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Research Fields

- Atmospheric chemistry
- Biogeochemistry
- Carbon Footprint Analysis
- Climatology
- Community & Disaster Planning
- Data Analysis & Statistical Modeling
- Ecology & Ecosystem Management
- Economics
- Energy policy & technology
- Ethics
- Fire
- Forestry & Forest Management
- Geographic Information Systems
- Horticulture
- Human Impacts - economics
- Human Impacts - health
- Human Impacts - policy
- Hydrology
- Impacts - agriculture & horticulture
- Impacts - ecosystems, populations
- Impacts - physical
- Instrumentation
- Mitigation Policy
- Modeling Climate
- Modeling Ecosystems
- Modeling Socioeconomic Processes
- Natural Resource Policy & Planning
- Outreach & Engagement
- Paleoclimatology
- Paleoecology
- Physical Ecology
- Physiological Ecology
- Urban Ecology
- Water Policy & Planning
- Other...

Specific Research Interests

Carbon dynamics in Pacific Northwest Forests

Decomposition of organic matter
Role of dead trees in ecosystems

Projects

Autotrophic respiration of forests

Modeling the effects of "partial" disturbance on forest carbon balances

Measuring woody detritus decomposition rates

Examining changes in forest carbon stores over succession

Selected Recent Publications

1. Sierra, C. A., J. I. del Valle, S. A. Orrego, F. H. Moreno, M. E. **Harmon**, M. Zapata, G. J. Colorado, M. A. Herrera, W. Lara, D. E. Restrepo, L. M. Berrouet, L. M. Loaiza, J. F. Benjumea. 2007. Total Carbon Stocks in a Tropical Forest Landscape of the Porcè Region, Colombia. *Forest Ecology and Management* 243:299-309.
2. Parton W., W. L. Silver, I. C. Burke, L. Grassens, M. E. **Harmon**, W. S. Curry, J. King, E. C. Adair, L. A. Brandt, S. C. Hart, and B. Fasth. 2007. Striking global-scale similarities in nitrogen release patterns during long term decomposition. *Science* 315: 361-364.
3. Smithwick, E. A. H., M. E. **Harmon**, and J. B. Domingo. 2007. Changing temporal patterns of forest carbon stores and net ecosystem carbon balance: The stand to landscape transformation. *Landscape Ecology* 22:77-94.
4. Chapin, F.S. IIIa, 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.
5. Krankina, O. N., R.A. Houghton, M.E. **Harmon**, E.H. Hogg, D. Butman, M. Yatskov, M. Huso, R.F. Treyfeld, V.N. Razuvaev, G. Spycher. 2005. Effects of Climate and Disturbance on Forest Biomass Across Russia. *Can. J. For. Res.* 35: 2281-2293.
6. Homann, P. S., M. E. **Harmon**, S. Remillard, and E. A. H. Smithwick. 2005. What the soil reveals: Potential total ecosystem C stores of the Pacific Northwest region, USA. *Forest Ecology and Management* 220: 270-283.
7. Janisch, J. E., M. E. **Harmon**, H. Chen, K. Cromack Jr., B. Fasth, and J. M. Sexton. 2005. Carbon flux from coarse woody debris in a Pacific Northwest conifer forest ecosystem: a chronosequence approach. *Ecoscience* 12:151-160.
8. Homann, P. S., S. Remillard, B. Bormann, and M. E. **Harmon**. 2004. Fractions of whole-soil C pools in Pacific Northwest old-growth forests. *Soil Science Society of America Journal* 68:2023-2030.
9. **Harmon**, M. E., K. Bible, M. J. Ryan, D. Shaw, H. Chen, J. Klopatek, and Xia Li. 2004. Production, respiration, and overall carbon balance in an old-growth *Pseudotsuga/Tsuga* forest ecosystem. *Ecosystems* 7:498-512.
10. Spears, J. D. H., Holub, S. M., M. E. **Harmon**, and K. Lajtha. 2003. The influence of logs on soil biology and nutrient cycling in an old-growth conifer forest, Oregon, USA. *Canadian Journal of Forest Research* 33:2193-2201.
11. Pruyn, M.L., M. E. **Harmon**, and B. L. Gartner. 2003. Stem respiratory potential in six softwood and four hardwood tree species in the central Cascades of Oregon. *Oecologia* 137: 10-21.
12. Smithwick, E. A. H., M. E. **Harmon**, J. B. Domingo. 2003. Modeling multiscale effects of light limitations and edge-induced mortality on carbon stores in forest landscapes. *Landscape Ecology* 18:701-721.
13. Hicks, W. T., M. E. **Harmon**, and R. P. Griffiths. 2003. Abiotic controls of nitrogen fixation and respiration in woody debris in the Pacific Northwest. *Ecoscience* 10:66-73.
14. Yatskov, M., O. N. Krankina, M. E. **Harmon**. 2003. A chronosequence of wood decomposition in the boreal forests of Russia. *Canadian Journal of Forest Research* 33: 1211-1226.
15. Hicks, W. T., M. E. **Harmon**, and D. D. Myrold. 2003. Biotic controls of nitrogen fixation and respiration in woody debris in the Pacific Northwest. *Forest Ecology and Management* 176: 25-35
16. Acker, S. A., C. B. Halpern, M. E. **Harmon**, and C. T. Dyrness. 2002. Trends in bole biomass accumulation, net primary production, and tree mortality in *Pseudotsuga menziesii* forests of contrasting age. *Tree Physiology* 22:213-217.
17. Chen H., **Harmon** M. E., Sexton J., and Fasth B. 2002. Fine root decomposition and N dynamics in coniferous forests of the Pacific Northwest of USA. *Canadian Journal of Forest Research* 32:320-331.
18. Franklin, J. F., T. A. Spies, R. Van Pelt, A. Carey, D. Thornburgh, D. R. Berg, D. Lindenmayer, M. E. **Harmon**, W. Keeton, and D. C. Shaw. 2002. Disturbances and the structural development of natural forest ecosystems with some implications for silviculture. *Forest Ecology and Management* 155:399-423.
19. **Harmon**, M. E. and B. Marks. 2002. Effects of silvicultural treatments on carbon stores in forest stands. *Canadian Journal of Forest Research* 32:863-877.
20. Hicks, W. T. and M. E. **Harmon**. 2002. Diffusion and seasonal dynamics of O₂ in woody debris from the Pacific Northwest, USA. *Plant and Soil*. 243:67-79.
21. Janisch, J. E. and M. E. **Harmon**. 2002. Successional changes in live and dead wood stores: Implications for Net Ecosystem Productivity. *Tree Physiology* 22:77-89.
22. Krankina, O. N., M. E. **Harmon**, Y. A. Kukuev, R. F. Treyfeld, N. N. Kashpor, V. G. Kresnov, V. M. Skudin, N. A. Protasov, M. Yatskov, G. Spycher,

- and E. D. Povarov. 2002. Coarse woody debris in forest regions of Russia. *Canadian Journal of Forest Research* 32:768-778.
23. Pruyn, M. L., B. L. Gartner, and M. E. **Harmon**. 2002. Within stem variation of respiratory potential in *Pseudotsuga menziesii* (Douglas-fir) trees. *New Phytologist* 154:359-372.
24. Pruyn, M. L., B. L. Gartner, and M. E. **Harmon**. 2002. Respiratory potential of old versus young ponderosa pine trees in the Pacific Northwest. *Tree Physiology* 22:105-116.
25. Randerson, J. T., F. S. Chapin, III, J. Harden, J. C. Neff, and M. E. **Harmon**. 2002. Net Ecosystem Production: A Comprehensive Measure of Net Carbon Accumulation by Ecosystems. *Ecological Applications* 12:937-947.
26. Smithwick, E. A. H., M. E. **Harmon**, S. M. Remillard, S. A. Acker, and J. F. Franklin. 2002. Potential upper bounds of carbon stores in forests of the Pacific Northwest. *Ecological Applications* 12:1303-1317.

Professional Activities