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Supplement of

Wildfires in northern Eurasia affect the budget of black carbon in the Arctic – a 12-year retrospective synopsis (2002–2013)

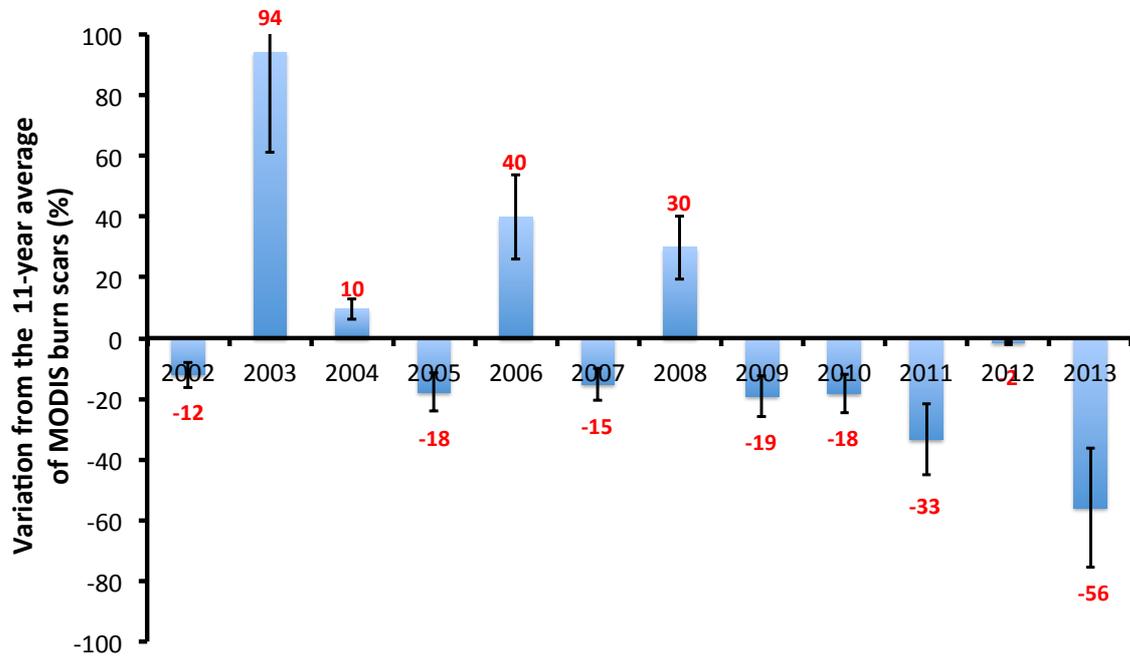
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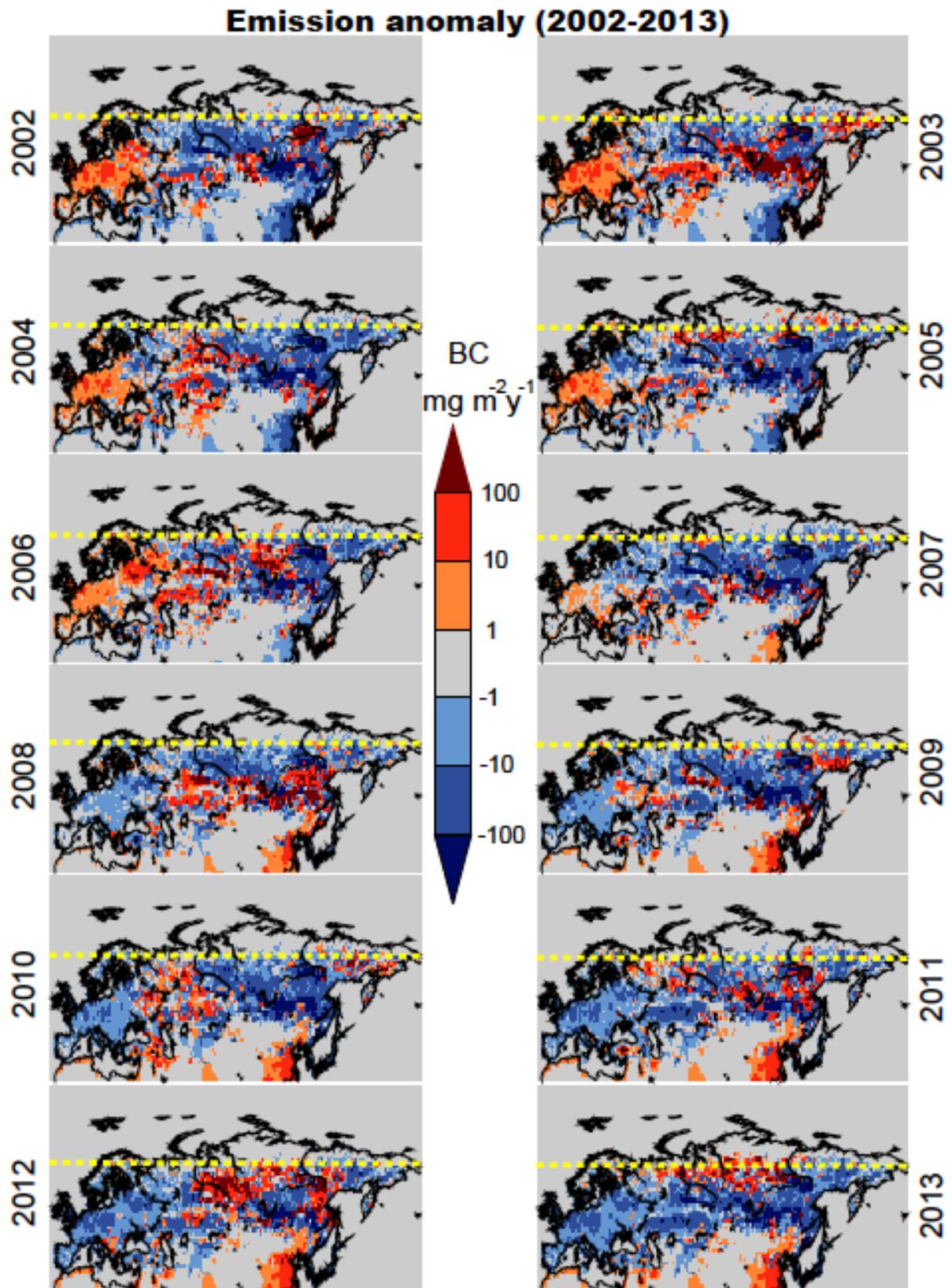
1 **SUPPLEMENTARY INFORMATION**

2

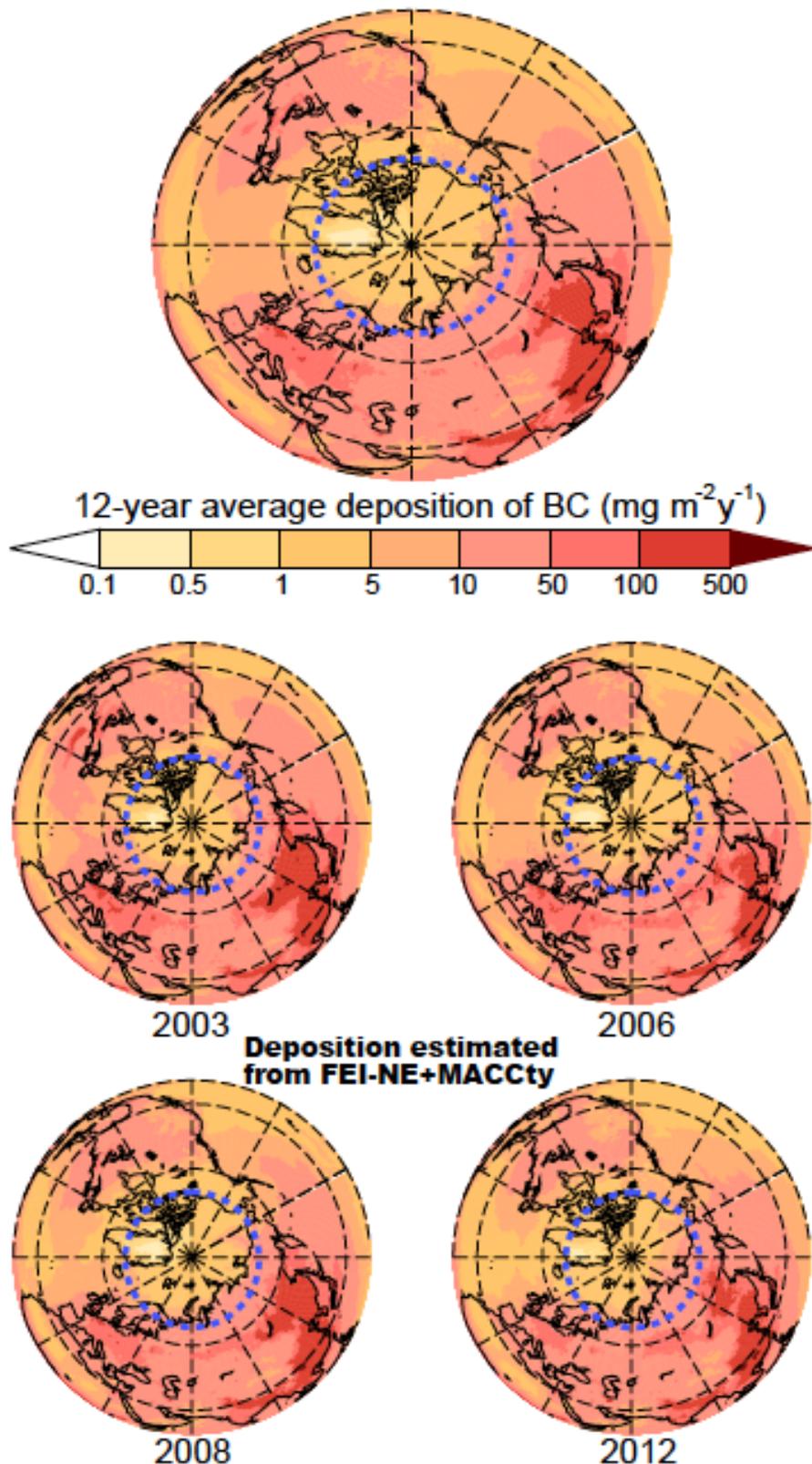


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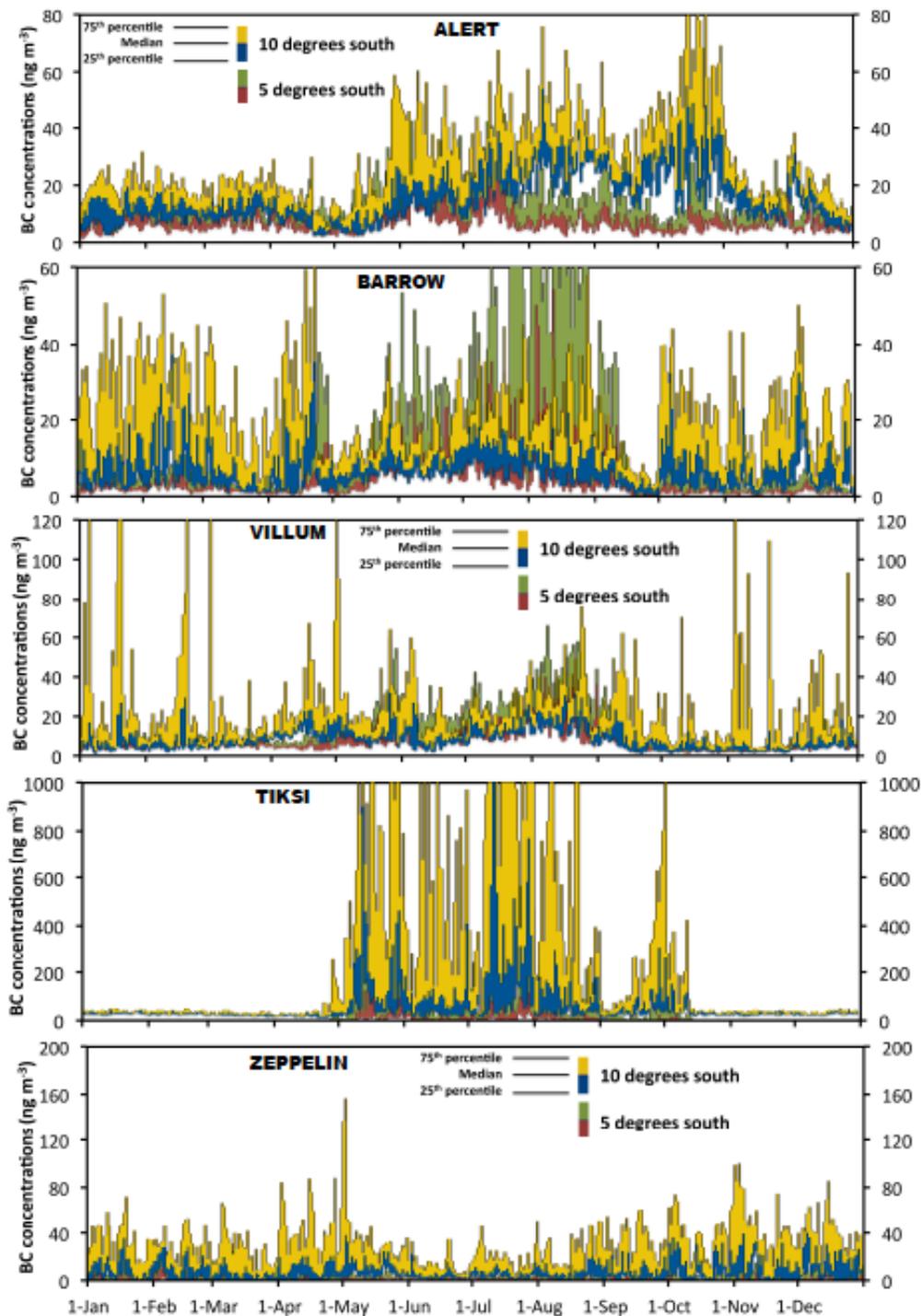
4 Figure S 1. Percentage variation of MODIS burn scars from the 12-year (2002–2013) average.
5 The most intense fire years are characterized by positive values comparing to the average for
6 the period 2002–2013 (1,075,208±378,399 burn scars).



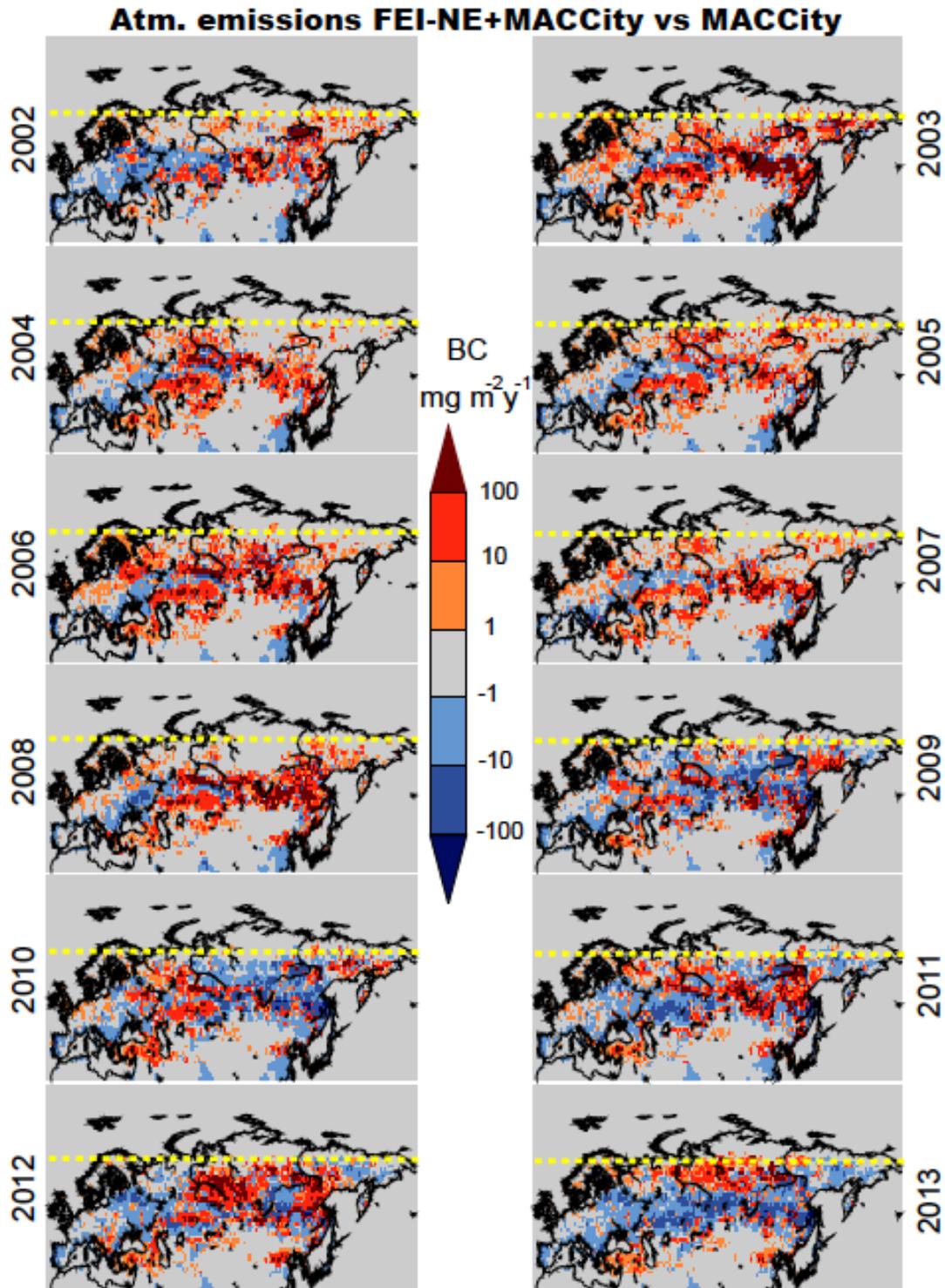
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 2 Figure S 2. Emission anomalies of BC ($\text{mg m}^{-2} \text{y}^{-1}$) in Northern Eurasia for the period 2002–
 3 2013 from our combined simulation (FEI-NE+MACCity). The dashed yellow line represents
 4 the border of the Arctic ($\sim 67^\circ\text{N}$).



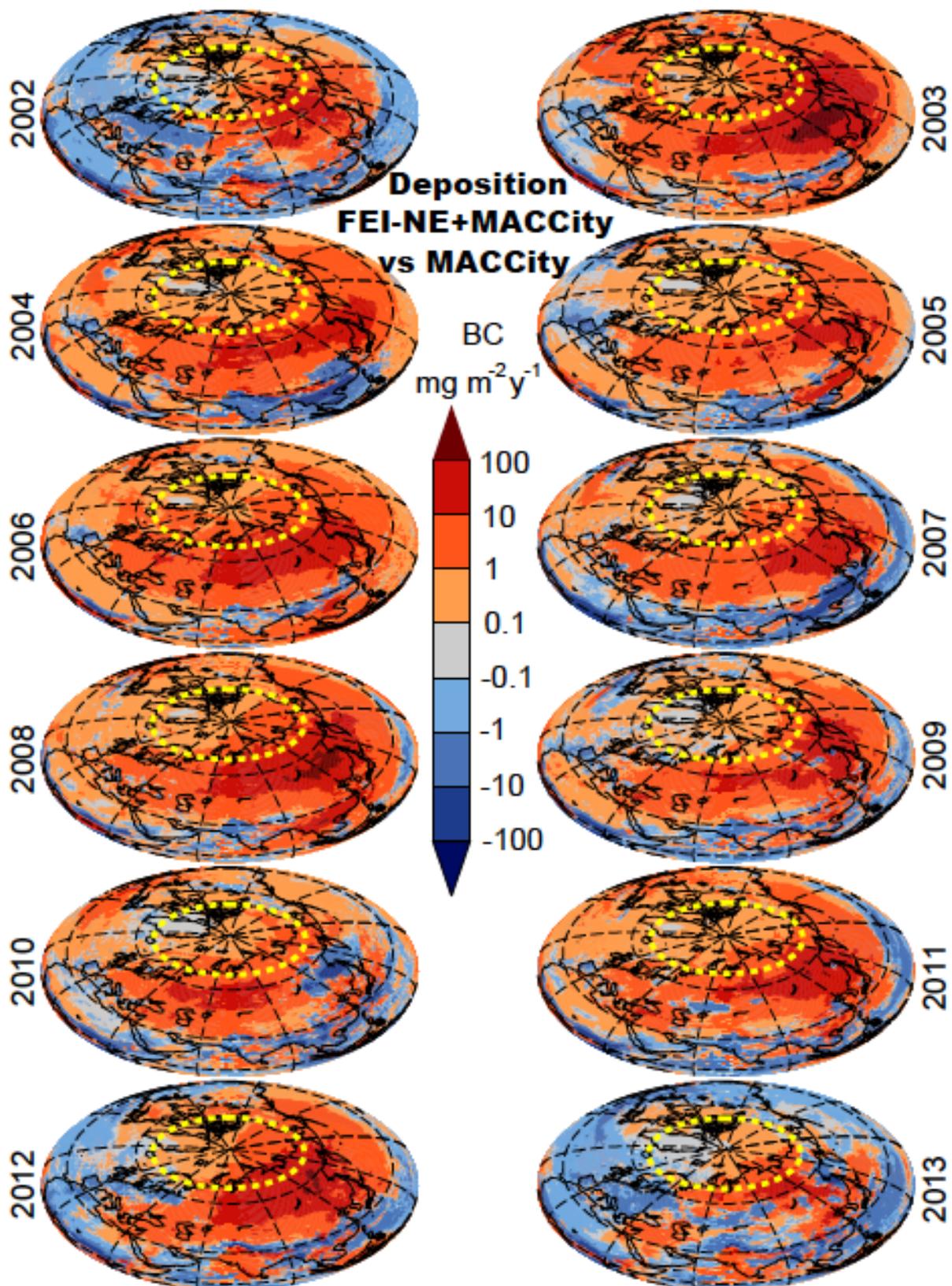
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 2 Figure S 3. Arctic deposition of BC ($\text{mg m}^{-2} \text{y}^{-1}$) over the Arctic (FEI-NE+MACCty
 3 simulation). The upper panel depicts the 11-year average deposition, while the lower 4 panels
 4 the most intense fire years (2003, 2006, 2008, and 2012). The dashed blue line represents the
 5 border of the Arctic ($\sim 67^\circ\text{N}$).



1
 2 Figure S 4. Surface modelled concentrations of BC for the FEI-NE+MACCity simulation in
 3 the Arctic stations 5° and 10° south of Alert, Barrow, Villum, Tiksi, and Zeppelin. The results
 4 are presented as Box & Whisker plots of surface daily concentrations of BC for the period
 5 2002–2013. The plots show the minimum value, the 25th percentile, which holds 25% of the
 6 values at or below it. The median is the 50th percentile, the third quartile is the 75th percentile
 7 and the maximum is the 100th percentile (i.e., 100% of the values are at or below it).



1
 2 Figure S 5. Difference in atmospheric emissions of BC ($\text{mg m}^{-2} \text{y}^{-1}$) between our combined
 3 simulation (FEI-NE+MACCity) and MACCity. The dashed yellow line represents the border
 4 of the Arctic ($\sim 67^\circ\text{N}$). Emissions were estimated by summing all the vertical layers for 365
 5 days of each of the years (2002–2013). Negative values were only observed in latitudes above
 6 35°N over Northern Eurasia, as a result of the difference in the emissions between FEI-
 7 NE+MACCity and MACCity simulations.



1
 2 Figure S 6. Difference in Arctic deposition of BC ($\text{mg m}^{-2} \text{y}^{-1}$) between our combined
 3 simulation (FEI-NE+MACCity) and MACCity. The dashed yellow line represents the border
 4 of the Arctic ($\sim 67^\circ\text{N}$). Deposition was estimated by summing all the 365 days of each of the
 5 years (2002–2013).