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Curriculum Vita

Professor of Geography  
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**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:**

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, The University of Tennessee 1980-81.  
Associate Professor of Civil Engineering, The 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, The University of Tennessee, 1974-79.

**PUBLICATIONS: In press or under review**

1. Regional Service Coverage Modeling, with A. Murray and M. O'Kelly, to appear in *Computers and Operations Research*
2. Tactical level forest management models:bridging the gap between strategic and operational problems, to appear as a chapter in *Handbook on Operations Research in Natural Resources on Strategic Forest Planning*, edited by A. Weintraub, T. Bjorndal, R. Epstein, and C. Romero Kluwer Press
3. BEAMR: an exact and approximate model for the p-Median Problem, to appear in *Computers and Operations Research*.

4. Analysis of facility systems' reliability when subject to attack or a natural disaster, with M.P. Scaparra, to appear as a chapter in *Reliability and Vulnerability in Critical Infrastructure*, edited by A. Murray and T. Grubestic, Springer-Verlag.
5. Protecting Critical Assets: the  $r$ -interdiction median problem with fortification, with M.P. Scaparra, to appear in *Geographical Analysis*.
6. A bilevel mixed-integer program for critical infrastructure protection planning, with M.P. Scaparra, to appear in *Computers and Operations Research*.
7. Optimal fortification as a maximal covering problem, with M.P. Scaparra, to appear in *European Journal of Operational Research*.
8. Locating and protecting critical reserve sites to minimize expected and worst case losses, with Jesse O'Hanley and K. Gilless, to appear in *Biological Conservation*.
9. The importance of In Situ site loss in nature reserve selection: balancing notions of complementarity and robustness, to appear in *Biological Conservation*.
10. Optimal dispersion and central places, with K. Curtin, to appear in *Journal of Geographical Systems*
11. Spatial optimization as a generative technique for sustainable multiobjective landuse allocation, with A. LigmannZielinska and P. Jankowski, submitted to *International Journal of Geographical Information Science*
12. Finding optimal paths in road networks with turn costs on a portable device, with W. Zeng, Q. Guan, submitted to *Geoinformatica*
13. Shortest paths on real road networks: the case for A\*, with W. Zeng, submitted to *International Journal of Geographical Information Science*.
14. Improving accessibility to rural health services: the maximal covering network improvement problem, with L. Murawski, submitted to *Socio-Economic Planning Sciences*.

## **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 Steve Hanke and John Boland | Publication of the Washington Suburban Sanitary Commission | Contract Report |
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| 2. | 1974 | “The Maximal Covering Location Problem,” with Charles ReVelle   | <i>Papers of the Regional Science Association</i> , 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   | <i>Geographical Analysis</i> , 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   | <i>Geographical Analysis</i> , 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 Research Series Report

- American Studies, 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. 895-902.

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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      |

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28. 1979 An Introduction and Guide to  
the Site Location of Public  
Facilities Utilizing the 'Gas  
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AID/TA-C-1363, April,  
Lyndon B. Johnson School of  
Public Affairs, Drawer Y,  
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29. 1979 "Generating Multiobjective  
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30. 1979 "Location Modeling Utilizing  
Maximum Service Distance  
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Analysis*, Vol. II, No.  
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31. 1980 "Water Quality Indexing and  
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32. 1980 "Developing Solid Waste  
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33. 1980 "A Multicriteria Approach to  
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Jerry Weaver *Modeling and  
Simulation*, Vol. II,  
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			Conference on 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



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| 42. | 1981 | “Ubicacion de Recursos de Salud en Las Zonas Rurales Del Cauca, Colombia,” with Eaton, Bennett, Hamon, and Lopez  | Institute for Latin American Studies, <i>Technical Paper Series</i> No. 32.  | Research 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  | <i>Technical Report No. 150</i> , Training   | Contract Report        |

		(BOOTS): System Overview,” with F.L. Keeler	Analysis and Evaluation Group N- 1, U.S. Navy, 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.</i> <i>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</i> <i>Technical Report No.</i> <i>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

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| 56. | 1983 | “The Formal and Computational Relationship of the Stochastic and Deterministic Median Location Problems,” with Jerry R. Weaver | Working Paper #83-004, Department of Management Science and Statistics, College of Commerce and Business Administration, The University of Alabama.           | Research Series Report |
| 57. | 1983 | “Incorporating Planning Preferences into Location Models,” with J. Penalba and D. Eaton  | <i>Modeling and Simulation</i> , 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   | <i>Modeling and Simulation</i> , 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     | <i>Working Paper #84-009</i> , 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”   | <i>Journal of Regional Science</i> , Vol. 24, No. 2.  | Refereed Article       |
| 61. | 1984 | “Generalized Coverage Models and Public Facility Location,” with K.L. Roberts  | <i>Papers of the Regional Science Association</i> , Vol. 53.  | Refereed Article       |
| 62. | 1984 | “Hauling Distance and Transfer Station Location”   | <i>The Journal of Environmental</i>   | Refereed Article       |

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Vol. 110, No. 5.
63. 1985 "A Median Facility Location Model with Nonclosest Facility Service," with Jerry Weaver *Transportation Science*, Vol. 19, No. 1. Refereed Article
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

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| 71. | 1987 | “The Formal and Computational Relationship of the Supporting Median Problem to the P-Median Problem,” with Jerry Weaver                   | <i>Transportation Research</i> , Vol. 21B, No. 4, pp. 323-329                   | Refereed Article |
| 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 |

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| 81. | 1990 | “Linear Programs for Nonlinear Hydrologic Estimation,” with H. Loaiciga   | <i>Water Resources Bulletin</i> , Vol 26, No. 4, pp. 1-12.          | Refereed 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. | 2992 | “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,”   | <i>Computers and Operations Research</i> , <sub>2</sub>             | Refereed Article |

- with A.K. Rathi and R.S. Solanki V19 N8:731-742.
90. 2992 “Allocating Resources to Support a Multicommodity Flow With Time Windows,” with A.K. Rathi and R.S. Solanki *Logistics and Transportation Review*, V28 N2:167-188. Refereed Article
91. 1993 “Modeling School Utilization and Consolidation,” with A.T. Murray *Journal of Urban Planning and Development-ASCE*, V119 N1:23-38 Refereed Article
92. 1993 “Maximal Covering Tree Problems,” with J. Current *Naval Research Logistics*, V40 N1:129-142. Refereed Article
93. 1993 “Analyzing Tradeoffs Between Zonal Constraints and Accessibility in Facility Location,” with Ross Gerrard *Computers and Operations Research* Refereed Article
94. 1993 “The Gateway Shortest Path Problem: Generating Alternative Routes for a Corridor Location Problem,” with K. Lombard *Geographical Systems*, Vol. 1, No. 1 Refereed Article
95. 1993 “The Choice Alternative to School Assignment,” with O.B. Schoepfle *Environment and Planning B: Planning and Design*, Vol. 20, 447-457 Refereed Article
96. 1993 “Disaggregating Forest Management Plans to Treatment Areas,” with K. Barber *Proceedings of the Stand Inventory Technology Conference of 1992* Proceedings
97. 1993 “Adjacency Constraint Aggregation,” with A.T. Murray *Proceedings of the International Symposium on Analysis and Management Decisions in Forestry*, Valdivia, Proceedings

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| 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 Modeling the Hierarchical Maximal Covering Location Problem with Referral,” with Ross Gerrard   | <i>Papers in Regional Science</i> 73, 425-453.  | Refereed 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        |



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| 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       |
| 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       |

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| 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 University Press  | Refereed Chapter |
| 115. | 1996 | “Selecting Biodiversity Management Areas,” with Frank Davis, David Stoms, William Okin, and K. Norman Johnson | <i>Sierra Nevada Ecosystem Project: Final Report to Congress Vol 2, Assessments and Scientific Basis for Management Options</i> , 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             | <i>Location Science</i> , Vol.4, (no.4):251-70.  | Refereed Article |
| 117. | 1996 | "Constructing and Selecting Adjacency Constraints," with Alan Murray  | <i>INFOR</i> , V34 N3:232-248.   | Refereed Article |
| 118. | 1996 | “Applying simulated annealing to location-planning models,” with Alan Murray                                  | <i>Journal of Heuristics</i> , 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   | <i>Geographical Systems</i> , Vol. 3: 221-241.   | Refereed Article |

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| 120. | 1996 | "Integrating Normative Location Models into GIS: problems and prospects with the p-median model," with Paul Sorensen                                  | <i>Spatial Analysis-Modelling in a GIS Environment</i> , Edited by Longely and Batty   | Refereed Chapter |
| 121. | 1996 | "Feasible alternatives generation in collaborative decision making," with D. Lemberg  | <i>Proceedings of the Geographic Information Systems/Land Information Systems</i> , Nov. 1996  | Proceedings      |
| 122. | 1996 | "Planning Management Activities to Protect Biodiversity with a GIS and an Integrated Optimization Model, with David Stoms, Frank Davis, B.J. Okin     | <i>Proceedings of the Santa Fe Conference</i>  | 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 | <i>Anthropology, Space, and Geographic Information Systems</i> , 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  | <i>Computers &amp; Operations Research</i> , V24 N2:127-140.   | Refereed Article |
| 125. | 1997 | "Facets for node packing," with Alan Murray   | <i>European Journal of Operational Research</i> , V101 N3:598-608.   | Refereed Article |
| 126. | 1997 | "Modeling community evacuation vulnerability using GIS," with Thomas Cova   | <i>International Journal of Geographical Information Science</i> ," Vol. 11, No. 8, pp.  | Refereed Article |

127. 1997 "The maximal Covering Location Problem," with C. ReVelle 763-784. 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 links between the p-median, location set covering, and 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
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

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| 134. | 1998 | “A systematic process for selecting representative research natural areas,” with David Stoms, Mark Bortchert, Max Moritz, and Frank Davis                     | <i>Natural Areas Journal</i> , 18, pp. 338-349.  | Refereed Article |
| 135. | 1998 | “Automated scheduling solutions for military training: operational issues and techniques,” with Reeves, Bloxham, and Keeler                                   | <i>Proceedings of the Interservice/Industry Training, Simulation and Education Conference</i> , Orlando, Florida, Nov 30-Dec 3, 1998 | Proceedings      |
| 136. | 1998 | "Operational forest planning and Steiner tree extensions ", A.T. Murray and A. Weintraub  | <i>Geographical Systems</i> , 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 | <i>Proceedings of the ACM</i> , 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 Noronha, Goodchild, and Fohl   | <i>Annals of Regional Science</i> , 33, pp. 197-212  | Refereed Article |
| 140. | 1999 | “Location modeling and GIS”   | <i>Geographical Information Systems</i> , Vol. 1 (second edition), Ed. By Longley, Goodchild, Maquire, and Rhine, John Wiley & Sons, | Chapter          |

			1999.	
141.	1999	“Manpower deployment in emergency services: Police, Fire, and EMS,” with P. Sorensen, and W. Corrigan	<i>Proceedings of the International Conference on Fire Service Deployment Analysis,</i> Indianapolis, Ind.	Proceedings
142.	1999	“A Study on a System for Guiding of the Optimal Route with a Hybrid Network and Grid Data Structure,” with K. Okunuki and J. Marston	<i>Proceedings of the Geographic Information Systems Association of Japan</i> 8; 135-138. (Japanese)	Proceedings
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	<i>Annals of OR</i> 95;271-285.	Refereed Article

A. Weintraub, A. Murray, and M. Guignard (previously listed as B-5)

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| 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” with T. Cova                      | <i>Transportation Research C</i> 8; 321-336.  | Refereed Article           |
| 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   | <i>Fire Technology</i> 37, 219-234  | Refereed Article           |

P.Sorensen and W.Corrigan

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| 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 transportation infrastructure impede public safety?” with R. Sexton                        | <i>Vehicle Intelligence and Transportation Analysis Laboratory report to Caltrans</i> | Contract Report  |
| 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 Stoms, Davis, and 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>                                    |                  |
| 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 Gerrard, Stine, and Gilpin                          | <i>Annals of the AAG 93(4); 814-827.</i>  | Refereed Article |
| 166. | 2003 | The Multi-Level Location Set Covering Model, with R.  | <i>Geographical Analysis 35(4); 277-</i>  | Refereed Article |



		Gerrard	289.	
167.	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
168.	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
169.	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
170.	2004	Identifying Critical Infrastructure: the Median and Covering Facility Interdiction Problems	<i>Annals of the AAG</i> 94(3); 491-502.	Refereed Article
171.	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
172.	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
173.	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</i> 22	Contract Report
174.	2005	Sustainable Urban Land Use allocation with Spatial Optimization, with A. Ligmann-	<i>GeoComputation 2005 Proceedings</i> , Ann Arbor MI. (CD-	Proceedings

		Zielinska and P. Jankowski	ROM).	
175.	2005	The SITES reserve selection system: a critical review	<i>Environmental Modeling and Assessment 10</i> ; 215-228.	Refereed Article
176.	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
177.	2006	Urban Land Use Allocation With Spatial Optimization, with A. Ligmann-Zielinska and P. Jankowski	<i>12<sup>th</sup> International Symposium on Spatial Data Handling (GICON 2006)</i>	Proceedings
178.	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
179.	2006	A Family of Location Models for Multiple-Type Discrete Dispersion, with Kevin Curtin	<i>Geographical Analysis 38</i> ; 248-270.	Refereed Article

### PRESENTATION AT CONFERENCES AND INVITED TALKS

<b>Year</b>	<b>Title</b>	<b>Meeting/Place</b>
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 Siting Model", Charles ReVelle and Jared Cohon	ORSA/TIMS Meeting in San 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	International Symposium on

	Baltimore Fire Protection Systems", with David Schilling, D.J. Elzinga, Charles ReVelle, and Jared Cohon	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 Facility Location", with Larry Roberts	75th Meeting of the AAG, Philadelphia, PA
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	11th Annual Pittsburgh Conference on Modelling and

	Authority", presented at the	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 Planning Regions: A Multiobjective Approach"	National meeting of the 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	ORSA/TIMS joint National Meeting, San Diego, CA

Weaver

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 Information Systems as Decision Making Tools, with Phillip Parent (presented by co-author)"	GIS-87 Conference, San 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 Geometry: Theoretical K-Systems"	Boston University, Boston, MA
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	Regional Science Association North American Meetings, Santa



	Craig Bloxham	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 Patterna 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	GIS-94 meeting, Vancouver, B.C.

	Support System for Forest Ecosystem Management,” with A.T. Murray and M.A. Figueroa	
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,” with A.T. Murray, Klaus Barber, and Richard Dyrland	Analysis Workshop III(Analysis in Support of Ecosystem Management) Lincoln Center, Ft. Collins, CO
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	Universidad de Chile Santiago,

	of combinatorial forestry planning problems”	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 Northwest Forest Plan Options,” with Dick Dyrland and K.Barber	USFS Regional Leadership Conference, Portland Ore.
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 <sup>rd</sup> 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 <sup>rd</sup> 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. Figueroa	Informs National Meeting in San Diego
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,"	Seventh Symposium on Systems Analysis in Forest Resources, Bellaire, MI

with K. Barber

Nov,1997	“Location search strategies and GIS: a case example applied to identifying difficult to evacuate neighborhoods,” with T. Cova	44 <sup>th</sup> 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 <sup>th</sup> North American Meetings of the Regional Science Association International, Buffalo, NY
April,1998	“Selecting biodiversity management areas,” with B.J. Okin	Interservice National Meeting, Montreal
Nov,1998	“Reducing data aggregation errors,” with D.M. Chen	45 <sup>th</sup> 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 <sup>th</sup> North American Meetings of the Regional Science Association International, Santa FE, NM
Nov,1998	“Searching for the best site,” with T. Cova	45 <sup>th</sup> 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 neighborhood”	Annual meeting of the Mission Canyon HOA, Natural History Museum, Santa Barbara, CA
Mar, 2002	“Reserve Design,” with Punta De Tralga Chile	International Syposium 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	International Symposium on



	the classic p-median problem”	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.	North American Meetings of the Regional Science Association,

	Middleton	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	Presentation to the Board of Santa

	Improving Transit Services	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

### **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, Doug Fischer, Ryan Sexton, Michael Vergeer, Scott O'Daniel

**PhD students:**

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

O. Benjamin Schoepfle, Argonne National  
Laboratory, Argonne, IL

Alan Murray, Professor, Department of Geography,  
Ohio State University

Ross Gerrard, Analyst, 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, Assistant Professor, University of  
Texas at Dallas, Dallas, TX

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

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

Richard Middleton, Post Doctoral Fellow, Los  
Alamos National Laboratory, Los Alamos, NM

**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.

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

<b>Years</b>	<b>Type of Position</b>	<b>Service</b>
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-present	Member	UC-Assembly

2005-present	Member	UCSB faculty legislature
2005-present	Member	UCSB executive council (academic senate)
2005-present	Member	Executive Committee, College of Letters and Science
2006(Spring)	Member	The Executive Vice Chancellor's advisory committee on IT Fees

Served as reviewer for *Forest 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* and *the Journal of Socio-Economic Planning Sciences*. Founding Co-Editor of *Location Science* (now a part of *Computers and Operations Research*) Member of the NSF proposal review panel for the Geography and Regional Science program (Spring, 2006). Member of past NSF and EPA proposal review panels.

## **PROFESSIONAL ACTIVITIES**

Professor Church has served as a consultant to a number of companies and agencies on a wide variety of problems. 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.