e-Environment Opportunities for ITU

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Agenda

- Definitions
- **ICTs for e-Environment**
- Background and Objectives
- Environmental issues grow in importance
- ICTs for environment: trends
- The Effects of ICTs
- e-Environment and Sustainable Development
- Implications for Developing Countries
- Opportunities for ITU
- Next steps

Definition: Information and Communication Technologies (ICTs)

- For purposes of the Report:
  - Umbrella term including any communication device or system encompassing, *inter alia*, radio, television, mobile phones, computer and networking hardware and software, satellite systems, as well as the various services and applications associated with them;

Definition: e-Environment

- Using ICTs for environmental protection and sustainable use of natural resources;
- Action for sustainable production and consumption and environmentally safe disposal and recycling of discarded hardware and components used in ICTs;
- Establishment of monitoring systems, using ICTs, to forecast and monitor the impact of natural and man-made disasters, particularly in developing countries, LDCs and small economies.

Source: Derived from Geneva Plan of Action (2003), World Summit on the Information Society (WSIS) Action Line C7: E-environment

Background on ICTs for e-Environment Report

- Principal investigators:
  - Richard Labelle with input from Ralph Rodschat (independent advisor), Tony Vetter (International Institute for Sustainable Development)
  - ITU ICT Applications and Cybersecurity Division
- August 2007: work started
- April 2008: draft for comments (~200 pages)
- June 2008: Final report to be released at 2nd ICTs and Climate Change Symposium (London)
- See www.itu.int/ITU-D/cyb/app/e-env.html
  - Comments to cybmail@itu.int

Rationale for Study

- ITU mandate in e-Environment relates to telecommunications and ICT applications
  - Dates from Plenipotentiary Resolution 35 (Kyoto, 1994)
- At 2006 World Telecommunication Development Conference, ITU mandated to:
  - Assist developing countries in the implementation of relevant ICT applications for environment and sustainable development
  - To develop guidelines on the technology and policy aspects of ICT applications, including e-Environment
- ITU is co-facilitator on issues related to WSIS Action Line C7: e-Environment

Objectives

- To better understand importance and impact of ICTs as tools for dealing with environmental issues, including climate change;
- To better understand inter-relationship of e-Environment with sustainable development, at global and regional levels;
- To better understand how ITU should approach e-Environment opportunities, including climate change

Interest in climate change grew during preparation of report (2007/2008)

- Publication of **Climate Change 2007**, 4th Assessment Report of Intergovernmental Panel on Climate Change (IPCC):
  - Wide media attention on definitive evidence presented underlining need to act immediately on climate change

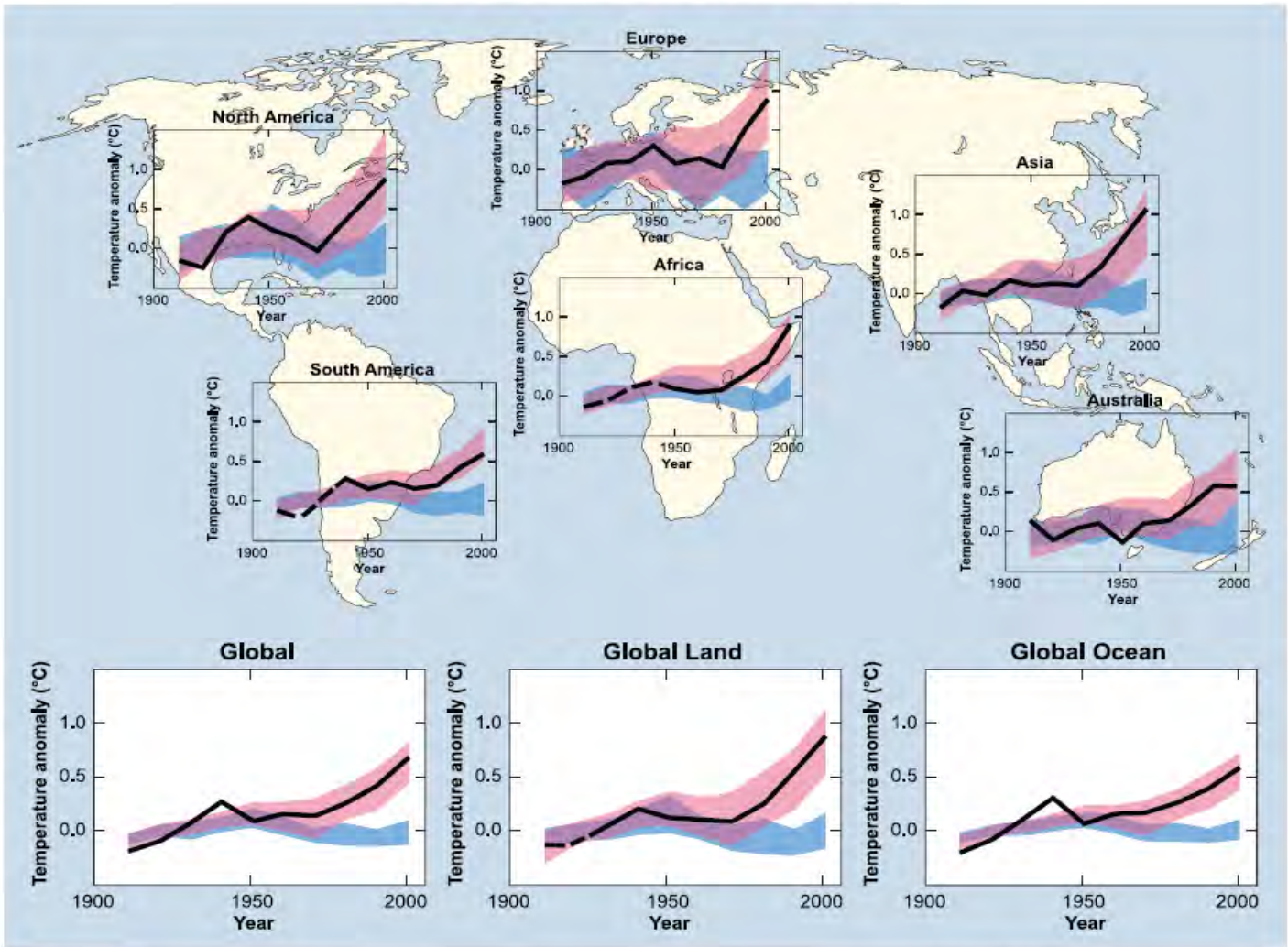
- **UN Climate Change Conference** in Bali
- IPCC and Al Gore receive **Nobel Peace Prize**:
  - "for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change"

ITU report highlights evidence of urgent nature of environmental issues

- Growing population
  - Growing industrial activity and pollution, growing GHG emissions
  - Growing human populations in more environmentally sensitive areas with lower carrying capacities
  - Growing human populations in areas that are more disaster prone
- Weather events more severe
  - Growing linkage between disasters and climate change
- IPCC reports show climate change is real and need for action is critical
  - "Warming of climate system is unequivocal from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level"

Source: Climate Change 2007", 4th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)

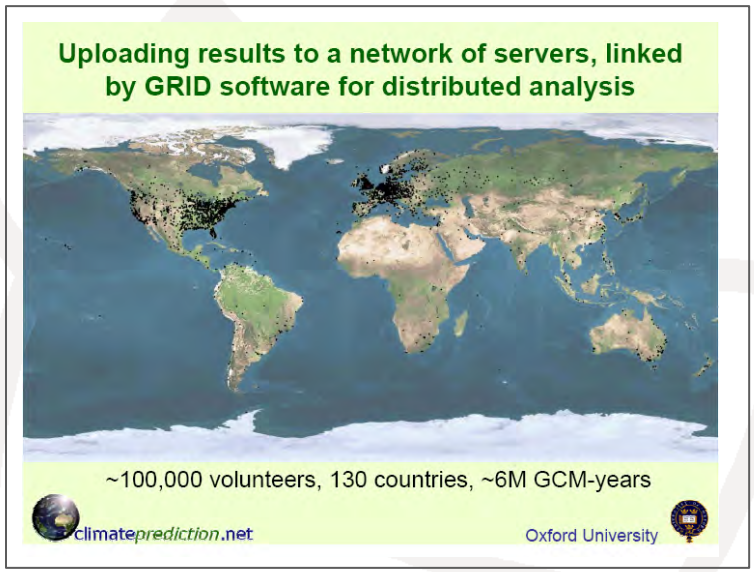
Global and Continental Temperature Change

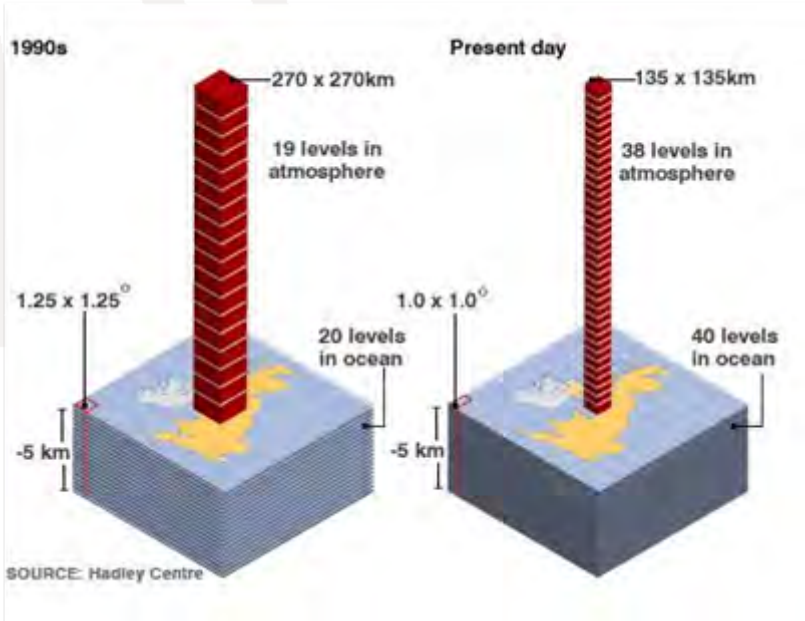


Source: "Climate Change 2007", 4th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)

Advances in Environment Analysis using ICTs

- Advanced climate change modelling has lead to more predictive climate models
- Software Grids





Source: http://www.climateprediction.net/project.php

ICTs for e-Environment: Trends

- Massive amounts of digital data produced and available online, including imagery
- Massive amounts of processing power available leads to…
  - a better understanding of the environment and environmental change…
  - which supports environmental research and decision-making
- Developing appropriate climate change mitigation and adaptation solutions depends on using ICTs

Simple View: Three Order Effects of ICTs

- 1st Order:
  - Negative impact of resources and energy to operate ICTs
- 2nd Order:
  - Efficiency gains from ICTs
    - Telecommuting, dematerialization
    - Supply chain and production efficiency
  - Structural benefits
    - Transportation efficiency
    - Warehousing and infrastructure efficiency
- 3rd Order:
  - Behavioural adaptation
    - Changes in business and consumer behaviour
    - Political priorities, impact unclear, requires more research
      - e.g., Jevons Paradox: greater efficiency often increases usage

Source: Yi, L. & Thomas, H.R. 2007. A review of research on the environmental impact of e Business and ICT. Environment International Volume 33, Issue 6, August 2007, Pages 841-849

More Complex View

Report examines ICT use in 6 areas of environmental action

Capacity Building
Public Awareness
Education
Sustainable Development

Report provides list of over 140 ICT environmental applications

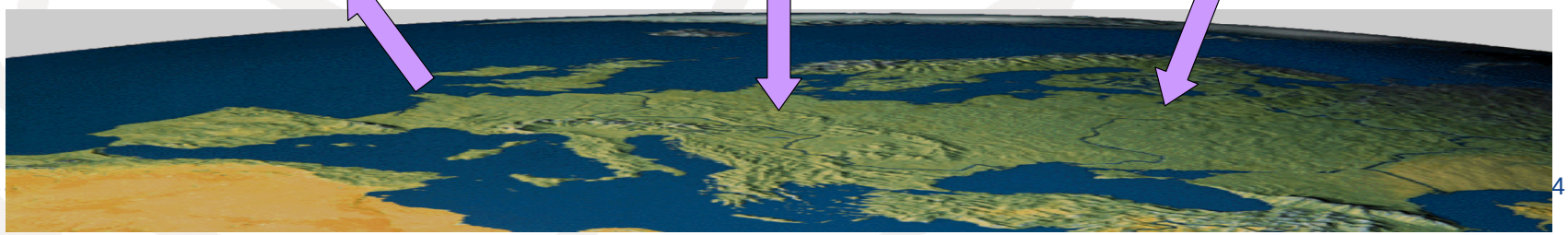
Analysis
GIS Systems
System Modelling
Grid computing

Planning
Data correlation (e.g., georeferencing)
Forecasting
Policy Formulation

Observation
Satellite Observation (air, water soil)
Human observation
Data archives

ICT Mitigation
ICT Operation
Telecommuting
Collaborative Tools

Management & Protection
Implementation
Enforcement



e-Environment and Sustainable Development

- Environmental concerns not on international policy agenda when UN created
- With evidence of environment deterioration, UN has became leading advocate for environmental issues and sustainable development
- Following UN Conference on the Human Environment (Stockholm 1972), United Nations Environment Programme (UNEP) established as main UN environmental body
- Post-Stockholm years, mounting concern led UNGA to convene World Commission on Environment and Development in 1983:
  - resulting **Brundtland Report** catalyst for 1992 UN Conference on Environment and Development (UNCED) also known as the Earth Summit.

International Agreements

- Over 900 multilateral and over 1500 bilateral agreements in the environmental area*
- UN Framework Convention on Climate Change (UNFCCC)
  - Signed by over 150 States in June 1992 at Rio "Earth Summit", recognizing climate change as "a common concern of humankind"
- Kyoto Protocol to the UNFCCC
- Convention on Biological Diversity
- Convention to Combat Desertification
- Convention on International Trade in Endangered Species (CITES)
- Convention on the Law of the Sea (LOS)
- Montreal Protocol on Substances that Deplete the Ozone

* *Source:* International Environmental Agreements Database Project: http://iea.uoregon.edu

Implications for developing countries

- All countries can respond to climate change by a process of *adaptation* to its impacts and by reducing GHG emissions (*mitigation*) thereby reducing rate and magnitude of climate change
- The capacity to adapt and mitigate is dependent on socio-economic and environmental circumstances and availability of ICTs
- Many countries have limited capacity to make beneficial use of ICTs for environmental action:
  - Limited access to Internet
  - Limited human capacity to analyze and interpret climate change data
  - Limited capacity to integrate scientific data into decision and policy making
  - Limited capacity to undertake adaptation and mitigation

Climate Change: Impact on Development

- **Africa:** By 2020, between 75 and 250 million people are projected to be exposed to increased water stress. By 2020, in some countries, yields from rain-fed agriculture could be reduced by up to 50%.
- **Asia:** Climate change is projected to impinge on the sustainable development of most developing countries of Asia… Coastal areas, especially heavily-populated megadelta regions in South, East and South-East Asia, will be at greatest risk due to increased flooding from the sea and, in some megadeltas, flooding from the rivers.
- **Latin America:** Changes in precipitation patterns and the disappearance of glaciers are projected to significantly affect water availability for human consumption, agriculture and energy generation.

Bangladesh faces climate change nightmare: "We are taking steps to face the threats of climate change. Bangladesh needs $4 billion to build embankments, cyclone shelters, roads and other infrastructure in the next 15 years to mitigate the threats" 14 April 2008, BBC

Riots, instability spread as food prices skyrocket: "Riots from Haiti to Bangladesh to Egypt over the soaring costs of basic foods have brought the issue to a boiling point and catapulted it to the forefront of the world's attention" 15 April 2008, Headline Story, CNN

Source: IPCC, 2007: Summary for Policymakers. In: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 7-22.; News Articles 14-15 April 2008

Opportunities for ITU

- Awareness promotion about importance of ICTs for environmental decision-making and action
  - Get decision-makers on board
- Strengthen capacity of developing countries to use ICTs for sustainable development
  - Work within existing mechanisms: National development planning frameworks & priorities, international multilateral aid frameworks, ITU, WMO, OECD DAC, PRSP process, etc.
  - Work closely with UNEP-WCMC, GEO and other partners
- Strengthen activities in disaster communications
- Develop and promote e-Environment strategies
  - Develop national planning framework & toolkit

National e-Environment Strategic Planning Framework

- Assessment
- Consultation and awareness promotion
- Vision statement, goals
- Strategy:
  - Policies
  - Development objectives & Immediate objectives
- Action plan
- Performance indicators (RBM → PRSP indicators)
- Monitoring and evaluation

Next Steps

- Circulate draft report, gather feedback, refine conclusions;
- Initiate preparation of an e-Environment toolkit comprised of best practices to assist developing countries to take advantage of ICTs for environmental research, planning and action;
- With partners (see Annex), undertake pilot e-Environment strategies and action plans in selected countries.

More Information

- ITU Climate Change
  - www.itu.int/climate/
- ITU-D e-Environment home page
  - www.itu.int/ITU-D/cyb/app/e-env.html

International Telecommunication Union

Committed to connecting the world

Annex: Key Partners for e-Environment Activities

- ITU Member States, WMO, UNEP (UNEP-WCMC, UNEP-GRID, Convention Secretariats), FAO, UNESCO, WHO, UNIDO, UNDP, other UN specialized agencies and programmes, UN Regional Commissions, GEF, WSIS partners, World Bank, etc.
- Regional environmental centres/groups: AOSIS, REC (Budapest), Bogor (Biotrop, etc.), IICA/CATIE (Costa Rica), IDRC, IISD
- Key private sector partners: ICT industry (e.g. GeSI), business associations (WBCSD)

Annex: Key Partners for e-Environment Activities

- Environmental / agriculture organizations:
  - IUCN, WWF, FOE, IIED & other stakeholders
  - CGIAR & NARS (National agriculture research services)
- Researchers:
  - IPCC, ICSU, GEO/GEOSS, etc.
  - Research associations, networks and centres, etc.