

TABLE OF CONTENTS
VOLUME I

Foreword	iii
Preface	v
Monday Plenary Sessions	1
Tuesday Plenary Sessions	49
Wednesday Plenary Sessions	168
Thursday Plenary Sessions	221
Rural Health Planning Session	288
Health Planning Sessions	321
Epidemiology Sessions	360
Cadastral Mapping Sessions	430
Cartography Sessions	469
Natural Resource Systems Sessions	510
Appendixes	616

MONDAY PLENARY SESSIONS

Introduction	2
Lessons Learned in Establishing Automated Cartographic Digital Data Bases	5
William T. Riordan	
The Beginnings of Medical Mapping	13
Arthur H. Robinson	
U.S. Atlas of Mortality	22
Paul E. Leaverton, David R. Slaby, and Eugene M. Diggs	

A Mechanism for Selecting Communities at High Risk for Cancer	26
Thomas J. Mason	
Display Technologies in Computer Aided Applications	33
Carlo Infante	
Cartography in 1990	40
A. Raymond Boyle	
Future Directions of Computer Graphics (Abstract)	48
Jim George	

TUESDAY PLENARY SESSIONS

Introduction	50
Efficient Multi-Attribute Retrieval Over Very Large Geographical Data Files	54
John L. Pfaltz	
The Geometry of Possible/Impossible Maps	63
Jean Claude Muller	
Statistical Cartography: What Is It?	77
Waldo Tobler	
A Survey of the Mathematics of Maps	82
Marvin White	
Digital Terrain Models: An Overview	97
Thomas K. Peucker	
Tree Structures for Region Representation	108
Azriel Rosenfeld and Hanan Samet	
Interactive Mapping Software of the Domestic Information Display System	119
John T. Dalton and James Billingsley	

Data Structures and Algorithms for Raster Data Processing	127
Albert L. Zobrist	
Automated Cartography as an Aid to Define Protection Areas Against Air Traffic Noise	138
Theodor M. Johannsen	
Triangular Systems in Surface Representation. .	146
Michael J. McCullagh	
VIDEO-Cartographic System	154
Henryk Z. Kowalski	
The International Cartographic Association - An Overview	164
Dean T. Edson	

WEDNESDAY PLENARY SESSIONS

Introduction	169
The Evolution of Domestic Information Display Systems	172
Edward K. Zimmerman	
Obstacles to Accurate and Valid Geographic Assessment of Vital Event Data	188
David R. Slaby, Robert J. Casady, Henry Malin, and Judy F. Coakley	
Automated Cartography in the National Parks Planning	198
Theodore W. Sudia and Ted R. Dinkel	
A Geological Survey Perspective on Digital Cartography	203
Rupert Southard	
Thoughts on Line Generalization	209
George F. Jenks	

THURSDAY PLENARY SESSIONS

Introduction	222
U.S.G.S. Digital Cartographic Data Base	225
Robert B. McEwen and Harry Jacknow	
The Ascendancy of Digital Cartography in DMA's Future	236
Robert A. Penney	
Large System Mapping and Related Data Base Experience	244
David Holland	
National Soils Data Base From the Soil Conservation Service	250
C. Gene Johnson	
The 1980 Census Update: An Emphasis on Geographic Products and the Summary Tapes (Abstract)	262
Lawrence Hugg	
Interactive Map Design (Abstract)	263
Fred Broome	
Interactive Compilation Using GIMMS	264
Thomas C. Waugh	
Interactive Color Mapping	272
Denis White	
Strategies of Real-Time Cartography	278
Harold Moellering	

RURAL HEALTH PLANNING SESSION

Introduction	289
Cartography as an Aid for Targeting Federal Resources to Rural Areas	291
Joseph M. Baldi	

Health and Coal Utilization in the
Rural South: A Cartographic Approach 296
Eugenia E. Calle

Application of Domestic Information
Display System to Alabama Infant
Mortality 304
James D. Leeper, Robert S. Northrup,
and Carl E. Ferguson Jr.

A Comparison of Selected Cardiovascular
Death Rates in Alabama by County of
Occurrence: Implications for Rural
Health Planning 310
David W. Coombs, Stephen Nye Barton,
and John T. Nichols

HEALTH PLANNING SESSIONS

Introduction 322

Medical Maps: Some Design Suggestions
for Mapping Health/Disease Statistics 324
David P. Bickmore and
Tessa Tulloch

A Graphics Oriented Computer System
for Health Care Planning: Design and
Development Principles 331
James Bohland, Charles Barb,
Georgia Lundy, and Anne Mulloy Ashmore

A Micro - Based Computer Mapping System:
An Application in Health Planning 339
Edward M. Bosanac, William Detweiler,
and Bruce L. Palmer

The Application of Automated Statistical
Mapping to Health Statistics 346
Henry Tom

Mapping the Predicted Need for Hospital
Beds 353
G. Joseph Meneley and
Gerard Rushton

EPIDEMIOLOGY SESSIONS

Introduction	361
Cartography and Computing Applications for Epidemiological Research in Britain	364
Louis M.F. Massé, Michel Gallou, and Basavanneppa Tallur	
PAREP: Populations at Risk to Environmental Pollution	369
D. Merrill, B. Levine, S. Sacks, and S. Selvin	
Dual Techniques for the Determination of Spatial Clustering of Mortality in Montreal, Quebec	377
William G. Nisen and Anne M. Hunt	
Monitoring Disease Diffusion Within an Automated Mapping Framework	385
Gerald F. Pyle and Jack J. Utano	
The Geochemistry of Disease: A Reawakening of a Multidisciplinary Approach to Disease Prevention	394
Rulon W. Rawson	
Assembly - Line Research--With Quality Control	403
Herbert I. Sauer	
"Bring Out Yer Dead": A Cartographic Analysis of the Spread of the Black Death in London, England, 1665	411
Gary W. Shannon and Robert G. Cromley	
An Interactive Mapping and Analysis System for Use With Environmental and Health Data	422
Laurence J. Milask and Carol G. Graves	

CADASTRAL MAPPING SESSIONS

Introduction 431

Cadastral Aerial Maps and a Permanent
Parcel Numbering System--Tools for
Local Government 433
 William H. Barg

Property Appraiser's Mapping
Project, Pinellas County, Florida 441
 George A. Donatello

City of Milwaukee Computer Graphics
System - The First 18 Months 448
 William E. Huxhold

Automated Land Records and Mapping
in Local Government - A Case Study in
San Diego 457
 Kenneth L. Pyle and
 Richard C. Dietz

Cost - Effective Digital Mapping:
Burnaby's Success 464
 H.T. Christie

CARTOGRAPHY SESSIONS

Introduction 470

Alternative Research Strategies and
Map Reading 474
 Michael W. Dobson

Tactical Orientation/Mobility Maps
Production and Testing 481
 Susan Von Gruenigan

Award Winning Map Designs 489
 Joseph W. Wiedel

The Benefits of Computer Assisted
Cartography for Map Reading 496
 Joel L. Morrison

The Mortality Atlas of Canada Project . . . 504
 Sidney W. Witiuk

NATURAL RESOURCE SYSTEMS SESSIONS

Introduction	512
The Use of a Biophysical (Ecological) Data Base for Park Planning	515
Joseph H. Arbour	
Spatial Data Handling Systems for Natural Resources	524
Jack Dangermond	
Geographic Information Systems: All That Glitters is Not Gold	541
David L. Day	
Joint State/Regional Environmental Planning Using the PEMSO/ADAPT Geographic Information System	546
Walter M. Grayman, Barbara A. Woolridge, E.B. Long, and Andrew C. Vidra	
Applications of an Interactive Graphics Design System to Forest Inventory in British Columbia	554
Frank Hegyi	
Issues in Natural Resource Systems	559
Robert J. Madill	
A Simple Information Management Theory for Complex Geographic Data	563
Helmut P. Moysenko	
Application of Remote Sensing Technology to Monitoring the Shore- Line Dynamics of Seashore Parks	572
Barry S. Wellar	
Hydrologic Monitoring Systems for the U.S. National Park Service	584
Vujica Yevjevich	

Design and Production Considerations
for an International Conservation
Atlas 597
 Carl E. Youngmann

An Overview of the Canada Geographic
Information System (CGIS) 610
 Terry Fisher and
 Connie MacDonald

APPENDIXES

AUTO-CARTO IV Staff and Committees 617

Author Index - Volume I 620

For a list of AUTO-CARTO IV participants
see Volume II, page 428.

MONDAY PLENARY SESSIONS

Introduction 2

Lessons Learned in Establishing Automated
Cartographic Digital Data Bases 5
William T. Riordan

The Beginnings of Medical Mapping 13
Arthur H. Robinson

U.S. Atlas of Mortality 22
Paul E. Leaverton, David R. Slaby,
and Eugenia M. Diggs

A Mechanism for Selecting Communities
at High Risk for Cancer 26
Thomas J. Mason

Display Technologies in Computer
Aided Applications 33
Carlo Infante

Cartography in 1990 40
A. Raymond Boyle

Future Directions of Computer
Graphics (Abstract) 48
Jim George