CONTENTS

Introduction	ix
How to use this book	xiii
PART 1: GEOSCIENCE	1
Mineral exploration from space Exploration Mapping Group Inc.	4
GIS paves the way for a clean energy future Esri and State of California	14
Improving a central repository for data and reports Geoscience	18
Bringing science stories to life with GIS San Diego State University	23
Ensuring that mining operates responsibly and efficiently New Mexico Energy, Minerals, and Natural Resources Department	27
PART 2: SUSTAINABLE ENERGY	33
Web map brings together conservation and green energy development The Nature Conservancy	36
An industry on the verge: Green hydrogen Esri	42
Location insights power the solar and wind energy industry Aegean Energy Group	46
Mapping renewable energy potential Prediction of Worldwide Energy Resources team, NASA	51

How and why utilities are shifting to renewables Xcel Energy, Austin Energy, and Ørsted	55
Mapping the future of energy through a geographic approach Energy Queensland	62
RT 3: ENVIRONMENTAL MONITORING	67
Using maps to reveal injustices US Environmental Protection Agency	69
Integrating emergency response US Environmental Protection Agency and Tetra Tech	<i>7</i> 5
Mapping equitable distribution of infrastructure funds Montana Department of Natural Resources and Conservation	78
Global collaboration fuels environmental impact assessment Bioinsight	82
3D mapping helps preserve freshwater resources US Environmental Protection Agency	88
RT 4: CLIMATE SCIENCE	93
Adding prediction to planning as disaster costs rise Esri	95
Tapping advanced analytics to map decades of climate risk $\ensuremath{AT\&T}$	98
Building a maritime spatial atlas to manage climate change Maritime and Port Authority of Singapore	103
Climate change prompts Grenada to create national digital twin	108
	Acel Energy, Austin Energy, and Ørsted Mapping the future of energy through a geographic approach Energy Queensland RT 3: ENVIRONMENTAL MONITORING Using maps to reveal injustices US Environmental Protection Agency Integrating emergency response US Environmental Protection Agency and Tetra Tech Mapping equitable distribution of infrastructure funds Montana Department of Natural Resources and Conservation Global collaboration fuels environmental impact assessment Bioinsight 3D mapping helps preserve freshwater resources US Environmental Protection Agency RT 4: CLIMATE SCIENCE Adding prediction to planning as disaster costs rise Esri Tapping advanced analytics to map decades of climate risk AT&T Building a maritime spatial atlas to manage climate change Maritime and Port Authority of Singapore Climate change prompts Grenada to create national

Mapping climate risks helps facilitate action New Mexico's Interagency Climate Change Task Force	114
Addressing climate change as a company-wide priority Esri	118
The business executive's blueprint for sustainability Esri	125
PART 5: WEATHER	131
A GIS-derived climatology of hail Esri	134
Integrating severe weather data helps manage snow removal New York State Department of Transportation	145
Weather forecasting takes a leap forward Weather Decision Technologies	149
Extreme heat spurs climate action Prague Institute of Planning and Development	156
PART 6: MARINE SCIENCE	161
Achieving sustainable prosperity with seafloor maps Clearwater Seafoods	163
3D and location intelligence help drive a sustainable ocean economy Esri	167
Sustainably growing the blue economy through shared ocean information	1 <i>7</i> 1

A global approach to preventing plastic from reaching the ocean	175
Namma Beach, Namma Chennai	
NEXT STEPS	182
Contributors	191