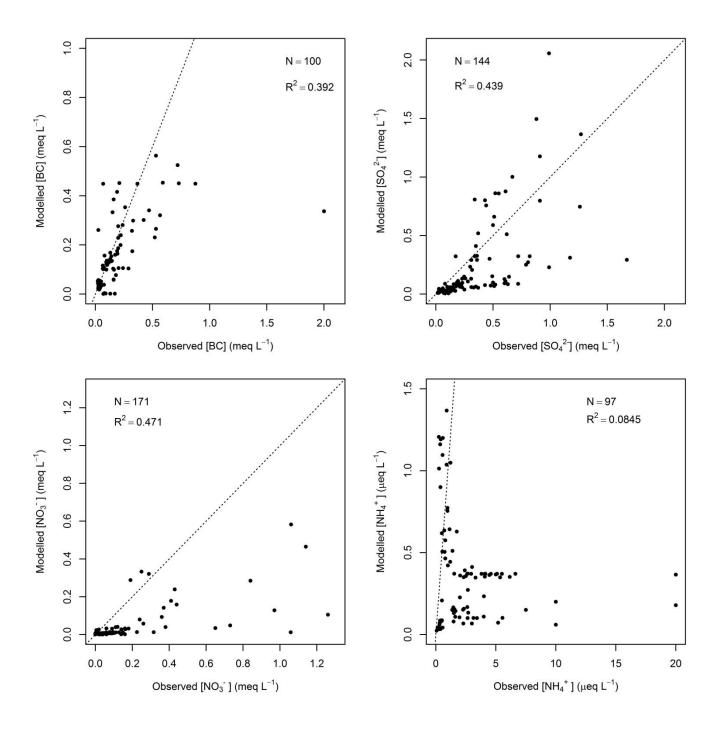
Supplementary Figures STOTEN-27089

Modelling study of soil C, N and pH response to air pollution and climate change using European LTER site observations

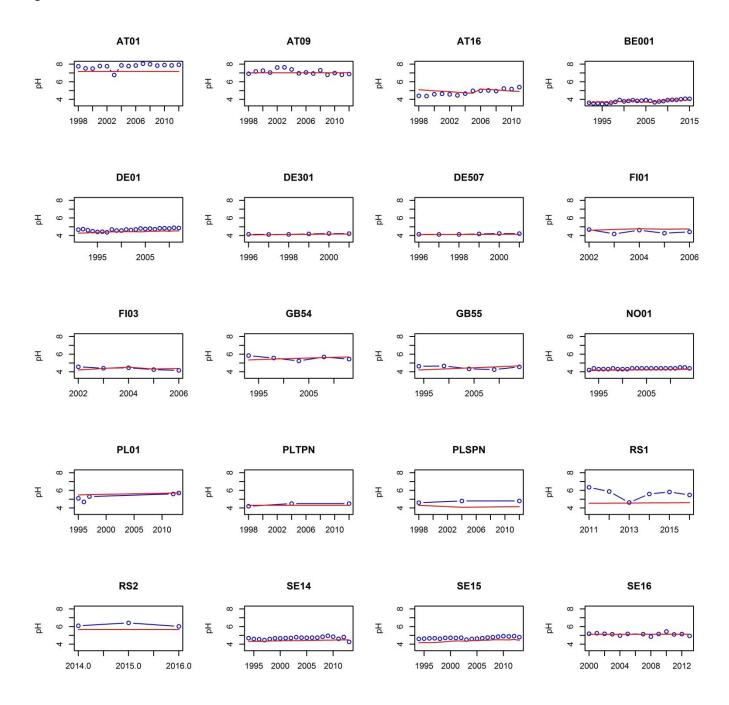
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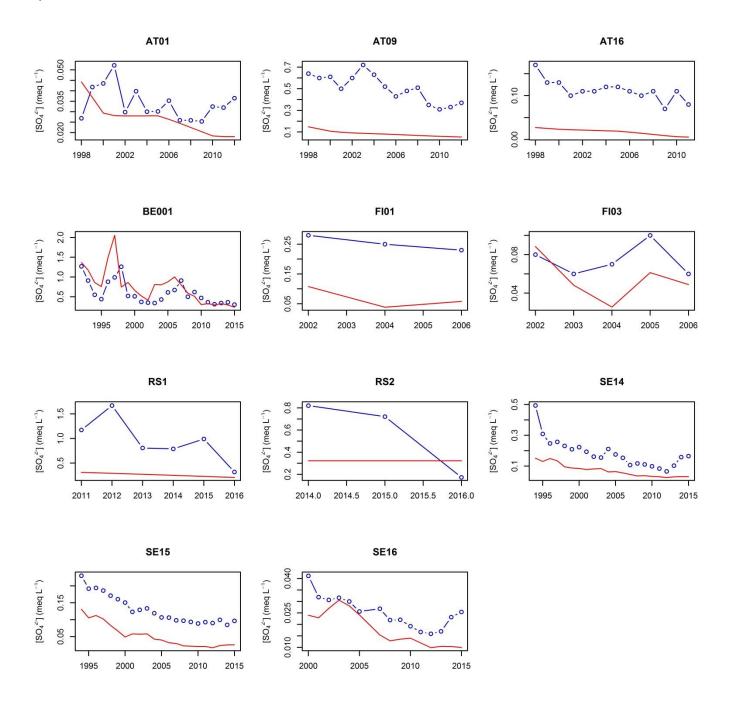
- **Figure A1**. Modelled versus observed values of soil solution concentrations of base cations (BC = Ca + Mg + K) (meq L⁻¹), sulphate SO_4^{2-} (meq L⁻¹), nitrate NO_3^{-} (meq L⁻¹) and ammonium NH_4^{+} (µeq L⁻¹).
- **Figure A2**. Time plots of observed (blue broken line) and modelled (red solid line) values of soil solution pH at those 20 sites for which there are at least three years of observations. Site codes in Suppl. Table A1.
- **Figure A3**. Time plots of observed (blue broken line) and modelled (red solid line) values of soil solution sulphate concentrations $[SO_4^{2-}]$ (meq L^{-1}) at those 11 sites for which there are at least three years of observations. Site codes in Suppl. Table A1.
- **Figure A4**. Time plots of observed (blue broken line) and modelled (red solid line) values of soil solution nitrate concentrations $[NO_3^-]$ (meq L^{-1}) at those 13 sites for which there are at least three years of observations. Site codes in Suppl. Table A1.
- **Figure A5**. Time plots of observed (blue broken line) and modelled (red solid line) values of soil solution nitrate concentrations $[NH_4^+]$ ($\mu eq L^{-1}$) at those 8 sites for which there are at least three years of observations. Site codes in Suppl. Table A1.
- **Figure A6**. Time plots of observed (blue broken line) and modelled (red solid line) values of soil solution base cation concentrations (sum of calcium, magnesium and potassium) [BC²⁺] (meq L⁻¹) at those 8 sites for which there are at least three years of observations. Site codes in Suppl. Table A1.
- **Figure A7a.** Time plots of simulated soil base saturation (BS, fraction 0-1) with 24 climate change scenarios, twelve representing climate forcing level RCP4.5 (light blue) and twelve RCP8.5 (orange).
- **Figure A7b.** Time plots of simulated soil base saturation (BS, fraction 0-1) with 24 climate change scenarios, twelve representing climate forcing level RCP4.5 (light blue) and twelve RCP8.5 (orange).
- **Figure A8a.** Time plots of simulated soil carbon to nitrogen ratio (C:N g g⁻¹) with 24 climate change scenarios, twelve representing climate forcing level RCP4.5 (light blue) and twelve RCP8.5 (orange).
- **Figure A8b.** Time plots of simulated soil carbon to nitrogen ratio (C:N g g⁻¹) with 24 climate change scenarios, twelve representing climate forcing level RCP4.5 (light blue) and twelve RCP8.5 (orange).
- **Figure A9a.** Time plots of simulated soil solution pH with 24 climate change scenarios, twelve representing climate forcing level RCP4.5 (light blue) and twelve RCP8.5 (orange).
- **Figure A9b.** Time plots of simulated soil solution pH with 24 climate change scenarios, twelve representing climate forcing level RCP4.5 (light blue) and twelve RCP8.5 (orange).



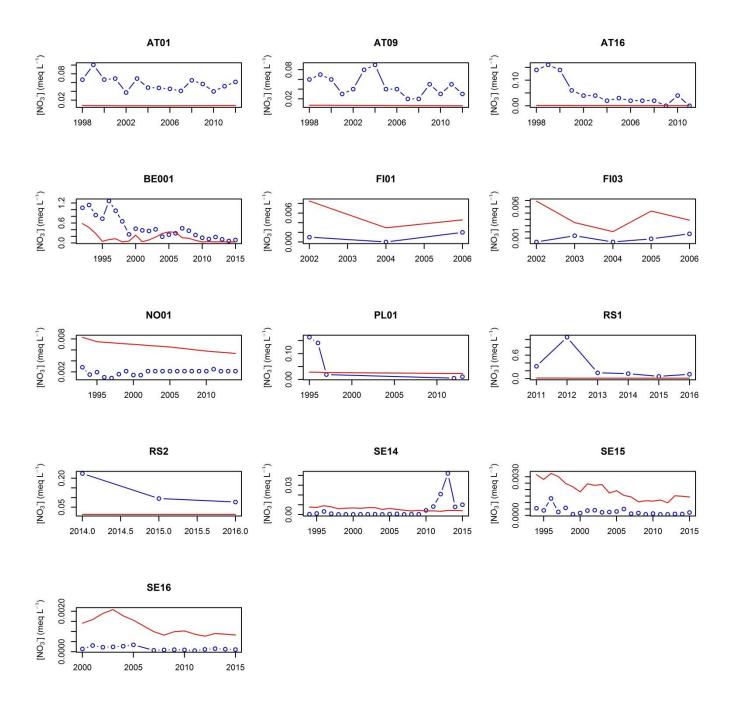
Supplementary Figure A1. Modelled versus observed values of soil solution concentrations of base cations (BC = Ca + Mg + K) (meq L⁻¹), sulphate SO_4^{2-} (meq L⁻¹), nitrate NO_3^{--} (meq L⁻¹) and ammonium NH_4^+ (µeq L⁻¹). Dashed line represents 1:1. Number of observations (N) and coefficient of determination (R²) shown.



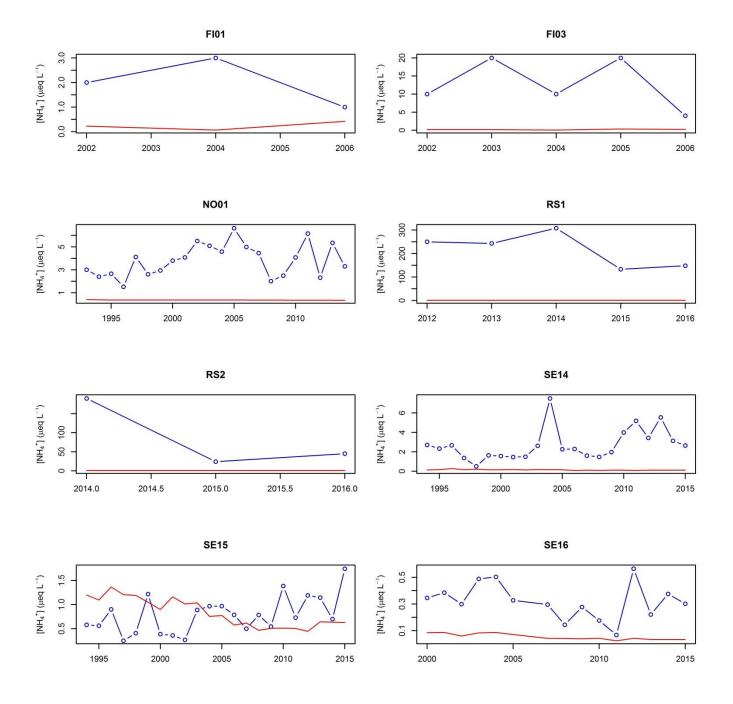
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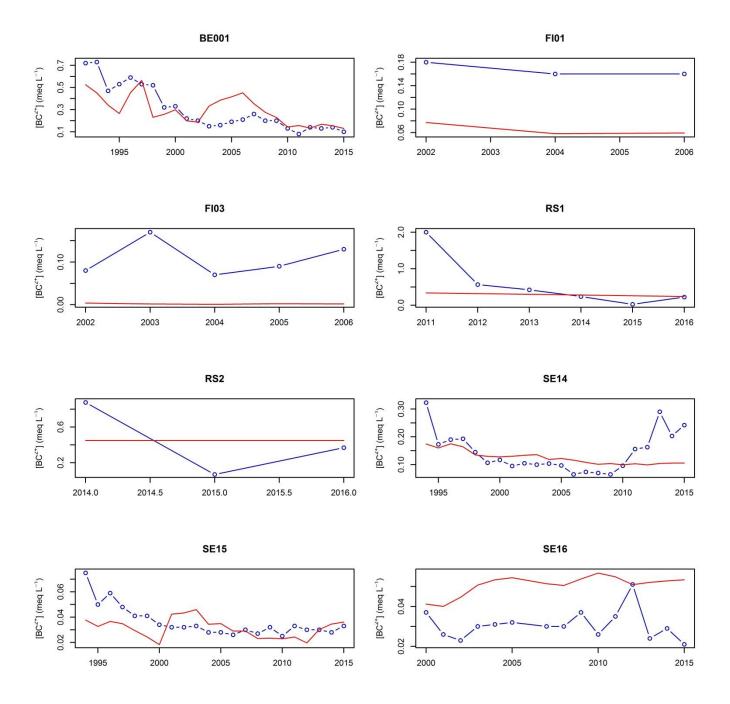
Supplementary Figure A3. Time plots of observed (blue broken line) and modelled (red solid line) values of soil solution sulphate concentrations $[SO_4^{2-}]$ (meq L^{-1}) at those 11 sites for which there are at least three years of observations. Site codes correspond to Supplementary Table A1.



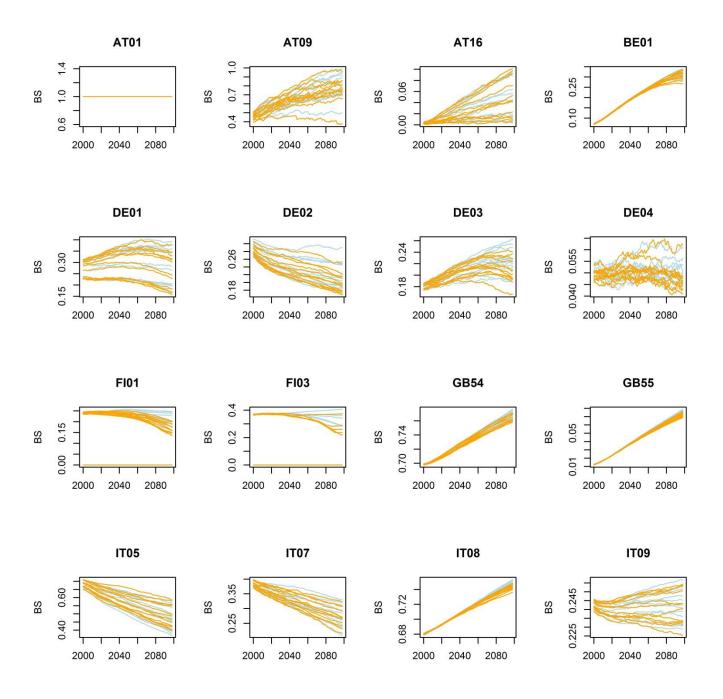
Supplementary Figure A4. Time plots of observed (blue broken line) and modelled (red solid line) values of soil solution nitrate concentrations [NO₃⁻] (meq L⁻¹) at those 13 sites for which there are at least three years of observations. Site codes correspond to Supplementary Table A1.



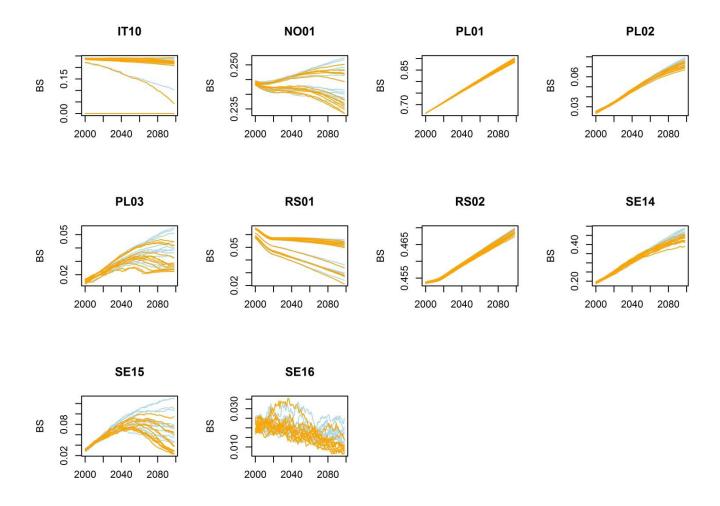
Supplementary Figure A5. Time plots of observed (blue broken line) and modelled (red solid line) values of soil solution nitrate concentrations $[NH_4^+]$ ($\mu eq~L^{-1}$) at those 8 sites for which there are at least three years of observations. Site codes correspond to Supplementary Table A1.



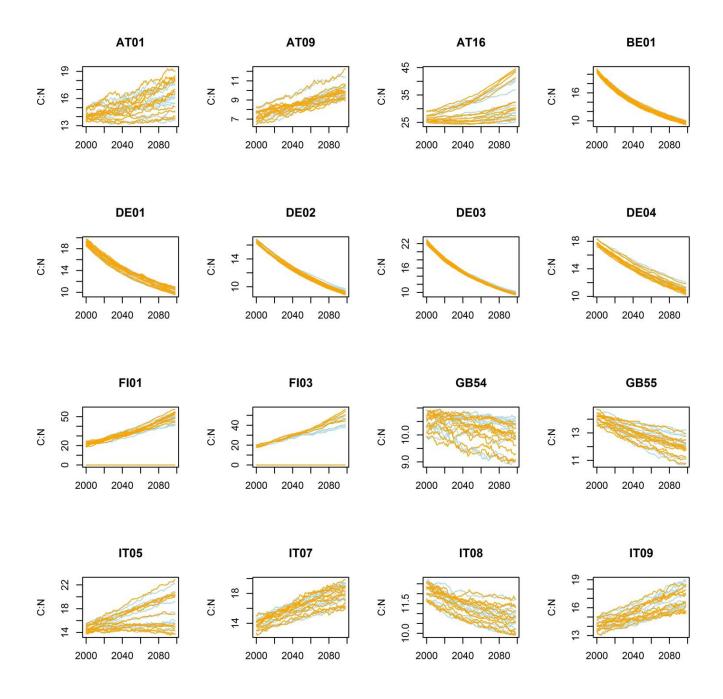
Supplementary Figure A6. Time plots of observed (blue broken line) and modelled (red solid line) values of soil solution base cation concentrations (sum of calcium, magnesium and potassium) [BC^{2+}] (meq L^{-1}) at those 8 sites for which there are at least three years of observations. Site codes correspond to Supplementary Table A1.



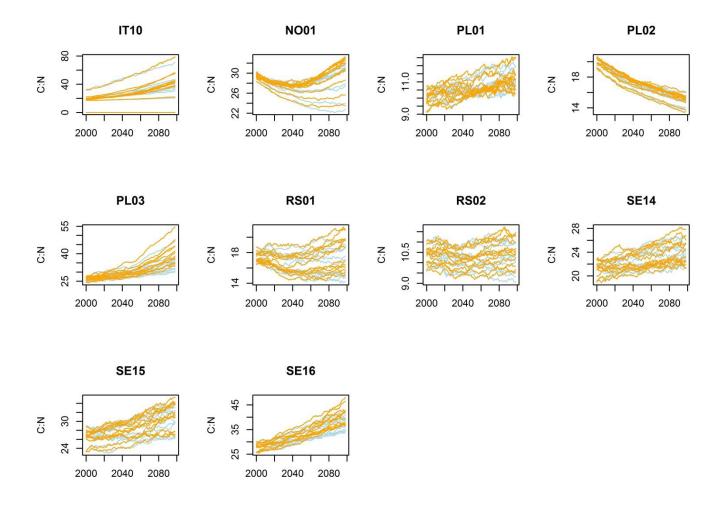
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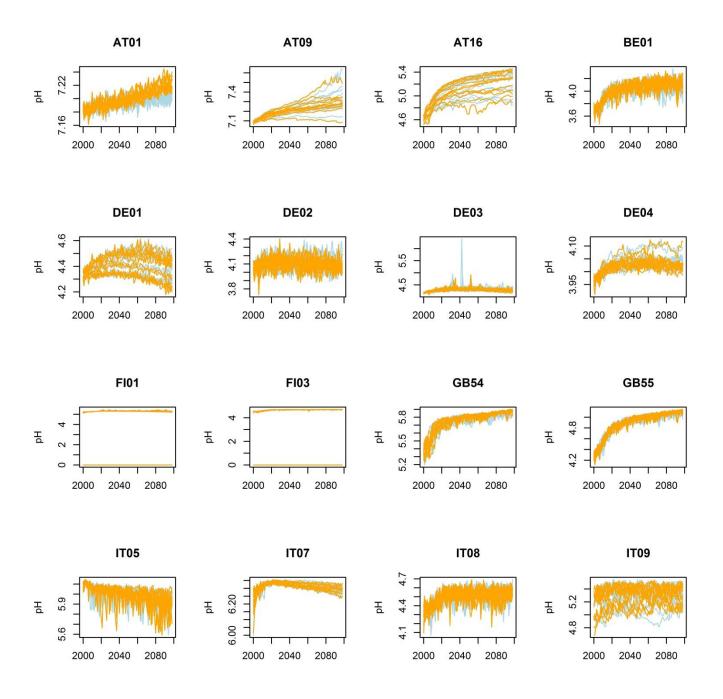
Supplementary Figure A7b. Time plots of simulated soil base saturation (BS, fraction 0-1) with 24 climate change scenarios, twelve representing climate forcing level RCP4.5 (light blue) and twelve RCP8.5 (orange). PL02 is PLSNP and PL03 is PLTNP in Supplementary Table A1.



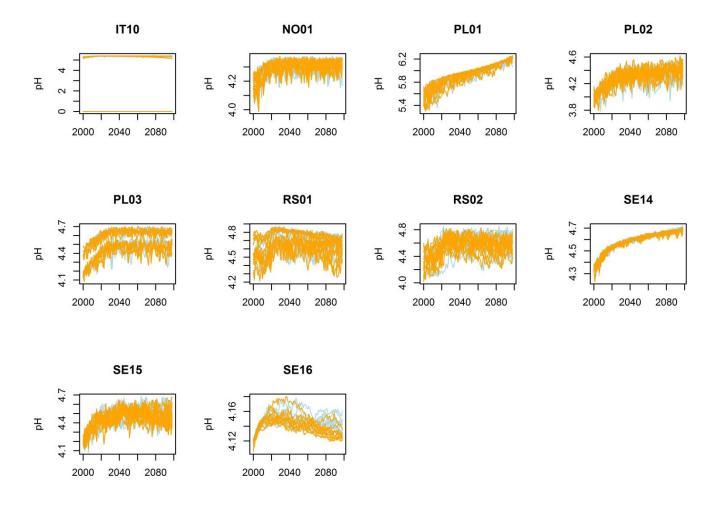
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Supplementary Figure A8b. Time plots of simulated soil carbon to nitrogen ratio (C:N g g⁻¹) with 24 climate change scenarios, twelve representing climate forcing level RCP4.5 (light blue) and twelve RCP8.5 (orange). PL02 is PLSNP and PL03 is PLTNP in Supplementary Table A1.



Supplementary Figure A9a. Time plots of simulated soil solution pH with 24 climate change scenarios, twelve representing climate forcing level RCP4.5 (light blue) and twelve RCP8.5 (orange). BE01 is BE001, DE03 is DE301 and DE04 is DE507 in Supplementary Table A1.



Supplementary Figure A9b. Time plots of simulated soil solution pH with 24 climate change scenarios, twelve representing climate forcing level RCP4.5 (light blue) and twelve RCP8.5 (orange). PL02 is PLSNP and PL03 is PLTNP in Supplementary Table A1.