

IPCC WGII

Impacts, Adaptation, and Vulnerability

Contribution to the Fourth Assessment Report

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**CLA, Chapter 1: Assessment of Observed Changes
and Responses in Natural and Managed Systems**

**NASA/Goddard Institute for Space Studies at
Columbia University**

**US CCSP Conference
November 14, 2005**

Martin Parry, WGII Co-Chair, and WGII Technical Support Office

Implementation Status

<i>Year</i>	<i>Date</i>	<i>Activity</i>
2003	Apr-Nov	<i>Outline Development and Approval</i>
2004	Sep	<i>1st Lead Author meeting</i>
2004	Dec - Feb	<i>Informal review of 0th draft</i>
2005	Mar	<i>2nd Lead Author meeting</i>
2005	Jul - Nov	<i>Expert review of 1st draft *</i>
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2006	Jan	<i>3rd Lead Author meeting</i>
2006	May - Jul	<i>Govt and Expert review of 2nd draft *</i>
2006	Sept	<i>4th Lead Author meeting</i>
2007	Dec - Feb	<i>Final Government review of 3rd draft</i>
2007	Apr	<i>Approval by WGII Plenary</i>

*** Review Editors ensure that expert and government review comments are properly considered and appropriately actioned**

WG II AR4 Guiding Principles Agreed by Plenary

- Focus on the assessment of NEW knowledge since 2001 TAR
- Be more concise – 2/3 TAR, 700 pp. instead of 1000 pp.
- Make better connections to WGI and WGIII.
- Expand use of literature in non-English journals, reports, etc
- Maintain continued principles from prior assessments, viz:
 - a) To be ‘policy- relevant’; not policy-prescriptive.
 - b) To aim for a balanced coverage which is integrated, accessible, and understandable; NB: Balance in WGII means equal treatment of ‘positive’ and ‘negative’ effects
 - c) To be conducted by the most able scientists, from all regions.

AR4 Policy Issues and Science Questions

KEY POLICY ISSUES

- Avoiding certain key effects

- Developing effective adaptation

- Seeking sustainable development in a future with climate change

- Meeting the challenge of climate change and variability now

SCIENCE QUESTIONS

- Where are the key vulnerabilities – regions, sectors?
- What are rates/magnitudes/types of climate change that could lead to these effects?

- Extent/limits of adaptive capacity?
- Its effectiveness and cost? (especially vs. mitigation)

- How does vulnerability and adaptive capacity vary under different paths of economic/social development?

- Extent to which early effects are detectable, now?
- Evidence for (and measurement of) effectiveness of (current) adaptation?

CLIMATE CHANGE: IMPACTS, ADAPTATION AND VULNERABILITY

Summary for Policymakers + Technical Summary

Introduction

I. ASSESSMENT OF OBSERVED CHANGES

1. Assessment of Observed Changes in Natural and Managed Systems

II. ASSESSMENT OF FUTURE IMPACTS AND ADAPTATION: SECTORS AND SYSTEMS

2. New Methods and Scenarios of the Future

3. Fresh Water Resources and their Management

4. Ecosystems and their Services

5. Food, Fibre, Forestry, and Fisheries

6. Coasts and Low-lying Areas

7. Industry, Settlement, and Society

8. Human Health

III. ASSESSMENT OF FUTURE IMPACTS AND ADAPTATION: REGIONS

9: Africa, 10: Asia, 11: Australia and New Zealand, 12: Europe, 13: Latin America

14: North America, 15: Polar Regions (Arctic and Antarctic), 16: Small Islands

IV. ASSESSMENT OF RESPONSES TO IMPACTS

17. Assessment of Adaptation Options, Capacity and Practice

18. Assessment of Inter-relationships between Adaptation and Mitigation

19. Assessing key vulnerabilities and the risk from climate change

20. Perspectives on Climate Change and Sustainability

Cross-Cutting Themes in WG2 AR4 Outline

Summary for Policymakers + Technical Summary

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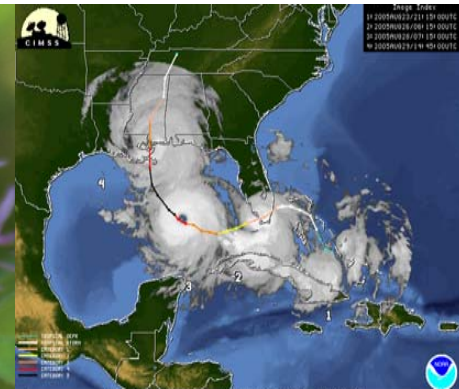
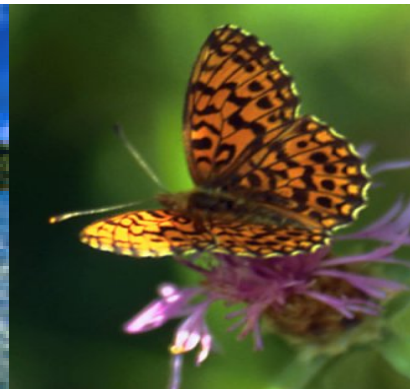
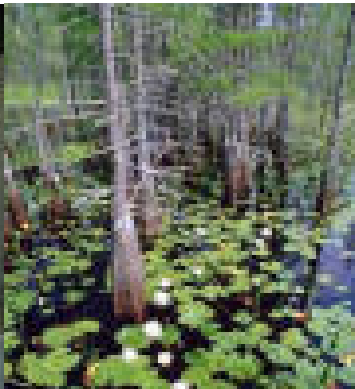
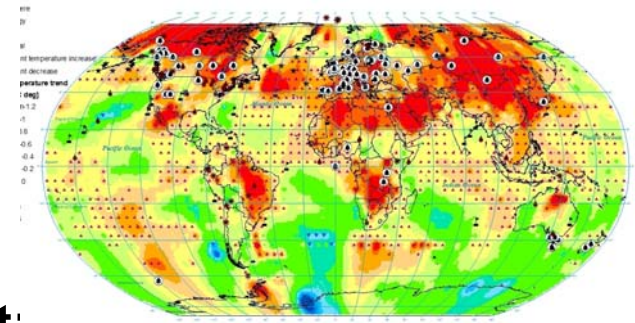
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20. Perspectives on Climate Change and Sustainability

Note: The themes of 'Technology' and 'Risk and Uncertainty' and Sustainable Development are sections in each chapter (see chapter guide boxes)

Section I. Assessment of Observed Changes

- Relationship of these to regional and global climate change and other stresses, e.g., land-use change
- What these relationships tell us about:
 - a) sensitivity vs resilience of different systems, places, sectors,
 - b) what time lags in response, etc
 - c) the nature of current adaptation and its efficacy
 - d) how this empirical knowledge can help improve our modelling of future impacts/adaptation



Section II: Assessment of Future Impacts and Adaptation in Systems and Sectors

TAR Systems/Sectors

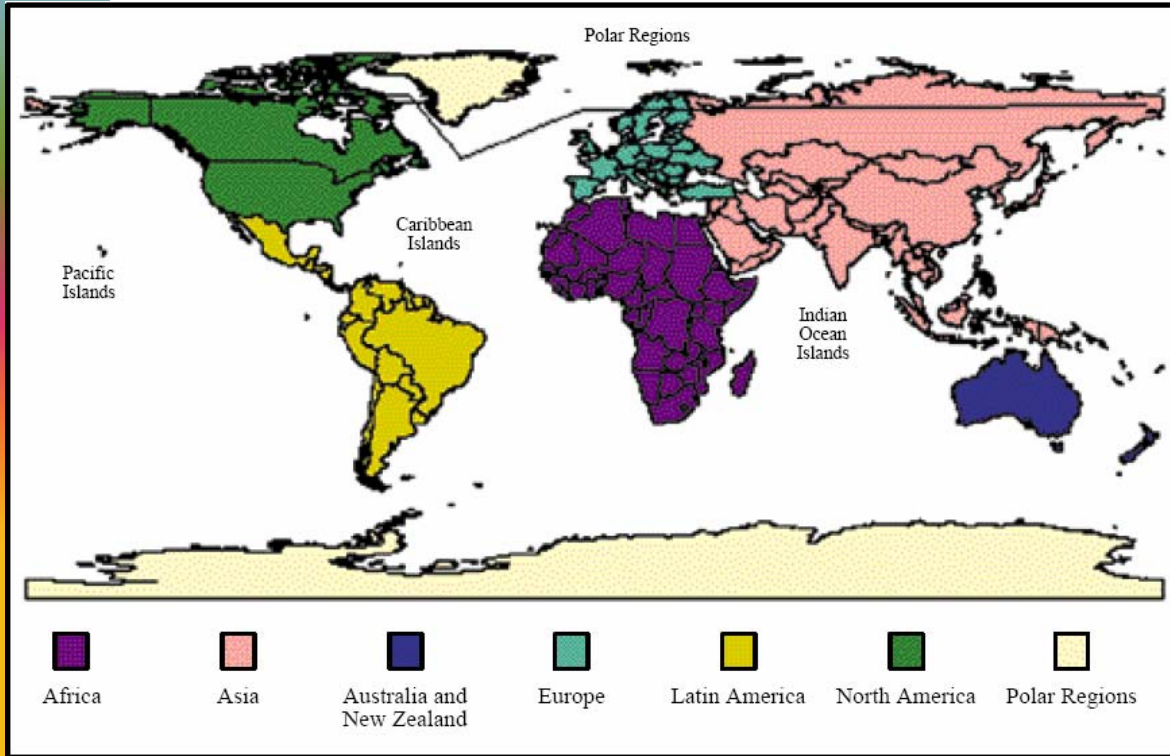
- Water
- Ecosystems (incl. food)
- Coastal and marine
- Settlement, energy, industry
- Insurance, financial
- Human health

AR4 Systems/Sectors

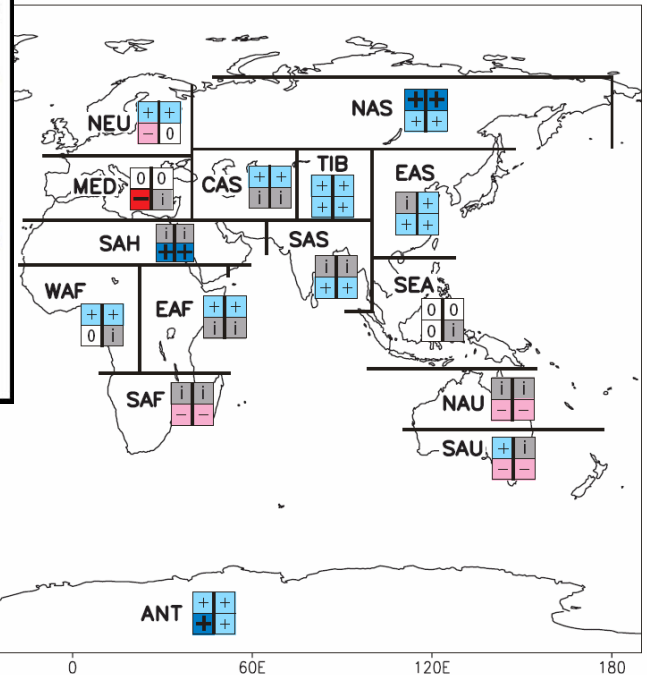
- Water
- Ecosystems
- Food, fibre, forestry, fisheries
- Coasts and low-lying areas
- Industry, settlement and society, incl insurance/finance
- Human health

Keeping regions and sectors broadly the same enables assessment of NEW knowledge compared with TAR

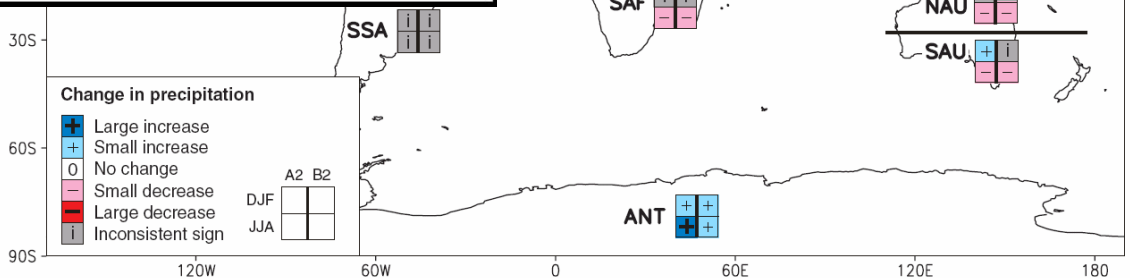
Section III: Assessment Future Impacts and Adaptation of Effects: Regions



← WGI Regions

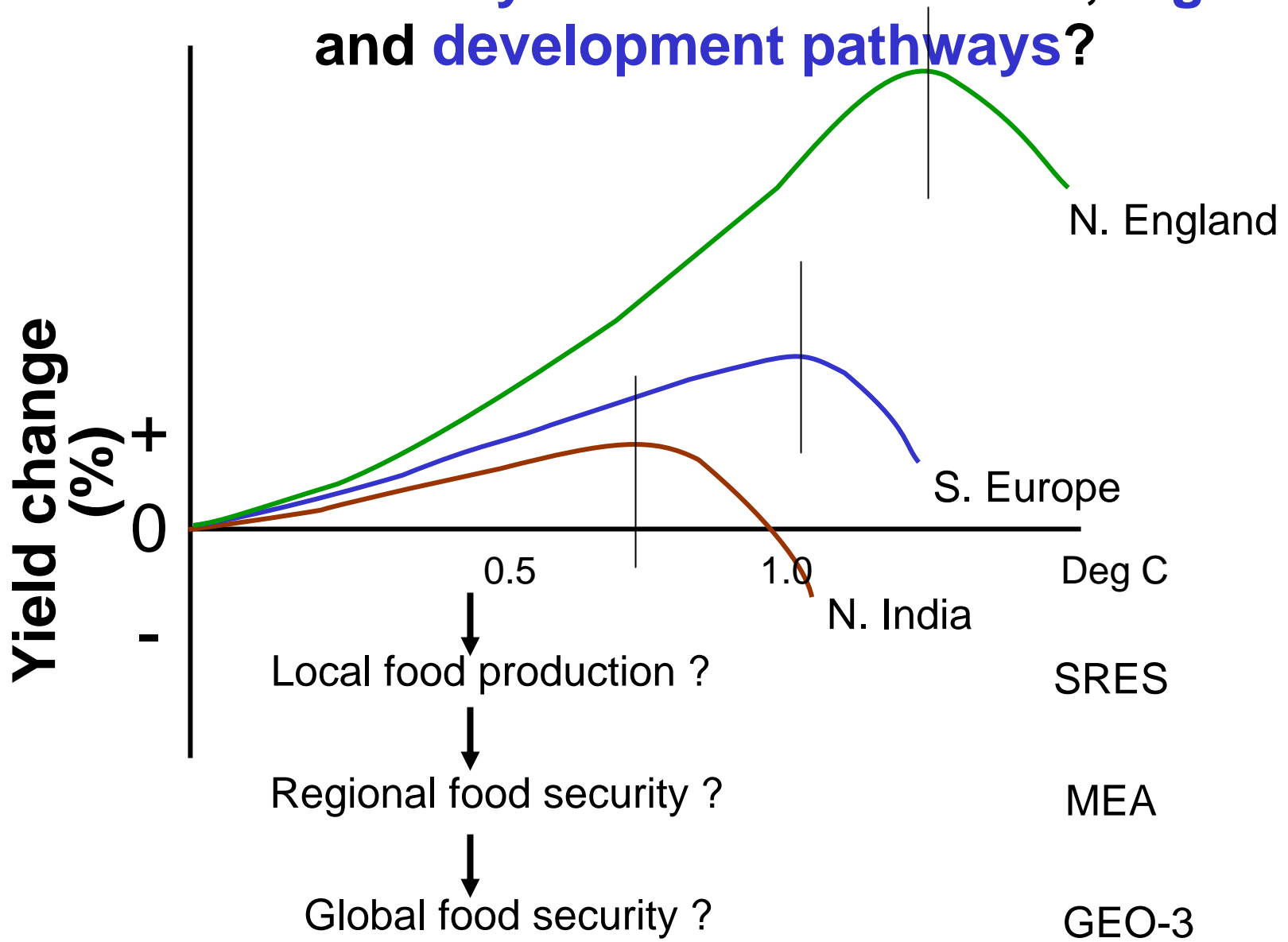


Linkage to
WGI Regions →



Analysis of inter-GCM consistency in regional precipitation change

What do we know about key **impacts, adaptation,** and **vulnerability** for different **sectors, regions,** and **development pathways?**



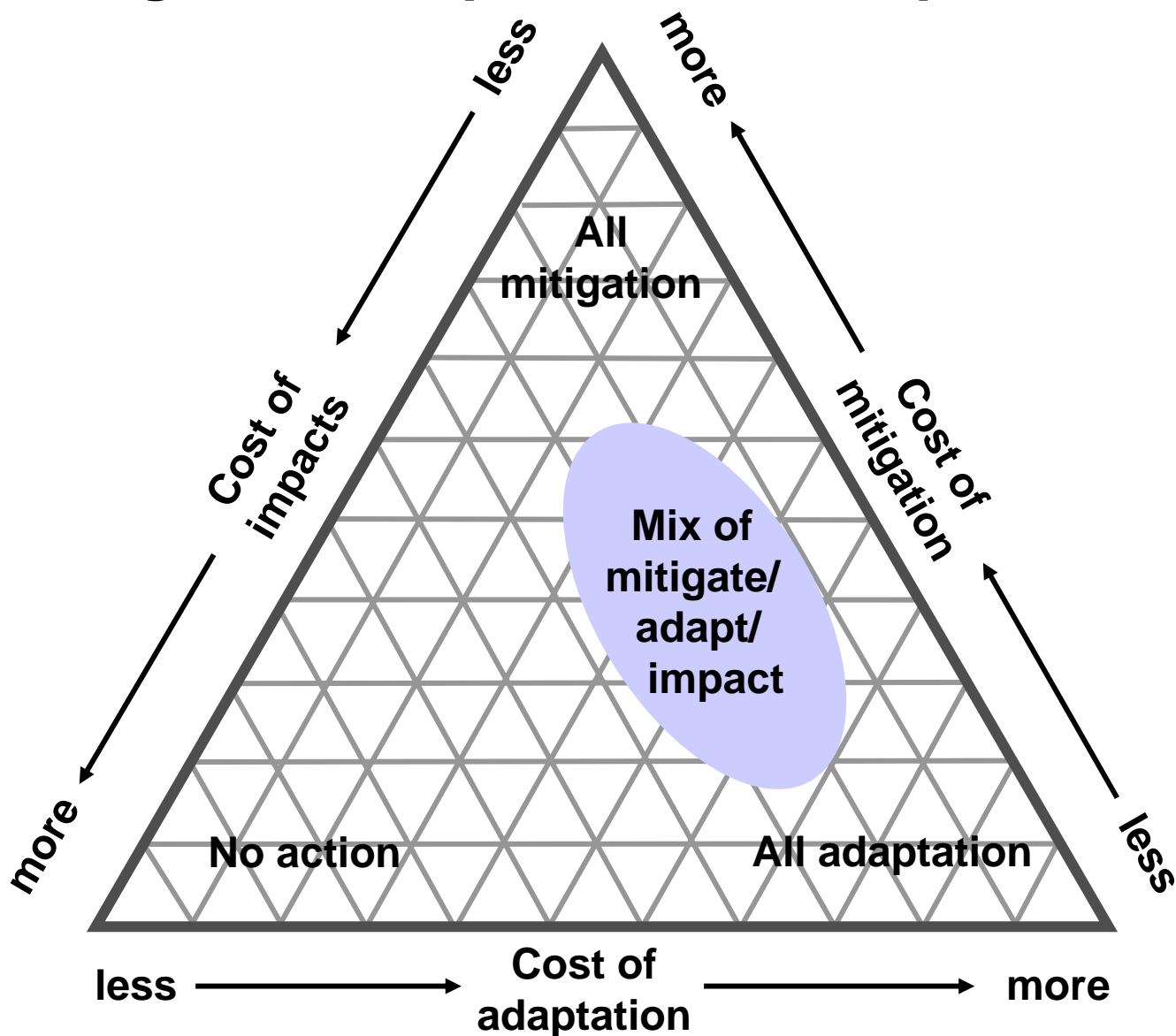
Summary Assessment for each Sectoral and Regional Chapter by Development Pathway, where the Available Information Allows

Pathway / level of development, governance and / or vulnerability	TIME HORIZON		
	NEAR c. 2020s	MEDIUM c. 2050s	LONGER c. 2080s
e.g. SRES Millennium GEO-3	Summary of expected impacts and adaptation	Summary of expected impacts and adaptation	Summary of expected impacts and adaptation
e.g. SRES Millennium GEO-3	Summary of expected impacts and adaptation	Summary of expected impacts and adaptation	Summary of expected impacts and adaptation
e.g. SRES Millennium GEO-3	Summary of expected impacts and adaptation potential	Summary of expected impacts and adaptation	Summary of expected impacts and adaptation
e.g. SRES Millennium GEO-3	Summary of expected impacts and adaptation	Summary of expected impacts and adaptation	Summary of expected impacts and adaptation

Section IV: Assessment of Responses to Impacts

- What more is now known about adaptation: especially options, costs, barriers
- How much do we know about the trade-offs and complementarities between adaptation and mitigation
- What we know about the risk of key impacts and its relationship to stabilisation/mitigation.
- What conclusions can we draw from current knowledge regarding climate change in the context of other stresses and its implications for sustainability.

What do we know about the connections between mitigation, adaptation and impacts?



(Holdridge diagram)

To participate in reviews:

<http://www.ipcc-wg2.org/index.html>

ipcc-wg2@metoffice.gov.uk



Section II: Assessment of future impacts and adaptation in Systems and Sectors

Content guide for chapters 3 to 8 in Section II:

1. Scope, key issues, summary of TAR conclusions, specific methods
2. Current sensitivity/vulnerability: to weather and climate; and to other stresses; current adaptation
3. Assumptions about future trends: climate, development, technology, etc.
4. Key magnitudes/rates of impacts and future vulnerabilities; costs and other economic aspects
5. Adaptation: practices, options and constraints
6. Implications for sustainable development
7. Key uncertainties, unknowns, research gaps and priorities

Section III: Assessment future impacts and adaptation of effects: Regions

Content guide for chapters 9 to 16 in Section III:

1. Summary of knowledge assessed in TAR
2. Current sensitivity/vulnerability: to weather and climate; and to other stresses; current adaptation
3. Assumptions about future trends: climate, development, technology, etc.
4. Summary of expected impacts: key vulnerabilities and their regional variation
5. Adaptation: regional differences in practices, options and constraints
6. Implications for sustainable development
7. Key uncertainties, unknowns, research gaps and priorities