



ELEVENTH INTERNATIONAL
INTERDISCIPLINARY
CONFERENCE ON THE
ENVIRONMENT

*June 22-25, 2005
Orlando, Florida*

Dear IFA Members:

*As we meet at this, our eleventh Annual Conference, we find a world much changed from what it was when we began. What has not changed, however, is the need to find ways to communicate with each other about environmental issues. We continue to need to educate each other about the interconnectedness and value of our disciplines in this communication process. We must remind ourselves that what we say and write is both a legacy and a guide for those yet to take up this cause. Globalization has not made us less responsible to each other. Rather, it simply makes us more responsible to a greater number of people. For our Association's small part in this perpetual quest for truth and collaboration, we should be proud. In eleven years we have given a forum for over 450 Papers and Panels. Our journal *Interdisciplinary Environmental Review* has published almost 100 articles. Persons from more than 35 countries have attended our Annual Conference. Lifelong friendships and research partnerships have been created. We are not yet large but we are also no longer alone. In a world with so many similar environmental groups, we should be proud of being among the first. As I end my administrative role with the IFA, allow me to commend each of you for what you have done and for what you will continue to do for the environment. And as my final word, let me congratulate and publicly thank Demetrius Kantarelis whose idea this association was and whose vision and passion has gotten it this far. I wish Michael Reiter, and all of the IFA membership, long and continued success.*

Best always,

Kevin J. Hickey

Chair, Advisory Board

Interdisciplinary Environmental Association

CONFERENCE SCHEDULE SUMMARY

	Wed. 22	Thursday 23	Friday 24	Saturday 25		
8		Registration (to 3pm) Grand Foyer	Registration (to 10am) Grand Foyer	Gather Grand Foyer	8	
8:30					8:30	
9	KSC Field Trip	Session 1: Silver Screen A Session 2: Silver Screen B	Session 5: Silver Screen A Session 6: Silver Screen B	Session 10: Silver Screen A Session 11: Silver Screen B	9	
9:30					9:30	
10					10	
10:30					10:30	
11					11	
11:30		Lunch (on your own)	Lunch (on your own)	Working Lunch Site TBD	11:30	
12					12	
12:30					12:30	
1			Session 3: Silver Screen A Session 4: Silver Screen B	Session 7: Silver Screen A Session 8: Silver Screen B Session 9: Set 1		1
1:30					1:30	
2				2		
2:30				2:30		
3		Break: Grand Foyer	Break: Grand Foyer		3	
3:30				3:30		
4		Keynote 1: Silver Screen	Keynote 2: Silver Screen		4	
4:30				4:30		
5				5		
5:30				5:30		
6				6		
6:30				6:30		
7				7		
7:30	Social: Site TBD		Banquet: Grand Ballroom		7:30	
8					8	
8:30					8:30	

CONFERENCE SCHEDULE

Wednesday, June 22

9am – 5pm Field Trip to Kennedy Space Center

All participants should bring identification, including passports if not of US citizenship. Meet in Studio City lobby; bus departs at 9AM.

7pm – 9pm Informal Social Gathering, Location TBA

Thursday, June 23:

8am – 4pm Registration
Grand Foyer

9am – 11am Session One: Public View and Conservation
Silver Screen A

Moderator: *Dr. Giorel Curran, Griffith University, Brisbane, QLD AUSTRALIA*

Discussant: *Dr. John Dobson, University of Wales Institute, Cardiff, WALES*

Augusta Blackstone, **Melissa Elander** et al, Plymouth State University
Community-Based Conservation in East Africa: A Case Study of Ndarakwai
Ranch, Tanzania

Augusta Blackstone, **Melissa Elander** et al, Plymouth State University
Community-Based Conservation in East Africa: A Case Study of the Western
Usambara Mountains, Tanzania

Dr. Charles Simpson, Plattsburgh State University
Local Knowledge and Environmental Responsibility: The Case of the Adirondack
Region of New York

9am – 11am Session Two: Wetlands and Coastal Studies
Silver Screen B

Moderator: *Dr. Guoxiang Liu, Clemson University*

Discussant: *Dr. Michael Reiter, Delaware State University*

Dr. John Tiedemann, Monmouth University
Watershed Sleuths: The Quest to Identify Sources of Fecal Pollution

Drs. A. K. Saghatelyan and **Marine Nalbandyan**, The Center for Ecological-
Noosphere Studies, NAS REPUBLIC OF ARMENIA
Complex Assessment of the Ecological State of River Hrazdan in the Limits of
Yerevan

Dr. Lin Tao and Xue Xiongzhi, Key Laboratory for Marine Environmental Science
of the Ministry of Education, PRC HINA, **Shawn Shen**, Saint Mary's University,
Halifax CANADA et al
Analysis of Coastal Wetland Changes and their Impacts on Eco-Environment by
Using Dispersed Data: A Case Study in Xiamen, China

11am - 1pm: Lunch (on your own)

1pm – 3pm Session Three: Aquatic Issues in Policy and Ecotourism
Silver Screen A

Moderator: *Dr. Raymond Scatone, Florida International University*
Discussant: *Dr. Giorel Curran, Griffith University, Brisbane, QLD AUSTRALIA*

Dr. Yeong Nain Chi, Louisiana Department of Wildlife and Fisheries and **Dr. Yan
Ling Chen**, Louisiana State University
A Tobit Analysis of Whale Watching Expenditures Associated with Environmental
Attitudes

Dr. John Dobson, Eleri Jones and David Botterill, University of Wales Institute,
Cardiff WALES
Exploitation or Conservation: Can Wildlife Tourism Help Conserve Vulnerable
and Endangered Species?

Dr. Philippa Wells, Auckland University of Technology, Auckland NEW
ZEALAND “For Environment, Read Conservation”: New Zealand and Green
Purity

1pm – 3pm: Session Four: Environmentalism in Practice
Silver Screen B

Moderator: *Kevin Hickey, Assumption College*
Discussant: *Dr. Anthony Lumby, Univ. KwaZulu-Natal, Durban SOUTH AFRICA*

Dr. Eric Fitch, Marietta College

The Seamless Garment: Is a “Consistent Life Ethic” without Consideration of the Environment Inconsistent?

Dr. Kimberly Reiter, Delaware State University

A Living History of Coastal Change in the St. Jones River NERR Site, Delaware

Dr. Bekir Parlak, Uludağ University Faculty of Economics and Administration, Bursa TURKEY and Dr. Mustafa Ökmen, Celal Bayar University, Sahlihli/Bursa TURKEY

An Agenda for Urban Air Pollution of Environmental Problems and Policies: The Turkish Case

3pm - 3:30pm Ice Cream Break
Grand Foyer

3:30pm – 5pm Keynote Speaker 1
Silver Screen

Ecological Processes in Spaceships Other than Earth Listen to your Mother

Dr. Aaron Mills

Chief Scientist, Biological Sciences Office, Kennedy Space Center, Florida
Department of Environmental Sciences, University of Virginia

Friday, June 24

8am – 10am Registration
Grand Foyer

9am – 11am Session Five: Environmental Analysis
Silver Screen A

Moderator: *Dr. Charles Simpson, SUNY Plattsburgh*

Discussant: *Dr. Guoxiang Liu, Clemson University*

Dr. Rebecca Johns, University of South Florida St. Petersburg

The Primacy of Spatial Analysis in Solving Environmental Dilemmas in the 21st Century

Dr. Demetri Kantarelis, Assumption College
Determinants of Ecological Footprint

Dr. Anthony Lumby, University of KwaZulu-Natal, Durban SOUTH AFRICA
Approaches to Economic Valuation in Environmental Impact Assessment: A Review

9am – 11am Session Six: Resource Management
Silver Screen B

Moderator: *Dr. Eric Fitch, Marietta College*

Discussant: *Melissa Elander, Plymouth State University*

Dr. David C. Keuhl, Ball State University
Bridging Knowledge through Process

Barbara Murray and Dr. Michael Reiter, Delaware State University
Preserving Biodiversity through State Land Acquisition Programs in Kent County, Delaware

Dr. Yeong Nain Chi and David R. Lavergne, Louisiana Department of Wildlife and Fisheries
Understanding Environmental and Fishing-Related Concerns of Red River Anglers in Louisiana

11am – 1pm Lunch (on your own)

1pm – 3pm Session Seven: Plants and Agriculture
Silver Screen A

Moderator: *Dr. Michael Reiter, Delaware State University*

Discussant: *Dr. Zhiming Yang, Delaware State University*

Dr. Guoxiang Liu et al, Clemson University
The Environmental Impacts of the Invasive Plant Purple Loosestrife (*Lythrum salicaria*) and its Hyperspectral Monitoring

Molly Puente, North Carolina State University
Can We Make Plants Cry Wolf? Manipulating Airborne Plant Chemicals to Improve Biological Control

Dr. AbuBakr AbdelAziz Mohamed, United Nations FAO Sub-Regional Office for Eastern and Southern Africa, Harare, ZIMBABWE
Interdisciplinary Approach in Agricultural Land Use Policy Planning: Concepts Challenges and Methodology

Drs. A. Am Puste, et al, Bidhan Chandra Krishi Viswavidyalaya (Agricultural University), Mohanpur INDIA
Aqua-Terrestrial Ecosystem and Its Environment for Generous Output and Soil-Water Impacts in Indian Subtropics

1pm – 3pm Session Eight: Environmental Health
Silver Screen B

Moderator: *Dr. Anthony Lumby, Univ. KwaZulu-Natal, Durban SOUTH AFRICA*
Discussant: *Dr. Bekir Parlak, Uludag University, TURKEY*

Dr. Ileana Prejbeanu, University of Medicine and Pharmacy of Craiova ROMANIA and Dr. Adriana Albu, University of Medicine and Pharmacy of Iasi ROMANIA
Gold Mining Between Risks and Benefits

Dr. Hal Marchand, Western Illinois University
Health and Environment: In Search of Common Theoretical Strands

2pm – 3pm Session Nine: The Ethics of Zoning Regulations, Private Property and the Potential for "Tragedy of the Commons": A Roundtable

Set 1

Moderators: *Kevin Hickey and Demetri Kantarelis, Assumption College*

3pm – 3:30pm Break
Grand Foyer

3:30pm – 5pm Keynote Speaker 2
Silver Screen

The Economic Value of Hurricane Forecasts

Dr. David Letson
Associate Professor of Marine Affairs and Economics
Rosensteil School of Marine and Atmospheric Science
University of Miami

7 pm – 9pm Banquet
Grand Ballroom

Voting for Vice President of the IEA
Outgoing President's Address: Dr. Demetri Kantarelis
Incoming President's Address: Dr. Michael Reiter

Saturday, June 25

8am - 9am Coffee
Grand Foyer

9am – 11am Session Ten: Land Use and Assessment
Silver Screen A

Moderator: *Dr. Demetri Kantarelis, Assumption College*

Discussant: *Dr. Phillipa Wells, Auckland University of Technology, NEW ZEALAND*

Alicia Revis, Delaware State University

Potential Effects of Development on Nutrient Loading in the St. Jones River Watershed

Dr. Kang S. Lu et al, Clemson University

Using Innovative Neural Networks to Simulate and Assess Land Use Change and Its Ecological Impact under Different Growth Scenarios

Dr. Michael Reiter et al, Delaware State University

Integrating Conceptual Modeling into a Strategy for Integrated Assessment of Environmental Issues

9am – 11am Session Eleven: Environmentalism as Politics
Silver Screen B

Moderator: *Melissa Elander, Plymouth State University*

Discussant: *Dr. Zhiming Yang, Delaware State University*

Dr. Giorel Curran, Griffith University, Brisbane, QLD AUSTRALIA

Whither Environmentalism? Environmental Politics in the New Millennium

Dr. Eric Fitch, Marietta College

Delay, Deny, Delete and Destroy: American Conservatism and Environmental Protection

Dr. Raymond Scattone, Florida International University

Climate Speak: Analyzing the Climate Change Discourse

11am – 1pm Business Meeting and Working Lunch
Room TBA

All participants are welcome to attend. Lunch will be provided.

ABSTRACTS

1. KEYNOTE BIOGRAPHIES AND ABSTRACTS

Dr. Aaron Mills

**Chief Scientist, Biological Sciences Office, Kennedy Space Center, Florida
Department of Environmental Sciences, University of Virginia**

Aaron Mills is currently serving as the Chief Scientist of the Biological Sciences office at Kennedy Space Center. He was originally trained in soil microbiology and earned a Ph.D. from Cornell University in 1976. After a post-doctoral fellowship at the University of Maryland where he studied the microbiology of petroleum degradation in cold climates, he was appointed to the faculty in the Department of Environmental Sciences at the University of Virginia, where he has taught and conducted research for 28 years. Dr. Mills is an interdisciplinary scientist who has published about 120 papers in diverse journals including ecological, geological, atmospheric, and hydrological publications. In addition to teaching courses in microbial ecology and environmental microbiology, he also teaches courses in global biogeochemistry and physical hydrology. He has served on a number of national and international committees including those sponsored by the National Science Foundation and the National Research Council. His current appointment is to direct research programs in bioregenerative life support for long term human missions to explore deep space, including planetary surfaces such as the moon and Mars.

Thursday Keynote Address

Ecological Processes in Spaceships Other than Earth: Listen to your Mother

During Earth's evolutionary history, elegantly balanced processes have allowed the planet to function successfully as a closed system in which elements are recycled resulting in no net gain or loss of materials, and only energy is required to be put into the system. Long-term human space missions will require the ability to regenerate food, water, and oxygen internally (the so-called closed loop system) rather than to resupply them from earth. The use of bioregenerative life support systems that rely on plants and microbes to accomplish these critical tasks will be essential to successful human colonization of Mars and the planets beyond. Design of these systems can benefit from copying similar systems evolved naturally on earth. Plants and associated microbes can provide clean air and water, and also a substantial amount of food, to humans in closed systems. A plant growth area of 3 to 5 m² can process 100% of the water requirement for an individual, and an area of 13-15 m² can provide 100% of the oxygen needed. Depending on nutritional requirements, an area of 20 to 50 m² can provide an adequate food supply. NASA's Advanced Life Support program supports substantial research to close the material cycling loops in spacecraft to allow surface exploration missions to Mars to occur by 2030.

Dr. David Letson
Associate Professor of Marine Affairs and Economics
Rosensteil School of Marine and Atmospheric Science
University of Miami

David Letson's interest in interdisciplinary teaching and research is both deep and enduring. He is Associate Professor of Marine Affairs and Economics at the University of Miami, where he specializes in the economics of weather and climate. As part of the Florida Alliance, he is using conjoint analysis to evaluate tradeoffs between the different dimensions of hurricane forecasts (e.g., track location versus storm intensity). At present, he is also examining relationships between recreational angling and various indices of weather and climate for research sponsored by the National Oceanic and Atmospheric Administration (NOAA)/National Marine Fisheries Service. He is also a member of the Southeastern Climate Consortium, where he assesses the value of seasonal climate information for agriculture in Argentina and the Southeastern United States.

Friday Keynote Address

The Economic Value of Hurricane Forecasts

Information about the weather has economic value only in terms of how it can affect human behavior. One challenge in assessing the economic value of hurricane forecasts is that it is inherently a multi-disciplinary endeavor, drawing not only from meteorology and statistics but from the entire spectrum of social sciences as well. Social systems are highly complicated, and engineering or scientific approaches to natural hazards can sometimes exacerbate the impact of hazards. Assessing the economic value of improved forecasts requires that we examine (1) the value of improved meteorological forecasting, (2) the value of improvements in the communication and understanding of forecasts, and (3) the value of responses to hurricane forecasts and warnings. And how does economics fit in? Developing and issuing hurricane forecasts is hardly free, and attaching a monetary value to these publicly available goods helps public officials determine if investing in forecast improvements is worthwhile. The discipline of economics contributes an ability to quantify changes in social welfare resulting from changes in the condition or availability of resources. Improving our knowledge of economic values informs policy making by identifying or at least approximating what may be the best choice between alternative investment options. Economists use market and non-market information to assess values that lead to suggested options and priorities for decision makers. Economics can also help identify indirect, counter-intuitive consequences of hurricane forecasts, such as increased vulnerability arising from an incorrect forecast. The value of hurricane forecasts has become an important public policy concern, and the public sector often provides or subsidizes meteorological data, forecasts, and technical assistance. Estimating forecast value can help show if improved forecast provision and dissemination would offer more benefit to society than alternative public investments such as infrastructure or forecasts of other hazards. Assessing the value of improved forecasts can help inform decisions about how we can best prepare for hurricanes.

2. PRESENTATION ABSTRACTS (*presenter)

Community-based Conservation in East Africa: A Case Study of Ndarakwai Ranch, Tanzania

Augusta Blackstone*, Melissa Elander, Chad Cleary, Heather Clogston, Katherine Donahue, Michael Hallworth, Heidi Jardin, Jeannie Kornfeld, Kyle Parent, Len Reitsma, Zachary Johnson
Plymouth State University
Plymouth, New Hampshire, USA

Multiple regions in East Africa face challenges due to increased rates of resource consumption and species extinction. The conservation strategy examined in this paper is that of community-based conservation, a locally-based initiative that has developed out of conservation biology, which strives to minimize habitat loss for wildlife and marginalization of under-represented people. Using a combination of ecological field work and ethnographic information gathering, the issues examined are how current land use in and around Ndarakwai Ranch, Tanzania, affects the ecology, social fabric and economy of each area. Dynamics between the local people and those responsible for enforcing regulations concerning resource use are examined through the lens of community-based conservation. Ndarakwai Ranch is a base for tourism, partly due to the fact that it serves as a wildlife corridor (elephant migration route) bordering on traditional Maasai lands. In 1996 modifications took place to provide a permanent water source for migratory animals. The water hole is a center of animal activity leading to increased damage to *Acacia mellifera* and *Acacia tortilis*, which is negatively correlated with distance from the water hole and may contribute to the decline in habitat suitability close to the water hole. This study shows that animal density as indicated by scat counts has decreased since the 2002 field season, which may have cascading effects on tourism. The Maasai live in the Great Rift Valley and grasslands of Kenya and Tanzania; traditionally following a semi-nomadic pastoral lifestyle. In order to learn more about community-based conservation efforts in the region, we gathered information about the Maasai perspective on wildlife, land use and restrictions on grazing. By observing the conflicts amongst stakeholders, it became clear that cooperation is vital to the success of community-based conservation. Our findings indicate that communication between stakeholders has begun; however, without cooperation amongst key players the long-term future for wildlife and local people are increasingly threatened as resource pressure intensifies.

Community-based Conservation in East Africa: A Case Study of Western Usambara Mountains, Tanzania

Augusta Blackstone, Melissa Elander*, Chad Cleary, Heather Clogston, Katherine Donahue, Michael Hallworth, Heidi Jardin, Jeannie Kornfeld, Kyle Parent, Len Reitsma, Zachary Johnson
Plymouth State University
Plymouth, New Hampshire, USA

Multiple regions in East Africa face challenges due to increased rates of resource consumption and species extinction. The conservation strategy examined in this paper is that of community-based conservation, a locally-based initiative that has developed out of conservation biology, which strives to minimize habitat loss for wildlife and marginalization of under-represented people. Using a combination of ecological field work and ethnographic information gathering, the issues examined are how current land use in the Usambara Mountains, Tanzania, affects the ecology, social fabric and economy of each area. Dynamics between the local people and those responsible for enforcing regulations concerning resource use are examined through the lens of community-based conservation. The Usambara mountain range is home to one of the most diversified floral communities in the world. Mazumbai Forest Reserve is a research forest managed by Sokoine University of Agriculture. It is surrounded by the lands owned by Shambaa, who practice monoculture and polyculture. The ecological study examines the recruitment potential of invasive crops in agricultural fields adjacent to forest reserves, found to be non-threatening to the integrity of the existing forest. The focus of the ethnographic aspects of community-based conservation was the positive and negative aspects of local agricultural practices, the sustainability of those practices, and the degree to which community-based conservation efforts address the challenges of becoming sustainable. Loss of natural resources, such as suitable trees for fuel wood, soil nutrients and land availability, have increased the challenges to becoming sustainable. Issues such as high population growth rate, corrupt politics and uncertain weather patterns compound conservation obstacles. Our findings indicate that communication between stakeholders has begun; however, without cooperation amongst key players the long-term future for wildlife and local people are increasingly threatened as resource pressure intensifies.

A Tobit Analysis of Whale Watching Expenditures Associated with Environmental Attitudes

Yeong Nain Chi
Louisiana Department of Wildlife and Fisheries
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Baton Rouge, LA 70898-9000

Yan Ling Chen*
Louisiana State University
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Baton Rouge, LA 70802

According to *Whale Watching 2000*, whale watching has continued to grow at a rapid rate since the late 1990s. In spite of its growing popularity, the existing research on whale watching expenditures is quite limited and has received only cursory attention in the literature of natural resource economics and related fields. This study provided an empirical analysis of understanding the relationship between individual consumption pattern and her or his socioeconomic characteristics associated with environmental attitudes for whale watching using data collected from a whale watching survey in 2000. A modified New Environmental Paradigm (NEP), proposed by Dunlan and Van Liere (1978), was developed for this survey included five statements that were framed to elicit positive attitudes toward the environment measured on a five-point Likert-type scale ranked from "strongly agree" to "strongly disagree". This study also employed the Tobit model, proposed by Tobin (1958), for estimating the consumption patterns of whale watching. The Tobit model of whale watching expenditures was estimated by maximizing the logarithm of the likelihood function using the censored and truncated regression procedures in LIMDEP (Greene, 1995). Empirical results showed that age, marital status, education level, membership of environmental groups, and modified NEP scores were significant in the Tobit model, which captured both participation and consumption decisions for whale watching. Results especially revealed that a significant and positive relationship was found between environmental attitudes, as measured by the NEP-based scale, and expenditures in whale watching. As individual NEP scores increase, respondents would be more likely to spend money to participate in whale watching. Empirical results of this study may provide important but current unavailable information about the demand for whale watching, the information about how different socioeconomic groups allocate their resources toward this wildlife-based recreation activity.

Understanding Environmental and Fishing-Related Concerns of Red River Anglers in Louisiana

Yeong Nain Chi
David R. Lavergne
Socioeconomic Research and Development Section
Louisiana Department of Wildlife and Fisheries
P.O. Box 98000
Baton Rouge, LA 70898-9000

The purpose of this study is to understand environmental and fishing-related concerns of Red River anglers and to identify groups exhibiting common patterns of responses using data collected from the 2004 Louisiana Fishing Survey (The Red River). Included in the questionnaire were 8 written statements measured on a five-point Likert-type scale (from “very” to “Not At All”) to examine the perceived preferences of environmental and fishing-related concerns. Factor analysis was performed using a principal component approach and a varimax rotation to delineate the underlying dimensions associated with environmental and fishing-related concerns. Empirical results revealed that 8 statements describing environmental and fishing-related concerns of Red River Anglers were condensed into two attitudinal dimensions. The Kaiser-Meyer-Olkin measure of sampling adequacy of 0.85 met the fundamental requirements for factor analysis. The internal consistency coefficient score of 8 statements showed Cronbach’s coefficient alpha of 0.82 was acceptable. Each of those two factors had a satisfactory Cronbach’s coefficient alpha of 0.76 and 0.72, respectively, with explained a cumulative 57.6% of the variance. Results suggested that Factor 1 emphasized “*Disturbance*” comprised 4 concerns, explained 29.2% of the variance with an eigenvalue of 2.34. Factor 2 emphasized “*Catching*” comprised 4 concerns, explained 28.4% of the variance with an eigenvalue of 2.27. The K-means cluster analysis was performed with a three-cluster solution: “*Avid*”, “*Leisure*”, and “*General*” groups. Results of the cluster analysis were tested for accuracy using the multiple discriminant analysis. The Box’s M was significant at the 1% level, and the Wilk’s Lambda scores indicated that group means were significantly different. The canonical correlation results supported that there were strong relationships between the discriminate score and the cluster membership. Results of this study provide insight into the understandings of environmental and fishing-related concerns that can be used to frame scenarios for recreational fisheries management purposes.

Whither Environmentalism? Environmental Politics in the New Millennium

Giorel Curran
Department of Politics and Public Policy
Griffith University, Brisbane Australia

This paper considers the standing of the environment movement and environmental politics at the beginning of the new century. It first traces a brief overview of the movement, from its genesis in the new social movements of the 1960s and 1970s, to the penetration of the sustainable development and ecological modernisation discourses from the 1980s onwards. It then considers the broader impacts of globalisation on movement politics as a whole, particularly on the rise of the anti-globalisation movement and the role of the environment movement within it. The paper's main task, however, is to reflect on the degree to which a common trajectory of social movements – the absorption of protest – has impacted on the environment movement and environmental politics generally. The absorption of protest thesis maintains that as the (environment) movement's concerns are taken up by the political and institutional establishment, as well as by the corporate sector, a process of cooptation, 'routinisation' and incorporation alters how key issues are managed, and the role that movement actors continue to play in articulating issues and negotiating policy. The broad impact can be a loss of power by environmental actors and activists who find the influence they were once able to exert over the environmental policy agenda is now limited. The paper investigates these claims through an exploration of the sustainable development and ecological modernisation discourses, drawing some examples from the Australian experience. It contends that these discourses, and the practices they generate, have shaped the contours of environmental politics considerably, and often to the exclusion of a range of alternative policy positions. Finally, after drawing together the various analytical strands it explores, the paper speculates on the future of environmental politics generally and in Australia in particular.

Exploitation or Conservation: Can Wildlife Tourism Help Conserve Vulnerable and Endangered Species?

John Dobson, Eleri Jones and David Botterill
Welsh School of Hospitality, Tourism and Leisure Management
University of Wales Institute
Cardiff, Colchester Avenue, Cardiff, UK, CF23 9XR

Wildlife tourism is increasingly utilizing vulnerable and endangered species as tourist attractions. This paper uses the South African cage diving industry as a case study to assess the contributions that the tourism industry can make to the conservation of the Great White Shark (*Carcharodon carcharias*). The study highlights that individual operators can make positive contributions using various mechanisms such as interpretation, education, and contributing towards scientific research. However, when the industry is examined as a collective whole then a number of paradoxes and complications emerge. The study demonstrates that operators face immense pressure when trying to reconcile conservation objectives with business profitability and client satisfaction. This can lead to the development of inappropriate business practices that are counter-productive to the overall aims of conserving target species such as the Great White Shark.

Delay, Deny, Delete and Destroy: American Conservatism and Environmental Protection

Eric J. Fitch
Marietta College
Marietta, Ohio

In the American political lexicon, the term NIMBY has become quite prominent. To it should be added, NIMEY and NIMTO; i.e. not in my election year and not in my term of office. The current U.S. federal administration is dominated in all three branches by ideological and pragmatic conservatives. Hostility toward the national environmental agenda which they inherited has been masked by subtle rhetoric and skilful use of the levers of power. The Bush administration has used the powers of the Executive to delay implementation of pending environmental initiatives, deny access of traditional environmental “players” to the process, delete from public access critical information and destroy environmental protections via use of the regulatory authority, control of the budget and cooperation with a mostly compliant Congress. This paper explores the skillfully crafted “big picture” of the Bush agenda toward the environment and their efforts at delegitimizing the American environmental movement.

Special emphasis will be paid toward the Bush administration efforts at:

- Delaying implementation of national and international policies with regard to climate change in the name of “science”
- Opening up military lands and bases from compliance with environmental laws in the name of military preparedness
- Removing information vital to action in the courts and in the field with regard to environmental hazards in the name of national security
- Development of national energy plans with no legitimate input from the environmental community
- Delaying implementation of vital air quality initiatives while waiting on Congress to pass their “Clean Skies” initiative
- Shrinking the budgets of key environmental agencies and sources of environmental information including EPA, NASA, NOAA, OSHA and others

The Seamless Garment: Is a “Consistent Life Ethic” Without Consideration of the Environment Inconsistent?

Eric J. Fitch,
Marietta College
Marietta, Ohio

Joseph Cardinal Bernardin, before his death in 1996, was one of the strongest proponents of the concept of the “seamless garment of life” or a consistent life ethic. This is a crosscutting concept in U.S. social and political discourse and a measure that has been used to evaluate politicians of all stripes: Democrats and Republicans, liberals and conservatives. In a nutshell, the seamless garment or the consistent life ethic calls upon its adherents to value human life from conception to natural death. The Seamless Garment is an allusion to the Christian scriptures wherein at the time of the execution of Jesus the Roman guards threw dice to determine who got his cloak; something that was considered too valuable to split. It is a philosophy that has attracted people from across not only Christianity, but a broader spectrum of believers. The consistent life ethic calls not just for opposition to abortion, euthanasia and war, but to capital punishment and torture. Adherents to the ethic call for the dignity of the human person to be recognized at all stages of life and the relief of human suffering to be at a premium. This standard is a difficult one for politicians in the United States to adhere to at this time. Traditional allegiances to political liberalism and conservatism and the platforms and doctrines of the leading political parties conflict with it at one level or another. This paper addresses the question of the role of the Environment from a moral and ethical standpoint in relation to the ‘consistent life ethic’ and the potential repercussions for its inclusion in the current American political calculus.

The Ethics of Zoning Regulations, Private Property and the Potential for "Tragedy of the Commons": A Roundtable

Kevin L. Hickey and Demetri Kantarelis (Moderators)
Assumption College
500 Salisbury Street
Worcester, MA 01609-1296
USA

The Primacy of Spatial Analysis in Solving Environmental Dilemmas in the 21st Century

Dr. Rebecca A. Johns
University of South Florida St. Petersburg
140 Seventh Avenue South
St. Petersburg, FL 33701

We live in an era in which once geographically discreet locales, experiences and perceptions are increasingly integrated into a complex global system, constructed through highways of exchange and extraction, information and financial flows, and well-worn relationships of dependence and domination, production and consumption. Neither traditional, reductionist science nor narrow policy directives can begin to approach our current environmental problems with the understanding and vision necessary to meet the challenges of this integrated world. An interdisciplinary approach to environmental solutions that links political, social, economic and ecological systems across space is required. Geography can provide this much-needed lens of analysis, stimulating innovation approaches to problem solving. Increasing numbers of environmental scientists and policy analysts are joining forces with geographers to access this unique world view. In this paper, I argue that a high level of geographic understanding is necessary to lift the veil of denial that space provides, hiding from us the increasingly severe consequences of our environmental actions. Spatial relations, while growing in complexity, are nonetheless largely invisible to the average person. Thus, geographic distance provides a convenient blind, which blocks from our view the displaced effects of resource consumption and waste production. Only an analysis that illuminates spatial relationships within economic, political, ecological and social realms, can facilitate the creation of appropriate solutions to the pressing problems of resource depletion and ecosystem destruction. Using case studies, I illustrate the positive benefits gained from applying a geographic analysis to common environmental problems, and highlight the creation of an interdisciplinary program that emphasizes the training of students as environmental leaders for the 21st Century.

Determinants of Ecological Footprint

Demetri Kantarelis, Ph.D.
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500 Salisbury Street
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According to a popular definition, "*The Ecological Footprint is a measure of the 'load' imposed by a given population on nature. It represents the land area necessary to sustain current levels of resource consumption and waste discharge by that population.*" The objective of my research is to critically analyze two ecological footprint models: the traditional one, focusing on the concept of sustainability alone, and another one which, in addition to sustainability limits, includes technological and economic constraints. Statistical analysis, based on time series and cross section data across countries, indicates that the traditional model does not measure true sustainability and is therefore invalid; more specifically, (1) the idea of needing enough world forest cover to appropriate emitted carbon is unrealistic; (2) it is shown that in energy consumption the footprint model's measures of nuclear power, renewable energies and land use estimates are mostly biased and distorted.

Bridging Knowledge through Process

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Solutions to environmental problems require an interdisciplinary approach to knowledge. While the natural/physical sciences contribute heavily to understanding the function of natural systems, it is in social/political institutions that decisions are made to govern human interaction towards the environment. The conception of knowledge in each of these domains is different, as is the process for acquiring it and utilizing it. This study explores the process needed to integrate these diverse, and often conflicting, approaches to knowledge.

The study targets the remedial action planning done in the Great Lakes since 1987. Forty-three Areas of Concern were established throughout the basin and in each a stakeholder planning committee was established. The committee was charged with developing a plan for remediating the water quality of the area. The committees were comprised of individuals from a breadth of interests including natural scientists, engineers, politicians, planners, activists, educators, and a variety of others. Over the past eighteen years, they have struggled through many circumstances to create plans with varying degrees of success. As each utilized slightly different procedural approaches and faced different obstacles, they provide an excellent laboratory for comparison of how knowledge from such disparate disciplines can be assimilated into a single plan.

The study offers an analysis of the elements of the process and the implications of the different ways of approaching the various steps and stages. The analysis focuses on revealing what needs to be intact prior to beginning the process, how information (scientific and other) is collected, shared, and utilized, and how decisions are made and formalized in these processes. It focuses specifically on the information itself, communication issues, structural elements, and factors outside the process and how these all work together to enhance or inhibit the use of environmental knowledge for planning and management. Following a detailed analysis of the process, a model for doing environmental management based on knowledge is developed and the basic principles of the model suggested.

The Environmental Impacts of the Invasive Plant Purple Loosestrife (*Lythrum salicaria*) and Its Hyperspectral Monitoring

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The environmental and ecological problems caused by invasive plants have become too severe to ignore. Purple Loosestrife was introduced from Europe to North America in the 1800s. Now known as the "purple plague", it has spread across 48 of 50 states in the US and all provinces in Canada. The U.S. Fish and Wildlife Service declared Purple Loosestrife "Public Enemy #1 on Federal Lands", and The Nature Conservancy listed it as the 2nd most troublesome weed in wetlands (Paul Treitz and Dennis Jelinski, 2001). This invader encroaches on wetland and forage land at a rate of about 190,000 hectares per year, kills off other native plants, reduces biodiversity, creates monocultures in wetlands and turns wildlife habitat into "biological desert". The direct costs are estimated at more than \$45 million annually in the United States, which has led to increasing efforts to control Purple Loosestrife. This paper provides a new method for identifying and mapping the distribution of Purple Loosestrife using hyperspectral remote sensing. The new tool and its resultant information will help effectively monitor and control this invasive species.

Using Innovative Neural Networks to Simulate and Assess Land Use Change and Its Ecological Impact under Different Growth Scenarios

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This study utilized a multilayer back propagation neural network to simulate future land use change and assess its direct ecological impacts. Although land use and ecosystems have been studied intensively from many disciplines, their interrelationships remain to be the weakest link within our human knowledge system. Many changes in land use and ecosystem characteristics are not perceived as problematic unless their detrimental impacts have cumulatively reached certain critical values or become too severe to ignore. While spatial modeling provides us a unique approach to understanding the dynamics of a specific land use system, scenario-based simulation enables us to foresee future changes and potential impacts that can be prevented or minimized. In this study, we developed an innovative land use model using a computational neural network. The network has not only a structure appropriate for addressing complex phenomena with interdependency problems, but also a predictive power that many conventional empirical models fail to reach. Rules are automatically learned from samples using a robust backpropagation algorithm. The model was applied in a coastal South Carolina region to simulate a binary land use change from the rural state to the urban state. The direct ecological impacts associated with this change under different growth scenarios were assessed in terms of loss of wetlands, habitat areas, and biodiversity as defined by the Gap-Analysis. Preliminary results indicate that the neural network performed fairly well statistically. The predicted urban land will be more than tripled even at the current growth pace. The direct ecological impact will be astonishing. The findings as early diagnosed warning signals will have significant implications for land use planning and environmental management in the region.

Approaches to Economic Valuation in Environmental Impact Assessment: A Review

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Environmental Impact Assessment (EIA) constitutes a form of systematic decision-making with a view to identifying the best project amongst a series of alternatives – that is, the project that will achieve an optimal allocation of resources within acceptable environmental parameters. Within the EIA process, the economic component is that of cost-benefit analysis, in which all costs and benefits, including environmental costs and benefits, are identified and valued. For economists, one of the major challenges facing the effective conduct of cost-benefit analysis is the ability to capture total economic value – that is, the full value of all activities, including environmental degradation and resource depletion. In turn, one of the major reasons for the failure to capture total economic value is the difficulty in assessing the value of all environmental impacts, particularly where such impacts are not reflected in market prices.

In order to remedy this example of market failure, it is imperative that we identify and value all environmental costs and benefits in order to achieve total economic value. For this purpose, a wide range of economic valuation techniques have been developed in order to allow us to assign a value to all environmental costs and benefits, especially those for which no markets exist. Following popular tradition, these valuation techniques are classified into two broad categories: objective/generally applicable techniques (where market prices or proxies are available) and subjective/selectively applicable techniques (where market prices cannot be used directly).

Against this background, the purpose of this paper is essentially threefold: (a) a brief review of the key issues in EIA with particular reference to cost-benefit analysis; (2) a discussion of the notion of total economic value and the need for economic valuation in cost-benefit-analysis; and (3) a review of the more important valuation techniques available to us.

Health and Environment: In Search of Common Theoretical Strands

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The disciplines of Environmental Education and Health Education are often viewed as having distinct orbits. Public health educators often fear to tread in the realm of Environmental Education, viewing the discipline as a minefield fraught only with engineers, wild life biologists, ecologists and data skewing environmentalists. Disciples of Environmental Education may look upon Health Education as a universe of Power Point trotting, flip chart pointing, biostatistical cheerleaders. Yet, to a significant degree, both disciplines are engaged in formulating appropriate behavior change strategies to enhance positive health and environmental outcomes, outcomes that are often inextricably bound. The two disciplines have evolved separate theoretical foundations and program planning models that are usually not common source. The purpose of this brief paper and round table discussion is to identify and discuss the critical current theories from the two disciplines that have the potential for informing prevention plans in both disciplines.

Interdisciplinary Approach in Agricultural Land Use Policy Planning: Concepts Challenges and Methodology

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The growing concern about land use problems has led to the realization that many problems in that domain cannot be addressed adequately through a single discipline. While land use problems are rooted in physical and biological sciences, they are driven by human behavior. Since land use problems are not disciplinary abstractions but real-life phenomena with many dimensions to them, they cannot be addressed adequately by mono-disciplinary approaches. Typically, agricultural land use policy planning requires understanding interactions among socio-economic and agro-ecological processes. These interactions, which are critical to the land use policy planning process, suggest the need for an interdisciplinary approach to understanding this problem.

It is argued that an interdisciplinary approach to problems of land use is specifically hampered by the lack of adequate methodology. The present lack of an interdisciplinary methodology is one of the main reasons why planned interventions fail or are not effective and why agricultural land use policy planning efforts have often not lived up to expectations. Currently, it is not clear how to implement such an interdisciplinary approach, but it is perceived that an initial necessary step is to integrate the different disciplines with their characteristically different focus on processes and scales. This paper aims to contribute to the development of an interdisciplinary approach to agricultural land use policy planning.

Preserving Biodiversity through State Land Acquisition Programs in Kent County, Delaware

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Governments and private land trusts play an increasingly important role in establishing an enduring landscape mosaic by setting aside land for recreation, creating nature preserves to maintain open space and biodiversity, and purchasing development rights on farms to preserve the agricultural economic base and manage growth. These land use decisions may have either a synergistic or detrimental effect on protecting biodiversity. In Kent County DE, 38,586 acres are dedicated to agricultural preservation through the Purchase of Development Rights (PDR), and 47,905 acres are located in state and federal parks. This research examines the network of preserved lands in Kent County to determine if they maintain the same species richness as preserves and contribute to the preservation of biodiversity. Data from GIS and the Mid-Atlantic Gap Analysis Project indicates that coastal plain pine/mixed hardwood forests and coastal plain pine beech-oak forests, the two largest upland vegetative alliances, are well represented both in the network of agricultural land in the PDR program and in state and federal parks. Using stratified vegetative sampling and statistical tests, we examined differences in species richness on ten sites located on agricultural land and ten sites preserved for parks between September and October of 2004 (with additional sampling scheduled for an additional eight week period between mid-May and July of 2005) to determine if the existing network of agricultural preservation land contributes to the preservation of biodiversity by protecting rare, threatened, or declining plant species or vegetative alliances. Preliminary analysis to date suggests that species richness is not substantially different between PDR agricultural land and parks in the county, and that overall species richness appears to be higher on the agricultural land.

An Agenda for Urban Air Pollution of Environmental Problems and Policies: The Turkish Case

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Population growth, industrial development and environmental pollution, which threatens natural resources in every country on earth, have made environmental problems one of the most important concerns of man in the last quarter of the twentieth century. Inventories of environmental problems are a working method in several developed and developing countries. In some countries, in fact, in addition to organizations concerned with the problems themselves, there are also offices whose special function is to conduct inventories of the problems. Such a need has also been felt in Turkey, where environmental problems have recently received increased attention, especially air pollution.

Air pollution can be defined as the quantity of pollutants sufficient to cause injury to human beings and other living creatures and damage to objects. Pollutants may be in the form, "air pollution standards" by both international organizations and many countries. The rapid urbanization that has been taking place in Turkey, particularly since the 1950s, is one of the most important causes of the country's air pollution. The pollution in cities is known to arise to a large extent from heating systems, combustion techniques and poor fuel quality.

Among the development affecting air pollution in the cities, many other factors play major roles besides population density. Some of these include incorrect urbanization for topographical and meteorological conditions, incorrect division of urban land into lots, low-quality fuel and improper combustion techniques, a shortage of green areas, an increase in the number of motor vehicles and inadequate disposal of wastes.

The principal goal of my report is to analyze the urban air pollution which connected with environmental policies. The problems of urban air pollution and environmental policies in Turkey are also among my objectives.

Gold Mining between Risks and Benefits

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Rosia Montana is a place with 4,125 inhabitants lying in a marvelous touristic area of the Western Carpathians. It is the oldest Romanian mining community with documentary evidence (*Alburnus Maior*, 131 AD). Its gold and silver deposits have been worked since the pre-Roman period.

The present exploitation project, which should start in 2008 and last for 17 years, has been promoted by a corporation with foreign investments of 80% of shares. According to this project the gold mining exploitation in *Rosia Montana* will be the largest in Europe; it will provide 300 tons of gold and 1600 tons of silver. The budget of Romania will get about 35 million USD per year and a number of 550 (temporary) jobs will be available for the local population.

At the same time the project will imply the displacement of about 2,000 inhabitants, respectively 800 households, 8 churches, 9 cemeteries, schools, etc and the destruction of important historical and archeological vestiges, many of them from the Roman period.

According to an official statement of the Romanian Academy, severe irremediable environmental consequences should also be taken into account. Hundreds hectares of forest will be cut down and that will profoundly influence the precipitations level, the temperature pattern, the soil erosion, the frequency and amplitude of floods caused by the rivers of the area, the wildlife, the touristic value of the region and the economical status of the population. The groundwater and the rivers will permanently be menaced to be polluted with cyanide coming from the tailing ponds where about 180,000 tons of water will have to be stocked in order to get decanted and neutralized. Tens million tons of stored waste rocks could slide generating a destroying avalanche. In the present variant, *Rosia Montana* project should not be carried out.

**Can We Make Plants Cry Wolf? :
Manipulating Airborne Plant Chemicals to Improve Biological Control**

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The single-crop agricultural systems that are common in much of the world are prone to herbivorous insect outbreaks. To control herbivores, pesticides are generally applied; however, this is not an effective long-term solution due to increasing insect resistance and harmful non-target effects. Because of this, many growers are looking for alternatives to pesticides, such as breeding for plant resistance to pests or supplementing populations of predators. One promising strategy is the use of inducible plant defenses. When damaged by herbivores, many plant species (including several important crops) produce airborne chemicals that are attractive to predators of the herbivores. The potential benefits of this defense are twofold. When herbivores are in the field, predators can use the plant chemicals to find herbivores more efficiently. When herbivores are not in the field, plants are able to divert their energy to growth instead of defense. While much work has been done describing the chemistry of these systems, there has been little effort directed at examining the potential effects of implementing this system in the field. I created a model, varying herbivore population dynamics and the timing of plant chemical production, to determine how herbivore abundance and the timing and duration of chemical production affected the value of the plant chemicals to predators. The chemicals were found to be most effective in attracting natural enemies when herbivore populations were low and when the signal production correlated with the presence of the herbivore. Growers relying on predators to control pests, such as on organic farms, should be aware that some plants are more effective at attracting predators because of their responsiveness to herbivore populations. This model begins to get at just what plant characteristics need to be manipulated to optimize use of predators in agricultural fields.

Aqua-Terrestrial Ecosystem and its Environment for Generous Output and Soil-Water Impacts in Indian Subtropics

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Soil, water and biological entity are the integral part of global natural resources, determined greatly wetlands and its diversity, habitats of thousands aquatic flora and fauna. Categorically, wetlands are lands transitional between terrestrial and permanent wet body, where soil is frequently waterlogged during rainy months with different water depths. Inland wetlands including coastal ecosystem comprises of 25-30% that intersected with main river system (*The Ganges, Brahmaputa, Padma, Mahanadi, Mahananda, Rupnarayan, Ajoy, Damodar, Kansabati* etc.) and it's so many tributaries like oxbow lakes (*mauns, chaur, jheels, beels, nayanjali* - as they are called locally), mostly dominated in the north-eastern part of the country. These are immense valuable, useful for fish-aquatic crop diversity, preserved carboniferous environment of the ecosystem as sources, sinks and transformers of a multitude of chemical, biological and genetic materials, which served as '*natures kidney*' and ultimately sustained economic stability to millions of people in the regions, marinating an ecological balanced in a very synchronized way. Case studies were undertaken on nature and characteristics of wetland ecosystem as per depth and submergence (permanent, semi-permanent and temporary in nature) and on production system of crop & fish variables for the benefits of mankind's. It reveals from the study, the physico-chemical properties of soils (pH, organic C, organic matter, available N, P and K) as well as water quality (pH, EC, BOD, COD, CO₃⁺, HCO₃⁻, NO₃⁻N, SO₄⁻S⁻ and Cl⁻) were remarkably influenced due to depth and durability of submergence of wet ecosystem. Consequently, production of protein and starch-rich aquatic food crops (water chestnut - *Trapa bispinosa* Roxb. and makhana - *Euryale ferox* Salisb.) as mono and integrated farming system along with fish genotypes (live fishes magur - *Clarias batrachus*, singi - *Heteropneustes fossilis* and sweet water fishes rohu - *Labeo rohita*, katla - *Katla katla*) are most important and sustained economic stability for upliftment of rural farm families in these study zones. It's individual, total and yield equivalence of the cropping systems were varied remarkably themselves including their production economics (GMR, NP and B-C ratio). In addition, utilization of 'Contingent Crop Planning' a mitigating options for tackling unprecedented flush flood situation during peak wet months. From the study it may be concluded that it is thus imperative to utilize this vast unused wetland ecosystem, particularly in the north-eastern part of the country with impetuously for food, livelihood, engagement of household labours and ultimately, economic stability that are inextricably linked with rural sustainability as well without any environmental degradation.

A Living History of Coastal Change in the St. Jones River NERR Site, Delaware

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While a major goal of the Environmental Cooperative Science Center (ECSC), a broad consortium of universities based at FAMU, is to provide conceptual models to assess the current condition of coastal ecosystems including the interaction with human communities and the postulation of possible directions and outcomes of current human activity, there has been limited systematic effort to assess the nature of recent coastal change in the perspectives and memories of the residents of, and actors within, those human communities. In order to place our knowledge of the dynamics of coastal ecosystem change within a living context, there must be an active investigation of historic use and occupation of these ecosystems using resources such as demographic and land use data, oral history, and community records. This project will attempt to collate such information to form a contextual picture of changes in the St. Jones River watershed by involving historians, community groups, high school educators, and retired resource managers through a Living History analysis. The Living History Project will initiate the creation of a sociocultural record of historic change in the DNERR (Delaware National Estuarine Research Reserve) and its watershed through the records and memories of the residents in place. It will combine archival and secondary sources with the collection, recording, and archiving of visual and oral testimony for change over the past sixty years (the estimated time range possible for human recollection – “recent” for the purposes of this project). The project will help retrieve socioeconomic data on the human communities, especially in the initial phases when local and state archives will be utilized for changing land use data and evidence of demographic shift over the past sixty years, and allow the collection of oral and other official and unofficial data from long-time residents and former resource managers; data that may not appear in the scientific or written records but has had an impact on human use and activity at or near the DNERR. By providing a database of information from informal sources and the context for changes and impacts the ECSC is studying in the area, we should be able to more accurately design our conceptual model for the St. Jones River watershed and make more effective decisions concerning risks and the management strategies required to address them. At the same time, this project will provide a watershed-wide network of community contacts to enhance the outreach and education aspects of our efforts.

Integrating Conceptual Modeling into a Strategy for Integrated Assessment of Environmental Issues

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Integrated assessment, the process of organizing and analyzing relevant information from a variety of disciplines, is becoming an important tool for considering both system constraints and stakeholder interests when addressing complex environmental problems. Four-component conceptual modeling (FCCM) is an integrated interdisciplinary modeling framework that incorporates information from multiple sources to address environmental issues within an adaptive management and decision context. FCCM illustrates the interacting components of an environmental system, allowing the formation of alternative causal hypotheses to explain system behavior. The conceptual model provides the basis for identifying the data and numerical models necessary to establish threshold (response) levels, performance measures, and key monitoring variables. The status of the system is then assessed and coupled to an adaptive management framework that develops and analyzes a set of plausible scenarios in order to select the most appropriate restoration and/or management actions to be taken. These actions are implemented, and the system is monitored to determine if the objectives have been met. If met, then nominal monitoring may continue to identify any future adjustments to the system. If the objectives have not been met but appear reachable, more time can be allowed or the ultimate goals for the action reassessed. If the objectives of the action do not appear achievable, the initial modeling may have to be revised and the process restarted with a new set of goals, performance measures, and monitoring variables to more accurately reflect the actual behavior of the system.

Potential Effects of Development on Nutrient Loading in the St. Jones River Watershed

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Historically, the state of Delaware has primarily been an agricultural state. However, in recent years, certain areas of the state (such as central Kent County) have become more urbanized with an increase in residential communities and related types of development. The Delaware National Estuarine Research Reserve has established a System-Wide Monitoring Program (SWMP) to provide water quality data for future adaptive management planning in response to watershed stressors such as changes in land use. The SWMP data, collected at several points in the St. Jones River watershed (SJRW), includes measures of river characteristics (temperature, conductivity, salinity, dissolved oxygen concentrations, water depth, pH, and turbidity), meteorological conditions, and nutrient loading (orthophosphates, ammonium, nitrite, nitrate, and chlorophyll). The objective of this project was to identify any existing correlations between water quality parameters (nutrient loading, dissolved oxygen, turbidity, pH) in the watershed and the number of developments established in the watershed within the last ten years. GIS and annual permit data for developments constructed in Kent County was compared to data from the SWMP converted to similar time units using weighted yearly averages to identify any relationships between water quality parameters and the number of developments and/or developed units within the SJRW and its sub-watersheds. Some correlations with water quality parameters did exist, and the time series were most strongly correlated with a lag time from permit to measured water parameter of two to three years. Unfortunately, the amount of completeness of the data for this watershed is still limited, making it difficult to draw strong conclusions for use in watershed management plans.

Complex Assessment of Ecological State of River Hrazdan in the Limits of Yerevan

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Assessing water ecosystems' ecological state requires interdisciplinary approaches underpinned with such scientific areas as hydrology, geochemistry and biochemistry, and agricultural sciences as well. A visual example of such an approach serves research of the assessment of the ecological state of River Hrazdan -Yerevan's main river. River Hrazdan water is used in economy, fish industry, and for domestic and cultural purposes. The set of approaches to be applied allows conducting comprehensive theoretical and practical researches. From hydrological and hydrochemical positions prior basic indices have been investigated, and a number of hydrochemical indices depending on River Hrazdan hydrological conditions established. The ion load of the water of Yerevan reservoir to which River Hrazdan inflows has been assessed, heavy metal accumulation in bottom sediment established.

Geochemical respect: geochemical stream of heavy metals in the water, suspended solids and bottom sediments has been studied. The character of man-made association formed in the city has been revealed which is represented by the following series of heavy metals: Ag-Zn-Pb-Cd-Ni-Cr-Mo-Cu. The forms of heavy metal transfer in system "water-suspended solids-bottom sediments" have been studied. Manifold excess of Pb, Zn, Cd concentration in water vs. maximum permissible concentration (MPC), has been recorded.

Biochemical research: dominating pollutants (NO_3 , NH_4 , PO_4) have been identified and the type of pollution established. In the south of Yerevan, manifold excess of NH_4 in water vs. MPC associated with sewage water pollution, have been established.

Agricultural respect: Irrigation properties of water, mineralogical composition, alkalinity, toxicity, and biogenic indices have been studied. Interpretation of research outcomes allows providing recommendations on water use in irrigation and river gorge exploitation for recreation purposes. The obtained data underlie creation of mathematical models of theoretical and practical nature.

Climate-Speak: Analyzing the Climate Change Discourse

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This paper examines the intersection of language, thought and the issue of climate change, particularly as it relates to discussion and policy initiatives (including non-action strategies). It uses Roland Barthes' work on *Mythologies* (1972) as a framework to view the current policy debate—recognizing the powerful role that language plays in manipulating thought, bounding discourse, and defining reality.

Analysis reveals that the language used by the Bush administration to discuss climate change is a decidedly “un-environmental” one, absent much of the history and facts of the issue. The Bush administration has painted a picture in which adhering to the guidelines of the Kyoto Protocol would be both “unfair” to the United States and economically disastrous to its economy. In doing so, it has sought to redefine the terms of the climate change debate: an environmental issue has been recast in economic terms. A review of the Bush Administration's Climate Change Action Plan exposes this underlying theme—the policy does nothing to reduce the overall amount of carbon dioxide emissions in the United States—in fact, it will increase it.

Moreover, given the current language in which climate change is being couched, future policy options offer little hope in effectively addressing the issue. A review of two significant addendums to the Kyoto Protocol, both strongly endorsed by the United States—carbon sequestration and carbon-dioxide trading schemes—shows the extent to which economic concerns have supplanted environmental goals. In conclusion, this paper underscores the need to understand “climate-speak” for what it is and to open the universe of discourse to include a broader array of values.

Local Knowledge and Environmental Responsibility: The Case of the Adirondack Region of New York

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Two comprehensive land-use policies have affected the Adirondack region of Northern New York. The first was organized by the nations of the Iroquois Confederacy and lasted from the pre-colonial period until the American Revolution. The second was initiated in the 1880s after loggers removed much of the timber cover. The new approach redefined the region as “wilderness,” initially to buffer the recreational estates of the New York City elite from timber operations. By mid-century, middle-class recreational use based on automobile access from metropolitan areas had transformed recreation and environmental politics. The old upper class and new middle-class worked together to support an expansion of state holdings exempt from logging and zoned to accommodate varying degrees of recreational intensity. The “wilderness” category, the largest, excluded all motorized access.

I argue that land-use based on indigenous principles of local knowledge permitted the sustainable co-existence of human populations within this landscape. A mode of being-in-the-world rather than a discrete epistemology, local knowledge comprises a human relationship with the biota of a specific location to permit human survival into repetitive generational cycles. Cultures built on this imperative are functionally comprehensive and spatially integrated. Wilderness zoning, seemingly a progressive response to the excesses of industrial capitalism, is one component of an unsustainable land-use pattern rooted in the instrumental rationality of the European Enlightenment. It subordinates rural areas to domination by outside elites. The designation of parklands is part of a larger system which uses markets and regulatory means to reduce rural regions to support roles in larger economic and political systems. According to their geo-political or economic “comparative advantage,” they become industrial zones, waste dumps, areas of dense urbanization, military practice zones, recreational areas, or bio-diversity reserves. The centralism, scale, and one-dimensionality of this land use system breaks the linkage between people and the particular landscapes upon which they depend for nurture and around which they construct their cultures and cosmologies. This rupture lies at the heart of environmental decay and modern alienation from nature.

Analysis of Coastal Wetland Changes and their Impacts on Eco-environment by Using Dispersed Data: a Case Study in Xiamen, China

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Coastal wetlands represent a fragile ecosystem between the ocean and land area. It plays a significant role in material circles and the energy flow of ecosystems. Constant influences of human economic activities and inappropriate exploitation have considerably changed the coastal wetlands in Xiamen. However, for years lacking concerns and understanding of the coastal wetlands, it is difficult for us to obtain the first-hand and long periodic data to study the changes of coastal wetlands in Xiamen and their impact on eco-environment. Therefore, we collect the data and information from the dispersed databases and make a systemic analysis with a study frame of 'PSR' including: the three main anthropogenic factors of (a) coastal land reclamation, (b) marine aquaculture and (c) input of Jiulong River through the estuary. The four significant changes of (i) minimization of the shallow sea area, (ii) increasing siltation in shore, (iii) sediment changes in the coastal wetlands and (iv) shrinking of the mangrove area; the five key functions of (1) climate change mitigation, (2) water and soil protection, (3) water purification, (4) habitat for wild animals and (5) high biological products; the impacts on eco-environment of Xiamen Bay of (I) sea water quality, (II) benthic community in offing marine, (III) siltation in navigation channels, (IV) wetland aquaculture and (V) the population of rare ocean animals. Finally, we offer advice on wetland conservation and management from the point of integrated methods.

Watershed Sleuths: The Quest to Identify Sources of Fecal Pollution

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Fecal contamination in some coastal watersheds results in harvest restrictions or closure of hard clam (*Mercenaria mercenaria*) beds. This is particularly true in several New Jersey watersheds, where sanitary quality necessitates classification of most areas as *Prohibited* or *Special Restricted*. Another environmental problem associated with pathogen contamination in coastal watersheds is the closing of bathing beaches due to stormwater discharged during storm events.

Pathogens can potentially enter coastal waters from a variety of sources, including runoff, stormwater discharges, septic systems, sewer lines, pets, wildlife, livestock, and boat waste. A major step toward remedying situations like shellfish bed contamination and beach closures would be to better determine sources of fecal contamination and implement corrective strategies to control these inputs.

Over the last decade, several new methodologies in microbiology and molecular biology have been developed which have demonstrated value for discriminating sources of fecal bacteria in waterways. Known collectively as Bacterial Source Tracking (BST), the applicability of these techniques to coastal watersheds presents tremendous potential for the definitive identification of sources of fecal contamination.

A variety of BST methods have been developed. One of the first BST approaches, Antibiotic Resistance Analysis (ARA) testing, has been used to discriminate human and nonhuman sources of fecal bacteria in both fresh and estuarine waters. Our BST approach entails field sampling and ARA testing procedures established and optimized through our work on a number of coastal watersheds in Monmouth County, New Jersey -- the Manasquan River Estuary, the Shark River Estuary, Wreck Pond, and Deal Lake. As a result of four years of BST research we believe that, at a minimum, BST techniques are suited for ruling out sources of pollution in a particular area. Furthermore, with enough sampling, they can also provide a discriminating tool for definitively identifying specific sources of pollution.

**“For Environment Read Conservation”
New Zealand and green purity**

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The international official and commercial face often presented by New Zealand is one of environmental consciousness. Log into tourist and publicity websites or those promoting business activities in the country and the message is the same; wonderful natural scenery, a veritable cornucopia and empty landscapes. Both the Environment and its subsidiary conservation/preservation have voices in Parliament. New Zealand is internationally active in a range of environmental campaigns and a signatory to environmental agreements such as the Montreal and Kyoto Protocols.

However, ranged against such perfection are such statistics as an ecological footprint comparable to that of Australia at 8.35 (hectares per head of population), and ranking below only United States and three other developed countries, well ahead of China (1.84) and India (1.06); a “nationally critical” (the category considered most at peril of extinction) state of 312 indigenous species out of a total 2061 threatened species, a range and distribution of contaminated sites; lakes and rivers threatened by potentially fatal pollution largely attributable to surrounding land use; sewage contamination of beaches; and low recycling levels.

These seeming contradictions pose a question: by championing an “easy” target, that of conservation, have we as New Zealanders shaped our perception of the “Environment” in such a way, and embodied it in law, as to diminish our ability and willingness to manage and to solve environmental problems?

Using water as an example, this paper examines the structure and focus of relevant law in New Zealand with a view to identifying the extent to which it is an appropriate means of solving environmental problems, as opposed to championing conservation/preservation of specific places or things. Evaluation of possible reforms or alternative approaches is provided.

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