

The Shuttle Radar Topography Mission (SRTM), flown on the Space Shuttle Endeavor in February 2000, measured the elevation of nearly all the Earth's land areas between latitudes 60° N and 56° S. For many regions, these SRTM data represent the most detailed and accurate information about the shape of the Earth's surface, or "topography." This type of data is essential for many regional-scale applications in geology, water resources management, urban and regional planning, ecology, glaciology, forest and rangeland management, and other fields.


The SRTM image shown at upper left is a three-dimensional perspective view of the Crater Highlands, located along the East African Rift in Tanzania. The highest point in this area is the 3648-meter peak of Mount Loolmalasin, shown in white near the center of the image. Beyond Mount Loolmalasin is the circular caldera known as Ngorongoro Crater, with Lake Makat situated in its center. The eastern end of Lake Eyasi is in the background. Other peaks, including Kitumbeine (center left), Gelai (right) and Longido (lower left) appear in the foreground. This image covers an area of approximately 48 km by 230 km.

The East African Rift is a zone where the African and Somali crustal plates are splitting apart. Volcanoes are often located along these types of spreading zones, where the thinning of the Earth's crust allows magma to rise toward the surface. Calderas such as Ngorongoro can result from large volcanic explosions, or from the collapse of the surface above a subterranean magma chamber.

The Crater Highlands and the adjacent Serengeti Plain are home to some of the largest and most spectacular populations of East African wildlife. The Ngorongoro Conservation Area provides habitat for the critically endangered black rhinoceros, as well as the hippopotamus, wildebeest, zebra, and the highest density of mammalian predators in Africa, including large numbers of lions.

The SRTM radar antennas are illustrated at upper right in an artist's rendition. Radar signals are transmitted by the main antenna, located inside the Shuttle's payload bay. The returning radar signals—reflected from the Earth's surface—are received by both the main antenna and by a secondary "outboard" antenna, located at the end of a 60-meter-long mast extending from the payload bay. By analyzing the slight differences in the phase of the signals received by these two antennas, it is possible to precisely measure the shape of the Earth's surface, using the techniques of radar interferometry.

Image credits: NASA/JPL and Robert Crippen (upper left); NASA Public Affairs Office (upper right).

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CONTENTS

1 **Concepts and Foundations of Remote Sensing 1**

- 1.1 Introduction 1
- 1.2 Energy Sources and Radiation Principles 4
- 1.3 Energy Interactions in the Atmosphere 9
- 1.4 Energy Interactions with Earth Surface Features 12
- 1.5 Data Acquisition and Interpretation 30
- 1.6 Reference Data 38
- 1.7 The Global Positioning System 42
- 1.8 Characteristics of Remote Sensing Systems 45

- 1.9 Successful Application of Remote Sensing 48
- 1.10 Geographic Information Systems 51
- 1.11 Organization of the Book 59
- Works Cited 60

2 **Elements of Photographic Systems 61**

- 2.1 Introduction 61
- 2.2 Early History of Aerial Photography 62
- 2.3 Photographic Basics 64
- 2.4 Film Photography 76
- 2.5 Digital Photography 96

- 2.6 Aerial Cameras 99
- 2.7 Spatial Resolution of Camera Systems 110
- 2.8 Aerial Videography 116
- 2.9 Multiband Imaging 120
- 2.10 Conclusion 121
- Works Cited 121

3 Basic Principles of Photogrammetry 123

- 3.1 Introduction 123
- 3.2 Basic Geometric Characteristics of Aerial Photographs 126
- 3.3 Photographic Scale 134
- 3.4 Ground Coverage of Aerial Photographs 140
- 3.5 Area Measurement 140
- 3.6 Relief Displacement of Vertical Features 146
- 3.7 Image Parallax 153
- 3.8 Ground Control for Aerial Photography 164
- 3.9 Production of Maps and Orthophotos 165
- 3.10 Flight Planning 181
- 3.11 Conclusion 188
- Works Cited 188

4 Introduction to Visual Image Interpretation 189

- 4.1 Introduction 189
- 4.2 Fundamentals of Visual Image Interpretation 190

- 4.3 Basic Visual Image Interpretation Equipment 207
- 4.4 Land Use/Land Cover Mapping 212
- 4.5 Geologic and Soil Mapping 223
- 4.6 Agricultural Applications 233
- 4.7 Forestry Applications 240
- 4.8 Rangeland Applications 250
- 4.9 Water Resource Applications 251
- 4.10 Urban and Regional Planning Applications 259
- 4.11 Wetland Mapping 269
- 4.12 Wildlife Ecology Applications 276
- 4.13 Archaeological Applications 281
- 4.14 Environmental Assessment 286
- 4.15 Natural Disaster Assessment 290
- 4.16 Principles of Landform Identification and Evaluation 302
- Works Cited 323

5 Multispectral, Thermal, and Hyperspectral Sensing 325

- 5.1 Introduction 325
- 5.2 Across-Track Scanning 326
- 5.3 Along-Track Scanning 332
- 5.4 Example Across-Track Multispectral Scanner and Imagery 334
- 5.5 Example Along-Track Multispectral Scanner and Imagery 338
- 5.6 Geometric Characteristics of Across-Track Scanner Imagery 340
- 5.7 Geometric Characteristics of Along-Track Scanner Imagery 350
- 5.8 Thermal Scanning 352
- 5.9 Thermal Radiation Principles 354

- 5.10 Interpreting Thermal Scanner Imagery 364
- 5.11 Radiometric Calibration of Thermal Scanners 375
- 5.12 Temperature Mapping with Thermal Scanner Data 378
- 5.13 FLIR Systems 379
- 5.14 Hyperspectral Sensing 380
- 5.15 Conclusion 391
Works Cited 391

6 Earth Resource Satellites Operating in the Optical Spectrum 392

- 6.1 Introduction 392
- 6.2 Early History of Space Imaging 397
- 6.3 Landsat Satellite Program Overview 399
- 6.4 Landsat-1, -2, and -3 402
- 6.5 Landsat-4 and -5 406
- 6.6 Landsat-6 Planned Mission 414
- 6.7 Landsat-7 414
- 6.8 Landsat Image Examples 419
- 6.9 Landsat Data Continuity Mission 429
- 6.10 Long-Term Future of the Landsat Program and the Global Earth Observation System of Systems 431
- 6.11 SPOT Satellite Program 432
- 6.12 SPOT-1, -2, and -3 432
- 6.13 SPOT-4 438
- 6.14 SPOT-5 440
- 6.15 SPOT Image Examples 442
- 6.16 Other Earth Resource Satellites 446
- 6.17 Meteorological Satellites Frequently Applied to Earth Surface Feature Observation 462

- 6.18 Ocean Monitoring Satellites 469
- 6.19 Earth Observing System 471
- 6.20 Space Station Remote Sensing 480
Works Cited 481

7 Digital Image Interpretation and Analysis 482

- 7.1 Introduction 482
- 7.2 Image Rectification and Restoration 485
- 7.3 Image Enhancement 499
- 7.4 Contrast Manipulation 500
- 7.5 Spatial Feature Manipulation 509
- 7.6 Multi-Image Manipulation 523
- 7.7 Image Classification 545
- 7.8 Supervised Classification 547
- 7.9 The Classification Stage 550
- 7.10 The Training Stage 557
- 7.11 Unsupervised Classification 568
- 7.12 Hybrid Classification 572
- 7.13 Classification of Mixed Pixels 574
- 7.14 The Output Stage 578
- 7.15 Postclassification Smoothing 580
- 7.16 Object-Oriented Classification 581
- 7.17 Classification Accuracy Assessment 585
- 7.18 Data Merging and GIS Integration 592
- 7.19 Hyperspectral Image Analysis 610
- 7.20 Biophysical Modeling 615
- 7.21 Scale Effects 617
- 7.22 Image Transmission and Compression 621
- 7.23 Conclusion 623
Works Cited 623

8 Microwave and Lidar Sensing 626

- 8.1 Introduction 626
- 8.2 Radar Development 627
- 8.3 Side-Looking Radar System Operation 630
- 8.4 Synthetic Aperture Radar 638
- 8.5 Geometric Characteristics of Radar Imagery 641
- 8.6 Transmission Characteristics of Radar Signals 648
- 8.7 Other Radar Image Characteristics 653
- 8.8 Radar Image Interpretation 658
- 8.9 Interferometric Radar 678
- 8.10 Radar Remote Sensing from Space 684
- 8.11 Seasat-1 686
- 8.12 Shuttle Imaging Radar 687
- 8.13 Almaz-1 693
- 8.14 ERS-1 and ERS-2 694
- 8.15 Envisat 696
- 8.16 JERS-1 697
- 8.17 ALOS 699
- 8.18 Radarsat 700
- 8.19 High Resolution Spaceborne Radar Systems 704
- 8.20 Shuttle Radar Topography Mission 705
- 8.21 Spaceborne Radar System Summary 708
- 8.22 Passive Microwave Sensing 709
- 8.23 Lidar 714
Works Cited 726

Appendix A Radiometric Concepts, Terminology, and Units 727

- Geometric Characteristics of Radiation Measurement 727
- Radiometric Terminology and Units 729

Appendix B Remote Sensing Data and Information Resources 732

- Sources of Remote Sensing Data and Information 732
- Remote Sensing Periodicals 734
- Remote Sensing Glossaries 734
- Online Remote Sensing Courses and Tutorials 735

Appendix C Sample Coordinate Transformation and Resampling Procedures 736

- Two-Dimensional Affine Coordinate Transformation 736
- Resampling Procedures 737

Appendix D Radar Signal Concepts, Terminology, and Units 741

- Signal Power and Radar Cross Section 741
- Complex Amplitude of Radar Signals 742

Index 746
