

The Atlas of  
Pennsylvania

EDITORIAL COMMITTEE

TEMPLE UNIVERSITY David J. Cuff

William J. Young

UNIVERSITY OF PITTSBURGH Edward K. Muller

THE PENNSYLVANIA STATE UNIVERSITY Wilbur Zelinsky

Ronald F. Ablar

PRODUCTION COORDINATOR

TEMPLE UNIVERSITY CARTOGRAPHIC LAB Mark T. Mattson

DESIGN AND PRODUCTION

DIRECTOR, MAP AND PAGE DESIGN Nancy Anderson Tsakos

*Map and Page Design, Graph Specialist* Nancy J. Wahl

DIRECTOR, CARTOGRAPHIC PRODUCTION Alan J. Willis

*Cartographic Production* Jeffrey Stafford

*Graphics Typography* Paul R. Anderson

TEXT MANAGEMENT, SYSTEM DESIGN Yvonne Keck Holman

MAP AND PAGE DESIGN

A Cooperative Project  
of the three Commonwealth Temple University, University of Pittsburgh, The Pennsylvania State University  
Research Universities

# The Atlas of Pennsylvania



Temple University Press: Philadelphia



Peirce F. Lewis (The Pennsylvania Mosaic)	The Pennsylvania State University
George H. Myer (Geology)	Temple University
Ben Marsh (Landforms)	Bucknell University
Elizabeth R. Marsh (Landforms)	Bucknell University
Brent Yarnal (Climate)	The Pennsylvania State University
Laurence S. Kalkstein (Water Budget)	University of Delaware
Robert E. Davis (Water Budget)	University of Delaware
Fredrick H. Utech (Natural Vegetation)	The Carnegie Museum of Natural History
Thomas L. Smith (Natural Vegetation)	The Nature Conservancy
Paul G. Wiegman (Natural Areas)	Western Pennsylvania Conservancy
Ke Chung Kim (Insects)	The Pennsylvania State University
Jay R. Stauffer, Jr. (Fish)	The Pennsylvania State University
C. J. McCoy (Amphibians and Reptiles)	The Carnegie Museum of Natural History
Daniel Brauning (Birds)	The Academy of Natural Sciences
Gordon L. Kirkland, Jr. (Mammals)	Shippensburg University of Pennsylvania
A. Elizabeth Watson (Environmental Overview)	Pennsylvania Department of Environmental Resources
W. Fred Kinsey III (Indians)	Franklin and Marshall College
James B. Richardson III (Indians)	The Carnegie Museum of Natural History
Ann Marie Dykstra (Exploration, Politics) Van Beck Hall (French and Indian War, American Revolution, Nineteenth-Century Wars)	University of Pittsburgh
William Trimble (Transportation: Aviation)	Auburn University
Philip Scranton (Manufacturing: Textiles)	Rutgers University, Camden
Richard O'Connor (Human Patterns, Labor)	University of Pittsburgh
Robert G. Doherty (Mining and Energy)	University of Pittsburgh
Louise Bem (Education)	Johnstown Flood Centennial Project
Lee Gutkind (Literature)	University of Pittsburgh
James H. Miller (Transportation)	The Pennsylvania State University
Lane J. Johnson (Agriculture)	Temple University
Malcolm D. Waskiewicz (Forestry)	Pennsylvania Department of Environmental Resources, Bureau of Forestry Pennsylvania Fish Commission
Roger B. Kenyon (Commercial Fishing)	
E. Willard Miller (Mineral Industries, Manufacturing)	The Pennsylvania State University
Roman A. Cybriwsky (Philadelphia)	Temple University

# Contents

xii	Preface	46	Wind
1	<b>The Pennsylvania Mosaic</b> <i>by Peirce F. Lewis</i>	47	Biomass
2	The Making of Eastern Pennsylvania	48	<b>SOILS</b>
5	Roads to the West	48	Mid-Atlantic States
5	Exploiting the North and West	49	Soils of Pennsylvania
6	Framing the Mosaic	50	Applications
7	A Mosaic for Living	51	Erosion
9	<b>Land and Resources</b> <i>edited by David J. Cuff</i>	52	<b>VEGETATION</b>
12	<b>GEOLOGY</b> <i>by George H. Myer</i>	52	Natural Vegetation <i>by Frederick H. Utech</i>
12	History	52	Habitats <i>by Thomas L. Smith</i>
13	Structure	57	Natural Areas <i>by Paul G. Wiegman</i>
14	Bedrock	58	<b>WILDLIFE</b>
16	Minerals	58	Insects <i>by Ke Chung Kim</i>
17	Hazards	60	Fish <i>by Jay R. Stauffer, Jr.</i>
18	<b>LANDFORMS</b> <i>by Ben Marsh and Elizabeth R. Marsh</i>	62	Amphibians and Reptiles <i>by C. J. McCoy</i>
18	Landform Regions	64	Birds <i>by Daniel Brauning</i>
25	Rivers and Glaciation	66	Mammals <i>by Gordon L. Kirkland, Jr.</i>
26	<b>CLIMATE</b> <i>by Brent Yarnal</i>	68	<b>ENVIRONMENTAL OVERVIEW</b> <i>by A. Elizabeth Watson</i>
26	Temperature	68	Threats
28	Precipitation	69	Stewardship
29	Applications	73	<b>Pennsylvania's Past</b> <i>edited by Edward K. Muller</i>
30	Climate Regions	76	<b>INDIANS</b> <i>by W. Fred Kinsey III and James B. Richardson III</i>
31	Water Budget <i>by Laurence S. Kalkstein and Robert E. Davis</i>	78	<b>EARLY CARTOGRAPHY</b>
32	<b>HYDROLOGY</b>	80	<b>EXPLORATION AND SETTLEMENT</b> <i>by Ann Marie Dykstra</i>
32	Surface Water	80	The Delaware Valley
34	Ground Water	80	The Ohio Valley
35	Water Use	81	Boundary Disputes
36	<b>AIR AND WATER QUALITY</b>	82	Land Policy
36	Air Pollution	83	Settlement Paths
37	Water Pollution		
38	<b>ENERGY RESOURCES</b>		
38	Coal		
42	Oil and Gas		
44	Hydropower		
45	Solar Radiation		

84	FRENCH AND INDIAN WAR <i>by Van Beck Hall</i>	146	Ethnic Activities
85	AMERICAN REVOLUTION <i>by Van Beck Hall</i>	147	LANGUAGE
86	HUMAN PATTERNS	148	SETTLEMENT LANDSCAPE
86	Demography	151	COMMUNICATIONS <i>by Ronald F. Abler</i>
88	Immigration and Ethnicity	151	Postal Services
90	Race	152	Telephone Service
91	Religion <i>by Wilbur Zelinsky</i>	153	Broadcasting, Cable, and Satellite
92	ECONOMIC ACTIVITY	154	CULTURE AREAS
92	Overview	155	CULTURAL RESOURCES
93	Agriculture	158	SPORTS
95	Forestry	161	CRIME AND PROTECTION
96	Transportation	162	POLITICS
100	Manufacturing	165	LITERATURE <i>by Lee Gutkind</i>
104	Mining and Energy	167	<b>Economic Activity</b> <i>edited by William J. Young</i>
107	Labor <i>by Richard O'Connor</i>	170	OVERVIEW
108	CITIES	170	State
110	NINETEENTH-CENTURY WARS <i>by Van Beck Hall</i>	170	SMSA
111	EDUCATION <i>by Louise Bem</i>	172	LAND USE
112	POLITICS <i>by Ann Marie Dykstra</i>	174	BUSINESS AND FINANCE
114	HISTORY REMEMBERED	174	Banking
117	<b>Human Patterns</b> <i>edited by Wilbur Zelinsky</i>	176	Business
120	DEMOGRAPHY	177	Government
120	Population	178	EMPLOYMENT <i>by Wilbur Zelinsky</i>
126	Residence and Household Structure	182	PERSONAL INCOME <i>by Wilbur Zelinsky</i>
127	Age, Sex, and Fertility	184	TRANSPORTATION <i>by James H. Miller</i>
128	Mortality	184	The Highway Network
130	Marital Characteristics	187	Surface Freight
131	Migration	190	Local Public
134	HEALTH		
136	EDUCATION		
140	HOUSING		
142	RELIGION		
144	ETHNICITY AND RACE		
145	Ethnicity		
146	Race		

191	Travel to Work <i>by Wilbur Zelinsky</i>	236	Population Change
192	Intercity Public	237	Population Characteristics
192	Air	238	Ethnicity
	<hr/>	239	Race
194	ENERGY	240	Housing
194	Overview	241	Social Indicators
195	Coal	242	Economic Activity
198	Oil and Gas	243	Occupations and Travel to Work
200	Electric Power		<hr/>
201	Selected Renewables	244	PITTSBURGH
	<hr/>	<i>by Edward K. Muller</i>	
202	AGRICULTURE	244	History
	<i>by Lane J. Johnson</i>	245	Land Use
202	General Trends	246	Reference Maps
202	Farms and Farm Land	247	Physical Setting
204	Patterns of Production	248	Population Characteristics
	<hr/>	250	Ethnicity
207	FORESTRY	251	Race
	<i>by Malcolm D. Waskiewicz</i>	252	Economic Activity
	<hr/>	253	Occupations
208	COMMERCIAL FISHING	254	Social Indicators
	<i>by Roger B. Kenyon</i>	255	Redevelopment
	<hr/>		<hr/>
209	MINERAL INDUSTRIES	257	Reference
	<i>by E. Willard Miller</i>		<hr/>
	<hr/>	258	LEGISLATIVE
210	MANUFACTURING		AND JUDICIAL DISTRICTS
	<i>by E. Willard Miller</i>		<hr/>
210	Pennsylvania: A Leading State	259	EXECUTIVE DISTRICTS
211	Employment		<hr/>
212	Structure	260	MAP RESOURCES
212	Industry Concentration		<hr/>
216	Production Workers	261	REFERENCE PLATES
	<hr/>	262-263	Northwest
217	TRADE AND SERVICES	264-265	Northeast
	<i>by Wilbur Zelinsky</i>	266-267	Southwest
217	Retail	268-269	Southeast
220	Wholesale		<hr/>
221	Services	270	GAZETTEER
	<hr/>		<hr/>
222	RECREATION	282	RECOMMENDED READINGS
222	Recreational Areas		<hr/>
227	Festivals and Events	284	INDEX
	<hr/>	288	GUIDE TO COUNTIES
229	Philadelphia and Pittsburgh		
	<hr/>		
232	PHILADELPHIA		
	<i>by Roman A. Cybriwsky</i>		
232	History		
234	Reference Maps		
235	Neighborhoods		