

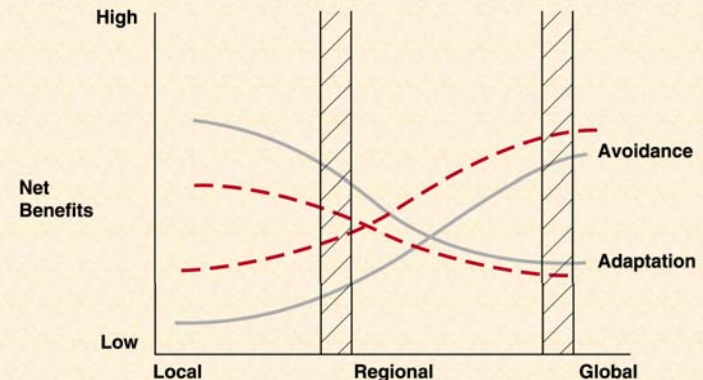
Reducing uncertainties about vulnerabilities to global environmental change

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Sponsor: USAID, DOE, ORNL LDRD, NASA

- ↪ This program seeks to reduce uncertainties about vulnerabilities to global environmental change, including climate change, at different scales -- from global to local -- and appropriate response strategies in the relatively near term
- ↪ The most significant scientific challenge in global climate change research is reducing uncertainties about consequences for ecosystems and human systems, and this program is the recognized global leader in exploring response strategies that combine both mitigation and adaptation
- ↪ Global, national, regional, and local stakeholders and decision-makers are asking that uncertainties about vulnerabilities and response strategies be reduced
- ↪ Reduced uncertainties will accelerate progress toward actions to reduce vulnerabilities at all scales, from global to local

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Early Analysis Indicates that Results of Cost-benefit Comparisons Are Scale-Dependent, Which Has Important Policy Implications



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This program of research and assessment is based on a decade of experience with research projects and national and international assessments. Examples include a \$1 million NASA-supported research project on “Global Change in Local Places,” implemented through the Association of American Geographers (1996-2000); leadership roles in the first U.S. National Assessment of Possible Consequences of Climate Variability and Change (1997-2001); co-authorship of the five-year Climate Change Action Plan of the U.S. Agency for International Development (USAID); key roles in the Third Assessment Report of Working Group II (impacts, vulnerabilities, and adaptation) of the Intergovernmental Panel on Climate Change (IPCC); an ORNL LDRD project to develop tools to integrate mitigation and adaptation as response strategies for climate change vulnerabilities; the first prototype assessment of vulnerabilities and response strategies in a developing country city, Cochin, India, with USAID support; the development of an Internet-accessible tool for self-assessments of vulnerability by developing country cities (VARA); key roles in an international Adaptation Research Workshop in New Delhi in November 2003; and emerging leadership roles in the Fourth Assessment Report of IPCC’s Working Group II (2004-2007).

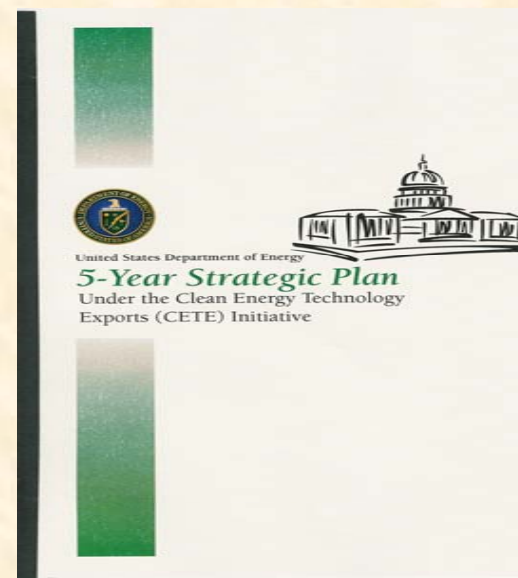
T. J. Wilbanks, P. Leiby, R. Perlack and others, “Possible Responses to Global Climate Change: Integrating Mitigation and Adaptation,” Environment, 4515(June 2003): 28-38.

Clean energy futures for developing countries

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Sponsor: USAID, DOE/EERE, DOE/PI

- ↪ This program is focused on identifying and facilitating pathways for developing countries to meet their growing needs for energy services in ways that reduce impacts on the environment, reduce pressures on global oil markets, and provide opportunities for U.S. energy technology exports
- ↪ Accelerating this process is considered one of the several most significant scientific challenges in making the world more sustainable over the next half-century
- ↪ This challenge is a high priority for U.S. national energy policy, for U.S. energy technology developers and exporters, and for developing country decision-makers
- ↪ Clarifying and facilitating realistic, cost-effective, technologically feasible clean energy pathways for developing countries is the central challenge for global energy research in the 21st century



Clean energy futures for developing countries

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This program of research and assessment is the result of an ORNL decision in 1981 that our energy technology and policy expertise should be directed toward global as well as U.S. energy needs. Since then, ORNL has led more than 70 energy and environmental projects in more than 40 developing countries, related to every major energy technology alternative and spanning subject matter from technology development to institution-building. For instance, ORNL has been particularly active over the past decade in India, a high priority developing country. In the past several years, ORNL has drafted the strategic plan for a nine-agency Clean Energy Technology Exports (CETE) initiative, supported by DOE; led a major clean energy project for the Eastern Caribbean region, supported by USAID; developed for DOE/EERE a decision support tool, including Geographic Information System (GIS) visualization components, to enable stakeholders in the U.S. and developing countries to identify localities where renewable energy and energy efficiency technologies are good prospects; and supported DOE/Policy in exploring bilateral and trilateral R&D collaborations in support of an international pursuit of a hydrogen economy.

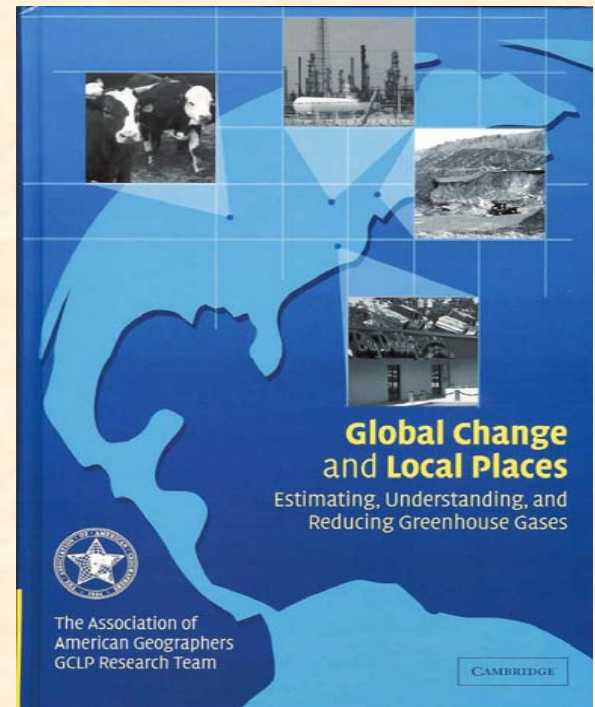
Five-Year Strategic Plan of the Clean Energy Exports Initiative, Interagency CETE Working Group, April 2002.

Understanding how scale matters in integrated environmental assessments

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Sponsor: ORNL LDRD, USAID, NASA

- ↪ This program is focused on improving the understanding of differences between and relationships among phenomena and processes that operate at geographic scales, related to integrated studies of nature-society relationships
- ↪ Relationships between macroscale and microscale processes constitute one of the great overarching issues in the sciences, and these relationships are emerging as a vastly understudied issue in nature-society assessments
- ↪ Global, national, regional and local stakeholders know intuitively that scale matters, but are hungry for insights about how and what difference it makes
- ↪ Understanding scale differences and relationships will significantly increase the likelihood that top-down policy initiatives and bottom-up local agency will work together in solving problems rather than working at cross-purposes



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ORNL has been a leader for more than a decade in exploring how scale matters in ecological assessments (e.g., Monica Turner, Robert O'Neill). In the past decade, this tradition has been extended to integrated nature-society assessments more broadly. A \$1 million NASA-supported research project co-led by ORNL, on “Global Change in Local Places,” pioneered analyses of how the scale of analyses of global climate change responses shapes the results. ORNL coordinated the regional component of the U.S. National Assessment of Possible Consequences of Climate Variability and Change. In the period 1999-2001, an ORNL LDRD project on responses to climate change directed particular attention to issues of geographic scale; and that research resulted in papers and publications that have made ORNL a recognized leader in the global research community in understanding these issues. For instance, ORNL’s conceptual contributions have served as a principal foundation for the “Subglobal Assessment” component of the international Millennium Ecosystem Assessment, 001-2005.

T. J. Wilbanks, “Geographic Scaling Issues in Integrated Assessments of Climate Change; Integrated Assessment, 3(2002): 100-114.