

May 15, 1995

EPA-SAB-RSAC-95-012

Honorable Carol M. Browner
Administrator
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, DC 20460

Subject: SAB Award Recommendations for the 1994 Scientific
and Technological Achievement Awards Program

Dear Ms. Browner:

The Science Advisory Board's 1994 Scientific and Technological Achievement Awards (STAA) Subcommittee has completed its review of the 115 papers nominated by the Agency for this year's awards program. As you are aware, the STAA program is sponsored by the Office of Research and Development (ORD), which has done a good job in soliciting and assembling these nominations. Each year the Board convenes a special panel to review nominated papers published by Agency researchers. Our recommendations for awards and further improvements in the STAA program are discussed in the enclosed report.

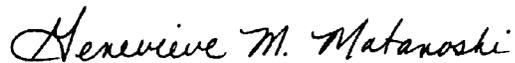
The Subcommittee feels that the overall quality of the papers nominated is good and the percentage of papers recommended for awards (32 percent) this year is similar to the percentage of papers recommended for awards last year. The Subcommittee is recommending a total of 37 awards, including awards for papers in each of the seven nomination categories. This year for the first time, an award was recommended in the Risk Management and Policy Formulation category. The Subcommittee is also recommending eleven papers for honorable mention in the hope that these promising research activities will be completed. In view of the Agency's emphasis on regulations based on sound science, we hope to see more high quality, peer-reviewed nominations of this nature in the near-term future. Authors recommended for awards this year are all nominated from within the Office of Research and Development; representing eleven research laboratories and the Office of Health Research. We recommend that ORD announce this program earlier next year, so other program offices will be encouraged to nominate peer reviewed papers.

The Subcommittee encourages the Agency to nominate peer-reviewed papers from all programs and areas of scientific research because scientific and technological achievements should not be limited to ORD or to EPA laboratories. The process of publishing EPA scientific findings in peer reviewed journals enhances the rigor of the science and the reputation of the Agency and its programs. Managers should provide opportunities for their program scientists to publish the data and technical analysis which supports the Agency's policies and regulations.

Although the papers nominated represent achievements in several important areas, the Subcommittee believes that the Agency's scientists should also be publishing papers in several other areas that are critical to achieve the Agency's goals. These areas include: Ecosystem Protection, Reducing the Uncertainties in Risk Assessments, Integrated Risk Assessments, Social Science Research on Risks and their Drivers, Regulatory Impact Assessment, and Environmental Risk Communication.

The Subcommittee continues to feel that the STAA program is an important mechanism for recognizing and promoting high quality, peer-reviewed work published in top scientific and technological journals. We are pleased to have participated in this process and believe it is appropriate for the Board to continue this annual review function. We would appreciate being informed of the final disposition of awards, and we look forward to serving the Agency again in this important activity.

Sincerely,



Dr. Genevieve Matanoski, Chair
Executive Committee
Science Advisory Board



Dr. Margaret Kripke, Chair
Research Strategies Advisory
Committee



Dr. Kenneth L. Dickson, Chair
1994 Scientific and
Technological Achievement
Awards Subcommittee

Enclosure

U.S. ENVIRONMENTAL PROTECTION AGENCY

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ABSTRACT

This report represents the conclusions and recommendations of the U.S. Environmental Protection Agency's Science Advisory Board regarding the 1994 EPA Scientific and Technological Achievement Awards (STAA) program. The STAA Subcommittee of the Science Advisory Board reviewed and evaluated the 115 papers nominated in seven scientific and technical categories for the 1994 STAA awards. The Subcommittee recommended 37 papers (32 percent of the nominations) for awards at three levels and also recommended to the Office of Research and Development (ORD) that additional papers be recognized with honorable mention. The Subcommittee recommended awards for papers from eleven EPA research laboratories and the Office of Health Research in ORD. The Subcommittee encouraged the Agency to continue support for the STAA program as a mechanism for recognizing and promoting high quality research in support of the Agency's mission.

KEY WORDS: Awards, Scientific Achievements

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1. EXECUTIVE SUMMARY

The Scientific and Technological Achievement Awards (STAA) Subcommittee of the Science Advisory Board (SAB) reviewed and evaluated the 1994 nominations for the STAA program. The Subcommittee evaluated 115 nominations of scientific and technical papers that were nominated by EPA research laboratory directors and program office division directors. The Subcommittee met in Washington, D.C., on March 23-24, 1995, to determine award recommendations.

The Subcommittee recommended thirty-seven papers for awards and recommended that eleven additional papers be recognized with honorable mention. The Subcommittee applied the evaluation criteria evenly across all nomination categories, without attempting to ensure equal numbers or percentages of awards in each category. The Subcommittee recommended awards for papers from eleven EPA research laboratories and the Office of Health Research within the Office of Research and Development.

2. INTRODUCTION

2.1 Request for Science Advisory Board Review

At the request of the Office of Research and Development (ORD), the Science Advisory Board agreed to convene a subcommittee to review and evaluate scientific and technological papers published in peer-reviewed journals by EPA authors and nominated for the 1994 EPA Scientific and Technological Achievement Awards (STAA) program. The STAA Subcommittee was asked to evaluate nominated papers for awards based on the rules developed by ORD. In December 1994, the Office of Research Program Management (ORPM) in ORD provided the SAB with copies of 115 nominations, and the 1994 STAA Nomination Procedures and Guidelines, which describe the award levels, eligibility criteria (including the minimum EPA contribution and employer status of the principal author), and the criteria the SAB uses to evaluate the nominations. ORPM grouped the papers into seven categories of science and technology, and screened the papers for conformance with the nomination guidelines.

As described in the 1994 STAA Nomination Procedures and Guidelines, the SAB was asked to recommend papers for each of three Levels of Award. Level I awards are for authors who have accomplished an exceptionally high-quality research or technological effort with national significance. These awards recognize the initiation or general revision of scientific/technological principles or procedures, or highly significant improvement in the value of a device, activity, program, or service to the public. Level II awards are for authors who have accomplished a notably excellent research or technological effort. These awards are for research with timely consequences which contributes to an important achievement within its discipline or field of study. Level III awards are for authors who have accomplished an unusually notable research or technological effort. Research for this award must relate to a mission or organizational component of the EPA, or significantly affect a relevant area of science/technology.

2.2 Subcommittee Review Procedures

Copies of all papers and the award program guidelines and nomination evaluation criteria were provided to Subcommittee members in advance of the review meeting. Subcommittee members selected papers to review based on their expertise. As part of the evaluation, Subcommittee members were also asked to rank their own expertise in the field of science and technology addressed by each paper they selected to review. Each paper was read by at least two qualified Subcommittee members prior to the

meeting and presented to the Subcommittee at the evaluation meeting.

In reviewing the papers, the Subcommittee members qualitatively considered evaluation criteria factors such as: the overall impact of the nominated paper(s) on scientific knowledge or technology relevant to environmental issues; the level of effort; the creativity, originality, initiative, and problem solving ability of the researchers; the beneficial impacts of the accomplishments and the recognition of the results outside the Agency; the extent to which an Agency function, mission, program, activity, or service is improved; and the nature and extent of the peer review, including the stature of the journal.

The Subcommittee met on March 23-24, 1995, in Washington, DC in a closed meeting due to the discussions of individual performance and potential cash awards. Consistent with the requirements of the Federal Advisory Committee Act, this closed meeting was announced in a Federal Register notice signed by the EPA Administrator. All Subcommittee members were present. The Subcommittee developed preliminary ratings for papers in each category, including discussion of each nominated paper. The Subcommittee made note of papers which had been incorrectly categorized, so that the final report recommendations would accurately reflect the subject areas of the nominated papers (see Appendix A). After completing all preliminary evaluations, the Subcommittee revisited the recommendations category by category to resolve any final issues, and ensure consistency in applying the award criteria across categories.

3. EVALUATION OF THE 1994 SCIENTIFIC AND TECHNOLOGICAL ACHIEVEMENT AWARDS NOMINATIONS

3.1 General Findings of the Subcommittee

The Subcommittee felt that the overall quality of the papers nominated was good, continuing a trend from past years. The Agency should continue to focus on improving the quality of its in-house research. The STAA program is an important mechanism for recognizing and promoting high quality, peer-reviewed work published in top scientific and technological journals. The authors recommended for awards this year are all from the Office of Research and Development. In the past, nominations have included several program offices and regional Environmental Services laboratories. The Subcommittee recommends that ORD request the submission of nominations earlier (perhaps in August), so that program offices have adequate time to prepare their nominations.

The Subcommittee also encourages the Agency to continue to broaden the scope of nominated papers and to promote multi-disciplinary research and those which directly support risk management and policy decisions. In evaluating nominations for awards, the Subcommittee looks for papers with well-developed hypotheses, good sampling or experimental design, where the theoretical basis is verified by field validation or through testing of a model. They also look for innovative applications of theories from other disciplines and collaborations of interdisciplinary teams of scientists and engineers.

In the interest of maintaining and improving the quality of the papers nominated for STAA awards, the Subcommittee urges greater involvement by EPA Laboratory and Office Directors in screening nominations for high scientific/technical merit and consistency with the eligibility criteria. The nomination statement is important in providing a context for the research, particularly where the paper is one in a series of published works. The Subcommittee found this information very helpful in evaluating the papers. The Subcommittee offers several recommendations (see section 3.2) for simplifying this section of the nomination form. While, the Subcommittee feels that nomination statements should not be written by the author(s), the statements should be verified for accuracy. In several instances where the first author of the nominated paper was not an EPA employee, the required justification provided for the nomination was not convincing or it was not provided.

In order to evaluate papers which present incremental results in a series of published works, the Subcommittee recommends that

the nomination guidelines prepared by ORD explicitly require discussion of related research published previously by the lead author(s), including information on any STAA awards given. When possible, nominations should include all papers in a series, providing they are within the time limit. This would allow a series of incremental studies to be evaluated for an award as a package. Many of the papers recommended for Honorable Mention appear to be part of a logical progression of research and testing. The Subcommittee has added citations for Honorable Mention papers again this year which ORD may wish to include in any subsequent correspondence with these authors. The citations may also indicate areas of research and analysis which could strengthen the merits of future nominations.

The 1994 STAA program represents the first time that the STAA Subcommittee has recommended a paper in the Risk Management and Policy Formulation category for an award. The Subcommittee hopes to see more peer reviewed papers nominated in the Risk Management and Policy Formulation category next year, as this is an important area of research for the Agency. The Subcommittee feels that the process of converting Agency policy analysis and the technical foundations of its rule making into scientific articles for peer review is essential to maintain the quality in its science. This is also an important way to improve the Agency's reputation for scientific achievement. Laboratory directors and program managers should encourage the authors of policy formulation papers and regulatory impact analyses to develop technical articles for peer reviewed literature.

Finally, the Subcommittee believes that the STAA program provides one view of the technical and scientific progress that the Agency is making in various areas of research. This year's activities represent strengths in a variety of technological assessments, analytical measurements, and in certain areas of human health effects research. The Subcommittee would also like to encourage the nomination of more, high quality peer reviewed papers related to the following categories:

- a. Watersheds and Ecosystem protection
- b. Environmental risk communication and perception
- c. Social Science Research on Risks
- d. Environmental Economics-technical support for regulatory impact analyses
- e. Environmental Education
- f. Ecological Risk Assessment-including assessments of landscape scale changes

g. Environmental Trends for Drivers of Future Risks-demographics, energy, consumerism, technology

3.2 STAA Program Administrative Recommendations

The Subcommittee commends the staff of ORPM for administering the STAA program. The staff has made significant improvements in the program and the nomination packages which have improved the program. The Subcommittee recommends that ORD management solicit participation of other Agency scientists as part of the Agency's goals to improve its scientific underpinnings and peer review of regulatory science. The following recommendations are directed to the ORD staff and managers that work with the STAA program.

ORD should revise and consolidate the STAA Program nomination forms to provide the nominators with information on the criteria that the SAB Subcommittee will use to evaluate the nominations. The Subcommittee observed that the current nomination form which includes information 1) nominee(s) accomplishments, 2) merits of the nomination, and 3) significance of the research, is often redundant and may be inconsistent with the evaluation criteria used by the Subcommittee. The Subcommittee recommends that these sections be combined to avoid some of the confusion and redundancy in the current form. The Subcommittee also recommends that the form be modified to require succinct information on the following evaluation criteria:

- a. Relevance of the scientific contribution to the advancement of scientific or technical knowledge on environmental issues
- b. Evidence of the originality, creativeness, initiative, and problem solving ability of the researchers
- c. Identification of the extent to which environmental protection has been strengthened by improving an EPA function, program, product, activity, or service
- d. When available, evidence of the recognition of the contribution from outside EPA
- e. An explanation of the nature of peer review (Note that this is particularly important to the Subcommittee for Book Chapters and some review articles).

The Subcommittee noted that nominating laboratories and program offices appear to have different screening procedures for selecting nominations for the STAA program. The Subcommittee encourages ORD to provide guidance to all EPA laboratories and program offices regarding the criteria for selecting nominees to the STAA program. The Subcommittee recommends that the STAA nomination form include information on the total number of peer

reviewed publications produced by the nominating organization during the nomination year and during the preceding two years. The total number of publications screened for submission to the STAA program should also be identified along with the total number submitted.

Finally, the Subcommittee again urges the Agency to publicize the names of the award winning scientists and their papers both within the Agency and outside the Agency in a variety of ways. For example, the Agency should announce these winners and make copies of their papers available through the Internet. The Agency should also develop press releases or letters from the Administrator that are targetted toward the journal that published the articles, professional society newsletters, and local newspapers in the vicinity of the scientists research facility.

3.3 Award Recommendations

The EPA authors recommended for awards include scientists from EPA research laboratories and one office within ORD. Awards were recommended for each of the seven nomination categories. A total of 37 papers were recommended for awards. A summary of the distribution of award recommendations among categories is presented in Table 1.

Table 1: Summary of 1994 Award Recommendations

Nomination Categories	Number Nominated ¹	Award Levels			Total Awards	Total (Percent)
		III	II	I		
Control Systems & Technology	18	4	1	-	5	(27%)
Ecology	12	3	1	-	4	(33%)
Health Effects	37	7	-	2	9	(24%)
Monitoring & Measurement Methods	23	5	2	-	7	(30%)
Review Articles	8	3	-	1	4	(50%)
Risk Management & Policy Formulation	4	-	1	-	1	(25%)
Transport & Fate	13	3	3	1	7	(54%)
Totals	115	25	8	4	37	(32%)

¹ Reflects papers as recategorized by the Subcommittee (see Appendix A)

The Subcommittee recommendations for awards are listed below by level of award. The category for each award is identified along with the number of the nomination. The seven categories defined by the STAA Program are abbreviated as follows: Control Systems and Technology (C94), Ecology (E94), Health Effects (H94), Monitoring and Measurement Methods (M94), Review Articles (R94), Risk Management and Policy Formulation (P94), and Transport and Fate (T94). Each award recommendation includes the nomination number (underlined).

3.3.1 Level I Award

1. For outstanding scientific achievements in environmental chemical carcinogenesis. H94-20

Title: 1 Cyclopenta[cd]Pyrene-Induced Tumorigenicity, Ki-ras Codon 12 Mutations and DNA Adducts in Strain A/J Mouse Lung Journal: Carcinogenesis Volume: 15 Number: 4 Pages: 601-606, 1994

Title: 2 Ki-ras Oncogene Mutations in Tumors and DNA Adducts Formed by Benz[j]Aceanthrylene and Benzo[a]Pyrene in the Lungs of Strain A/J Mice Journal: Molecular Carcinogenesis Volume: 8 Number: Pages: 186-192, 1993

Nominating Organization:
Health Effects Research Laboratory

EPA Author(s):

Dr. Stephen Nesnow
Dr. Jeffrey A. Ross
Ms. Barbara C. Roop
Dr. Marc J. Mass

Non-EPA Author(s):

Mr. Garret Nelson
Ms. Katrina Wilson
Ms. Anita Jeffers
Dr. Anthony J. Galati
Dr. Gary D. Stoner
Dr. Ramish Sangaiah
Dr. Avram Gold

2. For research on biologically-based dose response modeling for developmental toxicology. H94-30

Title: Biologically Based Dose-Response Modeling in Developmental Toxicology: Biochemical and Cellular Sequelae of 5-Fluorouracil Exposure in the Developing Rat. Journal: Toxicology and Applied Pharmacology Volume: 126 Number: 1 Pages: 129-144, May 1994

Nominating Organization:
Health Effects Research Laboratory

EPA Author(s):

Mr. Christopher Lau
Mr. Woodrow Setzer

Mr. Robert J. Kavlock
Mr. John M. Rogers

Non-EPA Author(s):

Ms. Dana L. Shuey
Ms. Tina Logsdon
Dr. Robert Zucker
Dr. Kenneth Elstein
Mr. Michael Narotsky

3. For enhancing the understanding of problem nitrous oxide in the atmosphere, in combustion and in industrial systems. **R94-08**

Title: Nitrous Oxide Behavior in the Atmosphere and in Combustion and Industrial Systems
Journal: Progress in Energy and Combustion Science Volume: 20 Pages: 149-202, August 1994

Nominating Organization:

Air and Energy Engineering Research Laboratory

EPA Author(s):

Dr. William P. Linak

Non-EPA Author(s):

Dr. John C. Kramlich

4. For scientific advances in the computation and prediction of physioco-chemical properties of organic chemicals Papers T94-08 and M94-24

Title: Estimation of Ionization Constants of Azo Dyes and Related Aromatic Amines:
Environmental Implication Journal:
Journal of Physical Organic Chemistry Volume: 7 Pages: 122-141, 1994

Nominating Organization:

Environmental Research Laboratory - Athens

EPA Author(s):

Mr. George L. Baughman
Dr. Samuel W. Karickhoff

Non-EPA Author(s):

Dr. S.H. Hilal
Dr. L.A. Carreira
Mr. C.M. Melton

AND

Title: Estimation of Gas-Liquid Chromatographic Retention Times from Molecular Structure
Journal of Chromatography A Volume: 662 Pages: 269-280, 1994

Nominating Organization:
Environmental Research Laboratory - Athens

EPA Author(s):
Dr. Samuel W. Karickhoff

Non-EPA Author(s):
Dr. Said Hilal
Dr. L.A. Carreira
Mr. C.M. Melton

3.3.2 Level II Award

1. For elucidating the role of combustion and sorbent parameters in prevention of polychlorinated dibenzodioxin/dibenzofuran formation. **C94-08**

Title: Role of Combustion and Sorbent Parameters in Prevention of Polychlorinated Dibenzo-p-Dioxin and Polychlorinated / Dibenzofuran Formation During Waste Combustion
Journal: Environmental Science and Technology Volume: 28 Number: 1 Pages: 107-118, January 1994

Nominating Organization:
Air and Energy Engineering Research Laboratory

EPA Author(s):
Dr. Brian K. Gullett
Dr. Paul M. Lemieux

Non-EPA Author(s):
Dr. James E. Dunn

2. For outstanding research in the area of plant metabolism and carbon flux in ecosystems. E94-03

Title: Mycorrhizae Alter Quality and Quantity of Carbon Allocated Below Ground Journal:
Nature Volume: 369 Pages: 58-60, May 1994

Nominating Organization:

Environmental Research Laboratory - Corvallis

EPA Author(s):

Dr. Paul T. Rygiewicz
Dr. Chris P. Andersen

3. For contributions to estimating the exposure and risk from ambient particle-bound pollution. M94-06

Title: Exposure and Risk from Ambient Particle-Bound Pollution in an Airshed Dominated by Residential Wood Combustion and Mobile Sources Journal: Environmental Health Perspectives Volume: 102 Number: Supplement 4 Pages: 75-84, October 1994

Nominating Organization:

Atmospheric Research and Exposure Assessment Laboratory

EPA Author(s):

Dr. Larry T. Cupitt
Dr. Joellen Lewtas

Non-EPA Author(s):

Mr. W. Graham Glen

4. For innovative research in environmental chromatigraphic analyses. M94-17

Title: Determination of Polar Volatile Organic Compounds in Water by Membrane Permeate and Trap GC-MS Journal of Chromatographic Science Volume: 31 Pages: 279-284, July 1993

Nominating Organization:

Environmental Monitoring Systems Laboratory - Cincinnati

EPA Author(s):

Dr. Jody A. Shoemaker
Mr. Thomas A. Bellar
Mr. James W. Eichelberger
Dr. William L. Budde

5. For contributions to regulatory policy concerning demolition of buildings containing asbestos construction materials. P94-04

Title: Asbestos Release from the Demolition of Two Schools in Fairbanks, Alaska Journal: Applied Occupational and Environmental Hygiene Volume: 9 Number: 6 Pages: 409-417, June 1994

Nominating Organization:

Risk Reduction Engineering Laboratory

EPA Author(s):

Mr. Roger C. Wilmouth

Non-EPA Author(s):

Mr. Michael S. Taylor

Ms. Barbara E. Meyer

6. For outstanding research on the photochemistry of Iron (III)-Polycarboxylate complexes. T94-03

Title: Photochemistry of Aqueous Iron(III)-Polycarboxylate Complexes: Roles in the Chemistry of Atmospheric and Surface Waters Journal: Environmental Science & Technology Volume: 27 Number: 12 Pages: 2517-2522, 1993

Nominating Organization:

Environmental Research Laboratory - Athens

EPA Author(s):

Dr. Richard G. Zepp

Non-EPA Author(s):

Dr. Bruce Faust

7. For contributions to modeling volatile organic compound emissions from U.S. forests. T94-11

Title: An Improved Model for Estimating Emissions of Volatile Organic Compounds from Forests in the Eastern United States Journal of Geophysical Research (atmospheres) Volume: 99 Number: D6 Pages: 12773-91, June 1994

Nominating Organization:

Air and Energy Engineering Research Laboratory

EPA Author(s):

Mr. Christopher D. Geron

Non-EPA Author(s):

Mr. Thomas E. Pierce

Dr. Alex Guenther

8. For the development, application, and validation of a bioaccumulation model for dioxin-like compounds. T94-13

Title: Development and validation of an air-to-beef food chain model for dioxin-like

compounds Journal: The Science of the Total Environment Volume: 156 Pages: 39-65,
November 11, 1994

Nominating Organization:
Office of Health and Environment Assessment

EPA Author(s):
Mr. Matthew Lorber

3.3.3 Level III Awards

1. For contributions to the fate of trace metals in incineration. C94-05

Title: Pilot-Scale Research on the Fate of Trace Metals in Incineration Journal: "Issues in Environmental Science and Technology: Waste Incineration and the Environment," Royal Society of Chemistry* Volume: 2 Pages: 95-112, July 1994

Nominating Organization:
Risk Reduction Engineering Laboratory

EPA Author(s):
Mr. Gregory J. Carroll

2. For contributions to understanding alternative disinfectants for drinking water. C94-06

Title: Alternative Disinfectants For Drinking Water Treatment Journal: American Society of Civil Engineers Journal of Environmental Engineering Volume: 120 Number: 4 Pages: 745-758, July/August 1994

Nominating Organization:
Risk Reduction Engineering Laboratory

EPA Author(s):
Mr. Benjamin W. Lykins, Jr.
Ms. Kathleen S. Patterson

Non-EPA Author(s):
Mr. Wayne E. Koffskey

3. For assessment of field scale systems for removal of creosote and pentachlorophenol from ground water. C94-10

Title: 1 Field-Scale Testing of a Hyperfiltration Unit for Removal of Creosote and

Pentachlorophenol from Ground Water: Chemical and Biological Assessment Journal: Archives of Environmental Contamination and Toxicology Volume: 26 Number: 3 Pages: 309-319, February 1994

Title: 2 Field-Scale Testing of a Two-Stage Bioreactor for Removal of Creosote and Pentachlorophenol from Ground Water: Chemical and Biological Assessment Journal: Archives of Environmental Contamination and Toxicology Volume: 26 Number: 3 Pages: 320-328, February 1994

Nominating Organization:
Environmental Research Laboratory - Gulf Breeze

EPA Author(s):

Dr. Douglas P. Middaugh

Non-EPA Author(s):

Mr. R. L. Thomas

Ms. S. E. Lantz

Ms. C. S. Heard

Dr. J. G. Mueller

4. For characterizing the operating conditions necessary to minimize emissions from emergency safety venting of rotary kilns. [C94-14](#)

Title: Operating Parameters to Minimize Emissions during Rotary Kiln Emergency Safety Vent Openings Journal: Hazardous Waste & Hazardous Materials Volume: 11 Number: 1 Pages: 111-128, March 1994

Nominating Organization:
Air and Energy Engineering Research Laboratory

EPA Author(s):

Dr. Paul M. Lemieux

Dr. William P. Linak

Ms. Carin Debenedictis

Non-EPA Author(s):

Mr. Jeffrey V. Ryan

Dr. Jost O.L. Wendt

Dr. James E. Dunn

5. For development of a technique for 3-dimensional visualization of physiologically based kinetic model results. [E94-08](#)

Title: 3-D Visualization of Physiologically Based Kinetic Model Outputs Journal:

Environmental Health Perspectives Volume: 102 Number: 11 Pages: 952-956, 1994

Nominating Organization:
Environmental Research Laboratory - Duluth

EPA Author(s):
Dr. John W. Nichols
Mr. Douglas Lothenbach
Dr. James M. McKim

Non-EPA Author(s):
Dr. Penny Rheingans
Mr. Loren Skow
Dr. Robert McGeachie

6. For the development and validation of a marine sediment bioaccumulation test. E94-10

Title: Individual and Combined Cytotoxic Effects of Cadmium, Copper and Nickel on Brown Cells of *Mercenaria*. Journal: Ecotoxicology and Environmental Safety Volume: 24 Pages: 328-337, March 1992

Nominating Organization:
Environmental Research Laboratory - Narragansett

EPA Author(s):
Dr. Gerald Zaroogian
Mr. Richard A. Voyer

Non-EPA Author(s):
Ms. Stefanie Anderson

7. For contributions toward understanding the role of bioturbation in sediment resuspension and its interaction with physical shearing. E94-12

Title: The Role of Bioturbation in Sediment Resuspension and its Interaction with Physical Shearing Journal of Experimental Marine Biological Ecology Volume: 171 Pages: 187-200, May 1993

Nominating Organization:
Environmental Research Laboratory - Narragansett

EPA Author(s):
Dr. Wayne R. Davis

8. For advances in understanding the role of promoters in carcinogenesis. H94-01

Title: Dose-Response Relationship in Multi-Stage Carcinogenesis: Promoters Journal: Environmental Health Perspectives Volume: 102 Number: 1 Pages: 255-264, April 1994

Nominating Organization:
Health Effects Research Laboratory

EPA Author(s):

Dr. Kirk T. Kitchin
Ms. Janice Brown
Dr. R. Woodrow Setzer

9. For developing a theoretical model and validating data for magnetic-field-induced biological effects. H94-10

Title: 1 Clarification and Application of an Ion Parametric Resonance Model for Magnetic Field Interactions with Biological Systems Journal: Bioelectromagnetics Volume: 15 Pages: 217-238, 1994

Title: 2 Empirical Test of an Ion Parametric Resonance Model for Magnetic Field Interactions with PC-12 Cells Journal: Bioelectromagnetics Volume: 15 Pages: 239-260, 1994

Nominating Organization:
Health Effects Research Laboratory

EPA Author(s):

Dr. Carl Blackman
Ms. Shawnee Benane
Mr. Dennis House

Non-EPA Author(s):

Ms. Janie Blanchard

10. For the application of artificial insemination to identify biomarkers of sperm fertilizing ability. H94-12

Title: The Ethane Dimethanesulphonate-Induced Decrease in the Fertilizing Ability of Cauda Epididymal Sperm is Independent of the Testis Journal of Andrology Volume: 15 Number: 4 Pages: 318-327, July/August 1994

Nominating Organization:
Health Effects Research Laboratory

EPA Author(s):

Dr. Gary R. Klinefelter
Mr. John W. Laskey
Ms. Janet Ferrell
Dr. Sally D. Perreault

Non-EPA Author(s):

Ms. Susan Jeffay
Mr. Juan Suarez
Ms. Naomi Roberts

11. In recognition of research leading to increased understanding of transport in pulmonary airways. H94-14

Title: 1 Fluid Dynamics of the Human Larynx and Upper Tracheobronchial Airways
Journal: Aerosol Science and Technology Volume: 19 Pages: 133-156, 1994

Title: 2 Influences on Cartilaginous Rings on Tracheobronchial Fluid Dynamics Journal:
Inhalation Toxicology Volume: 6 Pages: 185-203, 1994

Title: 3 Effects of Carinal Ridge Shapes on Lung Airstreams Journal: Aerosol Science and
Technology Volume: 21 Pages: 119-136, 1994

Nominating Organization:
Health Effects Research Laboratory

EPA Author(s):

Dr. Ted B. Martonen

Non-EPA Author(s):

Dr. Yadong Yang
Dr. Z. Zhang
Dr. R.C. Lessmann
Dr. Z.Q. Xue

12. For applying sensitivity analysis to improve metabolic estimates of a physiologically based pharmacokinetic model. H94-17

Title: Applications of Sensitivity Analysis to a Physiologically Based Pharmacokinetic Model for Carbon Tetrachloride in Rats Journal: Toxicology and Applied Pharmacology Volume: 128 Number: 1 Pages: 36-44, September 1994

Nominating Organization:
Health Effects Research Laboratory

EPA Author(s):

Dr. Marina Villafane Evans
Dr. Jane Ellen Simmons

Non-EPA Author(s):

Dr. William D. Crank
Dr. Hui-Min Yang

13. For studies in developmental toxicology of the interaction between dioxin and glucocorticoids. [H94-24](#)

Title: Interactive Regulation of Ah and Glucocorticoid Receptors in the Synergistic Induction of Cleft Palate by 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Hydrocortisone. Journal: Toxicology and Applied Pharmacology Volume: 128 Pages: 138-150, August 1994

Nominating Organization:

Health Effects Research Laboratory

EPA Author(s):

Dr. Barbara D. Abbott
Dr. Linda S. Birnbaum

Non-EPA Author(s):

Dr. G.H. Perdew
Ms. A.R. Buckalew

14. For studies in the formation of nitro-PAH derived DNA adducts in lungs of animals exposed to diesel emissions. [H94-31](#)

Title: Formation of DNA Adducts in Rat Lung Following Chronic Inhalation of Diesel Emissions, Carbon Black, and Titanium Dioxide Particles. Journal: Carcinogenesis Volume 15 Number: 7 Pages 1291-1299, July 1994

EPA Authors:

Dr. Jane Gallagher
Dr. Joellen Lewtas

Non-EPA Authors:

Dr. Uwe Heinrich
Mr. Michael George
Ms. Linda Hendee
Dr. David H. Phillips

15. For the development and demonstration of a spectroscopic technique for speciation and

quantification of sulfate particulate matter. M94-05

Title: 1 FT-IR Transmission Spectroscopy for Quantitation of Ammonium Bisulfate in Fine-Particulate Matter Collected on Teflon Filters Journal: Applied Spectroscopy Volume: 48 Number: 6 Pages: 702-705, June 1994

Title: 2 Speciation of Ambient Sulfate Particulate Matter Using FT-IR-Based Absorption to Complement Wet Chemical and Thermal Speciation Measurements Journal: Applied Spectroscopy Volume: 48 Number: 6 Pages: 706-711, June 1994

Nominating Organization:
Atmospheric Research and Exposure Assessment Laboratory

EPA Author(s):
Mr. Kenneth J. Krost
Dr. William A. McClenny

Non-EPA Author(s):
Mr. E.H. Daughtrey
Mr. D.D. Williams

16. For significant advancements in the science of monitoring environmental exposures of small children to pesticides. M94-10

Title: Evaluation of Methods for Monitoring the Potential Exposure of Small Children to Pesticides in the Residential Environment Journal: Archives of Environmental Contamination and Toxicology Volume: 26 Number: 1 Pages: 37-46, January 1994

Nominating Organization:
Atmospheric Research and Exposure Assessment Laboratory

EPA Author(s):
Dr. Robert G. Lewis

Non-EPA Author(s):
Mr. David E. Camann
Dr. Roy C. Fortmann

17. For development of a User's Guide for the investigation of dry-weather pollutant entries into storm-drainage systems. M94-20

Title: Investigation of Dry-Weather Pollutant Entries Into Storm-Drainage Systems Journal of Environmental Engineering Volume: 120 Number: 5 Pages: 1044-1066, September/October 1994

Nominating Organization:
Risk Reduction Engineering Laboratory

EPA Author(s):
Mr. Richard Field

Non-EPA Author(s):
Dr. Robert Pitt
Mr. Michael Brown
Mr. William Vilkelis
Dr. Edward Phackston
Ms. Melinda Lalor

18. For developing a methodology for measuring pollution prevention progress. M94-21

Title: A "Mark I" Measurement Methodology for Pollution Prevention Progress Occurring as a Result of Product Design Decisions Journal: Environmental Progress (American Institute of Chemical Engineers) Volume: 13 Number: 4 Pages: 220-239, November 1994

Nominating Organization:
Risk Reduction Engineering Laboratory

EPA Author(s):
Dr. David G. Stephan
Mr. James S. Bridges

Non-EPA Author(s):
Mr. Robert M. Knodel

19. For advances in the collection of representative ground water samples for metals analyses. M94-25

Title: Acquisition of Representative Ground Water Quality Samples for Metals Journal: Ground Water Monitoring Review Volume: 12 Number: 03 Pages: 167-176, Summer 1992

Nominating Organization:
Robert S. Kerr Environmental Research Laboratory

EPA Author(s):
Mr. Robert W. Puls

Non-EPA Author(s):

Mr. Robert Powell

20. For analyzing information on the use of physiologically-based toxicokinetic models in a mechanistic approach to aquatic toxicology. R94-02

Title: Use of Physiologically Based Toxicokinetic Models in a Mechanistic Approach to Aquatic Toxicology In: Aquatic Toxicology: Molecular, Biochemical and Cellular Perspectives, Chapter 11 Volume: 4 Pages: 469-519, 1994

Nominating Organization:
Environmental Research Laboratory - Duluth

EPA Author(s):
Dr. James M. McKim
Dr. John W. Nichols

21. For contributions toward understanding the toxicity of butadiene. R94-03

Title: A Brief Survey of Butadiene Health Effects: A Role for Metabolic Differences Journal: Environmental Health Perspectives - Supplements Volume: 101 Number: 06 Pages: 161-167, 1993

Nominating Organization:
Health Effect Research Laboratory

EPA Author(s):
Dr. Linda Birnbaum

22. For contributions to the risk assessment of male reproductive toxicity. R94-07

Title: Assessment of Male Reproductive Toxicity: A Risk Assessment Approach Journal: Principles and Methods of Toxicology Third Edition, ED: A.W. Hayes Volume: 3 Pages: 937-988, 1994

Nominating Organization:
Health Effects Research Laboratory

EPA Author(s):
Dr. Harold Zenick
Dr. Eric D. Clegg
Dr. Sally D. Perreault Darney
Dr. Gary R. Klinefelter
Dr. Leon Earl Gray

23. For scientific advancement in prediction of the reductive fate of diverse dyes in anoxic sediments. T94-01

Title: Transformation of Dyes and Related Compounds in Anoxic Sediments: Kinetics and Products
Journal: Environmental Science and Technology Volume: 28 Number: 2 Pages: 267-276, 1994

Nominating Organization:
Environmental Research Laboratory - Athens

EPA Author(s):
Mr. George L. Baughman
Dr. Eric J. Weber

24. For the development of a fundamental mass transfer model for indoor air emissions. T94-09

Title: Fundamental Mass Transfer Model for Indoor Air Emissions from Surface Coatings
Journal: Indoor Air Volume: 3 Pages: 263-268, 1993

Nominating Organization:
Air and Engineering Research Laboratory

EPA Author(s):
Dr. Bruce A. Tichenor
Dr. Leslie E. Sparks

Non-EPA Author(s):
Dr. Zhishi Guo

25. For modeling chlorine residuals in drinking water distribution systems.

Title: Modeling Chlorine Residuals in Drinking Water Distribution Systems
Journal of Environmental Engineering (ASCE) Volume: 120 Number: 4 Pages 803-820, July/August 1994

Nominating Organization: Risk Reduction Engineering Laboratory

EPA Authors:
Dr. Lewis Rossman
Dr. Robert M. Clark

Non-EPA Author:
Dr. Walter M. Grayman

3.4 Honorable Mention

The Subcommittee recognized several papers which, while not reaching award level, were deserving of honorable mention. The line of research initiated in these papers hold promise of advancing the scientific and engineering basis for environmental perspectives. Many of the papers represent a preliminary exploration of an area which when fully developed may be of great significance to the Agency.

1. C94-18

Glyphosate Removal from Drinking Water, Journal of Environmental Engineering Volume: 119 Number: 06 Pages: 1139-1157, Nov\Dec 1993

Nominating Organization: Risk Reduction Engineering Laboratory
EPA Author(s): **Mr. T.F. Speth**

The Subcommittee commends this work for its thorough evaluation of alternatives for the removal of glyphosate from surface water.

2. E94-09

Evaluation of Potential Confounding Factors in Sediment Toxicity Tests with Three Freshwater Benthic Invertebrates, Journal: Environmental Toxicology and Chemistry Volume: 13 Number: 4 Pages: 627-635, 1994

Nominating Organization: Environmental Research Laboratory - Duluth

EPA Author(s):
Dr. Gerald T. Ankley
Mr. Duane Benoit

Non-EPA Author(s):
Dr. James C. Balogh
Dr. Trefor Reynoldson
Dr. Kristin E. Day
Dr. Robert Hoke

The Subcommittee commends this research for its thorough evaluations and excellent design. It provides important information on the effects of several variables of significance to the development of sediment criteria.

3. H94-04

Title: 1 Behavioral Effects of Carbon Monoxide: Meta Analyses and Extrapolations Journal

of Applied Physiology Volume: 76 Number: 3 Pages: 1310-1316, 1994

Title: 2 Prediction of Carboxyhemoglobin Formation Due to Transient Exposure of Carbon Monoxide Journal of Applied Physiology Volume: 76 Number: 4 Pages: 1739-1745, 1994

Title: 3 Carboxyhemoglobin Formation Due to Carbon Monoxide Exposure in Rats Journal: Toxicology and Applied Pharmacology Volume: 128 Pages: 151-157, 1994

Nominating Organization: Health Effects Research Lab

EPA Author(s): **Dr. Vernon A. Benignus**

Non-EPA Author(s):

Dr. Zoltan Annau

Dr. Marjolein V. Smith

Dr. Philip A. Bromberg

Dr. Milan V. Hazucha, Ph.D.

This commended work is extremely competent and clear in its presentation. The Subcommittee noted that the work has clear practical use in a regulatory and an industrial setting.

4. H94-05

Separation of ³²P-Postlabeled DNA Adducts of Polycyclic Aromatic Hydrocarbons and Nitrated Polycyclic Aromatic Hydrocarbons by HPLC Journal: Chemical Research in Toxicology Volume: 7 Number: 4 Pages: 503-507, July/August 1994

Nominating Organization: Health Effects Research Laboratory

EPA Author(s):

Dr. Leon C. King

Dr. Jane E. Gallagher

Dr. Joellen Lewtas

The Subcommittee commends this research for developing approaches for separating and quantifying nitrated PAH-DNA adducts.

5. H94-22

Effects of Toluene Inhalation on Detection of Auditory Signals in Rats Journal: Neurotoxicology and Teratology Volume: 16 Number: 2 Pages: 149-160, 1994

Nominating Organization: Health Effects Research Laboratory

EPA Author(s):

Dr. Philip J. Bushnell

Dr. Kevin Crofton

Non-EPA Author(s):

Ms. Kristin L. Kelly

This paper is commended for its efforts in refining baselines for measuring altered attention that has potential application for assessing behavioral effects in human populations.

6. H94-36

Mutagenicity and Chemical Analysis of Emissions from the Open Burning of Scrap Rubber Tires Journal: Environmental Science and Technology Volume: 28 Pages: 136-141, January 1994

Nominating Organization: Air and Energy Engineering Research Laboratory

EPA Author(s):

Dr. Paul M. Lemieux

Dr. David M. DeMarini

Non-EPA Author(s):

Mr. Jeffrey V. Ryan

Ms. Lance R. Brooks

Mr. Ron W. Williams

This research is commended for its interdisciplinary collaboration and its application of innovative procedures to characterize and measure toxic emissions from the open burning of tires.

7. M94-11

A computer Program for the Determination of Most Probable Number and its Confidence Limits Journal of Microbiological Methods Volume: 18 Number: 2 Pages: 91-98, September 1993

Nominating Organization: Risk Reduction Engineering Laboratory

EPA Author(s): **Dr. Albert J. Klee**

This paper provides a significant advance in our ability to assess bacterial contamination using the Most Probable Number technique. Use of the program by the water industry will result in improved evaluation of water quality.

8. M94-16

Measurement of Vapor-Phase Organic Compounds at High Concentration Journal of Chromatography A. Volume: 676 Number: 10 Pages: 399-408, January 1994

Nominating Organization: Atmospheric Research and Exposure Assessment Laboratory

EPA Author(s): **Mr. Joachim D. Pleil**

Non-EPA Author(s):

Mr. Michael L. Stroupe

This paper is commended for the development of an innovative sample collection process for volatile organics that should contribute to improvements in the quality of environmental data.

9. M94-18

Determination of Hexavalent Chromium in Sludge Incinerator Emissions Using Ion Chromatography and Inductively Coupled Plasma Mass Spectrometry Journal: Environmental Science and Technology Volume: 26 Number: 10 Pages: 1944-1950, October 1992

Nominating Organization: Environmental Monitoring Systems Laboratory - Cincinnati

EPA Author(s):

Mr. Theodore D. Martin

Mr. Seymour Gold

Non-EPA Author(s):

Ms. Elizabeth J. Arar

Dr. Stephen E. Long

This work is commended for its contributions to sampling and analysis of hexavalent chromium emissions from stationary sources. The Subcommittee encourages the continued study and cost reduction of this approach.

10. T94-04

The Effects of Trends in Tillage Practices on Erosion and Carbon Content of Soils in the U.S. Corn Belt Journal: Water, Air and Soil Pollution Volume: 70 Number: 1-4 Pages: 389-401, 1993

Nominating Organization: Environmental Research Laboratory - Corvallis

EPA Author(s):

Dr. Jeffrey J. Lee

Dr. Donald L. Phillips

Non-EPA Author(s):

Mr. Rui Liu

The Subcommittee commends the authors for their advances over the previous award winning work. We encourage continued exploration of ways to maximize carbon sequestering in agricultural tillage practices and to document their contributions to global climate change and biodiversity of soil ecosystems.

11. T94-06

Accumulation of Polychlorinated Organic Contaminants from Sediment by Three Benthic Species Journal: Archives of Environmental Contamination and Toxicology Volume: 24 Pages: 290-297, October 1992

Nominating Organization: Environmental Research Laboratory - Narragansett

EPA Author(s):

Dr. Richard Pruell

Mr. Norman Rubinstein

Non-EPA Author(s):

Mr. Brian K. Taplin

Mr. Joseph A. LiVolsi

Mr. Robert D. Bowen

This paper is commended for the rigor of its assessment of marine invertebrate bioaccumulation. This effort is worthy of continued study.

APPENDIX A: PAPERS RECATEGORIZED BY THE SUBCOMMITTEE

Nominated Paper	New Category
C9407	Review Paper
H9427	Review Paper
T9407	Review Paper

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AN SAB REPORT: RECOMMENDATIONS ON THE 1994 SCIENTIFIC AND TECHNOLOGICAL ACHIEVEMENT AWARD NOMINATIONS

**PREPARED BY THE SCIENTIFIC AND
TECHNOLOGICAL ACHIEVEMENT
AWARDS SUBCOMMITTEE OF THE
RESEARCH STRATEGIES ADVISORY
COMMITTEE**