TEM (Terrestrial Ecosystem Model)

Description	The TEM is a process-based ecosystem model that describes carbon and nitrogen dynamics of plants and soils for terrestrial ecosystems of the globe. The TEM uses spatially referenced information on climate, elevation, soils, vegetation, and water availability as well as soil- and vegetation-specific parameters to make monthly estimates of important carbon and nitrogen fluxes and pool sizes of terrestrial ecosystems. The TEM operates on a monthly time step and at a 0.5° latitude/longitude spatial resolution.
Appropriate Use	Regional to global simulation of climate effects on ecosystem dynamics.
Scope	Regional to global.
Key Output	GPP, NPP, evapotranspiration, soil carbon and nitrogen, vegetation carbon and nitrogen.
Key Input	Vegetation, soil texture, elevation, solar radiation, precipitation, air temperature.
Ease of Use	Expertise in ecosystem science and biogeochemistry.
Training Required	Yes.
Training Available	See Contacts below.
Computer Requirements	High-end workstation.
Documentation	http://www.mbl.edu/eco42/.
Applications	Examined the time-dependent responses of terrestrial carbon storage and the net carbon exchange with the atmosphere as influenced by historical climate CO_2, land use and soil thermal regime.
Contacts for Framework, Documentation, Technical Assistance	Jerry M. Melillo, A. David McGuire, David W. Kicklighter, Yude Pan, Hanqin Tian, The Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA 02543 USA; e-mails: jmelillo@lupine.mbl.edu, ffadm@aurora.alaska.edu, dkick@mbl.edu.
Cost	Not specified.
References	Pan, Y., A.D. McGuire, J.M. Melillo, D.W. Kicklighter, S. Sitch, and I.C. Prentice. 2002. A biogeochemistry-based dynamic vegetation model and its application along a moisture gradient in the continental United States. *Journal of Vegetation Science* 13:369-382. Tian, H., J.M. Melillo, D.W. Kicklighter, S. Pan, J. Liu, A.D. McGuire, and B. Moore III. 2003. Regional carbon dynamics in monsoon Asia and its implications for the global carbon cycle. *Global and Planetary Change* 37:201-217. McGuire, A.D., C. Wirth, M. Apps, J. Beringer, J. Clein, H. Epstein, D.W. Kicklighter, J. Bhatii, F.S. Chapin III, B. de Groot, D. Efremov, W. Eugster, M. Fukuda, T. Gower, L. Hinzman, B. Huntley, G.J. Jia, E. Kasischke, J.M. Melillo, V. Romanovsky, A. Shvidenko, E. Vaganov, and D. Walker. 2002. Environmental variation, vegetation distribution, carbon dynamics, and water/energy exchange in high latitudes. *Journal of Vegetation Science* 13:301-314.