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EDUCATION

Ph. D.	1977	University of Rhode Island	Natural Resource Economics
M.S.	1973	University of Massachusetts	Food & Natural Resource Economics
B.B.A.	1970	University of Massachusetts	Corporate Finance/Economics

CAREER PROFILE

1991 to Present: *Research Professor and Director*, Natural Capital Research Group at **University of Maryland Center for Environmental Science (UMCES)**, Solomons Island, MD, also
Managing Owner and Director, **King and Associates, Inc.**, consulting and research firm, Solomons Island, MD

1987-1991: *Director of Resource Economics, ICF, Incorporated* and *Corporate Manager* of San Diego office

1978-1987: *Adjunct Professor, University of California, San Diego* (Economics Dept.)
Lecturer, Scripps Institution of Oceanography, La Jolla, CA
Managing Owner, King and Associates, Inc. & ERG, Pacific Inc., San Diego, CA

1977-1978: *Senior Economist, U.S. Dept. of Commerce*, NOAA, Oceanic Division, La Jolla, CA

1975-1976: *Assistant Professor, University of New Hampshire*, Natural Resource Economics

ACCOMPLISHMENTS

Thirty years of research and consulting experience in environmental and natural resource economics with a strong emphasis on coastal and ocean issues. Author of over one hundred reports, papers, and book chapters dealing with economic, business, and trade issues associated with environmental/economic linkages and international trade in natural resource products. Project manager on over fifty interdisciplinary science/policy research projects dealing with complex scientific/engineering/economic issues. Advisor to national and international natural resource and development agencies, small and large business interests, seaport administrations, environmental organizations, and insurance and financial institutions. Expert witness before U.S. and state congressional committees, at numerous administrative law judge hearings, and in over forty cases involving private litigation over natural resource-related economic losses. Served on scientific committees of the National Research Council and the National Academies of Science, and as senior economic consultant to United Nations, World Bank, U.S. congressional

committees, and various national industry/government councils.

Managed and contributed to economic portion of environmental impact statements related to many different types of resource development projects. Developed and pioneered practical applications of widely used ecosystem valuation methods, and economic tools to assess and compare environmental restoration and mitigation projects, invasive species problems, and coastal fishing-oil industry conflicts. Developed “scoring” methods to facilitate market-based solutions to problems related to wetlands, greenhouse gases, and water quality. Created widely used analytical tools for assessing and comparing ecosystem services and values to settle natural resource damage claims, and to manage environmental trading/banking programs. Developed fishery-related risk assessment methods for Lloyd’s of London. Ltd and other insurers, and GIS-based global fishing fleet allocation/decision-support models for H.J. Heinz (Starkist), Van Camp (Chicken of the Sea), and other global seafood companies. Developed fishery management models, tax programs, and foreign fishing access and rental agreements for individual island nations, and for regional multinational fishery organizations. Developed and applied innovative tools for assessing environmental/economic tradeoffs associated with beneficial environmental uses of dredged material, and for performing incremental cost analysis to compare options for large-scale environmental restoration. Developed economic tools for assessing and comparing ballast water treatment technologies and for evaluating alternative ballast water regulatory programs.

REPRESENTATIVE CLIENTS/PROJECTS

CURRENT (2009)

Maryland Port Administration Integrated economic and environmental analysis of environmentally beneficial dredge material placement options, including applications to protect and restore wetlands and create island habitats.

Mid-Atlantic Regional Coastal Ocean Observing System (MARCOOS), Assessing the value of physical ocean observations to users along several pathways involving fishing, fishery management, search and rescue, shipping, offshore energy, weather predictions, etc

U.S. Department of Commerce, NOAA, Managing economic component of the Chesapeake Inundation Prediction System (CIPS), a new NOAA storm-generated flooding prediction system for the Chesapeake Bay.

California Department of Fish and Game Updating the original California Interindustry Fishery (CIF) Model initially published as King and Shellhammer (1982) to reflect current industry conditions and economic impacts. (via contract through Humboldt State University)

Lenfest Ocean Program at Pew Charitable Trust Enforcement economics study of U.S. commercial fisheries to determine the effectiveness of existing enforcement activities and identify opportunities for improvements.

EPA, Regional ecosystem Vulnerability Assessment (ReVA) Development of socio-economic risk indicators and decision-support tools to prioritize environmental threats and risks in the mid-Atlantic and Southeast regions.

NOAA, Office of Habitat Protection Development of formulae and related guidebook and software for developing science-based and legally-defensible wetland mitigation (compensation) ratios; prepare workshops for NOAA field staff on east coast (Silver Spring, MD) and west coast (Seattle, WA)

Maryland Environmental Services, Environmental economic analysis of dredged material placement options and GIS-based assessments of aesthetic and other localized impacts of placement alternatives.

<u>Chesapeake Bay Program (STAC)</u>	Water Quality Trading
<u>World Resources Institute</u>	Water Quality Trading
<u>Great Lake Protection Fund</u>	Water Quality Trading
<u>Lake Tahoe Water Management District</u>	Water Quality Trading

PAST (through 2008)

Private Sector

Avatar Environmental, EPA-funded project to develop an integrated ecological risk assessment and ecosystem valuation database to allow users to find studies that can be combined using common end points.

Weston Solutions, Inc. Environmental/economic analysis of dredged material placement options, including NER (National Ecosystem Restoration) analysis to prioritize options and establish Federal cost sharing.

Oil Spill Class Action. Lead economic expert for property owners, businesses, and commercial fisherman in lawsuit for natural resource damages from the April, 1999 Pepco Oil Spill in the Patuxent River.

Scientific Certification Systems, Oakland, CA. Development of guidelines and protocols for answering production and chain of custody questions to support global seafood certification and labeling programs of the newly formed Marine Stewardship Council.

Fuji Bank, Tokyo. Analysis of competitive forces in global fisheries and fish markets, and assessment of long-term investment risks in Asian and Latin American seafood industries.

Bumblebee Seafoods, Thailand. Analysis of competitive conditions in global tuna markets and evaluation of alternative strategies for expansion and diversification of U.S. and Thai operations.

Asian Development Bank, Manila. Prepared report on tuna export opportunities for Pacific Island nations. Included price forecasts by product, type, and fish size and an assessment of most promising joint-venture strategies in the Pacific basin.

H.J. Heinz and Co., (Star-Kist, International), Pittsburgh, Pennsylvania. Analysis of international and domestic markets for raw/frozen and canned tuna and the impact of market changes on: 1) the financial performance of various national fishing fleets and seafood processing industries and 2) long-term investment and production strategies.

Lloyd's of London, Ltd. Retained four years (1980-1984) as lead consultant and expert witness evaluating risks, estimating losses, developing settlement offers, and supporting legal proceedings related to claims of lost earnings from high-seas fisheries and related losses in fish processing sectors.

Castle and Cooke, Inc. San Francisco, California. Analysis of recent changes in global fisheries and markets and their short-term and long-term impacts on various segments of Asian, Latin, and Pacific seafood industries.

Worldcom Corp Use regional economic "input-output" models to estimate state-level impacts on business sales, household income, jobs, taxes, and value added if Worldcom/MIC was not allowed to restructure and come out of bankruptcy.

Zapata-Haine Corporation, Mexico City. Evaluation of investments in high seas fisheries and global fish

canning facilities and assessment of trends in international seafood markets.

Asian Development Bank/United Nations. Analysis of world shrimp demand and forecast of international shrimp markets through 1985. Report supported successful expansion of global shrimp aquaculture industry during the 1980's.

Booz-Allen, Hamilton, Inc., Los Angeles. Optimization of global fish harvesting, processing, and distribution operations by Fortune 100 firm; integrated management of seafood, fishmeal, fish oil production systems.

Exxon Company, USA, California. Forecast impacts of offshore oil development on seven central California commercial fisheries. Provided basis for cash payments to fishermen for temporary fishing area preclusions.

Banpesca (National Fisheries Development Bank of Mexico). Development of a National Tuna Development Plan and financial/economic models to evaluate investment, production and financing decisions and joint venture and marketing proposals related to global tuna fisheries.

Van Camp Seafood, P.T. Mantrust, Indonesia. Analysis of global tuna fleet allocation and tuna procurement strategies using linear programming and other computerized decision models.

Exxon Company, USA, California. Post-project analysis of economic losses to commercial fishing operations from a three-year offshore oil development project in central California. Provided basis for final settlements with seven commercial fishing fleets for temporary fishing area preclusions.

Florida Wetlandsbank, Inc. Evaluation of Florida Mitigation Banking Review Team debit/credit guidelines and related methodologies, and an evaluation of their potential financial impacts on wetland mitigation ventures in Florida.

Fishermen's Cooperative Association of San Pedro. A study of alternative products and international markets for California market squid.

Southern California Investment Bank. Forecasts of risk and economic performance for selected U.S. commercial aquaculture industries.

Bechtel Group, Inc. San Francisco. Economic/financial analysis of fishery-oil conflicts associated with potential offshore/onshore facilities in Central California.

Cities Service Oil and Gas Corp. San Francisco. Economic/financial analysis of fishery-oil conflicts associated with potential offshore/onshore facilities in Central California

Non-profit Sector

Maryland Environmental Services, Environmental economic analysis of dredged material placement options and GIS-based assessments of aesthetic and other localized impacts of placement alternatives.

UMCES/Campbell Foundation Development of optimization model for prioritizing oyster restoration in the Chesapeake Bay and examining the opportunity costs of high risk oyster restoration investments.

Canaan Valley Institute, Assessment of environmental restoration alternatives in the mid-Atlantic Highlands region and develop criteria for prioritizing sites and identifying opportunities to develop export-oriented regional industries to provide ecosystem restoration materials, equipment, and skills.

Pennsylvania Environmental Council, Consultant to the PEC and local partnership organizations on projects to develop a registry, scoring criteria, and trading protocols for a prototype water quality credit trading system for the Conestoga River watershed to be used, eventually, in the Susquehanna River and Chesapeake Bay watersheds.

Florida Southwest Water Management District, Evaluation of proposed rules for sector-based water use restrictions during moderate, extreme, and severe droughts.

Civil Engineering Research Foundation (CERF) and International Institute for Energy Conservation (IIEC) Review of international experiences with the use of economic incentives for phasing lead out of gasoline, and recommendations for developing the least-cost strategy for effectively phasing lead out of gasoline in South Africa.

National Science Foundation, develop indicators and decision-support flow charts and prototype software to help focus wetland conservation/restoration initiatives. (through University of Rhode Island)

Canaan Valley Institute, County-level assessment of ecosystem restoration opportunities and related business opportunities and economic impacts.

Center for International Environmental Law. Applications of geographic information system to prioritize and support enforcement of environmental laws.

Resources for the Future. Legally defensible non-monetary indicators of ecosystem services and values based on site/landscape characteristics

Winrock International, Inc., Development of carbon sequestration supply function for U.S. forest and agricultural lands to support future greenhouse gas trading.

Resources for the Future, Washington, D.C. Assessing boundary and scale issues in the development of community, regional, and national environmental and economic indicators

Organization for Economic Cooperation and Development, Paris. Evaluate current applications of economic incentives for environmental protection in developed nations and assess potential in less developed nations.

Center for International Environmental Law. Applications of geographic information system to prioritize and support enforcement of environmental laws.

Environmental Law Institute. Economics of controlling agriculture-based nonpoint source pollution, and estimates of compliance costs for various regulatory alternatives.

World Wildlife Fund/Marine Stewardship Council. Guidelines for using non-government initiatives and industry and market-based incentives to encourage sustainable world fisheries.

East-West Center, Pacific Island Development Program, Honolulu. Prepared publication describing international trade in tropical Pacific fishery products, trade opportunities for central/western Pacific Island nations, and the role of multinationals in markets for Pacific seafood.

Pacific Fisheries Development Foundation, Honolulu, Hawaii. A benefit-cost and cost-effectiveness study of eleven fisheries and aquaculture research and development projects including: Micronesia - Port Development in Truk and Ponape; Guam - Transshipping Facilities; Saipan - High-seas Fisheries; Palau - Cold Storage/Transshipping Facilities; Samoa - Near-shore Fisheries; Tinian - Transshipping Facilities.

South Pacific Forum, Solomon Islands. Feasibility studies for tuna fishery support facilities, tuna fleet development and local cold storage and transshipping operations.

World Wildlife Fund, Washington, D.C. Development and testing of criteria for certifying that seafood products were harvested in fisheries that are sustainable and well managed.

Joint Fishing-Oil Industry Committee, Santa Barbara, California. Study of fishing industry-oil industry interactions in central California area and economic impact of OCS development on financial performance of commercial fishing operations in Santa Barbara Channel and Santa Maria Basin.

South Pacific Forum, Solomon Islands. Development of computerized databases to monitor foreign fishing in 200 mile fishing zones of seventeen member nations, and bio-economic vessel budget simulators to estimate appropriate access fees for various types of fishing vessels.

West Coast Fisheries Development Foundation, Portland, Oregon. Economic potential of alternative product forms and markets for U.S.-caught Pacific and jack mackerel.

National Coalition for Marine Conservation, Pacific Region. Conduct study of alternative ocean management policies for the state of California with consideration of recreational and non-consumptive uses of the marine environment as well as commercial ocean uses.

National Academy of Sciences, National Research Council, Washington, D.C. Analysis of global tuna fisheries, international tuna markets and the role of multinational corporations in high-seas fishery development.

Pacific Marine Fisheries Commission, Portland, Oregon. Prepared report describing the economic impacts of changing global patterns of tuna harvesting and processing and documented methodology for use in studies of changes in other fisheries.

Scripps Institution of Oceanography, Office of Sea Grant, La Jolla, California. Development of regional input-output models and economic multipliers for 19 coastal communities in California using the U.S. Dept. of Agriculture "IMPLAN" economic modeling system.

Scripps Institution of Oceanography, Office of Sea Grant.
1980/1981 Development of California Interindustry Fisheries (CIF) model.
Bio-economic extension of 1980/1981 California Interindustry Fisheries (CIF) model.
Financial/economic analysis of California seaports and harbors.

Environmental Law Institute, Washington, D.C. Prepare information for the revision of the 1987 "Cost of Environmental Protection Report" under contract to the EPA, Office of Policy Analysis.

President's Council on Sustainable Development. Application of natural resource accounting to evaluate alternatives for sustainable watershed management in the Upper Mississippi River Basin.

Environmental Business Council of the U. S., Boston, MA. Prepared a report for environmental industry trade organizations evaluating the legal, institutional, and technical barriers to increasing U.S. environmental technology exports.

Environmental Business Council of the U.S., Boston, MA. Analysis of technical, institutional, and market barriers to the export of U.S.-based environmental technologies

Environmental Defense Fund, Washington, D.C. Profile conceptual and practical problems with applying Benefit-Cost Analysis to the environment.

Greenpeace, International, Amsterdam. Analysis of global high seas fishing industries and related markets and their relationships to the incidental kill of marine mammals. Strategy development for promoting

“dolphin-safe” canned tuna label in U.S. markets and similar labeling initiatives in Europe and Asia

Public Sector

NOAA, Office of Habitat Protection Development of formulae and related guidebook and software for developing science-based and legally-defensible wetland mitigation (compensation) ratios; prepare workshops for NOAA field staff on east coast (Silver Spring, MD) and west coast (Seattle, WA)

NOAA, Office of Habitat Protection Integrated environmental/economic analysis of derelict fishing gear (ghost traps) in the Chesapeake Bay and cost/risk/benefit analysis of alternative gear identification and retrieval systems.

USDA, Economic Research Service Develop cost/risk profiles associated with invasive weeds using Cheatgrass in the Columbia River Basin as a case study. Use cost, risk, benefit data to test potential of innovative "risk-optimizer" software to prioritize responses on agricultural and natural lands.

EPA, Regional ecosystem Vulnerability Assessment (ReVA) Use of regional environmental risk/vulnerability indices and other landscape and land use data to guide cross-media and out-of-kind environmental trades, with illustrations for North Carolina and South Carolina.

EPA, Regional ecosystem Vulnerability Assessment (ReVA) Use of landscape indicators and other measures of geographic and socio-economic heterogeneity to develop rules to guide cross-media/inter-state environmental trading involving air and water credits in 15 counties in NC and SC in the vicinity of Charlotte, NC.

NOAA, Office of Habitat Protection, Guidelines for using economic analysis to prioritize and manage habitat protection and restoration strategies.

NOAA, Office of the Administrator, Prepare report on supply and demand conditions and other economic aspects of proposed water quality credit trading programs with special focus on the Chesapeake Bay region.

U.S. Department of Agriculture, APHIS. Development of Cost/Risk and Cost/Benefit Protocols to prioritize and manage spending to control harmful invasive plants on uncultivated land (natural habitats).

U.S. EPA, Office of Atmospheric Programs, (through Stratus Consulting, Inc.) Develop a standard method to “score” carbon sequestration credits and illustrate it using a sample of early U.S.-based carbon sequestration trades.

U.S. Environmental Protection Agency, Office of Air. Economic assessment of voluntary carbon sequestration trading in the United States – comparing cost, performance, and credits under alternative “scoring” systems.

U.S. Army Corps of Engineers, Waterways Experiment Station. The development of wetland indicators to guide national/regional wetland mitigation programs and to debit /credit wetland mitigation banking trades.

Environmental Protection Agency, Office of Policy Analysis. Economic Potential of Carbon sequestration in national and international carbon trading markets: practical methods of verifying and debiting and crediting trades that involve changes in land use and farm and forest management practices

U.S. Department of Agriculture, Economic Research Service. Develop and test a general analytical framework for assessing the economic effects of agricultural nutrient policies on fisheries and related coastal industries.

U.S. Department of Agriculture, Forest Service and Economic Research Service. An integrated cost-risk-benefit framework for prioritizing and developing response protocols related to noxious weed threats

U.S. Department of Agriculture/NRCS. Development of an ecosystem benefit website for field office staff; including methods and examples of related to absolute (dollar-based) and relative (non-dollar) ecosystem value estimates to guide environmental investments and to assess and compare mitigation trades.

U.S. Department of Justice, Washington, D.C. Development of ecosystem valuation methods to facilitate the settlement of natural resource damage claims; expert witness on specific cases involving coastal oil spills.

U.S. Department of Commerce, NOAA. Methods of comparing ecosystem functions, services and values and performing habitat equivalency analysis under Jan. 5, 1996 NRDA - Final Rule (15 CFR Part 990).

U.S. Army Corps of Engineers, Water Research Institute. Wetland location and watershed values: economic and environmental equity issues associated with off-site wetland mitigation banking.

U.S. Environmental Protection Agency, Office of Policy Analysis. Framework for assessing the benefits and costs of vegetative riparian buffers: with case studies for three Chesapeake Bay area sub-watersheds.

U.S. Environmental Protection Agency, Office of Policy Analysis. Relocating wetlands—the hidden costs of wetland mitigation: including case studies for the Chesapeake Bay and San Francisco Bay watersheds.

U.S. Department of Agriculture, Economic Research Service. A framework for evaluating the costs and benefits of managing noxious weeds, prioritizing problem areas, and selecting among weed management alternatives.

Government of Thailand. Economic assessment of proposed changes in U.S. tariffs and quotas related to imported processed seafood products.

Government of Papua New Guinea. Evaluation of export markets and joint venture pricing policies for shrimp, lobster and tuna.

Federated States of Micronesia. Financial feasibility and economic impact of proposed port and fishery development projects.

U.S. Dept. of Commerce, NMFS, Honolulu. Development of Linear Economic Models to analyze the potential economic impacts of statewide Limited Entry programs applied in a multifishery context (groundfish, lobster, shrimp, tuna).

U.S. Dept. of Interior, Office of Territorial Affairs, Washington, D.C. Evaluation of joint venture and marketing arrangements involving U. S. Trust Territories and multinational corporations.

U.S. Farm Credit Bank, Pacific Region, Sacramento, California. Phase I: Financial/economic analysis of fish processing and fishery-related joint venture opportunities in Asia, Europe and Latin America. Initial negotiation with potential joint venture partners for production. Phase II: Evaluation of raw/frozen and canned tuna markets in U.S., Japan and Europe; evaluation of trading opportunities and initial discussions with marketing joint venture partners.

U.S. Dept. of Commerce, NMFS, Honolulu. Prepared report describing economics of Hawaii skipjack tuna industry and identified fishery development strategies and global market opportunities.

Federal Trade Commission, Bureau of Economics, Washington, D.C. Analysis of market and non-market

barriers to entering the U.S. food processing industry.

U.S. Dept. of Commerce, NMFS, Seattle. Detailed financial analysis of U.S. high seas fishing operations including bio-economic analysis based on different resource/fishing conditions and delivery/market systems at locations around the world.

U.S. Dept. of Commerce, NMFS, La Jolla, California. Survey and analysis of financial performance for west coast salmon/albacore trollers.

Federated States of Micronesia. Evaluation of U.S. and Japanese investment proposals for new port facilities and investments in national fishing industries.

United Nations, Food and Agriculture Organization, Rome, Italy. Preparation of global fisheries chapter for "U.N. Report on State of Food and Agriculture, 1980-1985."

United Nations, Food and Agriculture Organization, Rome, Italy. Evaluation of port development and seafood industry development alternatives in the southwest Pacific.

United Nations, Food and Agriculture Organization, Rome, Italy. Evaluation of proposed food processing and marketing investments in Solomon Islands and Papua New Guinea.

United Nations, Technical Assistance Program, Rome, Italy. Assessment of financial feasibility and economic impacts of alternative industrial complexes proposed for western Pacific island nations by U.S. and Japan-based multinational corporations.

U.S. Army Corps of Engineers, Water Resources Institute. Development of decision tree framework for identifying and comparing environmental restoration alternatives.

U.S. Dept. of Commerce, NOAA, NMFS. Analysis of economic data for west coast fishing industries.

U.S. Dept. of Commerce, NOAA, NMFS. A cost and earnings study of selected fish harvesting and processing industries.

Government of Solomon Islands. Evaluation of infrastructure requirements and logistical systems to support development of high seas and coastal fishing operations and seafood processing industries.

Government of Kiribati, (Gilbert Islands). Evaluation of joint-venture, fleet acquisition and fish marketing opportunities for newly formed national fisheries corporation.

State of Washington. Economic Impacts of Alternative Fishery Management Policies Related to Salmon and Sturgeon Fisheries. Conducted analysis, prepared report, and testified at Congressional and Senate hearings.

U.S. Dept. of Commerce, NMFS, Terminal Island, California. Survey and analysis of west coast shrimp and groundfish trawlers and development of economic database for vessel budget simulators.

U.S. Interstate Commerce Commission, Washington, D.C. Study of economic impacts of proposed abandonment of Eel River Line by Northwest Pacific Railroad and assessment of transportation alternatives for Humboldt County industries.

U.S. Department of Transportation, FHWA, Environment Division, Washington, D.C. Evaluate the cost and performance of wetland mitigation and mitigation banking alternatives related to highway projects.

U.S. Department of Energy; Pittsburgh Energy Technology Center. Evaluate the costs and cost-effectiveness of wetland creation, restoration, and enhancement projects associated with mitigation for wetland impacts

related to offshore oil development.

U. S. Environmental Protection Agency, Office of Policy Analysis, Washington, D.C. Integrated ecological-economic analysis of stream restoration. Evaluation of site selection criteria and the cost-effectiveness of engineered and bio-engineered alternatives.

Agency for International Development. Evaluate potential of environmental economic tools for applications involving development-environment problems in sub-Saharan Africa.

U.S. Army Corps of Engineers, Water Resources Institute. Economics of Wetland Mitigation Banks. Evaluation of economic factors affecting supply and demand for wetland mitigation credits using four case studies.

U. S. Environmental Protection Agency, Region IX (San Francisco). Regional economic profile of wetland creation and restoration activities.

U. S. Environmental Protection Agency, Region IV (Atlanta). Economics of wetland restoration and development of methodologies for estimating appropriate mitigation "compensation ratios" for wetland regulations.

U.S. Bureau of Mines. Development and testing of a training program on the economics of ecological restoration.

U.S. Department of Interior, Minerals Management Service. Estimation and valuation of potential wetland impacts from 5-year OCS oil and gas leasing program (1992-1996) in 26 OCS lease areas.

U.S. Environmental Protection Agency, Office of Policy Analysis. Development of an environmental benefits database and an analytical framework for estimating environmental protection costs.

U.S. Department of Justice, Environment Division, Washington, D.C.; Develop procedures for tracing and measuring ecological-economic linkages and estimating ecosystem values to support natural resource damage claims; provide support for related litigation.

U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. Prepared economic analysis for benefits chapter of Regulatory Impact Analysis (RIM) of proposed revision to regulations governing EPA's Spill Prevention Control and Countermeasures program for oil. Project included development of market and non-market benefits associated with fishing, hunting, boating, bench-use, and tourism.

U.S. Environmental Protection Agency, Office of Radiation Programs, Radon Division. Economic analysis of user fees for training and testing of radon professionals. Project required cost and market analysis for regional programs to certify contractor proficiency in the design and use of radon testing equipment.

U.S. Environmental Protection Agency, Office of Policy Planning and Evaluation. Assessment of how offshore oil development affects coastal tourism. Project involved a comprehensive review of literature and comments received at public hearings and the development of a work plan for quantifying adverse impacts on visitations and use of coastal recreation facilities.

U.S. Environmental Protection Agency, Office of Solid Waste. Development of methods to evaluate impacts of potentially catastrophic releases of hazardous waste on wetland functions and values in order to develop location standards.

U.S. Environmental Protection Agency, Office of Policy Analysis. Development of cost/performance guidelines for evaluating wetland creation and restoration projects.

U.S. Environmental Protection Agency, Office of Policy Analysis. Assessment of methods to value economic losses associated with the aesthetic impacts of plastic debris wash-ups on U.S. beaches.

U.S. Environmental Protection Agency, Office of Air and Radiation. Economic analysis federal indoor radon measurement training and proficiency testing program.

U.S. Environmental Protection Agency, Office of Policy Analysis. Assessment of the economic impacts of medical waste tracking systems in ten Eastern States.

U.S. Environmental Protection Agency, Office of Solid Waste. Development of rapid-response economic impact and screening tools to assess the significance and incidence of industry-specific regulatory compliance costs.

State of California, Commercial Salmon Limited Entry Review Board, Sacramento. Analysis of interim salmon management regulations and evaluation of alternatives for permanent California salmon management legislation.

SELECTED REPORTS / PUBLICATIONS

“Gaming” Ballast Water Treatment Markets, September 8, 2010; available online at <http://www.SustainableShipping.com>

Enforcement and Compliance in U.S. Commercial Fisheries: Results from Two Recent Studies; a Report to Lenfest Ocean Program; August, 2010

Verifying Compliance with Ballast Water Discharge Regulations, (with Mario N. Tamburri) Ocean Development and International Law Journal, Vol. 41, No. 2; April, 2010

Economic Structure of California's Commercial Fisheries, (with Elizabeth Price, Steven C. Hackett, and M. Doreen Hansen) a Report to California Department of Fish and Game; June 3, 2009
PDF at: <http://www.dfg.ca.gov/marine/economicstructure.asp>

Rational noncompliance and the liquidation of Northeast groundfish resources, (with Jon G. Sutinen), Marine Policy Vol. 34, No. 1; 2010

Reassessing the Value of U.S. Coast Guard At-sea Fishery Enforcement, (with Read Porter, and Elizabeth Price) Ocean Development and International Law Journal, Vol. 40, No. 4; 2009

Linking optimization and ecological models in a decision support tool for oyster restoration and management, (with E.W. North, J. Xu, R.R. Hood, R.I.E. Newell, K.T. Painter, M.L. Kellogg, M.K. Liddel, and D.F. Boesch) Ecological Applications, Vol. 20, No. 3; 2010

An Economic, Legal and Institutional Assessment of Enforcement and Compliance in Federally Managed U.S. Commercial Fisheries, (with Elizabeth Price, Anichia Van Buren, Charlotte Shearin, Kathryn J. Mengerink, Read D. Porter, Jon G. Sutinen, Andrew Rosenberg, and Jill H. Swasey) a Report supported by the Lenfest Ocean Program; March 11, 2009

Managing Patuxent River Water Quality Looking Beyond Science and Politics to the Economics of Decision-making, A Report to NOAA National Ocean Service (NOS); with Patrick Hagan, Lisa Wainger, and Nicole Chigounis; April 15, 2007

The Future of the Patuxent River - An Economic Perspective, in The Bay Journal, Vol. 16, No. 2, Alliance for the Chesapeake Bay, Annapolis, MD, February, 2007

Developing Defensible Wetland Mitigation Ratios: Standard tools for "scoring" wetland creation, restoration, enhancement, and conservation with Elizabeth W. Price, University of Maryland Center for Environmental Science, A report prepared for NOAA, Office of Habitat Protection, Silver Spring, MD; February, 2007

WTO Rules create Farm Bill opportunities for Bay farmers, in The Bay Journal, Vol. 15, No. 8, Alliance for the Chesapeake Bay, Annapolis, MD, November, 2005

Crunch Time for Water Quality Trading, in Choices, A journal of the American Agricultural Economics Association, Vol. 20, No. 1; Spring, 2005

Sparing the rod spoils the bay, in The Bay Journal, Vol. 14, No. 9, Alliance for the Chesapeake Bay, Annapolis, MD, December, 2004

Developing Defensible Wetland Mitigation Ratios: A Companion to "The Five-Step Wetland Mitigation Ratio Calculator" by Dennis M. King and Elizabeth W. Price, University of Maryland, Center for Environmental Science; a report prepared for the NOAA, Habitat Protection Division, September 30, 2004

Development of Indicators to Assess Economic Vulnerabilities to Changes in Ecosystem Services: Case Study of Counties in Maryland, USA, with Lisa A. Wainger, et. al., Environmental Management, Vol. 34, No. 5, Springer Publishers, New York, December, 2004

Trade-Based Carbon Sequestration Accounting, in Environmental Management, Special Issue on Carbon Sequestration, a publication of Oak Ridge National Laboratory, Oak Ridge, TN, Winter 2003.

Will nutrient credit trading ever work? An assessment of supply problems, demand problems, and institutional obstacles, with Peter J. Kuch, in The Environmental Law Reporter, a journal of the Environmental Law Institute, Washington, DC, May, 2003

Economic incentives for phasing lead out of gasoline: A review of international experiences and recommendations for the government of South Africa, (with Peter J. Kuch) in South Africa's Fuel Quality Breakthrough: Phasing out Lead in Petrol, Pretoria, South Africa; January, 2003

Managing Environmental Trades: Lessons from Hollywood, Stockholm, and Houston in The Environmental Law Reporter, a journal of the Environmental Law Institute, Washington, DC, Fall, 2002

Anatomy of "Early" Carbon Sequestration Trading: Common sense can prevent costly and embarrassing mistakes, Special Report #5, Journal of the Forum for Environmental Law, Science, Engineering, and Finance (FELSEF), Washington, DC, Summer, 2002

Comparing investments in land-based CO₂ emission offset projects: bioenergy production vs. carbon sequestration, Chapter 19 in proceedings of the Electric Power Research Institute conference on bioenergy hosted by The World Bank, November 15-16, 2001

Assessing the economic value of biodiversity using indicators of site conditions and landscape context, Chapter 7 in The Valuation of Biodiversity Benefits, Organization for Economic Cooperation and Development (OECD). Paris, November, 2001

Priorities for Weed Risk Assessment: Using Landscape Context to assess indicators of functions, services, and values (with Lisa Wainger) Chapter 4 in Weed Risk Assessment, edited by R.H. Groves, CSIRO Publishing, Collingwood, Australia, June, 2001

Compensation for Lost Ecosystem Services: The Need for Benefit-based Transfer Ratios and Restoration Criteria, (with James Boyd, and Lisa A. Wainger), Stanford Environmental Law Review Vol.

20: No. 2, May, 2001

Wetland Value Indicators for Scoring Wetland Mitigation Trades, (with Lisa Wainger, James Salzman, and James Boyd), Stanford Environmental Law Review, Vol. 20: No. 2, May, 2001

Reforestation Frequently Flooded Agricultural Land: Will a Market for Carbon Sequestration Credits Be Enough?, (with Leonard Shabham, Laura Zepp, and Lisa Wainger), Journal of Sustainable Agriculture, Spring, 2001

Expanding HGM Wetland Assessment: Linking Wetland Function with Services and Values, (with Lisa A. Wainger, Candy C. Bartoldus and James S. Wakeley), Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS, October, 2000: (PDF file at: <http://www.wes.army.mil/el/wetlands/pdfs/trel00-17.pdf>)

Ecosystem Valuation, award-winning report/website, (with Marisa Mazzotta), funded by U.S. Department of Agriculture, NRCS, and U.S. Department of Commerce, NOAA, July, 2000 (www.ecosystemvaluation.org)

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