Environmental Research, Education and Sustainable Campus Initiative in National Taiwan University

Si-Chen Lee

President
National Taiwan University
Content

• Global Change Research Center
• Course Track
• Sustainable Campus Initiative
Global Change Research Center in National Taiwan University (since 1992)
AIM

- Integrating sub-disciplines of global change researches, with special emphasis on regional problems of Taiwan and the South East Asian region.
- Promoting international cooperation.
- Providing inter-disciplinary courses and educational workshops.
Organization

- Director
- Advisory Committee
- Research Divisions
  - Atmospheric Chemistry,
  - Climate Change,
  - Ocean Circulation and Coastal Zone Change,
  - Past Global Changes (PAGES),
  - Environmental Change and Ecology,
  - Information and Data
  - Sustainable Development and Economic-Social Impacts
Major project: Local Change Simulation Study

- Funded by National Science Council (NSC)
- Provide effective and useful data and information for studies on local impacts forced by climate change
- Regional Climate Simulation Database
  - [http://www.gcrc.ntu.edu.tw/climate](http://www.gcrc.ntu.edu.tw/climate)
Change with respect to 1990s: 2040s
(surface temperature at 2m above sea level)

Ensemble-mean of five global circulation models (~250kmx250km)

Warmer over higher latitude regions in 2040s over East Asia
Change with respect to 1990s: **2090s**
(surface temperature at 2m above sea level)

Ensemble-mean of five global circulation models (~250kmx250km)

Much Warmer over in 2090s
Statistical downscaling of Global data to Taiwan scale (1km x1km) Change with respect to 1990s

Ensemble-mean

Warmer over western and northern parts of Taiwan
Statistical downscaling of Global data to Taiwan scale (1km x1km) Change with respect to 1990s

Ensemble-mean

Lesser rainfall over western populated and industrialized regions.
The Environmental Challenge Facing Taiwan

- Serious water resources management problem
- Worsening of heat stress

threatening the public health, ecological system, agriculture production, etc.
The Environmental Challenge Facing Taiwan

- Projects being funded by NSC
  -- Impact of sea level rise
  -- the frequent occurrence of extreme weather events
Publications

• Quarterly Global Change Research Newsletter
  – 52 issues since August 1994
  – http://www.gcrc.ntu.edu.tw/English/Webpage/Publication/CenterPub.asp

• Weekly e-news on Global Change
  – More than 220 issues since 2002

• Global Change and Sustainable Development
  – An international e-journal
  – first issue: January 2007
Course Track

• **Earth System Science**
  - 20 credits minor track
  - Selected Courses in six different disciplines:
    • “Atmosphere”,
    • “Geosphere”,
    • “Oceanography”,
    • “Hydrosphere”,
    • “Biosphere”,
    • “Integrated System”
  - From 1997 to 2006, more than 120 students enrolled, 47 students have obtained certificates.
Course Track

• **Sustainable Resources**
  - 20 credits minor track
  - Selected Courses in **six** different disciplines:
    ● Water and Land Resources,
    ● Agricultural Resource
    ● Forest Resource
    ● Biomass Energy
    ● Policy and Management
    ● Integrated System

  - From 1997 to 2006, more than 35 students enrolled, 6 students have obtained certificates.
Since 2003, Annual Workshop on

Global Change and Sustainable Development Education

- *Three days short-term workshop*
- Different topics every year for trainees
  - trainees
    - Teachers in high school
    - NGOs
    - Civil service personnel
    - ...
  - Topics
    - Climate Change
    - Sustainable Cities
    - ...

Sustainable Campus Initiative in NTU

• **Motivations and goals**
  -- The responsibility to the environment: NTU has to follow the global trend of sustainable development
  -- The responsibility to provide expertise and natural resources in the campus to the public
  -- The responsibility to provide education on environmental sustainability to the leaders of the future
The Sustainable Campus Action Plan
(8 main subjects and 50 sub-projects)

• Establishment of Sustainable Campus Management System
• Energy Conservation
• Water Saving
• Hazard Reduction in Laboratories
• Pollution Reduction
• Campus Safety and Health
• Education on Sustainability
• Conservation of Campus Biodiversity and Cultural Heritage
Preliminary Achievement

• Established the SOPs for the Sustainable Campus Action Plan and carried on.

• Kept monitoring the performance of the sub-projects.

• Monitored the power and water consumption by installing meters for each building, and had reduced the water consumption significantly (10% reduction in 2006).

• Further reduced the amount of solid waste production significantly in 6 consecutive years (from 2670 tons/y in year 2001 to 2050 tons/y in year 2006)
Preliminary Achievement

- Set up Campus Information Center to convey the message of sustainable campus and continuously kept the campus open as an educational platform for the public.
- Joined the Taiwan Green School Partnership, an established NGO for green campus in Taiwan.
- Completed the 2006 NTU Sustainable Campus White Book.
Prospects

• We will actively enforce the Action Plan and keep checking the status of environmental sustainability in the campus;
• Establish environmental management systems on campus, prevent accidents, protect the health of the staff and promote the campus biodiversity;
• Practice education on sustainable development in the classes and in campus daily lives;
• Move forward sustainable development from campus on to the society;
• Become a model both in academia and in the public society.
Thanks