

CURRICULUM VITAE

Dr. Roger F. Tomlinson CM, President
Tomlinson Associates Ltd. Consulting Geographers
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Canada



CURRICULUM VITÆ

Dr. Roger F. Tomlinson CM

Personal Data

Date of Birth: 17 November 1933
Place of Birth: Cambridge, England
Citizenship: Canadian
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Education

B.Sc.(Hons.) Nottingham University, England.
Geography 1957 Major University Courses included full Geography syllabus plus 1 year of photogrammetry, plus 2 years of the full 3-year Geology degree.

B.Sc. Acadia University, Nova Scotia, Canada
Geology 1960 Courses included Canadian Structural Geology, Petroleum Geology and Geophysics.

M.Sc. McGill University, Montreal, Canada.
Geography 1961 Courses included Photo-Interpretation, Regional Geography of Labrador, Advanced Geomorphology, Geography of the Arctic, plus 1 year at McGill's Sub-Arctic Research Station, Knob Lake.
Thesis: *Glacial Geomorphology of the Kaumajet Mountain and Okak Bay Area of North-east Labrador*

Ph.D. University College, London, England.
1974 Thesis: *The application of electronic computing methods and techniques to the storage, compilation, and assessment of mapped data*

Experience

1951-1960 Royal Air Force. Pilot and Flying Officer. 3 years, 1951-54.

Leader, Nottingham University Glaciological Expedition to Norwegian Ice Cap, 1956 and 1957.

Research Assistant, McGill University; at McGill's Sub-Arctic Research Station, Knob Lake, Quebec.

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- 1959-1960 Assistant Professor, Acadia University, Nova Scotia (1959-1960 (on leave from Spartan for academic year); teaching Geography and Pleistocene Geology.
- 1959-1963 Spartan Air Services, Ottawa, Canada. Latterly as Chief, Computer Mapping Division. Experience included:
- a) Photo Geology - Chief of team completing 60,000 square miles of photo-geology of Northern Ontario.
 - b) Appraisal of land use and potential land use, Somalia, East Africa.
 - c) Engineering soil study for National Capital Commission of Ottawa/Hull area.
 - d) Study of marine erosion, deposition, current and wave action for Port of Sept Isles, Quebec.
 - e) Terrain analysis and ground freezing studies to determine problems of locating pipelines for the trans-shipment of iron ore in Northern Ontario.
 - f) Microwave Tower System, location of route and sites for 1,500 miles, Sault Ste. Marie to Winnipeg.
 - g) Townsite analysis for new town at Briarcliff, N. Ontario.
 - h) Location study for new port and industrial site on north shore of Lake Superior.
 - i) Seismic analysis of soil depths on numerous development sites.
 - j) Water fowl habitat analysis in prairie provinces, pilot study for Federal Wildlife Service.
 - k) Caribou range vegetation study in Northern Alberta.
 - l) Land use studies, Ottawa Green Belt.
 - m) Climate and irrigation study, Province of Chaco, Argentina.
 - n) Municipal consultant for regional planning and preparation of Master Land Use Plans.
 - o) Natural forest survey and plantation site analysis for pulp and paper mill location in Kenya, East Africa.
 - p) Development of computer techniques for analysis of forest survey data.

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During the period with Spartan Air Services, research by R. F. Tomlinson led to the formulation of concepts of multiple map storage and analysis in computers. As a result of this work the company created a Computer Mapping Division headed by R. F. Tomlinson and the Federal Government of Canada awarded the company a \$450,000 contract for research and development of geographic information systems.

1964-1969 Moved to Federal Government of Canada to become head of the geographic information systems development program. Consultant to the Rural Development Branch, Department of Forestry and Rural Development. Latterly in the position of Acting Director, Regional Planning Information Systems.

The work focussed on the research on geographic information systems and the development, implementation and operation of the Canada Geographic Information System (CGIS). The work responsibilities also included the broader tasks of determining criteria and techniques for evaluation of regional development programs, determining data requirements, design of program monitoring and program impact evaluation methods, advising the Deputy Minister directly on the effectiveness of the monitoring and evaluation efforts, establishing regular consultation between federal and provincial government agencies, and achieving compatible provincial program evaluation methodology and efficient federal-provincial data flow.

The work experience included initiation, planning and direction of the development of the Canada Geographic Information System, planning and direction of research into government program evaluation and monitoring techniques for comprehensive regional development in Prince Edward Island, New Brunswick, Manitoba and Quebec, and negotiating as the senior member of the Federal team in federal-provincial negotiations, developing cooperation between government departments at federal, provincial, regional, municipal and local levels, and direction of major commercial and university contracts on behalf of the Department.

1969-1970 Vice President, Multiple Access General Computer Corporation Ltd., Toronto, Canada. Duties included the setting up and direction of the Consulting Services Division of the Company, and the administrative duties as Vice President of a company of 200 persons.

1970-1971 Senior Advisor on Information Systems, Secretariat to the Premier, Government of Nova Scotia, Canada. Development of strategies for implementation of information systems in industry and urban sectors of the provincial economy. Initiated research on design of a provincial information system for land resources.

1971-1974 Canada Council Doctoral Fellow. Research on the relationship between geographic information systems, spatial analysis and decision making in government.

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- 1974-1975 Director and Principal Investigator of a Technical Advisory Group on Information Systems for Regional Land Use Planning, Office of Land Use and Water Planning, U.S. Department of the Interior.
- 1975-1977 Director and Principal Investigator of an interdisciplinary group for the evaluation of all digital spatial data handling within the U.S. Geological Survey. This project involved the evaluation and preparation of case study reports on over 50 spatial data systems, the construction of an inventory of computer software for spatial data handling and the conduct of 16 seminars for senior USGS professional staff. The final report of the project was used as a basis for spatial data handling policy and administration within USGS.
- 1977 Established Tomlinson Associates, a firm of consulting geographers
- 1977-1978 Consultant to Federal Government of Canada, Department of Indian and Northern Affairs, Parks Canada, for the evaluation of the geographical data needs and data handling requirements of the national parks of Canada.
- 1978-1979 Consultant to Federal Government of Canada, Department of Environment, Lands Directorate, for the evaluation of the Canada Geographic Information System (Canada Land Data System).
- 1979 Consultant to Gibbs & Hill, Inc., Resource Information Service, on the handling of spatial data and on development plan for a natural resources information system.
- 1979-1980 Consultant to the Government of Saskatchewan, Department of Tourism and Renewable Resources, for a study of computer assisted mapping systems for the forest resources of the Province of Saskatchewan.
- 1980 Lecturer and Consultant for U.S. Geological Survey Digital Cartographic Orientation Courses held in Reston, Va., Denver, Colo., Rolla, Mis., and Menlo Park, Ca.
- Consultant to Woodward Clyde, California, on the selection of a spatial information system for major engineering projects.
- Consultant to the Province of Alberta, Department of Energy and Natural Resources, on the Natural Resources Databank project.
- 1980-1981 Consultant to the U.S. Department of Commerce, Bureau of the Census, to determine the user requirements for cartographic automation for all U.S. census cartographic projects.
- Consultant to Federal Government of Canada, Department of Indian and Northern Affairs, and Yukon Territorial Government, for an examination of Yukon Territory natural resources data handling needs and for the specification and design of a Yukon Resources Information System.

- 1981 Consultant to the Province of New Brunswick, Department of Natural Resources, for specification of the data handling requirements for the Forest Inventory, and study of computer- assisted mapping systems for the forest resources of New Brunswick.
- Consultant to the Land Resources Information Service, Maritime Provinces of Canada, for the selection of a computer-assisted system for digital topographic mapping for the maritime provinces.
- Presentation of a series of seminars for the Maritime Resource Management Service and Land Registration and Information Service of the Council of Maritime Premiers, in Halifax, N.S., Fredericton, N.B., and Charlottetown, P.E.I., concerning new technology for handling land and natural resources data.
- 1981-1982 Consultant to the U.S. Department of Commerce, Bureau of the Census, in the development of an acquisition strategy for a topologically integrated geographic encoding and reference system (TIGER).
- 1982 Consultant to Nova Scotia Land Survey Institute, for specification of computer hardware requirements for an automated marine cartography program at the institute.
- Consultant to the State of Washington, Department of Natural Resources, for a Washington State GEOgraphic Multiple-use Analysis and Planning System (GEOMAPS) for the management of natural resources throughout the state, including review of system requirements, review of system design, benchmark testing, and selection of an appropriate system.
- 1981-1983 Consultant to The World Bank on the needs for resource evaluation and geographical analysis in the Bank. This study included an appraisal of World Bank operations procedures involving geographical data, the need for geographic information systems in the World Bank and member nations, the design of system acquisition and technology transfer processes, and future planning for geographic information system implementation in the World Bank.
- 1983 Consultant to U.S. Department of Agriculture, Forest Service, in the method of selection of computer-aided systems to handle data in the National Forests.
- Consultant to Canadian Forestry Service on requirements for computer-aided systems to handle provincial and federal forest data.
- Study for the Department of Energy, Mines and Resources, Canada, on Digital Cartographic Status and Developments in Canada. This study involved creating a directory of all small-scale (<1:10,000) map data in digital form in all federal, provincial, municipal and commercial agencies in Canada and an analysis of the data characteristics and utilization.

- 1984 Consultant to U.S. Department of Agriculture, Forest Service, to present a seminar on geographic information systems technology.
- Consultant to ESL Inc., Sunnyvale, California, to review their advanced geographic information systems research program.
- Consultant to Government of Saskatchewan, Department of Parks & Renewable Resources, to revise the 1980 study to include requirements of forestry, wildlife, fisheries and lands, with the object of acquiring a geographic information system in 1985.
- Consultant to Swedish Forest Service, to provide advice on currently available systems for forestry data handling and to present a seminar on geographic information systems technology to their staff.
- Established Tomlinson Associates Inc., a firm of consulting geographers in Wilmington, Delaware, U.S.A.
- 1984-85 Consultant to Ontario Ministry of Natural Resources, Forest Management Information Section, to perform functional requirements study, workload analysis, appraisal of in-house system capabilities, and benchmark test design for geographic information system for forest management in Ontario.
- 1985 Consultant to TRW, Inc., San Bernardino, California, in the use of geographic information systems for military purposes.
- Consultant to North Slope Borough, Alaska, to study and report on the current status of their geographic information system, including identification of defined needs, review of purchased software, equipment, services and system capability, recommendations for future development, and review of environmental sensitivity mapping program for Alaska North Slope.
- Consultant to Food and Agriculture Organization (FAO) of the United Nations to study and report on strategic plan for the establishment of FAO Geographic Information System including review of existing facilities and future FAO needs, overview of functional requirements, typical hardware and software specifications, staff requirements, institutional, infrastructural and physical environment required to implement the system, training and consultancy needs to operate and effectively manage the system, and system implementation problems likely to arise in the medium and long term. A full functional requirements study was also performed for a geographic information system at FAO headquarters in Rome.
- Consultant to Alberta Department of Energy and Natural Resources to advise on the collection and generation of performance statistics for simulation of a full-scale operational geographic information system for the Province of Alberta.

- 1984-86 Consultant to U.S. Department of Agriculture, Forest Service, evolve their existing IT strategy, to perform full functional requirements study for national procurement of geographic information systems for the U.S. Forest Service; including analysis of national forest data handling needs in six regions of the U.S., production of master data list, product directory, full data throughput analysis, analysis of present workload on existing computer systems, benchmark test design, performance of benchmark test and appraisal of geographic information systems, and training of Forest Service staff to enable them to carry out further assessments of data handling needs in future.
- 1986 Consultant to the Government of Saskatchewan, Department of Parks & Renewable Resources, for a full revision of their functional requirements, assessment of existing system capabilities, benchmark test design, series of benchmark tests and comparable system analysis, leading to system selection in December of 1986 and installation in April, 1987.
- Consultant to the Government of Alberta, Department of Energy & Natural Resources, for full assessment of functional requirements for the Divs. of Fish & Wildlife, Forest Service, Mineral Resources, Public Lands, and Resource Evaluation & Planning; assessment of existing system capabilities, plan of action, benchmark test design, series of benchmark tests, and comparable system analysis are being carried out.
- Consultant to the Government of the United Kingdom, Committee of Enquiry into the Handling of Geographic Information, to produce an analysis of North American experience of current and potential uses of Geographic Information Systems. The study examined the use of Geographic Information Systems in the application areas of Forestry, Property and Land Parcel Data, Utilities, Transport, Facility and Distribution Planning, Civil Engineering, and Agriculture and Environment Planning. The analysis included consideration of factors inhibiting effective Geographic Information System usage and the effect of availability of spatial data on system implementation. Also included were overviews of costs and benefits, technical developments and institutional concerns relating to Geographic Information Systems.
- 1986-1987 Consultant to the Government of Nova Scotia, Department of Lands and Forests, for revision of in-house IT strategy and functional requirements study, development of request for proposal, benchmark test design, benchmark testing and comparable system analysis, leading to selection of a Geographic Information System in February 1987 and installation in April 1987.
- 1986-1989 Consultant to ERTEC Corporation, San Bernardino, California, for design of spatial decision methodology for facilities location and network analysis for military purposes. Management review of major digitizing sub-contracts and data base building procedures to support the spatial analysis.

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- 1986-1987 Consultant to International Computers Ltd. (ICL), U.K., to review their geographic information system research and development program and advise on system design and market requirements.
- 1988 Consultant to the Dene/Metis of the Northwest Territories to evaluate requirements for a geographic information system for land and resource management planning.
- 1987-1988 Consultant to U.S. Department of Agriculture, Forest Service, to train Forest Service staff in Region 6 to enable them to carry out further assessments of data handling needs in future.
- 1987-1989 Consultant to the Government of Nova Scotia, Department of Agriculture and Marketing, Nova Scotia Soils Institute, for a functional requirements study and cost-benefit analysis for a geographic information system, prepare Request for Proposal for the System and benchmark testing of vendors leading to system acquisition.
- 1988 Consultant to Timberland Holdings Limited, Nova Scotia, to implement strategic planning review for Minas Basin Pulp & Power Co. Ltd., including functional requirements study, and hardware and software recommendations for a geographic information system for forest management.
- 1988-1990 Consultant to the City of Ottawa for a geographic information system needs assessment/feasibility study, including corporate needs assessment, functional requirements evaluation, cost-benefit analysis and implementation plan for the City.
- 1988-1990 Consultant to Federal Government of Canada, Indian Affairs and Northern Development, to carry out a feasibility study for the development of a geographic information system with respect to the Northern Flood Agreement.
- 1990 Consultant to Canadian Petroleum Products Institute relating to a workshop on Emergency Response Information Systems, including moderating at workshop, provision of technical expertise and information regarding possible design of an information system for emergency response, preparation of summary report with indication of future directions regarding use of GIS in Emergency Preparedness.
- Consultant to Federal Government of Canada, Energy, Mines and Resources, to carry out a survey of federal government databases, including design of questionnaire, verification of responses, creation of indexes and report on rate of growth of geo-referenced data, trends, balance of data sets across thematic categories, distribution of data sets compared to their underlying purpose, observations on data poorly represented and concerning standardization of formats, and availability of data in digital formats.
- Consultant to Yukon Territorial Government to carry out an evaluation of strategies for land and resource information systems in the Yukon, including coordination

strategy for development, maintenance of databases and graphic material, digital data distribution and responsibilities and their liabilities and costs, data exchange standards and methods of communication between GIS users, hardware/software configurations, cost-benefit analysis, recommendations concerning the utility and format of a map and database directory for the Yukon Territory, and detailed logical priority sequence for development of a land resource information system.

1990-91 Consultant to the Department of Natural Resources, State of Washington, to carry out the Analysis and General Design for their Land Records Modernization Project, including land record and data status evaluation, creation of data dictionaries, information needs assessment, information product descriptions, data flow required to create needed information, master input data list, data path analysis/document handling requirements, data use analysis/data handling requirements, functional requirements summary, alternative solutions report, technology assessment, security and legal reviews, risk analysis, cost and benefits analysis, rationale for recommended solution and implementation plan. The study covered data in the upland area and in the aquatic coastline and marine environments.

Consultant to Ontario Standard Labelled Road Network Group (OSLRNG), Ontario Ministry of Health, Geographic Information Systems Section. Project to develop standard labelling for the road network (SLRN) in Ontario, including refining components of the proposed database and assembling them into a preliminary conceptual model, identification of possible sources of data with associated costs and constraints, examination of options for cost sharing, database construction and maintenance, updating and management, and development of a plan for establishment of the SLRN design as an official standard.

1991 Consultant to State Government of Victoria, Australia to develop a strategic framework for GIS development for all departments and agencies in the State of Victoria, to report on the current situation and proposed future developments in GIS in Victoria, the technical perspectives and potential value of GIS to the State, the constraints, limitations or inefficiencies in the current operating environment of government GIS, and to prepare a detailed plan of action appropriate to the needs for GIS in Victoria.

1991-1992 Consultant to the Ohio-Kentucky-Indiana Council of Regional Governments to provide recommendations on procedures and processes for establishing regional GIS data management

1991-1993 Consultant to The Scottish Office, Central Research Unit, to carry out critical evaluation of proposals by the Macaulay Land Use Research Institute to meet their own GIS needs and report whether these could also satisfy broader GIS needs in the Scottish Office.

1992-1993 Consultant to the Ministry of Finance, State of Victoria, Australia. Full-scale Geographic Information System planning for five key government program areas of

the State (State Electoral Office, Land Administration and Assets Management, Community and Human Services, Natural Resources, and Planning and Infrastructure), covering 39 departments and agencies and involving over 300 individual staff members. The study included identification of information products and benefit scans of those products, detailed information product description, data handling load analysis, throughput analysis, data availability analysis, data conversion requirements, system interface requirements, communication requirements, multiple data use analysis, functional utilization analysis, GIS system configuration planning, cost models for system implementation, benefit:cost analysis, and preparation of reports for each of the key program areas, together with a final Strategy report setting out recommendations for coordinated Geographic Information System implementation throughout the State of Victoria.

- 1993-95 Consultant to Wascana Energy Inc., Regina, Saskatchewan. Development of GIS application for automated environmental assessment for new wells (points), pipelines (lines), or selected areas. Information product description and cost-benefit analysis. Logical and physical database design. Input programs written for 18 layers of data. Database building oversight. Environmental assessment analysis routines written in menu-driven form to allow non-GIS expert staff to carry out environmental assessment. Staff training to implement the programs.
- 1994 Consultant to Strategic Mortgage Services Inc., Costa Mesa, California. Evaluation of methodology to be used in property flood zone determinations to meet federal flood insurance requirements. Manual and GIS methodologies were assessed. Recommendations on future development of GIS capabilities were made.
- Consultant to Weyerhaeuser Corporation, Seattle, Washington. Senior Executive seminar on geographic information systems. Initial GIS planning discussions for U.S.\$46 million GIS investment.
- 1995 Consultant to Ontario Ministry of Natural Resources, Cambridge District, to assess GIS facilities and functionality with respect to core business needs of the District, including integration of management views with field staff experience to produce a strategy for data acquisition and management, development of applications required to produce the information required, necessary technology linkages to allow data to be brought together and information distributed, and pertinent staff training required to take advantage of new technologies.
- 1995-6 Consultant to Canadian Heritage Parks Canada, Jasper National Park, for a GIS User Needs Analysis and Implementation Strategy for the Park, including those data describing cultural, biological and physical environments, and municipal services and facilities, to result in a responsive plan for data acquisition, maintenance and management, a plan for necessary hardware and software capabilities, and a management plan for the cost-effective implementation of the requirements.

- 1995-6 Consultant to Ontario Ministry of Natural Resources, Systems Development Branch, regarding educational services relating to geographic information systems.
- 1999-2001 Development and implementation of a geographic information system to select optimal sites and coordinate rehabilitation work being carried out on the Rio Laja watershed, Guanajuato, Mexico, by Sociedad Audubon de México, Centro para los Adolescentes de San Miguel de Allende, FAI (Save the Children, México), Cuerpos de Conservación Guanajuato and Salvemos el Rio Laja, and to monitor, analyze and report on results of that work to funding agencies.
- 2001-2004 Consultant to Pacific Rim National Park Reserve, Parks Canada, concerning development of their geographic information system for management of the park, and to develop GIS for management of all National Parks.
- 2001 Consultant to the City of Phoenix, Arizona, regarding planning and management of their geographic information systems.
- 2002 Expert Consultant to Fiddler Gonzales & Rodrigues, LLP, Puerto Rico, in connection with court case concerning GIS Implementation for Centro de Recaudación Municipales (CRIM).
- 2004 - Consultant to Parks Canada to assist with planning for GIS in the National Parks of Canada.

Other Professional Activities

Advisor to INSÉE, Government of France, on the establishment of CERCLE (Centre d'Études et de Recherches sur les Collectivités Locales en Europe) in Strasbourg for the training of middle management levels of municipal civil servants in Europe in the theory and techniques of data use.

Advisor to the United Nations Educational, Scientific and Cultural Organization (Unesco) on Natural Resources Information Systems in Indonesia.

Unesco representative to the 1st International Conference on Soil Information Systems in the French-speaking World sponsored by the Agence de Coopération Culturelle et Technique and the Government of Senegal, 1975.

Unesco representative to the 1st International Conference on Soil Information Systems, Holland, 1975.

Advisor to the United Nations Industrial Development Organization (UNIDO) on the development of guidelines for industrial data banks for the use of international agencies, 1975.

Consultant to United Nations Environmental Program (UNEP) on the Global Environmental Monitoring System (GEMS), 1975

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Consultant to the United Nations Food and Agriculture Organization (FAO) on information integration on grasslands, soils and forests, 1975.

Consultant to FAO on the methods of handling data for the assessment of soil degradation in Africa and the Middle East, a preliminary study for the World Map of Soil Degradation, 1977-78; and on the preparation and presentation of the World Map on Soil Degradation using computer assisted cartography and information systems, 1979-80.

Advisor to the U.S. Department of Commerce, Census Use Study, on the design and implementation of workshops in five regional centres in the U.S. (Indianapolis, Atlanta, Boston, Pittsburg, and San Francisco) for the transfer of spatial data handling techniques (DIME system) to user agencies.

Unesco representative to the 2nd International Conference on Soil Information Systems in the French-speaking World sponsored by the Agence de Cooperation Culturelle et Technique and the Central African Republic, 1977.

Unesco representative to the Coordination meeting for the project "Reseau International de Traitement de Données de Sol" sponsored by the Agence de Coopération Culturelle et Technique, Ottawa, 1979.

Numerous seminars and training sessions on GIS Planning and Management, 1980 to present, for clients at all levels of government, international agencies and in the private sector.

Invited speaker to:

- Harvard Graphics Week, every year, 1977 to 1982
- AUTOCARTO III, San Francisco, 1978
- Second Alaska Conference on Computer Graphics and Geoprocessing, Anchorage, Alaska, 1981
- U.S.-Australia Seminar on Design and Implementation of Computer-based Geographic Information Systems, Hawaii, 1982
- Canadian Cartographic Association Annual Conference, 1981 and 1983
- URISA 21st Annual Conference (Keynote Speaker), Atlanta, Georgia, June 1983.
- International Symposium on Spatial Information Systems (Keynote Speaker), Zurich, Switzerland, August 1984
- FIG International Symposium on Land Information Systems, Edmonton, Alta., Oct. 1984
- NICOGRAPH '84, Tokyo, Japan, November 1984.

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- Beijing, China, State Science and Technology Commission Seminar on Development and Applications of Remote Sensing for Planning, Management and Decision-Making, National Remote Sensing Centre, April 15-25, 1985.
- United Nations Inter-Regional Seminar on the Role of Surveying, Mapping and Charting in Country Development Programs, sponsored by UN Department of Technical Cooperation for Development, Canadian International Development Agency, and Canada Department of Energy, Mines and Resources, November 1985.
- Beijing, China, Symposium on Territorial Development and Management, April 1986.
- Beijing, China, International Workshop on Geographic Information Systems, May 1987
- Nova Scotia College of Geographic Sciences, GIS Workshop, Lawrencetown, N.S., June 1987.
- GIS National Conference 1989, Energy Mines & Resources Canada, Workshop I, and keynote presentation.
- GIS for the 90s Conference, March 1990, Workshop on Geographic Information System Planning
- GIS Seminar "Myths, Options and Realities", Ontario Ministry of the Environment, February 1991, Keynote Speaker.
- GIS Potential and Limitations, Nova Scotia Department of Municipal Affairs, March 1992.
- Seminar on GIS Management, Primer Curso Internacional de Dirección de Proyectos GIS, Universidad Politécnica de Madrid, Spain, April 1992.
- Keynote Speaker, Geographic Information Seminar, Ontario Ministry of Natural Resources, October 1993.
- Keynote Speaker, SaskGeomatics '94, Regina, Saskatchewan.
- Keynote Speaker, ESRI Users Conference, Palm Springs, California, May 1996.
- First Angus Hamilton Lecture, GANB, Fredericton, N.B., November 1996.
- Public Lecture in celebration of Nova Scotia College of Geographic Sciences 50th Anniversary, November 1996.
- Public Lecture, Geomatics Association of Nova Scotia, Halifax, November 1996.
- Seminar on GIS Management, Deutsche Anwenderkonferenz, Freising, Germany, March 1997

- Keynote Speaker, GIS AM/FM Asia '97 & GeoInformatics '97 Conference, Taipei, Taiwan, May 1997.
- Keynote Speaker, 4th Annual GIS International Seminar 'GIS in Local Government', Korean Research Institute for Human Settlements, September, 1999.
- Keynote Speaker, South Florida GIS Expo 2000, Deerfield Beach, Florida, October 2000.

Professional Associations

In addition to professional work experience, a consulting geographer may work with other members of the discipline in scientific activities under the aegis of learned societies. Dr. Tomlinson has been active in such academic activities as follows.

Royal Geographical Society

Fellow (elected 1959)

Elected Honourary Corresponding Member 1983

International Geographical Union

Chairman, IGU Global Database Planning Project (IGU input to the ICSU International Geosphere/Biosphere Program) 1986-1994

Executive Secretary, IGU Research Development Committee
(elected 1982, re-elected 1984)

Member, IGU Commission on Remote Sensing (1964-68)

Chairman, IGU Commission on Geographical Data Sensing and Processing (elected 1968, re-elected 1972 and 1976).

Activities as Chairman of the IGU Commission included:

- Administrative direction of the Commission, 1968 to 1980. (This included the supervision of \$1.5 million in grants and contracts.)
- Member of advisory group providing technical direction and management guidelines to the Geography Applications Program, Office of the Director, U.S. Geological Survey, in the development of geographic information systems.
- Chairman of First and Second Unesco/IGU Symposia on Geographical Information Systems held in Ottawa in 1970 and 1972 respectively.
- Editor of two-volume, 1300-page text "Geographical Data Handling".
- Chairman of IGU delegation to COGEO DATA/IGU Conference on Earth Science Data Systems, Paris, November 1973.
- Member of Critique Group carrying out case studies of five spatial data handling systems in North America (Canada Geographic Information System, Polygon Information Overlay System, Minnesota Land Management Information System, Land Use and Natural Resources System of New York State, and Oak Ridge Regional Management Information System).

- Principal investigator of the IGU Inventory of Computer Software for Spatial Data Handling, funded by the RALI Program and the Geography Program of the U.S. Department of the Interior. This work represents the most comprehensive review of software for spatial data handling undertaken to date, describing over 600 systems and software programs worldwide. The resulting 3-volume reference text was published in 1980 and made available at no cost to scientists world-wide.
- Chairman of three interdisciplinary meetings in 1977 and 1978 to examine the methodological problems inherent in the future storage of large amounts of spatial data, held by the Commission in Ottawa, Toronto and Buffalo.
- Panel Chairman, NASA meeting on Landsat data and geographic information systems, 1977.
- Speaker and Panel Member, Third International Symposium on Computer Mapping and Cartography, 1978.
- Administrative Director of a three-week IGU workshop on remote sensing methods for regional and national planning held in Nigeria in July 1978, funded by the Canadian International Development Agency (CIDA) and Unesco. The working materials for this workshop included a 3-volume text on the recent applications of remote sensing technology, produced by the Commission.

Canadian National Committee for Geography - Member (elected 1984)

Canadian National Committee on Data for Science and Technology (CODATA)
Member (elected 1977-80, 1994-97, 1997-2000)

International Council of Scientific Unions (ICSU) Committee on Data for Science and Technology (CODATA), Advisory Group on Geoscience Data Handling
Member, 1976-78

CODATA Task Group on Space and Time Dependent Data
Chairman, 1976-80. This group coordinated a study by eight separate scientific unions into the methods of handling space and time varying data by scientists in different disciplines. The work was funded by CODATA, Unesco and the Department of Energy, Mines and Resources of the Government of Canada.

Canadian Association of Geographers
President, 1987-88
Vice President, 1986
Councillor, 1982
Editorial Board, *The Operational Geographer*, 1982-83
Chairman, Committee on Membership, 1982-83
Chairman, Committee on Professional Standing, 1984-85

Association of American Geographers
Vice Chairman, Specialty Group on GIS, 1992-3
Chairman, Specialty Group on GIS, 1993-4

Institute of Certified Management Consultants of Ontario. Elected as Certified Management Consultant (CMC), 1992.

URISA, Honorary Lifetime Member, Certified GIS Professional (GISP).

Other Professional Association Memberships:

Computer Society of Canada, Data Processing Management Association, Canadian Information Processing Society, Canadian Cartographic Association, Society of Sigma XI, American Society of Photogrammetry and Remote Sensing, Canadian Institute of Geomatics, Regional Science Association

Awards

Gold Medal, The Royal Canadian Geographical Society, October 2003. For singular vision and achievement in the field of geography.

Fellow, University College London, May 2003.

The President's Award, University of Redlands, February 28, 2002. In recognition of extraordinary contribution as the father of GIS.

Order of Canada, Appointment as Member, May 30, 2001

First ESRI Lifetime Achievement Award, 1997

GIS World Lifetime Achievement Award, 1996

Association of American Geographers James R. Anderson Medal of Honor for Applied Geography, 1995

Canadian Association of Geographers Award for Service to the Profession of Geography, 1991

Royal Geographical Society Murchison Award for contributions to the development of geographic information systems, 1988

Clubs

The Athenaeum, London

Publications

Books and Monographs:

Roger Tomlinson, (2003) *Thinking About GIS*. ESRI Press, Redlands, CA. (Russian Edition 2004)

R. F. Tomlinson and M.A.G. Toomey, (1999) "GIS and LIS in Canada" Chapter 15 *in Mapping a Northern Land: the Survey of Canada 1947-1994*, McGill Queen's University Press.

R. F. Tomlinson, (1998) "The Canada Geographic Information System" *in The History of Geographic Information Systems: Perspectives from Pioneers*, Prentice Hall PTR, New Jersey.

Mounsey, Helen and Roger F. Tomlinson (1988) *Building Databases for Global Science*. Taylor & Francis Ltd., U.K.

Tomlinson, Roger F. and Barbara B. Petchenik (1988) *Reflections on the Revolution: The Transition from Analogue to Digital Representations of Space, 1958-1988*. The American Cartographer, Vol. 15:3.

R. F. Tomlinson (1977) *Proceedings of the Commission on Geographical Data Sensing and Processing*, Moscow, 1976. IGU Commission on Geographical Data Sensing and Processing.

R. F. Tomlinson and H. W. Calkins (1977) *Geographic Information Systems, Methods and Equipment for Land Use Planning*. U.S. Geological Survey, Washington, D.C.

R. F. Tomlinson, H. W. Calkins and D. F. Marble (1976) *Computer Handling of Geographical Data*. Unesco Natural Resources Research Series, XIII, Unesco Press, Paris.

R. F. Tomlinson, ed. (1972) *Geographical Data Handling*, 2 vols., 1300 pp., IGU Commission on Geographical Data Sensing and Processing.

R. F. Tomlinson, ed. (1970) *Environment Information Systems*, IGU Commission on Geographical Data Sensing and Processing.

Papers:

R. F. Tomlinson, (2004) "The Rio Laja Watershed, Guanajuato, Mexico, Improving with GIS", *ArcNews*, Vol. 26, No. 2.

R. F. Tomlinson, (1998) "GIS Planning and Management in Response to Change", *Geo Info Systems*, Vol. 8, No. 9, pp. 40-41.

R. F. Tomlinson, (1997) "Federal Influences in Early GIS Development in Canada", *Geo Info Systems*, Vol. 7, No. 10, pp. 38-39.

R. F. Tomlinson, (1993) "Comprehensive Statewide GIS Planning in the State of Victoria, Australia", *Proceedings*, Geographic Information Seminar, Toronto, October 1993, Ontario Ministry of Natural Resources.

R. F. Tomlinson, (1992) "Regional Considerations in the Integration of Geographic Information System Activities: A Strategy from the Canadian North" *in The Role of Geographic Information Systems in Development Planning*, Taylor & Francis Ltd.

R. F. Tomlinson and Douglas A. Smith, (1991) "Assessing GIS Costs and Benefits: Methodological and Implementation Issues", *Int. Journal Geog. Inf. Systems*, 6:3, 247-256

R. F. Tomlinson, (1989a) "Geographic Information Systems - After the Pilot Project", Keynote Speech presented at Geographic Information Systems Seminar Beyond the Pilot Project - The Next Generation, Ontario Ministry of Natural Resources, November 1989, and published in their *Proceedings*.

-----, (1989b) "The GIS Planning Process", invited paper presented at the Workshop on Strategic Directions for Canada's Surveying, Mapping, Remote Sensing and GIS Activities, Energy, Mines and Resources Canada, November 13, 1989.

-----, (1989c) "Canadian GIS Experience", Special Issue - GIS in Canada, *CISM Journal*, Vol. 43, No. 3.

-----, (1989d) "Geographic Information Systems - Challenge for the 1990s", Paper presented at the Geographic Information Systems Conference 1989, Energy, Mines and Resources Canada, Ottawa, Feb. 27-Mar. 3. In press.

-----, (1989e) "Geographic Information Systems and Geographers in the 1990s", Presidential Address. *The Canadian Geographer* Vol. 33, No. 4.

R. F. Tomlinson, (1988a) "Opening Remarks" *in Building Databases for Global Science*, Helen Mounsey and R. F. Tomlinson, eds. Taylor & Francis Ltd., U.K.

R. F. Tomlinson, (1988b) "The Impact of the Transition from Analogue to Digital Cartographic Representation", *The American Cartographer*, Vol. 15, No.3. (Special Issue, R. F. Tomlinson Executive Editor, Barbara Petchenik Managing Editor.)

R. F. Tomlinson, (1987) "Review of North American experience of current and potential uses of geographic information systems", *Int. Journal Geog. Inf. Systems*, No. 3.

R. F. Tomlinson, (1984) Geographic information systems - a new frontier. Keynote paper presented at the International Symposium on Spatial Data Handling, Zurich, Switzerland, August 20-24, 1984. Paper published in *The Operational Geographer*, Vol. 5, 1985, pp. 31-36.

R. F. Tomlinson, (1981) An appraisal of the need for a natural resources information system(s) in the Yukon Territory. Paper presented at the Second Alaska Conference on Computer Graphics and Geoprocessing, Anchorage, Alaska, Sept. 24-26, 1981.

R. F. Tomlinson and A. R. Boyle (1981) The state of development of systems for handling natural resources inventory data. *Cartographica* 18:4, 66-95.

R. F. Tomlinson, (1980) The handling of data for natural resources development. Paper presented at the ITC Workshop on Information Requirements for Development Planning in Developing Countries, Enschede, Netherlands, February 19-23, 1980.

R. F. Tomlinson and A. H. Shapley (1980) Treatment of observational data in the geosciences: Estimation and approximation of data. In *Data Handling for Science and Technology* eds. Stephen A. Rossmassler and David G. Watson, North Holland Publishing Co., New York, N.Y., ISBN 0-444-860-12-6.

R. F. Tomlinson, (1978a) Design considerations for digital soil maps. In *Proceedings*, 11th Congress of the International Society of Soil Science, Edmonton, Alberta, Symposia Papers, 3, 191-206.

-----, (1978b) Interdisciplinary cooperation and technical exchange in methods of handling space-time varying data. Paper presented at the 6th International CODATA Conference, Santa Flavia, Italy, and published in their *Proceedings*.

-----, (1978c) Difficulties inherent in organizing earth data in a storage form suitable for query. Paper presented to AUTOCARTO III, Third International Symposium on Automation in Cartography, San Francisco, 1978, and published in their *Proceedings*.

R. F. Tomlinson and D. L. Day (1978d) Parks Canada evaluation of spatial data handling requirements. Parks Canada, Ottawa.

R. F. Tomlinson, D. S. Simonett and D. Steiner (1977) Roles of remote sensing applications and geographic information systems in national development, 1976-80. In *Proceedings of the Commission on Geographical Data Sensing and Processing, Moscow, 1976*. IGU Commission on Geographical Data Sensing and Processing.

R. F. Tomlinson, (1974a) The state of development of spatial data handling techniques. In *Proceedings of the First International Conference on Data Processing and Environment*. (Invited paper). Foundation Universitaire Luxembourgeoise.

-----, (1974b) Russian of 1974a, Soviet Academy of Sciences.

-----, (1974c) Polish of 1974a, Polish Academy of Sciences.

-----, (1974d) Spatial data characteristics and handling techniques. Invited paper presented at the 4th International CODATA Conference, Tsakhcadzor, U.S.S.R., and published in their *Proceedings*.

R. F. Tomlinson, (1971a) The economic, sociological and political nature of data banks for development. In *Data Banks for Development*, Proceedings, International Meeting on Data Banks for Development, St. Maximin, France, May 1971. Government of France, INSEE publication.

-----, (1971b) Geo-information systems and the use of computers in handling land use information. Paper presented at the USGS Conference on Land Use Classification Systems, Department of the Interior, Washington, D.C., and published in their *Proceedings*.

R. F. Tomlinson, (1970) Computer based geographical data handling methods. In *New Possibilities and Techniques for Land Use and Related Surveys*, ed. I. H. Cox. World Land Use Occasional Papers No. 8, Geographical Publications Ltd., Berkhamsted, Herts, England.

R. F. Tomlinson, (1968) A geographic information system for regional planning. In *Land Evaluation*, ed. G. A. Stewart. Papers of CSIRO Symposium, Canberra, August 1968. Macmillan of Australia, South Melbourne, Australia.

R. F. Tomlinson, (1967) An introduction to the geo-information system of the Canada Land Inventory. ARDA, Canada Land Inventory, Department of Forestry and Rural Development, Ottawa.

R. F. Tomlinson and W. G. E. Brown (1964) The application of photo-interpretation to urban planning. *The Canadian Surveyor*, March 1964, 34-42.

R. F. Tomlinson, (1963) Pleistocene evidence related to glacial theory in Northeastern Labrador. *Canadian Geography*, VII:2, 83-90.

R. F. Tomlinson, (1962) Computer mapping: An introduction to the use of electronic computers in the storage, compilation and assessment of natural and economic data for the evaluation of marginal lands. Paper presented to the National Land Capability Inventory Seminar held under the direction of the Agricultural Rehabilitation and Development Administration of the Canada Department of Agriculture, Ottawa, and published in their *Proceedings*.

R. F. Tomlinson and W. G. E. Brown (1962) The use of vegetation analysis in the photo-interpretation of surface material. *Photogrammetric Engineering*, Sept. 1962, 584-592.

R. F. Tomlinson, (1958) Geomorphological investigation in the Kaumajet Mountains and Okak Bay (North River) region of Labrador. *Arctic II*, 245-254.