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RICHARD L. CHURCH

Curriculum Vita

Professor of Geography
Department of Geography
University of California at Santa Barbara
Santa Barbara, CA 93106-4060

church@geog.ucsb.edu
(805) 893-4217, 893-3663

EDUCATION

Ph.D. The Johns Hopkins University, 1974
Environmental Systems Engineering
B.S. Lewis and Clark College, 1970
Majors in Chemistry and Math

POSITIONS AND DATES:

Associate Dean of Math, Life and Physical Sciences, UCSB, 2010-present.
Professor of Geography, U.C.S.B., 1982 – present.
Chairman, Department of Geography, U.C.S.B, 1984 - 1988.
Associate Professor of Geography, U.C.S.B., 1980-82.
Adjunct Associate Professor of Civil Engineering, University of Tennessee 1980-81.
Associate Professor of Civil Engineering, University of Tennessee, 1979-80.
Member of The Management Science Faculty Committee
College of Business, University of Tennessee, 1975-80.
Assistant Professor of Civil Engineering, University of Tennessee, 1974-79.

HONORS:

Elected Fellow of the Regional Science Association International, 2009
Elected Fellow of the American Association for the Advancement of Science, 2009
Lifetime Achievement Award, Section on Location Analysis of the Institute for
Operations Research and the Management Sciences (INFORMS), 2012

PUBLICATIONS: under review/development

1. Optimum Location of Motorway Interchanges: Concessionaires' Perspective, with Antonio Antunes and Hugo Repolho, to appear in *ASCE: Journal of Transportation Engineering*.

2. Protecting supply system to mitigate potential disaster: a model to fortify capacitated facilities, with M. Paola Scaparra, to appear *International Regional Science Review*
3. Aggregation in continuous space coverage modeling, with D. Tong, to appear *International Journal of Geographical Information Science*
4. Optimal Location of Railway Stations: The Lisbon-Porto High Speed Rail Line, with H. Repolho and A. Antunes, submitted to *Transportation Science* for review.
5. The Multiple Resource Probabilistic Interdiction Median, with M. P. Scaparra, C. Losada, and M. Daskin, under review
6. How to Identify and Map Habitat Cores, submitted as a Chapter in: Conservation Planning from the bottom up: a practical guide to tools and techniques for the twenty-first century, edited by Charles Convis and Lance Craighead (to be published by ESRI press).
7. Interdiction of p -median systems with facility recovery time and frequent disruptions: a resiliency analysis, with Chaya Losada and M. Paola Scaparra, submitted for review to *Annals of the AAG*.
8. Design of a spatially explicit model to optimize the selection of torrent control measures to reduce peak run-off in a small watershed, with Jochen Breschan and Hans Heinemann, submitted to the journal *Hazards*
9. A spatially explicit model that optimizes a portfolio of reforestation measures plus retention dam to reduce peak storm- runoff in a small watershed, with Jochen Breschan and Hans Heinemann, to be submitted to *Environment and Planning*
10. Vector Assignment Ordered Median Problem: a unified median problem, with Ting Lei, submitted for review to *International Regional Science Review*.

PUBLICATIONS: BOOKS

Church, R.L. and A.T. Murray (2009) *Business Site Selection, Location Analysis, and GIS*, John Wiley & Sons Inc, Hoboken, NJ.

PUBLICATIONS: ARTICLES, REPORTS AND MONOGRAPHS

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|----|------|--|--|-----------------|
| 1. | 1972 | “An Assessment of Rate Making Policy Alternatives for the Washington Suburban Sanitary Commission,” with | Publication of the Washington Suburban Sanitary Commission | Contract Report |
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Steve Hanke and John Boland

2. 1974 "The Maximal Covering Location Problem," with Charles ReVelle *Papers of the Regional Science Association*, Vol.32, pp. 101-118. Refereed Article
3. 1975 "An Examination of Alternate Rate-Making Policies for the Washington Suburban Sanitary Commission," with John Boland, Steve Hanke, and Phillip Carver Publication of the Washington Suburban Sanitary Commission Contract Report
4. 1975 "A Note on the Location Model of Holmes, Williams and Brown," with Charles ReVelle, and David Schilling *Geographical Analysis*, Oct., pp. 457-459 Refereed Article
5. 1976 "Multiobjective Location Analysis of Regional Energy Facility Siting Problems," with Jared Cohon Report for the Division of Biomedical and Environmental Research, United States Energy Research and Development Administration, Under Contract No. EY-76-C-02-0016 Contract Report
6. 1976 "Maximal Covering Over a Network," with Michael E. Meadows The University of Tennessee, Department of Civil Engineering, Research Series No. 28 Research Series Report
7. 1976 "On Locating an Obnoxious Facility on a Network: The Maximum Median Problem," with Robert S. Garfinkel Working Paper 27, College of Business Administration, The University of Tennessee Research Series Report
8. 1976 "Theoretical and Computation Links Between the p-Median, Location Set Covering, and the *Geographical Analysis*, Oct., pp. 406-415 Refereed Article

- maximal Covering Location Problem,” with Charles ReVelle
9. 1977 “Results of a New Approach to Solving the p-Median Problem with Maximum Distance Constraints,” with M. Meadows *Geographical Analysis*, Oct, pp. 364-378. Refereed Article
 10. 1977 “Facility Location: A Review of Context Free and EMS Models,” with C. ReVelle, D. Schilling, J. Cohon, and J. Elzinga *Health Services Research*, Summer, pp. 129-146 Refereed Article
 11. 1977 “A Spatial Model for the Location Construct of Teitz,” with Charles ReVelle *Papers of the Regional Science Association*, pp. 129-135. Refereed Article
 12. 1978 “Optimum Spacing of Supply Centers” *Transportation Engineering (ASCE)*, July, pp. 529-530 Discussion
 13. 1978 “Energy Facility Siting by Multiobjective Location Analysis,” with Jared Cohon and Charles ReVelle *Modeling and Simulation*, Volume 9, W.G. Vogt and M.H. Mickle, editors, School of Engineering, University of Pittsburgh, pp. 1-10 Proceedings
 14. 1978 “Análisis de Ubicación: Una Guía para Los Planificadores de Servicios de Salud,” with David Eaton and Charles ReVelle Documento Metodológico de Trabajo #53A, Sector Analysis Division, Agency for International Development Research Series Report
 15. 1978 “Analysis de Ubicación: Una Guía para los Planificadores de Servicios de Salud,” with Eaton and ReVelle Technical Papers Series - No. 20, Office for Public Sector Studies, Institute of Latin American Studies, Research Series Report

- the University of Texas at Austin.
16. 1978 “On Deployment of Health Resources in Rural Valle Del Cauca, Colombia,” with Eaton, Bennet, Hamon, and Lopez
Lyndon B. Johnson School of Public Affairs, Drawer Y, University Station, The University of Texas at Austin, Austin, Texas, Special Project Report.
Contract Report
 17. 1978 “On Locating an Obnoxious Facility: The Maximum Median Problem,” with Robert Garfinkel
Transportation Science, July, pp. 107-118.
Refereed Article
 18. 1978 “Modelling of an Oversaturated Intersection by Reservoir Analogy,” with Charles ReVelle
Transportation Research,
Refereed Article
 19. 1979 “On Determining Many Close to Optimal Configurations for Single and Multiple Objective Location Problems,” with D. Huber
Civil Engineering Series #34, The University of Tennessee
Research Series Report
 20. 1979 “Data Base Location and Evaluation for Heavy Metals Discharge Into Municipal Wastewater Systems,” with Minear, Ball and Hines
Proceedings of the NSF Management of Toxics in Sludges Symposium, Miami Beach.
Proceedings
 21. 1979 “A Simulation Approach for Base Line Energy Siting Analysis,” with Edward L. Hillsman
Modeling and Simulation, Volume 10, Part 3: Energy and Environment, Proceedings of the Tenth Annual Pittsburgh Conference, April 25-27, School of Engineering, University of Pittsburgh, pp. 895-

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|-----|------|--|--|------------------|
| 22. | 1979 | “Data Base Location and Evaluation for Heavy Metals Discharge into Municipal Wastewater Systems,” with R.A. Minear, R.O. Ball, and D. Hines | <i>Proceedings of Eighth National Conference on Municipal Sludge Management, Impacts of Industrial Toxic Materials on POTW Sludge, March 11-21, Miami Beach, Florida, pp. 48-54.</i> | Proceedings |
| 23. | 1979 | “The Team/Fleet Models for Simultaneous Facility and Equipment Siting,” with Schilling, ReVelle, Elzinga, and Cohon | <i>Transportation Science, May, pp. 163-175</i> | Refereed Article |
| 24. | 1979 | “Comments on the Net Accessibility Model of Orloff”, with Larry Roberts and Thomas Bell | <i>Geographical Analysis (Jan), pp. 89-93.</i> | Refereed Article |
| 25. | 1979 | “Environmental Optimization of Power Lines,” with Timothy Clifford | <i>Environmental Engineering Division of ASCE, pp. 438-439.</i> | Refereed Article |
| 26. | 1979 | “Applications of a Multiojective Facility Location Model to Power Plant Siting in a Six State Region,” with ReVelle, Eagles, Cohon, and Eberhart | <i>Computers and Operations Research, pp. 214-227.</i> | Refereed Article |
| 27. | 1979 | Deployment of a Multi-Purpose Ambulance System”, with Bryan L. Hamon and David J. Eaton | <i>Modeling and Simulation, Volume 10, Part 4: Socio-Economic Systems, Proceedings of the Tenth Annual</i> | Proceedings |

- Pittsburgh
Conference, April 25-
27, School of
Engineering,
University of
Pittsburgh, pp. 1437-
1445.
28. 1979 An Introduction and Guide to
the Site Location of Public
Facilities Utilizing the 'Gas
Program' Appendix C to Final
Report to AID, Contract
AID/TA-C-1363, April,
Lyndon B. Johnson School of
Public Affairs, Drawer Y,
University Station, The
University of Texas at
Austin. Contract
Report
29. 1979 "Generating Multiobjective
Tradeoffs: A Bicriterion
Algorithm applied to a
Reservoir Planning Problem,"
with Jared Cohon and Daniel
Sheer *Water Resources
Research* Refereed
Article
30. 1979 "Location Modeling Utilizing
Maximum Service Distance
Criteria," with Michael E.
Meadows *Geographical
Analysis*, Vol. II, No.
4, October, p. 358-
373. Refereed
Article
31. 1980 "Water Quality Indexing and
Scoring," with Roy O. Ball *Journal of
Environmental
Engineering*, ASCE Refereed
Article
32. 1980 "Developing Solid Waste
Planning Regions for the
Tennessee Valley Authority" *Modeling and
Simulation*, Vol. II,
Part 4, Proceedings of
the Eleventh Annual
Conference on
Modeling and
Simulation Proceedings
33. 1980 "A Multicriteria Approach to
Ambulance Location," with
Jerry Weaver *Modeling and
Simulation*, Vol. II,
Part 4, Proceedings of
the Eleventh Annual
Conference on Proceedings

			Modeling and Simulation	
34.	1980	“Average Response Time and Workload Balance: Two Criteria for Ambulance Station Location,” with Jerry Weaver	<i>Proceedings of the Health Systems Conference, Montreal</i>	Proceedings
35.	1980	“Coal Fired Power Plant Ash Utilization in the TVA Region,” with D.W. Weeter and W.T. Davis	U.S. Environmental Protection Agency, EPA-600/7-80-172.	Contract Report
36.	1980	Conceptual design of a water quantity model, with J. Dobson, T. Bell, and A. Shepherd	Oak Ridge National Laboratory, TM-7397	Technical Report
37.	1981	“A Comparison of Two Baseline Screening Approaches to Regional Energy Facility Siting,” with Thomas L. Bell	<i>GeoJournal</i> , Supplementary Issue 3, pp. 17-36.	Refereed Article
38.	1981	“On Determining Facility Configurations which Maximize Benefits,” with Thomas L. Bell	<i>Geographical Perspectives</i> , No. 48, Fall.	Refereed Article
39.	1981	“Signal Operation Optimization Using a Reservoir Analogy,” with Charles ReVelle	<i>Modelling and Simulation</i> , Proceedings of the Twelfth Annual Conference on Modeling and Simulation.	Proceedings
40.	1981	“Data Base for Influent heavy Metals in Publicly Owned Treatment Works,” with Roger Minear and Roy Ball	Final Report for Grant No. R805606-01, EPA	Contract Report
41.	1981	“On the Development of Course Selection Models”	Final Project Report, Training Analysis and Evaluation Group, U.S. Navy, Orlando, Florida.	Contract Report
42.	1981	“Ubicacion de Recursos de	Institute for Latin	Research

- | | | | | |
|-----|------|---|--|------------------|
| | | Salud en Las Zonas Rurales Del Cauca, Colombia,” with Eaton, Bennett, Hamon, and Lopez | American Studies, <i>Technical Paper Series</i> No. 32. | Series Report |
| 43. | 1982 | “On Deployment of Health Resources in Rural Valle de Cauca, Colombia,” with Eaton, Bennett, Hamon and Valencia Lopez | <i>Planning and Development Processes in the Third World</i> , Institute of Management Sciences Series, Vol. 17, North Holland Publishing Co., (Elsevier: Amsterdam), pp. 331-359. | Refereed Chapter |
| 44. | 1982 | “Selecting Sites for Rural Health Workers,” with V. Bennett and D. Eaton | <i>Social Science and Medicine</i> , Vol. 16, pp. 63-72 | Refereed Article |
| 45. | 1982 | Commentary on the highest form of geographer’s art, with R. Golledge, D. Simonett, J. Dozier, J. Estes, et al. | <i>Annals of the AAG</i> 72; 557-558 | Refereed Note |
| 46. | 1983 | “Computational Procedures for Location Problems on Stochastic Networks,” with Jerry Weaver | <i>Transportation Science</i> , Vol. 17, No. 2, May, pp. 168-180 | Refereed Article |
| 47. | 1983 | “Modelling Spatial Allocation-Location Solutions for General Practitioner Medical Services in Cities: The Equity-Revenue Maximizing Conflict Case,” with R. Stimson | <i>Regional Science and Urban Economics</i> , Vol. 13, pp. 161-172. | Refereed Article |
| 48. | 1983 | “Linear Programming in Hazardous Waste Management,” with Richard Reeves | <i>Journal of Environmental Engineering</i> , ASCE | Refereed Article |
| 49. | 1983 | “Basic Organizing/Optimizing Training Schedules System (BOOTS): System Overview,” with F.L. Keeler | <i>Technical Report No. 150</i> , Training Analysis and Evaluation Group N-1, U.S. Navy, | Contract Report |

			Orlando, Florida	
50.	1983	“Multiobjective Power Plant Siting Models” Optimization, Heuristic Approaches, and Generating Alternative Configurations,” with Bell and Weaver	Final Report to Department of Energy contract DE-ASOS-79EV10316	Contract Report
51.	1983	“BUILD: Baseload Utility Integrated Location Decisions: A Model of the Future Spatial Distribution of Electric Power Production,” with Hillsman and Alvic	Oak Ridge National Laboratory Report ORNL-5969	Contract Report
52.	1983	“The Basic Organizing/Optimizing Training Scheduler (BOOTS): User's Guide,” with F.L. Keeler	<i>Technical Report No. 151</i> , Training Analysis and Evaluation Group, U.S. Navy, Orlando, Florida	Contract Report
53.	1983	“Sample Data Files and Extracts for the BOOTS System,” with F. L. Keeler	<i>Supplement to Technical Report No. 151</i> , Training Analysis and Evaluation Group, U.S. Navy, Orlando, Florida	Contract Report
54.	1983	“Location Modelling of Naval Schools: A Case Study of the Instructor Training School System, “with O.B. Schoepfle	Final Project Report (Grant #NC1339-77-C0017 U.S. Navy) Vol I: Technical Report	Contract Report
55.	1983	“Location Modelling of Naval Schools: A Case Study of the Instructor Training School System,” with O.B. Schoepfle,	Final Project Report (Grant #NC1339-79-C0017 U.S. Navy), Vol II: Programs, Data Sets, and Documentation	Contract Report
56.	1983	“The Formal and Computational Relationship of the Stochastic and Deterministic Median Location Problems,”	Working Paper #83-004, Department of Management Science and Statistics,	Research Series Report

- with Jerry R. Weaver
- College of Commerce
and Business
Administration, The
University of
Alabama.
57. 1983 “Incorporating Planning Preferences into Location Models,” with J. Penalba and D. Eaton *Modeling and Simulation*, Vol 14, Part 4, Proceedings of the Fourteenth Annual Pittsburgh Conference, April, pp. 1367-1371 Proceedings
58. 1983 “A Comparison of Solution Procedures for Covering Location Problems,” with J. Weaver *Modeling and Simulation*, Vol 14, Part 4, Proceedings of the Fourteenth Annual Pittsburgh Conference, April, pp. 1417-1422. Proceedings
59. 1984 “The Formal and Computational Relationship of the Supporting Median Problem to the p-Median Problem,” with Jerry R. Weaver *Working Paper #84-009*, Department of Management Science and Statistics, College of Commerce and Business Administration, University of Alabama, April Research Series Report
60. 1984 “The Planar Maximal Covering Location Problem” *Journal of Regional Science*, Vol. 24, No. 2. Refereed Article
61. 1984 “Generalized Coverage Models and Public Facility Location,” with K.L. Roberts *Papers of the Regional Science Association*, Vol. 53. Refereed Article
62. 1984 “Hauling Distance and Transfer Station Location” *The Journal of Environmental Engineering (ASCE)*, Vol. 110, No. 5. Refereed Article
63. 1985 “A Median Facility Location Model with Nonclosest Facility *Transportation Science*, Vol. 19, No. Refereed Article

- Service,” with Jerry Weaver 1.
64. 1985 “Location-Allocation Modeling in Archaeological Settlement Pattern Research: Some Preliminary Applications,” with Thomas L. Bell *World Archaeology*, Vol. 16, No. 3, p. 354-371 Refereed Article
65. 1985 “Transmission Corridor Location Modelling,” with Dennis Huber *The Transportation Journal*, ASCE, Vol. III, No. 2. Refereed Article
66. 1986 “A Location Model Based on Multiple Metrics and Multiple Facility Assignment,” with Jerry Weaver *Transportation Research-B*, Vol. 20B, No. 4, pp. 283-296 Refereed Article
67. 1986 “Theoretical Links Between Median and Coverage Location Problems,” with Jerry Weaver *Annals of Operations Research* Vol. 6, pp. 1-19. Refereed Article
68. 1987 “Hierarchical Location Analysis Utilizing Covering Objectives,” with David Eaton in Gerard Rushton and Avijit Ghosh eds., *Spatial Analysis and Location Allocation Modeling*, pp. 163-185. Refereed Chapter
69. 1987 “Location - Allocation Modelling in Archaeology,” with Thomas Bell in Gerard Rushton and Avijit Ghosh eds., *Spatial Analysis and Location Allocation Modeling*, pp. 76-100. Refereed Chapter
70. 1987 “Evolution of Geographic Information Systems as Decision Making Tools,” with Phillip Parent *Proc. GIS-87*, published by The American Society of Photogrammetry and Remote Sensing Proceedings
71. 1987 “The Formal and Computational Relationship of the Supporting Median Problem to the P-Median Problem,” with Jerry Weaver *Transportation Research*, Vol. 21B, No. 4, pp. 323-329 Refereed Article

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|-----|------|---|---|------------------|
| 72. | 1988 | “A Hybrid FLEET Model for EMS System Design,” with Geoff Bianchi | <i>Social Science and Medicine</i> , Vol. 26, No. 1, pp. 163-171 | Refereed Article |
| 73. | 1988 | “Build-1: A Disaggregate Model of the U.S. Electric Utility Industry,” with E.L. Hillsman and D.R. Alvic | <i>European Journal of Operations Research</i> , Vol. 35, pp. 30-44. | Refereed Article |
| 74. | 1988 | “Late Horizon Regional Efficiency in the Northeastern Basin of Mexico: A Location-Allocation Perspective,” with T.L. Bell and L. Gorenflo | <i>Journal of Anthropological Archaeology</i> , Vol. 7, No. 1, pp. 163-202. | Refereed Article |
| 75. | 1988 | “An Analysis of Ancient Egyptian Settlement Patterns using Location-Allocation Covering Models,” with T.L. Bell | <i>Annals of the AAG</i> , Vol. 78, No. 4, pp. 701-714 | Refereed Article |
| 76. | 1988 | “Trauma System Design: An Examination of Los Angeles County,” with G. Bianchi | <i>Proceedings Third International Symposium of Medical Geography.</i> | Proceedings |
| 77. | 1989 | “A FAST Network-Based Hybrid Heuristic for the Assignment of Students to Schools,” with O.B. Schoepfle | <i>Journal of Operational Research Society</i> , Vol. 40, No. 11, pp. 1029-1040 | Refereed Article |
| 78. | 1990 | “A Regionally Constrained p-Median Problem” | <i>Geographical Analysis</i> , Vol. 22, No. 1., pp. 23-32. | Refereed Article |
| 79. | 1990 | “A Heuristic for a Hybrid FLEET model,” with G. Bianchi | <i>Computers and Operations Research</i> , Vol. 17, No. 5, pp. 481-494. | Refereed Article |
| 80. | 1990 | “Unpacking Central Place Theory I,” with T. Bell | <i>Geographical Analysis</i> , Vol. 22, No. 2, pp. 95-115. | Refereed Article |
| 81. | 1990 | “Linear Programs for Nonlinear | <i>Water Resources</i> | Refereed |

		Hydrologic Estimation,” with H. Loaiciga	<i>Bulletin</i> , Vol 26, No. 4, pp. 1-12.	Article
82.	1990	“Analyzing the Potential for Consolidation of Household Shipments by the MTMC,” with R. Gerrard	<i>Report to Oak Ridge National Laboratory</i>	Contract Report
83.	1991	“Bicriterion Maximal Covering Location Formulation which considers the satisfaction of uncovered demand,” with J. Current and J. Storbeck	<i>Decision Sciences.</i> , Vol. 22, No. 1, pp 38-52	Refereed Article
84.	1991	“The P-Median Scheduling and Location Problem,” with Craig Bloxham	<i>Papers in Regional Science.</i> , Vol. 70, 1:21-35	Refereed Article
85.	1991	“The Nested Hierarchical Median Facility Location Model,”with Jerry R. Weaver	<i>INFOR</i> , Vol. 29,N2:100-115.	Refereed Article
86.	1991	“A New Network Representation of a Classic School Districting Problem,” with O. B. Schoepfle	<i>SocioEconomic Planning Sciences</i> Vol. 25., No. 3, pp 189-197.	Refereed Article
87.	1992	“The Fixed Charge Maximal Covering Location Problem,” with Rhonda R. Davis	<i>Papers in Regional Science</i> , Vol. 71, no. 3, pp 199- 216.	Refereed Article
88.	1992	“An Interface for Exploring Spatial Alternatives for a Corridor Location Problem,” with S.R. Loban and K. Lombard	<i>Computers and GeoSciences</i> ,V18 N8:1095-1105.	Refereed Article
89.	2992	“A Macro Level Analysis of the Airlift Deployment Problem,” with A.K. Rathi and R.S. Solanki	<i>Computers and Operations Research</i> , V19 N8:731-742.	Refereed Article
90.	2992	“Allocating Resources to Support a Multicommodity Flow With Time Windows,” with A.K. Rathi and R.S.	<i>Logistics and Transportation Review</i> , V28 N2:167-188.	Refereed Article

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|-----|------|---|--|------------------|
| 91. | 1993 | “Modeling School Utilization and Consolidation,” with A.T. Murray | <i>Journal of Urban Planning and Development-ASCE</i> , V119 N1:23-38 | Refereed Article |
| 92. | 1993 | “Maximal Covering Tree Problems,” with J. Current | <i>Naval Research Logistics</i> , V40 N1:129-142. | Refereed Article |
| 93. | 1993 | “Analyzing Tradeoffs Between Zonal Constraints and Accessibility in Facility Location,” with Ross Gerrard | <i>Computers and Operations Research</i> | Refereed Article |
| 94. | 1993 | “The Gateway Shortest Path Problem: Generating Alternative Routes for a Corridor Location Problem,” with K. Lombard | <i>Geographical Systems</i> , Vol. 1, No. 1 | Refereed Article |
| 95. | 1993 | “The Choice Alternative to School Assignment,” with O.B. Schoepfle | <i>Environment and Planning B: Planning and Design</i> , Vol. 20, 447-457 | Refereed Article |
| 96. | 1993 | “Disaggregating Forest Management Plans to Treatment Areas,” with K. Barber | <i>Proceedings of the Stand Inventory Technology Conference of 1992</i> | Proceedings |
| 97. | 1993 | “Adjacency Constraint Aggregation,” with A.T. Murray | <i>Proceedings of the International Symposium on Analysis and Management Decisions in Forestry</i> , Valdivia, Chile | Proceedings |
| 98. | 1994 | “Designing a spatial decision support system for forest ecosystem management,” with A.T. Murray and M.A. Figueroa | <i>Proceedings of GIS-94 Symposium</i> , February, Vancouver, BC, 651-658 | Proceedings |
| 99. | 1995 | “A Generalized Approach to | <i>Papers in Regional</i> | Refereed |

		Modeling the Hierarchical Maximal Covering Location Problem with Referral,” with Ross Gerrard	<i>Science</i> 73, 425-453.	Article
100.	1994	“Designing a Hierarchical Planning Model for USDA Forest Service Planning,” with A.T. Murray and Klaus Barber	<i>Proceedings of the 1994 Symposium on Systems Analysis in Forest Resources</i> , Asilomar Conference Center, Pacific Grove, California, 401-409	Proceedings
101.	1994	“Integrating Normative Location Models into GIS: Problems and Prospects with the P-Median Model,” with Paul Sorensen	<i>Technical Report 94-5</i> , National Center for Geographical Information and Analysis	Research Series Report
102.	1994	“A Cellular Automaton Modelling for Urban Heat Island Mitigation,” with I. Embutsu, M. Goodchild, M. Takeyama, and K. Baba	<i>Proceedings of GIS/LIS 94</i>	Proceedings
103.	1994	A Conceptual Navigable Database Model for Intelligent Vehicle Highway Systems,” with J. Gottsegen, and M. Goodchild	<i>Proceedings of GIS/LIS 94</i>	Proceedings
104.	1994	Final Report: Caltrans Agreement 65T155, MOU1, with D. Coughlan, T. Cova, M. Goodchild, J. Gottsegen, and D. Lemberg	National Center for Geographic Information and Analysis	Contract Report
105.	1995	“A Comparison of Strategies for Data Storage Reduction in Location-Allocation Problems,” with Paul Sorensen	<i>Technical Report 95-4</i> , National Center for Geographical Information and Analysis	Research Series Report
106.	1995	“A General Construct for the Zonally Constrained p-Median Problem,” with Ross Gerrard	<i>Environment and Planning B</i> , 22, 213-236.	Refereed Article

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|------|------|---|--|------------------|
| 107. | 1995 | “Heuristic Solution Approaches to Operational Forest Planning Problems,” with Alan Murray | <i>OR Spektrum</i> , 17, 193-203. | Refereed Article |
| 108. | 1995 | “Solid Waste Disposal Site Location,” with Alan Murray | <i>Journal of Urban Planning and Development (ASCE)</i> , 121, 109-114. | Refereed Article |
| 109. | 1995 | “A Spatial Decision Support System for Doing Hierarchical Habitat Planning,” with A.T. Murray, Klaus Barber, and R. Dyrland | <i>Analysis in Support of Ecosystem Management: Analysis Workshop III</i> , April 10-13, Ft. Collins, CO., 283-289. | Proceedings |
| 110. | 1995 | “A Spatial Search for Neighborhoods that May be Difficult to Evacuate,” with T. J. Cova | <i>Proceedings: GIS/LIS 95</i> , Nashville, TN, Vol 1, 203-212. | Proceedings |
| 111. | 1995 | “Measuring the Efficacy of adjacency Constraint Structure in Forest Planning,” with Alan Murray | <i>Canadian Journal of Forest Research</i> , 25, 1416-1424. | Refereed Article |
| 112. | 1996 | “Analyzing Cliques for Imposing Adjacency Restrictions in Forest Models,” with Alan Murray | <i>Forest Science</i> , 42, N2:166-175. | Refereed Article |
| 113. | 1996 | “Reserve Selection as a Maximal Covering Location Problem,” with David Stoms and Frank Davis | <i>Biological Conservation</i> , 76, 105-112. | Refereed Article |
| 114. | 1996 | “Spatial allocation in archaeology: an opportunity for re-evaluation,” with Amy Ruggles | <i>New Methods, Old Problems: Geographic Information Systems in Modern Archaeological Research</i> , edited by H.D.G. Mascher, Southern Illinois | Refereed Chapter |

- University Press
115. 1996 "Selecting Biodiversity Management Areas," with Frank Davis, David Stoms, William Okin, and K. Norman Johnson *Sierra Nevada Ecosystem Project: Final Report to Congress Vol 2, Assessments and Scientific Basis for Management Options, Water Resources Center Report 37, Center for Water and Wildland Resources, University of California at Davis, Davis, CA, 1503-1528* Refereed Chapter
116. 1996 "Closest assignment constraints and location models: properties and structure," with Ross Gerrard *Location Science, Vol.4, (no.4):251-70.* Refereed Article
117. 1996 "Constructing and Selecting Adjacency Constraints," with Alan Murray *INFOR, V34 N3:232-248.* Refereed Article
118. 1996 "Applying simulated annealing to location-planning models," with Alan Murray *Journal of Heuristics, Vol.2, (no.1):31-53.* Refereed Article
119. 1996 "A Comparison of Strategies for Data Storage Reduction in Location-Allocation Problems," with Paul Sorensen *Geographical Systems, Vol. 3: 221-241.* Refereed Article
120. 1996 "Integrating Normative Location Models into GIS: problems and prospects with the p-median model," with Paul Sorensen *Spatial Analysis-Modelling in a GIS Environment, Edited by Longely and Batty* Refereed Chapter
121. 1996 "Feasible alternatives generation in collaborative decision making," with D. Lemberg *Proceedings of the Geographic Information Systems/Land* Proceedings

- Information Systems,*
Nov. 1996
122. 1996 "Planning Management Activities to Protect Biodiversity with a GIS and an Integrated Optimization Model, with David Stoms, Frank Davis, B.J. Okin *Proceedings of the Santa Fe Conference* Proceedings
123. 1996 "An Analysis of Late-Horizon Settlement Patterns in the Teotihuacan-Temascalapa Basins: a Location-Allocation and GIS Based Approach, with A. Ruggles *Anthropology, Space, and Geographic Information Systems*, edited by M.S. Aldenderfer and H.D.G. Maschner, Oxford University Press Refereed Chapter
124. 1997 "Solving the anti-covering location problem using Lagrangian relaxation," with Alan Murray *Computers & Operations Research*, V24 N2:127-140. Refereed Article
125. 1997 "Facets for node packing," with Alan Murray *European Journal of Operational Research*, V101 N3:598-608. Refereed Article
126. 1997 "Modeling community evacuation vulnerability using GIS," with Thomas Cova *International Journal of Geographical Information Science*, Vol. 11, No. 8, pp. 763-784. Refereed Article
127. 1997 "The maximal Covering Location Problem," with C. ReVelle Chapter in "Location Theory (Modern Classics in Regional Science), edited by J. Thisse, K. Button, and P. Nijkamp, Edward-Elgar Publishing Refereed Article, republished
128. 1997 "Theoretical and computational Chapter in Refereed

- links between the p-median, location set covering, and the maximal covering location problem,” with C. ReVelle
- “Location Theory (Modern Classics in Regional Science), edited by J. Thisse, K. Button, and P. Nijkamp, Edward-Elgar Publishing
- Article, republished
129. 1997 "Selecting conservation reserves using species-covering models: Adapting the ARC/INFO GIS," with Ross Gerrard, David Stoms, and Frank Davis
- Transactions in GIS*, 2:45-60.
- Refereed Article
130. 1997 "Using proximity restrictions for locating undesirable facilities," with Alan Murray
- Studies in Locational Analysis* (special issue), 11:1-11.
- Refereed Article
131. 1998 "Impact models for siting undesirable facilities," with Alan Murray, Ross Gerrard, and Wing Tsui
- Papers in Regional Science*, V77 N1:19-36.
- Refereed Article
132. 1998 “Mapping chaparral in the Santa Monica Mountains using multiple endmember spectral mixture models,” with D.A. Roberts, M Gardner, S. Ustin, G. Scheer, and R.O. Green
- Remote Sens. Environ*, 65, pp. 267-279.
- Refereed Article
133. 1998 "Location Issues in forest management," with Alan Murray and Andres Weintraub
- Location Science* 6: pp. 137-153.
- Refereed Article
134. 1998 “A systematic process for selecting representative research natural areas,” with David Stoms, Mark Bortchert, Max Moritz, and Frank Davis
- Natural Areas Journal*, 18, pp. 338-349.
- Refereed Article
135. 1998 “Automated scheduling solutions for military training: operational issues and techniques,” with Reeves,
- Proceedings of the Interservice/Industry Training, Simulation and Education*
- Proceedings

- Bloxham, and Keeler
Conference ,
Orlando, Florida,
Nov 30-Dec 3, 1998
136. 1998 "Operational forest planning and Steiner tree extensions ", A.T. Murray and A. Weintraub
Geographical Systems, 5 Refereed Article
137. 1998 "Positional distortion in geographic data sets as a barrier to interoperation," with K. Curtin, P. Folh, C. Funk, M. Goodchild, P. Kyriakidis, and V. Naronha
Proceedings of the ACM, Baltimore, MD Proceedings
138. 1999 "The LRMS Linear Referencing Profile: Technical Evaluation," with V. Naronha, M. Goodchild, S. Kulkarni, and S. Aydin
Research report for contract DTFH61-91-Y-30066 Contract Report
139. 1999 "Location expression standards for ITS: testing the LRMS cross street profile," with Naronha, Goodchild, and Fohl
Annals of Regional Science, 33, pp. 197-212 Refereed Article
140. 1999 "Location modeling and GIS"
Geographical Information Systems, Vol. 1 (second edition), Ed. By Longley, Goodchild, Maquire, and Rhine, John Wiley & Sons, 1999. Chapter
141. 1999 "Manpower deployment in emergency services: Police, Fire, and EMS," with P. Sorensen, and W. Corrigan
Proceedings of the International Conference on Fire Service Deployment Analysis, Indianapolis, Ind. Proceedings
142. 1999 "A Study on a System for Guiding of the Optimal Route
Proceedings of the Geographic Proceedings

		with a Hybrid Network and Grid Data Structure,” with K. Okunuki and J. Marston	<i>Information Systems Association of Japan</i> 8; 135-138. (Japanese)	
143.	2000	"Optimizing the location of harvesting equipment and access roads," with A. Murray	<i>Proceedings of the 1997 Symposium on Systems Analysis in Forest Resources, USDA General Technical Report NC-205.</i>	Proceedings
144.	2000	“Integrating the Biodiversity Management Area Selection Model into a Multi-Use Forest Programming Model: The Case of RELMdss,” with W.J. Okin, W.J., M. Figueroa, and K. Barber	<i>Proceedings of the 1997 Symposium on Systems Analysis in Forest Resources, USDA General Technical Report NC-205.</i>	Proceedings
145.	2000	“Understanding the tradeoffs between site quality and species presence in reserve site selection,” with R. Gerrard, A. Hollander, and D. Stoms	<i>Forest Science</i> 46; 157-167.	Refereed Article
146.	2000	“Forest Planning at the Tactical Level,” with A. Murray and K. Barber	<i>Annals of OR</i> 95; 3-18.	Refereed Article
147.	2000	“Forest Management Models and Combinatorial Algorithms: analysis of state of the art,” with A. Weintraub, A. Murray, and M. Guignard (previously listed as B-5)	<i>Annals of OR</i> 95;271-285.	Refereed Article
148.	2000	“Exploratory spatial optimization in site search: a neighborhood operator approach,” with T. Cova	<i>Computers, Environment and Urban Systems</i> ; 401-419	Refereed Article
149.	2000	“Mapping evacuation risk on transportation networks using a spatial optimization model”	<i>Transportation Research C</i> 8; 321-336.	Refereed Article

		with T. Cova		
150.	2000	“Contiguity constraints for a single region site search problems,” with T. Cova	<i>Geographical Analysis</i> 32, 306-329.	Refereed Article
151.	2000	“Support System development for forest ecosystem management,” with A. Murray, M. Figueroa, and K. Barber	<i>European Journal of Operational Research</i> 121; 247-258.	Refereed Article
152.	2000	“The school boundary stability problem over time,” with D.S.Lemberg	<i>Socio-Economic Planning Sciences</i> 34; 159-176.	Refereed Article
153.	2000	“Mapping evacuation risk on transportation networks using a spatial optimization model,” with T. Cova	<i>Geographic Information Systems in Transportation Research</i> , ed by J-C. Thill	Reprinted Refereed Article
154.	2001	“Habitat evaluation using GIS: A case study applied to the San Joaquin Kit Fox,” with R. Gerrard, P. Stine, and M. Gilpin	<i>Landscape and Urban Planning</i> 52; 239-255	Refereed Article
155.	2001	“GIS and large-scale linear programming: evolution of a spatial decision support system for land use management”	<i>Regional Science and Business</i> , ed. G. Clarke & M. Madden, Springer-Verlag, Berlin-Heidelberg.	Refereed Chapter
156.	2001	“Manpower Deployment in Emergency Services,” with P.Sorensen and W.Corrigan	<i>Fire Technology</i> 37, 219-234	Refereed Article
157.	2002	“Geographical Information Systems and Location Science”	<i>Computers and Operations Research</i>	Refereed Article
158.	2002	“Spatial Optimization Models”	<i>International Encyclopedia of the Social and Behavioral Sciences</i>	Chapter
159.	2002	“Modeling Small Area Evacuation: Can existing	<i>Vehicle Intelligence and Transportation</i>	Contract Report

		transportation infrastructure impede public safety?" with R. Sexton	<i>Analysis Laboratory report to Caltrans</i>	
160.	2002	"Linear Referencing and alternative expressions of location for transportation," with V. Noronha	<i>Vehicle Intelligence and Analysis Laboratory Report to Caltrans</i>	Contract report
161.	2002	"Economic Instruments for Habitat Conservation," with D. Stoms, F. Davis, and R. Gerrard	<i>Report to WorldBank</i>	Contract Report
162.	2003	"COBRA: a new formulation for the classic p-median location problem"	<i>Annals of Operations Research 122; 103-120.</i>	Refereed Paper
163.	2003	"Clustering and compactness in reserve site selection: an extension of the biodiversity management area selection model," with D. Fischer	<i>Forest Science 49(4); 555-565.</i>	Refereed Article
164.	2003	"Measuring accessibility for people with a disability," with J. Marston	<i>Geographical Analysis 35(1); 83-96.</i>	Refereed Article
165.	2003	"Constructing Cell-Based Habitat Patches Useful in Conservation Planning Patch," with R. Gerrard, P. Stine, and M. Gilpin	<i>Annals of the AAG 93(4); 814-827.</i>	Refereed Article
166.	2003	"The Multi-Level Location Set Covering Model," with R. Gerrard	<i>Geographical Analysis 35(4); 277-289.</i>	Refereed Article
167.	2003	"A Framework for setting land conservation priorities using multi-criteria scoring and an optimal allocation strategy," with F. Davis, D. Stoms, C. Costello, E. Machado, J. Metz, R. Gerrard, S. and Andleman, H. Regan	Report to the Resources Agency of California, August 2003	Contract Report

168.	2004	“Fundamentals of Location and Layout Problems,” with Charles ReVelle	Chapter 1, Part 2, in <i>Decision Analysis, Location Models, and Scheduling Problems</i> by H.A. Eiselt and C.L. Sandblom.	Book Chapter
169.	2004	"Location Models on Networks," with Charles ReVelle	Chapter 2, Part 2, in <i>Decision Analysis, Location Models, and Scheduling Problems</i> by H.A. Eiselt and C.L. Sandblom.	Book Chapter
170.	2004	"Continuous Location Models," with Charles ReVelle	Chapter 3, Part 2, in <i>Decision Analysis, Location Models, and Scheduling Problems</i> by H.A. Eiselt and C.L. Sandblom.	Book Chapter
171.	2004	“Identifying Critical Infrastructure: the Median and Covering Facility Interdiction Problems,” with P Scaparra and R. Middleton	<i>Annals of the AAG</i> 94(3); 491-502.	Refereed Article
172.	2005	“A GRASP and path relinking heuristic for rural road network development,” with M.P. Scaparra	<i>Journal of Heuristics</i> 11; 89-108.	Refereed article
173.	2005	“A relative access measure to identify barriers to efficient transit use by persons with visual impairments,” with J. Marston	<i>Disability and Rehabilitation</i> 27; 769-779.	Refereed article
174.	2005	“Spatial and Temporal Utility Modeling to Increase Transit Ridership,” with V. Noronha, T. Lei, W. Corrigan, S. Burbidge, and J. Marston	<i>California PATH Research Report UCB ITS PRR 2005 22</i>	Contract Report
175.	2005	“Sustainable Urban Land Use allocation with Spatial Optimization,” with A.	<i>GeoComputation 2005 Proceedings</i> , Ann Arbor MI. (CD-	Proceedings

		Ligmann-Zielinska and P. Jankowski	ROM).	
176.	2005	“The SITES reserve selection system: a critical review,” with D. Fischer	<i>Environmental Modeling and Assessment</i> 10; 215-228.	Refereed Article
177.	2005	“An optimal modeling approach for the interdiction median problem with fortification,” M.P. Scaparra	<i>Kent Business School, Working Paper No. 78</i>	Research report
178.	2006	“Urban Land Use Allocation With Spatial Optimization,” with A. Ligmann-Zielinska and P. Jankowski	<i>12th International Symposium on Spatial Data Handling (GICON 2006)</i>	Proceedings
179.	2006	“A Family of Location Models for Multiple-Type Discrete Dispersion,” with Kevin Curtin	<i>Geographical Analysis</i> 38; 248-270.	Refereed Article
180.	2006	“Planning for Disruptions in Supply Chain Networks,” with L. Snyder, M.P. Scaparra, and M. Daskin,	<i>Tutorials in Operations Research, INFORMS, 2006</i>	Refereed chapter
181.	2007	“Protecting Critical Assets: the r -interdiction median problem with fortification,” with M.P. Scaparra	<i>Geographical Analysis</i> 39; 129-146.	Refereed Article
182.	2007	“Optimal dispersion and central places,” with K. Curtin	<i>Journal of Geographical Systems</i> 9; 167-187.	Refereed Article
184.	2007	“Locating and protecting critical reserve sites to minimize expected and worst case losses, “with Jesse O’Hanley and K. Gillless	<i>Biological Conservation</i> 134; 130-141.	Refereed Article
185.	2007	“The importance of In Situ site loss in nature reserve selection: balancing notions of	<i>Biological Conservation</i> 135; 170-180.	Refereed Article

- complementarity and robustness,” with J. O’hanley and K. Gilles
186. 2008 “Regional Service Coverage Modeling,” with A. Murray and M. O’Kelly *Computers and Operations Research* 35; 339-355. Refereed Article
187. 2008 “BEAMR: an exact and approximate model for the p-Median Problem” *Computers and Operations Research* 35; 417-426. Refereed Article
188. 2008 “Tactical level forest management models: bridging the gap between strategic and operational problems” *Handbook on Operations Research in Natural Resources on Strategic Forest Planning*, edited by A. Weintraub, T. Bjorndal, R. Epstein, and C. Romero Kluwer Press, 343-363. Refereed chapter
189. 2008 “A bilevel mixed-integer program for critical infrastructure protection planning,” with M.P. Scaparra *Computers and Operations Research* 35; 1905-1923. Refereed Article
190. 2008 “An exact solution approach for the interdiction median problem with fortification,” with M.P. Scaparra *European Journal of Operational Research* 189; 76-92. Refereed Article
191. 2008 Spatial optimization as a generative technique for sustainable multiobjective land use allocation, with A. Ligmann-Zielinska and P. Jankowski *International Journal of Geographical Information Science* 22; 601-622. Refereed Article
192. 2008 A framework for modeling rail transport vulnerability, with Steven Peterson *Growth and Change* 30; 617-641. Refereed Article
193. 2009 *Business Site Selection, Location Analysis, and GIS*, John Wiley & Sons Inc, Hoboken, NJ. Book

with A.T. Murray

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| 194. | 2009 | Finding shortest paths on real road networks: the case for A*, with Zeng Wen | <i>International Journal of Geographical Information Science</i> , Vol. 23, No. 4, 531–543 | Refereed Article |
| 195. | 2009 | Tribute to C.S. ReVelle, with J. Current & M. Daskin | <i>Geographical Analysis</i> 41: 3–8 | editorial |
| 196. | 2009 | Improving accessibility to rural health services: the maximal covering network improvement problem, with Lisa Murawski | <i>Socio-Economic Planning Sciences</i> 43: 102-110 | Refereed Article |
| 197. | 2009 | Planning for a disaster: a review of the literature with a focus on transportation related issues, with Micah Barachman | FiRST Report, GeoTrans Laboratory, UCSB | Contract Report |
| 198. | 2010 | Integrating expected coverage and local reliability for emergency medical services location problems, with Paul Sorensen | <i>Socio-Economic Planning Sciences</i> 44: 8-18 | Refereed Article |
| 199. | 2010 | On a bi-level formulation to protect uncapacitated p-median systems with facility recovery time and frequent disruptions, with Chaya Losada and Paola Scaparra. | <u><i>Electronic Notes in Discrete Mathematics</i></u> 36: 591-598 (2010) | On-line peer reviewed journal |
| 200. | 2010 | Mapping Transit-Based Access: Integrating GIS, Routes and Schedules, with Ting Lei | <i>International Journal of Geographical Information Science</i> | Refereed Article |
| 201. | 2010 | Introduction to special issue on location modeling, with M. Kuby | <i>Networks and Spatial Economics</i> 10:293-295 | Editorial |
| 202. | 2010 | Optimum Location of Motorway Interchanges: Users' Perspective, with Hugo Repolho and Antonio Antunes | <i>ASCE: Journal of Transportation Engineering</i> 136:956-963. | Refereed Article |

203.	2010	Transmission Corridor Location: multi-path alternative generation using the kth shortest path method, with A. Medrano	<i>Report to Argonne National Laboratory, Dec 2010</i>	Final Contract Report
204.	2011	The p -Regions Problem, with Juan Carlos Duque and Richard Middleton	<i>Geographical Analysis 43:104-128</i>	Refereed Article
205.	2011	Designing robust facility coverage networks to hedge against worst case facility losses, with Jesse O'Hanley	<i>European Journal of Operational Research 209: 23-36.</i>	Refereed Article
206.	2011	Constructs for multi-level closest assignment in location modeling, with Ting Lei	<i>International Regional Science Review 34:339-367.</i>	Refereed Article
207.	2011	Introduction to the ISOLDE XI Special Issue, with Alan Murray	<i>International Regional Science Review 34:283-284.</i>	Editorial
208.	2011	Locating Short-Term Empty-Container Storage Facilities to Support Port Operations: A User Optimal Approach, with Ting Lei	<i>Transportation Research Part E 47:738-754</i>	Refereed Article
209.	2011	Restoring forest landscapes for biodiversity conservation and rural livelihoods: a spatial optimization model, with F. Orsi & D. Geneletti	<i>Environmental Modeling & Software 26:1622-1638.</i>	Refereed Article
210.	2011	Scheduling initial and maintenance fuels removal activities: a user's guide to the mFASST Program	<i>Report to the US Forest Service under contract 10-CS-11052007-013.</i>	Contract Report
211.	2011	Modelo De Localizacao Óptima De Estacoes Ferroviarias: A Futura Linha De Alta Velocidade Lisboa-Porto, with	<i>Proceedings, Anpet 2011</i>	Proceedings

H. Repolho and Antonio
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PRESENTATION AT CONFERENCES AND INVITED TALKS

Year	Title	Meeting/Place
Nov. 1973	"The Maximal Covering Location Problem", with Charles ReVelle, Invited paper	Twentieth North American Meetings of the Regional Science Association, Atlanta GA
Nov, 1974	"Bus Stop Location by Integer Programming", with Charles ReVelle, presented at the 1974 ORSA/TIMS Meetings in Chicago.	ORSA/TIMS Meetings in Chicago, IL.
May, 1975	"Theoretical and Computational Links Between the p- Median Problem and the Maximal Covering Location Problem", with Charles ReVelle	Regional Science Association Meeting in Chicago, IL
Nov, 1975	"An Optimal Approach to an Expanded Form of the Location Set Covering Problem", with Michael Meadows	ORSA/TIMS Meetings, Las Vegas, NV
Apr, 1976	"On Locating an Obnoxious Facility on a Network", with Robert Garfinkel	ORSA/TIMS Meeting in Philadelphia, PA
Apr, 1976	"Maximal Covering Over a Network", with Michael Meadows	ORSA/TIMS Meeting in Philadelphia, PA
Nov, 1976	"Linear Programming Approaches to Hydrologic Processes", with Michael Meadows	ORSA/TIMS Meeting in Miami, FL
Nov, 1976	"A Cutting Hyperplane Method for Generating Solutions to Multiobjective Problems", with Jared Cohon and Daniel Sheer	ORSA/TIMS Meeting in Miami, FL
May, 1977	"A Multiobjective Energy Facility	ORSA/TIMS Meeting in San

	Siting Model", Charles ReVelle and Jared Cohon	Francisco, CA
Nov, 1977	"A Spatial Model for the Location Construct of Teitz", with Charles ReVelle	XXIII North American Meetings of the Regional Science Association in Toronto, Canada.
Nov, 1977	"Applications of Modelling in Solid Waste Management", with James Male	ORSA/TIMS Meeting in Atlanta, GA
Nov, 1977	"An Application of Computer Programming to Chemical Equilibrium Modelling of a Groundwater Study", with Raymond Rose and Roger Minear	29th Southeast Regional Meeting of ACS, Tampa, FL
Apr, 1978	"On Determining Facility Configurations which Maximize Benefits", with Thomas Bell	International Symposium on Location Decisions, Banff, Alberta
Apr, 1978	"The Fleet Location Model of the Baltimore Fire Protection Systems", with David Schilling, D.J. Elzinga, Charles ReVelle, and Jared Cohon	International Symposium on Location Decisions, Banff, Alberta
Nov, 1978	"Contrasts Between Facility Location Approaches and Non-Hierarchical Cluster Analysis"	ORSA/TIMS Meeting in Los Angeles, CA
May, 1979	"Multiobjective Location Modelling", with Charles ReVelle	Northeast Regional Science Association Meetings, Amherst, MA
Apr, 1979	"A Simulation Approach to Base Line Energy Siting Analysis", with Edward Hillsman	Tenth Annual Pittsburgh Conference on Modelling and Simulation, Pittsburgh, PA
Apr, 1979	"Deployment of a Multi-Purpose Ambulance System", with Dave Eaton and Bryon Hamon	Tenth Annual Pittsburgh Conference on Modelling and Simulation, Pittsburgh, PA
Apr, 1979	"The Maximal Advantageous Covering Problem: Balancing Impact and Accessibility in Public	75th Meeting of the AAG, Philadelphia, PA

	Facility Location", with Larry Roberts	
July, 1979	"The Oak Ridge SCOAL Models", with Edward Hillsman	USDA Summer Workshop GP-8 on National Coal Models, Bozeman, MT
Apr, 1979	"Water Quality Indexing and Scoring", with Roy O. Ball	American Society of Civil Engineers National Meeting, Boston, MA
Oct, 1979	"On Determining Many Close to Optimal Solutions to the p-Median Problem" with Dennis Huber	ORSA/TIMS meeting in Milwaukee, WI
Apr, 1980	"A Central Place Theoretical Covering Model" presented with Thomas L. Bell	Association of American Geographers national meetings in Louisville, KY
Apr, 1980	"Developing Solid Waste Planning Regions for the Tennessee Valley Authority", presented at the	11th Annual Pittsburgh Conference on Modelling and Simulation, Pittsburgh, PA
May, 1980	"The Maximal Advantageous Covering Model"	ORSA/TIMS Meeting in Washington, D.C.
Nov. 1980	"A Framework for Solving Multiobjective Location Problems"	Regional Science Association Meetings in Milwaukee, WI
Apr, 1981	"Air Quality Monitor Network Design Models: An Overview"	Environmetrics '81, Washington, D. C.
Apr, 1981	"A Comparison of Two Baseline Procedures for Power Plant Siting"	Association of American Geographers Meetings, Los Angeles, CA
Apr, 1981	"Signal Operation Optimization Using a Reservoir Analogy"	11th Annual Pittsburgh Conference on Modelling and Simulation, Pittsburgh, PA
May, 1982	"Recent Developments in Covering Models for the Location of Emergency Facilities"	ORSA/TIMS meeting in Detroit, MI
Apr, 1982	"Determining Solid Waste	National meeting of the

	Planning Regions: A Multiobjective Approach"	Association of American Geographers, San Antonio, TX
Nov, 1982	"Generalized Covering Models and Public Facility Location"	Regional Science Association meetings in Pittsburgh, PA
Oct, 1982	"Regional Power Plant Siting Models"	ORSA/TIMS joint National Meeting, San Diego, CA
Oct, 1982	"School Districting under Changing Levels of Enrollments"	ORSA/TIMS joint National Meeting, San Diego, CA
Oct, 1982	"Three Issues in Hazardous Materials and Wastes Transportation: Emergency Response, Routing, and Facility Location", with Richard Reeves	ORSA/TIMS joint National Meeting, San Diego, CA
Oct, 1982	"The Vector Assignment Stochastic (VAST) Median Location Model", with Jerry Weaver	ORSA/TIMS joint National Meeting, San Diego, CA
Apr, 1983	"Regional Power Plant Siting Heuristic"	Association of American Geographers annual meeting, Denver, CO
Apr, 1983	"An Analysis of Late Horizon Settlement in the Basin of Mexico Using a Location-Allocation Model", with Bell and Gorenflo (presented by Bell)	The 48th Annual meeting of the Society of American Archaeology, Pittsburgh, PA
Apr, 1983	"Incorporating Planning Preferences into Location Models", with Jorge Penalba and David Eaton	Fourteenth Annual Pittsburgh Conference on Modeling and Simulation, Pittsburgh, PA
Apr, 1983	"Solution Procedures for the Maximal Covering Location Problem", with Jerry Weaver	Fourteenth Annual Pittsburgh Conference on Modeling and Simulation, Pittsburgh, PA
Nov, 1983	"The Formal and Computational Relationship of The Stochastic and Deterministic Median Location Problems", with Jerry Weaver	ORSA/TIMS National Meetings, Orlando FL

Feb, 1984	"An Analysis of the Late Horizon Settlement in The Northeastern Basin of Mexico", with Larry Gorenflo	23rd Annual Meetings of the Western Regional Science Association, Monterey, CA
Apr, 1984	"Modelling to Generate Alternative Solutions"	Annual Meetings of the Association of American Geographers, Washington, D.C.
May, 1984	"Hazardous Materials Transportation"	The Institute of Transportation Studies, U.C. Berkeley
June, 1984	"Approaches to Solving Covering Problems," with Jerry Weaver	Third International Symposium on Locational Decisions, Boston, MA
Aug, 1984	"The Supporting Median Problem," presented with Jerry Weaver	IFORS Meeting, Washington, D.C.
Apr, 1985	"The Nested Hierarchical Median Problem", with Jerry Weaver	ORSA/TIMS Meeting, Boston, MA
May, 1985	"Facility Location Modelling", invited seminar presentation	Transportation Research Center, Northwestern University
Nov, 1985	"Balancing Access and Service Coverage"	North American Meetings of the Regional Science Association, Philadelphia, PA
Nov, 1985	"Locating Buying Centers in a Coffee Cooperative"	North American Meetings of the Regional Science Association, Philadelphia, PA
Apr, 1986	"A District Sensitive Location Model"	ORSA/TIMS meeting, Los Angeles, CA
Nov, 1986	"Solving the Maximal Covering Location Problem"	Thirty-Third North American Meetings of The Regional Science Association, Columbus, OH
Nov, 1986	"Optimizing Energy Costs in the Ugandan Coffee Cooperating Marketing System"	Thirty-Third North American Meetings of The Regional Science Association, Columbus, OH
Oct, 1987	"Evolution of Geographic	GIS-87 Conference, San

	Information Systems as Decision Making Tools, with Phillip Parent (presented by co-author)	Francisco, CA
Nov, 1987	"Regionally Constrained Median Problems"	Thirty-Fourth North American Meetings of The Regional Science Association, Baltimore, MD
Nov, 1987	"The Generalized Nonreferral Nested Hierarchical Maximal Covering Location Problem: Formulations and Solutions", with Jerry Weaver	Thirty-Fourth North American Meetings of The Regional Science Association, Baltimore, MD
June, 1987	"New Structures and Reformulations for the Hierarchical and Nonhierarchical Covering Location Models, with J. Weaver (presented by co-author)	International Symposium on Locational Decisions IV, Namur, Belgium
Oct, 1988	"Reformulating the Maximal Expected Coverage Location Model" with K. Ellison	ORSA/TIMS national meeting, Denver, CO.
Oct, 1988	"Multicriteria Optimization and Urban Facilities Planning" with J. Grimes	ORSA/TIMS national meeting, Denver, CO.
Nov, 1988	"Inclusion and Reduction Rules in Covering Models," with K. Ellison	Thirty-fifth North American meetings of the Regional Science Association, Toronto
Nov, 1988	"Location and Redeployment of Emergency Service Units," with J.R. Weaver	Thirty-fifth North American meetings of the Regional Science Association, Toronto
May, 1989	"The Maximal Covering Tree Problem", presented by coauthor John Current	CORS/ORSA/TIMS international meeting, Vancouver, Canada
Apr, 1989	A Fast Network-Based Heuristic for the Assignment of Students to Schools, presented by coauthor, O.B. Schoepfle	Annual meeting of the AAG, Baltimore, MD
Oct, 1989	"Unpacking Central Place	Boston University, Boston, MA

Geometry: Theoretical K-
Systems"

Oct, 1989	"Deployment Analysis Prototype of the U.S. Transcom", with A.J.Rathi and R. Solanki	ORSA/TIMS national meeting, New York City, NY
Nov, 1989	"Modeling School Assignments as a Generalized Network", with O.B. Schoepfle	Regional Science Association North American Meetings, Santa Barbara, CA
Nov, 1989	"Analyzing Tradeoffs for the Regionally Constrained Median Problem", presented with Ross Gerrard	Regional Science Association North American Meetings, Santa Barbara, CA
Nov, 1989	"The p-Median Scheduling and Location Problem", presented with Craig Bloxham	Regional Science Association North American Meetings, Santa Barbara
Nov, 1989	"Perspectives of Location Theory in Water Resources Modeling"	Regional Science Association North American Meetings, Santa Barbara, CA
May, 1990	"Ties Between the Family of Knapsack and Assignment Problems"	TIMS/ORSA national meeting, Las Vegas, NV
May, 1990	"Analyzing Ancient Egyptian Settlement Patterns: Extensions to Previous Work", with T.L. Bell	TIMS/ORSA national meeting, Las Vegas, NV
Apr, 1990	Relaxing Mathematical Packing Requirements in Hierarchical Central Place Systems, presented by coauthor T.L. Bell	AAG annual meeting, Toronto
Apr, 1990	An Exact Network Representation of a "Classic" School Districting Problem, presented by coauthor O.B. Schoepfle	AAG annual meeting, Toronto
June, 1990	Data Base System Design and Placement for Geographical Information Systems, with Michael Goodchild	Fifth International Symposium on Location Decisions (ISOLDE), Lake Arrowhead, CA

June, 1990	A Median Location Model which Allows nonclosest Unit Service and Multiple Service Units at a site, with Jerry R. Weaver	Fifth International Symposium on Location Decisions (ISODE), Lake Arrowhead, CA
June, 1990	The Minimal Cost/Maximal Covering Forest Problem on a Tree, with J. Current	Fifth International Symposium on Location Decisions (ISOLDE), Lake Arrowhead, CA
Nov, 1990	"A New Approach to Modeling School Assignments Using Controlled Choice," with O. Schoepfle	Regional Science Association North American Meetings, Boston, MA
Nov, 1990	"The P-Median Transportation Problem," with J. Weaver	Regional Science Association North American Meetings, Boston, MA
Nov, 1990	"The Fixed Charge Maximal Covering Location Problem," with R. Davis	Regional Science Association North American Meetings, Boston, MA
May, 1991	"P-Median Problem with Overlapping Zonal Constraints," with R. Gerrard	TIMS/ORSA National Meeting, Nashville, TN
May, 1991	"The relationship between the FLEET and MOFLEET Location Models," with J.R. Weaver	TIMS/ORSA National Meeting, Nashville, TN
Nov 1991	"Location-Allocation Models with Design Constraints," with R. Gerrard	TIMS/ORSA National Meeting, Anaheim, CA
Nov, 1991	"The Hierarchical Maximal Covering Location Problem," with R. Gerrard	Regional Science Association North American Meetings, New Orleans, LA
Nov, 1991	"A Dual Based Heuristic for the Maximal Covering Location Problem," with R. Davis	Regional Science Association North American Meetings, New Orleans, LA
Nov, 1991	"Modeling School Utilization and Consolidation," with A. Murray	Regional Science Association North American Meetings, New Orleans, LA

Nov, 1991	"Analyzing and Comparing Alternative Configurations of Location-Allocation Models," with A. Ruggles	Regional Science Association North American Meetings, New Orleans, LA
Nov, 1991	"Network Based Modeling of "Controlled Choice" School Assignment," with O. Schoepfle	Regional Science Association North American Meetings, New Orleans, LA
Feb, 1992	"An Analysis of Late-Horizon Settlement Patterns in the Teotihuacan-Temascalapa Basins: A Location-Allocation and GIS based Approach," with and presented by Amy Ruggles	Anthropology of Human Behavior Through Geographic Information and Analysis: An International Conference, Santa Barbara, CA,
April, 1992	"Exploring Spatial Alternatives for a Corridor Location Problem," with S.C. Loban and K.L. Lombard	Association of American Geographers 88th Annual Meeting, San Diego, CA
Nov, 1992	"Forest Planning and Management Using Large Scale Linear Programming," with A. Murray and S. Loban	ORSA/TIMS National Meeting, San Francisco, CA
Nov, 1992	"The Reliability of Alpha-Reliability," with A. Murray	ORSA/TIMS National Meeting, San Francisco, CA.
Nov, 1992	"Vehicle Availability and Estimating Service Coverage," with A. Murray	North American Regional Science Association Meetings, Chicago, IL
Nov, 1992	"A Fast Network-Based Hybrid Heuristic For "Controlled Choice" Assignments," with O. Schoepfle	North American Regional Science Association Meetings, Chicago, IL
Nov, 1992	"The p-median Problem with Overlapping Zonal Constraints," with R. Gerrard	North American Regional Science Association Meetings, Chicago, IL
Mar, 1993	"Spatial allocation in archaeology: an opportunity for re-evaluation," with and presented by A. Ruggles (presenter)	Geographic Information Systems and the Advancement of Archaeological Method and Theory, Southern Illinois University

Mar, 1993	"Adjacency Constraint Aggregation," with and presented by A. Murray,"	International Symposium on Analysis and Management Decisions in Forestry, Valdivia, Chile
Nov, 1993	"An Improved Formulation for Location Covering with Thresholds," with R. Gerrard	ORSA/TIMS meeting, Boston, MA
Nov, 1993	"Heuristic Approaches for Solving Area-Based Forest Planning Problems," with A.T. Murray	ORSA/TIMS meeting, Phoenix, AZ
Feb, 1994	"Designing a Spatial Decision Support System for Forest Ecosystem Management," with A.T. Murray and M.A. Figueroa	GIS-94 meeting, Vancouver, B.C.
Apr, 1994	"Developing a Spatial Decision Support System for Land Use Management," with A.T. Murray	ORSA/TIMS meeting, Boston, MA
Apr, 1994	"The BLAST heuristic for Location Models," with P. Sorensen	ORSA/TIMS meeting, Boston, MA.
Sept, 1994	"Designing a hierarchical planning Model for USDA Forest Service planning," with A.T. Murray and K. Barber	Sixth Symposium on Systems Analysis and Management Decisions in Forestry, Asilomar Conference Center, Pacific Grove, CA
Sept, 1994	"Artificial landscape visualization of ecosystem management plans," with A.T. Murray, M.A. Figueroa, A. Ager, and R.J. McGaughey	Decision Support -2001, Toronto, Canada
Nov, 1994	"Expanding Spatial Detail and Restrictions in Public Sector Location Models," with A.T. Murray	Forty-First North American Meeting of the Regional Science Association International, Ontario, Canada
Apr, 1995	"Successfully Integrating the Ecosystem Hierarchy: Designing a Hierarchical Planning Model that Allows Bridging Between Levels,"	Analysis Workshop III(Analysis in Support of Ecosystem Management) Lincoln Center, Ft. Collins, CO

	with A.T. Murray, Klaus Barber, and Richard Dyrland	
Apr, 1995	"Hierarchical land use approach for the USDA Forest Service," with A.T. Murray, M.A. Figueroa, and Klaus Barber (presenter)	INFORMS(Institute for Operations Research and the Management Sciences) meeting, Los Angeles, D.C.
Apr, 1995	"Modeling Future Desired Conditions," with A.T. Murray (presenter)	INFORMS(Institute for Operations Research and the Management Sciences) meeting, Los Angeles, D.C.
Sept, 1995	"Heuristic methods for the solution of combinatorial forestry planning problems"	Universidad de Chile Santiago, Chile
Nov, 1995	"A Spatial Search for Neighborhoods that May be Difficult to Evacuate, with T. Cova (presenter)	GIS/LIS 95, Nashville, TN
Nov, 1995	"Generalizations of the Classic Weber Problem"	Forty-Second North American Meeting of the Regional Science Association International, Cincinnati, Ohio
Nov, 1995	"Biodiversity Management Area Selection," with David Stoms, Frank Davis, and B.J. Okin	Forty-Second North American Meeting of the Regional Science Association International, Cincinnati, Ohio
Dec, 1995	"Designing Spatial Decision Support Systems for Ecosystem Management"	Environmental Assessment Division, Argonne National Laboratory, Illinois
Jan, 1996	"Planning Activities to Protect Biodiversity with a GIS and an Integrated Optimization Model," with David Stoms, Frank Davis, and B.J. Okin	Third International Conference/Workshop on Integrating GIS and Environmental Modeling, Santa Fe, NM
Feb, 1996	"Regional Ecosystem and Land Management Decision Support Tool (RELM): Demonstration of Interagency Analysis of the	USFS Regional Leadership Conference, Portland Ore.

	Northwest Forest Plan Options,” with Dick Dyrland and K.Barber	
May, 1996	"Special Constructs for Solving the Maximal Covering Problem using Lagrangian Relaxation”	INFORMS(Institute for Operations Research and the Management Sciences) meeting, Washington, D.C.
May, 1996	"Developing an Exploratory Search Process for a Public Sector Location Problem,” with Michael Figueroa (presenter)	INFORMS(Institute for Operations Research and the Management Sciences) meeting, Washington, D.C.
May, 1996	"Long Range School District Boundary Assignment,” with David Lemberg (presenter)	INFORMS(Institute for Operations Research and the Management Sciences) meeting, Washington, D.C.
July, 1996	"Locational Issues in Forest Management,” with A.T. Murray and A. Weintraub	ISOLDE(International Symposium on Locational Decisions) meeting, Jasper, Alberta, Canada
July, 1996	"Optimizing harvesting operations: locating towers, skidders and roads,” with A.T. Murray (presenter)	ISOLDE(International Symposium on Locational Decisions) meeting, Jasper, Alberta, Canada
Nov,1996	“Land cover classification using Multiple Endmember Spectral Mixture Models and the Maximal Covering Problem: Mapping Chaparral in Southern California,” with D. Roberts and M. Gardner	43 rd North American Meetings of the Regional Science Association International, Washington, DC
Nov,1996	“Applying the maximal covering problem in Reserve Site Selection,” with R. Gerrard, D. Stoms, and F. Davis	43 rd North American Meetings of the Regional Science Association International, Washington, DC,
Nov,1996	“Modeling for desired future conditions in a National Forest,” with K. Barber and A. Murray	Albuquerque, NM
May,1997	“Generating alternatives in forestry modeling,” with K. Barber, A. Murray, and M.	Informs National Meeting in San Diego

Figueroa

May,1997	“Forest Planning and Steiner Tree Extensions,” with A. Murray	Informs National Meeting, San Diego, CA
May,1997	“Optimizing the Location of Harvesting Equipment and Access Roads,” with A. Murray	Seventh Symposium on Systems Analysis in Forest Resources, Bellaire, MI
May,1997	“Integrating the biodiversity management area selection model into multi-use forest programming models: The case of RELMdss,” with K. Barber	Seventh Symposium on Systems Analysis in Forest Resources, Bellaire, MI
Nov,1997	“Location search strategies and GIS: a case example applied to identifying difficult to evacuate neighborhoods,” with T. Cova	44 th North American Meetings of the Regional Science Association International, Buffalo, NY
Nov,1997	“Modeling the disposal of spent nuclear fuel-Part II. ,” with O.B. Schoepfle and F. Monette	44 th North American Meetings of the Regional Science Association International, Buffalo, NY
April,1998	“Selecting biodiversity management areas,” with B.J. Okin	Informs National Meeting, Montreal
Nov,1998	“Reducing data aggregation errors,” with D.M. Chen	45 th North American Meetings of the Regional Science Association International, Santa FE, NM
Nov,1998	“Location Modeling using GIS,” with R. Gerrard and V. Noronha	45 th North American Meetings of the Regional Science Association International, Santa FE, NM
Nov,1998	“Searching for the best site,” with T. Cova	45 th North American Meetings of the Regional Science Association International, Santa FE, NM
Dec,1998	“Automated scheduling solutions for military training and operational issues and techniques,” with R. Reeves, C. Bloxham, and F.L. Keeler	Interservice/Industry Training, Simulation and Education Conference, Orlando, FL

Mar,1999	“Manpower deployment in emergency services: Police, Fire, and EMS,” with P. Sorensen and W. Corrigan	International Conference on Fire Service Deployment Analysis, Indianapolis, IN, March, 1999
Sept.,1999	“Deployment Planning in EMS and Police,” with S. Grah	VISICON 99 conference, San Diego
Oct., 1999	Optimization models and reserve design	Craighead Environmental Research Institute, Bozeman, Montana
Oct., 2000	Application of Covering models to reserve design	Craighead Environmental Research Institute, Bozeman, Montana
Sept., 2000	Developing a Fire and Habitat Management Model, with D. Fischer and K. Barber	Eight Symposium on Systems Analysis and Forest Resources, Aspen, Colorado
Sept., 2000	“GIS data models and location modeling algorithms”	GIS-2000, Savannah, GA
Sept., 2000	“Object Fields,” with T. Cova and M. Goodchild	GIS-2000, Savannah GA
Nov., 2000	“Matching ships to units for large-scale military sealift, with Schoepfle, Macal, and VanGroning	North American Meetings of the Regional Science Association, Chicago, IL
Nov., 2000	“The Multi-level location set covering problem, a preliminary analysis”	North American Meetings of the Regional Science Association, Chicago, IL
Nov., 2000	“What can ants do as spatial analysts?”	North American Meetings of the Regional Science Association, Chicago, IL
Feb, 2002	“COBRA: a new formulation for the classic p-median problem”	Western Regional Science Association Annual Meetings, Monterey Calif.
May, 2002	“Getting out in the event of a wildland fire: modeling the evacuation of the Mission Canyon	Annual meeting of the Mission Canyon HOA, Natural History Museum, Santa Barbara, CA

neighborhood”

Mar, 2002	“Reserve Design,” with Punta De Tralga Chile	International Symposium on Systems Analysis and Forestry, Punta De Tralga Chile
June, 2002	“Multiple Level Location Set Covering Problem,”	International Symposium on Location Decisions, Fredricton, NB.
June, 2002	“COBRA: a new formulation fo the classic p-median problem”	International Symposium on Location Decisions, Fredricton, NB.
Oct, 2002	Multilevel covering and site selection for species protection	Craighead Environmental Research Institute, Bozeman, Montana
Nov, 2002	Solving patch based reserve design problems	INFORMS national meeting, San Jose, CA
Nov, 2003	BEAMR: Both exact and approximate model representations for the p-median problem	Annual North American Meetings of the Regional Science Association International, Philadelphia, PA.
Nov, 2003	Corridor Location: generating alternatives with the multi-gateway model, with M.P. Scapara	Annual North American Meetings of the Regional Science Association International, Philadelphia, PA.
Nov, 2003	Spatial optimization and planning for sustainability	Keynote talk on Sustainable planning at ETH Zurich
Jan, 2004	A Relative Access Measure to Identify Barriers to Efficient Transit Use by Persons with Visual Impairments, with J. Marston	Transportation Research Board Meetings, Washington, D.C.
May, 2004	Reserve Site Selection under Uncertainty, with J. O’Hanley	IFORS/CORS, Banff, Canada
Nov, 2004	A patch based conservation siting problem, with R. Gerrard and R. Middleton	North American Meetings of the Regional Science Association, Seattle, WA

Nov, 2004	Protecting critical assets against intentional harm, with M.P. Scaparra	North American Meetings of the Regional Science Association, Seattle, WA
Nov, 2004	Identifying critical infrastructure, with M.P. Scaparra	North American Meetings of the Regional Science Association, Seattle, WA
Nov, 2004	Heuristic distillation for the p-median problem, with R. Middleton	North American Meetings of the Regional Science Association, Seattle, WA
Dec, 2004	Critical infrastructure issues in the emergency evacuation of small areas	Florida State Department of Transportation Meeting on Remote Sensing and Transportation, Jacksonville, FL
Dec, 2004	Identifying and protecting critical assets: a case example for a facility location problem	Seminar presentation, UC Berkeley
April, 2005	Beyond 9-11: the new challenges for spatial analysts	Plenary talk (Spatial and analytical modeling) National Meetings of the Association of American Geographers
June, 2005	Heuristic Distillation, with R. Middleton	International Symposium on Location Decisions, Seville, Spain.
June, 2005	Optimizing passive protection in facility systems, with M.P. Scaparra and J. O'Hanley	International Symposium on Location Decisions, Seville, Spain.
June, 2005	Mathematical Models for critical infrastructure protection planning, with M.P. Scaparra	International Symposium on Location Decisions, Seville, Spain.
July, 2005	Identifying and protecting critical assets	Presentation at Ohio State University
July, 2005	Protecting critical infrastructures: The p-median interdiction problem with fortification" with M.P. Scaparra	IFORS meetings, Honolulu, Hawaii

Oct, 2005	California Spotted Owl Management Patches	Craighead Environmental Institute, Montana
Nov, 2005	EliAS: a new structure for the p-median problem	Regional Science Association Meetings, Las Vegas, NV
Nov, 2005	Siting a Bombing Range, with R. Gerrard and C. Bloxham	Regional Science Association Meetings, Las Vegas, NV
Dec, 2005	Mapping Transit Access and Improving Transit Services	Presentation to the Board of Santa Barbara Metropolitan Transit District
Feb, 2006	Exact models for the regionalization problem, with J.C. Duque and R. Middleton	Western Regional Science Association Conference, Santa Fe, NM
Feb, 2006	Beyond Swapping: the case for heuristic concentration, with R. Middleton	Western Regional Science Association Conference, Santa Fe, NM
Feb, 2006	Developing spatial optimization models for the protection of sensitive habitats: case examples of the San Joaquin Kit Fox and the California Spotted Owl	Seminar at University of Southern California
March, 2006	Site location and Geographical Information Systems	Seminar at Kent University, Canterbury, England
Sept, 2006	Modeling effective habitat after forest activities	Craighead Environmental Institute, Montana
Nov, 2006	Charles ReVelle, a leader in location science.	INFORMS national meeting, Pittsburgh, Pa.
Nov, 2006	Optimal fortification of capacitated facilities	INFORMS national meeting, Pittsburgh, Pa.
Nov, 2006	Planning for disruptions in supply chain networks, with L. Snyder, M.P. Scaparra, and M. Daskin	INFORMS national meeting, Pittsburgh, Pa.
Nov, 2006	Modeling flexible EMS services, with P. Sorensen	North American meetings of the RSAI, Toronto, Canada

Nov, 2006	Analyzing vulnerability: systems reliability under attack, M.P. Scaparra	North American meetings of the RSAI, Toronto, Canada
Feb, 2007	Improving accessibility to rural health services: The maximal covering network improvement problem, with L. Murawski	Western Regional Science Association meetings, Newport Beach, CA
Nov. 2007	Using a location model to estimate the amount of usable habitat for a territorial species, with R. Gerrard	North American Meetings of the RSAI, Savannah, GA
Nov. 2007	Building Probabilistic Covering Models using α -reliability and local busyness estimates, with P. Sorensen	Morth American Meetings of the RSAI, Savannah, GA.
Jan. 2008	The role of spatial optimization in Transportation modeling	University of California Transportation Center, conference
Feb. 2008	A framework for modeling rail transport vulnerability, with S. Peterson	Western Regional Science Association Meetings, Hawaii
April, 2008	Understanding the need for preservation and protection	China University of Geosciences, Wuhon
April, 2008	Reserve design for threatened biological elements	University of Wuhon, Wuhon,
April, 2008	Reserve design for threatened biological elements	Chengdu University, Xi'an
April, 2008	Using spatial properties to efficiently formulate a facility location problem	China University of Geosciences, Beijing
June, 2008	Designing robust coverage networks to hedge against worst-case facility losses, with Jesse O'Hanley	Eleventh International Symposium on Locational Decisions (ISOLDE XI) Santa Barbara, CA
June, 2008	Location models for roadway interchanges, with H. Repohlo and	ISOLDE XI, Santa Barbara, CA

A. Antunes

June, 2008	The minimal cost-maximal covering p-forest problem, with J. Current	ISOLDE XI, Santa Barbara, CA
June, 2008	Locational analysis and GIS, with Alan Murray	ISOLDE XI, Santa Barbara, CA
June, 2008	A multi-level modeling approach for the capacitated p-median interdiction problem with fortification, with M.P. Scaparra	ISOLDE XI, Santa Barbara, CA
June, 2008	The historical allocation and location (HAL) model for static EMS location problems, with Paul Sorensen	ISOLDE XI, Santa Barbara, CA
October, 2008	Scheduling fuels removal projects across a forest	Institute for Operations Research and Management Science) INFORMS, Washington, DC
Nov. 2008	Optimizing the storage of empty containers away from a port complex	North American Meetings of Regional Science, New York, NY
Feb., 2009	Network and facility systems fragility	Physics Department, UCSB
Mar., 2009	Modeling the most with the least: the case of the p-median problem	Keynote talk at the Location and Network Design (LAND) workshop in Pucon, Chile, sponsored by the Complex Systems Institute, University of Chile
May, 2009	Hydrogen Economy & Fuel Cell vehicles	Environmental Studies, UCSB
Sept., 2009	An Integer Programming-based model to include ecosystem services into the prioritization of forest restoration areas, presented, with F. Orsi and Davide Geneletti (presented by Orsi)	2nd European Congress of Conservation Biology Czech University of Life Sciences, Prague

Sept., 2009	Analyzing the Fragility of the U.S. Rail network: a proposed framework	University of Kent
Oct., 2009	Generalized constraints for closest assignment in location modeling, with Ting Lei	INFORMS National Conference, San Diego, CA.
Oct., 2009	The “Marching Army” heuristic and its application to a large scale location problem, with Matt Niblett	INFORMS National Conference, San Diego, CA.
Oct., 2009	The vulnerability of a supply system with facility recovery time: Analysis and Improvement, with Chaya Losada & Paola Scaparra	INFORMS National Conference, San Diego, CA.
Nov., 2009	Infrastructure fragility: modeling the impacts of losing a railroad bridge	Keynote talk at GIS day, Kansas University, Lawrence, KS
Nov., 2009	A new class of dispersion-based facility location models, with Ting Lei	North American Meetings of the Regional Science Association International, San Francisco, CA
Nov., 2009	The “Marching Army” heuristic and its application to a large scale location problem, with Matt Niblett	North American Meetings of the Region Science Association International, San Francisco, CA
Dec., 2009	Locating short term storage facilities for empty transport containers: a study of the Los Angeles region	Seminar at the Nanzan University, Nagoya, Japan
Dec., 2009	Modeling flexible EMS services	Urban OR workshop, Nagoya Japan
Feb., 2010	Mitigating the impacts of Global Shipping on Los Angeles: a focus on drayage	Arizona State University, Tempe, AZ
Feb., 2010	Corridor Location: the multi-gateway model	Western Regional Science Association, Sedona AZ.

Oct, 2010	Optimizing the disruption of a median service system	INFORMS, Austin, Tx
Oct, 2010	Optimizing Access: a network facility location design problem	INFORMS, Austin, Tx
Nov. 2010	Optimizing Access: a network facility location design problem	North American Meetings of the Regional Science Association International, Denver, CO
Dec., 2010	Differentiated least cost path selection on raster networks, with Antonio Medrano	Argonne National Lab
Dec., 2010	Forest Fuels Treatment Scheduling	Institute fur Terrestrische Okosysteme, ETH-Zurich
Jan., 2011	Optimizing the disruption of a median service system	INFORMS Computing Society, Monterey, CA
Jan., 2011	Mitigating the impacts of Global Shipping on Los Angeles: a focus on drayage	Univ. of Redlands
March, 2011	Scheduling fuels treatments to reduce the severity and size of fire	Keynote talk at the 14 th Symposium for Systems Analysis and Forest Resources
April, 2011	Modeling the most with the least: a case example of the p -median location problem	Department of Industrial & Systems Engineering, Texas A&M University
Nov. 2011	Modeling Corridor Location Alternatives: new methods and R&D needs (with John Krummel and Antonio Medrano)	Office of Electricity, USDOE, Washington, D.C.
Nov, 2011	The 40 th anniversary of Toregas, Swain, ReVelle and Bergman	Fellows Plenary talk of the North American Meetings of the Regional Science Association, Miami, FL
Nov, 2011	Modeling the response capabilities of ambulances: how long will it take?	North American Meetings of the Regional Science Association, Miami, FL

Dec, 2011	Modeling the Disruption of a p -median system	Civil Engineering Department, University of Coimbra, Portugal
Dec, 2011	The 40 th anniversary of Toregas, Swain, ReVelle, & Bergman: Covering the high points	Keynote talk at LAND-TRANSLOG II, Puerto Varas, Chile
Dec, 2011	High speed rail – an optimization model for locating stations and scheduling trains	Land-TRANSLOG II, Puerto Varas, Chile

Masters students:

Dennis Huber, Wing Sing Tsui, Jeffrey Christian, Daudi Migereko, Nancy Hoke, Richard Reeves, Christine Symogyi, Robert Vallera, Philip Parent, Ross Gerrard, Craig Bloxham, James Damkowitz, Joseph Grimes, Scott Loban, Geoffrey Bianchi, Amy Ruggles, Tom Cova, Paul Sorensen, Kristie Lombard, Michael Figueroa, Doug Fischer, Ryan Sexton, Michael Vergeer, Scott O'Daniel, Lisa Murawski, David Gaines, Matt Niblett, and Micah Brachman

PhD students:

Jerry R. Weaver: Professor, College of Business; University of Alabama, Tuscaloosa, AL

O. Benjamin Schoepfle, Consultant, Palos Heights, IL.

Alan Murray, Professor, School of Geographical Sciences, Arizona State University, Tempe, AZ.

Ross Gerrard, GIS Analyst and Spatial analyst, Sierra Nevada Framework team, U.S. Forest Service

David Lemberg, Associate Professor, Department of Geography, University of Western Michigan, Kellogg, MI

Paul Sorensen, Researcher, Rand Corporation, Santa Monica, CA

Tom Cova, Associate Professor, Department of Geography, University of Utah, Salt Lake City, UT

Kevin Curtin, Associate Professor, George Mason

University, Fairfax, VA

William Corrigan, Senior Analyst, Nielson Corp.,
San Diego, CA

Jesse O'Hanley, Lecturer, Kent Business School,
University of Kent, Canterbury, UK

Richard Middleton, Researcher-Staff Member, Los
Alamos National Laboratory, Oak Ridge, TN

Ting Lei, Post-doctoral scholar, Univ. of Oklahoma

RESEARCH GRANTS RECEIVED

1. National Science Foundation, Efficient Location of Urban Public Facilities, Co-P. I., 1978, \$23,000.
2. Tennessee Valley Authority, Determining Solid Waste Planning Districts for the Tennessee, P. I., 1979, \$7,000.
3. Tennessee Valley Authority, Utilization of Coal-Fired Power Plant Ash, Co-P. I., 1980, \$22,000.
4. US Department of Energy, Development and Assessment of Regional Power Plant Siting Models, Co-P. I., 1981, \$65,000.
5. U.S. Naval Training Command, Development of School Location Models, Phase II, P. I., 1980, \$29,000.
6. National Science Foundation, Location Analysis and Settlement Research, Co-P. I., 1981, \$56,000.
7. U.S. Naval Training Command (subcontract through University of Tennessee) Development of School Location Models, Phase III, P.I., 1981. \$24,000.
8. University of Tennessee, Location Analysis and Settlement Research, P.I., 1981. \$28,000.
9. U.S. Naval Training Command, Development of a Heuristic Scheduling Algorithm, P.I., 1982, \$24,000.
10. National Science Foundation, Research in Mobile Delivery and Periodic Marketing Systems, P.I., 1983, \$20,000.

11. UC Institute for Transportation Studies, Preliminary Studies of Hazardous Materials Transportation, P.I. , 1984, \$5,000.
12. US Naval Training Command (Interagency Agreement, Naval Training Systems Center) Logistics Modeling, P.I., 1987, \$28,000.
13. Oak Ridge National Laboratory, The Development of a Prototype Module for Shipping Consolidation, P.I., 1989, \$17,947.
14. USDA Forest Service "Developing Tactical and Operational Forest Planning Decision Support Systems", U.S. Forest Service (USDA PSW-90-0017CA), Co-P. I., 1990, \$51,117.
15. Caltrans, CalTrans Long Range Development Plan, Co-P.I., (65K936), 1990-1991 \$13,372.
16. USDA Forest Service, Analytical and Graphic Support Systems for Landscape Analysis Related to Forest Plan Implementation and Update, P.I. (USDA PSW-91-005CA) Mar 1991 to Dec 1991, \$22,977.
17. USDA Forest Service, Continuation and Extension of the Cooperative Research Project on Analytical and Graphic Support Systems for Landscape Analysis, related to Forest Plan Implementation and Update, P.I. (USDA PSW-91-005CA), 4/1/92-12/31/92, \$42,619
18. USDA Forest Service, Resolving Conflicts Between Harvesting and Oldgrowth Management for Biodiversity, U.S. Forest Service, Co. P.I., USDA PSW-91-0030CA), 9/24/91- 12/31/93, \$39,337.
19. USDA Forest Service, Spatial Decision Support Systems for Forest Plan Implementation and Update, P.I. (USDA PSW-92-0007CA), 4/30/92-6/30/93, \$54,000.
20. Hitachi of America Limited, Cooperative Research program with NCGIA Co-P.I., 4/1/92-3/31/93, \$116,715.
21. USDA Forest Service (Supplement #1), Spatial Decision Support Systems for Forest Planning, P.I. (USDA PSW-92-0039CA) 4/30/92-6/30/93, \$37,569.
22. USDA Forest Service (Supplement #2), Spatial Decision Support Systems for Forest Planning, P.I. USDA PSW-92-0040CA), 4/30/92-6/30/93, \$39,486.
23. Hitachi of America Limited, Cooperative research with NCGIA, Co-P.I., 4/1/93-3/31/94, \$149,881.

24. California Department of Transportation, Distributed Navigable Database Design and Implementation Issues, Co-P.I., 1992-19993, \$135,000.
25. U.S.Army CERL, Geographic Information Systems Database Development for Land Condition Trend Analysis, Co-P.I., 6/12/93-9/30/93 \$16,779.
26. USDA Forest Service, Spatial Decision Support Systems for Forest Planning: The Development of FEMdss, P.I., 10/1/93-9/30/94. \$64,624.
27. National Science Foundation, National Center for Geographic Information and Analysis, Co-I., 1993-1996, \$3,497,000.
28. USDA Forest Service, Spatial Decision Support Systems for Forest Planning: The Development of FEMdss, P.I. 1993-1995, \$57,000.
29. US Army Corp of Engineers, Construction Engineering Lab, Geographic Information Systems Database Development for Land Condition Trend Analysis, P.I., 1994, \$3,813, \$9,711. & \$1,291.
30. US Army Corp of Engineers, Construction Engineering Lab, Development of Digital Elevation Models(DEM) from Contour Lines for the White Sands Missile Range, P.I., 1994, \$9,230.
31. USDA Forest Service, Spatial Decision Support Systems for Forest Planning: The Development of FEMdss, P.I., 1994-1995, \$22,500.
32. UC Davis (USDA Forest Service), Sierra Nevada Ecosystems Project: Modeling Desired Future Conditions in Forest Planning, P.I., 1994-1995, \$60,000.
33. Hitachi of America Limited, Cooperative research with NCGIA, Co-P.I., 1994-1996, \$133,000.
34. California Department of Transportation, System Integration Issues of a Distributed Navigable Database Design and Implementation, Co-P.I., 1994-1996, \$160,000.
35. USDA Forest Service, Regional Ecosystems and Land Management Decision Support System: Further Development Issues, P.I., 1996-1997, \$22,500.
36. U.S. Department of Transportation, Dwight D. Eisenhower Fellowship Program, P.I., 1996-1997, \$59,007.
37. USDA Forest Service Challenge Grant, Regional Ecosystems and Land Management Decision Support System: Extending Functionality, P.I., 1996-1997, \$65,779.
38. USDA Forest Service, RELMdss development, P.I., 1997, \$22,500.

39. USDA Forest Service, Extending the functionality on the Regional Ecosystem and Land Management Decision Support System, P.I., 1996-1997, \$50,000.
40. NASA, Modeling and prediction of wildfire hazard in Southern California, Integration of models with imaging spectrometry Co-P.I., 1997-1998, \$75,000.
41. US Department of Transportation, Systems integration issues of distributed navigable database design and implementation issues, Co-P.I., 1997-1998, \$100,000.
42. National Science Foundation, Advancing Geographic Information Science, Co-P.I., 1997-2001, \$2,299,774.
43. Viggen Corporation, Spatial interoperability testbed-support (supplement #1), Co-P.I., 1997-1998, \$100,000.
44. Viggen Corporation, Spatial data interoperability testbed-support (supplement #2) Co-P.I., 1997-1998, \$177,800.
45. USDA Forest Service, Developing a heuristic solver for RELMdss (Regional Ecosystem and Land Management Decision Support System), P.I., 1999-2000, \$27,000.
46. National Aeronautics and Space Administration, Modeling and Prediction of Wildfire Hazard in Southern California, Integration of Models with Imaging Spectrometry, Co-P.I., 1999-2001, \$95,000.
47. California State University: Dominguez Hills (NASA-RESAC), Center for Managing Fire Hazards at the Urban-Wildlands Interface, Co-P.I., 1999-2002, \$568,290.
48. Oak Ridge National Laboratory, Location Referencing Message Specification (LRMS)- Testing, Co-P.I. 2000-2000, \$24,900.
49. U.S. Geological Survey, Decision Support Systems for Conservation Planning: A multifaceted approach using GIS, optimization, and ecological principles, P.I., 2000-2001, \$233,473
50. California Department of Transportation, Task Order 304A: Traffic Simulation and Modeling Travel Times, P.I., 2000-2002, \$120,182.
51. Battelle Memorial Laboratory, ITS Standard Testing Evaluation Program, Co-P.I., 2000-2002, \$96,825.
52. U.S. Department of Transportation, Applications of Remote Sensing to Transportation Infrastructure Management, Co-P.I., 2000-2006, \$2,100,132.56

53. California State University- Long Beach (NASA RESAC), The Southern California Wildfire Hazard Center: Integrated Assessment of Wildfire Hazard, Co-P.I., 2001-2001, \$172,973.
54. USDA Forest Service, Fuels Treatment and Habitat Protection, P.I., 2002-2002, \$10,000.
55. USDA Forest Service, Fuels Treatment and Habitat Protection, P.I., 2002-2003, \$94,369.
56. California Department of Transportation, Translating GIS Street Network Files for use with Paramics, P.I., 2002-2003, \$65,000.
57. Caltrans/PATH (Partners in Advanced Transit and Highways), P.I. 2004-2005, \$83,000.
58. USDA Forest Service, Fuels Treatment and Habitat Protection, P.I. 2004-present, 125,000.
59. USDA Forest Service, Scheduling Model Development, P.I., 2005-2006 \$30,000.
60. USDA Forest Service, Fuels, Treatment and Habitat protection (supplement) P.I. 2006-2007 \$10,000.
61. USDA Forest Service, Modeling forest management for habitat protection, P.I., 2/15/2007 to 2/15/2009, \$40,000.
62. USDOT, MeTrIS: metropolitan transportation system applying space based technologies for freight congestion mitigation, Co-P.I., 7/1/2007 to 6/30/2010, \$1,490,933.
63. CALTRANS, First Responder Support Systems Testbed (FiRST), P.I. ,8/1/2007 to 6/30/2010, \$1,296,000.,
64. USDA Forest Service, Modeling fuels treatments in US Forests, P.I., 3/1/2010-9/30/2011, \$40,000..
65. Argonne National Laboratory, Corridor Location: a preliminary assessment of multi-path alternative generation based upon the Kth shortest path method, P.I. 7/1/2010-12/31/2010, \$29,516.
66. Caltrans, First Responder Support Testbed (FiRST)-Phase II: Cross Cutting Cooperative Systems for emergency management, P.I. 5/12/2010-6/30/2012, \$1,150,000.

67. Argonne National Laboratory, Corridor Location: developing spatially
Comprehensive search algorithms to support transmission line location, P.I. 9/1/2011-
1/31/2012. \$30,300.
68. University of California Transportation Center, Transit route design for smaller cities:
working towards sustainability, P.I. 8/1/2011-4/30/2012. \$44,000.

UNIVERSITY SERVICE (does not include activities at the University of Tennessee)

Years	Type of Position	Service
1984-1988	Chair	Department of Geography
1990-1998	Graduate Advisor	Department of Geography
1989-1990	Member	Student Fees Advisory Committee
1990-1992	Member	Faculty Welfare Committee
1991-1992	Member	Executive Committee of the College of Letters and Sciences
1992-1993	Chair	Executive Committee of the College of Letters and Sciences
1992-1995	Member	Committee of Educational Policy and Academic Planning
1993-1995	Member	Campus Recharge Committee
1994-1995	Member	Special Senate Committee on Clearview
1995	Member	Chancellor's Advisory Committee for Clearview
1995	Member	Vice-Chancellor's "Contracting for Services" Workgroup
1995-1996	Member	SCAPE
1996	Member	Senate Committee on Rules and Jurisdiction
1996	Chair	Special Senate Committee on Sedgwick Ranch
1996-1998	Member	UCSB Graduate Council
1998-2000	Chair	UCSB Graduate Council
1999	Member	UCSB Parking Plus 2 Committee
1998-2000, 1988-1989	Member	UCSB Parking and Transportation Committee

1999-2000	Chair	UCSB Graduate Council
1998-2000	Member	UC-System-Coordinating Council of Graduate Affairs
1999-2001	Member	UCSB WASC re-accreditation steering committee (Western Association of Schools and Colleges)
1999-2001	Chair	WASC re-accreditation subcommittee on Graduate Education
1999-2000	Member	Transportation and Parking committee
1999-2000	Member	UCSB enrollment task force
1999-2000	Chair	Cost and Facilities subcommittee for enrollment task force
1999-2000	Member	UCSB Catalog committee
1999-2000	Member	Divisional Advisory Committee to the Chair of the Academic Senate
1999-2000	Member	Coordinating committee on collective bargaining
2000-present	Member	Chancellor's advisory committee on Highway 217 (also served on Value Engineering Workshop)
2001-2002	Vice-Chair	UC-System- Coordinating Council of Graduate Affairs
2002-2003	Chair	UC-System- Coordinating Council of Graduate Affairs
2001-2003	Member	UC-System- Council of Research
2002-2003	Member	UC-System- Academic Planning Council
2002	Member	UC-CSU Joint PhD program Board
2002-2004	Member	UCSB Faculty Advisory Committee for The Center for Entrepreneurship & Engineering Management
2002-2003	Member	UC-Assembly
2005-2010	Member	UC-Assembly
2005-2010	Member	UCSB faculty legislature
2005-2010	Member	UCSB executive council

		(academic senate)
2005-2007	Member	Executive Committee, College of Letters and Science
2006(Spring)	Member	The Executive Vice Chancellor's special advisory committee on IT Fees
2006-2008	Member	The Chancellor's Parking Rate Payer Board
2008 (Spring)	Member	Executive Committee, College of Letters and Science
2008-present	Chair	The Chancellor's Rate Payer Board

Served as reviewer for *Transportation Science*, *Transportation Research*, *Transportation Engineering*, *Forest Science*, *Management Science*, *European Journal of Operational Research*, *Geographical Analysis*, *Environment and Planning*, *Computers and Operations Research*, *Operations Research*, *Annals of O.R.*, *Biological Conservation*, *International Journal of Geog. Information Science*, *Annals of the AAG*, *Environment and Planning*, *Management Science*, *Journal of Regional Science*, *Papers in Regional Science*, as well as other journals. Serves on the editorial board of *Geographical Analysis*, *the Journal of Socio-Economic Planning Sciences*, and *the International Regional Science Review* Founding Co-Editor of *Location Science* (now a part of *Computers and Operations Research*) Have served on a number of NSF and EPA proposal review panels. In 2008, Prof. Church was the chair and organizer for the Eleventh Triennial International Symposium on Locational Decisions (ISOLDE XI), held in Santa Barbara, CA.

PROFESSIONAL ACTIVITIES

Professor Church has served as a consultant to a number of companies and governmental agencies on a wide variety of problems (logistics, environmental management, site selection, transportation). In 1991 he, along with two former graduate students, started ISERA GROUP, Inc., which specialized in scheduling systems for manpower deployment as well as systems for scheduling training activities. ISERA developed software is now used by the US NAVY in a variety of settings from recruit training to flight training schools and has been purchased by the German Air Force and the Australian Army. Other software is now being used by a wide variety of EMS service systems in the U.S. and Canada to optimally schedule operations. Professor Church served as President from 1991-1998 and Chairman of the Board until 2001 when the firm was sold to a venture capital group. In 2005 ISERA Group was split and sold to Zoll, Inc. and Envisage, Inc. He is a co-inventor on a US Patent on estimating manpower needs for emergency medical systems from computerized data systems.