Adapting to climate change
Insights from the research community

http://www.adaptation.arizona.edu/adaptation2012

Diana Liverman

With thanks to all presenters

THE UNIVERSITY OF ARIZONA.

PROVIA
PROGRAMME OF RESEARCH ON
CLIMATE CHANGE VULNERABILITY,
IMPACTS AND ADAPTATION

Plenary Speakers


Joseph Alcamo


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Mark Howden


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Kathy Jacobs


Richard Klein


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Maria Lemos


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Mannava Sivakumar


Mohammed Boulahya


Sebastian Catovsky


Cecilia Conde

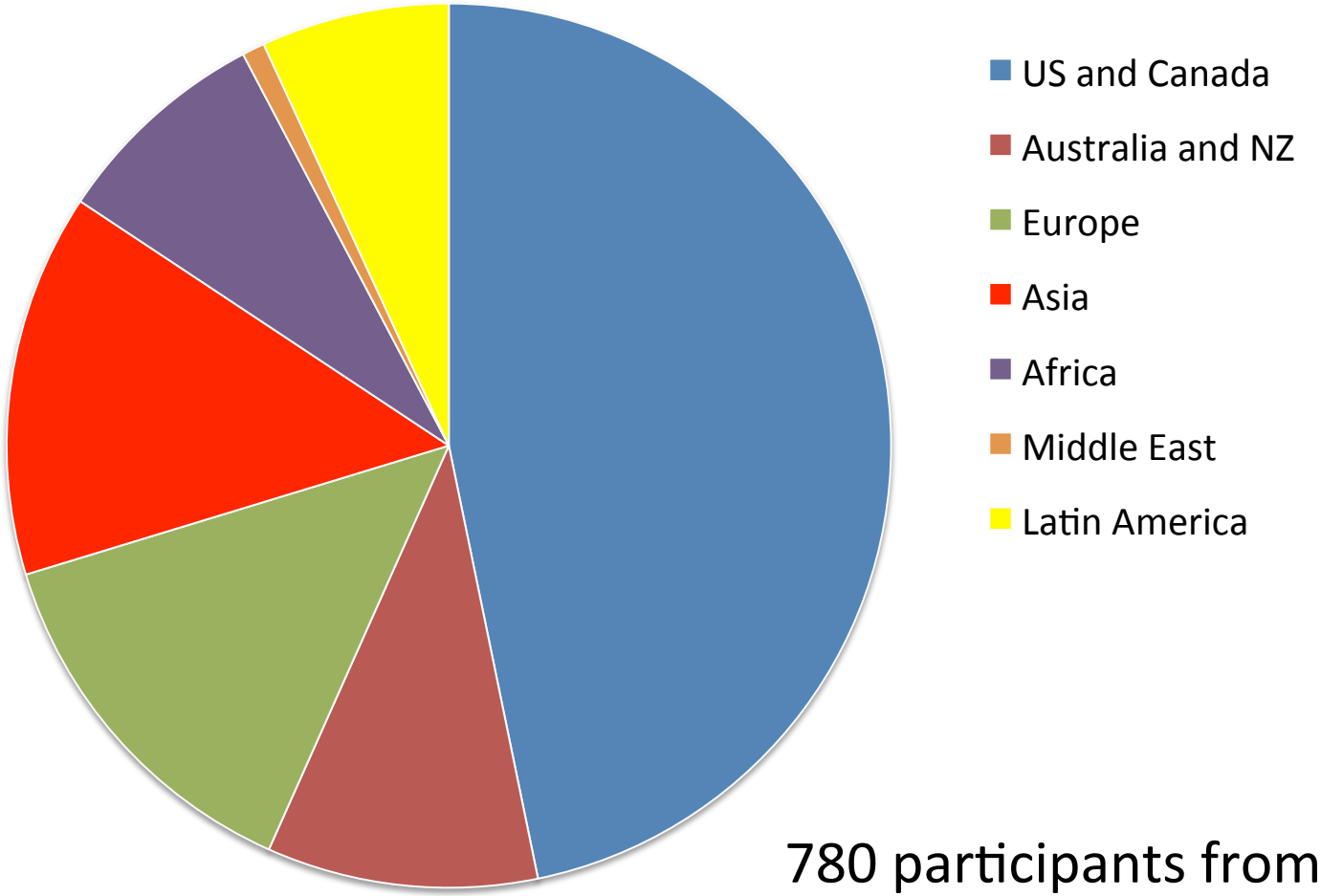

Alex Guerra Noriega


Steve Jennings


Youssef Nassef


Roger Street

Tucson Conference Participants



780 participants from 63 countries

PROVIA

PROVIA
PROGRAMME OF RESEARCH ON CLIMATE CHANGE VULNERABILITY, IMPACTS AND ADAPTATION

- To provide international coordination of research on vulnerability, impacts and adaptation (VIA) to climate change;
- To prioritize research on VIA; help access funds;
- To communicate new knowledge about adaptation to governments, UNFCCC and agencies.
- Guidance on research methods

http://www.provia-climatechange.org/

UNEP, WMO, UNESCO

(committee includes Huq, Parry, Klein, Palutikof, Patwardan, Rosenzweig, Field, Noble, Zambrano, Gordon, Osman-Elasha, Erda, Alcamo..)

Plenaries

- Policy and Science (Alcamo/Patwardan)
- NGO/Private sector
- Research challenges (New/Klein)
- Adaptation and Development
- Transformative Adaptation
- Enabling adaptation (climate services etc)

- *Sessions on indigenous, women, engineering, art, communication, military, evaluation, ecosystem and community based adaptation*

ADAPTATION TO CLIMATE CHANGE

Time to Adapt to a Warming World, But Where's the Science?

With dangerous global warming seemingly inevitable, users of climate information—from water utilities to international aid workers—are turning to climate scientists for guidance. But usable knowledge is in short supply

DENVER, COLORADO—The people who brought us the bad news about climate change are making an effort to help us figure out what to do about it. As climate scientists have shown, continuing to spew greenhouse gases into the atmosphere will surely bring

Switzerland. What's needed is not simply data but processed information that an engineer sizing a storm-water pipe to serve for the next 50 years or a farmer in Uganda considering irrigating his fields can use to make better decisions in a warming world.

ing." More concisely, climatologist Bruce Hewitson of the University of Cape Town in South Africa said that a result is actionable science if you would spend your own money on it.

Behar said he finds the uncertainties surrounding actionable climate information "fairly overwhelming" these days. And he's having trouble coming up with intermediaries between users and scientists who can at least put the uncertainties into perspective without killing any motivation to act, he said. "It's a wild, wild West in the assessment world," Behar said. "It's every man for himself." "We're drowning in data," Hewitson added, and "we're not very good at turning it into information."

Links to sustainable development policy

- Food security > adaptation for food system not just crops
- Ecosystem Management > can it be cheaper and more effective than alternatives
- Disaster Reduction > climate early warning systems as a priority with integrated vulnerability assessment

Challenges for climate science

- Can early warning be improved through weather and seasonal forecasts?
- Can climate science provide greater and more certain regional detail and better information on extremes? Would it be useful?
- Can events and impacts be attributed to anthropogenic warming?

Contrasting perspectives on climate science

- 'Adapting to climate change … will require accurate and reliable predictions of changes in regional weather systems, especially extremes.'

  – Nature editorial, 2008 and Shukla et al., 2009

- 'Effective and robust adaptation strategies are not significantly limited by lack of accurate and precise regional climate predictions.'

  - Hulme and Dessai, 2008

There are more and more adaptation researchers, who produce more and more adaptation research.

But are we getting any wiser?

14 studies of Nile Delta
176,000 google hits on climate vulnerability

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Enhancing the rigor of adaptation research

- Define goals clearly
- Resolve conceptual confusion
- Move beyond qualitative case studies to comparative and quantitative assessment
- Ensure rigorous research methods and analysis
- Build on prior research
- Evaluate the successes and failures of adaptation
- Look at adaptation across all sectors

Based on Klein and others at Adaptation 2012

Adaptation and international development

- Where are the greatest adaptation needs?
- Who should be responsible for adaptation?
- Who will the money come from?
- Who manages the funds?
- Who is eligible for the funds?
- What sort of technologies should be funded?
- How do we know if adaptation is effective?

Challenges in costing adaptation

- Defining the baseline and counterfactual (to estimate avoided damages)
- What/whose costs to include and how to measure non market values (culture, ecosystems)
- Estimating side benefits
- Discounting

Difficulties in costing adaptation

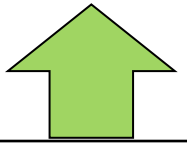
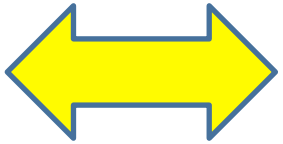
	Cost (billions per year)	Assumptions
World Bank (2006)	9-41	Cost of climate proofing ODA, FDI and GDI
Stern (2007)	4-37	As above but with higher proportion of sensitive investments at higher cost
UNDP HDR (2007)	5-67 (2015)	As above plus social protection (PRS) and disaster response
Oxfam (200)	50	Costs for implementing NAPAs and for NGOs
UNFCCC (2007)	26-67 (2030)	Public and private in major sectors (not ecosystems, energy, tourism)
World Bank EACC (2010)	75-100 (2050)	Focus on additional need for hard infrastructure
IIED (2009)	300+	Include adaptation deficit, ecosystems etc.

How to assess the effectiveness of adaptation

- **Has it reduced exposure or risk?**
  - **probably the most useful (at present)**
- **Have any actions been taken?**
  - **easy to measure but are they affecting outcome?**
- **Has the outcome been altered? (i.e. reduced impact)**
  - **How to measure? Need clear attribution and long-term monitoring**

Catowsky and Parry at Adaptation 2012

Assessing adaptation:
Indicators to monitor change in flood risk: UK

Change in Risk (exposure and sensitivity) indicators	Trend
Change in number of properties located in floodplain	
Change in area of hard (impermeable) surfacing	
Change in action indicators	**Trend**
Number of properties benefitting from flood defences	
Uptake of property-level flood resilience measures	
Uptake of measures to make space for water and manage surface water run-off	

Catowsky at Adaptation 2012

Private and public concerns:
Acclimatize clients

Firth at Adaptation 2012






Isle of Man Government

Netherlands Government

Insurance as adaptation

Insurance allows public and private risk sharing

- What are the benefits?
- Can it keep up with climate change?
- Can poorer people gain access?
- Can it promote maladaptation?
- What about ecosystems?

Challenges for adaptation policy and practice

- Overcoming individual and institutional barriers to adaptation
- Finding additional funds for adaptation
- Mainstreaming adaptation into development
- Moving beyond studies, plans and pilots to action
- Working with the private sector and NGOs
- Paying attention to ecosystems
- Assessing technology options
- Community participation including women and indigenous peoples

Messages to Rio+20

- Climate adaptation is an imperative and without it many other actions will be undermined
- Adaptation is relevant to all major groups and countries
- Funding and capacity for adaptation is inadequate to the challenge
- Adaptation must be at the core of sustainable development and can provide multiple benefits

Considering the full range of adaptation options: Food Security

- Adaptation to more than changes in yields
  - Food production, processing, distribution, consumption
  - Quantity, quality, cultural value
  - Full range of foods including inland fisheries, livestock
- Adaptation using full range of technology and knowledge
  - Indigenous, genetics, reducing loss and wasye