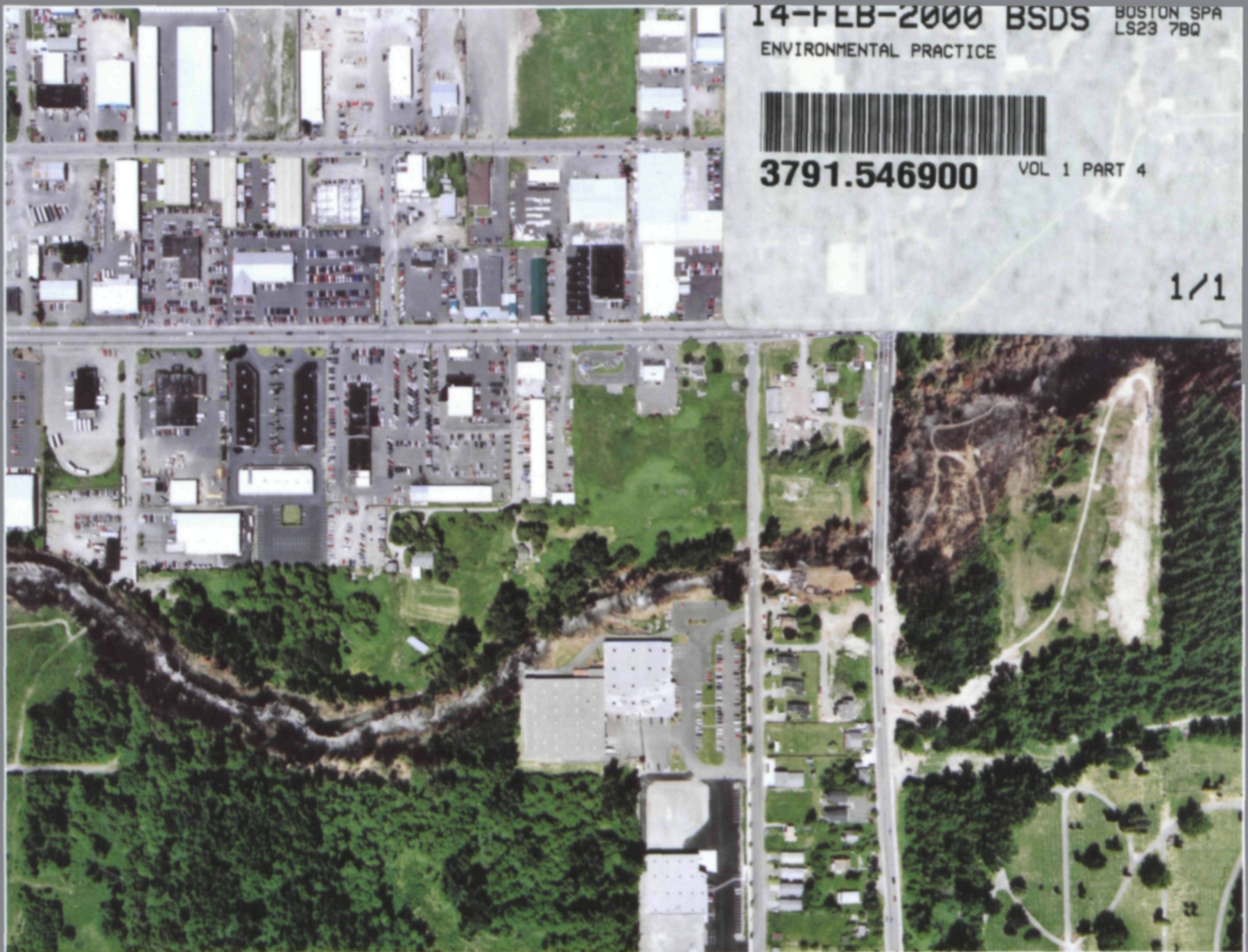


# ENVIRONMENTAL PRACTICE

Journal of the National Association of Environmental Professionals

Burned Riparian Zone Shows Dangers of Hydrocarbon Transport



NATIONAL ASSOCIATION OF ENVIRONMENTAL PROFESSIONALS

OXFORD UNIVERSITY PRESS

THE EVERGREEN STATE COLLEGE



# ENVIRONMENTAL PRACTICE

## Journal of the National Association of Environmental Professionals

Published by Oxford University Press

in cooperation with the Graduate Program in Environmental Studies, The Evergreen State College, Olympia, WA 98505

### Editor-in-Chief

John H. Perkins, PhD  
The Evergreen State College

### Managing Editor

Catherine A. French, PhD  
The Evergreen State College

### Assistant Editors

Craig Dragovich  
Susan Harris  
The Evergreen State College

### Production Assistants

Bonita Evans & Emily Jelsing  
The Evergreen State College

### Editorial Office

SEM 3127  
The Evergreen State College  
2700 Evergreen Pkwy NW  
Olympia, WA 98505  
(phone) 360-866-6000 ext 5955  
(fax) 360-867-6553  
(e-mail) frenchca@evergreen.edu

### CONTRIBUTING EDITORS

#### Central Europe

Nicola Ostertag  
Neuberstr. 25  
01307 Dresden  
Germany

#### Chapter Reports

Bruce Hasbrouck  
HDR Engineering, Inc.  
5100 West Kennedy Blvd., #300  
Tampa, FL 33609-1840

#### Committee and Working Group Reports

Gary F. Kelman  
Maryland Department of the Environment  
Water Management Administration  
2500 Broening Highway  
Baltimore, MD 21224

#### Educational Affairs and Issues

Cynthia Fridgen, PhD  
Resource Development Department  
Michigan State University  
East Lansing, MI 48824-1222

#### Environmental Communication and Public Participation

Susan L. Senecah, PhD  
Environmental Studies Department  
Marshall 107  
SUNY College of Environmental Science & Forestry  
Syracuse, NY 13210

#### Environmental Health in the Andean Region

José Suárez Torres, MD, PhD  
Fundacion Cimas del Ecuador  
Ave. America N34-274  
PO Box 17-21-942  
Quito, Ecuador

#### Environmental History and Contemporary Affairs

John Opie, PhD  
New Jersey Institute of Technology  
95 Tahoma Trail  
New Buffalo, MI 49117-9196

#### Environmental Security and Dispute Resolution

Craig B. Davis, PhD  
School of Natural Resources  
The Ohio State University  
Columbus, OH 43210-1085

#### Ethics

Tom Cuba, PhD, CEP  
Delta Seven, Inc.  
P.O. Box 3241  
St. Petersburg, FL 33731

#### Former Soviet Union and Eastern Europe

Thomas B. Rainey, PhD  
The Evergreen State College

#### Military Environmental Issues

John J. Fittipaldi, CEP  
Army Environmental Policy Institute  
Georgia Institute of Technology  
430 10th Street NW, Suite S-206  
Atlanta, GA 30318-5768

#### Natural History

Russell Rogers  
6637 Glenwood Drive SW  
Olympia, WA 98512

#### Politics

Susan Campbell  
2005 Eastside Street NE  
Olympia, WA 98506

#### Solid Waste Management

Marc C. Bruner, PhD  
Solid Waste Authority of Palm Beach County  
7501 North Jog Road  
West Palm Beach, FL 33412

#### South Asia

D. K. Banerjee, PhD  
School of Environmental Sciences  
Jawaharlal Nehru University  
New Delhi 110 067

#### Tribal Governments and Minority Cultures

Linda Moon Stumpff, DPA  
Alan Parker  
The Evergreen State College

### ADVISORY BOARD

Michael S. Baram, Esq.  
Director, Center for Law and Technology  
Boston University School of Law  
765 Commonwealth Ave, Rm 866  
Boston, MA 02215

Robert Bartlett, PhD  
Department of Political Science  
Purdue University  
West Lafayette, IN 47907

Susan Power Bratton, PhD  
Lindaman Center  
Whitworth College  
Spokane, WA 99251

Donald A. Brown  
Rachel Carson State Office Building  
400 Market Street  
9th Floor  
PO Box 8464  
Harrisburg, PA 17105-8464

John Cairns, Jr., PhD  
Department of Biology  
University Center for Environmental and Hazardous Materials Studies  
Virginia Polytechnic Institute and State University  
Blacksburg, VA 24061-0415

Richard A. Carpenter  
Rt. 5, Box 277  
Charlottesville, VA 22901

Robert H. Harris, PhD  
Environ Corporation  
214 Carnegie Center  
Princeton, NJ 08540-6284

Carolyn T. Hunsaker, PhD  
Oak Ridge National Laboratory  
PO Box 2008  
Oak Ridge, TN 37831-6038

James L. Jaffe, Esq.  
Jaffe, Trutanich, Scatena & Blum  
250 Montgomery Street, Suite 900  
San Francisco, CA 94104

Burton C. Kross, PhD  
Department of Preventive Medicine and Environmental Health  
University of Iowa  
Iowa City, IA 52242

Charles Malone, PhD, CEP  
State of Nevada  
Agency for Nuclear Projects  
Nuclear Waste Project Office  
Capitol Complex  
Carson City, NV 89710

Richard McLean, PhD  
PTRL Environmental Services  
12700 Shelbyville Road  
Danville Building  
Louisville, KY 40243

Bruce Piasecki, PhD  
Rensselaer Polytechnic Institute  
110 8th Street  
Troy, NY 12180

Edwin Pister  
Desert Fishes Council  
PO Box 337  
Bishop, CA 93514

David Orr, PhD  
Environmental Studies Program  
Oberlin College  
Oberlin, OH 44074-1095

Joseph C. Reinert, PhD  
Office of Policy Development  
(2123)  
US Environmental Protection Agency  
401 M Street SW  
Washington, DC 20460

David J. Scheaffer  
EcoHealth Research Inc.  
701 Devonshire Dr. #209  
Champaign, IL 61820

Chris Whipple, PhD  
ICF Consulting  
2101 Webster Street, Suite 1000  
Oakland, CA 94612-3060

*Environmental Practice* is the successor to *The Environmental Professional*, which appeared from 1978-1995. *Environmental Practice* will endeavor to honor the fine traditions established by *The Environmental Professional* while simultaneously opening new avenues of discussion on environmental issues.

# CONTENTS

---

## POINTS OF VIEW

<i>J. H. Perkins</i>	EDITORIAL: Safety in Moving and Storing Petroleum Products	173
<i>A. J. McCusker</i>	FROM THE PRESIDENT OF NAEP: 2000! NAEP's Birthday	175
<i>M. C. Bruner</i>	PERSPECTIVE: Speaking of Solid Waste	176
<i>G. F. Kelman</i>	PERSPECTIVE: Tag Line, You're It: A Frank Discussion of the Need for a National Credential for Environmental Professionals	178
<i>D. C. Guzewich</i> & <i>P. A. Timm</i>	PERSPECTIVE: Opportunity May Be Knocking: A New Paradigm for Defense Department Installation Environmental Management	180
<i>J. M. Souby</i>	PERSPECTIVE: Enlibra: A New Shared Doctrine for Environmental Management and the Evolution of Environmental Policy in the West	181

## NEWS & INFORMATION

<i>M. E. Cast</i>	Public Involvement Challenges in Developing a Defense Department 'Range Rule'—An Analysis	186
<i>M. Willis</i>	Environmental Business Opportunities in Pollution Prevention in Latin America	189
<i>N. Bhat</i>	Environmental Practices vis-à-vis Industrialization: An Indian Scenario	193
<i>H. J. Hounq</i>	Industrial Waste Management in Taiwan	196
<i>UFZ Staff</i>	Introducing the UFZ Centre for Environmental Research Leipzig-Halle	200
<i>G. F. Kelman</i>	NAEP Working Group News	202
<i>B. Hasbrouck</i>	NAEP Chapter News	203
	Other News of the Association	204

## FEATURES & REVIEWS

<i>C. B. Johnson,</i> <i>G. W. Weaver, &amp;</i> <i>D. P. Larsen</i>	RESEARCH ARTICLE: A Comparison of Land Use and Land Cover Data in Watersheds of the Mid-Atlantic Region, USA	209
<i>S. Simon</i>	ENVIRONMENTAL REVIEW: A Framework for Sustainable Water Management: Integrating Ecological Constraints in Policy Tools in the United Kingdom	227
<i>J. P. Tiefenbacher</i> & <i>C. W. Chandler</i>	RESEARCH ARTICLE: Factors Affecting Hydrocarbon Vapor Transport from Leaking Petroleum Storage Tanks to Buildings	239
<i>C. Fridgen,</i> <i>H. Haas,</i> & <i>P. Kakela</i>	RESEARCH ARTICLE: Estimating the Value of a State's Waste Stream	247
<i>G. S. Comp</i>	BOOK REVIEW: Jo Treweek, <i>Ecological Impact Assessment</i>	255

*Continued*

<i>H. M. Draper</i>	BOOK REVIEW: Virginia H. Dale & Mary R. English, eds., <i>Tools to Aid Environmental Decision Making</i>	256
<i>C. A. French</i>	BOOK REVIEW: Michael Brower & Warren Leon, <i>The Consumer's Guide to Effective Environmental Choices: Practical Advice from the Union of Concerned Scientists</i>	258

<b>CONTRIBUTORS</b>		260
---------------------	--	-----

<b>VOLUME 1 INDEX</b>		263
-----------------------	--	-----

*On the Cover:* Burned riparian area resulted from the rupture of a petroleum-products pipeline in Bellingham, Washington, on June 10, 1999. Approximately 277,000 gallons of fuel spilled into Whatcom Creek (flowing from right to left), and the vapors were ignited by children playing with a fireplace lighter. Three people died in the resulting fire, and \$3.5 million in damages resulted. Petroleum pipelines and storage tanks pose dangers to life and property. See Editorial (page 173) and Research Article (pages 239–246) for additional information. Photo courtesy of Washington State Department of Transportation Aerial Photography.

*Environmental Practice* (ISSN 1466-0466) is a quarterly journal published by Oxford University Press, 2001 Evans Rd., Cary, NC 27513-2009 for the National Association of Environmental Professionals. The editorial office is at The Evergreen State College, Olympia, WA, 98505.

**Subscriptions:** Subscription is included with membership in the National Association of Environmental Professionals. All other subscriptions include four issues and begin with the first issue of the current volume. The annual rates (Volume 1, 1999) are £55 (UK & Europe), US\$80 (USA & elsewhere) for individuals; £86 (UK & Europe), US\$125 (USA & elsewhere) for institutions. Single issues are available for £17 (UK & Europe), US\$25 (USA & elsewhere) for individuals; £27 (UK & Europe), US\$39 (USA & elsewhere) for institutions. All prices include postage. Individual rates apply only when issues of the journal are sent to a private address and payment is made by personal check or credit card. All requests for subscriptions, single issues or back issues, changes of address, and claims for missing issues should be sent to:

North America: Oxford University Press, Journals Customer Service, 2001 Evans Road, Cary, NC 27513-2009, USA Toll-free in the USA and Canada 800-852-7323 or 919-677-0977. Fax: 919-677-1714. E-mail: [jnlorders@oup-usa.org](mailto:jnlorders@oup-usa.org)

Elsewhere: Oxford University Press, Journals Customer Service, Great Clarendon St., Oxford OX2 6DP, UK. Tel: +44 1865 267907. Fax: +44 1865 267485. E-mail: [jnl.orders@oup.co.uk](mailto:jnl.orders@oup.co.uk)

**Advertising:** Contact Journals Advertising at 919-677-0977, x 5256.

**Requests for permissions, reprints, and photocopies:** All rights reserved; no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photo-

copying, recording, or otherwise, without either prior written permission of the publisher (Oxford University Press, Journals Special Sales, Great Clarendon St., Oxford OX2 6DP, UK; Tel: +44 1865 267561, fax: +44 1865 267985) or a license permitting restricted copying issued in the USA by the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923. Fax: 508-750-4744 or in the UK by the Copyright Licensing Agency Ltd., 90 Tottenham Court Road, London W1P 9HE, UK. Reprints of individual articles are available only from the authors.

**Copyright:** It is a condition of publication in the journal that authors grant exclusive copyright license to the National Association of Environmental Professionals. Requests for permission to reprint material found in the journal should come to Oxford University Press. This ensures that requests from third parties to reproduce articles are handled efficiently and consistently and will also allow the article to be as widely disseminated as possible. Authors may use their own material in other publications provided that the journal is acknowledged as the original place of publication and Oxford University Press is notified in writing and in advance.

**Abstracting/indexing:** *Environmental Practice* is indexed in *Pollution Abstracts*.

*Environmental Practice* is printed on acid-free paper that meets the minimum requirements of ANSI Standard Z39.48-1984 (Permanence of Paper). The paper is 100% recycled with 30% post-consumer waste.

Copyright © 1999 National Association of Environmental Professionals

**Postal Information:** *Environmental Practice* is published quarterly by Oxford University Press, 2001 Evans Road, Cary, NC 27513-2009. Postmaster: Send address changes to *Environmental Practice*, Journals Subscription Department, Oxford University Press, 2001 Evans Rd., Cary, NC 27513-2009, USA.

---

## Mission Statement for *Environmental Practice*

### Aims and Scope

*Environmental Practice* is the official journal and newsletter of the National Association of Environmental Professionals (NAEP). The central purpose of *Environmental Practice* is to provide an open forum to NAEP members and other concerned individuals for the discussion and analysis of significant environmental issues. Research Articles, Environmental Reviews, and Commentaries appearing in *Environmental Practice* are peer-reviewed and aim for the highest standards of professional quality.

*Environmental Practice* is a source for continuing professional renewal and development. It aims to serve men and women at all stages of their careers, from initial training through mid- and senior-levels. Environmental work is an exciting, dynamic field, and *Environmental Practice* strives to match that pace with lively and timely commentary on the critical issues of the day. *Environmental Practice* aims to provide authoritative discussion on issues of wide interest to the international community of environmental professionals.

Professionals from many different disciplinary backgrounds, working in many different arenas, are faced with developing imaginative approaches for the practical resolution of a wide variety of environmental problems. *Environmental Practice* provides a comprehensive outlet for the publication

of such interdisciplinary findings. This publication actively seeks breadth of viewpoint and method because it holds that solutions to environmental problems are often to be found in understanding the linkages among issues previously considered separate. Periodically, *Environmental Practice* will devote its pages to selected topics of special concern to a significant segment of the readership.

Priority for publication is given to articles that offer insightful views on the importance and interpretation of results from an interdisciplinary perspective. Reports of findings should go beyond a laboratory analysis, a field experiment, a philosophical discussion, or a theoretical modeling, for example, and discuss the implications of the findings for public policy or professional practice. *Environmental Practice* seeks especially to publish studies that link data and findings in science and technology with issues of public policy, health, environmental quality, law, political economy, management, and the appropriate standards for expertise. Many publications achieve excellence through tightly focused specialization, but in contrast *Environmental Practice* seeks its accomplishments through the promotion of excellent research and writing on the common interests among different kinds of specialists.

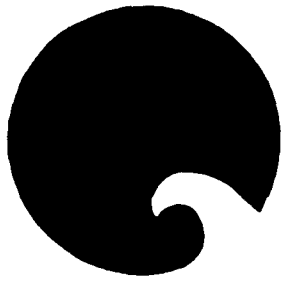
For the NAEP membership, *Environmental Practice* will carry NAEP news (national and chapter), and brief sketches of representative professional activities and issues. Whenever possible, *Environmental Practice* will seek to draw connections among current events, statements from leaders, pertinent research and scholarship, and NAEP concerns.



**Seafood  
Arts Districts  
Waterfront  
Museums  
Parks  
Seminars  
Workshops  
Networking  
Technical Tours  
Outdoor Recreation**



**NAEP's 25<sup>TH</sup> ANNUAL CONFERENCE**  
*"Overcoming Barriers to Environmental Improvement"*



**Portland, Maine**  
**June 25 - 29, 2000**



*For more information contact Lance McCold at  
(phone) 423-574-5216  
(e-mail) [mccoldln@ornl.gov](mailto:mccoldln@ornl.gov)  
(web) [www.naep.org](http://www.naep.org)*

**Proposed Tracks**

**Regulatory Issues**

**Utilities**

**NEPA**

**Transportation**

**Training & Higher Education**

**Coastal Zone Management**

**Environmental Management**

**Issues for Federal & State Environmental Programs**

**Place-Based Environmental Management**

**Public Involvement**