BALTEX Survey on

Biogeochemical Modelling Activities in the Baltic Sea Basin

Model Name	LPJ-GUESS LPJ-DGVM
Model Description	Dynamic vegetation/ecosystem model optimised for regional (LPJ-GUESS) and global (LPJ-DGVM) studies.
State Variables	- carbon biomass by vegetation compartment (leaves, fine roots, sapwood, heartwood), plant functional type (PFT) and age class (LPJ-GUESS) - leaf area index, woody plant height, stem diameter and crown area by PFT and age class (LPJ-GUESS) - woody plant population structure by age class and patch (LPJ-GUESS) - PFT distribution in geographic/bioclimatic space - soil organic matter (two pools) and litter carbon - soil water content (two layers) - snow pack size
On a scale between 1 and 10, please classify your model	1 Biogeochemical cycling, matter fluxes 2 3 4 5 6 7 8 9 10 Ecosystem functioning - Ecosystem structural and functional dynamics, taking account of C and H2O cycles
Dimension (0D, 1D, 2D, 3D)	2D
Modeled Area (Marine, terrestial, combined)	terrestrial
Coupled to hydrological component	yes
Suited for climate change sensitivity studies	yes
Publications	**Gerten, D., Schaphoff, S., Haberlandt, U., Lucht, W. & Sitch, S. 2004.** Terrestrial vegetation and water balance - hydrological evaluation of a dynamic global vegetation model. *Journal of Hydrology* 286: 249-270. **Hickler, T., Prentice, I.C., Smith, B., Sykes, M.T. & Zaehle, S. 2006.** Implementing plant hydraulic architecture within the LPJ Dynamic Global Vegetation Model. *Global Ecology and Biogeography* 15: 567-577.

	Knorr, W., Smith, B., Widlowski, J.L., Pinty, B. & Gobron, N. 2004. Combining remote sensing techniques with productivity models: a case study for monitoring carbon stocks in northern European forests. In: Stamatiadis, S., Lynch, J.M. & Schepers, J.S. (eds) *Remote Sensing for Agriculture and the Environment*, pp. 52.64. OECD Publications, ella, Larissa, Greece. **Koca, D., Smith, B. & Sykes, M.T. 2006.** Modelling regional climate change effects on Swedish ecosystems. *Climatic Change.* 78: 381-406. **Lucht, W., Prentice, I.C., Myneni, R.B., Sitch, S., Friedlingstein, P., Cramer, W., Bousquet, P., Buermann, W. & Smith, B. 2002.** Climatic control of the high-latitude vegetation greening trend and Pinatubo effect. *Science* 296: 1687-1689. **Morales, P., Hickler, T., Rowell, D.P., Smith, B. & Sykes, M.T.** Changes in European ecosystem productivity and carbon balance driven by Regional Climate Model output. In press, *Global Change Biology.* **Morales, P., Sykes, M.T., Prentice, I.C., Smith, P., Smith, B., Bugmann, H., Zierl, B., Friedlingstein, P., Viovy, N., Sabaté, S., Sanchez, A., Pla, E., Gracia, C.A., Sitch, S., Arneth, A. & Ogee, J. 2005.** Comparing and evaluating process-based ecosystem model predictions of carbon and water fluxes in major European forest biomes. *Global Change Biology.* 11: 2211-2233. **Schaphoff, S., Lucht, W., Gerten, D., Sitch, S., Cramer, W. & Prentice, I.C. 2006.** Terrestrial biosphere climate storage under alternative climate projections. *Climatic Change* 74: 97-122. **Schröter, D., Cramer, W., Leemans, R., Prentice, C., Araújo, M.B., Arnell, N.W., Bondeau, A., Bugmann, H., Carter, T.R., Garcia, C.A., de la Vega-Leinert, A.C., Erhard, M., Ewert, F., Glendining, M., House, J.I., Kankaanpää, S., Klein, R.J.T., Lavorel, S., Lindner, M., Metzger, M.J., Meyer, J., Mitchell, T.D., Reginster, I., Rounsevell, M., Sabaté, S., Sitch, S., Smith, B., Smith, J., Smith, P., Sykes, M.T., Thonicke, K., Thuiller, W., Tuck, G., Zaehle, S. & Zierl, B. 2005.** Ecosystem service supply and vulnerability to global change in Europe. *Science* 310: 1333-1337. **Sitch, S., Smith, B., Prentice, I.C., Arneth, A., Bondeau, A., Cramer, W., Kaplan, J., Levis, S., Lucht, W., Sykes, M., Thonicke, K. & Venevsky, S. 2003.** Evaluation of ecosystem dynamics, plant geography and terrestrial carbon cycling in the LPJ Dynamic Global Vegetation Model. *Global Change Biology* 9: 161-185. **Smith, B., Prentice, I.C. & Sykes, M.T. 2001.** Representation of vegetation dynamics in modelling of terrestrial ecosystems: comparing two contrasting approaches within European climate space. *Global Ecology and Biogeography* 10: 621-637. **Zaehle, S., Bondeau, A., Carter, T.R., Cramer, W., Erhard, M., Prentice, I.C., Reginster, I., Rounsevell, M.D.A., Sitch, S., Smith, B., Smith, P.C. & Sykes, M.** Projected changes in terrestrial carbon storage in Europe under climate and land use change, 1990-2100. In press, *Ecosystems*. **Zaehle, S., Sitch, S., Prentice, I.C., Liski, J., Cramer, W., Erhard, M., Hickler, T. & Smith, B. 2006.** The importance of representing age-related decline in forest NPP for modeling regional carbon balances. *Ecological Applications* 16: 1555-1574. **Zaehle, S., Sitch, S., Smith, B. & Hatterman, F. 2005.** Effects of parameter uncertainties on the modeling of terrestrial biosphere dynamics. *Global Biogeochemical Cycles* 19: 3020.
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Remarks