AGU PUBLICATIONS

Journal of Geophysical Research: Biogeosciences

Supporting Information for

Timing of the compensation of winter respiratory carbon losses provides explanatory power for net ecosystem productivity of forests

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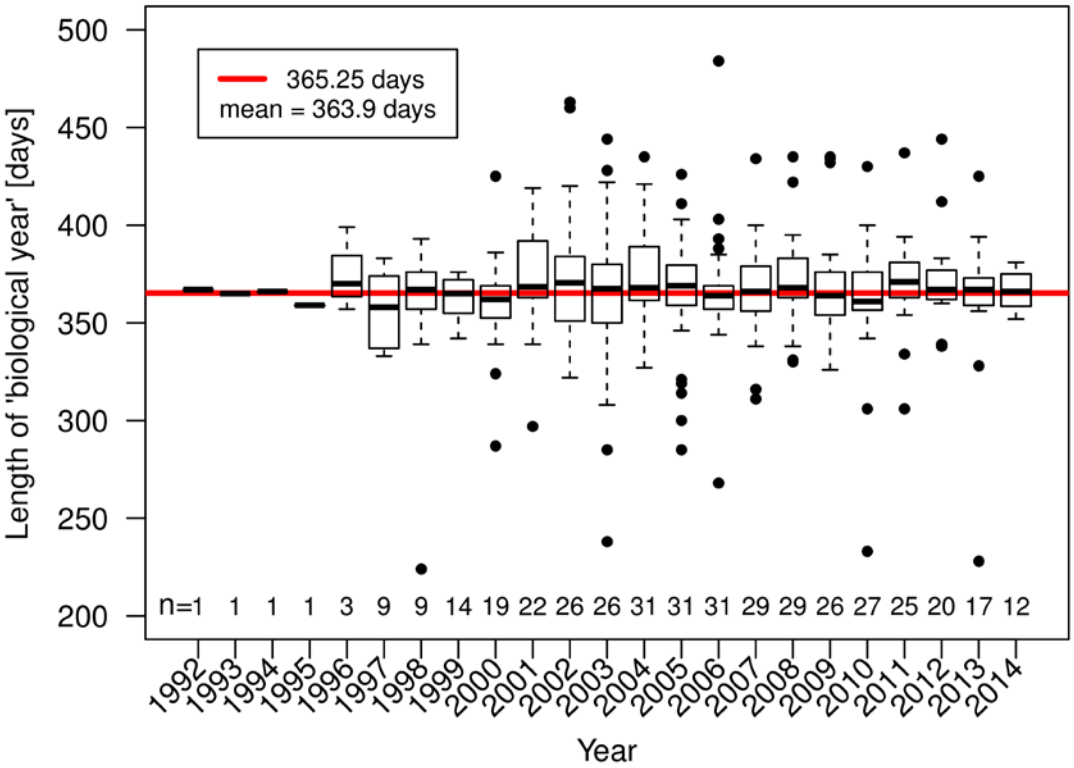

Figure S1. Length of ’biological years’ in days for the dynamic integration method (of net ecosystem productivity, NEP_c) (see Fig. 1). The integration periods vary from less than 224 days (seven months) to more than 484 days (16 months). However, the average length is with 363.9 days very close to an actual calendar year (classical method). Site-years included: 347.

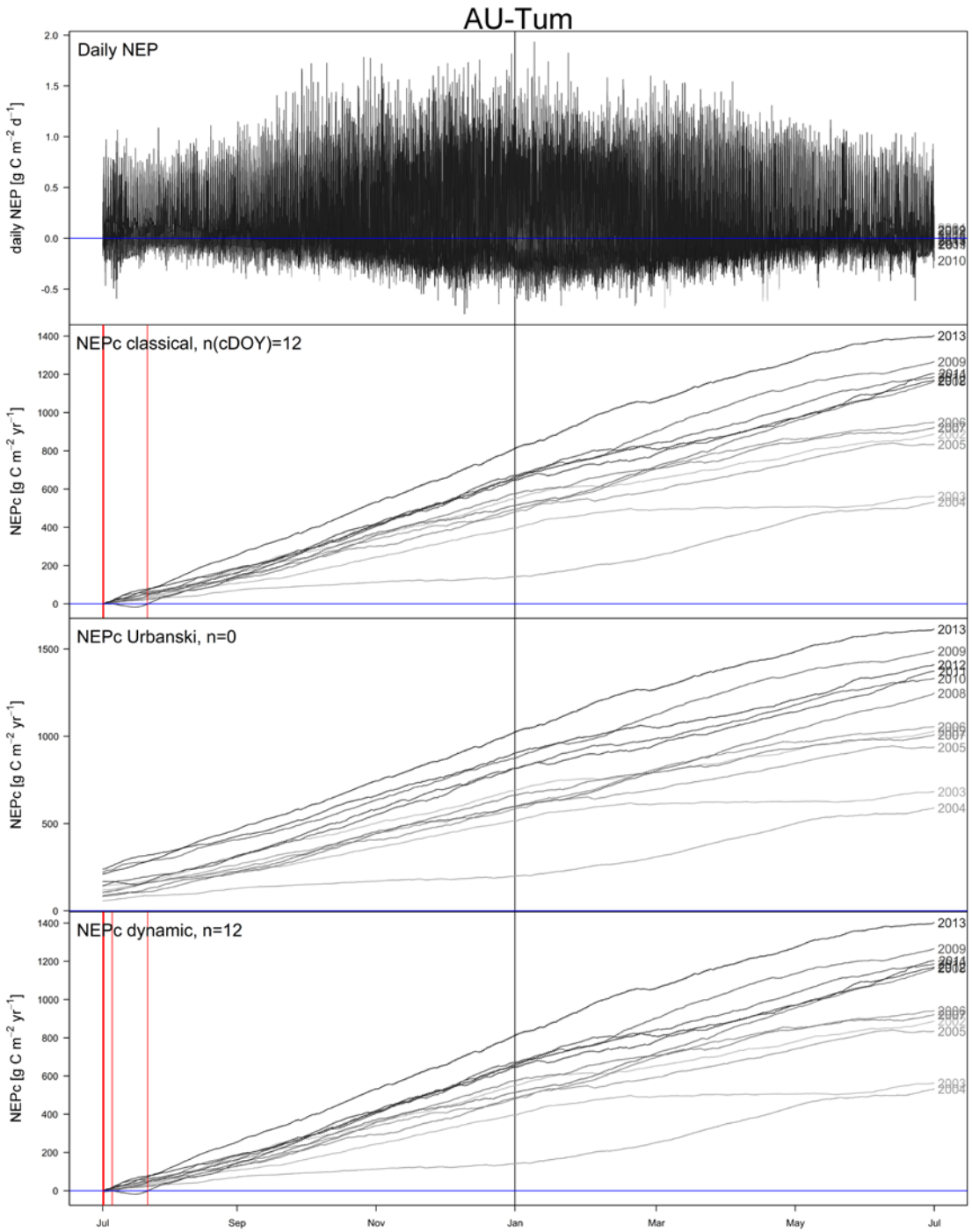

Figure S AU-TUM. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y-1/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Tumbarumba, Australia (AU-TUM, Tab. 1).

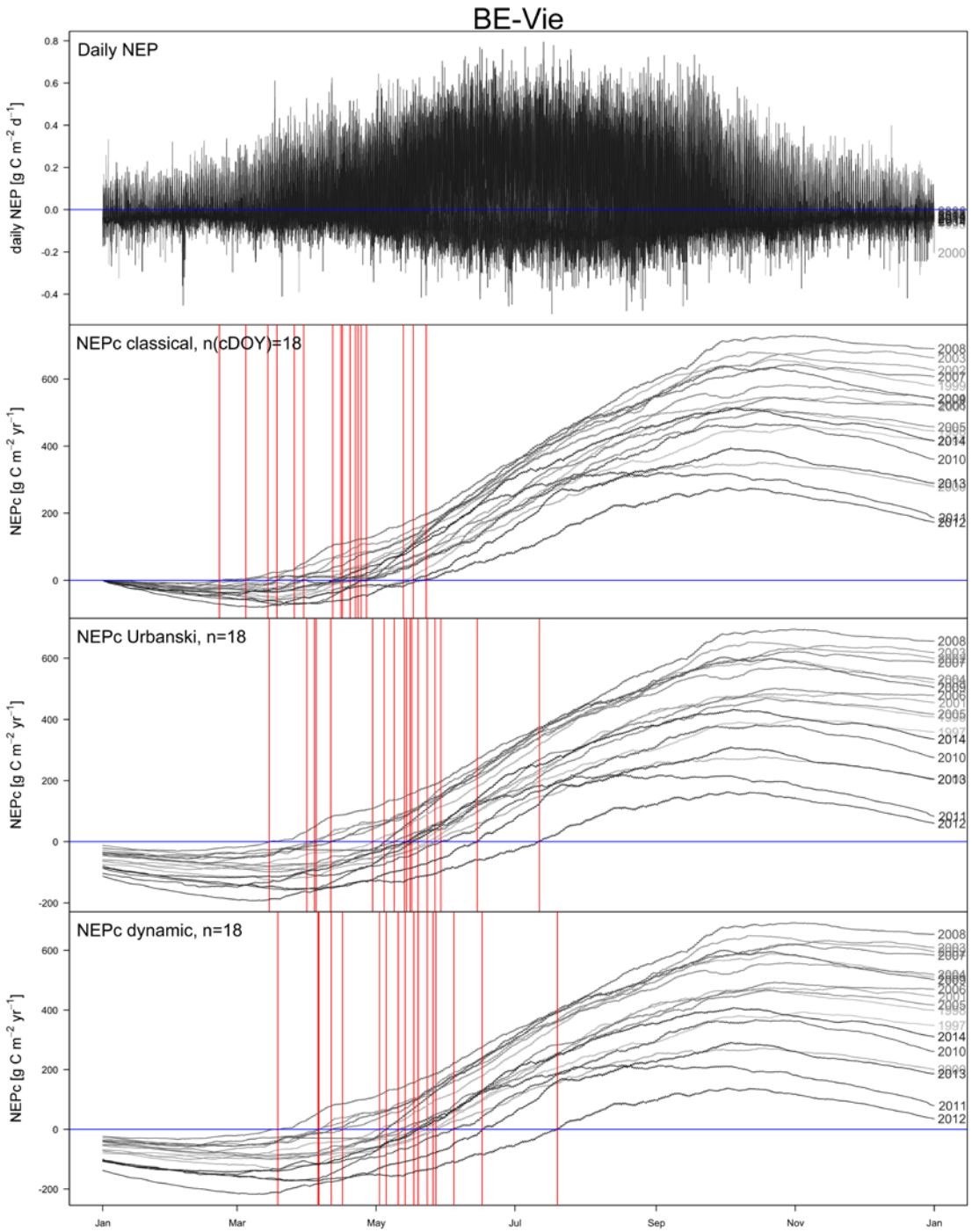

Figure S BE-VIE. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Vielsalm, Belgium (BE-VIE, Tab. 1). The red vertical lines depict the compensation days (cDOY).

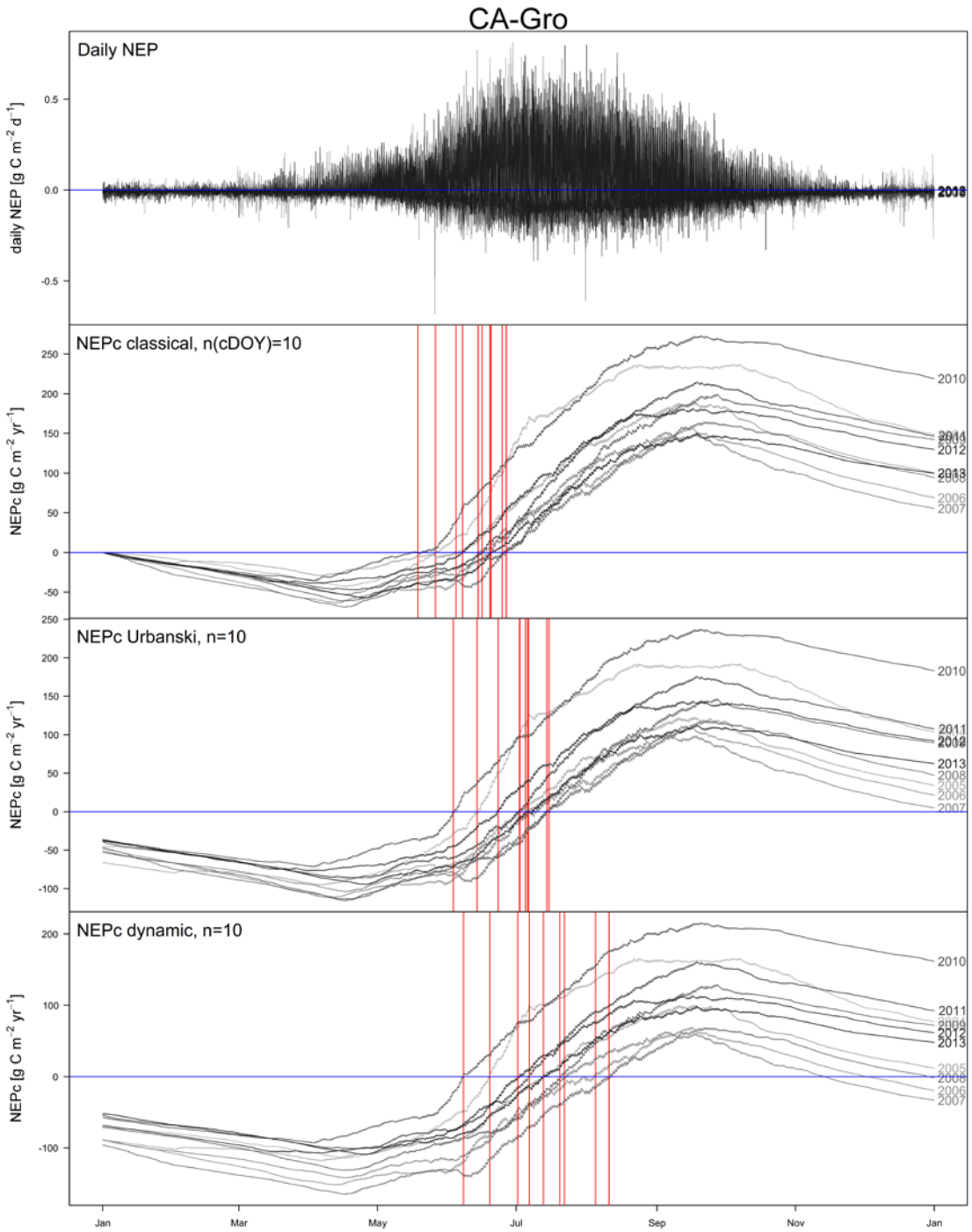

Figure S CA-GRO. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Ontario, Groundhog River, Boreal Mixedwood Forest, Canada (CA-GRO, Tab. 1). The red vertical lines depict the compensation days (cDOY).

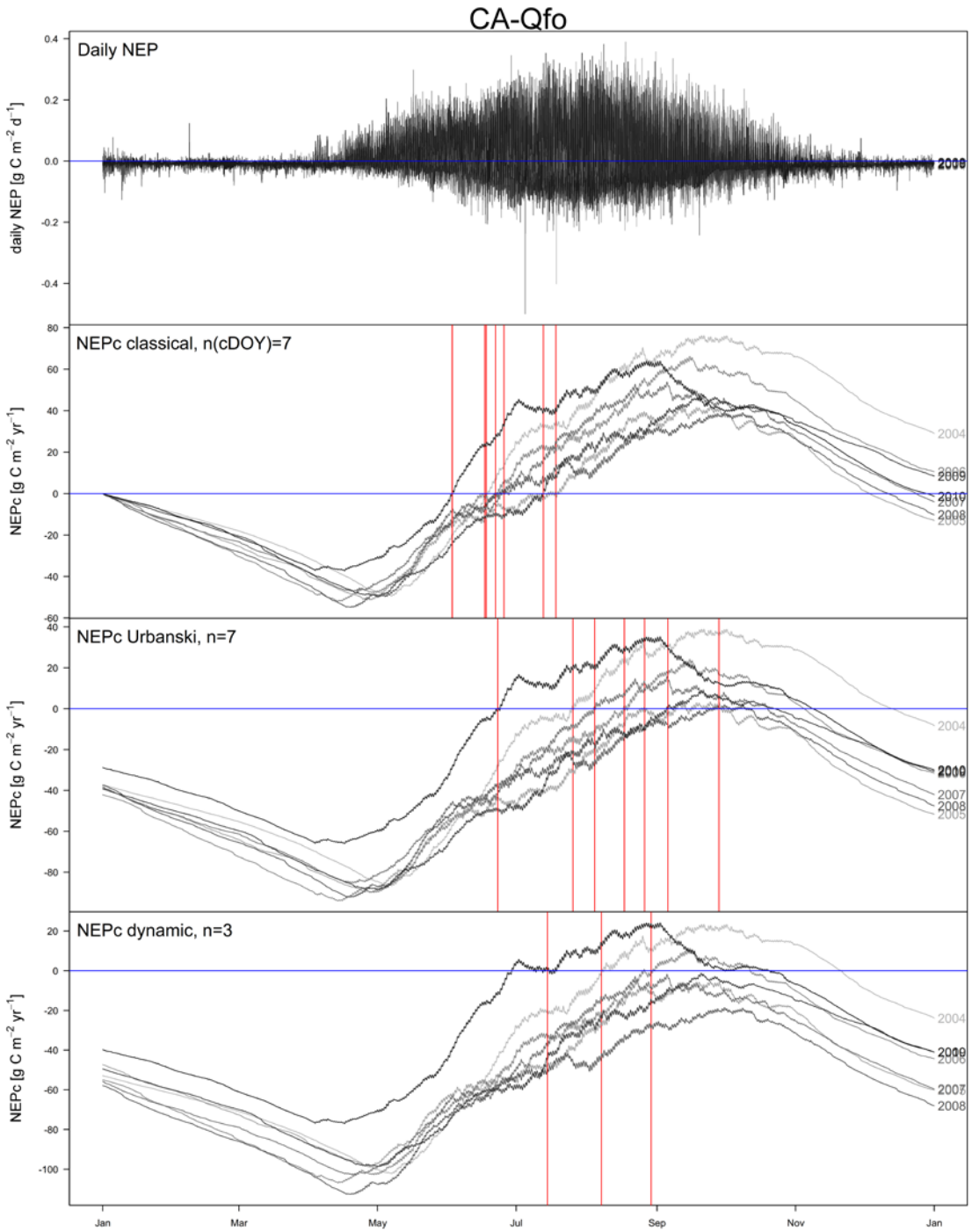

Figure S CA-QFO. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Quebec, Eastern Boreal, Mature Black Spruce, Canada (CA-QFO, Tab. 1). The red vertical lines depict the compensation days (cDOY).

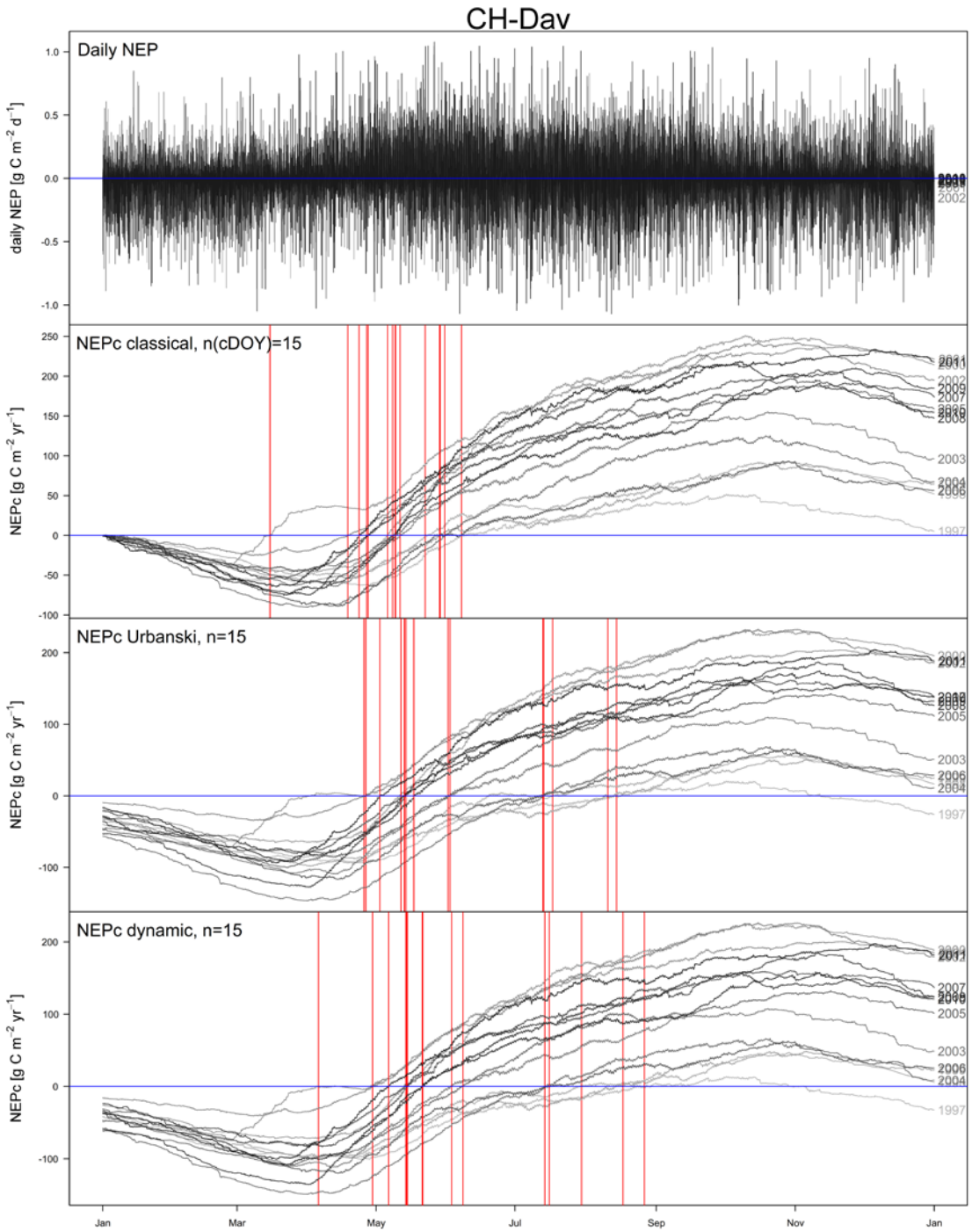

Figure S CH-DAV. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Seehornwald, Davos, Switzerland (CH-DAV, Tab. 1). The red vertical lines depict the compensation days (cDOY).

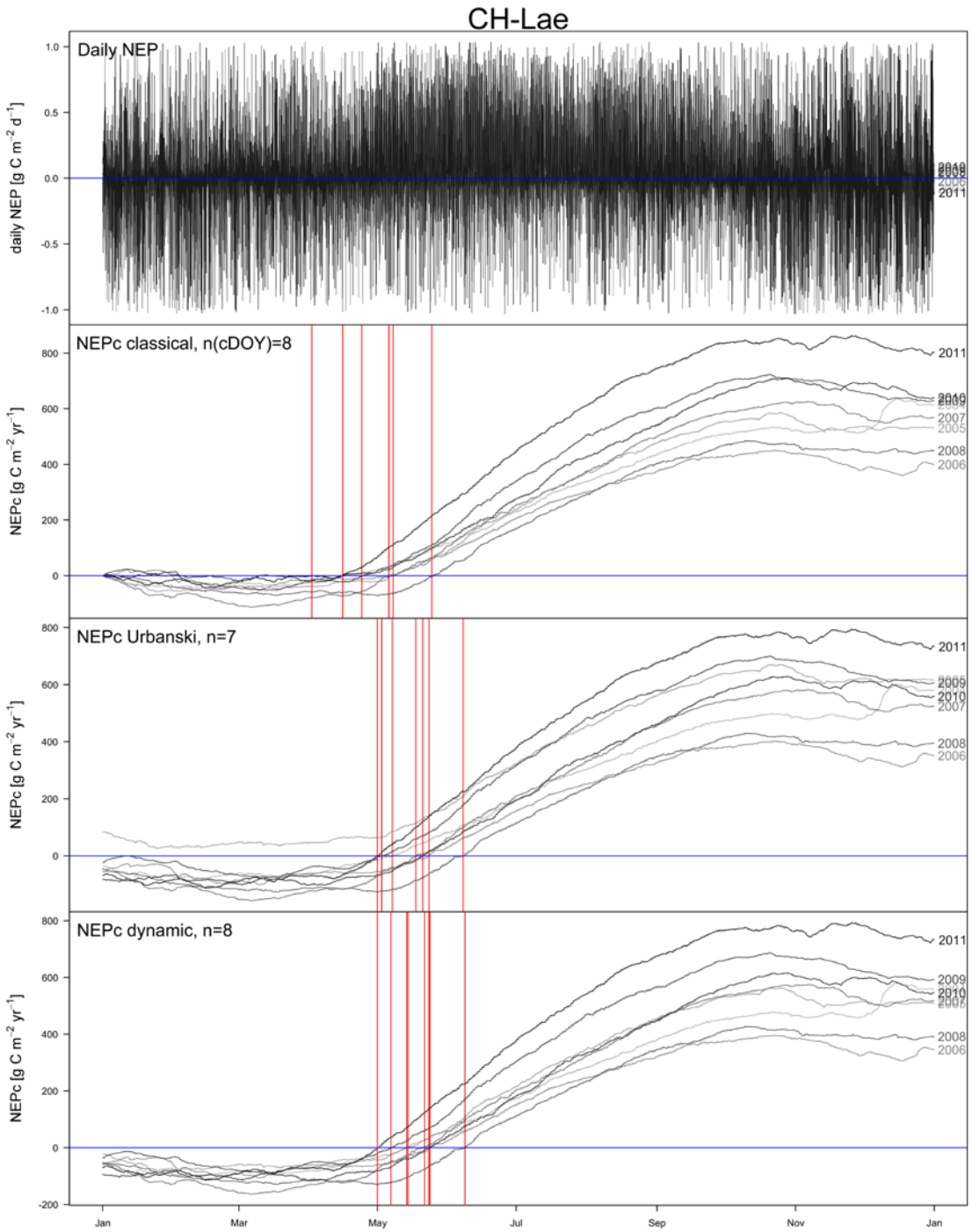

Figure S CH-LAE. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Lägeren, Switzerland (CH-LAE, Tab. 1). The red vertical lines depict the compensation days (cDOY).

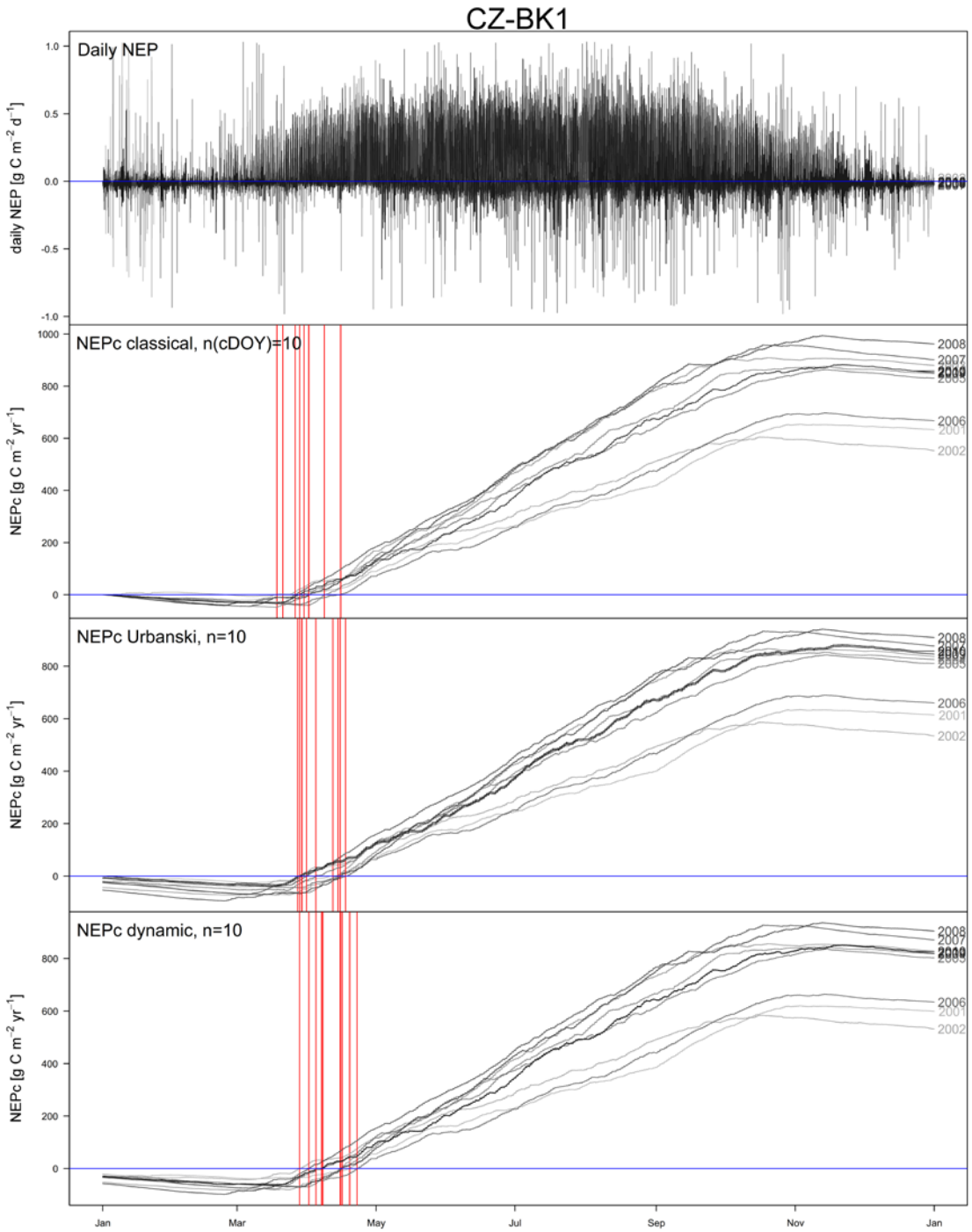

Figure S CZ-BK1. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Bily Kriz, Czech Republic (CZ-BK1, Tab. 1). The red vertical lines depict the compensation days (cDOY).

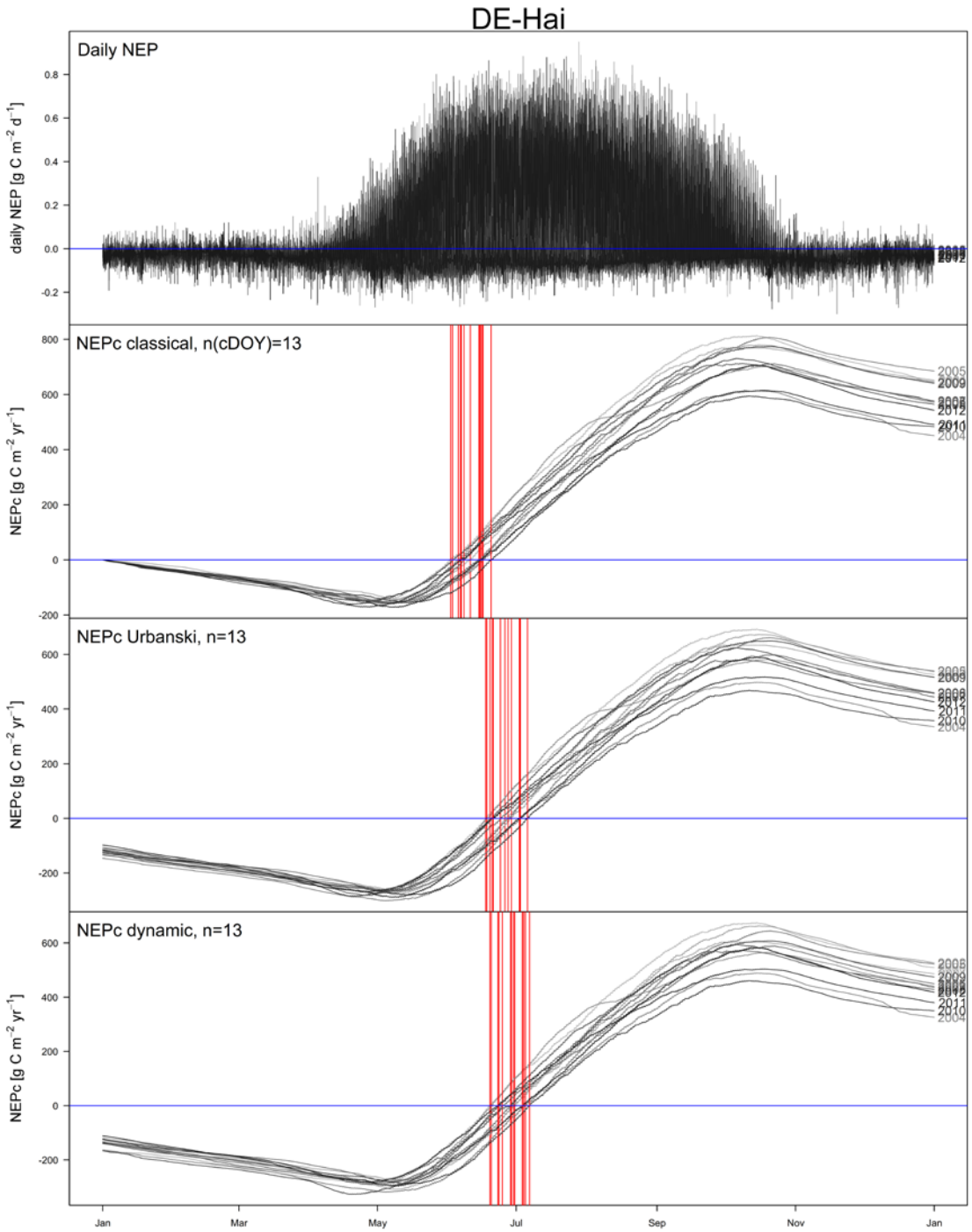

Figure S DE-HAI. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Hainich, Germany (DE-HAI, Tab. 1). The red vertical lines depict the compensation days (cDOY).

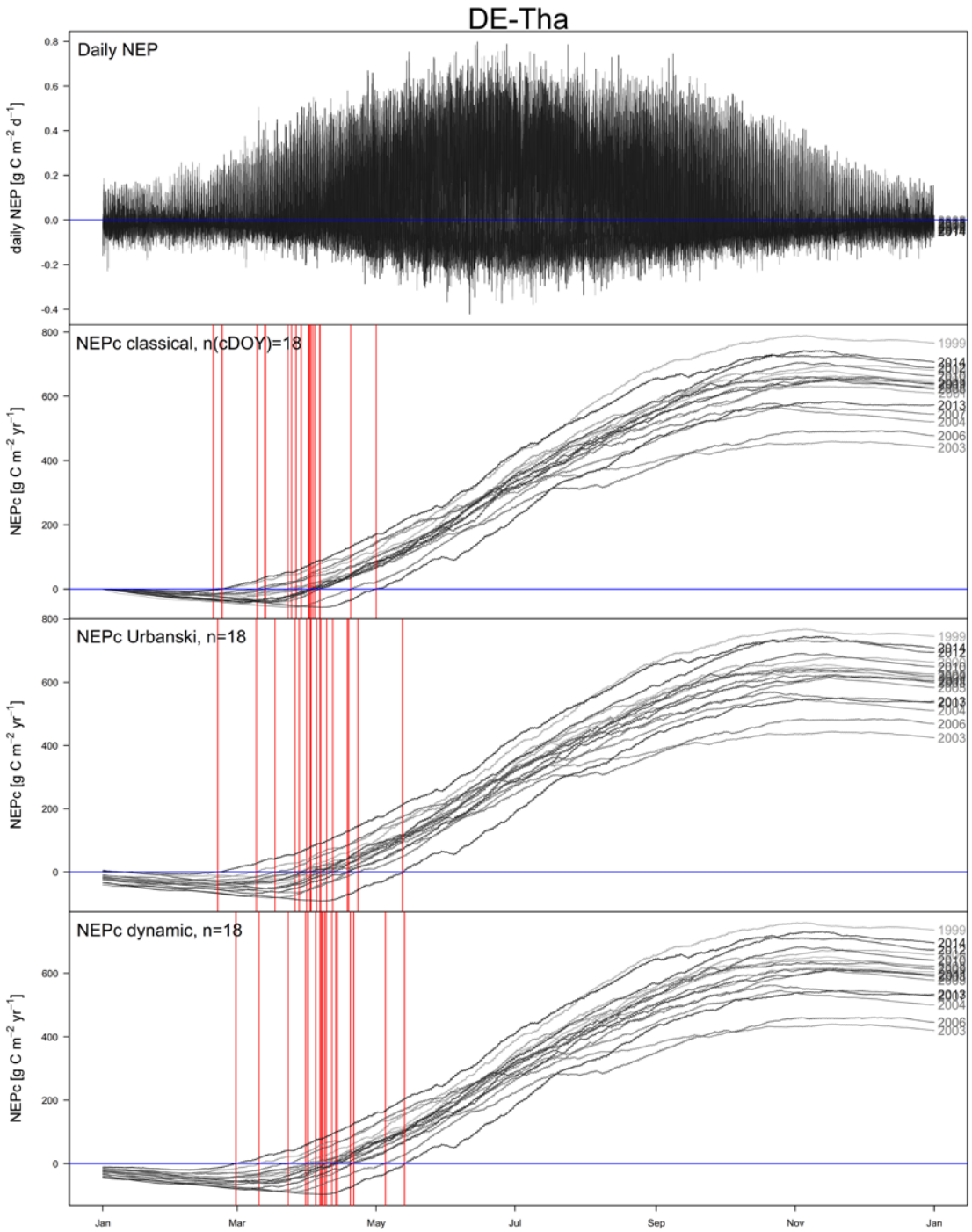

Figure S DE-THA. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Tharand, Germany (DE-THA, Tab. 1). The red vertical lines depict the compensation days (cDOY).

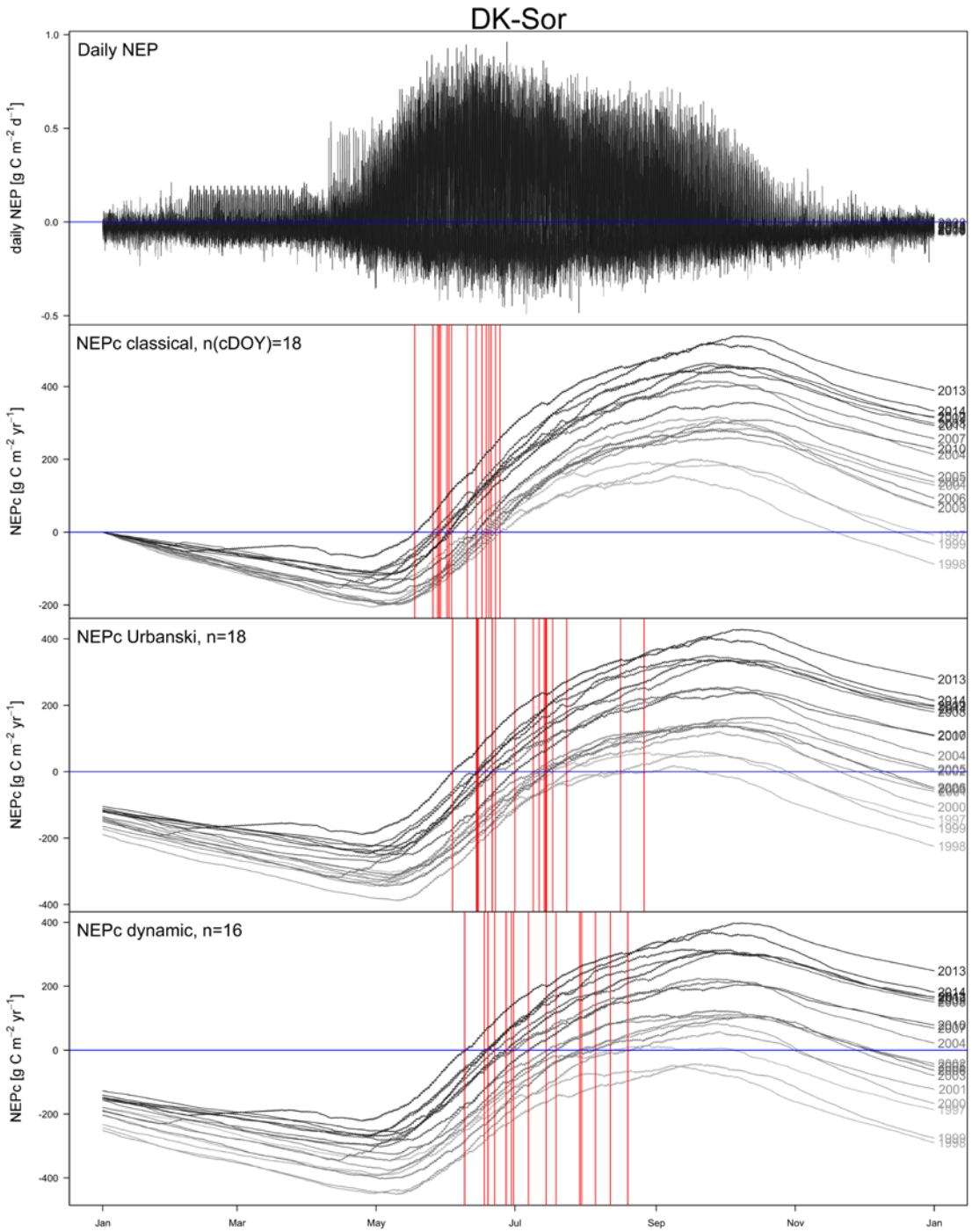

Figure S DK-SOR. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Soroe, Denmark (DK-SOR, Tab. 1). The red vertical lines depict the compensation days (cDOY).

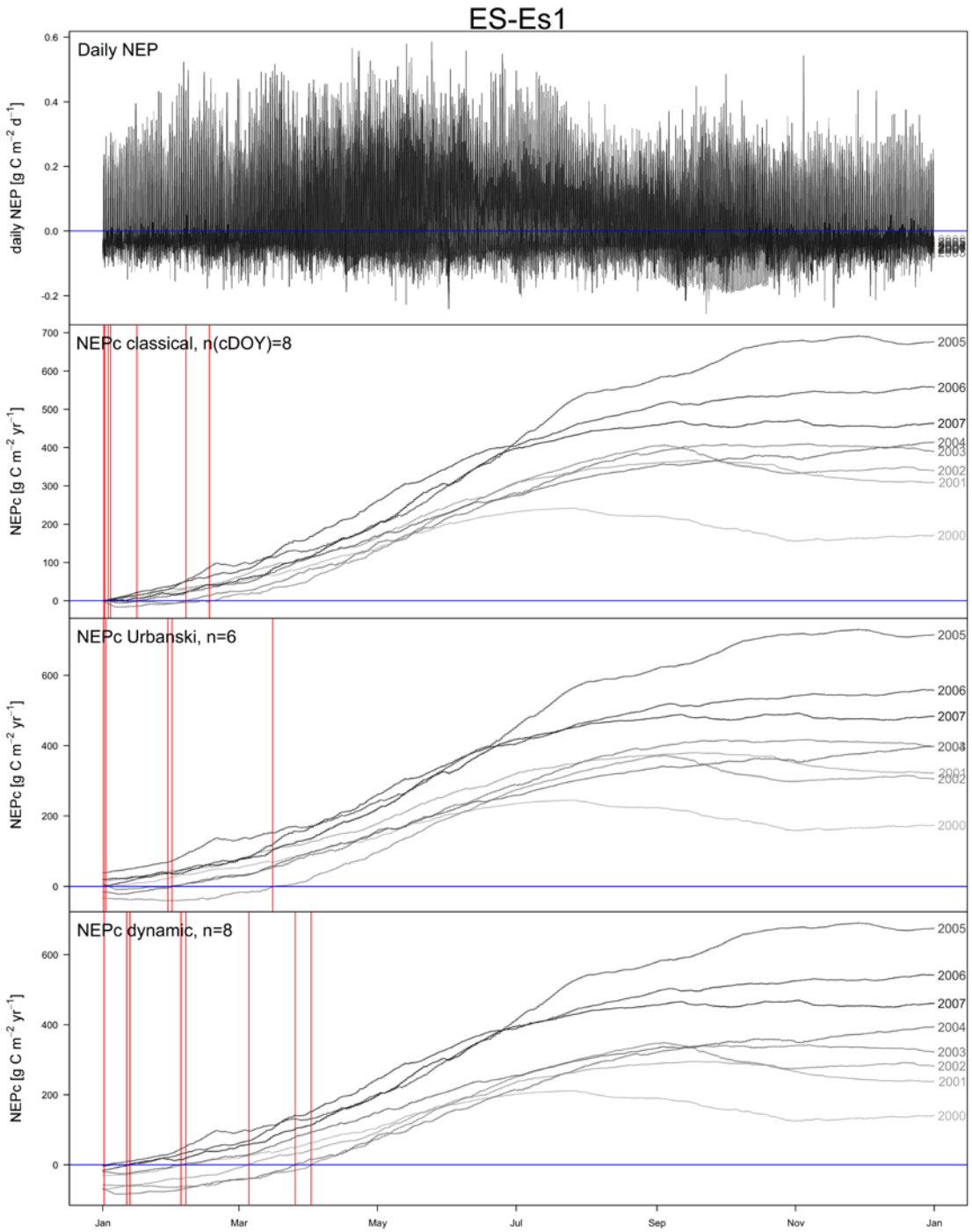

Figure S ES-ES1. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for El Saler, Spain (ES-ES1, Tab. 1). The red vertical lines depict the compensation days (cDOY).

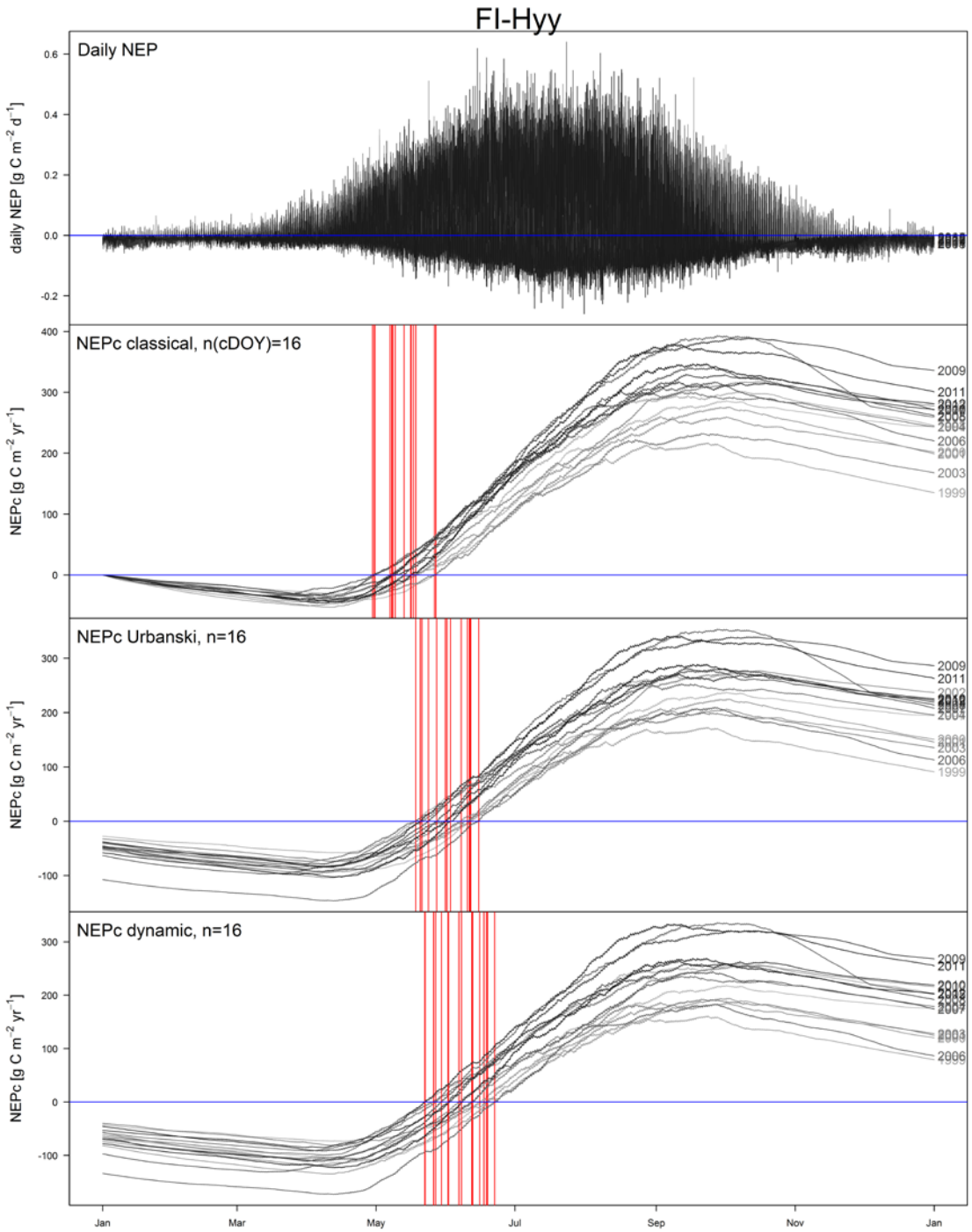

Figure S FI-HYY. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Hyytiälä, Finland (FI-HYY, Tab. 1). The red vertical lines depict the compensation days (cDOY).

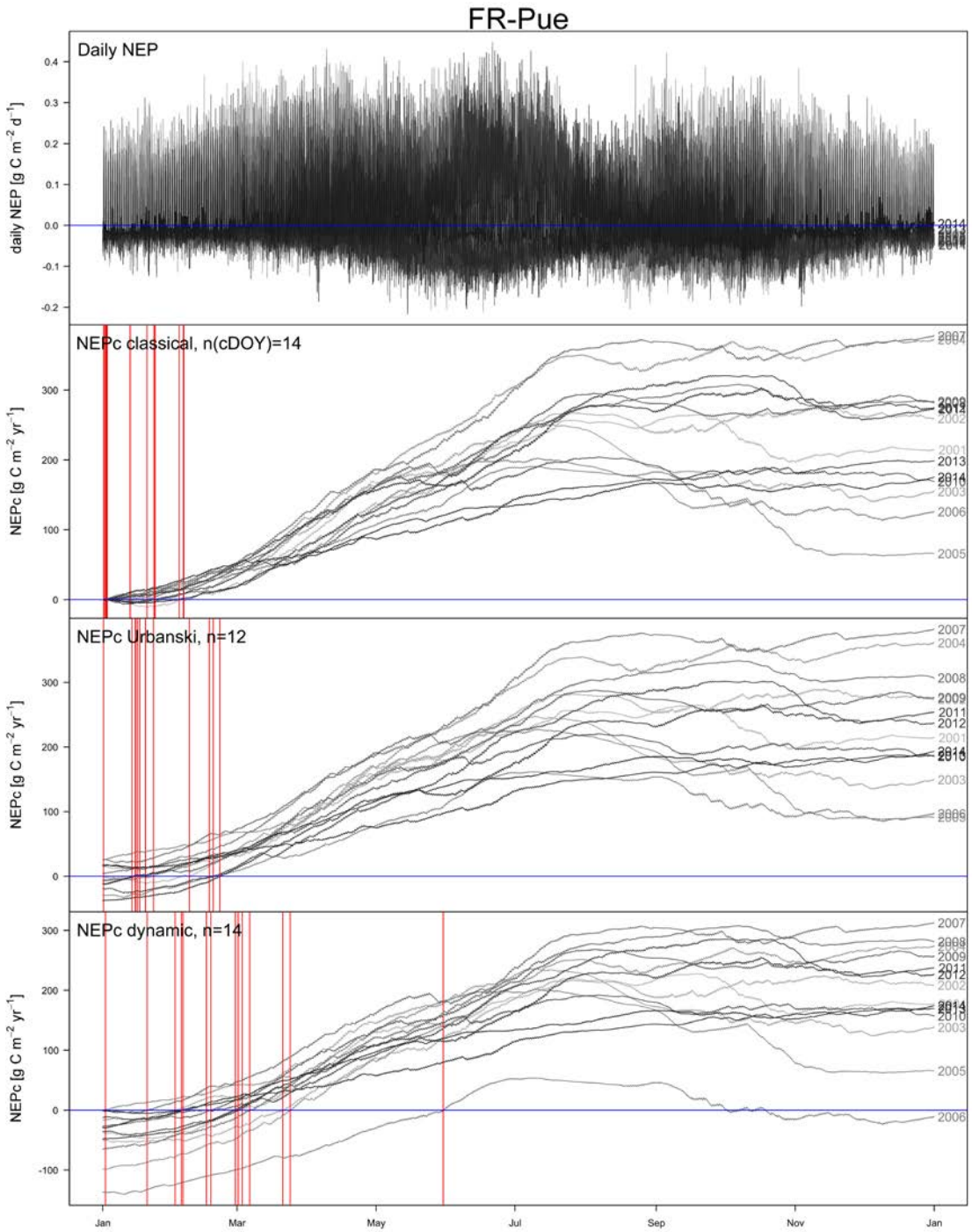

Figure S FR-PUE. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Puechabon, France (FR-PUE, Tab. 1). The red vertical lines depict the compensation days (cDOY).

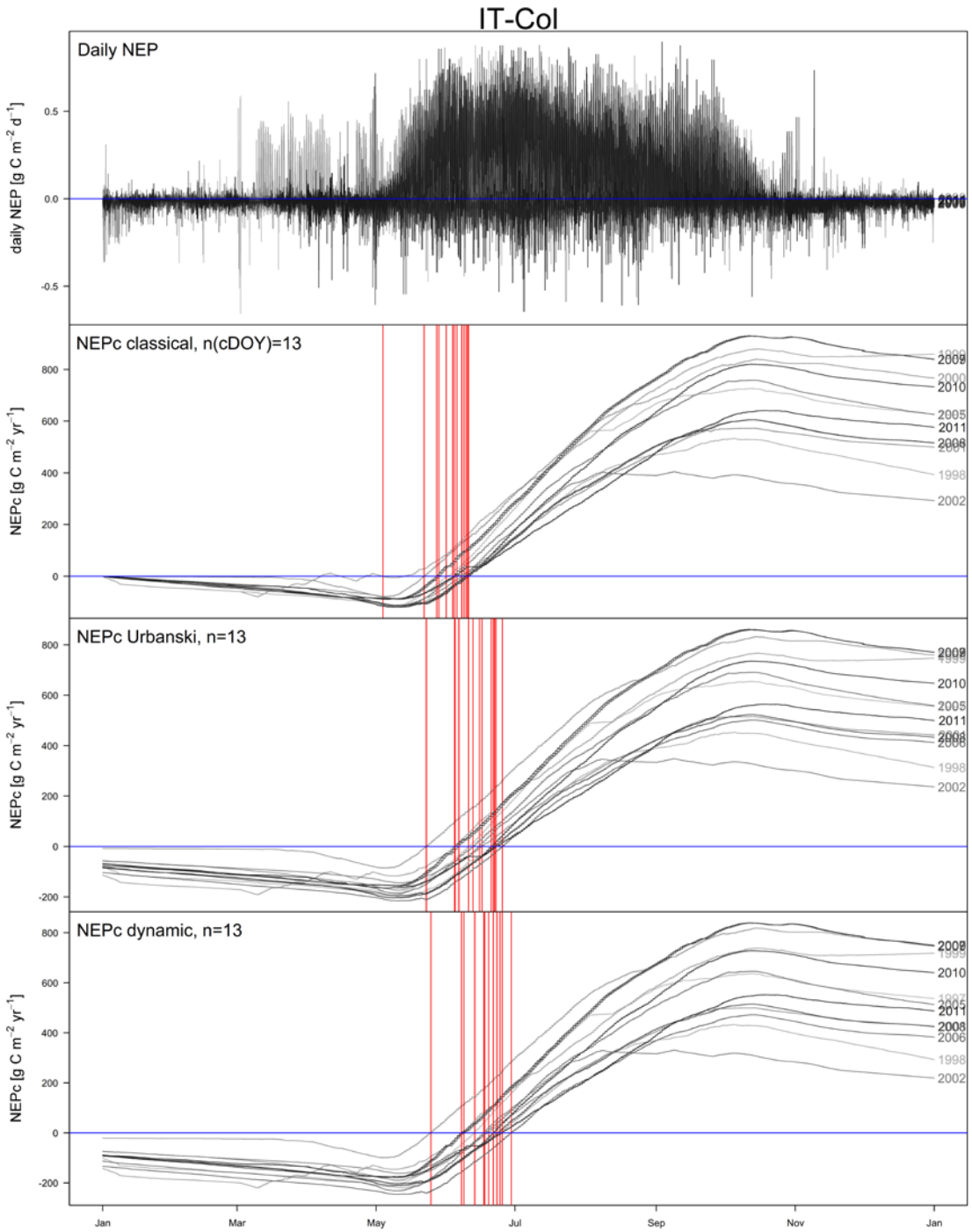

Figure S IT-COL. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Collelongo, Italy (IT-COL, Tab. 1). The red vertical lines depict the compensation days (cDOY).

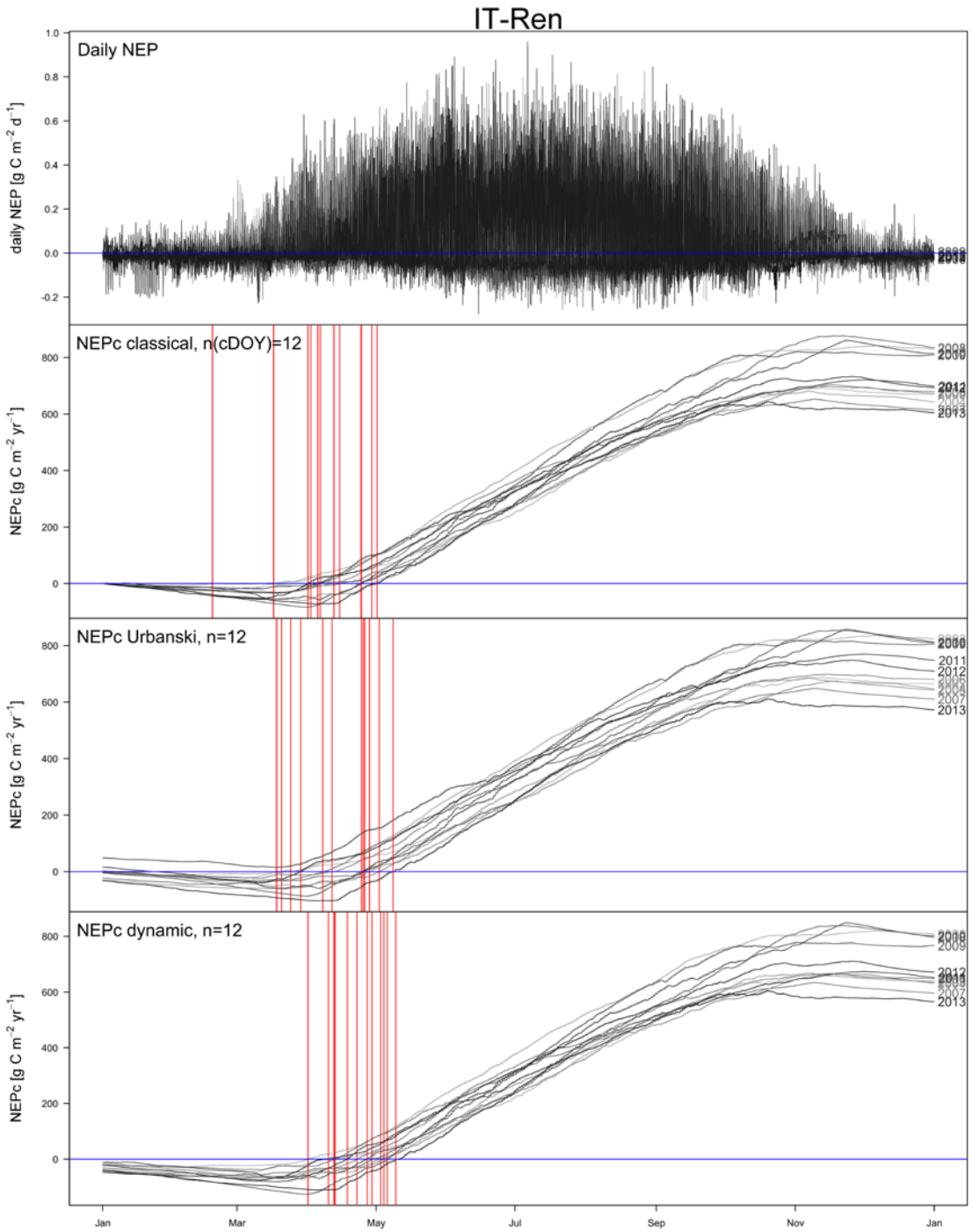

Figure S IT-REN. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Renon, Italy (IT-REN, Tab. 1). The red vertical lines depict the compensation days (cDOY).

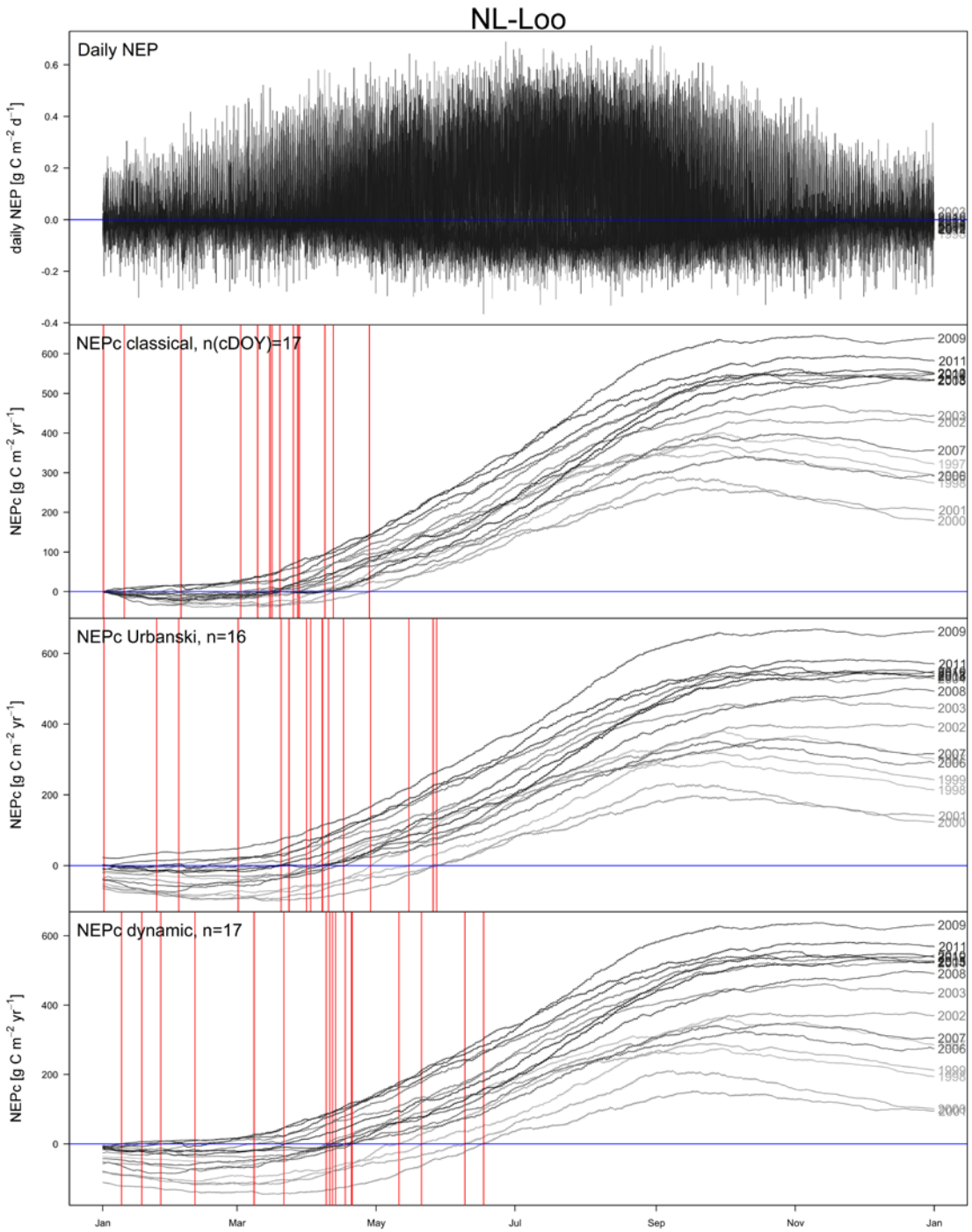

Figure S NL-LOO. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Loobos, The Netherlands (NL-LOO, Tab. 1). The red vertical lines depict the compensation days (cDOY).

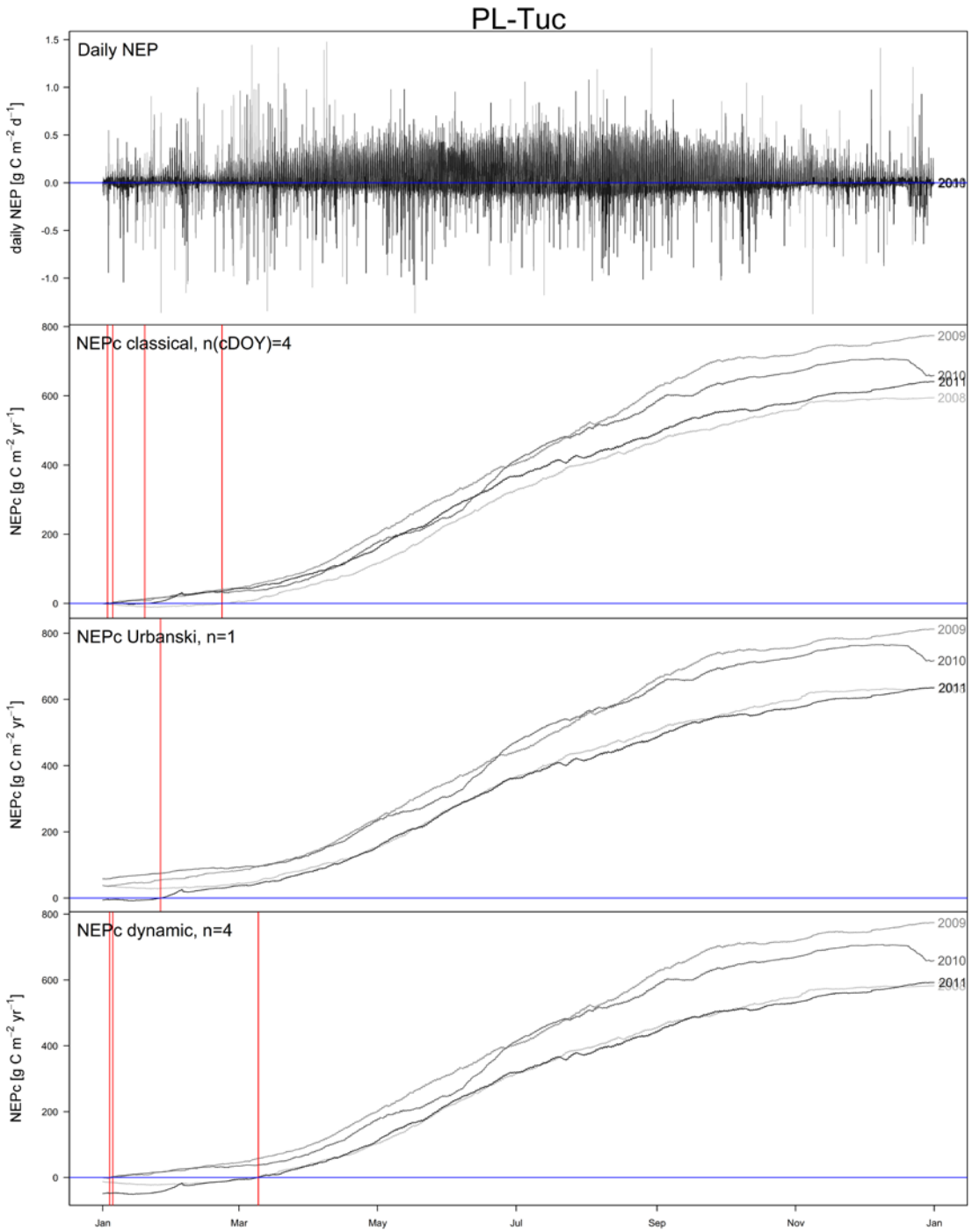

Figure S PL-TUC. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Tuczno, Poland (PL-TUC, Tab. 1). The red vertical lines depict the compensation days (cDOY).

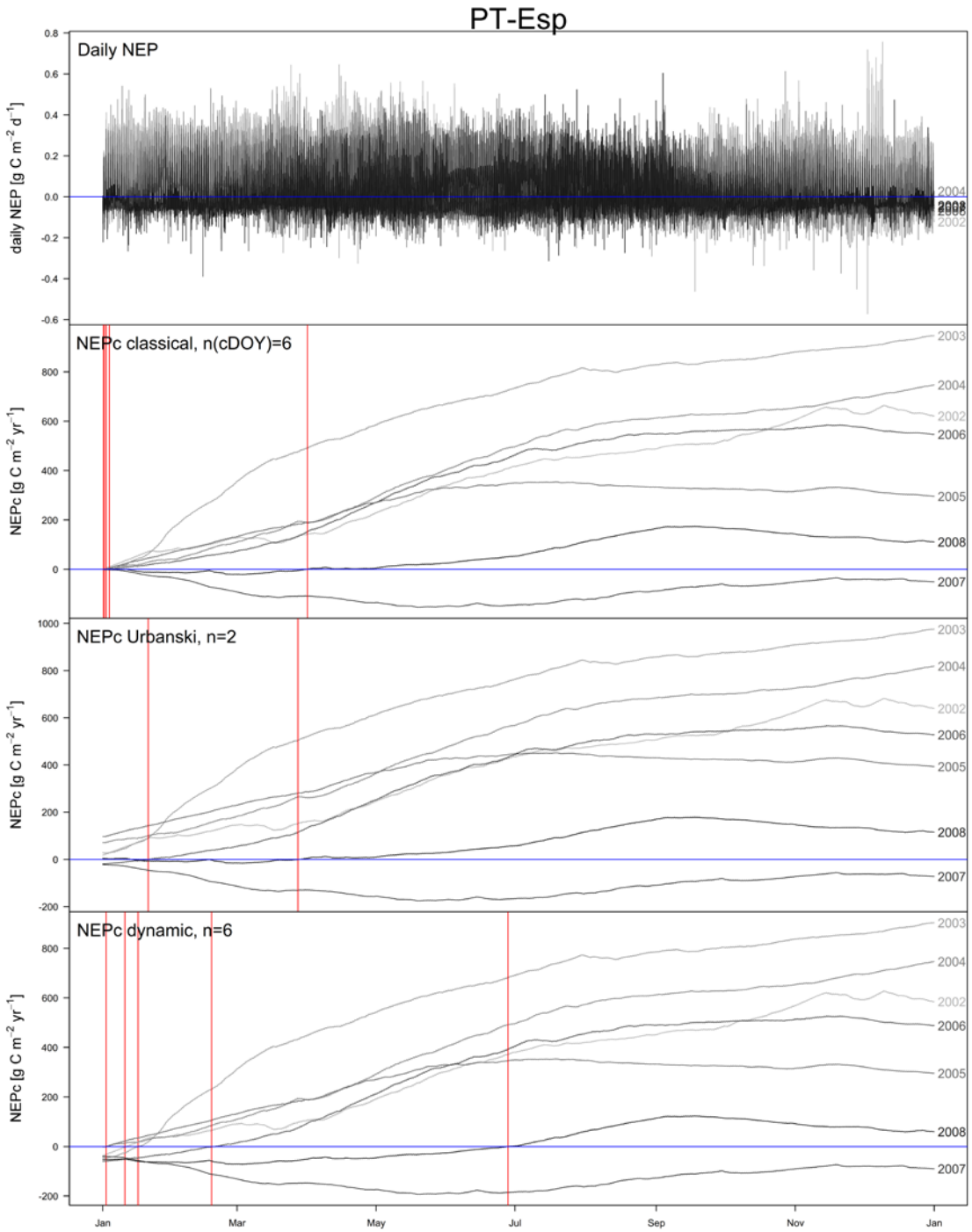

Figure S PT-ESP. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Espirra, Portugal (PT-ESP, Tab. 1). The red vertical lines depict the compensation days (cDOY).

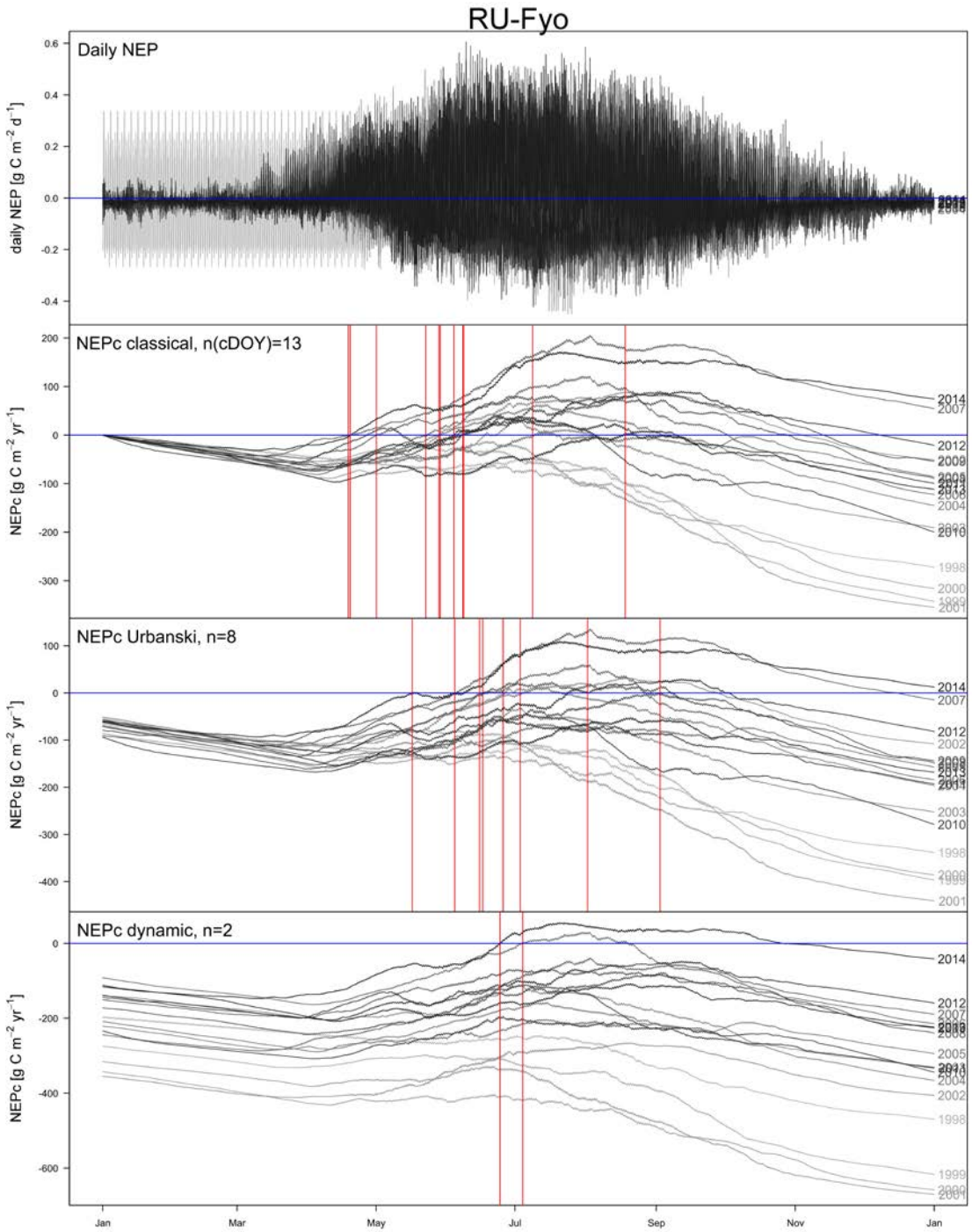

Figure S RU-FYO. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Fyodorovskoye, Russia (RU-FYO, Tab. 1). The red vertical lines depict the compensation days (cDOY).

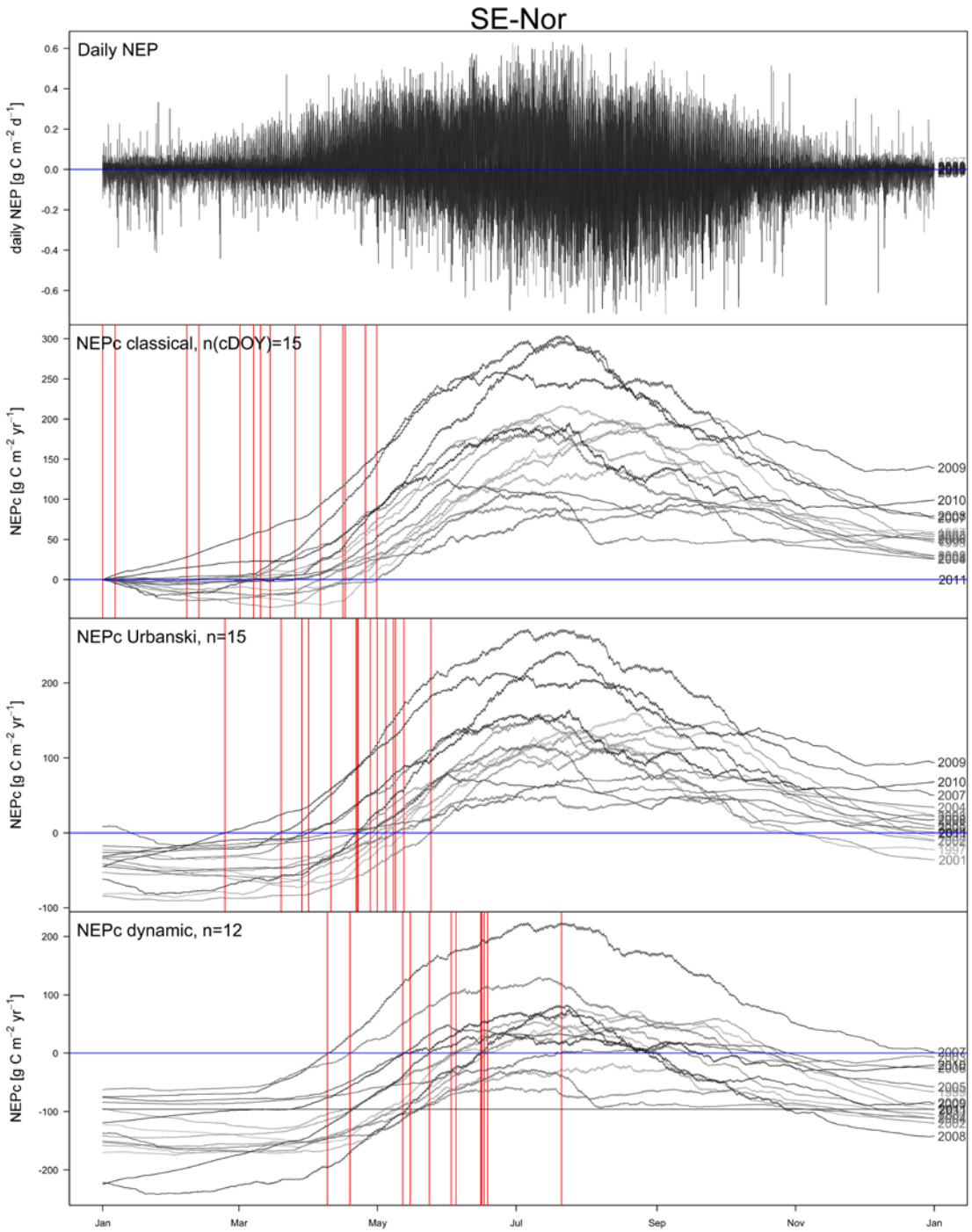

Figure S SE-NOR. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Norunda, Sweden (SE-NOR, Tab. 1). The red vertical lines depict the compensation days (cDOY).

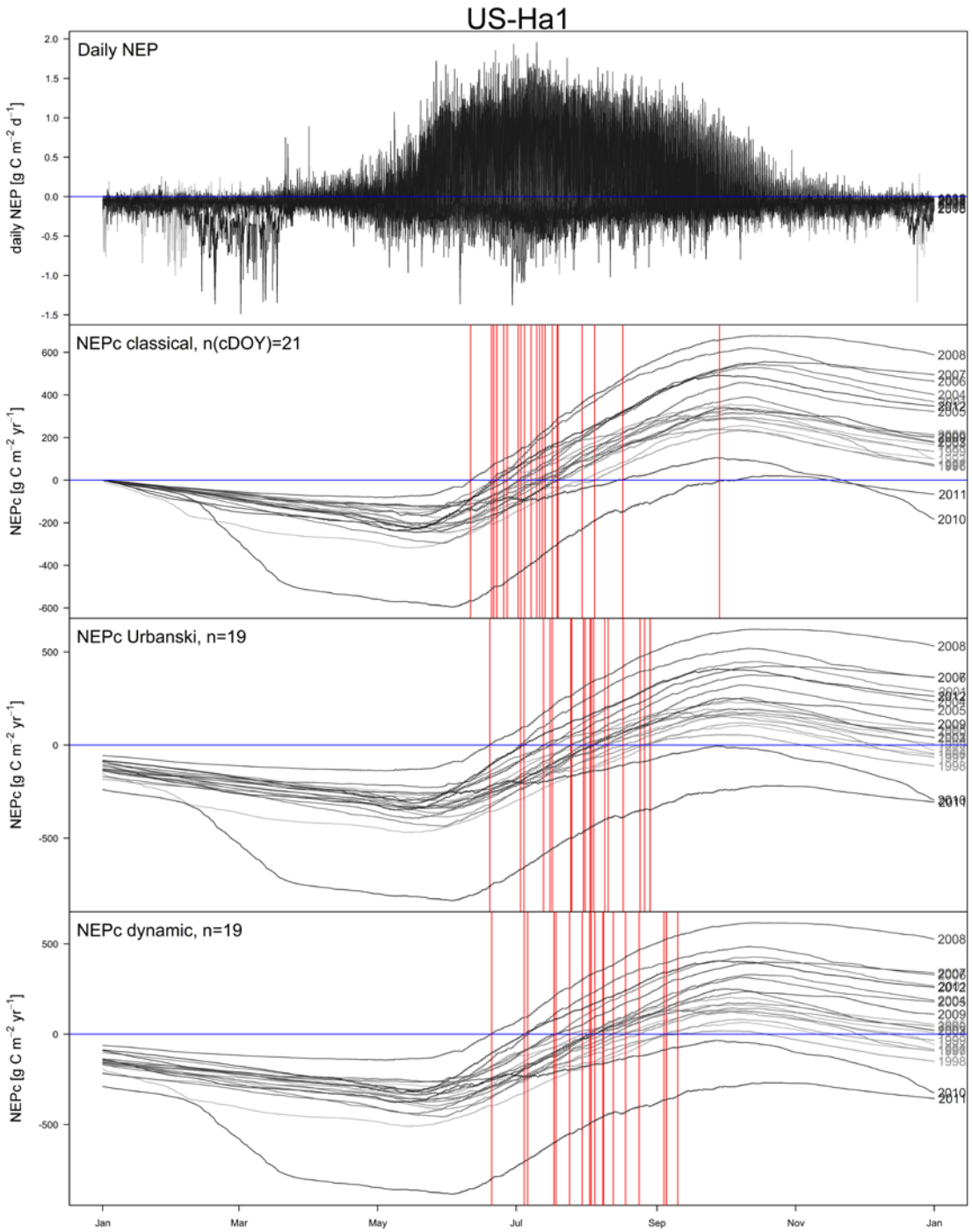

Figure S US-HA1. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Harvard Forest EMS Tower (HFR1), USA (US-HA1, Tab. 1). The red vertical lines depict the compensation days (cDOY).

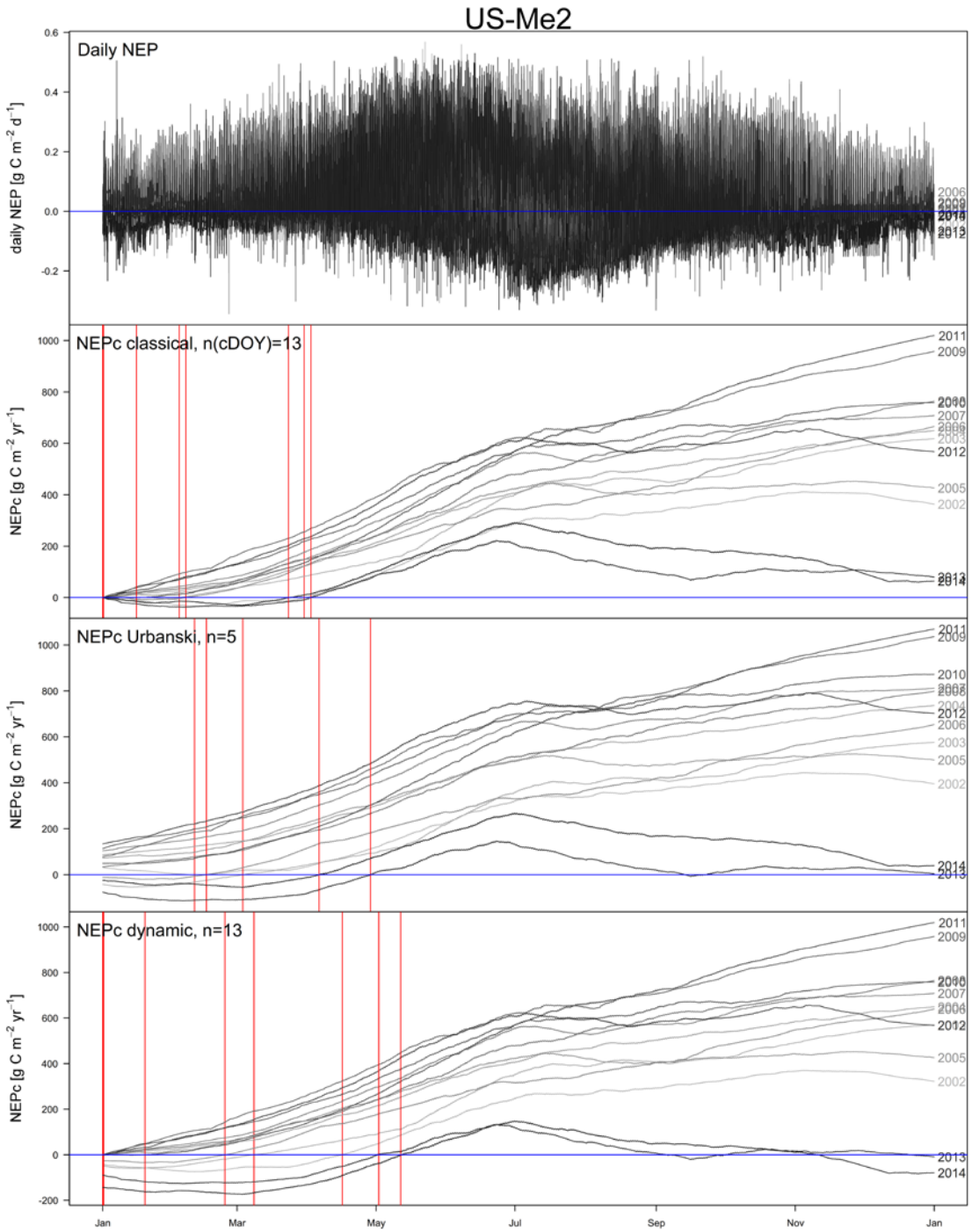

Figure S US-ME2. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Metolius-intermediate aged ponderosa pine, USA (US-ME2, Tab. 1). The red vertical lines depict the compensation days (cDOY).

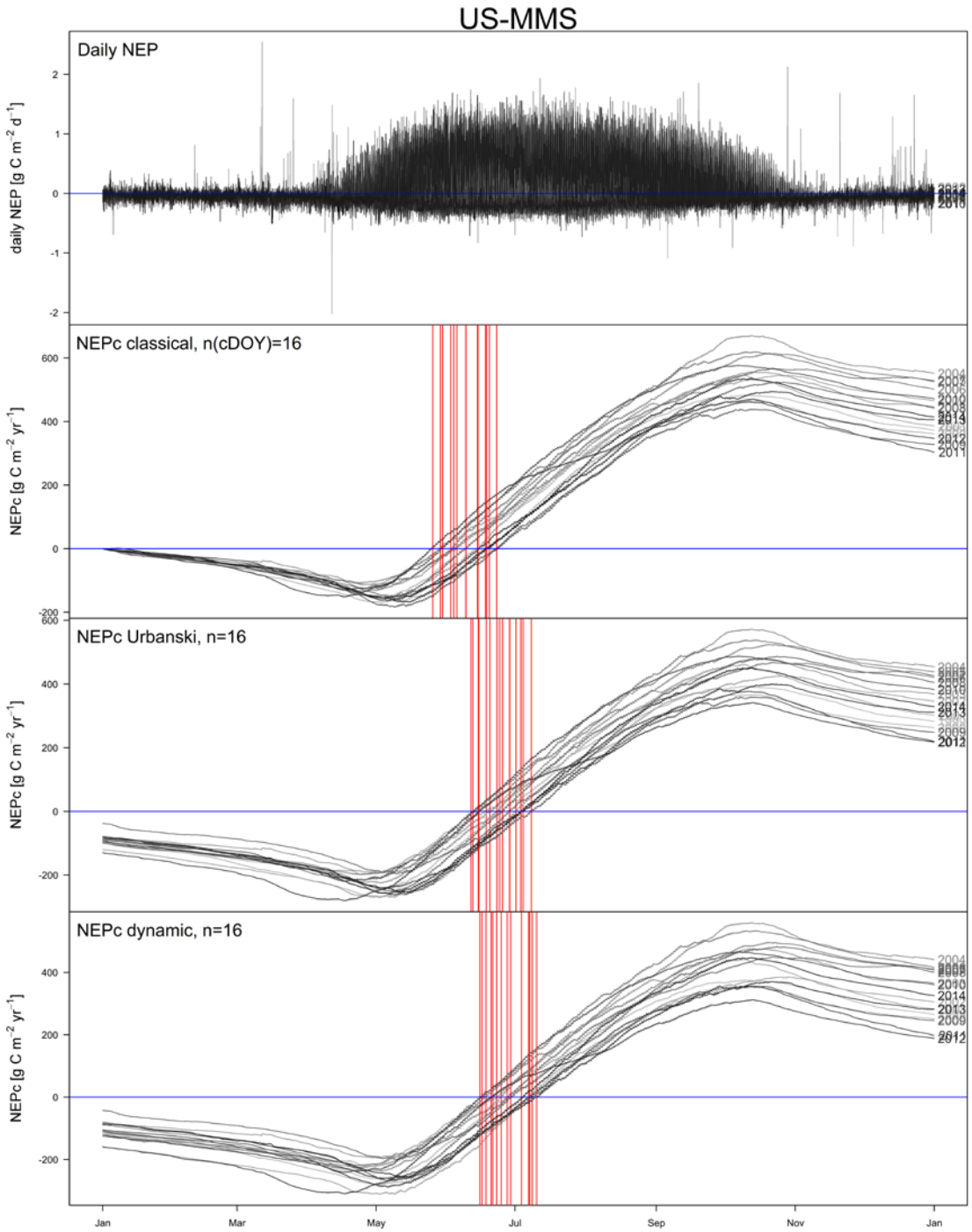

Figure S US-MMS. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Morgan Monroe State Forest, USA (US-MMS, Tab. 1). The red vertical lines depict the compensation days (cDOY).

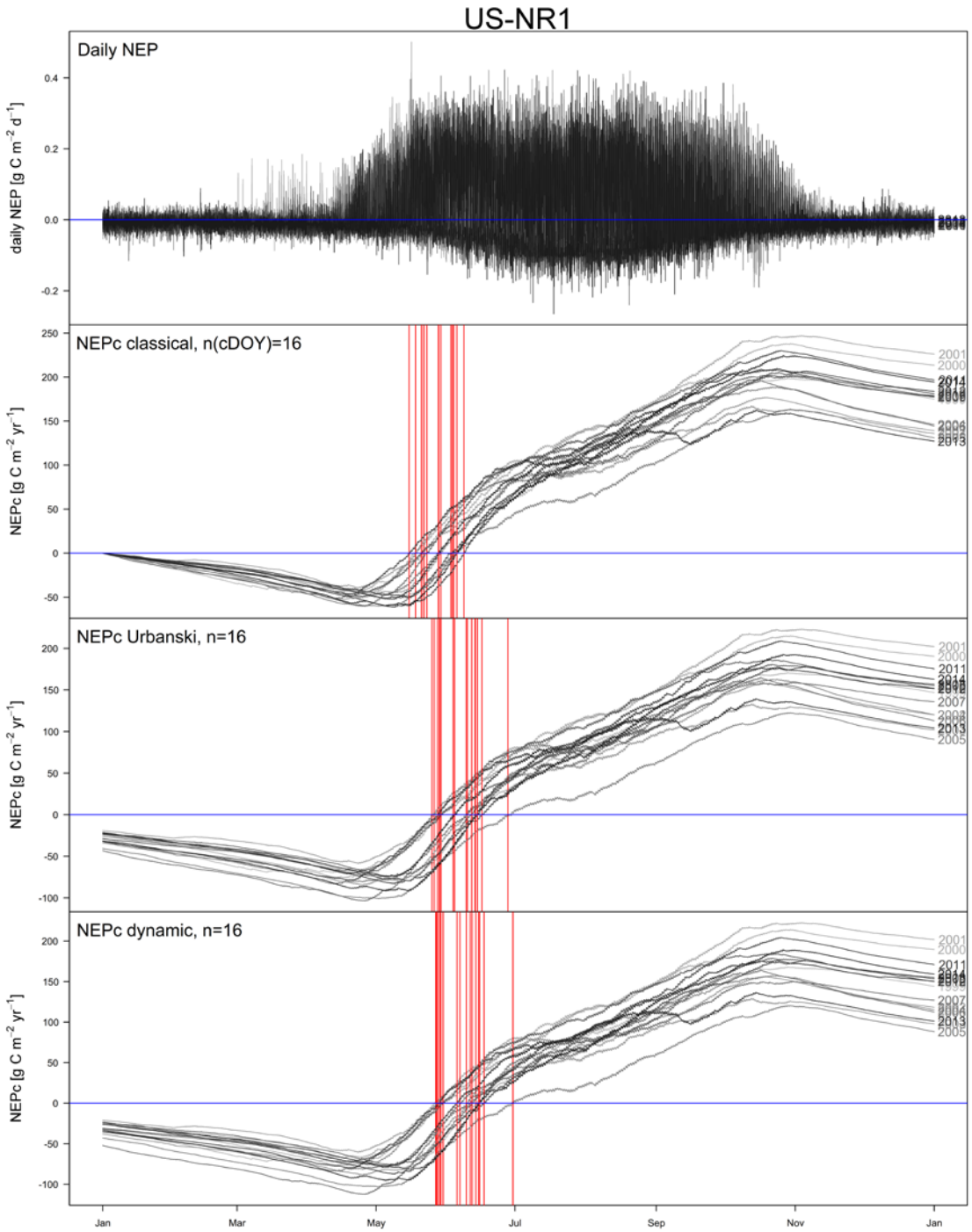

Figure S US-NR1. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Niwot Ridge Forest (LTER NWT1), USA (US-NR1, Tab. 1). The red vertical lines depict the compensation days (cDOY).

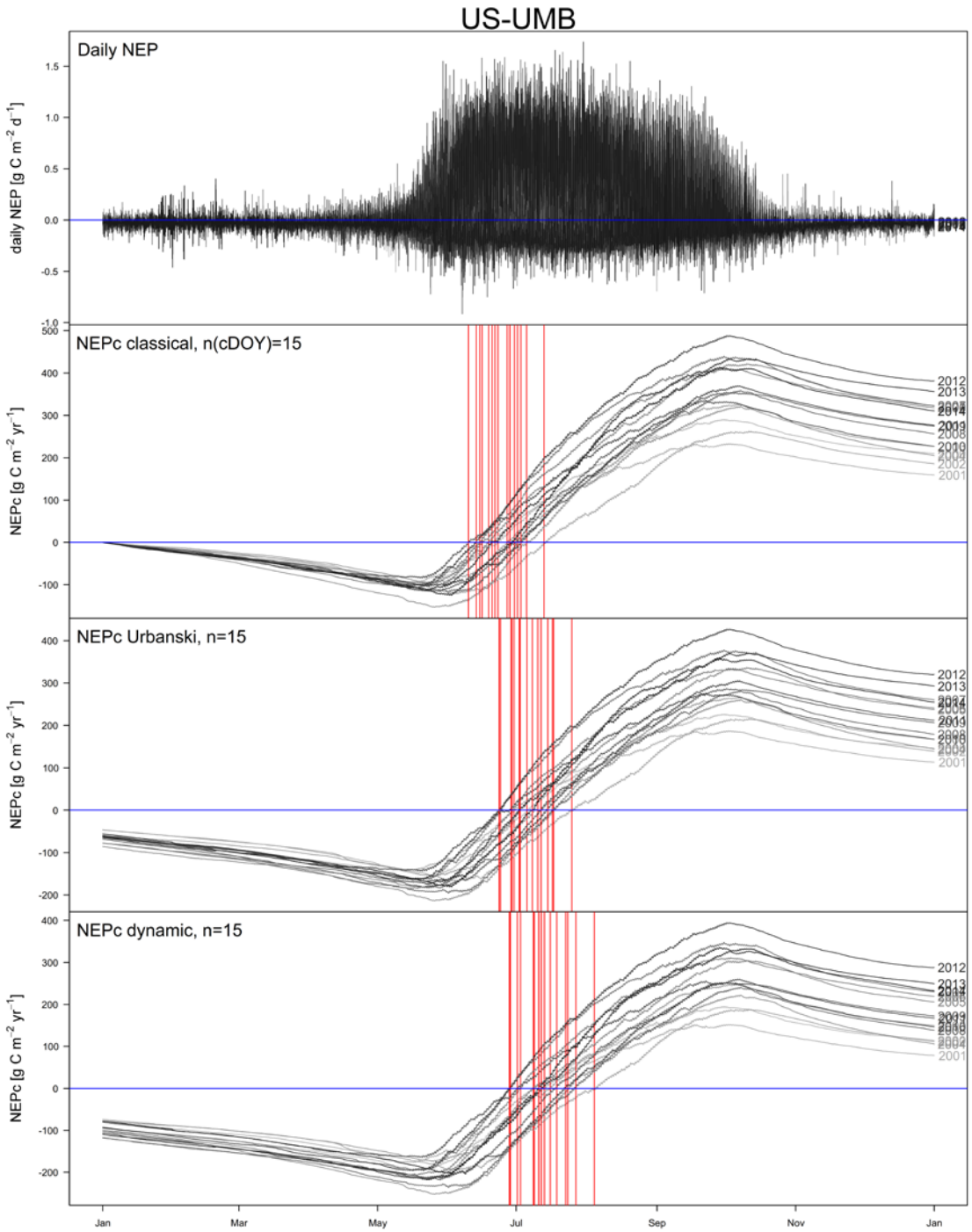

Figure S US-UMB. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Univ. of Mich. Biological Station, USA (US-UMB, Tab. 1). The red vertical lines depict the compensation days (cDOY).

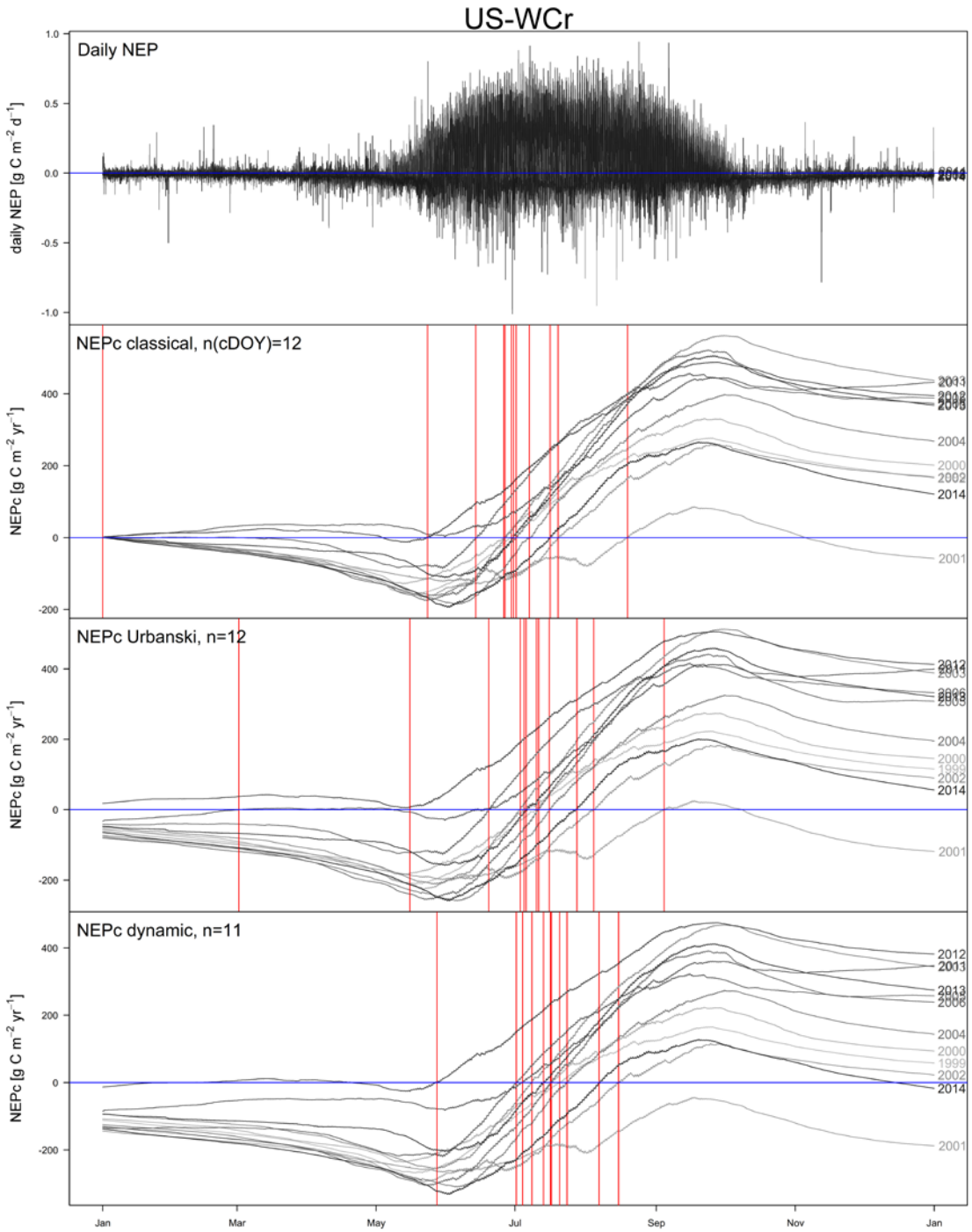

Figure S US-WCR. Daily net ecosystem productivity (NEP) [g C m^{-2} d^{-1}] and integrated NEP (NEP_c) [g C m^{-2} y^{-1}/integration $period^{-1}$] for three integration approaches (classical, Urbanski, dynamic, see Fig. 1) for Willow Creek, USA (US-WCR, Tab. 1). The red vertical lines depict the compensation days (cDOY).