The Environmental Lecture Series
The Environmental Lecture Series was established at Ashland University when the Environmental Science program was implemented in 1991-92. The lecture series was designed to support the Environmental Science program by allowing students, faculty and members of North Central Ohio communities to interact with leaders in the environmental field. Over the years, the lecture series has generated significant campus and community involvement and support. Past themes have included: Business and the Environment (1992-93, sponsored by a grant from GTE), Environmental Concerns in Everyday Life (Fall 1993), Christian Perspectives on Environmental Stewardship (Spring 1994), The Science and Politics of Global Warming (1994-95), Risk and Regulation (1995-96), Biodiversity (1996-97), Sustainable Agriculture (1997-98), Environmental Issues and Ohio’s Future (1998-99), Global Resources (1999-2000), The Ecology of Changing Environments (2000-2001) and Extinction: Past, Present and Future (2001-2002). The coordinators of the 2002-2003 Environmental Lecture Series are Dr. Jeffrey Weidenhamer, Professor of Chemistry, and Dr. Soren Brauner, Professor of Biology.

The Environmental Science Program
Ashland University offers majors in Biology/Environmental Science, Chemistry/Environmental Science, Geology/Environmental Science and Toxicology. A minor in Environmental Science is offered for non-science majors such as Business and Radio/TV. These programs are enhanced by Ashland’s individual attention, small classes and modern scientific instrumentation. For more information about the Environmental Science Program at AU, contact Program Director Dr. Soren Brauner at (419) 289-5275 or e-mail <envsci@ashland.edu>.

Energy: Problems and Prospects
The 2002-2003 Environmental Lecture Series at Ashland University
Sponsored by The Fran and Warren Rupp Foundation
The 2002-2003 Environmental Lecture Series is made possible through a grant from The Fran and Warren Rupp Foundation, Mansfield, Ohio.

All lectures are free and open to the public and will be broadcast live on the Internet at http://www.ashland.edu-colleges/arts_sci/envsci/esp.html.

**“Natural Capitalism and Business”**

Catherine Greener  
Rocky Mountain Institute  
Wednesday, Sept. 18, 2002  
7:30 p.m., HCSC Auditorium

Catherine Greener is a principal and team leader of the Rocky Mountain Institute’s commercial and industrial services consulting team. Before her association with RMI, Greener was director of public policy at Carnegie Mellon as adjunct faculty and as an ed public policy at Carnegie Mellon as adjunct faculty and as an

Since 1982, Rocky Mountain Institute (RMI) has worked with corporations, governments, communities and citizens to help them solve problems, gain competitive advantage, increase profit and create wealth through the more productive use of resources.

In 1999, RMI launched the Natural Capitalism Practice to provide a wide range of consulting services to businesses and organizations of all sizes. The practice is grounded in RMI’s unique blend of whole-system thinking, integrative design, end-usable-cost analysis and interdisciplinary knowledge of advanced technologies and techniques.

Natural Capitalism provides organizations with a clear and consistent path toward both short and long-term prosperity. Catherine Greener will share her experiences assisting business leaders from around the world with how to make their businesses more sustainable.

**“A Kluge for the Climate: Using Fossil Fuels Without Emitting CO2”**

Dr. David Keith  
Carnegie Mellon University  
Tuesday, Oct. 29, 2002  
7:30 p.m., HCSC Auditorium

It is possible to use fossil fuels without atmospheric emissions of carbon dioxide (CO2). All the technologies required to capture the carbon from fossil fuels while generating carbon-free energy generally, such as electricity and hydrogen, and sequestering the resulting carbon dioxide away from the atmosphere currently exist at large scale. The idea that CO2 capture could play a central role in our energy future is nevertheless a radical break with present thinking about how energy systems might meet the climate challenge.

This lecture will describe the technology required to capture CO2 from fossil fuels, first describing the physics behind existing technologies and then posing some more difficult challenges, such as the problem of capturing CO2 directly from air. The speaker will provide some context by reviewing the CO2-climate problem, emphasizing the scale of the transformation that will be required in our energy supply systems, and finally sketching the controversial role of technology in meeting the climate challenge.

David W. Keith is assistant professor of engineering and public policy at Carnegie Mellon University. Keith joined the CMU faculty in 1999. His general research interests span climate and energy policy, atmospheric science and the quantification of uncertainty. In addition to the policy work on CO2 mitigation, Keith is also involved in more technically focused efforts related to carbon management including engineering modeling of CO2 capture, economic modeling of electric markets, and assessment of geological sequestration and analysis of legal and regulatory issues.

Keith received his bachelor of science degree in mechanical engineering from Northwestern University and a master of business administration degree from the University of Michigan.

**“Protecting America’s Last Great Wilderness – The Arctic National Wildlife Refuge”**

Randall Snodgrass  
Director of Government Relations for World Wildlife Fund  
Tuesday, February 11, 2003  
7:30 p.m., HCSC Auditorium

For more than 30 years, conservationists have fought to prevent oil drilling in America’s largest wildlife sanctuary – the Arctic National Wildlife Refuge in remote northeast Alaska. President George W. Bush and his administration have made it a priority to persuade Congress to open the area to oil and gas development. But polls consistently show a majority of Americans oppose drilling in what has been called “Our Last Great Wilderness.”

Randall Snodgrass, chief lobbyist for World Wide Fund in Washington, D.C., will present a slide-illustrated lecture on why conservationists remain steadfast in their efforts to protect this magnificent wildlife refuge.

Snodgrass is director of government relations for World Wildlife Fund in Washington, D.C. His career in conservation spans more than 25 years, during which he has focused on wildlife and public land issues, including working to pass the Alaska Lands Act, protect the Arctic National Wildlife Refuge and strengthen the Endangered Species Act.

Before joining WWF in 1996, Snodgrass served for four years as director of wildlife policy for National Audubon Society. He co-chaired the coalition of conservation groups working to protect endangered species. From 1977 to 1990, he worked on public land issues for The Wilderness Society, first as southeast regional director in Atlanta, Ga., then as director of the Alaska Program in Washington, D.C.

Snodgrass received degrees in geology and botany from Ohio State University and was a Richard King Mellon Fellow in environmental policy at the Yale University School of Forestry and Environmental Studies and School of Law.

**“Renewable Energy Systems, Energy Storage and Hydrogen”**

Dr. John Turner  
Principal Scientist  
Center for Basic Sciences  
National Renewable Energy Lab  
Tuesday, April 8, 2003  
7:30 p.m., HCSC Auditorium

Renewable energy offers the possibility of providing a complete, sustainable energy infrastructure without anthropogenic emissions of CO2. The major renewable energy systems include photovoltaics (solar cells), solar thermal (electric and thermal), wind, biomass (plants and trees), hydroelectric, ocean and geothermal. However, these energy systems must include a viable energy storage technology, and this is particularly important for intermittent resources such as PV, solar thermal and wind energy. Energy storage technologies include hydrogen, batteries, flywheels, superconductivity, ultracapacitors, pumped hydro, molten salts (for thermal storage) and compressed air. One of the most versatile energy storage systems and the best energy carrier for transportation is hydrogen. The production of hydrogen from water via renewable resources and its storage and delivery represents an essential part of a sustainable energy system. Hydrogen, when used in a fuel cell, regenerates the water and completes the cycle.

This lecture will describe key renewable energy systems and their coupling to the hydrogen infrastructure. A summary of the research on hydrogen technologies ongoing at the National Renewable Energy Laboratory will also be included.

John A. Turner, Ph.D., is an electrochemist in the Center for Basic Sciences at the National Renewable Energy Laboratory. His research is primarily concerned with enabling technologies for the implementation of hydrogen systems into the energy infrastructure. This includes direct conversion (photocellysis) systems for hydrogen production from water, new materials for fuel cell separa-
tors, and corrosion protection for fuel cell metal bipolar plates. Other work involves the study of electrode materials for high energy density lithium batteries and fundamental processes of charge transfer at air/electrode interfaces.

Turner holds a bachelor of science degree in chemistry from Idaho State University and Ph.D. in analytical chemistry from Colorado State University.