Global Climate Change – New Challenges to Environmental Sciences and Education

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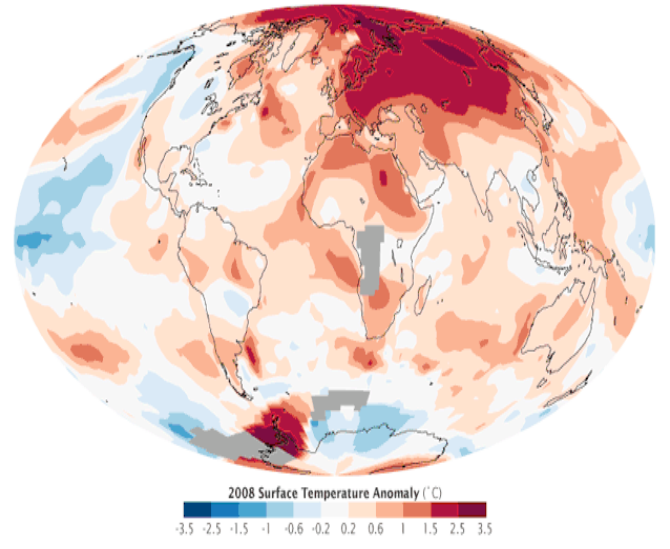
What we know about the problem?

"Global warming is a misnomer, because it implies something that is gradual, something that is uniform,
something that is quite possibly benign. What we are experiencing with climate change is none of those things."

John Holdren, ***Meeting the Climate Change Challenge,***
National Council for Science and the Environment, 2008.

Tangible Effects of Climate Change
have already been observed



Global temperatures for 2006 (in 8C) relative to the 1951–1980 average.
Source: NASA

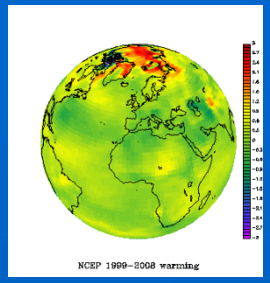
Environmental Challenges

- The greenhouse effect;
- Ultraviolet radiation;
- Acid Precipitation;
- Stratosperic ozone depletion;
- Forest ecosystem global changes;
- Natural disasters;
- Loss of Biological biodiversity

Environmental Challenges and Impact on Human Health

- Technological disasters;
- Transboundary Movements of Hazardous Waste;
- Global Chemical Contamination;
- Rapid urbanization and Deforestation;
- ……

- Environmental-related diseases
- Psychological effects of disasters on survivors



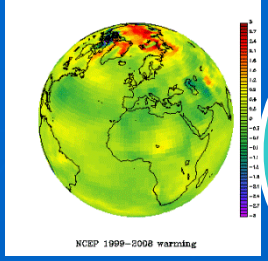
NEW APPROACH TO NEW CHALLENGES

- New emerging event;
- Unique and urgent ;
- Rapidly advancing around the globe;
- Lack professionals dealing with the problems;
- Lack modern theoretical knowledge, evidence-based practice and environmental health ethics

Integrated and Multidisciplinary Approach

Three Levels

- Policies to be adopted
- Actions to link climate change to diseases
- Reforming Public Health Systems



NEW APPROACH TO NEW CHALLENGES NEW INTERNATIONAL AGREEMENTS

- **The Kyoto Protocol** - International Agreement United Nations Framework Convention on Climate Change - (internationally binding emission reduction targets);
- **The Intergovermental Panel on Climate Change (IPCC)** – International Body - United Nations Environmental Programme (UNEP) and World Meteorological Organization (Assessment of Climate Change);
- **Lancet Commission** – "Managing the Health Effects of Climate Change"
- **WHO Response** – World Health Assembly - New Workplan on Climate Change and Health

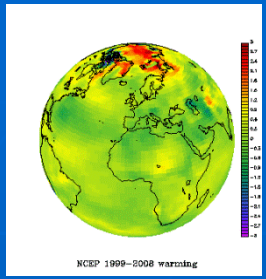
Intergovernmental Panel on Climate Change (IPCC 2007)

Lancet Commissions Climate Change

World Health Assembly Resolutions

- The biggest global health threat of the 21st century;
- Impact on Health – next decade;
- Lives and wellbeing – at increased risk

- WHO active and long-standing program



ETHICAL PRINCIPLES - TO GLOBAL CLIMATE CHANGE

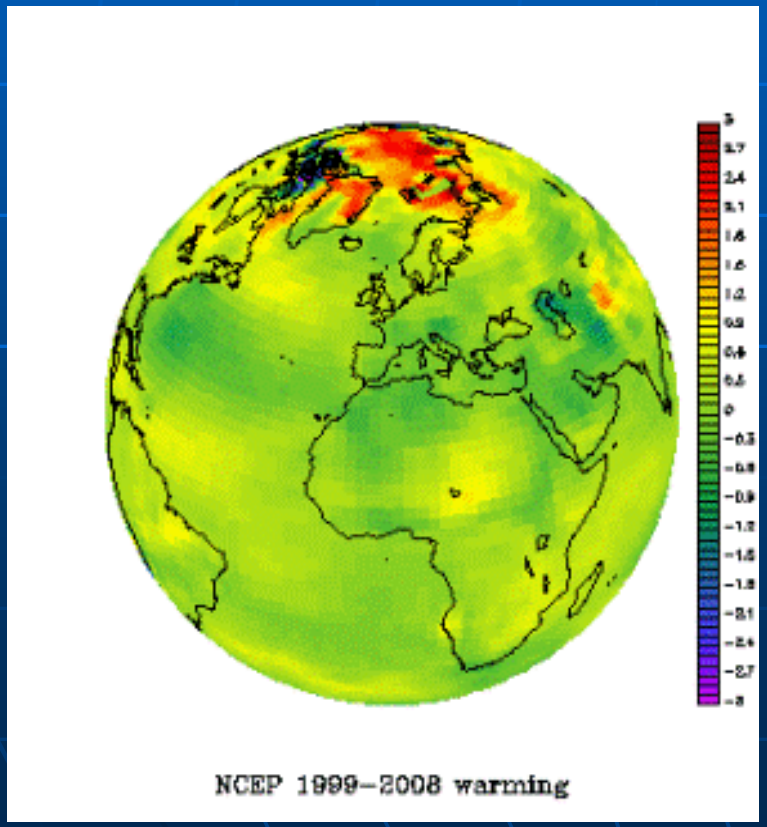
- Global climate change itself – not simply its possible impacts – constitutes an ethical challenge;
- No simple basis for an ethical response to the challenges of global climate change;
- Ethics, as properly understood, is a constitutive part of all reasonably justifiable responses to the challenges of global climate change.

Climate Change Management

Requires

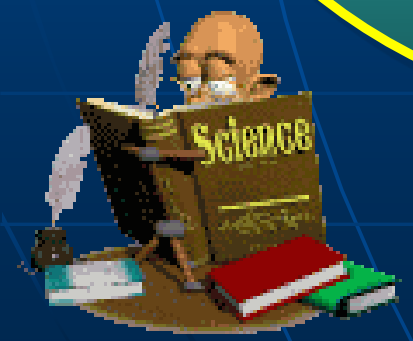
- Inputs from All Sectors of Government and Civil Society
- Collaboration between many academic disciplines
- New ways of International Collaboration

CLIMATE CHANGE EDUCATION



- Teaching Climate Change in universities – cutting topic across the boundaries of traditional divisions in academic disciplines;
- Profound implication for social, economic and political decision-making;
- Dialogue between the humanities, the social sciences, and the physical sciences – rare within universities;

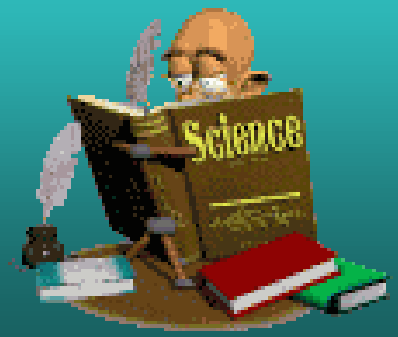
Although research on global climate change is rapidly advancing around the globe, we lack professionals to deal with the problems on the basis of modern theoretical knowledge and evidence-based practice.



History

- About 10 years ago - Climate change issue in two different programs: Hygiene (for students of the medicine faculty) and Ecology (for students of the public health faculty of Tbilisi State Medical University.
- In 2011 Global warming topics - a part of syllabuses of: Environmental Epidemiology (for master course students) and Fundamentals of epidemiology (for students of English Language faculty of medicine.

Aim of the program – Preparation of target oriented environmental health practitioners, researchers.



Prerequisites for the acceptance in this program include a student (third year) from medical university, with adequate background of in all sciences (subjects) studied in medical university at this level

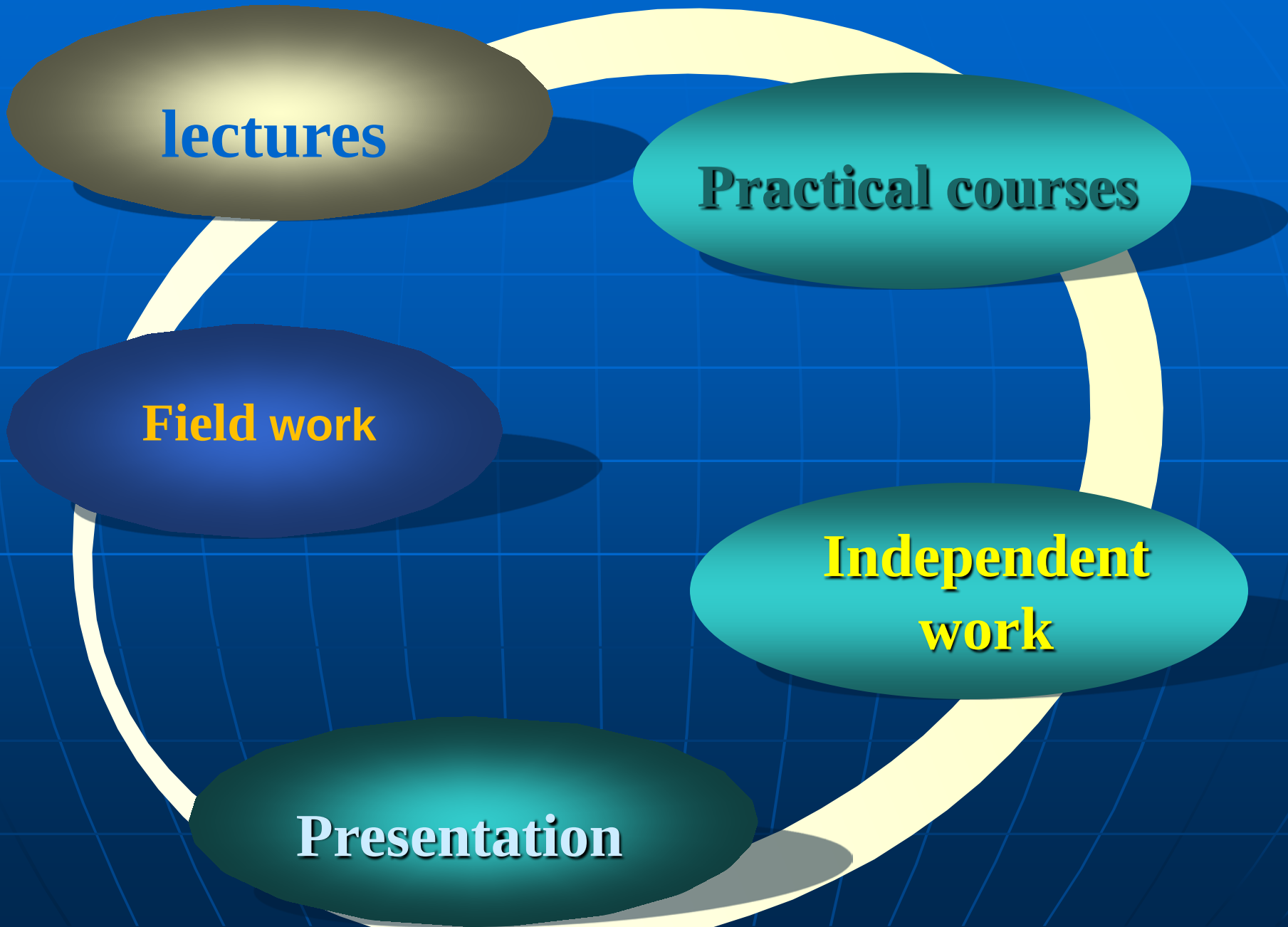
ACTIONS TO BE TAKEN

- Addressing climate change - dialogue between science and practice in diverse environments;
- Extension of the teaching disciplines list;
- Inclusion of Environmental health topics with closely related ethical issues;
- Introduction of standardized curricula and methodology;
- Teaching at BA and MA level;

New Approaches to Teaching

- Tbilisi State Medical University, in collaboration with the University of Wisconsin Madison - Curriculum Development on Global Climate Change.
- Collaboration - new approaches: to teaching of global environmental and population health problems and new insights about climate change.
- Evidence-based practice Teaching to health professionals – Prominent role of Research in the climate change curricula.

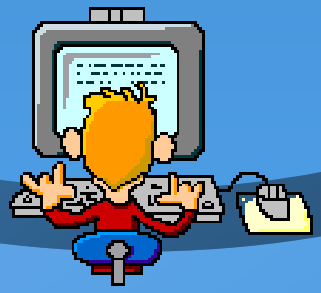
COURSE FORMAT



Practical courses and discussions use to further explore the issues.

Each student is preparing paper on topic of student's choice.

Final PowerPoint presentation takes place during last classes.



Topic:
Ozone Depletion and Ultraviolet Radiation

- Ultraviolet radiation
- Stratosperic ozone depletion
- Human health effects of ozone depletion

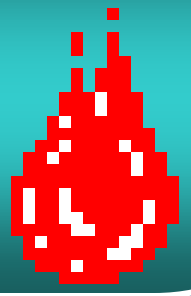
Topic:
Deforestation and Desertification

- Forest ecosystem global changes
- Forest ecosystems and change

Topic:
Biodiversity

- Loss of Biological biodiversity
- biodiversity

Topic:
Health Consequences of War



- Chemical warfare
- Biological warfare
- Nuclear warfare
- Guerilla warfare, terrorism and deliberate environmental destruction
- Modern conventional warfare

Topic:
Disasters

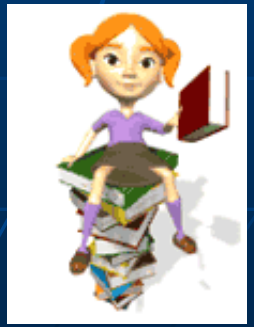
- Emergency actions
- Natural and technological disasters
- Psychological effects of disasters on survivors

Topics:

- Acid Precipitation
- Transboundary Movements of Hazardous Waste
- Global Chemical Contamination

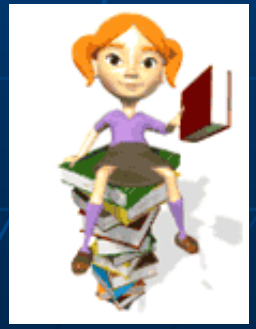
Practical Classes

- Field work
- Descriptive epidemiological study – Problem identification – Hypothesis Generation
- Working on thesis
- Presentation Preparation



Climate Change in Dedoplistskaro (Observed in 1950-2005)

- Air Temperature (risen by 0.6^0 C)
- Precipitation (rainfall rose by 6% and precipitation increased by 10 mm)
- Humidity (warm period increase – by 4%; cold period – by 2%)
- Increase – frequency of high wind ($v \geq 30$ m/s)
- Most effected drought regions



Healthcare in the Region
Problems and Problem Solving

Problems

- Increase in vector-borne diseases; Malaria – 73% in Kakheti, Leishmaniosis, Diarrhea
- Malnutrition

Problem Solving

- Adaptation Measures – Mitigation CC negative impact on Human Health
- Raising Public Awareness
- Hygienic norms under water scarcity conditions
- Public healthcare system and its qualitative perfection

On completion of the program, students should be able to:

- Describe the relationship between global ecological change and health
- Summarize the evidence and the debates regarding global health determinants and their impact
- Identify the obstacles to resolving these problems, and
- Formulate strategies that encourage people to think globally and act locally

ULTIMATE GOAL

- Creation of human resources efficiently dealing with new challenges and consciously applying ethical principles

Conclusions

1. Dialogue between science and practice in a biodiverse environment;
2. Standardized curriculum and methodology applicable in different universities;
3. Further advancing research;
4. Exchanging information;
5. Achieving ultimate goal - Human resources dealing with new challenges and consciously applying ethical principles.

AFTERWORDS

- **Ethics is not something added on top of other issues related to climate change, but rather a constitutive part of all of the reasonably justifiable responses to the challenges of climate change. Therefore, it can be stated unequivocally that climate change cannot be dealt with adequately and properly if the ethical dimensions are not highlighted, well understood, and taken into account in decisions about responses.**

- **Not to make climate change a (new) theme of ethics, but rather to make ethics a core and necessary element of any debate about climate change and its challenges.**

From the Report by the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST), 9-12 October 2011

Questions?