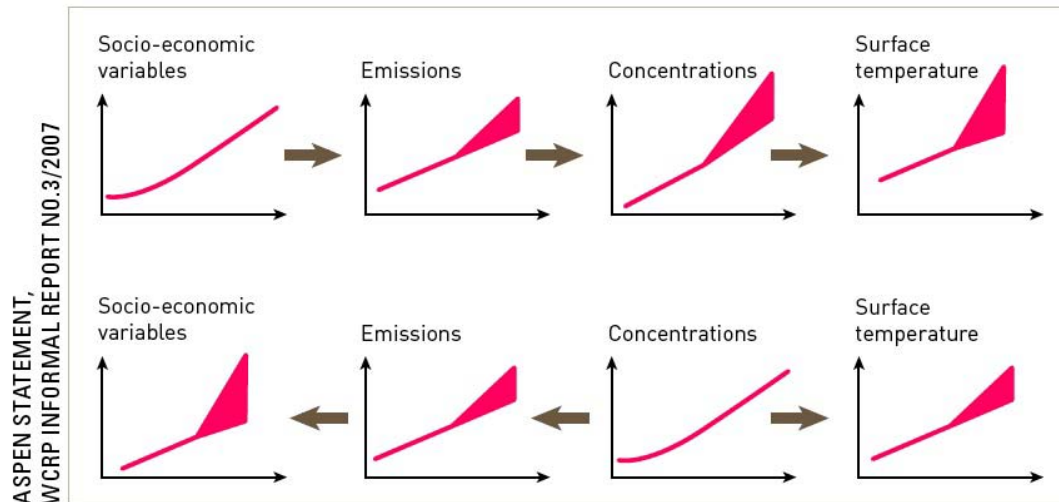
- WCRP organized global model runs for all IPCC assessments (e.g. PCMDI archive)
 - open access to the entire world without any restrictions
 - use for climate science + regional projections (WG 1), impact assessments (WG 2 & 3)

● Focusing now on regional models



Support to the UNFCCC process

WCRP & IGBP modelling communities developed framework for future emission scenarios across all IPCC WGs (Aspen Report)



Top: traditional forward approach starting with socio-economic variables;

Bottom: new approach starting with concentration.

Supporting Mitigation, Adaptation and Risk Management



Improved understanding of Earth's climate system is needed to make climate products better



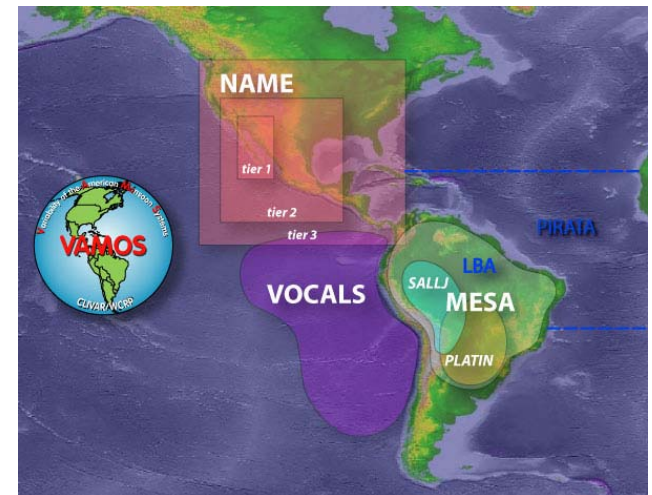
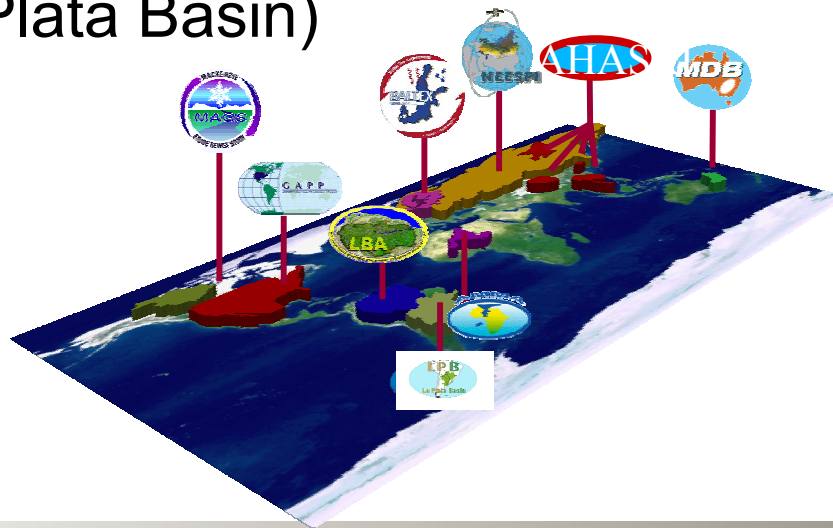
Detection and attribution studies

- Assessments of chemistry and climate (e.g. ozone depletion)



Supporting Mitigation, Adaptation and Risk Management

- Coordinate climate studies around the world
 - monsoons (Asia, S America)
 - Latin American hydroelectric planning (e.g. La Plata Basin)



Supporting Mitigation, Adaptation and Risk Management

- Improve global models – essential input for regional models
- Refine downscaling techniques (global to regional scale)
- Evaluate regional model outputs with users in the region



Supporting Mitigation, Adaptation and Risk Management



Focus on user requirements: Regional workshop model

- Bring development community and climate scientists together to determine requirements
- Gather and analyze regional climate data and model outputs
- Build regional capacity in producing and analyzing climate products
- Produce and evaluate products with the stakeholders

Capacity Building

- Open data access for researchers around the world (e.g. PCMDI archive)
- Easy access for less sophisticated users: allowing regional assessments by African users: Africa Climate Atlas
- Workshops on use of model outputs
 - WCRP-ICTP training seminar
 - WCRP-START-WCP seasonal forecasting workshop

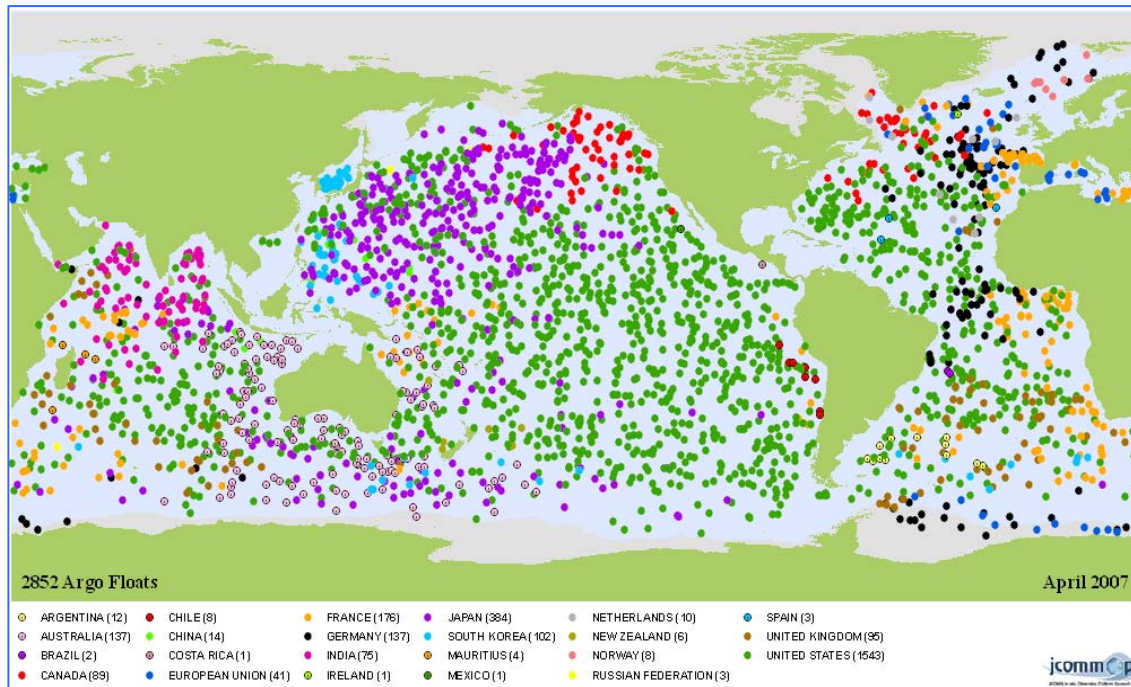


What do we need to do?

Key Steps



Sustained Observation of the climate system



Observations are critical & urgent – atmosphere, land, oceans, cryo-, bio-sphere

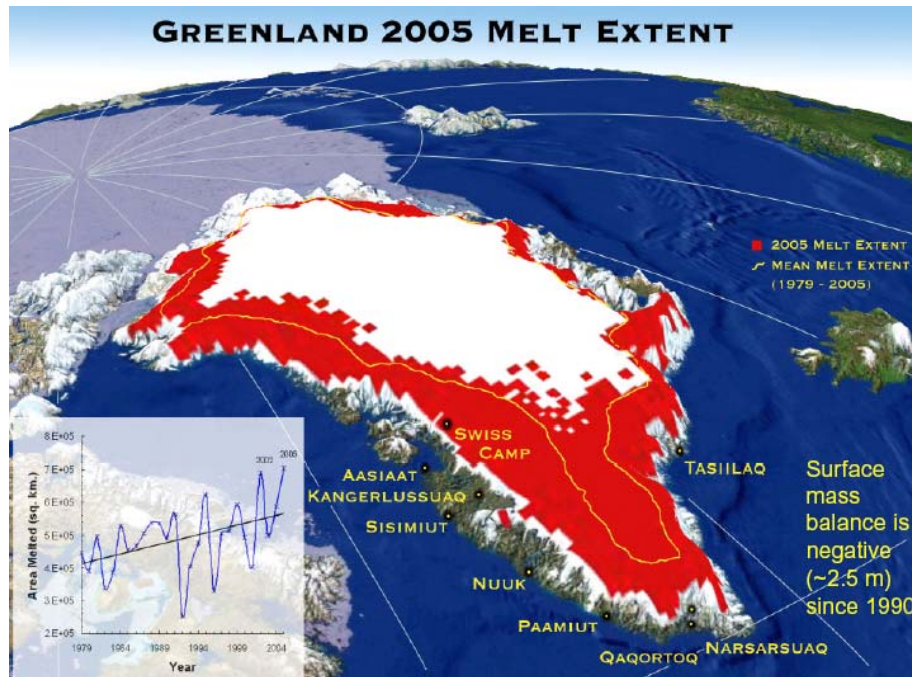
We cannot take today's observation tomorrow!

What do we need to do?

Key Steps



Address scientific uncertainties

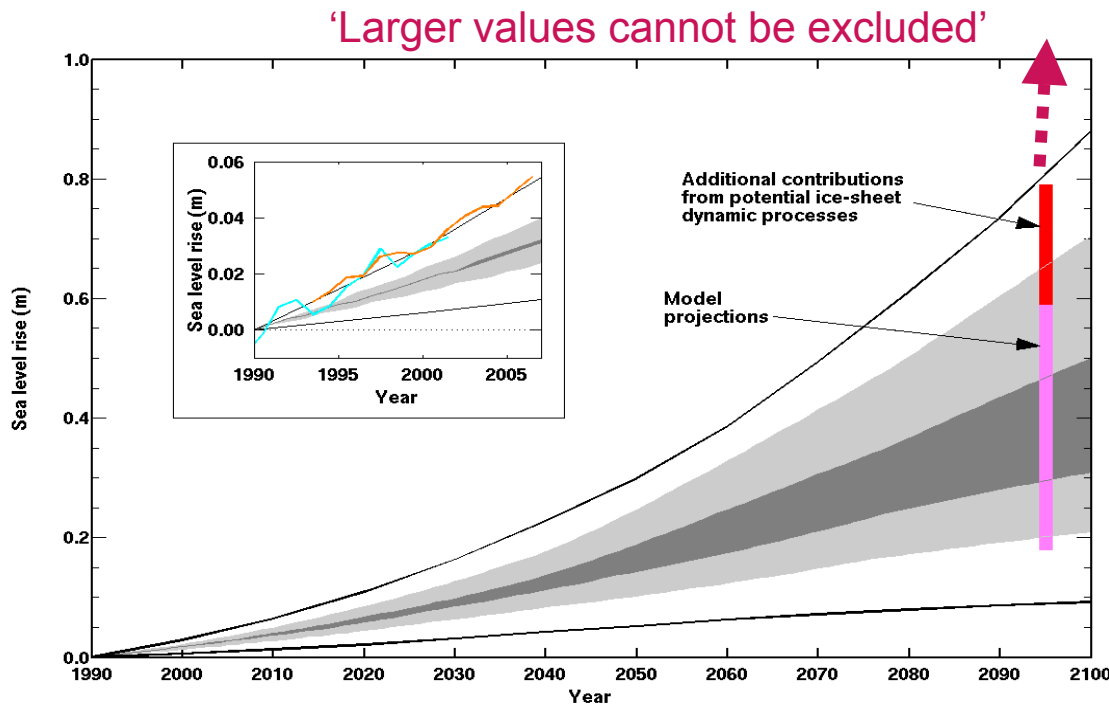


Uncertainties in ice-sheet stability and its impact on sea level a major concern for tens to hundreds of millions of people!

What do we need to do?

Key Steps

Address scientific uncertainties (cont.)



Current sea-level rise near the upper end of the IPCC projections and accelerating - why?

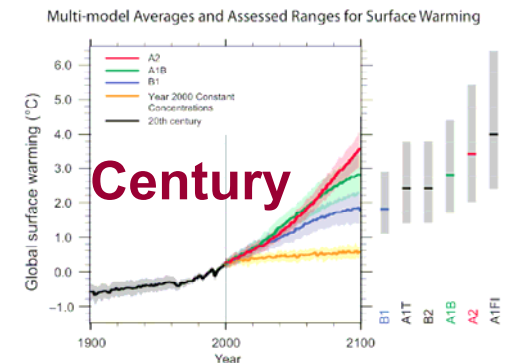
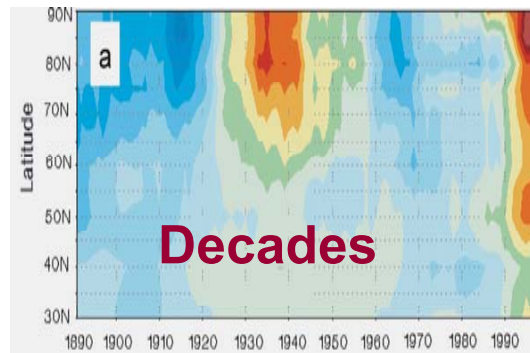
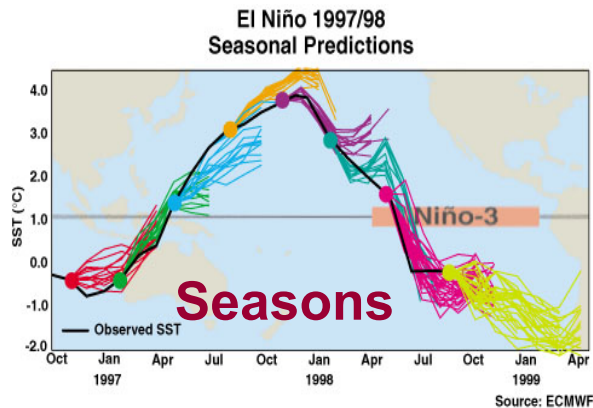
IPCC 2001; IPCC 2007; Rahmstorf et al. 2007

What do we need to do?

Key Steps

Develop and test next generation climate models (projection, attribution and prediction), confront with observations and build confidence

- At various time scales: focus on seasonal to decadal prediction and attribution ('seamless prediction')

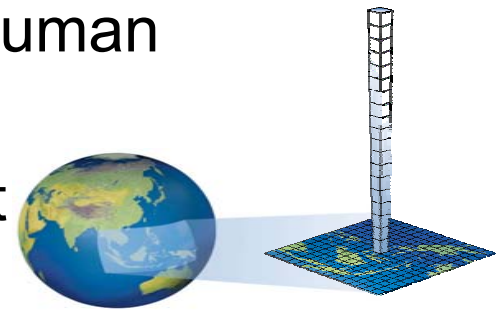
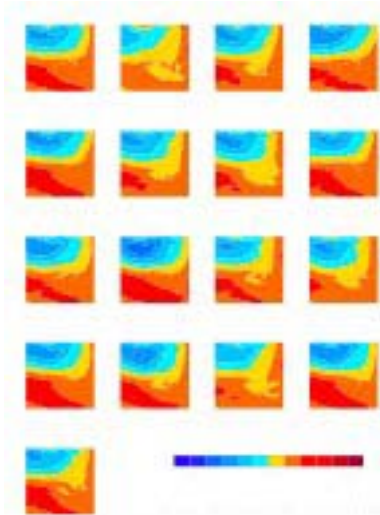


What do we need to do?

Key Steps

Develop and test next generation climate models

- At various space scales: global to regional prediction
- Improve Climate System Models (physics, biogeochemistry, biology of the atmosphere, oceans, land, cryosphere and all elements of human influences)
- Generate better ensembles to account for uncertainty



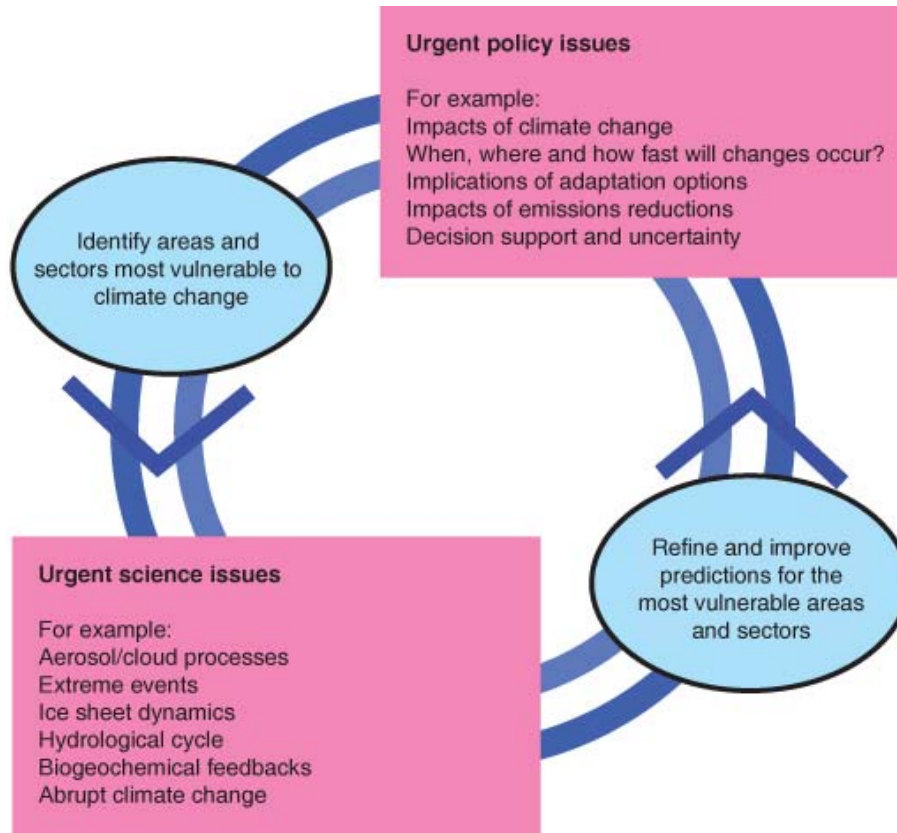
What do we need to do?

Key Steps

- Develop the capability to effectively use state-of-the-science climate system models (capacity building)
- Efficiently use the knowledge we already have
 - WCRP-IGBP-GCOS Workshop: Learning from IPCC AR4, Sydney, Australia, Oct. 2007
 - Development of risk management framework (next slide)

What do we need to do?

Key Steps



Frame Science around
Impacts, Adaptation,
Mitigation: a Risk
Management
Framework

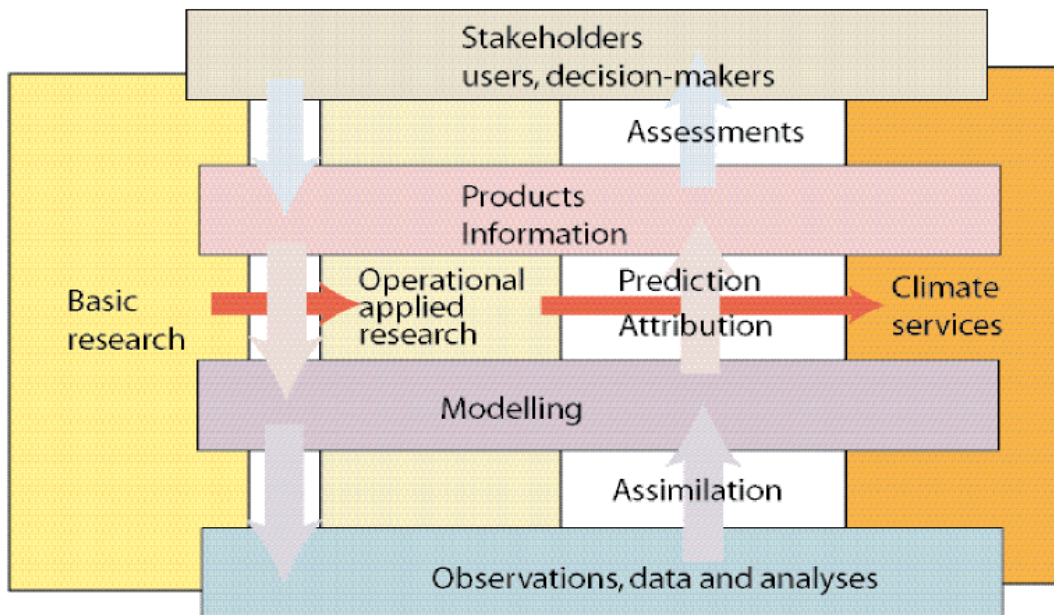
*Report: WCRP-IGBP-GCOS
Workshop Learning from
IPCC AR4. Sydney, Australia,
Oct. 2007*

What do we need to do?

Key Steps



Strengthen our Climate Information System



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