

Contents

Preface	v
Acknowledgements	xi
Contributors	xv
Part I Establishing a Landscape-Scale Forest Carbon Monitoring Site	
1 Defining a Landscape-Scale Monitoring Tier for the North American Carbon Program	3
David Y. Hollinger	
2 Study Site Characterization	17
Chris Potter and Richard Birdsey	
3 Meteorological Measurements	27
David Y. Hollinger	
Part II Measuring Aboveground Carbon Pools	
4 Estimating Aboveground Carbon in Live and Standing Dead Trees	39
Peter S. Curtis	
5 Measuring Carbon in Shrubs	45
David C. Chojnacky and Mikaila Milton	
6 Estimating the Carbon in Coarse Woody Debris with Perpendicular Distance Sampling	73
Harry T. Valentine, Jeffrey H. Gove, Mark J. Ducey, Timothy G. Gregoire, and Michael S. Williams	
Part III Measuring Aboveground Carbon Fluxes	
7 Measuring Litterfall and Branchfall	91
Pierre Bernier, Paul J. Hanson, and Peter S. Curtis	
8 Methods for Estimating Litter Decomposition	103
Noah J. Karberg, Neal A. Scott, and Christian P. Giardina	

9 Measuring the Decomposition of Down Dead-Wood 113
 Neal A. Scott and Sandra Brown

Part IV Measuring Belowground Carbon Pools and Fluxes

10 Measuring Forest Floor, Mineral Soil, and Root Carbon Stocks 129
 Andrew J. Burton and Kurt S. Pregitzer

11 Quantifying Soil Respiration at Landscape Scales 143
 John B. Bradford and Michael G. Ryan

12 Measurement of Methane Fluxes from Terrestrial Landscapes Using Static, Non-steady State Enclosures 163
 Peter Weishampel and Randall Kolka

13 Measurement and Importance of Dissolved Organic Carbon 171
 Randall Kolka, Peter Weishampel, and Mats Fröberg

Part V Supplemental Variables for Carbon Cycle Modeling

14 Forest Canopy Structural Properties 179
 Marie-Louise Smith, Jeanne Anderson, and Matthew Fladeland

15 Estimation of Forest Canopy Nitrogen Concentration 197
 Marie-Louise Smith, David Y. Hollinger, and Scott Ollinger

Part VI Lessons from the Past and Opportunities in the Future

16 Integrating Field Measurements with Flux Tower and Remote Sensing Data 207
 Kenneth J. Davis

17 Landscape-Scale Carbon Sampling Strategy – Lessons Learned 227
 John B. Bradford, Peter Weishampel, Marie-Louise Smith, Randall Kolka, David Y. Hollinger, Richard. A. Birdsey, Scott Ollinger, and Michael G. Ryan

Index 239