
Steven W. Running

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Born: April 18, 1950; U.S. Citizen; Marital Status: Married, 2 children
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Education:

Ph.D. Forest Ecophysiology; Colorado State University, Fort Collins, 1979
M.S. Forest Management; Oregon State University, Corvallis, 1973
B.S. Botany; Oregon State University, Corvallis, 1972

Society Affiliations:

American Geophysical Union
American Meteorological Society
Ecological Society of America
American Association for the Advancement of Science

Nat'l/Int'l Committee Appointments:

NCAR CCSM Land Model Working Group (LMWG) Co-Chair, 2006-2008
AGU Committee of Fellows 2006-2008
Dept of Energy, Terrestrial Carbon Science Research Program, Co-Chair, 2005-2006.
National Research Council, NASA Earth Science Decadal Survey, 2005-2006.
NRC Committee on Environmental Satellite Data Utilization 2002-2005.
Intergovernmental Panel on Climate Change, Chapter Lead Author 2004-2007.
International Geosphere-Biosphere Programme Science Executive Committee 2004-2007.
National Research Council: Committee on Earth Studies 2004-2006.
NCAR CCSM Land Model Working Group (LMWG) Co-Chair, 2002-2004.
Interagency Carbon Cycle Science Committee 2002 - 2005
NAS-NRC Review of NASA Earth Science Enterprise Science Plan for 2000-2010.
NASA - Earth Observing System MODIS Science Team Member, 1989-2007.
NCAR Climate System Model (CSM) Advisory Board, 1996-2000.
NASA Mission to Planet Earth Biennial Review Panel, 1997.
Terrestrial Observation Panel for Climate of the World Meteorological Organization, 1995-2001.
National Academy of Sciences, National Research Council, Climate Research Committee, 1995-2001.
NRC Panel on Climate Observing System Status, 1998
NSF - National Center for Ecological Analysis and Synthesis, Science Advisor Board, 1994-1997.
NASA Earth Observing System, Land Science Panel, Chair 1994-2000.
World Climate Research Program, International Land Surface Climatology Science Panel, 1994-1996.
World Climate Research Program, Global Terrestrial Observing System Committee, 1994-1995.
International Geosphere-Biosphere Program, Biospheric Aspects of the Hydrologic Cycle, Vice-Chair, 1991-1996.
National Science Foundation, Ecosystem Studies Program panel member 1991-1993.
World Climate Research Program - WCRP/IGBP Land Surface Experiments, 1990-1994.
NASA Earth Science and Applications Advisory Subcommittee, 1990-1993.
NASA - Boreal Forest Ecosystem-Atmosphere Study (BOREAS) Steering Committee member, 1989-1991.
International Geosphere-Biosphere Program - Committee on Global Hydrology, 1988-1990.
NASA - Terrestrial Ecosystems Program Advisory Group, 1988-1990.
NASA - Management Operations Working Group, 1988-1990.
NASA - Interdisciplinary Studies Review Panel, 1986.
NASA - MODIS Instrument Panel, 1984-1986.
NASA - Global Biology Review Panel, 1983-1984.
National Academy of Sciences, Space Science Board participant, 1982-1984.
NASA - Land Related Global Habitability Program Planning, 1982-1983.

Awards, Honors:

Co-awardee, Nobel Peace Prize 2007
University of Montana, Lud Browman award for scientific writing, 2007
Oregon State Univ. College of Forestry, Distinguished Alumni, 2006
Burk-Brandenburg Montana Conservation Award, 2006
Fellow of the American Geophysical Union, 2002
University of Montana BN Faculty Achievement Award, 1991
University of Montana, Distinguished Scholar, 1990

Proposal Reviewer:

American Institute of Biological Sciences
 California Space Institute
 Canada Foundation for Innovation
 National Aeronautics and Space Administration
 National Oceanic and Atmospheric Administration
 National Environmental Research Council of the United Kingdom
 National Science Foundation
 Natural Sciences and Engineering Research Council of Canada
 U.S. Dept. of Energy
 U.S. Environmental Protection Agency
 U.S. Geological Survey
 U.S.D.A. Cooperative Research Program
 Western Regional Center of the National Institute for Global Environmental change

Journal Referee:

Agricultural and Forest Meteorology
 Agronomy Journal
 AI Applications in Natural Resource Management
 American Naturalist
 Australian Journal of Forest Research
 Bioscience
 Canadian Journal of Botany
 Canadian Journal of Forest Research
 Canadian Journal of Remote Sensing
 Climatic Change
 Climate Research
 Ecological Applications
 Ecology
 Forest Science
 Global Change Biology
 Int'l Journal of Hydrological Processes
 Int'l Journal of Remote Sensing
 Journal of Applied Meteorology
 Journal of Climate
 Journal of Environmental Quality
 Journal of Geophysical Research
 Journal of Hydrology
 Journal of Range Management
 National Geographic Research and Exploration
 Nature
 Northwest Science
 Remote Sensing of Environment
 Science
 Tellus
 The National Academies
 Tree Physiology
 USFS Intermountain Forest and Range Experiment Station
 USFS Pacific Northwest Forest and Range Experiment Station
 USFS Rocky Mountain Forest and Range Experiment Station
 Water, Air and Soil Pollution
 Water Resources Research

Experience:

1988-present	Professor, Forest Ecology, College of Forestry & Conservation, University of Montana
2005	Visiting Professor, University of Firenze, Florence, Italy
2003	Professor, Visiting McMaster Fellow, CSIRO Land and Water, Canberra, ACT Australia
1993	Visiting Sabbatical Scientist, Dept of Plant Ecology, Lund University, Sweden
1986-87	Visiting Sabbatical Scientist, CSIRO Division of Forest Research, Canberra, Australia
1983-1988	Associate Professor, Forest Ecophysiology, School of Forestry, University of Montana, Missoula
1979-1983	Assistant Professor, Forest Ecophysiology, School of Forestry, University of Montana, Missoula
1979	Senior Research Associate, Natural Resource Ecology Laboratory, Colorado State University
1976-1979	Research Forester, Forest and Mountain Meteorology Project, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado
1976-1979	Graduate Research Assistant, Dept. of Forest and Wood Sciences, Colorado State University

1974-1976 Research Assistant, Coniferous Forest Biome, Oregon State University
 1973-1974 Forest Ecologist, Environmental Associates Inc., Corvallis, Oregon

Publications:

- Zhang, K., J. Kimball, K. McDonald, J. Cassano, and S.W. Running. (2007) Impacts of large-scale oscillation on pan-Arctic terrestrial net primary production. *Geophysical Research Letters*, VOL. 34, L21403, doi:10.1029/2007GL031605, 2007
- Mu, Q, F. Heinsch, M. Zhao, S. W. Running. (2007) Development of a global evapotranspiration algorithm based on MODIS and global meteorology data. *Remote sensing of the environment (In Press)*
- Chiesi, M, F. Maselli, M. Moriondo, L. Fibbi, M. Bindi, S. W. Running. (2007) Application on BIOME-BGC to simulate Mediterranean forest processes. **(In Press)**
- Mu, Q., M. Zhao, F. A. Heinsch, M. Liu, H. Tian and S. W. Running. (2007) Evaluating water stress controls on primary production in biogeochemical and remote sensing based models. *Journal of Geophysical Research*, Volume 112, Number G01012 - 2007 (doi: 10.1029/2006JG000179)
- Zhang, K, J. S. Kimball, M. Zhao, W. C. Oechel, J. Cassano, S. W. Running. (2007) Sensitivity of pan-Arctic terrestrial net primary productivity simulations to daily surface meteorology from NCEP-NCAR and ERA-40 reanalyses. *Journal of Geophysical Research* 112 G01011, doi: 10.1029/2006JG000249, 2007
- Cleugh, A. H., R. Leuning, Q. Mu, S. W. Running. (2007) Regional evaporation estimates from flux tower and MODIS satellite data. *Remote Sensing of Environment* 106 285-304.
- Friend, A. D., A. Arneeth, N. Y. Kiang, M. Lomas, J. Ogee, C. Rodenbeck, S. W. Running, J-D Santaren, S. Sitch, N. Viovy, F. I. Woodward and S. Zaehle. (2007) FLUXNET and modelling the global carbon cycle. *Global Change Biology*, Volume 2007, Number 13, page 610-633 - 2007 (doi: 10.1111/j.1365-2486.2006.01223.x)
- Kimball, J. S., M. Zhao, A. D. McGuire, F. A. Heinsch, J. Clein and M. Calef, W. M. Jolly, S. Kang, S. E. Euskirchen, K. C. McDonald, S. W. Running. (2007) Recent Climate-Driven Increases in vegetation productivity for the Western Arctic: Evidence of an acceleration of the northern terrestrial carbon cycle. *Earth Interactions* 11: Page No. 4
- Mildrexler, D.J., M. Zhao, F.A. Heinsch, S.W. Running. (2007) A new satellite-based methodology for continental-scale disturbance detection. *Ecological Applications*, Volume 17, Number 1, page 235-250 - 2007
- Reichstein, M., P. Ciais, D. Papale, R. Valentini, S. Running, N. Viovy, W. Cramer, A. Granier, J. Ogee, V. Allard, M. Aubinet, Chr. Bernhofer, N. Buchmann, A. Carrara, T. Grünwald, M. Heimann, B. Heinesch, A. Knohl, W. Kutsch, D. Loustau, G. Manca, G. Matteucci, F. Miglietta, J.M. Ourcival, K. Pilegaard, J. Pumpanen, S. Rambal, S. Schaphoff, G. Seufert, J.F. Soussana, M.J. Sanz, T. Vesala, M. Zhao. (2006) Reduction of ecosystem productivity and respiration during the European summer 2003 climate anomaly: a joint flux tower, remote sensing and modelling analysis. *Global Change Biology* 12: 1-18
- White, J.D., N.A. Scott, A.L. Hirsch, S. W. Running. (2006) 3-PG Productivity Modeling of Regeneration Amazon Forests: Climate Sensitivity and Comparison with MODIS-Derived NPP. *Earth Interactions* 10: 1-26.
- Liang, S., T. Zheng, R. Liu, H. Fang, S. Tsay, S. W. Running. (2006) Estimation of incident photosynthetically active radiation from Moderate Resolution Imaging Spectrometer data. *Journal of Geoscience Research* 11 doi: 10.1029/2005JD006730.
- Heinsch, F., M. Zhao, S. Running, J. Kimball, R. Nemani, K. Davis, P. Bolstad, B. Cook, A. Desai, D. Ricciuto, B. Law, W. Oechel, H. Kwon, H. Luo, S. Wofsy, A. Dunn, J. Munger, D. Baldocchi, L. Xu, D. Hollinger, A. Richardson, P. Stoy, M. Siqueira, R. Monson, S. Burns, L. Flanagan. (2006) Evaluation of remote sensing based terrestrial productivity from MODIS using regional tower eddy flux network observations. *IEEE Transactions on Geoscience and Remote Sensing*.
- Cohen, W. B., T. K. Maier-sperger, D. P. Turner, W. D. Ritts, D. Pflugmacher, R. E. Kennedy, A. Kirschbaum, S. W. Running and S. T. Gower (2006). MODIS land cover and LAI Collection 4 product quality across nine sites in the western hemisphere. *IEEE Transactions on Geoscience and Remote Sensing*, Volume 44, Number 7, page 1843-1857 - July 2006 (doi: 10.1109/TGRS.2006.876026)
- Boisvenue, C., and S. W. Running(2006), Impacts of Climate Change on Natural Forest Productivity-Evidence Since the Middle of the 20th Century, *Global Change Biology* 12, 1-21, doi:10.1111/j.1365-2486.2006.01134.x
- Reeves, M. C., M. Zhao, and S. W. Running (2006). "Applying improved estimates of MODIS productivity to characterize grassland vegetation dynamics." *Rangeland Ecology & Management* 59(1): 1-10.
- Kimball, J. S., M. Zhao, K. C. McDonald and S. W. Running. (2006), Satellite Remote Sensing Of Terrestrial Net Primary Production For The Pan-arctic Basin And Alaska. *Mitigation and Adaptation Strategies for Global Change* 11: 783-804.
- Mildrexler, D. J., M. Zhao and S.W. Running. (2006) Where Are the Hottest Spots on Earth? *EOS Transactions*, 87(43) 461,467

- Morissette, J. T., F. A. Heinsch and S. W. Running (2006). Monitoring Global Vegetation using Moderate-Resolution Satellites. *EOS Transactions*, Volume 87, Number 50, page 568 - 12 Dec 2006
- Kang, S., J. S. Kimball and S. W. Running (2006). Simulating effects of fire disturbance and climate change in boreal forest productivity and Evapotranspiration. *Science of the Total Environment*, Volume 362, page 85-102 - 2006 (doi: 10.1016/j.scitotenv.2005.11.014)
- Running, S. W. (2006) Is Global Warming Causing More, Larger Wildfires. *Science* 313.
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- Turner, D. P., W. D. Ritts, M. Zhao, S. A. Kurc, A. L. Dunn, S. C. Wofsy, E. E. Small and S. W. Running. (2006) Assessing interannual variation in MODIS-based estimates of gross primary production. *IEEE Transactions on Geoscience and Remote Sensing*, Volume 44, Number 7, page 1899-1907 - July 2006 (doi: 10.1109/TGRS.2005.876027)
- Chaplin, F.S.III, G. M. Woodwell, J. T. Randerson, E. B. Rastetter, G. M. Lovett, D. D. Baldocchi, D. A. Clark, M. E. Harmon, D. S. Schimel, R. Valentini, C. Wirth, J.D. Aber, J. J. Cole, M. L. Goulden, J. W. Harden, M. Heimann, R. W. Howarth, P. A. Matson, A. D. McGuire, J. M. Melillo, H. A. Mooney, J. C. Neff, R. A. Houghton, M. L. Pace, M. G. Ryan, S. W. Running, O. E. Sala, W. H. Schlesinger, E. D. Schulze (2006). Reconciling Carbon-cycle Concepts, Terminology, and Methods. *Ecosystems* 9: 1041-1050. doi:10.1007/s10021-005-0105-7
- Zhao, M., S. W. Running, and R. R. Nemani (2006), Sensitivity of Moderate Resolution Imaging Spectroradiometer (MODIS) terrestrial primary production to the accuracy of meteorological reanalyses, *J. Geophys. Res.*, 111, G01002, doi:10.1029/2004JG000004.
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- Milesi, C., H. Hashimoto, S.W. Running, R.R. Nemani. (2005), Climate variability, vegetation productivity and people at risk. *Global and Planetary Change* 47:221-231.
- Martel, M. C., H. A. Margolis, C. Coursolle, F. J. Bigras, F. A. Heinsch and S. W. Running (2005). Decreasing photosynthesis at different spatial scales during the late growing season on a boreal cutover. *Tree Physiology*, Volume 25, page 689-699 - 2005
- Zhao, M., F.A. Heinsch, R.R. Nemani, S.W. Running. (2005) Improvements of the MODIS terrestrial gross and net primary production global data set. *Remote Sensing of Environment* 95:164-176.
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- Zhao, M., F.A. Heinsch, R.R. Nemani, S.W. Running. (2005) Improvements of the MODIS terrestrial gross and net primary production global data set. *Remote Sensing of Environment* 95:164-176.
- Turner, D., W. Rits, W. Cohen, T. Maeirsperger, S. Gower, A. Kirschbaum, S. Running, M. Zhao, S. Wofsy, A. Dunn, B. Law, J. Campbell, W. Oechel, H. Kwon, T. Meyers, E. Small, S. Kurc, J. Gamon. (2005) Site-level evaluation of satellite-based global production monitoring. *Global Change Biology* 11:666-684.

- Fagre, D.B., S.W. Running, R.E. Keane, D.L Peterson. (2004) Assessing climate change effects on mountain ecosystems using integrated models: A case study. In: *Global Change and Mountain Regions: A State of Knowledge Overview*. U.M. Huber, H.K. Bugmann, M.A. Reasoner (Eds.), Kluwer Academic Press, Dordrecht, The Netherlands.
- McDonald, K., J. Kimball, M. Zhao, E.Njoku, R. Zimmermann, S. Running. (2004) Spaceborne microwave remote sensing of seasonal freeze-thaw processes in the terrestrial high latitudes: Relationships with land-atmosphere CO₂ exchange, pp. 167-178. In: *Proceedings of Society of Photo-Optical Instrumentation Engineers (SPIE)*. Honolulu, HI, November, 2004.
- McDonald, K, J. Kimball, E. Njoku, R. Zimmerman, M. Zhao. (2004) Variability in springtime thaw in the terrestrial high latitudes: Monitoring a major control on the biospheric assimilation of atmospheric CO₂ with spaceborne microwave remote sensing. *Earth Interactions* 8(20):1-23.
- Kimball, J., M. Zhao, K. McDonald, F. Heinsch, S. Running. (2004) Satellite observations of annual variability in terrestrial carbon cycles and seasonal growing seasons at high northern latitudes, pp. 244-254. In: *Proceedings of Society of Photo-Optical Instrumentation Engineers (SPIE)*. Honolulu, HI, November 9-11, 2004.
- Kittel, T.G.F., S.W. Running, VeMAP2 Participants. (2004) VEMAP Phase 2 bioclimatic database. I. Gridded historical (20th century) climate for modeling ecosystem dynamics across the conterminous USA. *Climate Research* 27:151-170.
- Poole, G., J. Stanford, S. Running, C. Frissell, W. Woessner, B. Ellis. (2004) A patch hierarchy approach to modeling surface and subsurface hydrology in complex flood-plain environments. *Earth Surface Processes and Landforms* 29:1,259-1,274.
- Hashimoto, H., R. Nemani, M. White, W. Jolly, S. Piper, C. Keeling, R. Myneni, S. Running. (2004) El-Niño-Southern Oscillation-induced variability in terrestrial carbon cycling. *Journal of Geophysical Research* 109(D23110):1-8.
- Running, S.W. (2004) Global land datasets for next generation biospheric monitoring. *American Geophysical Union Eos Transactions* 85(50):543-545.
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- Running, S., R. Nemani, F. Heinsch, M. Zhao, M. Reeves, H. Hashimoto. (2004) A continuous satellite-derived measure of global terrestrial primary production. *BioScience* 54(6):547-560.
- Jolly, W.M. R. Nemani, S.W. Running. (2004) Enhancement of understory productivity by asynchronous phenology with overstory competitors in a temperate deciduous forest. *Tree Physiology* 24:1,069-1,071.
- Kimball, J.S., K. C. McDonald, S. W. Running, S. E. Frolking. (2004) Satellite radar remote sensing of seasonal growing seasons for boreal and subalpine evergreen forests. *Remote Sensing of Environment* 90:243-258.
- Jolly, W.M., S.W. Running. (2003) Effects of precipitation and soil water potential on drought deciduous phenology in the Kalahari. *Global Change Biology* 10(3):303-308.
- Cohen, W., T. Maersperger, A. Yang, S. Gower, D. Turner, W. Ritts, M. Berterretche, S. Running. (2003) Comparisons of land cover and LAI estimates derived from ETM+ and MODIS for four sites in North America: A quality assessment of 2000/2001 provisional MODIS products. *Remote Sensing of Environment* 88: 233-255.
- Turner, D., W. Ritts, W. Cohen, S. Gower, M. Zhao, S. Running, S. Wofsy, S. Urbanski, A. Dunn, J. Munger. (2003) Scaling gross primary production (GPP) over boreal and deciduous forest landscapes in support of MODIS GPP product validation. *Remote Sensing of Environment* 88:256-270.
- Kang, S., S. Running, J. Lim, M. Zhao, C. Park, R. Loehman. (2003) A regional phenology model for detecting onset of greenness in temperate mixed forests, Korea: An application of MODIS leaf area index. *Remote Sensing of Environment* 86:232-242.
- Nemani, R., C. Keeling, H. Hashimoto, W. Jolly, S. Piper, C. Tucker, R. Myneni, S. Running. (2003) Climate-driven increases in global terrestrial net primary production from 1982 to 1999. *Science* 300:1,560-1,563.
- Pielke Sr., R., G. Marland, R. Betts, T. Chase, J. Eastman, J. Niles, D. Niyogi, S. Running. (2003) The influence of land-use change and landscape dynamics on the climate system: Relevance to climate-change policy beyond the radiative effect of greenhouse gases. In: *Capturing Carbon and Conserving Biodiversity: The Market Approach*, chapter 9, pp.157-172. I.R. Swingland (Ed.), Earthscan Publications Ltd., London.

- Milesi, C., C. Elvidge, R. Nemani, S. Running. (2003) Assessing the impact of urban land development on net primary productivity in the southeastern United States. *Remote Sensing of Environment* 86:401-410.
- Nishida, K., R. Nemani, J. Glassy, S. Running. (2003) Development of an evapotranspiration index from Aqua/MODIS for monitoring surface moisture status. *IEEE Transactions on Geoscience and Remote Sensing* 41(2):493-501.
- Nemani, R., M. White, L. Pierce, P. Votava, J. Coughlan, S. Running. (2003) Biospheric monitoring and ecological forecasting. *Earth Observation Magazine* 12(2):6-8.
- Milesi, C., C.D. Elvidge, R.R. Nemani, S.W. Running. (2003) Assessing the environmental impacts of human settlements using satellite data. *Management of Environmental Quality* 14(1):99-107.
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- Running, S.W. (2002) MODIS vegetation workshop report. *The Earth Observer* 14(5):14-15.
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- Poole, G.C., J.A. Stanford, C.A. Frissell, S.W. Running. (2002) Three-dimensional mapping of geomorphic controls on flood-plain hydrology and connectivity from aerial photos. *Geomorphology* 48:329-347.
- Pielke, R. Sr., G. Marland, R. Betts, T. Chase, J. Eastman, J. Niles, D. Niyogi, S. Running. (2002) The influence of land-use change and landscape dynamics on the climate system: Relevance to climate-change policy beyond the radiative effect of greenhouse gases. *Philosophical Transactions of The Royal Society of London* 360:1-15.
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PhD Students

Name	Year	Thesis title
Ramakrishna R. Nemani	1987	Mapping forest evapotranspiration and photosynthesis by coupling satellite data with ecosystem simulation.
George A. Riggs	1989	Airborne imaging spectrometry and ecological modelling of coniferous forests.
Joseph Coughlan	1991	Biophysical aggregation of a forested landscape using a knowledge-based model.

Ronda L. Korol	1993	Development and evaluation of a biophysical tree growth model.
Robert G. Kremer	1993	Remote sensing and ecosystem simulation modeling of the intermountain sagebrush-steppe with implications for global climate change.
Lars L. Pierce	1993	Scaling ecosystem models from watersheds to regions: tradeoffs between model complexity and accuracy.
Kevin C. Ryan	1993	Effects of artificial defoliation and girdling on water relations shoot and stem growth of ponderosa pine.
Daolan Zheng	1993	Predicting daily soil temperature and available soil water capacity through topographical analysis at various scales using climate and satellite data.
Joseph D. White	1996	Spatial and temporal scale effects on assessment of a regional ecosystem model: modeling climate change in Glacier National Park, USA.
Galina Churkina	1998	Analyzing climatic and human influences on global terrestrial productivity.
Peter E. Thornton	1998	Regional ecosystem simulation: combining surface and satellite-based observations to study linkages between terrestrial energy and mass budgets.
Michael A. White	1999	Monitoring and modeling growing season dynamics.
Geoffrey C. Poole	2000	Analysis and dynamic simulation of morphologic controls on surface and ground-water flux in a large alluvian flood plain.
Cristina Milesi	2004	Monitoring and modeling human interactions with ecosystems
Matt Reeves	2004	Derivation of wheat yield and rangeland productivity in the northern Great Plains using MODIS algorithms
William Jolly	2004	Developing a near real-time system for monitoring the foliar phenology of the terrestrial biosphere
Pat Andrews	2005	A physiologically-based, weather-driven model for fuel moisture for fire danger rating and fire potential assessment
Rachel Loehman	2006	Modeling Interactions among climate, landscape, and emerging diseases: A hantavirus case study
Celine Boisvenue	2007	Assessing Forest Responses to climate change and resolving productivity measurements across spatial scales