College of Urban and Environmental Sciences

PEKING UNIVERSITY

OUTLINE

- The College
- Selected research highlights
- Facilities
- Students activities

THE COLLEGE: OVERVIEW

History

- *Developed from the Department of Geography*
- *Set up in 1928*

People

- *Faculty:* 85; *Staff*: 14
- *Undergraduate: 360*
- *Master's student: 420*
- *Ph. D. Student: 150*

THE COLLEGE: ACADEMIC

Integrated study across science, technology and policy

- *Environmental Sciences*
- *Ecology*
- *Geography (Physical + Human)*
- *Urban and Regional Planning*

Three research focuses

- *Global Change and Ecological and Environmental Responses*
- *Environmental Pollution and Effects on Human Health*
- *Urban and Regional Sustainable Development*

ENVIRONMENTAL SCIENCES

- Environmental biogeochemistry: *source and fate of persistent organic pollutant and metals*;
- Environmental toxicology: *bioavailability, bioaccumulation, biomagnification and exposure of persistent organic pollutants and endocrine disrupters;*
- Environmental policy: *environmental tax*

ECOLOGY

- Global change ecology: *carbon cycle and nationwide carbon estimation; climate change and plant/ecosystem responses; below ground ecology*;
- Biodiversity and conservation: *vegetation science and biodiversity conservation*;
- Applied ecology: *Landscape ecology and restoration ecology*;
- Long-term ecological observation

GEOGRAPHY

- Physical geography: *land use and land cover changes; natural resources (land, water, and climate resources);*
- Economic geography: *urban and regional development; industrial agglomeration; industrial ecology; energy policy; real estate and land economics;*
- Geomorphology and Quaternary geology: *Quaternary environmental change; environmental archeology;*
- Historical geography: *historical environmental change; historical land use; historical economic geography.*

URBAN AND REGIONAL PLANNING

- Urbanization studies: *urban structure, urban social geography, and urban demographics*;
- Planning: *Regional planning, urban planning and design, land use planning; national scenic area planning and world heritage research; landscape architecture; tourism and recreational planning*;
- Architecture

SELECTED RESEARCH HIGHLIGHTS

- *Carbon cycles of terrestrial ecosystems in China*
- *Biodiversity: patterns and conservation*
- *PAH Emission inventory and outflows*
- *Ecotoxicology*
- *Industrial carbon emission and energy policy*
- *Quaternary environmental change*
- *City cluster and megacities in China*

CARBON CYCLES OF TERRESTRIAL ECOSYSTEMS IN CHINA

- **Field measurement**
- **Modeling**
- **Controlled experiment**

Vol 451|3 January 2008|doi:10.1038/nature06444 nature

LETTERS

The carbon balance c

Shilong Piao[1], Jingyun Fang[1], Philippe Ciais[2]

Global terrestrial ecosystems absorbed carbon 1–4 Pg yr^{-1} during the 1980s and 1990s, offsetting 1 of the fossil-fuel emissions[1,2]. The regional patterns terrestrial carbon sources and sinks, however, remain uncertain[1–3].

Net carbon dioxide losses of northern ecosystems in response to autumn warming

Shilong Piao[1], Philippe Ciais[1], Pierre Friedlingstein[1], Philippe Peylin[2], Markus Reichstein[3], Sebastiaan Luyssaert[4], Hank Margolis[5], Jingyun Fang[6], Alan Barr[7], Anping Chen[8], Achim Grelle[9], David Y. Hollinger[10], Tuomas Laurila[11], Anders Lindroth[12], Andrew D. Richardson[13] & Timo Vesala[14]

The carbon balance of terrestrial ecosystems is particularly sensitive to climatic changes in autumn and spring[1–4], with spring and autumn temperatures over northern latitudes having risen by about 1.1 °C and 0.8 °C, respectively, over the past two decades[5]. process-oriented terrestrial biosphere model (ORCHIDEE)[16] is combined with an atmospheric transport model (LMDZt)[17] to quantify the processes through which autumn warming controls the carbon balance of ecosystems (see Methods).

1.5 PgC yr^{-1} in 2006, making China the largest emitter in the world[4].

BIODIVERSITY: PATTERNS AND CONSERVATION

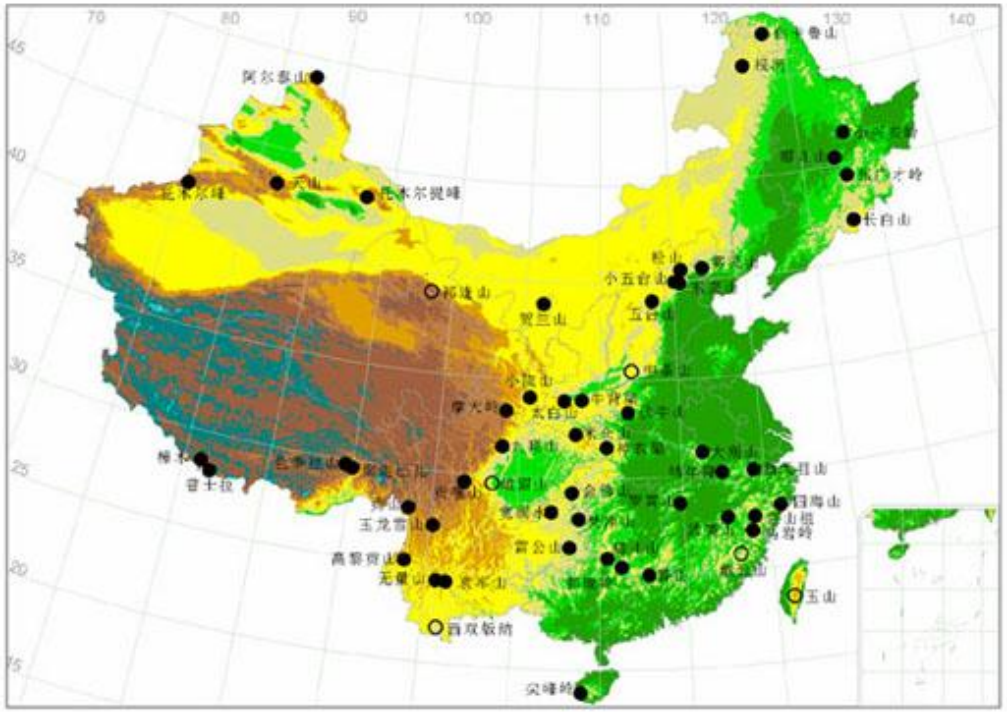
13388–13392 | PNAS | August 11, 2009 | vol. 106 | no. 32

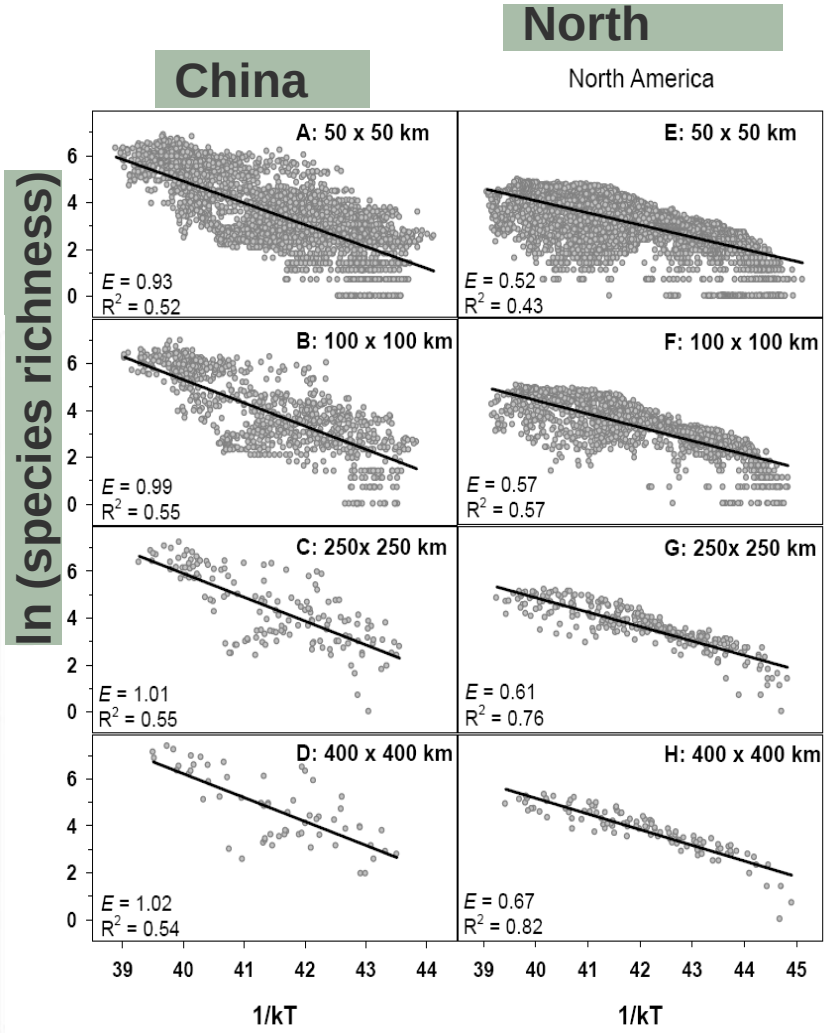
PNAS

Temperature dependence, spa
species diversity in eastern A

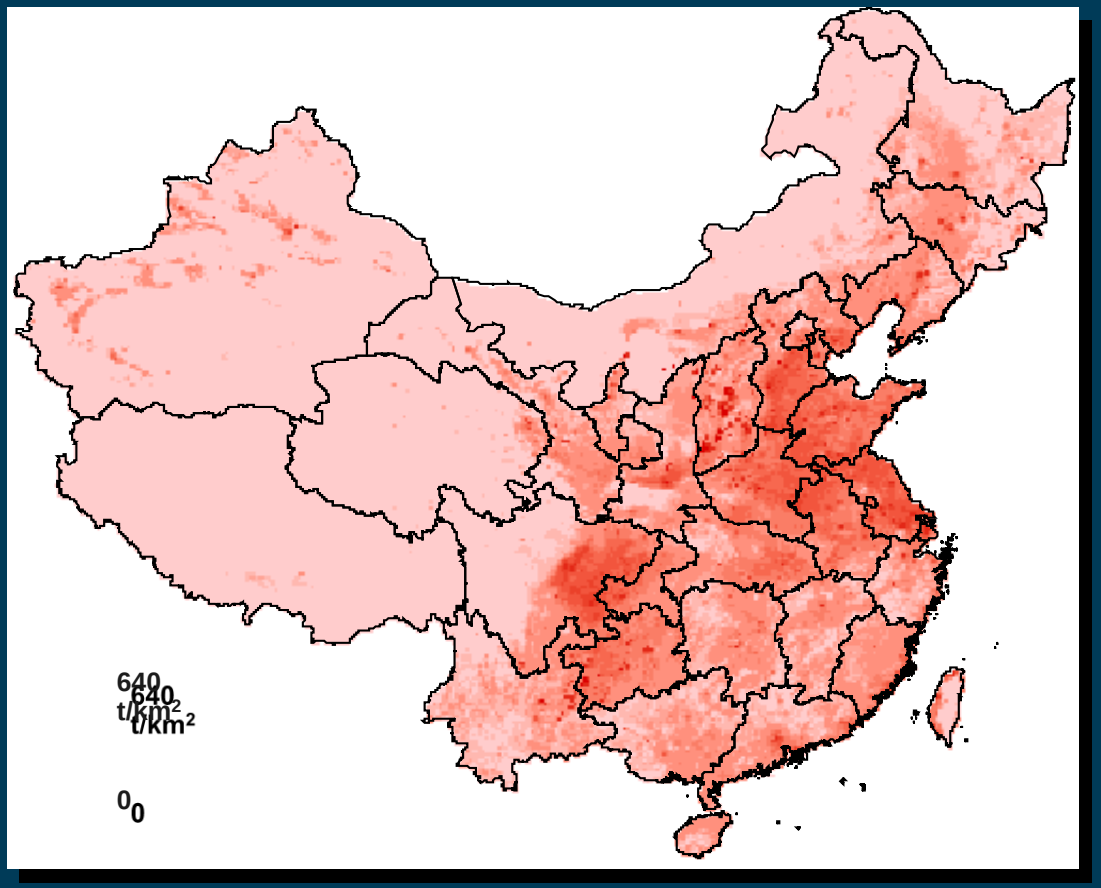
Zhiheng Wang[a], James H. Brown[b,1], Zhiyao Tang[a], and Jingyun Fa

[a]Department of Ecology, College of Urban and Environmental Sciences and Laborato

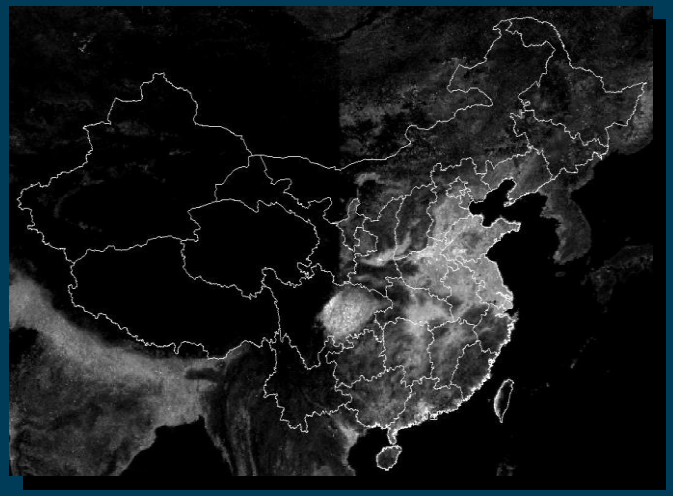




PAH EMISSION INVENTORY AND OUTFLOWS



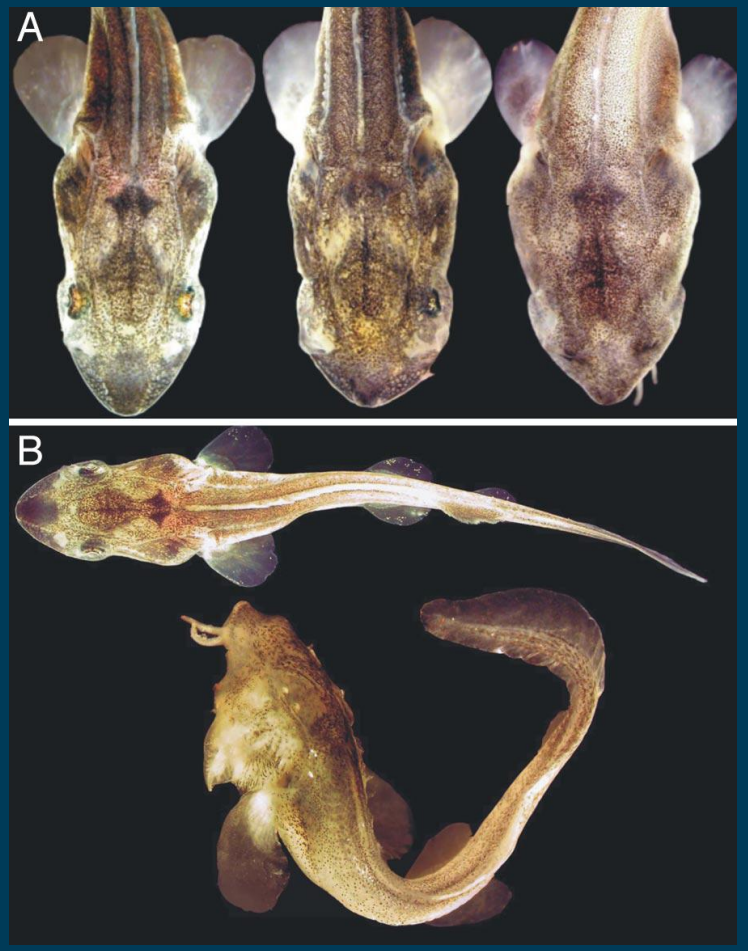
Emission density



Optical depth of aerosol (MODIS)

ECOTOXICOLOGY

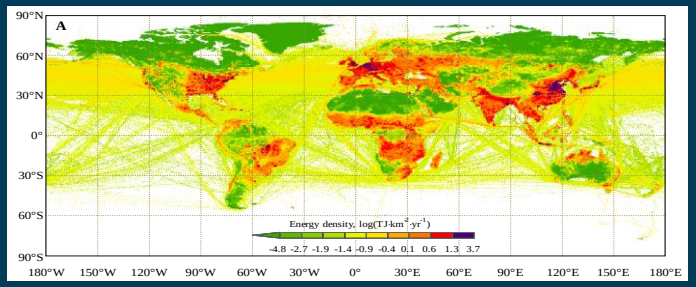
Malformations of the endangered Chinese sturgeon, and its causal agent



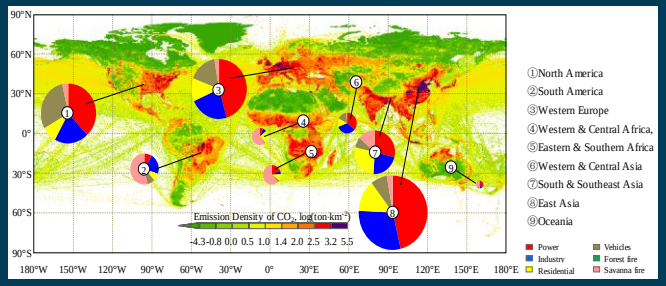
PNAS, **2009,** 106: **9339–9344**

ENERGY POLICY AND LEGISLATION

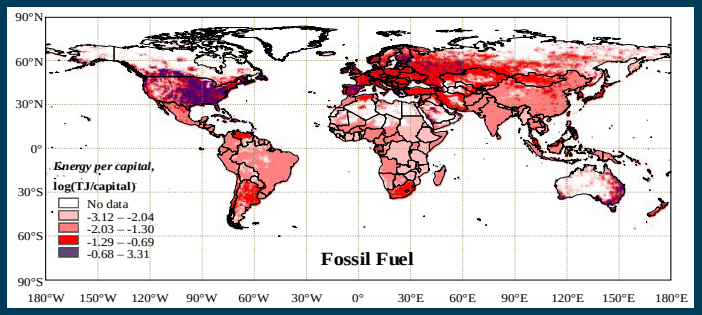
Database building



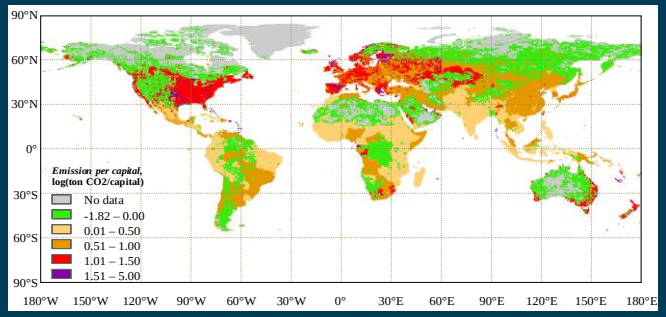
Global combustion energy consumption



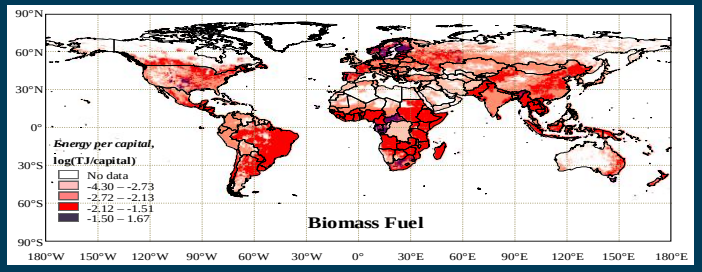
Global CO_2 emission



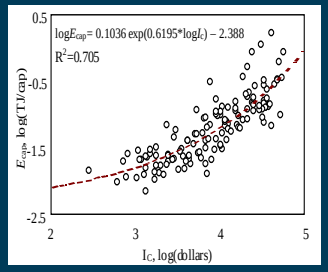
Global fossil fuel energy consumption



Global CO_2 emission per capita

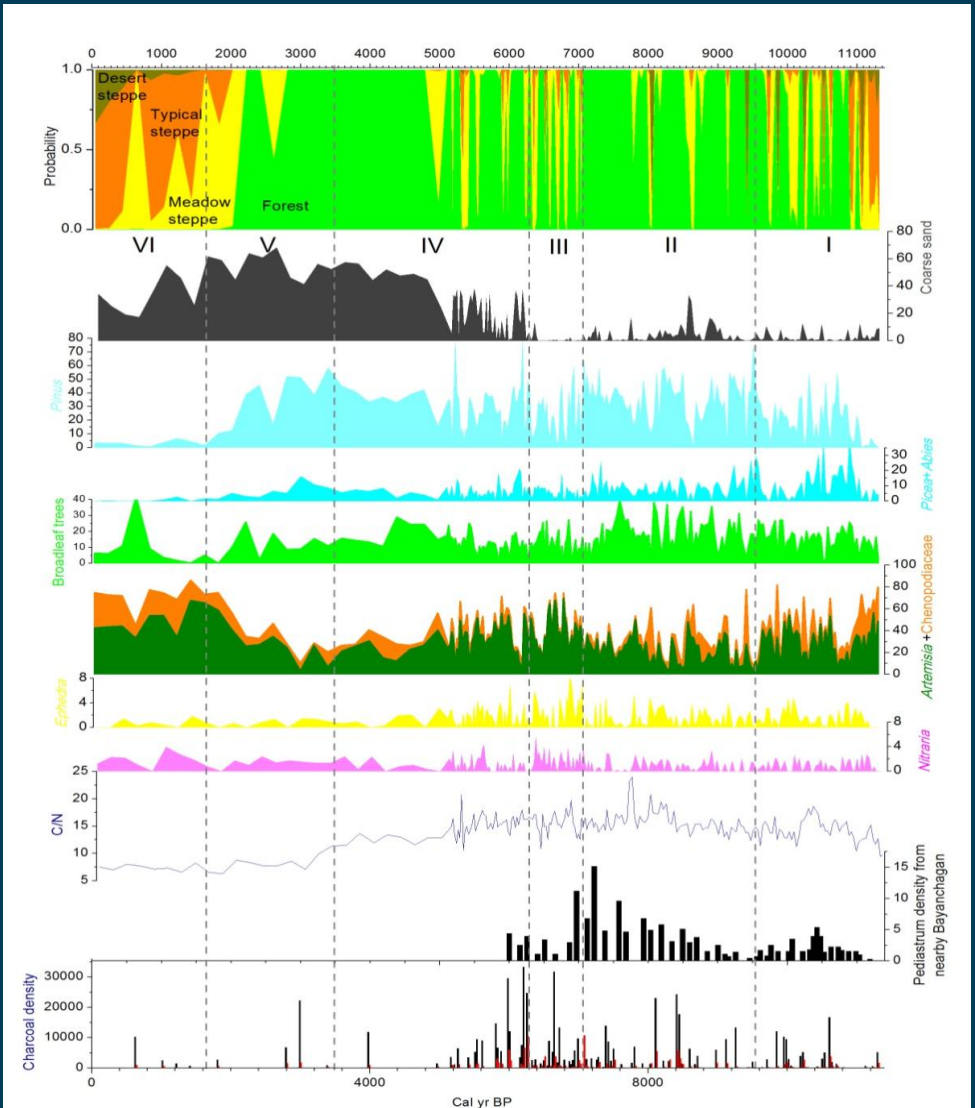


Global per capita biofuel energy consumption

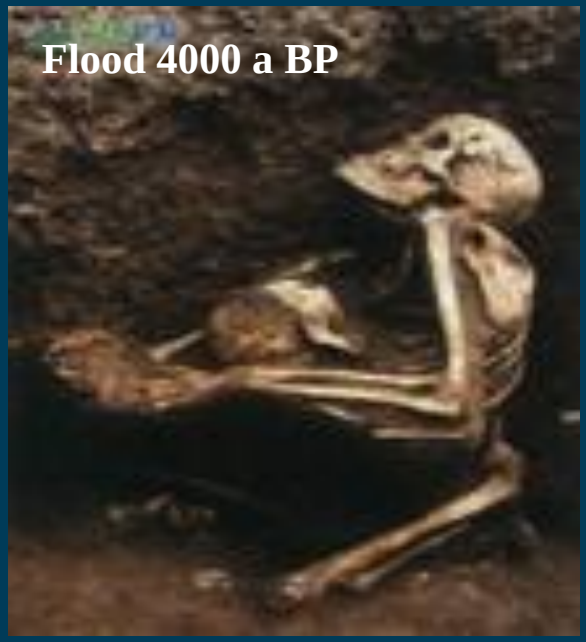


Per capita emission and per capita income

QUATERNARY ENVIRONMENTAL CHANGE IN CHINA

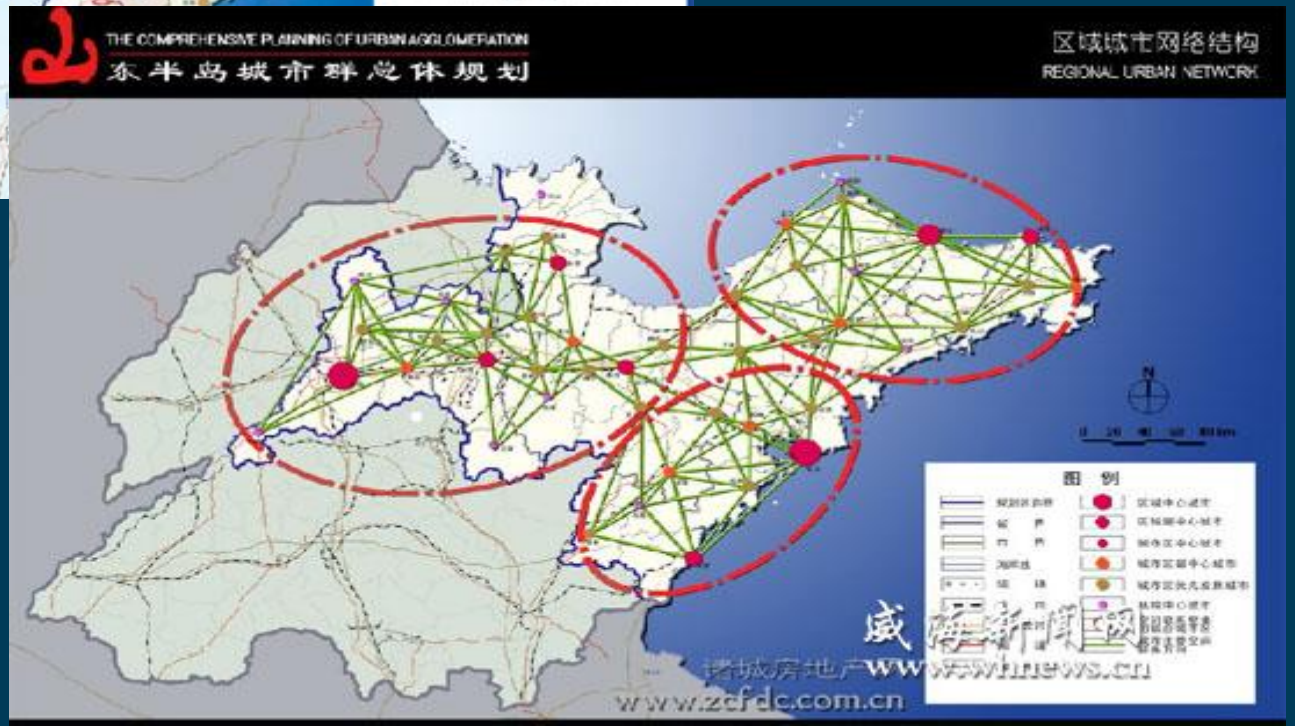


- Sediment analysis
- Tree-ring analysis
- Historical documents
- Archeological findings



CITY CLUSTER AND MEGACITY IN CHINA

- Industrial clusters
- Regional economic relations
- Energy flow



FACILITIES: PKU SAIHANBA OBSERVATORY

- Atmosphere, water and ecosystem monitoring
- Ecological restoration experiment
- Students' field practice

FACILITIES: LABORATORY

STUDENTS ACTIVITIES

- *Environmental Education Center for Chinese University Students*
- *Green campus project*
- *International student forum*

THE CENTER

Started in Jan. 2007

Special prize of Toyota Environmental Protection (1 mill)

An example: Green campus

GREEN CAMPUS PROJECT

- Investigation
- Planning

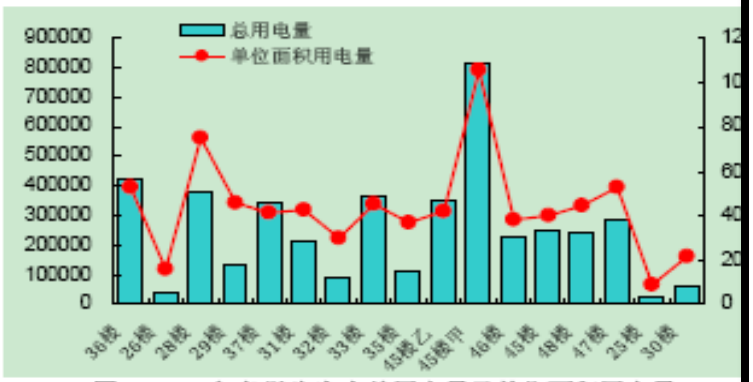


图5-6 2004年各学生宿舍总用电量及单位面积用电量

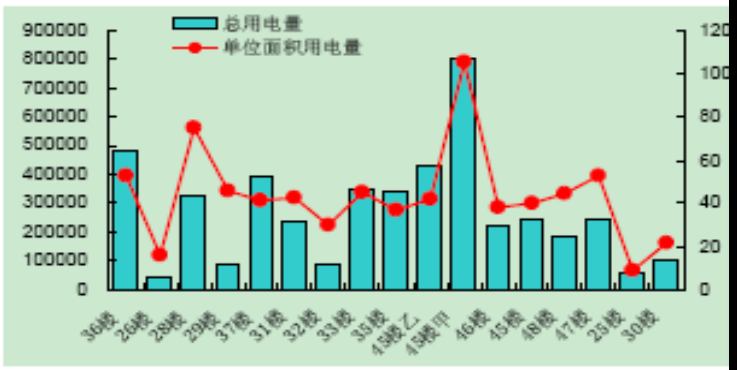


图5-7 2005年各学生宿舍总用电量及单位面积用电量

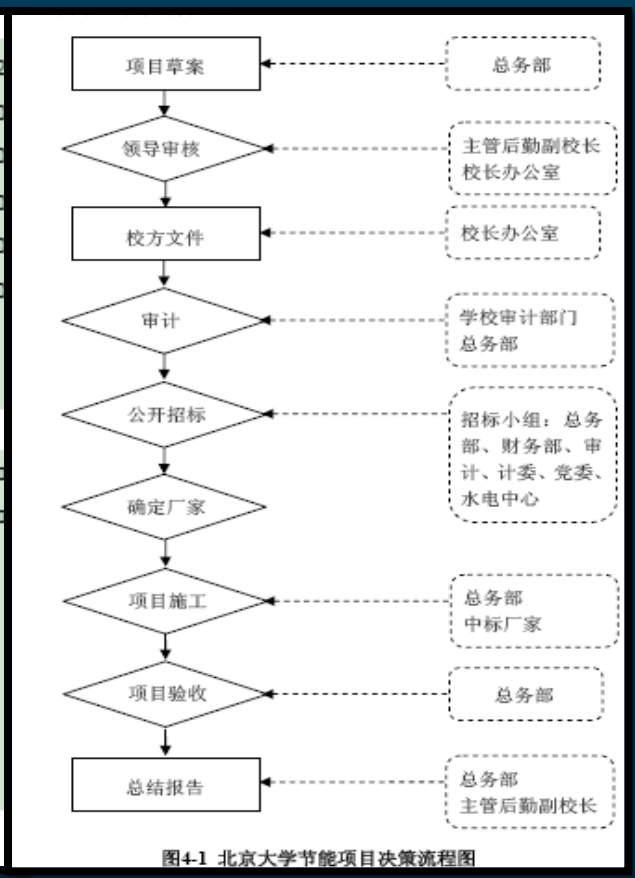


图4-1 北京大学节能项目决策流程图

INTERNATIONAL STUDENT FORUM

Environmental forum

University student organizations, NGOs

2007: Fight against Desertification: from Vision to Action

2008: Low-carbon Economy and Livable Cities

2009: Energy, City and Climate Change

2010: Low-carbon Economy summit

THANK YOU!